TRI-COUNTY Multi-Jurisdictional Natural Hazards Mitigation Plan

January 2019

Participants

Bartonville, Village of
Chillicothe, City of
East Peoria, City of
Eureka, City of
Germantown Hills, Village of
Hanna City, Village of
Morton, Village of
Pekin, City of
Peoria, City of
Peoria Heights, Village of
Roanoke, City of
Tazewell County
Tri-County Regional Planning Commission
Tremont, Village of
Washington, City of
Woodford County

The five year update of this Plan must be completed on or before October 23, 2024.

ACKNOWLEDGEMENTS

Updating this Plan in a way that will be useful for the participating jurisdictions involved a considerable amount of cooperation. For this update, more emphasis was needed on developing specific mitigation projects for the participating jurisdictions. Through this effort, approximately 220 specific mitigation actions are identified and described. This is a substantial accomplishment that was achieved through many phone calls, one-on-one discussions, and small group meetings that were conducted in addition to the Mitigation Advisory Committee meetings held in East Peoria.

This updated Plan should serve as the "road map" to better protect current residents from the physical and emotional impacts caused by severe weather and other natural hazards. Information assembled in this Plan clearly describes these impacts, and the weather information collected over the past 60+ years in the Tri-County area and the rest of Illinois supports the weather findings in our neighboring states—that there has been a continuing increase in the number of severe weather events. Even if this increase was not occurring, this Plan provides local leaders with the information they need to reduce the impacts that will continue to be caused by future severe weather events.

We strongly encourage those who read this Plan and other residents throughout the Tri-County area to support their county EMA coordinators and municipal officials in actively seeking the implementation of the mitigation actions identified in this document.

Identifying, verifying and gathering information about severe weather events involved research into various files and discussions with individuals. Chris Miller and Heather Stanley at the National Weather Service Weather Forecast Office in Lincoln kindly responded to requests for additional information and helped verify natural hazard events, especially tornadoes, within the Tri-County area. Tony O'Neal, Ameren Illinois, was able to provide infrastructure damage information for several of the major severe storms and severe winter storms between 2010 and 2017. This information was not available in state or federal databases and provides a glimpse into the scope of the damages sustained to infrastructure as a result of natural hazard events that have impacted the area.

Cover photographs from top to bottom and left to right:

- *November 17, 2013 EF4 tornado destroyed homes in Washington*
  Photograph obtained from National Weather Service Weather Forecast Office in Lincoln
- *April 17 & 18, 2013 flooding damaged homes in Roanoke*
  Photograph provided courtesy of the Village of Roanoke
- *February 28, 2017 EF3 tornado damaged homes near Washburn*
  Photograph provided courtesy of the Woodford County Emergency Management Agency

TRI-COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

TAZEWELL COUNTY, ILLINOIS
WOODFORD COUNTY, ILLINOIS
PARTICIPATING PEORIA COUNTY, ILLINOIS MUNICIPALITIES

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Researched and written for the Tri-County Mitigation Advisory Committee
by Andrea J. Bostwick and Greg R. Michaud
American Environmental Corporation

American Environmental

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1.0 INTRODUCTION

1.0 INTRODUCTION

Each year natural hazards (i.e., severe thunderstorms, tornadoes, severe winter storms, flooding, etc.) cause damage to property and threaten the lives and health of the residents of the Tri-County area. Since 1973, the Tri-County area has been a part of 12 federal disaster declarations. **Figure 1** identifies each declaration including the year the disaster was declared, the counties covered under the declaration and the type of natural hazard that triggered the declaration.

Figure 1
Federal Disaster Declarations: Tri-County Area

Declaration Number	Year	Natural Hazard(s) Covered by Declaration	County(s) Covered
373	1973	severe storms; flooding	Tazewell & Peoria
438	1974	severe storms; flooding	Tazewell, Woodford & Peoria
583	1979	severe storms; flooding	Tazewell, Woodford & Peoria
674	1982	severe storms; flooding	Tazewell, Woodford & Peoria
735	1985	severe storms; flooding	Tazewell, Woodford & Peoria
871	1990	severe storms; flooding; tornadoes	Tazewell
1469	2003	severe storms; tornadoes	Tazewell & Woodford
1681	2006	severe winter storm	Woodford
1800	2008	severe storms; flooding	Woodford & Peoria
1960	2011	severe winter storm	Tazewell, Woodford & Peoria
4116	2013	severe storms; straight-line winds; flooding	Tazewell, Woodford & Peoria
4157	2013	severe storms; straight-line winds; tornadoes	Tazewell & Woodford

Since 2010, Tazewell and Woodford counties and select participating Peoria County municipalities have experienced 343 natural hazard events including thunderstorms with damaging winds, hail one inch or greater in diameter, lightning strikes, severe winter storms, extreme cold, riverine flooding, flash flooding, tornadoes, drought, excessive heat and landslides. While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning.

While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning. This prevention-related concept of emergency management often receives the least amount of attention, yet it is one of the most important steps in creating a hazard-resistant community.

What is hazard mitigation planning?

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural hazards. This process helps the participating jurisdictions reduce their risk from natural hazards by identifying vulnerabilities and developing mitigation actions to lessen and sometimes even eliminate the effects of a hazard. The results of this process are documented in a natural hazards mitigation plan.

Why prepare an all hazards mitigation plan?

By preparing, adopting and updating a natural hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the plan. These funds can help provide local government entities with the opportunity to complete mitigation projects that would not otherwise be financially possible.

The federal hazard mitigation funds are made available through the Disaster Mitigation Act of 2000, an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which provides federal aid for mitigation projects, but only if the local government entity has a Federal Emergency Management Agency (FEMA) approved hazard mitigation plan.

How is this plan different from other emergency plans?

A natural hazards mitigation plan is aimed at identifying projects and activities that can be conducted prior to a natural disaster, unlike other emergency plans which provide direction on how to respond to a disaster after it occurs. This is the second update of the Tri-County hazard mitigation plan which was last updated in 2010. This update describes in detail the actions that can be taken to help reduce or eliminate damages caused by specific types of natural hazards.

1.1 PARTICIPATING JURISDICTIONS

Recognizing the benefits of having an updated natural hazards mitigation plan, the Tri-County Regional Planning Commission invited Tazewell and Woodford counties and all the municipalities within these two counties to participate. In addition, the municipalities within Peoria County were invited to participate since the County chose to prepare its own multi-hazard mitigation plan in 2017 covering just the unincorporated areas of the County. **Figure 2** identifies the participating jurisdictions that are represented in the Plan.

Figure 2
Participating Jurisdictions Represented in the Plan

❖ Tazewell County ➢ East Peoria, City of ➢ Morton, Village of ➢ Pekin, City of ➢ Tremont, Village of ➢ Washington, City of	❖ Woodford County ➢ Eureka, City of ➢ Germantown Hills, Village of ➢ Roanoke, Village of	❖ Participating Peoria County Municipalities ➢ Bartonville, Village of ➢ Chillicothe, City of ➢ Hanna City, Village of ➢ Peoria, City of ➢ Peoria Heights, Village of

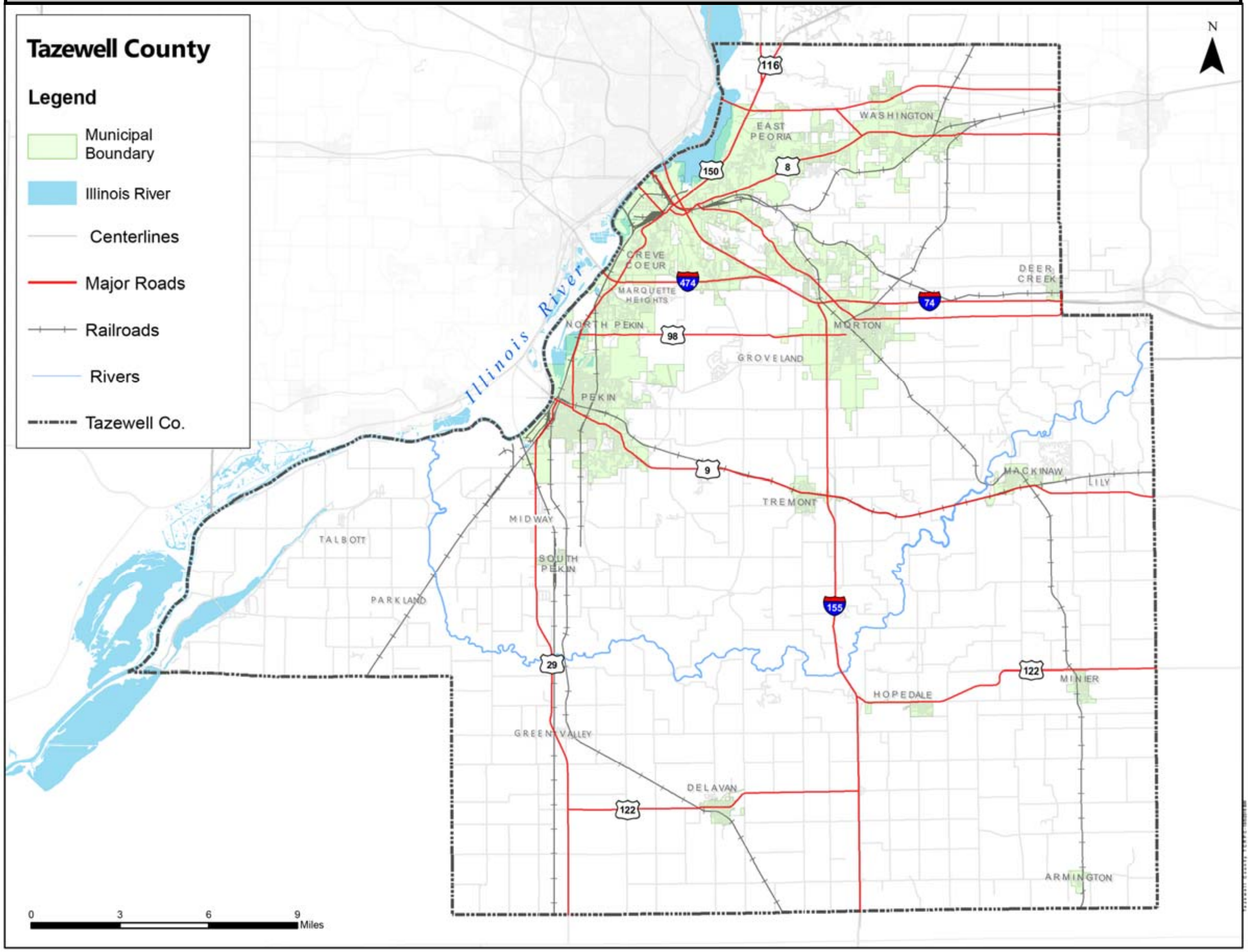
The following provides information by county on the geography, topography, economy and population/demographics of the study area as well as land use and development trends.

1.1.1 TAZEWELL COUNTY

COUNTY PROFILE

Tazewell County is located in central Illinois and is part of the Peoria-Pekin Metropolitan Statistical Area (MSA), which also includes Woodford and Peoria counties. The County covers approximately 658 square miles. **Figure 3** provides a location map of Tazewell County and the

Figure 3
Tazewell County Location Map



participating municipalities. The topography is generally flat to moderate sloping with the areas adjacent to streams and drainage ways gently sloping to very steep. The County is located between the metropolitan areas of Peoria and Bloomington-Normal and is bounded to the north by Woodford County, to the east by McLean County, to the south by Logan and Mason counties, and to the west by the Illinois River. The City of Pekin is the county seat.

Tazewell County has traditional been known for its agriculture history and economy. According to the 2012 Census of Agriculture, there were 942 farms in Tazewell County occupying approximately 81% (337,376 acres) of the total land area in the County. The major crops include corn, soybeans, vegetables, pumpkins and popcorn while the major livestock includes hogs and pigs, sheep and lambs and turkeys. The County ranks 1st in the State for pumpkins, 2nd for vegetables and popcorn, 25th for corn and 26th for soybeans. In terms of livestock, the County ranks 7th for sheep and lambs, 8th for turkeys and 34th for hogs and pigs. Tazewell County ranks 18th in crop cash receipts and 24th in livestock cash receipts.

Manufacturing is the largest industry in Tazewell County. A total of 15,427 jobs in manufacturing exist in the county or 27% of the workforce. The top three private sector companies in Tazewell County are Caterpillar with 3,710 employees, Walmart with 1,351 employees, and Farmers Insurance with 1,260 employees. According to U.S. Cluster Mapping the top traded economic cluster in the County is distribution and electronic commerce with 3,720 jobs in 2016.

Figure 4 provides demographic data on the County and each of the participating municipalities along with information on housing units and assessed values. The assessed values are for all residential structures and associated buildings (including farm homes and building associated with the main residence.) The assessed value of a residence in Tazewell County is approximately one-third of the market value.

Figure 4
Demographic Data by Participating Jurisdiction – Tazewell County

Participating Jurisdiction	Population (2010)	Projected Population (2025)	Total Area (Sq. Miles) (2010)	Number of Housing Units (2010)	Housing Unit Density (Units/ Sq. Mile) Rounded Up	Total Assessed Value of Housing Units (2016)
Tazewell County (unincorporated)	25,755	25,953	586.280	10,285	18	$408,622,464
East Peoria	23,402	23,582	22.144	10,590	531	$307,711,479
Morton	16,267	16,392	12.997	6,973	539	$345,125,877
Pekin	34,094	34,356	15.137	14,714	1,011	$318,602,708
Tremont	2,236	2,253	0.944	942	---	$34,645,060
Washington	15,134	15,250	8.187	6,189	757	$289,130,261

Sources: Illinois Department Public Health, Population Projects for Illinois Counties 2010 to 2025.
Tazewell County Assessments Office.
U. S. Census Bureau, 2010 Census U.S. Gazetteer Files.
U.S. Census Bureau, American FactFinder.

LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Tazewell County is the largest county by area in the Tri-County region and has a high percentage of farmland. As discussed previously, approximately 81% of the land area within the County is used for farming practices. Agriculture is and will continue to be a major industry within the County and a vital part of the County's economy.

The City of East Peoria has become a regional retail hub, offering a wide selection of nationally recognized retailers and restaurants. It is also home of the Per-A-Dice Hotel and Casino. Pekin, Morton, and Washington are communities of choice for family living. The County is also home to Illinois Central College's main campus in East Peoria, as well as their south campus in Pekin.

Between 2000 and 2010 the population increased by 5% from 128,485 to 135,394. This growth is part of a larger trend. U.S. Census Bureau records indicate that between 1900 and 2000, the population of Tazewell County increased over 300% from 33,221 to 128,485. All of the participating municipalities have experienced increases in their populations, some significantly, since 2000. Washington had the largest increase of 40% from 10,841 to 15,134. Tremont's population increased by 10% from 2,029 to 2,236; Morton increased by 7% from 15,198 to 16,267; East Peoria increased by 3% from 22,638 to 23,402 and Pekin increased by 1% from 33,857 to 34,094.

According the Tazewell County Community Development Administrator, no substantial changes in development have occurred within hazard prone areas of the County that have impacted its overall vulnerability since the first Plan update was approved. In terms of the participating jurisdictions, none have experienced substantial changes in development that have impacted their overall vulnerability since the first Plan update was approved with the exception of East Peoria according to the Tri-County Regional Planning Commission.

Between 2012 and 2017 sixteen commercial development projects, seven of them multi-tenant, the East Peoria City Hall and the East Peoria Library/Civic Plaza were constructed in the Levee District of East Peoria. These structures are protected from the 1% annual chance flood (100-year flood) by a provisionally-accredited levee. While the levee reduces the risk of flooding, it cannot eliminate all flood risk. The USACE's Levee Safety Senior Oversight Group considers the risk associated with this levee to be low. This change in development has the potential to increase the City's vulnerability to flooding along the riverfront if a flood overtops or breaches the levee allowing floodwaters to inundate the protected areas behind. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

There are no large-scale economic initiatives underway in the County. Substantial changes in land use (from forested and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No sizeable increases in residential or commercial/industrial developments are expected within the next five years.

1.1.2 WOODFORD COUNTY

COUNTY PROFILE

Woodford County is located in central Illinois and is part of the Peoria-Pekin Metropolitan Statistical Area (MSA), which also includes Tazewell and Peoria counties. The County covers approximately 542 square miles. **Figure 5** provides a location map of Woodford County and the participating municipalities. The topography is generally flat to moderate sloping with the areas adjacent to streams and drainage ways gently sloping to very steep. The County is located between the metropolitan areas of Peoria and Bloomington-Normal and is bounded to the north by Marshall and LaSalle counties, to the east by Livingston County, to the south by McLean and Tazewell counties, and to the west by the Illinois River. The City of Eureka is the county seat.

Woodford County has traditionally been known for its prime agricultural land and family farms. According to the 2012 Census of Agriculture, there were 958 farms in Woodford County occupying almost 96% (322,983 acres) of the total land area in the County. The major crops include corn and soybeans while the major livestock includes hogs and pigs, roosters, pullets for laying and layers. The County ranks 23rd in the State for corn and 28th for soybeans. In terms of livestock, the County ranks 1st for roosters, for pullets for laying, 7th for layers and 13th for hogs and pigs. Woodford County ranks 22nd in crop cash receipts and 18th in livestock cash receipts.

Woodford County is home to Eureka College, the college home of President Ronald Reagan. Manufacturing in the County does not have a large base; however, manufacturing is the largest industry in Woodford County. A total of 2,516 jobs in manufacturing exist in the county or 23% of the workforce. The top three private sector companies in in Woodford County are Eureka Community Unit School District 140 with 260 employees, Parsons Company with 221 employees, and CNH America LLC with 208 employees. According to U.S. Cluster Mapping the top traded economic cluster in Woodford County is distribution and electronic commerce with 976 jobs in 2016.

Figure 6 provides demographic data on the County and each of the participating municipalities along with information on housing units and assessed values. The assessed values are for all residential structures and associated buildings (including farm homes and building associated with the main residence.) The assessed value of a residence in Woodford County is approximately one-third of the market value.

LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Woodford County is largely rural with a growing bedroom community population. Agricultural dominates the majority of Woodford County land use. As discussed previously, approximately 96% of the land area within the County is used for farming practices. Agriculture is and will continue to be a major enterprise within the County and a vital part of the County's economy.

Figure 5
Woodford County Location Map

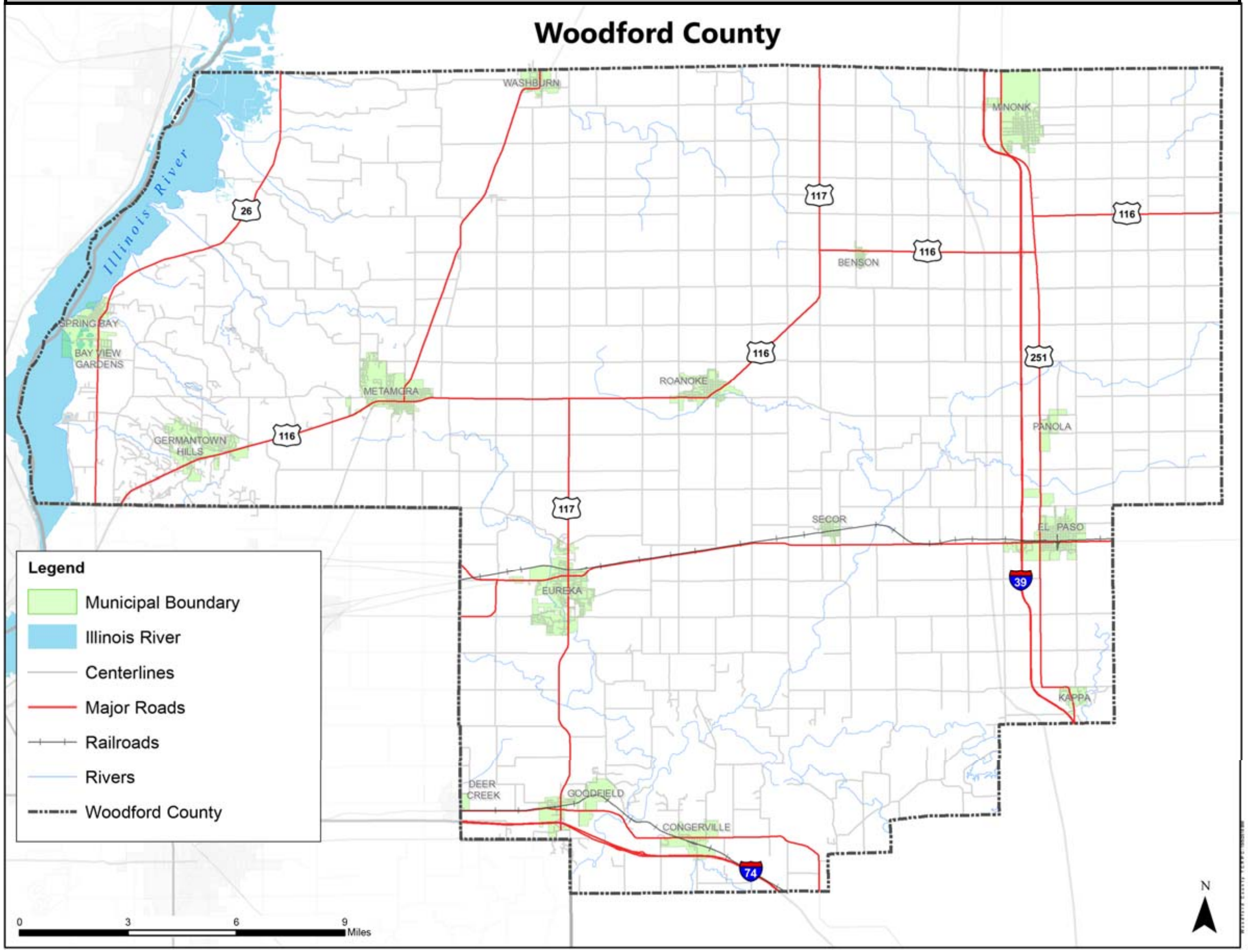


Figure 6
Demographic Data by Participating Jurisdiction – Woodford County

Participating Jurisdiction	Population (2010)	Projected Population (2025)	Total Area (Sq. Miles) (2010)	Number of Housing Units (2010)	Housing Unit Density (Units/ Sq. Mile) Rounded Up	Total Assessed Value of Housing Units (2016)
Woodford County (unincorporated)	14,955	15,998	524.014	5,755	12	$260,938,760
Eureka	5,295	5,664	3.071	2,023	670	$58,089,549
Germantown Hills	3,438	3,678	1.673	1,218	749	$81,900,782
Roanoke	2,065	2,209	0.961	867	---	$22,289,797

Sources: Illinois Department Public Health, Population Projects for Illinois Counties 2010 to 2025.
Woodford County Supervisor of Assessments.
U. S. Census Bureau, 2010 Census U.S. Gazetteer Files.
U.S. Census Bureau, American FactFinder.

Between 2000 and 2010 the population increased by 9% from 35,469 to 38,664. This is part of a larger trend. U.S. Census Bureau records indicates that between 1900 and 2000, the population of Woodford County increased by 62% from 21,822 to 35,469. All of the participating municipalities have experienced increased in their populations since 2000. Germantown Hills had the largest increase of 62.9% from 2,111 to 3,438 while Eureka increased by 8.7% from 4,871 to 5,295 and Roanoke increased by 3.6% from 1,994 to 2,065.

No substantial changes in development within hazard prone areas have occurred within Woodford County that have impacted its overall vulnerability since the first Plan update was approved according to the Woodford County Emergency Management Agency Director with the exception of the buyout of twelves homes located in floodways between 2013 and 2015. In terms of the participating jurisdictions, none have experienced substantial changes in development that have impacted their overall vulnerability since the first Plan update was approved according to the Tri-County Regional Planning Commission.

There are no large-scale economic initiatives underway in the County. Substantial changes in land use (from forested and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No sizeable increases in residential or commercial/industrial developments are expected within the next five years.

1.1.3 PEORIA COUNTY (INCLUDING THE PARTICIPATING MUNICIPALITIES)

COUNTY PROFILE

An overview of Peoria County is being provided given the interconnectedness between the participating municipalities and Peoria County. This information is necessary for the reader when evaluating the natural hazards and mitigation actions contained later in this Plan.

Peoria County is located in central Illinois and is home to the region's metropolitan center, the City of Peoria. Peoria County is part of the Peoria-Pekin Metropolitan Statistical Area (MSA), which also includes Tazewell and Woodford counties. The County covers approximately 631 square miles. **Figure 7** provides a location map of Peoria County and the participating municipalities. The topography is generally flat to moderate sloping with the areas adjacent to streams and drainage ways gently sloping to very steep. The County is bounded to the north by Stark and Marshall counties, to the east by Illinois River, to the south by Fulton County and to the west by Knox County. The City of Peoria is the county seat.

Agriculture has played a major role in making Peoria what it is today and is still the largest land use in the County. According to the 2012 Census of Agriculture, there were 917 farms in Peoria County occupying approximately 63% (250,263 acres) of the total land area in the County. The major crops include corn, soybeans, and forage-land used for all hay and haylage, grass silage and greenchop while the major livestock includes hogs and pigs, cattle and calves, layers and broilers. The County ranks 35th in the State for 45th in the state forage-land used for all hay and haylage, grass silage and greenchop, 45th for corn and 53rd for soybeans. In terms of livestock, the County ranks 12th for broilers, 26th for layers, 35th for horses, 36th for cattle and calves and 51st for hogs and pigs. Peoria County ranks 35th in crop cash receipts and 46th in livestock cash receipts.

Naturally, residents and visitors alike equate Peoria with Caterpillar Inc., but the region also boasts the USDA's National Center for Agricultural Utilization Research Lab, a renowned medical community with the only Level 1 trauma center in the Tri-County region, and many innovative high-tech firms. The Peoria Next Innovation Center, a technology business incubator, is leading the region's growth in its manufacturing economy through innovation and improving the manufacturing process.

With the presence of Caterpillar Inc., one would equate the largest industry in Peoria County as manufacturing. However, the largest industry in Peoria County is actually health care and social services with 24,327 jobs or 24% of the workforce. The top three private sector companies in Peoria County are Caterpillar Inc. with 8,157 employees, OSF Saint Francis Medical Center with 5,800 employees, and Unity Point Health Methodist with 2,979 employees. According to US cluster Mapping, the top traded economic cluster is Business Services with 20,957 jobs in 2016.

Figure 8 provides demographic data on each of the participating Peoria County municipalities along with information on housing units and assessed values. The assessed values are for all residential structures and associated buildings. The assessed value of a residence in Peoria County is approximately one-third of the market value.

LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Peoria County is the largest county by population in the Tri-County region and is home to the region's metropolitan center, the City of Peoria. As discussed previously, approximately 63% of the land area within the County is used for farming practices. Agriculture is an important part of the County's economy and will continue to be a key enterprise.

Figure 7
Peoria County Location Map

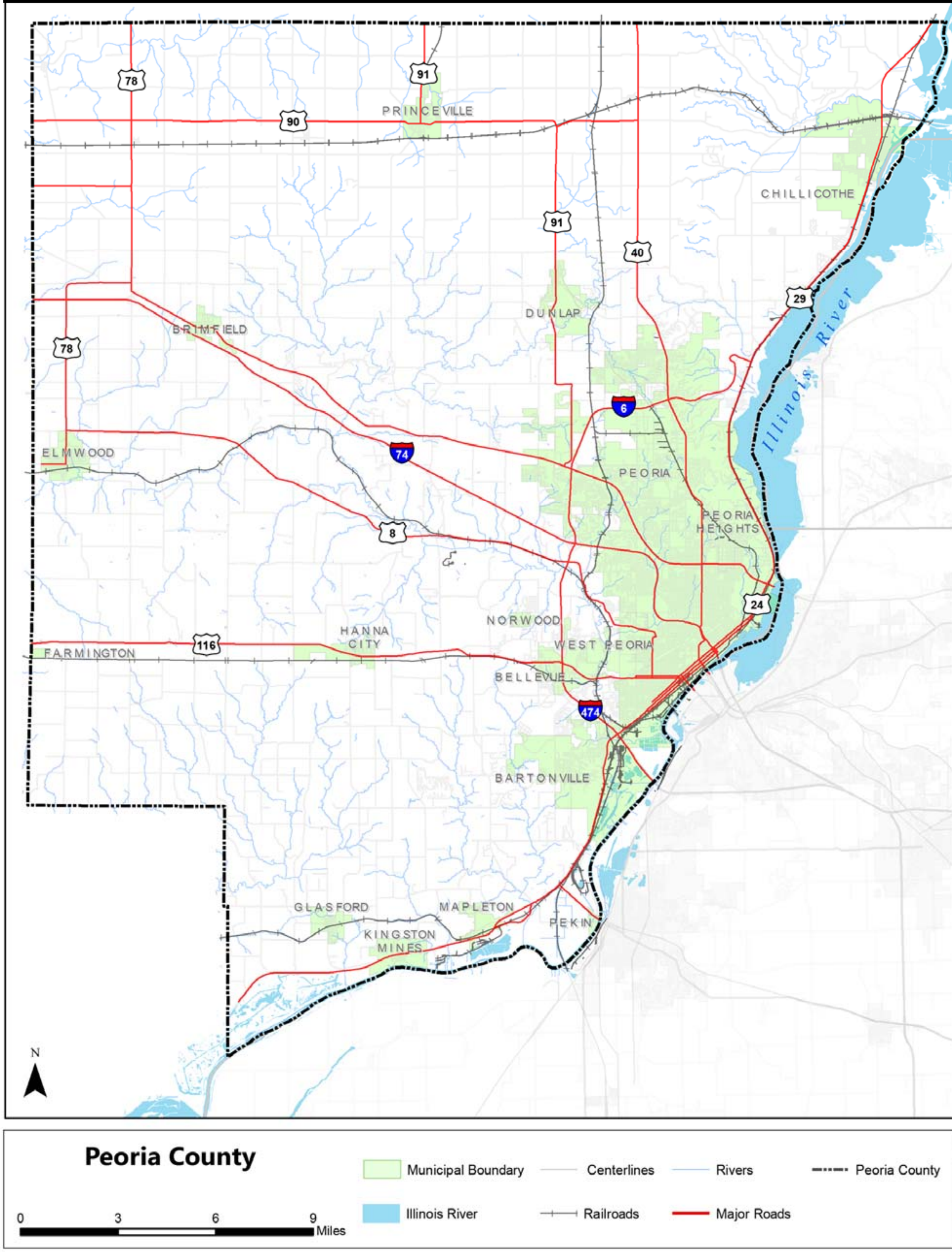


Figure 8
Demographic Data for Participating Peoria County Municipalities

Participating Jurisdiction	Population (2010)	Projected Population (2025)	Total Area (Sq. Miles) (2010)	Number of Housing Units (2010)	Housing Unit Density (Units/ Sq. Mile) Rounded Up	Total Assessed Value of Housing Units (2016)
Bartonville	6,471	6,338	8.612	2,812	327	$71,993,160
Chillicothe	6,097	5,972	5.416	2,719	502	$75,928,298
Hanna City	1,225	1,200	0.478	584	---	$15,185,830
Peoria	115,007	112,649	50.227	52,621	1,048	$1,372,986,619
Peoria Heights	6,156	5,962	6.973	3,093	444	$72,652,006

Sources: Illinois Department Public Health, Population Projects for Illinois Counties 2010 to 2025.
Tazewell County Assessments Office.
U. S. Census Bureau, 2010 Census U.S. Gazetteer Files.
U.S. Census Bureau, American FactFinder.

The City of Peoria is primarily known for heavy manufacturing with the strong presence of Caterpillar Inc. and Komatsu Mining Division; however, it is also home of USDA's National Center for Agriculture Utilization Research Lab, a renowned medical community, and several post-secondary educational institutions. The County is home to Bradley University, Illinois Central College's Downtown and North campuses, Robert Morris College, Midstate College and the University of Illinois College of Medicine.

Between 2000 and 2010 the population increased by 2% from 183,433 to 186,494. U.S. Census Bureau records indicate that between 1900 and 2000, the population of Peoria County has increased over 107% from 88,608 to 183,433. All of the participating municipalities, with the exception of Peoria Heights, experienced increases in their populations since 2000. Hanna City had the largest increase of 21% from 1,013 to 1,225. Bartonville's population increased by 3% from 6,310 to 6,471; Chillicothe increased by 2% from 5,996 to 6,097 and Peoria increased by 2% from 112,936 to 115,007. Peoria Heights population decreased by 8% from 6,635 to 6,087.

According to the Tri-County Regional Planning Commission no substantial changes in development within hazard prone areas have occurred within the participating Peoria County municipalities that have impacted their overall vulnerability since the first Plan update was approved, with the exception of Peoria. In 2017 the Riverfront Village Platform and parking deck, which housed three restaurants and 200 parking spaces and was located in the floodplain of the Illinois River, was demolished and replaced with green space. This change in development decreased the City's vulnerability to flooding along the riverfront. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

With the exception of a small housing development being built in Peoria Heights, there are no large-scale economic initiatives underway in the participating municipalities. Substantial changes in land use (from forested land to residential, commercial and industrial) are not anticipated within the participating municipalities in the immediate future. No sizeable increases in residential or commercial/industrial developments are expected within the next five years.

2.0 PLANNING PROCESS

2.0 PLANNING PROCESS

The Tri-County Multi-Jurisdictional Natural Hazards Mitigation Plan (the Plan) was updated through the Tri-County Mitigation Action Committee (MAC or Committee). The Plan was prepared to comply with the Disaster Mitigation Act of 2000 and incorporates the Federal Emergency Management Agency's (FEMA) 10-step planning process approach. **Figure 9** provides a brief description of the process utilized to prepare this Plan.

Figure 9
Description of Planning Process

Tasks	Description
Task One: Organize	The MAC was reformed with broad representation and specific expertise to assist the Tri-County Regional Planning Commission and the Consultant in updating the Plan.
Task Two: Public Involvement	Early and ongoing public involvement activities were conducted throughout the Plan's development to ensure the public was given every opportunity to participate and provide input.
Task Three: Coordination	Agencies and organizations were contacted to identify plans and activities currently being implemented that impact or might potentially impact hazard mitigation activities.
Task Four: Risk Assessment	The Consultant identified and profiled the natural hazards that have impacted the Tri-County area (Tazewell and Woodford counties and select municipalities in Peoria County) and conducted a vulnerability assessment to evaluate the risk to each participating jurisdiction.
Task Five: Goal Setting	After reviewing existing plans and completing the risk assessment, the Consultant assisted the MAC in updating the goals and objectives for the Plan.
Task Six: Mitigation Activities	The participating jurisdictions were asked to identify mitigation actions that had been started and/or completed since the 2010 Plan was adopted. In addition, they were also asked to identify any new mitigation actions based on the results of the risk assessment. The new mitigation actions were then analyzed, categorized and prioritized.
Task Seven: Draft Plan	The updated draft Plan summarized the results of Tasks One through Six. In addition, it described the responsibilities to monitor, evaluate and update the Plan. The updated draft Plan was reviewed by the participants and a public forum was held to give the public an additional opportunity to provide input. Comments received were incorporated into the updated draft Plan and submitted to the Illinois Emergency Management Agency (IEMA) and FEMA for review and approval.
Task Eight: Final Plan	Comments received from IEMA and FEMA were incorporated in to the final updated Plan. The final updated Plan was then submitted to the counties and participating municipalities for adoption. The Plan will be reviewed periodically and updated again in five years.

The Plan update and development was led at the staff level by Reema Abi-Akar, Planner I and Michael Bruner, Planner I of the Tri-County Regional Planning Commission. American Environmental Corp. (AEC), an environmental consulting firm with experience in hazard mitigation, risk assessment and public involvement, was employed to guide the Commission and participating jurisdictions through the planning process.

Participation in the planning process, especially by the counties and local government representatives, was crucial to the update and development of the Plan. To ensure that all participating jurisdictions took part in the planning process, participation requirements were established. Each participating jurisdiction agreed to satisfy the following requirements in order to be included in the updated Plan. All of the participating jurisdictions met the participation requirements.

- ➢ Attend MAC meetings.
- ➢ Submit a list of documents (i.e., plans, studies, reports, maps, etc.) relevant to the hazard mitigation planning process.
- ➢ Identify and submit a list of critical infrastructure and facilities.
- ➢ Review the risk assessment and provide information on additional events and damages.
- ➢ Participate in the update of the mitigation goals.
- ➢ Submit a list of mitigation actions started and/or completed since the adoption of the 2010 Plan, if applicable.
- ➢ Identify and submit a list of new mitigation actions.
- ➢ Review and comment on the updated draft Plan.
- ➢ Formally adopt the updated Plan.
- ➢ Where applicable, incorporate the updated Plan into existing planning efforts.
- ➢ Participate in the updated Plan maintenance.

2.1 MITIGATION ADVISORY COMMITTEE

As previously mentioned, at the start of the planning process, the Tri-County Mitigation Action Committee (MAC) was reformed to update the hazard mitigation plan. The MAC included representatives from each participating jurisdiction, as well as emergency services (fire, law enforcement and American Red Cross), healthcare, higher education, insurance, GIS, planning and utilities.

Figure 10 details the entities represented on the MAC and the individuals who attended on their behalf. The MAC was chaired by the Tri-County Regional Planning Commission.

Additional technical expertise was provided by the staff at the Illinois Emergency Management Agency Hazard Mitigation Unit, the Illinois Department of Natural Resources Office of Water Resources, the Illinois Environmental Protection Agency, the Illinois State Water Survey, the Illinois State Geological Survey, National Weather Service Weather Forecast Office in Lincoln and the University of Illinois.

Figure 10
Sheet 1 of 2
Tri-County Mitigation Action Committee Member Attendance Record

Representing	Name	Title	10/25/2017	3/14/2018	6/20/2018	9/27/2018	1/10/2019
Ameren	O'Neal, Anthony	Emergency Response Specialist	X	X			
American Environmental Corp.	Bostwick, Andrea	Senior Project Manager	X	X	X	X	X
American Environmental Corp.	Krug, Zachary	Environmental Specialist		X	X	X	X
American Environmental Corp.	Michaud, Greg	Emergency Services Manager	X				
American Red Cross	Coker, John	Government Operations	X	X			
American Red Cross	Learned, Julie	Distaster Program Manager			X		
Bartonville, Village of	Nelson, Larry	ESDA Director		X			X
Bartonville, Village of	Ricca, Leon	President					X
Bradley University	Joschko, Brian	Police Chief	X	X			
Chillicothe, City of	Mettille, Scott	Police Chief	X				
Chillicothe, City of	Parker, Rachel	Economic Development Director		X		X	
East Peoria, City of	Barron, Dennis	Director of Public Works		X		X	X
East Peoria, City of	Grugan, Garry	Assistant Fire Chief	X				
East Peoria, City of	Knapp, John	Deputy Fire Chief/Fire Marshal		X	X		X
East Peoria, City of	Servis, Alan	Fire Chief	X				
Eureka, City of	Brown, Melissa	City Administrator	X		X	X	X
Eureka College	Ege, Daryle	Physical Plant Director	X				
Fondulac Rehabilitation & Healthcare	Milburn, Connie	CRC/Marketing	X				
Fondulac Rehabilitation & Healthcare	Mehaffy, Ryan	Administrator	X				
Germantown Hills, Village of	Hinrichsen, Mike	President	X	X	X	X	
Germantown Hills, Village of	Brecklin, Rich	Superintendent of Public Works		X	X		X
Germantown Hills, Village of	Sasso, Ann	Village Administrator		X	X		
Greater Peoria Sanitary District	Meyer, Thomas	Director of Operations	X	X			
Hanna City, Village of	Path, Charles	Trustee	X				
Hanna City, Village of	Stear, Bill	Trustee	X				
Hanna City, Village of	Winterroth, Fred	Mayor		X	X	X	X
Heartland Health Services	Shake, Melody	Vice President of Quality & Compliance		X			
Illinois American Water	Horstmann, Lori	Superintendent	X				
Illinois American Water	Krolicki, Ryan	Supervisor	X				
Illinois Central College	Schwiderski, Erika	Police Lieutenant	X		X		
Luthern Hillside Village	Corrie, Richard	Plant Operations Director		X			
Luthern Hillside Village	Heiden, Shelly	Executive Director	X				
Morton, Village of	Bullard, James	Engineering Technician	X		X		X
National Weather Service	Stanley, Heather	Meteorologist	X	X			
OSF Healthcare	Orr, Nick	IT Disaster Recovery Specialist			X		
Pekin, City of	Nelson, Kurt	Fire Chief	X	X			
Pekin Insurance	Vincent, Larry	Disaster Recovery Manager		X			
Peoria, City of	Vaughn, Mike	Emergency Management Coordinator	X	X	X	X	
Peoria City/County Health Department	Marks, Jason	Emergency Preparedness Coordinator			X		X
Peoria Heights, Village of	Fick, Matt	Administrator	X	X			
Peoria Heights, Village of	Sutton, Dustin	Administrator			X		
Peoria Regional Office of Education	Derry, Beth	Regional Superintendent	X				
Roanoke, Village of	Knepp, Bob	Trustee				X	X
Roanoke, Village of	Smith, Michael	President					X
Snyder Village	Brownfield, Mike	Maintenance Director	X	X			
Tazewell County - EMA	Cook, Dawn	Director	X	X	X		
Tazewell County - EMA	Zuercher, Jerry	Deputy Director					X
Tazewell County - GIS	Baker, Janna	Coordinator	X	X	X		
Tazewell County - Health Department	Goetze, Melissa	Environmental Helath Supervisor	X				
Tazewell County - Health Department	Neavear, Ev	Director of Environmental Health	X				
Tazewell County - Highway	Parr, Dan	Assistant County Engineer	X		X		
Tazewell County - Sheriff	Gillespie, Tim	Captain	X				
Tazewell County - Sheriff	Kempf, Gerald	Captain		X			
Tazewell County - Sheriff	Kline, Kyle	Captain					X
Tremont, Village of	Dodwell, Mike	Police Chief	X		X		

Figure 10
Sheet 2 of 2
Tri-County Mitigation Action Committee Member Attendance Record

Representing	Name	Title	10/25/2017	3/14/2018	6/20/2018	9/27/2018	1/10/2019
Tri-County Regional Planning Commission	Abi-Akar, Reema	Planner	X	X	X	X	X
Tri-County Regional Planning Commission	Bruner, Michael	Planner	X	X	X	X	X
Tri-County Regional Planning Commission	Lees, Ray	Planning Program Manager	X				
Tri-County Regional Planning Commission	Miller, Eric	Executive Director	X				
Washington, City of	Oliphant, Jon	Planning & Development Director	X		X		X
Washington, City of	Andrews, Ed	City Engineer/Public Works Director	X	X	X	X	
Woodford County - EMA	McCanless, Kent	Director	X	X	X		X
Woodford County - Health Department	Schulz, Dustin	Emergency Planner	X				
Woodford County - Highway Department	Loy, Lindell	County Engineer	X				
Woodford County - Sheriff	Smith, Matt	Sheriff		X			X
Woodford County - Supervisor of Assessments	Bell, Mary	Supervisor of Assessments	X				
Woodford County - Zoning	Jording, Lisa	Zoning Administrator	X			X	

Mission Statement

Over the course of the first two meetings, the MAC developed a mission statement that described their objectives for this Plan update.

"The mission of the Tri-County Mitigation Advisory Committee is to develop a mitigation plan that documents project and activities to reduce the negative impacts of natural hazards on citizens, infrastructure, private property and critical facilities."

MAC Meetings

The MAC met five times between October, 2017 and January 2019. **Figure 10** identifies the representatives present at each meeting. **Appendices A** and **B** contain copies of the attendance sheets and meeting minutes for each meeting. The purpose of each meeting, including the topics discussed, is provided below.

First MAC Meeting – October 25, 2017

The purpose of this meeting was to explain the planning process to the MAC members and give them a brief overview on what a natural hazards mitigation plan is and why it needs to be updated. Drafts of a mission statement and updated mitigation goals were presented for review. Committee members were asked to identify of any natural hazard events that have occurred within the County since the 2010 Plan was completed.

Representatives for the participating jurisdictions were asked to complete the forms entitled "List of Existing Planning Documents", "Critical Facilities" and "Identification of Severe Weather Shelters" and return them at the next meeting. Copies of a hazard events questionnaire and citizen questionnaire were also distributed.

Second MAC Meeting – March 14, 2018

At the second MAC meeting portions of the updated natural hazard risk assessment section associated with the most significant hazards were presented for review. The MAC discussed the draft mission statement and updated mitigation goals and finalized both.

MAC members were asked to identify any mitigation projects and activities their jurisdictions had started and/or completed since adopting 2010 Plan. Ideas for new potential mitigation projects and activities were presented. All participating jurisdictions were asked to complete the form entitled "New Hazard Mitigation Projects" while those jurisdictions who participated in the 2010 Plan were also asked to complete the form entitled "Existing Mitigation Project/Activity Status" and return at the next meeting.

Third MAC Meeting – June 20, 2018

The purpose of the third MAC meeting was to review the portions of the updated natural hazard risk assessment section associated with the less significant hazards and to discuss the vulnerability analysis for tornadoes. The MAC also reviewed and approved the updated mitigation project prioritization methodology and discussed how the mitigation projects and activities identified by the participating jurisdictions would be presented in the updated Plan.

Fourth MAC Meeting – September 27, 2018

At the fourth meeting the vulnerability analysis for floods was presented for review. The MAC members also reviewed the draft jurisdiction-specific mitigation action tables which identified and prioritized the new and existing mitigation projects and activities provided by the participants. Members were given the opportunity to add additional projects and activities to their tables. The sections outline the mitigation strategy, plan maintenance and adoption were also discussed.

Fifth MAC Meeting – January 10, 2019

The purpose of the fifth MAC meeting was to provide the public an opportunity to provide comments on the draft updated Plan.

2.2 PUBLIC INVOLVEMENT

To engage the public in the planning process, a comprehensive public involvement strategy was developed. The strategy was structured to engage the public in a two-way dialogue, encouraging the exchange of information throughout the planning process. A mix of public involvement techniques and practices were utilized to:

- disseminate information;
- identify additional useful information about natural hazard occurrences and impacts;
- assure that interested residents would be involved throughout the updated Plan's development; and
- cultivate a sense of ownership of the updated Plan, thus increasing the likelihood of adoption by the participating jurisdictions.

The dialogue with the public followed proven risk communication principles to help assure clarity and avoid overstating or understating the impacts posed by the natural and man-made hazards identified in the updated Plan. The following public involvement techniques and practices were applied to give the public an opportunity to access information and participate in the dialogue at their level of interest and availability.

Citizen Questionnaire

A citizen questionnaire was developed to help gather information and gauge public perceptions about the types of natural hazards that affect the Tri-County region. The questionnaire was distributed to the MAC members who were encouraged to make it available to their residents. A copy of the questionnaire is contained in **Appendix C**.

A total of 40 questionnaires were completed and returned to the MAC. Of the 40 responses, 20 were received from Tazewell County residents, 13 were received from Peoria County residents (including the participating municipalities) and seven were received from Woodford County residents. Questionnaires were completed by residents in each participating jurisdiction, with the exception of Bartonville and Chillicothe. The responses provided useful information to the MAC members as they identify how best to disseminate information on natural hazards and safeguard the public and their property. Furthermore, these responses identify the kinds of projects and activities the public is likely to support. The following provides a summary of the results by county.

Tazewell County

A review of the 20 questionnaires received for Tazewell County residents revealed the following:

- Respondents felt the most frequently encountered natural hazards in Tazewell County are severe storms (thunderstorms, hail, lightning and heavy rain) and severe winter storms, followed by floods and tornadoes. These results are consistent with the weather records compiled for the County and as described in this Plan.
- The most effective ways identified to communicate when natural hazards occur, as noted by respondents, were via the internet, social media (Facebook, Twitter, etc.) and television. Information disseminated via radio and mail also ranked among the highest effective means.
- In terms of the most needed mitigation projects and activities, the following three categories received the strongest support:
  - maintaining power during storms by burying power lines, trimming trees and/or purchasing backup generators (80%);
  - retrofitting critical infrastructure to reduce potential damages (65%); and
  - maintaining/installing siren(s) or other alert systems (60%).

  Flood or drainage protection projects (55%) and maintaining roadways during snow and heavy rain events (50%) also received strong support.

Woodford County

A review of the seven questionnaires received for Woodford County residents revealed the following:

- Respondents felt the most frequently encountered natural hazards in Woodford County are severe storms (thunderstorms, hail, lightning and heavy rain) followed by severe winter storms and floods. Weather records indicate that severe storms are in fact the most frequently occurring natural hazard in the County, followed by severe winter storms.

- The most effective ways identified to communicate when natural hazards occur, as noted by respondents, were via social media (Facebook, Twitter, etc.) and through municipal/county government, although most of the respondents did not answer this question. Information disseminated via the internet, fact sheets or brochures or by local fire and law enforcement were also identified as effective means of communication.
- In terms of the most needed mitigation projects and activities, the following four categories received the strongest support:
  - maintaining power during storms by burying power lines, trimming trees and/or purchasing backup generators (28.6%);
  - maintaining/installing siren(s) or other alert systems (28.6%);
  - constructing tornado safe shelters (28.6%); and
  - maintaining roadways during snow and heavy rain events (28.6%).

Peoria County (including the participating municipalities)

A review of the 13 questionnaires received for Peoria County residents revealed the following:

- Respondents felt the most frequently encountered natural hazards in Peoria County are severe storms (thunderstorms, hail, lightning and heavy rain) followed by severe winter storms. These results are consistent with the weather records compiled for the participating municipalities and as described in this Plan.
- The most effective ways identified to communicate when natural hazards occur, as noted by respondents, were via television and the internet. Information disseminated via newspapers, radio and fact sheets or brochures were also identified as effective means of communication.
- In terms of the most needed mitigation projects and activities, the following three categories received the strongest support:
  - maintaining power during storms by burying power lines, trimming trees and/or purchasing backup generators (76.9%);
  - maintaining roadways during snow and heavy rain events (69.2%); and
  - retrofitting critical infrastructure to reduce potential damages (65%).

  Disseminating public information fact sheets (61.5%) and flood or drainage protection projects (53.8%) also received strong support.

FAQ Fact Sheet

The "Frequently Asked Questions" fact sheet was updated and disseminated to help explain what a natural hazards mitigation plan is and briefly described the planning process. The fact sheet was made available at the government offices of participating jurisdictions. A copy of the fact sheet is contained in **Appendix D**.

Press Releases

Press releases were prepared and submitted to local print media outlets prior to each MAC meeting. The releases announced the purpose of the meetings and how the public could become involved in the updated Plan's development. **Appendix E** contains a list of the print media outlets that received the press releases while copies of the releases and any news articles published can be found in **Appendix F**.

MAC Meetings

All of the meetings conducted by the MAC were open to the public and publicized in advance to encourage public participation. At the end of each meeting, time was set aside for public comment. In addition, Committee members were available throughout the planning process to talk with residents and local government officials and were responsible for relaying any concerns and questions voiced by the public to the MAC.

Public Forum

The final meeting of the MAC, held on January 10, 2019, was conducted as an open-house public forum. The open-house format was chosen for this forum instead of a hearing to provide greater convenience for residents who wished to participate. Residents were able to come and go at any time during the forum, reducing conflicts with business, family, and social obligations.

At the forum, residents were able to review a draft of the updated Plan; meet with representatives from the participating jurisdictions, the Tri-County Regional Planning Commission and the Consultant; ask any questions; and provide comments on the draft updated Plan. Individuals attending the public forum were provided with a two-page handout summarizing the planning process and a comment sheet that could be used to provide feedback on the draft updated Plan. **Appendices G** and **H** contain copies of these materials.

Public Comment Period

After the public forum, the draft updated Plan was made available for public review and comment through January 25, 2019 at the Tri-County Regional Planning Commission's Office and website. Residents were encouraged to submit their comments electronically, by mail or through representatives of the MAC.

Results of Public Involvement

The public involvement strategy implemented during the planning process created a dialogue among participants and interested residents, which resulted in many benefits, a few of which are highlighted below.

- *Acquired additional information about natural hazards*. Verifiable hazard event and damage information was obtained from participants that presents a clearer assessment of the extent and magnitude of natural hazards that have impacted the Tri-County area. This information included details about thunderstorms with damaging winds, severe winter storms, floods, tornadoes and landslides not available from state and federal databases.
- *Obtained infrastructure and critical facilities damage information*. Data collection surveys soliciting information about infrastructure and critical facilities damaged by severe storms and other natural hazards were used to supplement information obtained from government databases. This information was vital to the preparation of the vulnerability assessment.
- *Increased awareness of the impacts associated with natural hazard events within the Tri-County area*. Understanding how mitigation actions can reduce risk to life and property

helped generate ***144 new mitigation projects and activities*** at the local level that had not been previously identified in either the original or 2010 Plan or any other planning process. In addition, six municipalities (Tremont, Morton, Eureka, Germantown Hills, Bartonville and Hanna City) that had not previously taken part in the mitigation planning process chose to participate in this Plan update.

2.3 PARTICIPATION OPPORTUNITIES FOR INTERESTED PARTIES

As part of the formation of the MAC, the Tri-County Regional Planning Commission reached out to numerous different entities (including schools, not-for-profit organizations, healthcare facilities, utilities and other interested parties) in the Tri-County area to provide them an opportunity to participate in the planning process. In addition, the Planning Commission contacted regional media outlets to publicize the process and reach anyone who might have an interest or possess information which could be helpful in updating the Plan.

Healthcare
Input was sought from the regional healthcare community. Representatives from Fondulac Rehabilitation & Healthcare, Heartland Health Services, Lutheran Hillside Village, OSF Healthcare and Snyder Village all attended MAC meetings and provided input and support to the planning process.

Schools
Representatives from Illinois Central College, Bradley University, Eureka College and the Peoria Regional Office of Education attended MAC meetings. These individuals participated in the planning process and were able disseminate information to their various organizations regarding the impacts natural hazard events have had on the Tri-County area.

Not-for-Profit
The Government Operations Liaison and the Disaster Program Manager with the Central Illinois Chapter of the American Red Cross served on the MAC and provided input into the planning process. Two meteorologists with the National Weather Service Forecast Office in Lincoln participated in the planning process and served on the MAC. They proved invaluable in identifying and verifying additional natural hazard event records. Their resources and experience helped to provide a more comprehensive understanding of the natural hazards that have impacted the Tri-County area.

Utilities
Utility companies serving the area were also invited to participate in the Plan update. Representative from the Greater Peoria Sanitary District, Illinois American Water and Ameren Illinois all attended MAC meetings and provided support to the planning process. The Emergency Response Specialist for Ameren Illinois was able to provide infrastructure damage information not available in state or federal databases that provides a glimpse into the scope of the damages that have be sustained to infrastructure from natural hazard events in the region.

Neighboring Counties
A memo was sent to EMA/ESDA coordinators in the surrounding counties inviting them to participate in the mitigation planning process and attend the Public Forum. The counties

contacted included Fulton, Knox, LaSalle, Livingston, Logan, Marshall, Mason, McLean, Stark and Peoria. **Appendix I** contains a copy of the invitation memo.

2.4 INCORPORATING EXISTING PLANNING DOCUMENTS

As part of the planning process, each participating jurisdiction was asked to identify and provide existing documents (plans, studies, reports and technical information) relevant to the updated Plan. **Figure 11** summarizes the availability of existing planning documents by participating jurisdiction. These documents were reviewed and incorporated into the Plan whenever applicable.

Tazewell and Woodford counties as well as a majority of the participating municipalities are fortunate to have the resources and abilities to potentially expand on and improve the existing policies and programs identified in Figure 11. This conclusion is based on an examination of their capabilities related to: staff and organization; technical capability; fiscal situation; policies and programs; present legal authority; and political resolve.

Many of the participating jurisdictions have actively sought and received assistance from the Tri-County Regional Planning Commission and Greater Peoria Economic Development Council as well as technical assistance from the Tazewell County Community Development Department, the Woodford Building and Zoning Department and the Peoria County Planning and Zoning Department to develop and maintain a wide array of plans, programs and ordinances. All but one of the participating jurisdictions have comprehensive plans in place and a majority have land use plans. All of the participating Peoria County municipalities as well as all of the Tazewell County participating jurisdictions have enacted building codes. While there is still resistance from unincorporated Woodford County residents towards building codes, the County's Building and Zoning Department has worked diligently to implement community and economic development initiatives.

Figure 11
Existing Planning Documents by Participating Jurisdiction

Existing Planning Documents	Tazewell County Participants						Woodford County Participants				Peoria County Municipal Participants				
	Tazewell County	East Peoria	Morton	Pekin	Tremont	Washington	Woodford County	Eureka	Germantown Hills	Roanoke	Bartonville	Chillicothe	Hanna City	Peoria	Peoria Heights
Plans															
Comprehensive Plan	X		X	X	X	X	X	X	X	X	X	X	X	X	X
Emergency Management Plan	X	X		X		X	X	X	X		X	X		X	X
Land Use Plan			X		X	X	X	X	X	X	X	X	X	X	X
Codes & Ordinances															
Building Codes	X	X	X	X	X	X		X		X	X	X	X	X	X
Drainage Ordinances	X		X		X	X	X	X	X		X	X			X
Historic Preservation Ordinance						X					X			X	X
Subdivision Ordinance(s)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Zoning Ordinances	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Maps															
Existing Land Use Map	X		X		X	X	X	X	X	X	X	X		X	X
Infrastructure Map	X	X	X		X	X		X	X		X	X			X
Zoning Map	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Flood-Related															
Flood Ordinance(s)	X	X	X	X	X	X	X	X		X	X	X		X	X
Flood Insurance Rate Maps	X	X	X	X	X	X	X	X		X	X	X		X	X
Repetitive Flood Loss List	X		X				X					X			
Elevation Certificates for Buildings	X		X			X	X				X	X			

3.0 RISK ASSESSMENT

3.0 RISK ASSESSMENT

Risk assessment is the process of evaluating the vulnerability of people, buildings and infrastructure in order to estimate the potential loss of life, personal injury, economic injury and property damage resulting from natural hazards. This section summarizes the results of the risk assessment conducted on the natural hazards in the Tri-County area (Tazewell and Woodford counties and select municipalities in Peoria County). The information contained in this section was gathered by evaluating local, state and federal records from the last 68 years.

This risk assessment identifies the natural hazards deemed most important to the Tri-County Mitigation Advisory Committee (MAC) and includes a profile of each that identifies past occurrences, the severity or extent of the hazard, and the likelihood of future occurrences. It also provides a vulnerability assessment which identifies the impacts to public health and property, evaluates the assets of the participating jurisdictions (i.e., residential buildings, critical facilities and infrastructure) and estimates the potential impacts each natural hazard would have on the health and safety of the residents as well as buildings, critical facilities and infrastructure. Where applicable, the differences in vulnerability between participating jurisdictions are described.

One of the responsibilities of the Tri-County MAC was to review the natural hazards included in the 2010 Plan and decide if additional hazards should be included in the Plan update. Over the course of the first two meetings, the MAC members discussed their experiences with natural hazard events and reviewed information about various hazards.

After discussing the hazards, the Committee chose not to add any additional natural hazards to those included in the 2010 Plan. The Committee also chose not to include wildfires in the Plan update due to their limited impact on the people and infrastructure within the Tri-County area. Historical data indicates that wildfires have been virtually non-existent and no documentation was found on wildfire events in the Tri-County area.

The following identifies the hazards included in this Plan update:

- severe storms (thunderstorms, hail, lighting & heavy rain)
- severe winter storms (snow, ice & extreme cold)
- tornadoes
- floods
- extreme heat
- drought
- landslides
- earthquakes
- mine subsidence & sinkholes
- dams
- levees

The subsequent sections provide detailed information on each of the selected natural hazards. The sections are color coded and ordered by the frequency with which the natural hazard has previously occurred within the Tri-County area, starting with severe storms (thunderstorms, hail, and lightning). Each natural hazard section contains three subsections: identifying the hazard, profiling the hazard and assessing vulnerability.

3.1 SEVERE STORMS (THUNDERSTORMS, HAIL, LIGHTNING & HEAVY RAIN)

HAZARD IDENTIFICATION

What is the definition of a severe storm?

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) defines a "severe storm" as any thunderstorm that produces one or more of the following:

- winds with gust of 50 knots (58 mph) or greater;
- hail that is at least one inch in diameter (quarter size) or larger; and/or
- a tornado.

While severe storms are capable of producing deadly lightning, the NWS does not use lightning to define a severe storm. However, a discussion of lightning is included in this section because it is capable of causing extensive damage. ***For the purposes of this report, tornadoes and flooding are categorized as separate hazards and are not discussed under severe storms.***

What is a thunderstorm?

A thunderstorm is a rain shower accompanied by lightning and thunder. An average thunderstorm is approximately 15 miles in diameter, affecting a relatively small area when compared to winter storms or hurricanes, and lasts an average of 30 minutes. Thunderstorms can bring heavy rain, damaging winds, hail, lightning and tornadoes.

There are four basic types of thunderstorms: single-cell, multi-cell, squall line, and supercell. The following provides a brief description of each.

Single-cell Thunderstorm

Single cell storms are small, weak storms that only last about ½ hour to an hour and are not usually considered severe. They are typically driven by heating on a summer afternoon. Occasionally a single cell storm will become severe, but only briefly. When this happens, it is called a pulse severe storm.

Multi-cell Thunderstorm

Multi-cell storms are the most common type of thunderstorms. A multi-cell storm is organized in clusters of at least two to four short-lived cells. Each cell usually lasts 30 to 60 minutes while the system as whole may persist for many hours. Multi-cell storms may produce hail, strong winds, brief tornadoes, and/or flooding.

Squall Line

A Squall line is a group of storms arranged in a line, often accompanied by "squalls" of high wind and heavy rain. The line of storms can be continuous or there can be gaps and breaks in the line. Squall lines tend to pass quickly and can be hundreds of miles long but are typically only 10 to 20 miles wide. A "bow echo" is a radar signature of a squall line that "bows out" as winds fall behind the line and circulation develops on either end.

<u>*Supercell Thunderstorm*</u>
Supercell storms are long-lived (greater than one hour) and highly organized storms that feed off a rising current of air (an updraft). The main characteristic that sets a supercell storm apart from other thunderstorm types is the presence of rotation in the updraft. The rotating updraft of a supercell (called a mesocyclone when visible on radar) helps a supercell storm produce extreme weather events. Supercell storms are potentially the most dangerous storm type and have been observed to generate the vast majority of large and violet tornadoes, as well as downburst winds and large hail.

Despite their size, all thunderstorms are dangerous and capable of threatening life and property. Of the estimated 100,000 thunderstorms that occur each year in the United States, roughly 10% are classified as severe.

What kinds of damaging winds are produced by a thunderstorm?

Aside from tornadoes, thunderstorms can produce straight-line winds. A straight-line wind is defined as any wind produced by a thunderstorm that is not associated with rotation. There are several types of straight-line winds including downdrafts, downbursts, microbursts, gust fronts and derechos.

Damage from straight-line winds is more common than damage from tornadoes and accounts for most thunderstorm wind damage. Straight-line wind speeds can exceed 87 knots (100 mph), produce a damage pathway extending for hundreds of miles and can cause damage equivalent to a strong tornado.

The NWS measures a storm's wind speed in knots or nautical miles. A wind speed of one knot is equal to approximately 1.15 miles per hour. **Figure 12** shows conversions from knots to miles per hour for various wind speeds.

Figure 12
Wind Speed Conversions

Knots (kts)	Miles Per Hour (mph)	Knots (kts)	Miles Per Hour (mph)
50 kts	58 mph	60 kts	69 mph
52 kts	60 mph	65 kts	75 mph
55 kts	63 mph	70 kts	81 mph
58 kts	67 mph	80 kts	92 mph

What is hail?

Hail is precipitation in the form of spherical or irregular-shaped pellets of ice that occur within a thunderstorm when strong rising currents of air (updrafts) carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice.

Hailstones grow by colliding with supercooled water drops. The supercooled water drops freeze on contact with ice crystals, frozen rain drops, dust, etc. Thunderstorms with strong updrafts continue lifting the hailstones to the top of the cloud where they encounter more supercooled water and continue to grow. Eventually the updraft can no longer support the weight of the hail or the updraft weakens and the hail falls to the ground.

In the United States, hail causes more than $1 billion in damages to property and crops annually. Hail has been known to cause injuries, although it rarely causes fatalities or serious injury.

How is the severity of a hail event measured?

The severity or magnitude of a hail event is measured in terms of the size (diameter) of the hailstones. The hail size is estimated by comparing it to known objects. **Figure13** provides descriptions for various hail sizes.

Figure 13
Hail Size Descriptions

Hail Diameter (inches)	Description	Hail Diameter (inches)	Description
0.25 in.	pea	1.75 in.	golf ball
0.50 in.	marble/mothball	2.50 in.	tennis ball
0.75 in.	penny	2.75 in.	baseball
0.88 in.	nickel	3.00 in.	tea cup
1.00 in.	quarter	4.00 in.	grapefruit
1.50 in.	ping pong ball	4.50 in.	softball

Source: NOAA, National Severe Storm Laboratory.

Hail size can vary widely. Hailstones may be as small as 0.25 inches in diameter (pea-sized) or, under extreme circumstances, as large as 4.50 inches in diameter (softball-sized). Typically hail that is one (1) inch in diameter (quarter-sized) or larger is considered severe.

The severity of a hail event can also be measured or rated using the TORRO Hailstorm Intensity Scale. This scale was developed in 1986 by the Tornado and Storm Research Organisation of the United Kingdom. It measures the intensity or damage potential of a hail event based on several factors including: maximum hailstone size, distribution, shape and texture, numbers, fall speed and strength of the accompanying winds.

The Hailstorm Intensity Scale identifies ten different categories of hail intensity, H0 through H10. **Figure 14** gives a brief description of each category. This scale is unique because it recognizes that, while the maximum hailstone size is the most important parameter relating to structural damage, size alone is insufficient to accurately categorize the intensity and damage potential of a hail event.

It should be noted that the typical damage impacts associated with each intensity category reflect the building materials predominately used in the United Kingdom. These descriptions may need to be modified for use in other countries to take into account the differences in building materials typically used (i.e., whether roofing materials are predominately shingle, slate or concrete, etc.).

Figure 14
TORRO Hailstorm Intensity Scale

Intensity Category		Typical Hail Diameter millimeters (approx.)*	Typical Hail Diameter inches (approx.)*	Description	Typical Damage Impacts
H0	Hard Hail	5 mm	0.2”	pea	no damage
H1	Potentially Damaging	5-15 mm	0.2” – 0.6”	pea / mothball	slight general damage to plants, crops
H2	Significant	10-20 mm	0.4” – 0.8”	dime / penny	significant damage to fruit, crops, vegetation
H3	Severe	20-30 mm	0.8” – 1.2”	nickel / quarter	severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40 mm	1.0” – 1.6”	half dollar / ping pong ball	widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50 mm	1.2” – 2.0”	golf ball	wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60 mm	1.6” – 2.4”	golf ball / egg	bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-75 mm	2.0” – 3.0”	egg / tennis ball	severe roof damage, risk of serious injuries
H8	Destructive	60-90 mm	2.4” – 3.5”	tennis ball / tea cup	severe damage to aircraft bodywork
H9	Super Hailstorms	75-100 mm	3.0” – 4.0”	tea cup / grapefruit	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	> 100 mm	> 4.0”	softball	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open

* Approximate range since other factors (i.e., number and density of hailstones, hail fall speed and surface wind speed) affect severity.

Source: Tornado and Storm Research Organisation, TORRO Hailstorm Intensity Scale Table.

What is lightning?

Lightning, a component of all thunderstorms, is a visible electrical discharge that results from the buildup of charged particles within storm clouds. It can occur from cloud-to-ground, cloud-to-cloud, within a cloud or cloud-to-air. The air near a lightning strike is heated to approximately 50,000°F (hotter than the surface of the sun). The rapid heating and cooling of the air near the lightning strike causes a shock wave that produces thunder.

Lightning on average causes 60 fatalities and 400 injuries annually in the United States. Most fatalities and injuries occur when people are caught outdoors in the summer months during the afternoons and evenings. In addition, lightning can cause structure and forest fires. Many of the wildfires in the western United States and Alaska are started by lightning. According to the NWS lightning strikes cost more than $1 billion in insured losses each year.

Are alerts issued for severe storms?

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***severe thunderstorm watches*** and ***warning****s* for Peoria, Tazewell and Woodford Counties depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A severe thunderstorm watch is issued when conditions are possible in or near the watch area. Individuals should stay alert for the latest weather information and be prepared to take shelter.
- **Warning.** A severe thunderstorm warning is issued when a severe thunderstorm is approaching or occurring. Warnings indicate imminent danger to life and property for those who are in the path of the storm.

3.1.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of severe storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe storms occurred previously? What is the extent of these previous severe storms?

Figures 15, **16**, and **17** located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in Tazewell County. The severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning and heavy rain. Severe storms are the most frequently occurring natural hazard in Tazewell County.

Severe Storms Fast Facts – Occurrences

Number of recorded Thunderstorms with Damaging Winds (1960 – 2017): ***236***

Number of recorded Severe Hail Events (1960 – 2017): ***98***

Number recorded of Lightning Strike Events (1991 – 2017): ***3***

Highest Recorded Wind Speed: ***83 knots (June 29, 1998 countywide)***

Largest Hail Recorded: ***3.00 inches (May 28, 2003 at Washington)***

Most Likely Month for Thunderstorms with Damaging Winds to Occur: ***June***

Most Likely Month for Severe Hail to Occur: ***May***

Most Likely Time for Thunderstorms with Damaging Winds to Occur: ***Afternoon/Early Evening***

Most Likely Time for Severe Hail to Occur: ***Afternoon/Early Evening***

Thunderstorms with Damaging Winds

NOAA's Storm Events Database and NOAA's Storm Data Publications were used to document 237 reported occurrences of thunderstorms with damaging winds in Tazewell County between 1960 and 2017. Of the 236 occurrences, 156 had reported wind speeds of 50 knots or greater. There were 80 occurrences, however, where the wind speed was not recorded.

The highest wind speed recorded in Tazewell County occurred county-wide on June 29, 1998 when winds reached 83 knots (95 mph) during a thunderstorm event. Thunderstorms with damaging winds have been *recorded* in every participating municipality within the County on multiple occasions.

Figure 18 charts the reported occurrences of thunderstorms with damaging winds in Tazewell County by month. Of the 236 events, 172 (73%) took place in May, June, July and August making this the peak period for thunderstorms with damaging winds in Tazewell County. Of those 172 events, 62 (36%) occurred during June, making this the peak month for thunderstorms with damaging winds.

Figure 18
Graph: Thunderstorms with Damaging Winds by Month Tazewell County: 1960 – 2017

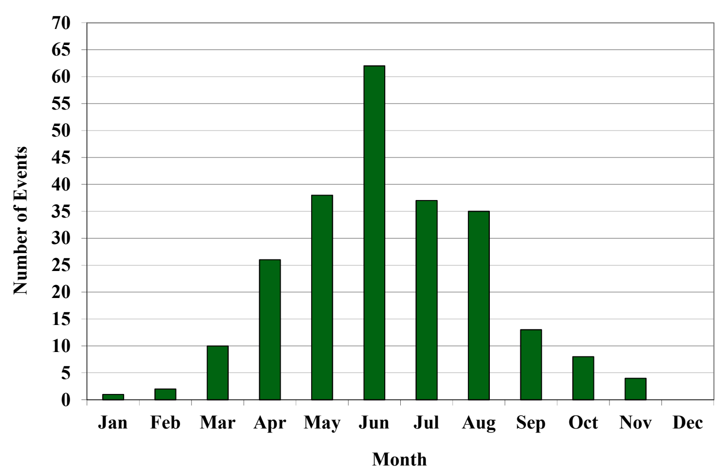
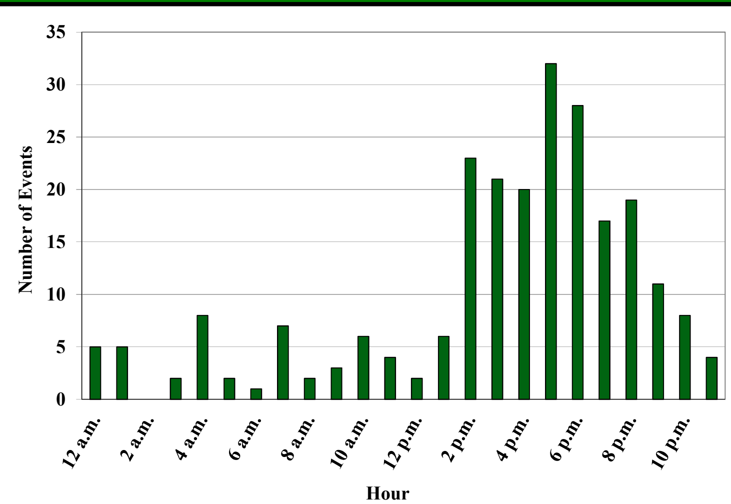


Figure 19 charts the reported occurrences of thunderstorms with damaging winds by hour. Of the 236 occurrences, approximately 81% occurred during the p.m. hours, with 160 of the events (68%) taking place between 2 p.m. and 9 p.m.

Figure 19
Graph: Thunderstorms with Damaging Winds by Hour Tazewell County: 1960 – 2017



Hail

NOAA's Storm Events Database was used to document 98 reported occurrences of severe storms with hail one (1) inch in diameter or greater in Tazewell County between 1960 and 2017. Of the 98 occurrences, 45 produced hailstones 1.50 inches or larger in diameter.

The largest hail stones documented in Tazewell County measured 3.00 inches in diameter (tea cup-sized) and fell on May 28, 2003 at Washington. Hail one (1) inch in diameter or greater has been *recorded* in every participating municipality on multiple occasions.

Figure 20 charts the reported occurrences of hail by month. Of the 98 occurrences, 69 (70%) took place in April, May and June making this the peak period for hail in Tazewell County. Of the 69 events, 28 (41%) occurred during May, making this the peak month for hail events.

Figure 20
Graph: Hail Events by Month Tazewell County: 1960 – 2017

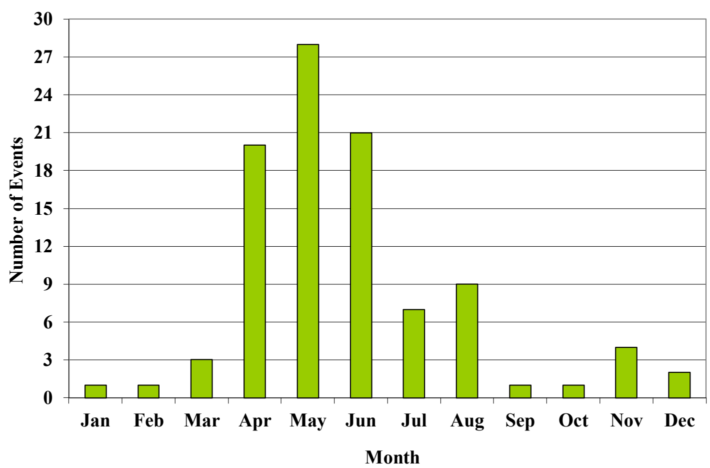


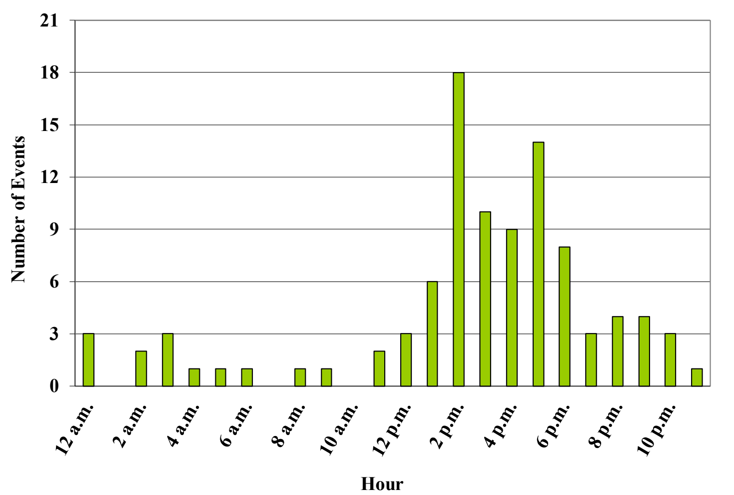
Figure 21 charts the reported occurrences of hail by hour. Approximately 85% of all the hail events occurred during the p.m. hours, with 59 of the events (60%) taking place between 2:00 p.m. and 7:00 p.m.

Lightning

While lightning strike events occur regularly across central Illinois, NOAA's Storm Events Database and NOAA's Storm Data Publications only identified three recorded occurrences of lightning strikes in Tazewell County between 1991 and 2017. One event each took place in June, July and October. All three events occurred during the p.m. hours.

These represent the ***reported occurrences*** of lightning strike events. The NWS acknowledges that lightning strike events area not well recorded, due in part to the rural nature of most Illinois counties. Only those events with impacts, such as property damage or injuries/fatalities, are reported. As a result, lightning strike events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Figure 21
Graph: Hail Events by Hour Tazewell County: 1960 – 2017



According to data from Vaisala's National Lightning Detection Network, Tazewell County averaged at least 12 to 20 cloud-to-ground lightning flashes per square mile annually between 2005 and 2014. **Figure 22** illustrates the cloud-to-ground lightning flash density (number of cloud-to-ground flashes per square mile) by county for the continental United States. In comparison, Illinois averaged 14.1 cloud-to-ground lightning flashes per square mile between 2006 and 2015, ranking it eighth in the Country for lightning flash density.

<u>*Heavy Rain*</u>
While heavy rain events occur on a fairly regular basis across central Illinois, NOAA's Storm Events Database does not include any *recorded* heavy rain events for Tazewell County. This may be due in part to a lack of uniform reporting guidelines for heavy rain events.

What locations are affected by severe storms?

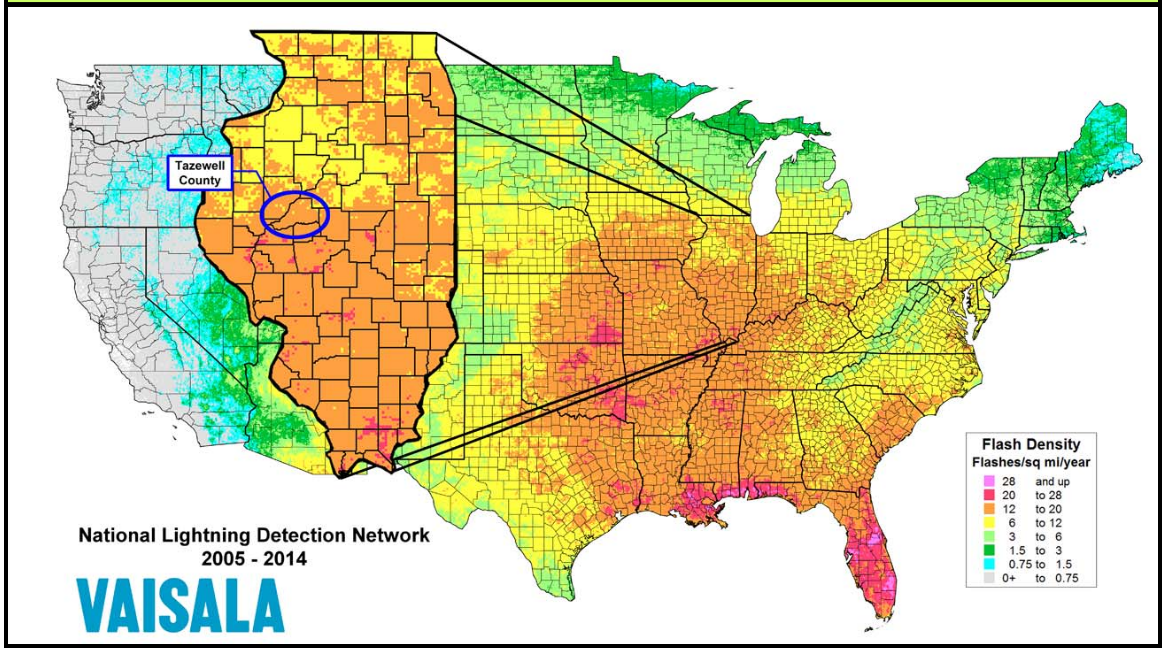
Severe storms affect the entire County. A single severe storm event will generally extend across the entire County and affect multiple locations. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency (IEMA) classifies Tazewell County's hazard rating for severe storms as "severe." (IEMA's hazard rating system has five levels: low, guarded, elevated, high and severe.)

What is the probability of future severe storm events occurring?

<u>*Thunderstorms with Damaging Winds*</u>

Tazewell County has had 236 verified occurrences of thunderstorms with damaging winds between 1960 and 2017. With 236 occurrences over the past 58 years, Tazewell County should expect to experience at least four thunderstorms with damaging winds each year. There were 33 years over the last 58 years where multiple (three or more) thunderstorms with damaging winds occurred. This indicates that the probability that multiple thunderstorms with damaging winds may occur during any given year within the County is 57%.

Figure 22
Cloud-to-Ground Lightning Flash Density: Tazewell County



Hail

There have been 98 verified occurrences of hail one (1) inch in diameter or greater between 1960 and 2017. With 98 occurrences over the past 58 years, Tazewell County should expect to experience at least one severe hail event each year. There were 24 years over the last 58 years where two or more hail events occurred. This indicates that the probability that more than one severe storm with hail may occur during any given year within the County is 41%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe storms.

Are the participating jurisdictions vulnerable to severe storms?

Yes. All of Tazewell County is vulnerable to the dangers presented by severe storms due to the topography of the region and its location in relation to the movement of weather fronts across central Illinois. Since 2008, Tazewell County has recorded 68 thunderstorms with damaging winds, 35 severe storms with hail one (1) inch in diameter or greater and one verified lightning strike event.

Figure 23 details the number thunderstorms with damaging winds and hail events that were recorded in or near each participating municipality while **Figure 24** details the number of thunderstorms with damaging winds and hail events that were recorded in or near unincorporated areas of Tazewell County. Of the participating municipalities, Pekin has had more recorded occurrences of thunderstorms with damaging winds and hail events than any of the other municipalities. Of the three recorded lightning strikes, one occurred in the participating municipality of Morton.

Figure 23
Verified Severe Storm Events by Participating Municipality – Tazewell County

Participating Municipality	Number of Events	
	Thunderstorm & High Wind	Severe Hail
East Peoria	14	9
Morton	29	13
Pekin	53	22
Tremont	19	10
Washington	21	14

Figure 24
Verified Severe Storm Events in Unincorporated Tazewell County

Unincorporated Area	Number of Events	
	Thunderstorm & High Wind	Severe Hail
Allentown	3	1
Dillon	3	1
Groveland	7	6
Lilly	1	1
Mayfair	0	1
Midway	2	0
Parkland	5	1
Pekin Municipal Airport	1	0
Schaeferville	3	3
Spring Lake	2	1
Talbott	1	0

What impacts resulted from the recorded severe storms?

Severe storms as a whole have caused an estimated $6.99 million in recorded property damages and $1 million in recorded crop damages. The following provides a breakdown of impacts by category.

Thunderstorms with Damaging Winds

Data obtained from NOAA's Storm Events Database and NOAA's Storm Data Publications indicates that between 1960 and 2017, 85 of the 236 thunderstorms with damaging winds caused $6.89 million in property damages and $1 million in crop damages. Damage information was either unavailable or none was recorded for the remaining 151 reported occurrences.

NOAA's Storm Events Database documented 14 injuries as the result of three separate thunderstorm with damaging wind events. The following provides a brief description of each event.

- On June 23, 1995 six workers were injured when a thunderstorm with damaging winds blew down the roof of a motel that was being constructed.
- Six semi-truck drivers were injured on February 11, 1999 when a thunderstorm with damaging winds blew their semis over on Interstate 74.

- On April 23, 2009 two individuals suffered minor injuries when a thunderstorm with damaging winds flipped a car over on the US Route 150 bridge.

Hail
Damage information was either unavailable or none was recorded for any of the 98 hail events experienced between 1960 and 2017. No injuries or fatalities were reported as a result of any of the recorded hail events either.

Lightning
Data obtained from NOAA's Storm Events Database and NOAA's Storm Data Publications indicates that between 1991 and 2017, lightning strike events caused $95,050 in property damages. No injuries or fatalities were reported as a result of any of the three lightning strike events.

Severe Storms Fast Facts – Impacts/Risk

Thunderstorms with Damaging Winds Impacts
- Total Property Damage: ***$6,894,950***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***$1,025,000***
- Injuries: ***14***
- Fatalities: ***n/a***

Severe Hail Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Lightning Strike Impacts
- Total Property Damage: ***$95,050***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Severe Storms Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Medium/High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from severe storms?
In Tazewell County, the greatest risk to health and safety from severe storms is vehicle accidents. Hazardous driving conditions resulting from severe storms (i.e., wet pavement, poor visibility, high winds, etc.) can contribute to accidents that result in injuries and fatalities. Traffic accident data assembled by the Illinois Department of Transportation from 2011 through 2015 indicates that wet road surface conditions were present for 11.6% to 16.2% of all crashes recorded annually in the County.

While other circumstances cause wet road surface conditions (i.e., melting snow, condensation, light showers, etc.), law enforcement officials agree that hazardous driving conditions caused by severe storms add to the number of crashes. **Figure 25** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when wet road surface conditions were present.

What is the level of risk/vulnerability to public health and safety from severe storms?

For Tazewell County the level of risk or vulnerability posed by severe storms to public health and safety is considered to be low. This assessment is based on the fact that despite their relative frequency, the number of injuries and fatalities is low. In addition, UnityPoint Health – Pekin in Pekin as well as hospitals in Peoria (Peoria County), Eureka (Woodford County), Bloomington/Normal (McLean County), Lincoln (Logan County), Havana (Mason County) and Canton (Fulton County) and regional health centers in Springfield (Sangamon County) and the

Quad Cities area (Rock Island County) are equipped to provide care to persons injured during a severe storm.

Figure 25
Severe Weather Crash Data – Tazewell County

Year	Total # of Crashes	Presence of Wet Road Surface Conditions		
		# of Crashes	# of Injuries	# of Fatalities
2011	2,507	406	134	1
2012	2,502	290	105	0
2013	2,559	406	129	0
2014	2,567	336	100	3
2015	2,499	346	127	1
Total:	**12,634**	**1,784**	**595**	**5**

Source: Illinois Department of Transportation.

Are existing buildings, infrastructure and critical facilities vulnerable to severe storms?

Yes. All existing buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are vulnerable to damage from severe storms. Structural damage to buildings is a relatively common occurrence with severe storms. Damage to roofs, siding, awnings and windows can occur from hail, flying and falling debris and high winds. Lightning strikes can damage electrical components and equipment (i.e., appliances, computers etc.) and can cause fires that consume buildings. If the roof is compromised or windows are broken, rain can cause additional damage to the structure and contents of a building.

Infrastructure and critical facilities tend to be just as vulnerable to severe storm damage as buildings. The infrastructure and critical facilities that are the most vulnerable to severe storms are related to power distribution and communications. High winds, lightning and flying and falling debris have the potential to cause damage to communication and power lines, power substations, transformers and poles, and communication antennas and towers.

The damage inflicted by severe storms often leads to disruptions in communication and creates power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service. Power outages and disruptions in communications can impair vital services, particularly when backup power generators are not available. Participating jurisdictions acknowledged the need for emergency backup generators to allow continued operation of critical facilities such as municipal buildings, storm shelters, police and fire stations, heating and cooling centers, and lift stations. Of the participants, Tremont does not have emergency backup generators at its drinking water well sites or one of its lift stations while Washington will require a backup generator at Five Points should it become a designated warming center.

In addition to affecting power distribution and communications, debris and flooding from severe storms can block state and local roads hampering travel. When transportation is disrupted, emergency and medical services are delayed, rescue efforts are hindered and government services can be affected.

Based on the frequency with which severe storms occur in Tazewell County, the amount of property damage previously reported and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe storms is medium to high.

Are future buildings, infrastructure and critical facilities vulnerable to severe storms?

Yes and No. All of the participating jurisdictions have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms. However, infrastructure such as new communication and power lines will continue to be vulnerable to severe storms as long as they are located above ground. High winds, lightning and flying and falling debris can disrupt power and communication. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from severe storms?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe storms. With only 88 of the 337 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. Since all existing structures within Tazewell County are vulnerable to damage, it is highly probable that there will be future dollar losses from severe storms.

Tazewell County

Figure 15
(Sheet 1 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/16/1960	3:00 p.m.	Tremont^	n/a	n/a	n/a	n/a	n/a	
7/21/1961	4:40 p.m.	Pekin	n/a	n/a	n/a	n/a	n/a	
8/7/1968	2:30 p.m.	East Peoria Washington	n/a	n/a	n/a	n/a	n/a	winds downed tree limbs and caused minor building damage
5/29/1969	4:10 p.m.	Hopedale^	n/a	n/a	n/a	n/a	n/a	
10/10/1969	8:00 p.m.	Pekin	n/a	n/a	n/a	n/a	n/a	
5/1/1973	10:15 p.m.	South Pekin^	n/a	n/a	n/a	n/a	n/a	
5/1/1973	11:15 p.m.	Pekin	52 kts	n/a	n/a	$25,000	n/a	
6/26/1973	9:00 a.m.	Spring Lake^	n/a	n/a	n/a	n/a	n/a	winds uprooted trees and caused damage to a few homes
6/19/1974	6:20 p.m.	Dillon^	n/a	n/a	n/a	n/a	n/a	
6/21/1974	7:25 p.m.	Delavan	n/a	n/a	n/a	n/a	n/a	
4/29/1975	5:24 p.m.	Delavan	60 kts	n/a	n/a	n/a	n/a	
5/19/1975	4:40 p.m.	Delavan	52 kts	n/a	n/a	n/a	n/a	
3/26/1976	8:55 p.m.	Pekin	n/a	n/a	n/a	n/a	n/a	
3/26/1976	9:00 p.m.	Creve Coeur	n/a	n/a	n/a	n/a	n/a	
3/26/1976	9:10 p.m.	Groveland Morton Tremont	n/a	n/a	n/a	n/a	n/a	
5/4/1977	5:30 p.m.	Delavan Hopedale Tremont	n/a	n/a	n/a	n/a	n/a	
6/5/1977	3:20 p.m.	Pekin	50 kts	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$25,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 2 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8/13/1980	5:35 p.m.	Morton	54 kts	n/a	n/a	n/a	n/a	
9/1/1980	3:00 a.m.	Tremont	n/a	n/a	n/a	n/a	n/a	2 steel grain bins were destroyed
9/16/1980	5:10 p.m.	East Peoria	n/a	n/a	n/a	n/a	n/a	
8/24/1982	12:55 p.m.	Tremont	n/a	n/a	n/a	n/a	n/a	
8/24/1982	1:00 p.m.	Delevan	n/a	n/a	n/a	n/a	n/a	
7/29/1983	3:45 p.m.	Pekin Municipal Airport	n/a	n/a	n/a	n/a	n/a	winds damaged 2 planes
4/29/1984	8:00 p.m.	Green Valley Delavan	n/a	n/a	n/a	n/a	n/a	winds blew down trees in the southwestern part of the County
4/29/1984	8:50 p.m.	Washington^	n/a	n/a	n/a	n/a	n/a	
7/10/1984	9:30 p.m.	South Pekin	n/a	n/a	n/a	n/a	n/a	winds downed tree limbs and power lines
7/2/1985	6:45 p.m.	northern half of the county	n/a	n/a	n/a	n/a	n/a	scattered power outages occurred due to trees falling across power lines
7/4/1985	9:45 p.m.	northern half of the county	n/a	n/a	n/a	n/a	n/a	winds caused widespread minor damage to trees, telephone and electric utilities
7/31/1986	1:30 p.m.	countywide	n/a	n/a	n/a	n/a	n/a	- winds downed thousands of trees - widespread power outages were experienced - 5,000 houses without power
9/19/1986	4:50 a.m.	Hopedale Minier	52 kts	n/a	n/a	n/a	n/a	*Hopedale/Minier area* many large trees blocked roads
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 3 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/21/1987	8:25 p.m.	Pekin	n/a	n/a	n/a	n/a	n/a	winds blew down trees
5/21/1987	9:45 p.m.	Morton	n/a	n/a	n/a	n/a	n/a	400 homes were without power for several hours when trees fell across power lines
7/31/1987	3:05 p.m.	Pekin	52 kts	n/a	n/a	$25,000	n/a	- winds toppled large trees in and around the City - one home was so badly damaged by a large tree that it was rendered uninhabitable
4/22/1988	8:00 p.m.	East Peoria^	n/a	n/a	n/a	$25,000	n/a	winds demolished a large construction trailer and a building under construction a mile south of the City
4/22/1988	8:50 p.m.	Morton	n/a	n/a	n/a	$2,500	n/a	*Event Description Provided Below*
Morton - a large part of a motel roof was torn off						*Morton area* - winds nearly demolished a large turkey farm building - some downed trees and power lines blocked roads		
5/8/1988	4:10 p.m.	Pekin	n/a	n/a	n/a	$250,000	n/a	- winds severely damaged a block/brick beach house - 2 homes were damaged by falling trees
Subtotal:				**0**	**0**	**$102,500**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 4 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/8/1988	4:20 p.m.	East Peoria	61 kts	n/a	n/a	$1,500,000	n/a	*Event Description Provided Below*
- strong winds and downbursts severely damaged 33 homes • some of the heaviest damage occurred in Fond Du Lac Heights and a two-block stretch from Clayton Court to near Oakwood Drive - parts of roofs were blown off of homes - a couple of garages were destroyed - a restaurant on IL Rte. 116 and Caterpillar Drive lost its entire roof while 70 individuals were dining but no injuries occurred								
5/8/1988	4:30 p.m.	Marquette Heights	n/a	n/a	n/a	$25,000	n/a	- winds damaged 25 large trees, uprooting some of them - 10 homes had roof damage - 3 cars were damaged by falling trees
11/15/1988	10:00 p.m.	Minier Hopedale^	n/a	n/a	n/a	$25,000	n/a	<u>*Minier*</u> - a roof was blown off a house <u>*Hopedale area*</u> - winds destroyed a hog building - part of the roof of a farmhouse was torn off
4/27/1990	5:01 p.m.	Hopedale^	52 kts	n/a	n/a	n/a	n/a	
8/29/1990	1:00 a.m.	Pekin^	n/a	n/a	n/a	n/a	$25,000	
5/17/1991	8:32 p.m.	Parkland^	n/a	n/a	n/a	n/a	n/a	winds blew down trees
5/17/1991	8:44 p.m.	Minier	n/a	n/a	n/a	n/a	n/a	winds blew down trees
5/31/1991	6:20 p.m.	Pekin	n/a	n/a	n/a	$25,000	n/a	winds toppled trees and blew down power lines
6/15/1991	2:46 p.m.	Morton^	55 kts	n/a	n/a	n/a	n/a	
6/15/1991	3:20 p.m.	Pekin	n/a	n/a	n/a	$2,500	n/a	winds downed power lines
5/4/1992	1:52 p.m.	Pekin	n/a	n/a	n/a	$250	n/a	several medium to large sized trees were blown down
Subtotal:				**0**	**0**	**$1,577,750**	**$25,000**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 5 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/17/1992	3:00 p.m.	Morton	n/a	n/a	n/a	n/a	n/a	
6/17/1992	3:00 p.m.	South Pekin	n/a	n/a	n/a	n/a	n/a	
6/7/1992	3:20 p.m.	Delavan	n/a	n/a	n/a	n/a	n/a	- trees and power lines were blown down - a tree was blown onto a house causing damage
6/23/1992	8:40 p.m.	Pekin	52 kts	n/a	n/a	n/a	n/a	
7/2/1992	1:10 p.m.	Creve Coeur	n/a	n/a	n/a	n/a	n/a	the roof was blown off of a community recreation center
9/7/1992	9:40 p.m.	Pekin	n/a	n/a	n/a	n/a	n/a	trees were blown down
9/9/1992	4:30 p.m.	Washington^	57 kts	n/a	n/a	n/a	n/a	
9/9/1992	5:03 p.m.	Deer Creek	n/a	n/a	n/a	n/a	n/a	winds damaged trees
5/12/1993	5:43 p.m.	East Peoria	n/a	n/a	n/a	n/a	n/a	winds blew down tree limbs and power lines
8/15/1993	8:15 p.m.	Creve Coeur	n/a	n/a	n/a	n/a	n/a	a large tree was blown down onto power lines
8/15/1993	8:20 p.m.	East Peoria	n/a	n/a	n/a	$500	n/a	a 20-inch diameter tree was blown down
8/23/1993	4:40 p.m.	Creve Coeur	n/a	n/a	n/a	$50	n/a	large tree limbs were blown down
8/23/1993	4:50 p.m.	Washington	n/a	n/a	n/a	n/a	n/a	
8/23/1993	4:56 p.m.	Deer Creek^	n/a	n/a	n/a	n/a	n/a	
8/23/1993	5:05 p.m.	Deer Creek	n/a	n/a	n/a	$500	n/a	a 10-inch diameter tree was blown down
8/23/1993	5:35 p.m.	Deer Creek	n/a	n/a	n/a	$50	n/a	large tree limbs were blown down
8/23/1993	6:10 p.m.	Groveland	n/a	n/a	n/a	$500	n/a	large tree limbs were blown down
Subtotal:				**0**	**0**	**$1,600**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 6 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/26/1994	5:45 p.m.	Washington	n/a	n/a	n/a	$2,500	n/a	_Washington_ - several houses had siding damage _Washington area_ - winds damaged a two mile wide swath of crops
6/26/1994	5:50 p.m.	Creve Coeur	n/a	n/a	n/a	$2,500	n/a	- a vent stack was blown off the roof of the Wesleyan Church - 3-inch diameter tree limbs were blown down
6/26/1994	5:52 p.m.	Pekin	n/a	n/a	n/a	$2,500	n/a	- large tree limbs were blown down - trees were blown down along IL Rte. 98
6/26/1994	5:55 p.m.	Tremont^	n/a	n/a	n/a	$25,000	n/a	- winds damaged siding on several homes - large trees were blown down on Townline and Schrader Roads - winds damaged crops
7/2/1994	5:05 p.m.	Marquette Heights	n/a	n/a	n/a	n/a	n/a	a 3-inch diameter tree was blown down
7/20/1994	5:07 p.m.	South Pekin	n/a	n/a	n/a	$50	n/a	power lines were blown down
7/20/1994	5:22 p.m.	Pekin	n/a	n/a	n/a	$50	n/a	- part of the roof of a Western Auto Parts store was blown off - large tree limbs were blown down
6/20/1995	6:45 p.m.	countywide	n/a	n/a	n/a	n/a	n/a	winds downed 6 to 12 inch diameter tree limbs
Subtotal:				**0**	**0**	**$32,600**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 7 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/21/1995	6:55 p.m.	Minier	52 kts	n/a	n/a	n/a	n/a	winds blew a trained spotter's truck 3 feet off the road
6/23/1995	11:05 p.m.	Morton	n/a	6	0	n/a	n/a	- wind blew down the roof of a motel that was being constructed - 6 workers were injured, though none seriously - at another nearby construction site, the top two floors of a three-story townhouse complex were flattened
3/25/1996	4:00 a.m.	countywide	n/a	n/a	n/a	n/a	n/a	winds blew down numerous power lines and caused minor damage across the County *rain could not be documented with this event*
6/23/1996	10:18 p.m.	Delavan	55 kts	n/a	n/a	n/a	n/a	winds blew down a 12-inch diameter tree which landed on a pickup truck
6/23/1996	10:44 p.m.	South Pekin Midway	n/a	n/a	n/a	n/a	n/a	wind blew down numerous large tree limbs and power lines
7/24/1996	11:45 a.m.	Morton	n/a	n/a	n/a	n/a	n/a	several large trees were blown down in the Pine Lake area
10/29/1996	4:40 p.m.	Pekin Armington	n/a	n/a	n/a	n/a	n/a	*Pekin* - winds blew down numerous tree limbs and power lines *Armington* - a carport was blown off a house
Subtotal:				**6**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 8 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
10/30/1996	1:00 a.m.	countywide	57 kts	n/a	n/a	n/a	n/a	winds blew down trees, tree limbs and power lines *Pekin* - a tree fell onto a house causing damage to a bedroom *rain could not be documented with this event*
4/5/1997	3:12 p.m.	Parkland^	n/a	n/a	n/a	n/a	n/a	winds blew over a carport
4/5/1997	3:27 p.m.	countywide	n/a	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down throughout the area with some areas sustaining more serious damage
4/6/1997	9:15 a.m.	countywide	52 kts	n/a	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines *rain could not be documented with this event*
4/30/1997	2:19 p.m.	Pekin	58 kts	n/a	n/a	n/a	n/a	trees, tree limbs and power lines were knocked down
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 9 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4/30/1997	2:00 p.m.	countywide	61 kts	n/a	n/a	n/a	n/a	- hundreds of power lines were blown down across the area - numerous trees and tree limbs were blown down - widespread structural damage was reported - numerous sheds, grain bins and machine sheds were either blown over, damaged or destroyed
5/18/1997	9:23 p.m.	Pekin	n/a	n/a	n/a	n/a	n/a	winds blew down numerous large tree limbs
6/12/1997	11:55 a.m.	Parkland^	n/a	n/a	n/a	n/a	n/a	winds blew down several power lines
9/29/1997	10:00 a.m.	countywide	52 kts	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down *rain could not be documented with this event*
3/27/1998	6:55 p.m.	Delavan Green Valley South Pekin Tremont Morton	52 kts	n/a	n/a	$500,000	n/a	*Green Valley/South Pekin/Tremont* - winds blew down numerous trees and tree limbs *Morton* - winds damaged a car dealership as shingles, rocks and other debris were blown onto approx. 300 cars, knocking out windows in some and causing large dents in others
Subtotal:				**0**	**0**	**$500,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 10 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/19/1998	6:05 p.m.	countywide	n/a	n/a	n/a	n/a	n/a	numerous trees and tree limbs were blown down
5/24/1998	1:25 a.m.	Pekin	n/a	n/a	n/a	n/a	n/a	winds blew down a large tree limb onto a driveway
6/14/1998	7:30 a.m.	Washington	n/a	n/a	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines
6/18/1998	6:17 p.m.	countywide	n/a	n/a	n/a	n/a	n/a	- numerous trees, tree limbs and power lines were blown down *Morton* - winds blew off part of the roof of a shopping center - some of the debris damaged several vehicles in the adjacent parking lot *Washington* - a construction trailer was blown over
6/28/1998	7:24 p.m.	Armington	n/a	n/a	n/a	n/a	n/a	numerous large tree limbs were blown down
6/29/1998	3:40 p.m.	countywide	83 kts	n/a	n/a	$2,000,000	$1,000,000	*Event Description Provided Below*
Morton - as a tornado moved through the southwestern portions of the Village, strong microburst winds caused considerable tree and power line damage as well as structural damage in and close to the tornado path						*South Pekin* - 7 railroad cars were blown over 2 high-tension towers were blown down		
Subtotal:				**0**	**0**	**$2,000,000**	**$1,000,000**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 11 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
11/10/1998	5:30 a.m.	countywide	n/a	n/a	n/a	n/a	n/a	winds downed thousands of power lines and tree limbs and blew over hundreds of trees across the region *Creve Coeur area* - winds ripped sheet metal from a storage tank containing ammonia - some pieces of sheet metal sheared open two relief valves, releasing gas fumes into the air - homes were evacuated *rain could not be documented with this event*
2/11/1999	3:23 p.m.	countywide	51 kts	6	0	$40,000	n/a	*Event Description Provided Below*
numerous trees were blown over and several sheds, barns and outbuildings were either damaged or destroyed *Delavan* - blew the roof off a house *Delavan area* - winds took the roof off a corn crib and flipped over an irrigation rig 3 miles southwest of the City *South Pekin* - a dozen power poles were blown down *Tremont* - a semi was blown over on IL Rte. 9 near the interchange with I-155 *Tremont area* - tops of numerous trees were torn off and a swing set was blown over *Morton area* - 6 semis were blown over on I-74 causing 6 minor injuries and damaging 2 of the semis								
Subtotal:				**6**	**0**	**$40,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 12 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/4/1999	3:34 p.m.	Delavan^	n/a	n/a	n/a	n/a	n/a	- a semi was blown over on I-155 east of Delavan, the driver was uninjured - several trees were blown down nearby
7/28/1999	1:20 a.m.	Pekin Groveland Morton	52 kts	n/a	n/a	n/a	n/a	*Pekin* several large tree limbs were blown down
8/12/1999	7:15 p.m.	Armington	n/a	n/a	n/a	$10,000	n/a	several trees were blown down
8/23/1999	5:40 p.m.	Delavan Tremont Morton	52 kts	n/a	n/a	n/a	n/a	several large tree limbs were blown down
4/20/2000	4:59 a.m.	countywide	64 kts	n/a	n/a	$600,000	n/a	*Event Description Provided Below*
numerous trees, tree limbs, power poles and power lines were blown down countywide *Green Valley* - a large empty grain bin was blown over - several sheds were destroyed - an irrigation system was wrapped around a couple of power poles *Groveland* - a radio tower was blown down causing $500,000 in damage *Pekin* - new townhouses under construction were destroyed *Morton* - part of a roof from a business was blown off - debris from the roof damaged 3 cars in the parking lot *Washington* - a building housing a restaurant and bakery was destroyed - a hanger at a private airport was destroyed - 3 planes in the hanger were damaged *Minier* - several homes sustained roof damage - a couple shed were destroyed								
6/20/2000	7:02 p.m.	Pekin	n/a	n/a	n/a	n/a	n/a	several power lines were blown down
6/23/2000	4:25 p.m.	countywide	77 kts	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down
Subtotal:				**0**	**0**	**$610,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 13 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8/17/2000	5:45 p.m.	Parkland^	n/a	n/a	n/a	n/a	n/a	a 12-inch diameter tree was blown down onto some power lines
8/23/2000	5:15 p.m.	Mackinaw	n/a	n/a	n/a	n/a	n/a	a 15-inch diameter tree was blown down
9/11/2000	9:46 p.m.	Pekin Schaeferville Dillon^	52 kts	n/a	n/a	n/a	n/a	*Pekin* - numerous trees and power lines were reported down - a construction trailer was blown over and traveled some 100 feet from its original location *Pekin Energy Plant* - a large construction sign made of steel and brick was partially blown over
4/21/2001	5:50 p.m.	Green Valley^	50 kts	n/a	n/a	n/a	n/a	an irrigation tower was blown over
6/14/2001	6:05 p.m.	Pekin North Pekin Marquette Heights East Peoria Creve Coeur Morton Washington	50 kts	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down
7/23/2001	3:15 p.m.	Hopedale Armington	52 kts	n/a	n/a	n/a	n/a	several trees were blown down
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 14 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8/9/2001	7:20 p.m.	Pekin Tremont	52 kts	n/a	n/a	n/a	n/a	power lines and trees were blown down
8/22/2001	5:46 p.m.	South Pekin Pekin Groveland Morton East Peoria[^] Washington	50 kts	n/a	n/a	n/a	n/a	<u>*South Pekin*</u> - an out building was destroyed - trees were blown down <u>*Washington area*</u> - trees were blown down
8/22/2001	5:46 p.m.	Hopedale[^]	50 kts	n/a	n/a	n/a	n/a	trees were blown down
8/30/2001	7:10 p.m.	Pekin North Pekin Marquette Heights Creve Coeur East Peoria	52 kts	n/a	n/a	n/a	n/a	<u>*Pekin*</u> 4 to 6 inch limbs were blown down
10/24/2001	11:40 a.m.	Delavan[^]	56 kts	n/a	n/a	n/a	n/a	
3/9/2002	3:00 a.m.	countywide	54 kts	n/a	n/a	n/a	n/a	- numerous reports of downed power lines, power poles and trees - several reports of minor damage to roofs and storage sheds *rain could not be documented with this event*
4/24/2002	2:30 p.m.	Mackinaw[^]	50 kts	n/a	n/a	n/a	n/a	numerous trees were blown down in the Mackinaw River State Fish & Wildlife area
Subtotal:				**0**	**0**	**$0**	**$0**	

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 15 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/13/2002	6:43 p.m.	Delavan	50 kts	n/a	n/a	n/a	n/a	several power lines were blown down
6/4/2002	4:18 p.m.	countywide	55 kts	n/a	n/a	n/a	n/a	numerous limbs and several trees were blown down countywide, especially in the Washington area
7/26/2002	4:10 a.m.	Pekin[^] Allentown Mackinaw	52 kts	n/a	n/a	n/a	n/a	several trees and power lines were blown down
2/11/2003	6:41 p.m.	Tremont	51 kts	n/a	n/a	n/a	n/a	
4/4/2003	8:30 a.m.	Delavan[^]	56 kts	n/a	n/a	n/a	n/a	numerous large tree limbs were blown down
5/28/2003	2:00 p.m.	Washington	60 kts	n/a	n/a	n/a	n/a	- numerous trees were blown down - some of the trees landed on buildings causing minor to moderate damage
6/25/2003	6:30 p.m.	countywide	60 kts	n/a	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines, especially in the northern half of the County *Morton* several cars in a shopping center parking lot were damaged due to flying debris
7/8/2003	2:35 p.m.	Pekin Allentown Mackinaw[^]	52 kts	n/a	n/a	n/a	n/a	several trees, tree limbs and power lines were blown down
Subtotal:				**0**	**0**	**$0**	**$0**	

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 16 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
7/21/2003	12:55 a.m.	Creve Coeur East Peoria Groveland Tremont	60 kts	n/a	n/a	n/a	n/a	- numerous trees, tree limbs and power lines were blown down - several of the fallen trees caused minor damage to the roof of a couple of houses - several cars sustained damage from the trees
4/20/2004	4:45 p.m.	Pekin Schaeferville	52 kts	n/a	n/a	n/a	n/a	
4/24/2004	7:28 p.m.	Delavan	52 kts	n/a	n/a	n/a	n/a	
5/23/2004	8:30 a.m.	Delavan	52 kts	n/a	n/a	n/a	n/a	winds blew down several telephone poles as well as large tree limbs
5/30/2004	3:43 p.m.	Morton	55 kts	n/a	n/a	n/a	n/a	several large trees were blown down
5/30/2004	4:30 p.m.	Pekin Hopedale Armington	52 kts	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were down between Pekin and Armington
7/11/2004	3:45 p.m.	Hopedale Tremont^ Morton	52 kts	n/a	n/a	n/a	n/a	*Hopedale* a machine shed lost a small portion of its roof *Morton* numerous large tree limbs were blown down
7/22/2004	11:00 a.m.	Pekin	50 kts	n/a	n/a	n/a	n/a	- winds blew down several trees, tree limbs and power lines - one tree fell onto an unoccupied truck damaging it
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 17 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8/18/2004	8:04 p.m.	South Pekin	50 kts	n/a	n/a	n/a	n/a	several large tree limbs were blown down
10/29/2004	10:35 p.m.	Parkland Green Valley Delavan	55 kts	n/a	n/a	n/a	n/a	*Parkland area* an addition to a house that was under construction had half of its roof blown off
5/19/2005	5:32 p.m.	Mackinaw^	52 kts	n/a	n/a	n/a	n/a	
5/19/2005	5:45 p.m.	Washington^	50 kts	n/a	n/a	n/a	n/a	a large tree was blown down
6/4/2005	10:40 a.m.	South Pekin^	50 kts	n/a	n/a	n/a	n/a	winds blew down a 10-inch diameter tree
6/8/2005	1:55 p.m.	Delavan^	50 kts	n/a	n/a	n/a	n/a	
7/26/2005	3:31 p.m.	Morton	50 kts	n/a	n/a	n/a	n/a	numerous large tree branches were blown down
7/26/2005	3:40 p.m.	Mackinaw^	52 kts	n/a	n/a	n/a	n/a	several 12-inch diameter trees were blown down
7/26/2005	4:00 p.m.	South Pekin	50 kts	n/a	n/a	n/a	n/a	several trees and power lines were blown down
9/19/2005	2:38 p.m.	Groveland	52 kts	n/a	n/a	n/a	n/a	
9/19/2005	2:41 p.m.	Morton	60 kts	n/a	n/a	n/a	n/a	part of the roof of a shopping center was torn off
9/19/2005	2:50 p.m.	Hopedale	50 kts	n/a	n/a	n/a	n/a	numerous tree limbs were blown down across the Village
9/19/2005	2:52 p.m.	Pekin	50 kts	n/a	n/a	$1,500	n/a	a large tree limb fell on a house
9/19/2005	3:08 p.m.	Armington	n/a	n/a	n/a	n/a	n/a	- numerous trees were blown down - one tree fell on top of a car
Subtotal:				**0**	**0**	**$1,500**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 18 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
11/5/2005	9:24 p.m.	Pekin Tremont Mackinaw Delavan Hopedale	52 kts	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down
3/12/2006	8:30 p.m.	Allentown^	52 kts	n/a	n/a	n/a	n/a	windows were blown in on a house
4/2/2006	5:20 p.m.	Pekin	50 kts	n/a	n/a	n/a	n/a	- several tree limbs were blown down - siding was blown off a house
4/2/2006	5:30 p.m.	Minier	52 kts	n/a	n/a	n/a	n/a	power lines were blown down
4/2/2006	5:45 p.m.	Mackinaw	52 kts	n/a	n/a	n/a	n/a	winds damaged the roof of a small building
4/13/2006	10:30 p.m.	Washington	52 kts	n/a	n/a	$30,000	n/a	- power lines were blown down - the local Walmart lost $30,000 in food due to loss of power
4/13/2006	10:55 p.m.	South Pekin^ Dillon	60 kts	n/a	n/a	n/a	n/a	- a shed was destroyed and 2 large outbuildings were damaged - numerous trees, power poles and power lines were blown down
4/16/2006	12:45 p.m.	Tremont^	60 kts	n/a	n/a	n/a	n/a	2 large two-wheel grain hauling trailers were flipped over
5/24/2006	2:39 p.m.	Tremont Mackinaw	56 kts	n/a	n/a	n/a	n/a	*Mackinaw area* numerous large tree limbs and several highway signs were blown down
5/24/2006	2:40 p.m.	Hopedale	62 kts	n/a	n/a	n/a	n/a	- several large trees were blown down - a garage was shifted off its foundation
Subtotal:				**0**	**0**	**$30,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 19 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/24/2006	2:43 p.m.	Hopedale^	61 kts	n/a	n/a	n/a	n/a	
6/22/2006	7:10 a.m.	South Pekin	52 kts	n/a	n/a	n/a	n/a	a 12-inch diameter tree was blown down
6/22/2006	7:12 a.m.	Pekin	52 kts	n/a	n/a	n/a	n/a	1 15-inch diameter tree was blown down
6/22/2006	7:13 a.m.	Washington	50 kts	n/a	n/a	n/a	n/a	
6/22/2006	7:20 a.m.	Mackinaw	52 kts	n/a	n/a	n/a	n/a	a circus tent was partially blown down
7/2/2006	7:09 p.m.	Armington^	56 kts	n/a	n/a	n/a	n/a	
7/19/2006	2:55 p.m.	countywide	56 kts	n/a	n/a	n/a	n/a	numerous trees and power lines were blown down
3/31/2007	6:30 p.m.	Morton^ Washington^	65 kts	n/a	n/a	n/a	n/a	*Morton area* - at a farmstead a shed was severely damaged and a couple of grain bins sustained minor damage - minor damage occurred to the siding and gutters of the home *Washington area* - power lines were blown down
5/15/2007	1:05 p.m.	Deer Creek	52 kts	n/a	n/a	n/a	n/a	several 2 to 3 inch tree branches were blown down
8/7/2007	11:25 p.m.	Spring Lake^	53 kts	n/a	n/a	n/a	n/a	
8/22/2007	7:05 p.m.	Pekin	61 kts	n/a	n/a	$15,000	n/a	numerous trees were blown down
1/7/2008	5:11 p.m.	Morton Allentown Mackinaw	52 kts	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$15,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 20 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/26/2008	1:10 a.m.	Morton	56 kts	n/a	n/a	$2,000	n/a	a large tree was blown down across North Main Street
6/15/2008	2:11 p.m.	Creve Coeur	61 kts	n/a	n/a	$75,000	n/a	- numerous trees, large tree limbs and power lines were blown down - an A frame house was destroyed when 2 large trees fell on it
6/15/2008	2:15 p.m.	Green Valley	61 kts	n/a	n/a	$20,000	n/a	numerous trees were blown down along IL Rte. 29
6/15/2008	2:19 p.m.	Pekin	52 kts	n/a	n/a	$10,000	n/a	numerous large tree limbs were blown down
6/15/2008	2:25 p.m.	Tremont	56 kts	n/a	n/a	n/a	n/a	
6/15/2008	2:30 p.m.	Morton Deer Creek	62 kts	n/a	n/a	$20,000	n/a	numerous tree and tree limbs were blown down
7/21/2008	7:25 p.m.	Delavan	52 kts	n/a	n/a	n/a	n/a	a portion of a large tree fell across a road
8/5/2008	4:05 a.m.	East Peoria	61 kts	n/a	n/a	$2,000	n/a	winds snapped 3 six to eight-inch diameter trees
4/23/2009	7:30 p.m.	East Peoria	61 kts	2	0	$10,000	n/a	- winds flipped a car over on the US Rte. 150 bridge - 2 minor injuries were reported - a wooden playset was destroyed - minor shingle damage occurred to several homes - approx. 500 people were without power
6/1/2009	6:25 p.m.	Hopedale^	52 kts	n/a	n/a	n/a	n/a	a large tree limb was blown down
Subtotal:				**2**	**0**	**$139,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 21 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/1/2009	6:30 p.m.	Pekin	52 kts	n/a	n/a	$12,000	n/a	- a few trees were blown down - scattered power outages were noted
6/18/2009	4:06 a.m.	Morton	61 kts	n/a	n/a	$50,000	n/a	several trees and power lines were blown down
6/27/2009	7:19 p.m.	Washington	52 kts	n/a	n/a	$35,000	n/a	numerous large tree branches and power lines were blown down
7/24/2009	10:21 p.m.	Mackinaw	52 kts	n/a	n/a	$5,000	n/a	- a tree was blown down onto a john boat docked at the Heritage Lake fishing pier - the boat later sank
8/4/2009	7:30 a.m.	Pekin	61 kts	n/a	n/a	$25,000	n/a	numerous tree limbs were blown down
8/4/2009	7:55 a.m.	Washington	52 kts	n/a	n/a	$2,000	n/a	large tree branches were blown down near Beverly Manor School
8/19/2009	2:30 p.m.	Mackinaw Washington	52 kts	n/a	n/a	$35,000	n/a	*Mackinaw* several 9-iunch diameter tree limbs were blown down *Mackinaw area* several large tree limbs were blown down near Heritage Lake *Washington* numerous tree limbs were blown down
8/19/2009	2:50 p.m.	Talbott^	52 kts	n/a	n/a	$65,000	n/a	- a machine shed was destroyed - a barn was pushed off its foundation - windows were broken out - several trees were broken off or uprooted
Subtotal:				**0**	**0**	**$229,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 22 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4/4/2010	7:03 p.m.	South Pekin	52 kts	n/a	n/a	$10,000	n/a	several large tree limbs were broken down
5/13/2010	6:25 a.m.	South Pekin^	52 kts	n/a	n/a	n/a	n/a	a few tree limbs were broken
6/2/2010	12:40 a.m.	Armington^	70 kts	n/a	n/a	$125,000	n/a	- grain bins and machine sheds were damaged - a large tree limb was blown down onto the roof of a house
6/2/2010	12:40 a.m.	Washington^	52 kts	n/a	n/a	$30,000	n/a	a tree and several power lines were blown down at IL Rte. 24 and Pleasantview Road
6/2/2010	12:40 a.m.	Mackinaw^ Lilly	70 kts	n/a	n/a	$116,000	n/a	*Mackinaw area* - the roof of a house and several outbuildings were damaged - numerous trees and power lines were blown down *Lilly* - the roof of a barn was damaged - a large tree was blown down across Fast Avenue - a semi-truck was tipped over
6/23/2010	6:10 p.m.	Pekin	52 kts	n/a	n/a	$20,000	n/a	a tree was blown down onto a house on Prince Street
6/23/2010	6:13 p.m.	Morton	52 kts	n/a	n/a	$15,000	n/a	numerous small tree limbs were blown down
Subtotal:				**0**	**0**	**$328,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 23 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
10/26/2010	4:12 a.m.	Pekin	52 kts	n/a	n/a	$15,000	n/a	- several 18-inch branches were blown down - a large tree was blown down on Walnut Street
10/26/2010	4:30 a.m.	Morton Tremont Hopedale Mackinaw^	52 kts	n/a	n/a	$75,000	n/a	*Morton* power poles were blown down *Hopedale* - several power poles were blown down - the roof of a shed was damaged - 4 pear trees were toppled *Mackinaw area* a tree limb was blown onto power lines, resulting in a power outage to much of Mackinaw and Heritage Lake
10/26/2010	4:36 a.m.	Washington	52 kts	n/a	n/a	$40,000	n/a	power poles were blown down
5/25/2011	5:15 a.m.	Delavan	52 kts	n/a	n/a	$95,000	n/a	*Delavan* - part of the roof was blown off the high schools - power was knocked out to the south side of the City *Delavan area* - windows were broken at a house - a metal shed was blown down onto a road
Subtotal:				**0**	**0**	**$225,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 24 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/25/2011	5:05 p.m.	Pekin	52 kts	n/a	n/a	n/a	n/a	- a 3-inch diameter tree branch was blown down
6/4/2011	6:18 p.m.	Pekin	52 kts	n/a	n/a	$15,000	n/a	several trees were blown down
6/21/2011	6:05 p.m.	Morton	52 kts	n/a	n/a	$2,000	n/a	winds snapped a 12-inch diameter tree
8/8/2011	5:44 p.m.	East Peoria Creve Coeur	56 kts	n/a	n/a	$242,000	n/a	<u>*East Peoria*</u> wind damage occurred over a 2-block radius with several trees blown down on cars and house in the 1100 block of Springfield Road <u>*Creve Coeur*</u> a 12-inch diameter tree fell onto a house <u>*East Peoria/Creve Coeur area*</u> several trees were blown down on Pekin Avenue
6/16/2012	6:55 p.m.	Tremont	52 kts	n/a	n/a	n/a	n/a	- a tree was blown onto a house - several power lines were knocked down
6/16/2012	7:15 p.m.	Washington	52 kts	n/a	n/a	n/a	n/a	a tree and several tree limbs were blown down
7/26/2012	6:10 p.m.	Armington	52 kts	n/a	n/a	$42,000	n/a	- the roof an old school was damaged - numerous trees and tree branches were blown down - power lines were knocked down as well, causing power outages
5/20/2013	6:39 p.m.	Creve Coeur	52 kts	n/a	n/a	$4,000	n/a	a tree was blown onto a fence
Subtotal:				**0**	**0**	**$305,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 25 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/31/2013	3:00 p.m.	Morton	52 kts	n/a	n/a	$10,000	n/a	several branches were blown down at Queenwood and Main Street
5/12/2014	8:40 p.m.	Pekin	52 kts	n/a	n/a	$30,000	n/a	a few trees and power lines were blown down
5/12/2014	8:45 p.m.	East Peoria	52 kts	n/a	n/a	n/a	n/a	an 8-inch diameter tree limb was blown down on Fondulac Drive
6/30/2014	8:41 p.m.	Washington	5 kts	n/a	n/a	$1,000	n/a	a 5 to 6-inch diameter tree branch was blown down
7/14/2014	10:20 a.m.	Pekin	52 kts	n/a	n/a	$30,000	n/a	- 2 trees were uprooted and several large tree limbs were blown down - numerous power lines were knocked down as well
7/14/2014	10:27 a.m.	Schaeferville	52 kts	n/a	n/a	$4,000	n/a	a large tree was blown onto power lines
7/14/2014	10:30 p.m.	Pekin	52 kts	n/a	n/a	$5,000	n/a	windows were blown out of the Menards
8/4/2014	6:13 p.m.	Marquette Heights	52 kts	n/a	n/a	$30,000	n/a	a few trees and power lines were blown down
8/23/2014	10:30 a.m.	Pekin	52 kts	n/a	n/a	$18,000	n/a	several tree branches were blown down
6/7/2015	6:30 p.m.	Pekin	70 kts	n/a	n/a	n/a	n/a	several trees were snapped and uprooted
6/7/2015	6:45 p.m.	Pekin	70 kts	n/a	n/a	$30,000	n/a	a large tree was blown onto a garage and the roof of a house
Subtotal:				**0**	**0**	**$158,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15 (Sheet 26 of 29) Severe Storms – Thunderstorms with Damaging Winds 1960 – 2017								
Date(s)	**Start Time**	**Location(s)**	**Magnitude (Knots)**	**Injuries**	**Fatalities**	**Property Damage**	**Crop Damage**	**Description**
6/10/2015	8:50 p.m.	Marquette Heights Creve Coeur East Peoria	52 kts	n/a	n/a	$179,000	n/a	*Marquette Heights* - a 10-inch diameter tree was blown down at Douglas and Pontiac Streets - a 16-inch diameter tree split and blocked a road *Creve Coeur* - numerous trees and power lines were blown down - a few trees fell onto houses *East Peoria* - numerous trees and power lines were blown down
6/10/2015	8:50 p.m.	Pekin	52 kts	n/a	n/a	$80,000	n/a	numerous trees and tree branches were blown down
6/10/2015	9:00 p.m.	Washington Tremont^	52 kts	n/a	n/a	$52,000	n/a	*Washington* several trees and power lines were blown down *Tremont area* a 14 to 16-inch diameter tree was blown down onto Townline Road at the Mackinaw River Bridge
7/16/2015	4:23 p.m.	Armington	61 kts	n/a	n/a	$12,000	n/a	several trees were blown down
8/18/2015	4:52 p.m.	Hopedale^	52 kts	n/a	n/a	$20,000	n/a	a 45 by 50-foot pole barn under construction was blown over
8/18/2015	4:55 p.m.	Hopedale	52 kts	n/a	n/a	$2,000	n/a	a power line was blown down on Oak Street
Subtotal:				**0**	**0**	**$345,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 27 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
11/11/2015	7:20 p.m.	Pekin Groveland Morton	52 kts	n/a	n/a	$11,000	n/a	*Event Description Provided Below*
Pekin - a large tree branch was blown down onto a house causing minor roof damage - several large tree branches were blown down blocking Fenley Ave. - $11,000 in property damage was recorded in the City *Morton* - a tree was snapped *Ameren (regional information, including Tazewell County)* - 20,000 customers were without power for up to a day - 43 wires downed - 13 poles replaced - 25 service lines to individual customers damaged - 20 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed								
4/2/2016	9:00 a.m.	Pekin	52 kts	n/a	n/a	$5,000	n/a	winds caused scattered damage and power outages *Pekin* shingles were blown off the roof of a house *rain could not be documented with this event*
7/13/2016	3:50 p.m.	Marquette Heights	61 kts	n/a	n/a	$2,000	n/a	an 18-inch diameter tree was snapped
Subtotal:				**0**	**0**	**$18,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 28 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
7/13/2016	5:05 p.m.	Mackinaw	61 kts	n/a	n/a	$30,000	n/a	*Mackinaw* numerous trees were snapped around the Village *Mackinaw area* a 50-foot tall poplar tree approx. 12 to 15 feet in diameter was blown over onto Heritage Drive at Heritage Lake
7/24/2016	7:38 p.m.	Green Valley	52 kts	n/a	n/a	$3,000	n/a	2 – 12-inch diameter trees were blown down across IL Rte. 29
7/24/2016	9:59 p.m.	Hopedale	52 kts	n/a	n/a	$15,000	n/a	- a large, rotten tree was snapped about 10 feet above the ground - numerous large branches were blown down - a strip of tin was torn from a metal roof - a flag pole was bent to the ground
3/6/2017	11:43 p.m.	Morton	52 kts	n/a	n/a	$12,000	n/a	a semi was blown over on I-155 at the Main Street exit
3/7/2017	12:12 a.m.	Washington^	52 kts	n/a	n/a	$10,000	n/a	a wall of the Washington Township shed was blown down
5/26/2017	2:07 p.m.	Morton	61 kts	n/a	n/a	$100,000	n/a	numerous trees and power lines were blown down on the north side of the Village north of I-74 from Lakeland Rd. eastward to Tennessee Ave.
Subtotal:				**0**	**0**	**$170,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Tazewell County

Figure 15
(Sheet 29 of 29)
Severe Storms – Thunderstorms with Damaging Winds
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/19/2017	5:50 p.m.	Mackinaw^	52 kts	n/a	n/a	n/a	n/a	2 – 6-inch diameter tree limbs were blown down
7/10/2017	6:23 p.m.	Pekin^	61 kts	n/a	n/a	$30,000	n/a	several trees were blown over
7/10/2017	7;01 p.m.	South Pekin	61 kts	n/a	n/a	$12,000	n/a	a 24-inch diameter tree was blown onto a car
8/3/2017	6:00 p.m.	Minier	52 kts	n/a	n/a	n/a	n/a	several small tree branches were blown down across the Village
Subtotal:				**0**	**0**	**$42,000**	**$0**	
GRAND TOTAL:				**14**	**0**	**$6,894,950**	**$1,025,000**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Tony O'Neal, Emergency Response Specialist – Illinois Crisis Management, Ameren Illinois.
Tri-County MAC member responses to Natural Hazard Events Questionnaire.

Tazewell County

Figure 16
(Sheet 1 of 6)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/4/1960	7:00 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
6/10/1963	1:15 p.m.	Washington	1.00 in.	n/a	n/a	n/a	n/a	
5/15/1968	6:10 p.m.	Morton^	1.75 in.	n/a	n/a	n/a	n/a	
5/13/1970	2:45 a.m.	Lilly^	1.00 in.	n/a	n/a	n/a	n/a	
6/9/1972	3:40 p.m.	Pekin	1.75 in.	n/a	n/a	n/a	n/a	
6/14/1974	6:37 p.m.	Tremont	1.75 in.	n/a	n/a	n/a	n/a	
5/30/1975	1:05 p.m.	Minier	1.00 in.	n/a	n/a	n/a	n/a	
6/20/1975	4:11 p.m.	Washington	1.00 in.	n/a	n/a	n/a	n/a	
8/18/1975	5:45 p.m.	Dillon^	1.75 in.	n/a	n/a	n/a	n/a	
5/28/1978	2:00 p.m.	Washington East Peoria	1.25 in.	n/a	n/a	n/a	n/a	
7/26/1978	2:00 p.m.	Hopedale^	1.75 in.	n/a	n/a	n/a	n/a	
7/26/1978	2:55 p.m.	Mackinaw	2.00 in.	n/a	n/a	n/a	n/a	
6/2/1980	12:50 a.m.	Pekin^	1.75 in.	n/a	n/a	n/a	n/a	
6/2/1980	9:55 a.m.	Pekin Schaeferville	1.75 in.	n/a	n/a	n/a	n/a	
7/13/1982	4:45 p.m.	Washington^	1.75 in.	n/a	n/a	n/a	n/a	
3/27/1985	9:13 p.m.	Mackinaw	1.75 in.	n/a	n/a	n/a	n/a	
3/28/1985	12:30 a.m.	Minier^	1.50 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Tazewell County

Figure 16
(Sheet 2 of 6)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/23/1985	12:10 p.m.	Tremont	1.75 in.	n/a	n/a	$2,500	$2,500	*Tremont* - vehicles and roofs sustained minor damage *Tremont area* - crops sustained minor damage
4/22/1988	8:50 p.m.	Morton Groveland	1.75 in.	n/a	n/a	n/a	n/a	
6/15/1991	2:45 p.m.	East Peoria	1.75 in.	n/a	n/a	n/a	n/a	
10/23/1991	3:15 p.m.	Washington	1.75 in.	n/a	n/a	n/a	n/a	
12/8/1991	2:22 p.m.	Tremont	2.75 in.	n/a	n/a	n/a	n/a	
8/23/1993	4:14 p.m.	Washington	1.00 in.	n/a	n/a	n/a	n/a	
8/23/1993	5:45 p.m.	Minier	1.75 in.	n/a	n/a	n/a	n/a	
4/26/1994	6:12 p.m.	Minier	1.75 in.	n/a	n/a	n/a	n/a	
6/26/1994	5:54 p.m.	Greene Valley	1.00 in.	n/a	n/a	n/a	n/a	
6/26/1994	5:55 p.m.	Tremont	1.75 in.	n/a	n/a	n/a	n/a	
6/26/1994	6:00 p.m.	Delavan	1.00 in.	n/a	n/a	n/a	n/a	
7/20/1994	5:39 p.m.	East Peoria	1.50 in.	n/a	n/a	n/a	n/a	
5/9/1995	5:15 p.m.	Schaeferville	1.75 in.	n/a	n/a	n/a	n/a	
5/13/1995	5:46 p.m.	Pekin^	1.75 in.	n/a	n/a	n/a	n/a	
4/18/1996	6:55 p.m.	Delavan	1.75 in.	n/a	n/a	n/a	n/a	
4/19/1996	5:38 p.m.	Delavan	1.75 in.	n/a	n/a	n/a	n/a	
12/23/1996	12:37 p.m.	Tremont^	1.00 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Tazewell County

Figure 16
(Sheet 3 of 6)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8/24/1997	1:54 p.m.	Hopedale^	1.25 in.	n/a	n/a	n/a	n/a	
8/24/1997	2:10 p.m.	East Peoria Morton Delavan	1.00 in.	n/a	n/a	n/a	n/a	
4/7/1998	5:30 p.m.	Marquette Heights	1.75 in.	n/a	n/a	n/a	n/a	
4/15/1998	10:43 p.m.	Pekin	1.75 in.	n/a	n/a	n/a	n/a	
5/12/1998	5:50 p.m.	Pekin	1.75 in.	n/a	n/a	n/a	n/a	
6/11/1998	2:50 p.m.	Delavan^	1.25 in.	n/a	n/a	n/a	n/a	
6/4/1999	3:20 p.m.	Tremont	1.75 in.	n/a	n/a	n/a	n/a	
4/20/2000	5:00 a.m.	Parkland^ South Pekin Midway Pekin Schaeferville Groveland Morton Washington^	1.75 in.	n/a	n/a	n/a	n/a	
5/8/2000	9:20 p.m.	Green Valley Delavan	1.00 in.	n/a	n/a	n/a	n/a	
5/12/2000	6:40 a.m.	Delavan	1.25 in.	n/a	n/a	n/a	n/a	
5/12/2000	3:30 p.m.	Groveland Morton	1.50 in.	n/a	n/a	n/a	n/a	
5/18/2000	5:02 p.m.	Hopedale^	1.75 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Tazewell County

Figure 16
(Sheet 4 of 6)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4/10/2001	12:15 a.m.	Tremont	1.00 in.	n/a	n/a	n/a	n/a	
4/21/2001	4:50 p.m.	Spring Lake Pekin Mackinaw	1.25 in.	n/a	n/a	n/a	n/a	
8/18/2001	11:39 a.m.	Delavan	2.50 in.	n/a	n/a	n/a	n/a	
7/26/2002	4:15 a.m.	Mackinaw	1.00 in.	n/a	n/a	n/a	n/a	
4/4/2003	2:40 p.m.	Green Valley^	1.75 in.	n/a	n/a	n/a	n/a	
5/8/2003	9:30 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
5/8/2003	9:50 p.m.	Pekin Groveland Morton	2.50 in.	n/a	n/a	n/a	n/a	
5/9/2003	7:15 p.m.	Armington^ Minier	2.00 in.	n/a	n/a	n/a	n/a	
5/28/2003	1:54 p.m.	Washington Mayfair Mackinaw	3.00 in.	n/a	n/a	n/a	n/a	
6/28/2003	3:22 p.m.	Washington	1.75 in.	n/a	n/a	n/a	n/a	
7/8/2003	2:35 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
5/30/2004	3:33 p.m.	Morton Washington	1.25 in.	n/a	n/a	n/a	n/a	
5/30/2004	4:36 p.m.	Delavan	2.75 in.	n/a	n/a	n/a	n/a	
3/30/2005	3:29 p.m.	Delavan^	1.00 in.	n/a	n/a	n/a	n/a	
6/29/2005	4:20 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
6/29/2005	4:28 p.m.	Tremont^	1.75 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Tazewell County

Figure 16
(Sheet 5 of 6)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4/13/2006	10:38 p.m.	Pekin Groveland Morton	1.75 in.	n/a	n/a	n/a	n/a	
1/7/2008	5:11 p.m.	Morton	1.00 in.	n/a	n/a	n/a	n/a	
5/13/2008	4:49 p.m.	Washington East Peoria Morton	2.00 in.	n/a	n/a	n/a	n/a	
6/3/2008	8:13 p.m.	Delavan^	1.00 in.	n/a	n/a	n/a	n/a	
6/3/2008	8:33 p.m.	Delavan	1.00 in.	n/a	n/a	n/a	n/a	
6/19/2009	2:12 p.m.	Tremont	1.00 in.	n/a	n/a	n/a	n/a	
5/6/2010	11:15 p.m.	Hopedale	1.00 in.	n/a	n/a	n/a	n/a	
5/24/2010	7:30 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
2/27/2011	8:16 p.m.	Armington^	1.00 in.	n/a	n/a	n/a	n/a	
4/15/2011	6:43 p.m.	Delavan	1.00 in.	n/a	n/a	n/a	n/a	
5/11/2011	4:25 p.m.	Delavan^	1.75 in.	n/a	n/a	n/a	n/a	
5/13/2011	5:06 p.m.	Tremont	1.00 in.	n/a	n/a	n/a	n/a	
5/13/2011	5:36 p.m.	Hopedale	1.00 in.	n/a	n/a	n/a	n/a	
5/22/2011	12:47 p.m.	Tremont^	1.00 in.	n/a	n/a	n/a	n/a	
5/22/2011	1:10 p.m.	Deer Creek	1.00 in.	n/a	n/a	n/a	n/a	
6/26/2011	10:40 p.m.	Armington	1.00 in.	n/a	n/a	n/a	n/a	
8/13/2011	1:52 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
8/13/2011	2:03 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
8/13/2011	2:45 p.m.	Allentown^	1.00 in.	n/a	n/a	n/a	n/a	
4/1/2012	2:38 a.m.	Morton	1.00 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Tazewell County

Figure 16
(Sheet 6 of 6)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
9/7/2012	8:20 a.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
4/17/2013	6:10 p.m.	Washington	1.00 in.	n/a	n/a	n/a	n/a	
11/17/2013	11:29 a.m.	Armington^	1.00 in.	n/a	n/a	n/a	n/a	
4/8/2015	3:09 a.m.	Morton	1.25 in.	n/a	n/a	n/a	n/a	
4/8/2015	3:39 a.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
4/8/2015	3:34 a.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
11/2/2016	3:27 p.m.	East Peoria	1.25 in.	n/a	n/a	n/a	n/a	
11/2/2016	3:33 p.m.	Groveland	1.00 in.	n/a	n/a	n/a	n/a	
11/2/2016	3:35 p.m.	Morton	1.50 in.	n/a	n/a	n/a	n/a	
4/10/2017	2:42 p.m.	East Peoria	1.75 in.	n/a	n/a	n/a	n/a	
4/10/2017	2:45 p.m.	Washington	1.00 in.	n/a	n/a	n/a	n/a	
4/10/2017	2:52 p.m.	Washington	1.75 in.	n/a	n/a	n/a	n/a	
5/26/2017	2:01 p.m.	East Peoria	1.00 in.	n/a	n/a	n/a	n/a	
5/26/2017	2:06 p.m.	East Peoria	1.00 in.	n/a	n/a	n/a	n/a	
5/26/2017	2:08 p.m.	Morton	1.00 in.	n/a	n/a	n/a	n/a	
7/10/2017	6:28 p.m.	Pekin	1.00 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	
GRAND TOTAL:				**0**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Tazewell County

Figure 17
Severe Storms – Lightning Events
1991 – 2017

Date(s)	Start Time	Location(s)	Injuries	Fatalities	Property Damage	Crop Damage	Description
10/23/1991	3:40 p.m.	Green Valley^	n/a	n/a	$45,000	n/a	lightning started a fire which gutted a two-story farmhouse
7/20/1994	5:35 p.m.	Morton	n/a	n/a	$50	n/a	lightning struck a tree and started a fire
6/26/2008	2:45 p.m.	Washington^	0	0	$50,000	$0	- lightning struck a tree next to a house, setting the house on fire - 2 rooms were burned and damage was done to the roof and siding - a vehicle parked nearby also sustained damage
GRAND TOTAL:			**0**	**0**	**$95,050**	**$0**	

^ Lightning strike event verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

3.1.2 WOODFORD COUNTY

HAZARD PROFILE

The following identifies past occurrences of severe storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe storms occurred previously? What is the extent of these previous severe storms?

Figures 26, **27**, and **28** located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in Woodford County. The severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning and heavy rain. Severe storms are the most frequently occurring natural hazard in Woodford County.

Severe Storms Fast Facts – Occurrences

Number of recorded Thunderstorms with Damaging Winds (1966 – 2017): ***161***

Number of recorded Severe Hail Events (1974 – 2017): ***47***

Number recorded of Lightning Strike Events (1960 – 2017): ***5***

Highest Recorded Wind Speed: ***70 knots (July 21, 2008 at Roanoke)***

Largest Hail Recorded: ***4.00 inches (May 30, 2004 at Secor)***

Most Likely Month for Thunderstorms with Damaging Winds to Occur: ***June***

Most Likely Month for Severe Hail to Occur: ***May***

Most Likely Time for Thunderstorms with Damaging Winds to Occur: ***Afternoon/Early Evening***

Most Likely Time for Severe Hail to Occur: ***Afternoon/Early Evening***

Thunderstorms with Damaging Winds

NOAA's Storm Events Database, NOAA's Storm Data Publications and information included in the 2010 Plan were used to document 161 reported occurrences of thunderstorms with damaging winds in Woodford County between 1966 and 2017. Of the 161 occurrences, 114 had reported wind speeds of 50 knots or greater. There were 47 occurrences, however, where the wind speed was not recorded.

The highest actual wind speed recorded in Woodford County occurred at Roanoke on July 21, 2008 when winds reached 70 knots (81 mph) during a thunderstorm event. Thunderstorms with damaging winds have been *recorded* in every participating municipality within the County on multiple occasions.

Figure 29 charts the reported occurrences of thunderstorms with damaging winds in Woodford County by month. Of the 161 events, 98 (61%) took place in May, June and July making this the peak period for thunderstorms with damaging winds in Woodford County. Of those 98 events, 43 (44%) occurred during June, making this the peak month for thunderstorms with damaging winds.

Figure 30 charts the reported occurrences of thunderstorms with damaging winds by hour. Of the 161 occurrences, approximately 76% occurred during the p.m. hours, with 90 of the events (56%) taking place between 2 p.m. and 8 p.m.

Figure 29
Graph: Thunderstorms with Damaging Winds by Month Woodford County: 1966 – 2017

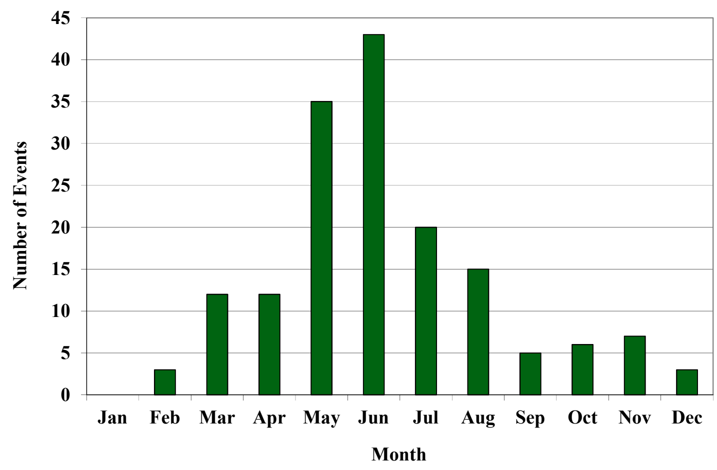
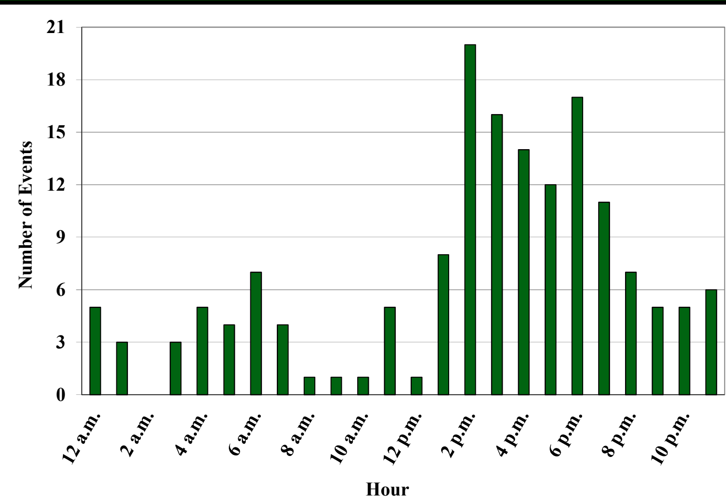


Figure 30
Graph: Thunderstorms with Damaging Winds by Hour Woodford County: 1966 – 2017



<u>*Hail*</u>
NOAA's Storm Events Database was used to document 47 reported occurrences of severe storms with hail one (1) inch in diameter or greater in Woodford County between 1974 and 2017. Of the 47 occurrences, 26 produced hailstones 1.50 inches or larger in diameter.

The largest hail stones documented in Woodford County measured 4.00 inches in diameter (grapefruit-sized) and fell on May 30, 2004 at Secor. Hail one (1) inch in diameter or greater has been *recorded* in every participating municipality on multiple occasions.

Figure 31 charts the reported occurrences of hail by month. Of the 47 occurrences, 34 (72%) took place in April, May and June making this the peak period for hail in Woodford County. Of the 34 events, 14 (41%) occurred during May, making this the peak month for hail events.

Figure 31
Graph: Hail Events by Month Woodford County: 1974 – 2017

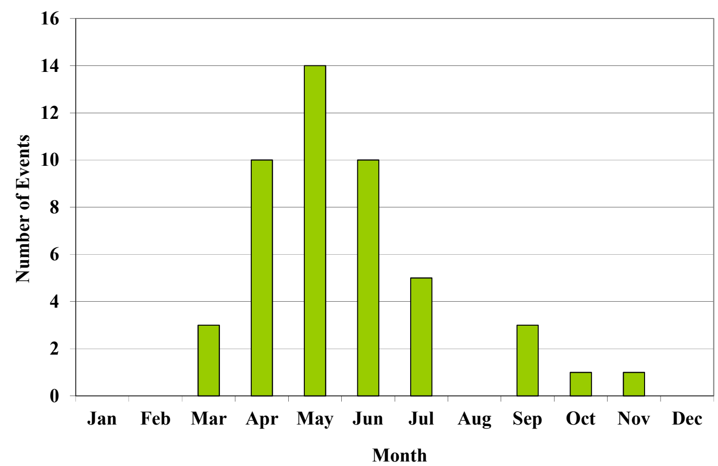
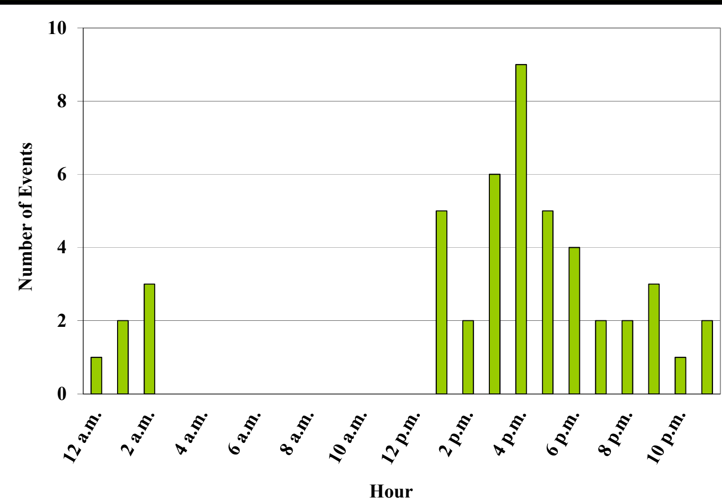


Figure 32 charts the reported occurrences of hail by hour. Approximately 87% of all the hail events occurred during the p.m. hours, with 31 of the events (66%) taking place between 1:00 p.m. and 7:00 p.m.

Figure 32
Graph: Hail Events by Hour Woodford County: 1974 – 2017



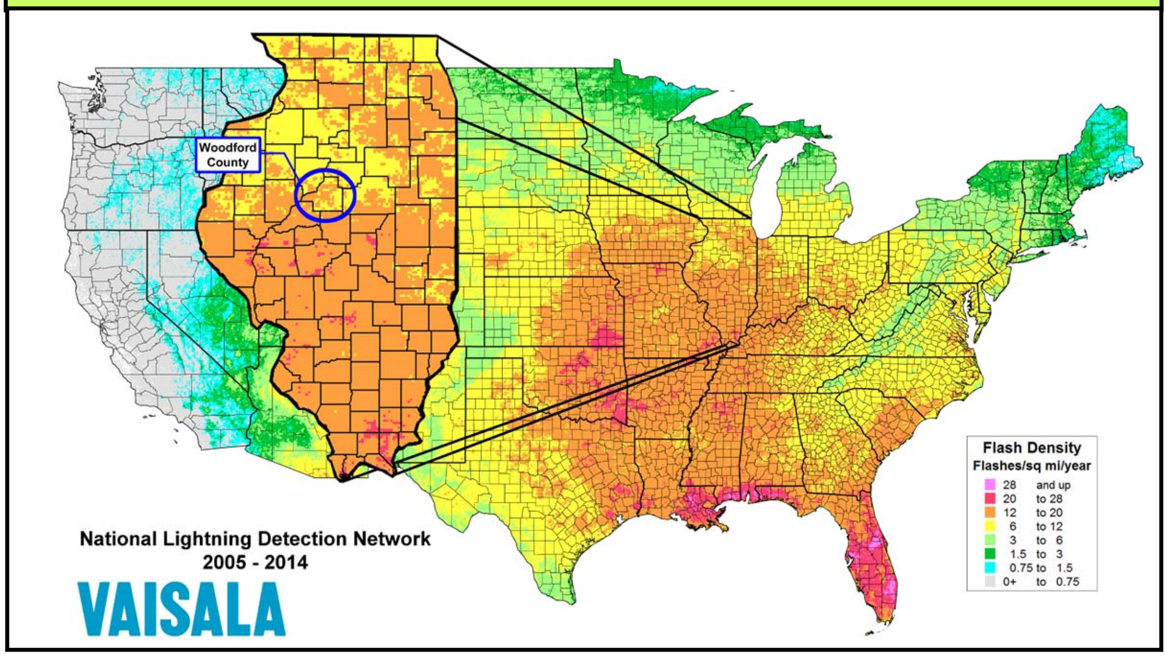
<u>*Lightning*</u>

While lightning strike events occur regularly across central Illinois, NOAA's Storm Events Database and NOAA's Storm Data Publications only identified five recorded occurrences of lightning strikes in Woodford County between 1960 and 2017. Three of the five events each took place in June while the remaining two events took place in May and July. Of the four events with recorded times, half occurred during the a.m. hours and half occurred during the p.m. hours.

These represent the ***reported occurrences*** of lightning strike events. The NWS acknowledges that lightning strike events area not well recorded, due in part to the rural nature of most Illinois counties. Only those events with impacts, such as property damage or injuries/fatalities, are reported. As a result, lightning strike events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

According to data from Vaisala's National Lightning Detection Network, Woodford County averaged at least 9 to 16 cloud-to-ground lightning flashes per square mile annually between 2005 and 2014. **Figure 33** illustrates the cloud-to-ground lightning flash density (number of cloud-to-ground flashes per square mile) by county for the continental United States. In comparison, Illinois averaged 14.1 cloud-to-ground lightning flashes per square mile between 2006 and 2015, ranking it eighth in the Country for lightning flash density.

Figure 33
Cloud-to-Ground Lightning Flash Density: Woodford County



<u>*Heavy Rain*</u>

While heavy rain events occur on a fairly regular basis across central Illinois, NOAA's Storm Events Database does not include any *recorded* heavy rain events for Woodford County. This may be due in part to a lack of uniform reporting guidelines for heavy rain events.

What locations are affected by severe storms?

Severe storms affect the entire County. A single severe storm event will generally extend across the entire County and affect multiple locations. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency (IEMA) classifies Woodford County's hazard rating for severe storms as "severe." (IEMA's hazard rating system has five levels: low, guarded, elevated, high and severe.)

What is the probability of future severe storm events occurring?

Thunderstorms with Damaging Winds

Woodford County has had 161 verified occurrences of thunderstorms with damaging winds between 1966 and 2017. With 161 occurrences over the past 52 years, Woodford County should expect to experience at least three thunderstorms with damaging winds each year. There were 23 years over the last 52 years where multiple (three or more) thunderstorms with damaging winds occurred. This indicates that the probability that multiple thunderstorms with damaging winds may occur during any given year within the County is 44%.

Hail

There have been 47 verified occurrences of hail one (1) inch in diameter or greater between 1974 and 2017. With 47 occurrences over the past 44 years, Woodford County should expect to experience at least one severe hail event each year. There were 14 years over the last 44 years where two or more hail events occurred. This indicates that the probability that more than one severe storm with hail may occur during any given year within the County is 32%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe storms.

Are the participating jurisdictions vulnerable to severe storms?

Yes. All of Woodford County is vulnerable to the dangers presented by severe storms due to the topography of the region and its location in relation to the movement of weather fronts across central Illinois. Since 2008, Woodford County has recorded 59 thunderstorms with damaging winds, 15 severe storms with hail one (1) inch in diameter or greater and four verified lightning strike events.

Figure 34 details the number thunderstorms with damaging winds and hail events that were recorded in or near each participating municipality while **figure 35** details the number of thunderstorms with damaging winds and hail events that were recorded in or near unincorporated areas of Woodford County. Of the participating municipalities, Roanoke has had more recorded occurrences of thunderstorms with damaging winds and hail events than any of the other municipalities. Of the five recorded lightning strikes, two occurred in participating municipalities, one in Germantown Hills and one in Roanoke.

Figure 34 Verified Severe Storm Events by Participating Municipality – Woodford County		
Participating Municipality	**Number of Events**	
	Thunderstorm & High Wind	**Severe Hail**
Eureka	20	7
Germantown Hills	13	4
Roanoke	26	8

Figure 35 Verified Severe Storm Events in Unincorporated Woodford County		
Unincorporated Area	**Number of Events**	
	Thunderstorm & High Wind	**Severe Hail**
Cazenovia	2	0
Cruger	1	0
Low Point	7	0
Oak Ridge	2	0
Woodford	4	1

What impacts resulted from the recorded severe storms?

Severe storms as a whole have caused an estimated $2.45 million in recorded property damages and $30,000 in recorded crop damages. The following provides a breakdown of impacts by category.

Thunderstorms with Damaging Winds

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and information included in the 2010 Plan indicates that between 1966 and 2017, 61 of the 161 thunderstorms with damaging winds caused $1.7 million in property damages and $30,000 in crop damages. Damage information was either unavailable or none was recorded for the remaining 100 reported occurrences.

NOAA's Storm Events Database documented 2 injuries as the result of two separate thunderstorm with damaging wind events. Detailed information on the injuries sustained was only available for one of the events. On July 5, 1980 an individual was injured when a thunderstorm with damaging winds overturned a mobile home.

Severe Storms Fast Facts – Impacts/Risk

Thunderstorms with Damaging Winds Impacts
- Total Property Damage: ***$1,711,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***$30,000***
- Injuries: ***2***
- Fatalities: ***n/a***

Severe Hail Impacts
- Total Property Damage: ***$400,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Lightning Strike Impacts
- Total Property Damage: ***$348,500***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***1***
- Fatalities: ***n/a***

Severe Storms Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Medium/High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

Hail

Data obtained from NOAA's Storm Events Database indicates that between 1974 and 2017, two of the 47 severe hail events caused $400,000 in property damages. Damage information was either unavailable or none was recorded for the remaining 45 reported occurrences. No injuries or fatalities were reported as a result of any of the hail events.

Lightning

Data obtained from NOAA's Storm Events Database and NOAA's Storm Data Publications indicates that between 1960 and 2017, four of the five lightning strike events caused $348,500 in property damages. NOAA's Storm Events Database documented one injury as the result of a lightning strike event. On July 6, 2010 a road construction flagger on Illinois Route 89 between Washburn and Cazenovia was struck by lightning. The flagger was struck in the left shoulder and had part of his left boot blown off where the lightning exited his body.

What other impacts can result from severe storms?

In Woodford County, the greatest risk to health and safety from severe storms is vehicle accidents. Hazardous driving conditions resulting from severe storms (i.e., wet pavement, poor visibility, high winds, etc.) can contribute to accidents that result in injuries and fatalities. Traffic accident data assembled by the Illinois Department of Transportation from 2011 through 2015 indicates that wet road surface conditions were present for 10.7% to 14.4% of all crashes recorded annually in the County.

While other circumstances cause wet road surface conditions (i.e., melting snow, condensation, light showers, etc.), law enforcement officials agree that hazardous driving conditions caused by severe storms add to the number of crashes. **Figure 36** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when wet road surface conditions were present.

Figure 36
Severe Weather Crash Data – Woodford County

Year	Total # of Crashes	Presence of Wet Road Surface Conditions		
		# of Crashes	# of Injuries	# of Fatalities
2011	465	67	12	0
2012	447	53	17	0
2013	501	62	16	0
2014	525	56	26	0
2015	467	59	16	1
Total:	**2,405**	**297**	**87**	**1**

Source: Illinois Department of Transportation.

What is the level of risk/vulnerability to public health and safety from severe storms?

For Woodford County the level of risk or vulnerability posed by severe storms to public health and safety is considered to be low. This assessment is based on the fact that despite their relative frequency, the number of injuries and fatalities is low. In addition, Advocate Eureka Hospital in Eureka as well as hospitals in Peru and Ottawa (LaSalle County), Pontiac (Livingston County), Bloomington/Normal (McLean County), the Peoria area (Tazewell and Peoria Counties) and regional centers in Springfield (Sangamon County) and the Quad Cities area (Rock Island County) are equipped to provide care to persons injured during a severe storm.

Are existing buildings, infrastructure and critical facilities vulnerable to severe storms?

Yes. All existing buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are vulnerable to damage from severe storms. Structural damage to buildings is a relatively common occurrence with severe storms. Damage to roofs, siding, awnings and windows can occur from hail, flying and falling debris and high winds. Lightning strikes can damage electrical components and equipment (i.e., appliances, computers etc.) and can cause fires that consume buildings. If the roof is compromised or windows are broken, rain can cause additional damage to the structure and contents of a building.

Infrastructure and critical facilities tend to be just as vulnerable to severe storm damage as buildings. The infrastructure and critical facilities that are the most vulnerable to severe storms are related to power distribution and communications. High winds, lightning and flying and falling debris have the potential to cause damage to communication and power lines, power substations, transformers and poles, and communication antennas and towers.

The damage inflicted by severe storms often leads to disruptions in communication and creates power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service. Power outages and disruptions in communications can impair vital services, particularly when backup power generators are not available. Participating jurisdictions have acknowledged the need for emergency backup generators to allow continued operation of critical facilities such as municipal and county buildings, storm shelters, police and fire stations, heating and cooling centers, and lift stations. Of the participants, Germantown Hills does not have emergency backup generators at its lift stations or village hall while the County does not have an emergency backup generator at the Courthouse which serves as the Emergency Operations Center/Joint Information Center for the County.

In addition to affecting power distribution and communications, debris and flooding from severe storms can block state and local roads hampering travel. When transportation is disrupted, emergency and medical services are delayed, rescue efforts are hindered and government services can be affected.

Based on the frequency with which severe storms occur in Woodford County, the amount of property damage previously reported and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe storms is medium to high.

Are future buildings, infrastructure and critical facilities vulnerable to severe storms?

Yes and No. While Eureka and Roanoke have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms, the County and Germantown Hills do not. In addition, infrastructure such as new communication and power lines will continue to be vulnerable to severe storms as long as they are located above ground. High winds, lightning and flying and falling debris can disrupt power and communication. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from severe storms?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe storms. With only 67 of the 213 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. Since all existing structures within Woodford County are vulnerable to damage, it is highly probable that there will be future dollar losses from severe storms.

Woodford County

Figure 26
(Sheet 1 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
7/5/1966	8:15 p.m.	Metamora^ Roanoke^ Eureka^	52 kts	n/a	n/a	n/a	n/a	
8/7/1968	2:30 p.m.	Eureka	n/a	n/a	n/a	n/a	n/a	
5/27/1973	1:00 p.m.	Minonk^	n/a	n/a	n/a	n/a	n/a	
6/20/1974	6:30 p.m.	Eureka	n/a	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #438)***
5/24/1975	5:30 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	winds knocked down two-69 kilovolt power lines causing a 6-hour power outage in the central portion of the County
12/14/1975	2:55 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	- winds uprooted several pine trees - siding was torn from a house - a pickup truck was turned partially around
3/26/1976	9:15 p.m.	Germantown Hills	n/a	n/a	n/a	n/a	n/a	
3/26/1976	9:20 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	
3/26/1976	9:25 p.m.	Washburn	n/a	n/a	n/a	n/a	n/a	
5/4/1977	6:10 p.m.	Roanoke	52 kts	n/a	n/a	n/a	n/a	
5/29/1978	6:50 p.m.	Secor	n/a	n/a	n/a	n/a	n/a	
7/21/1978	4:20 p.m.	Washburn	n/a	n/a	n/a	n/a	n/a	
7/5/1980	3:00 a.m.	Goodfield	n/a	1	0	n/a	n/a	an individual was injured when winds overturned a mobile home
8/13/1980	5:35 p.m.	Metamora	52 kts	n/a	n/a	n/a	n/a	
Subtotal:				**1**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26 (Sheet 2 of 20) Severe Storms – Thunderstorms with Damaging Winds 1966 – 2017								
Date(s)	**Start Time**	**Location(s)**	**Magnitude (Knots)**	**Injuries**	**Fatalities**	**Property Damage**	**Crop Damage**	**Description**
9/1/1980	3:25 p.m.	Eureka	n/a	n/a	n/a	n/a	n/a	winds caused severe tree and building damage
4/13/1981	11:50 p.m.	Goodfield	n/a	n/a	n/a	n/a	n/a	
6/20/1981	6:05 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	
12/27/1982	11:22 p.m.	Roanoke	61 kts	n/a	n/a	n/a	n/a	
12/27/1982	11:55 p.m.	Cazenovia	61 kts	n/a	n/a	n/a	n/a	
3/6/1983	5:06 p.m.	Roanoke	n/a	n/a	n/a	n/a	n/a	
4/29/1983	8:00 p.m.	southwestern part of the county	n/a	n/a	n/a	$2,500	n/a	
4/29/1984	8:23 p.m.	Roanoke	56 kts	n/a	n/a	n/a	n/a	
5/14/1985	5:30 p.m.	Minonk	n/a	n/a	n/a	n/a	n/a	
7/2/1985	6:25 p.m.	Germantown Hills Oak Ridge^	52 kts	n/a	n/a	n/a	n/a	*Germantown Hills* many tree limbs were blown down
11/19/1985	2:00 p.m.	Low Point^	n/a	n/a	n/a	n/a	n/a	
5/20/1987	6:10 p.m.	Roanoke^	n/a	n/a	n/a	n/a	n/a	
5/21/1987	8:25 p.m.	Spring Bay Low Point	57 kts	n/a	n/a	n/a	n/a	winds blew trees down
5/8/1988	4:45 p.m.	Goodfield^	69 kts	n/a	n/a	$25,000	n/a	winds destroyed 3 trailers and heavily damaged 5 others at the Timberline Court
Subtotal:				**0**	**0**	**$27,500**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 3 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
10/17/1988	7:45 a.m.	Spring Bay Germantown Hills Metamora	n/a	n/a	n/a	n/a	n/a	*Metamora* winds shattered a 12’ x 12’ plate glass window *Metamora area* winds destroyed a mobile home several miles west of the Village
11/17/1988	7:45 a.m.	Roanoke^	55 kts	1	0	n/a	n/a	
5/24/1989	11:45 p.m.	Eureka^	n/a	n/a	n/a	$250,000	n/a	winds caused heavy damage to farm buildings east of the City
6/13/1990	7:50 p.m.	Washburn^	52 kts	n/a	n/a	n/a	n/a	
6/13/1991	7:37 p.m.	Benson	n/a	n/a	n/a	$2,500	n/a	winds downed trees and utility poles
6/17/1992	2:41 p.m.	Roanoke	61 kts	n/a	n/a	n/a	n/a	winds damaged trees
6/17/1992	3:00 p.m.	El Paso	n/a	n/a	n/a	n/a	n/a	
7/2/1992	1:17 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	winds caused heavy roof damage to several homes
7/2/1992	1:27 p.m.	Roanoke	52 kts	n/a	n/a	n/a	n/a	
9/9/1992	4:47 p.m.	Eureka	n/a	n/a	n/a	n/a	n/a	winds damaged trees
8/15/1993	7:50 p.m.	Spring Bay	n/a	n/a	n/a	$5,000	n/a	several 6-inch diameter trees were blown down
7/20/1994	6:31 p.m.	El Paso	n/a	n/a	n/a	n/a	n/a	a large tree and a street light pole were blown down
Subtotal:				**1**	**0**	**$257,500**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 4 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
3/25/1996	4:00 a.m.	countywide	n/a	n/a	n/a	n/a	n/a	winds blew down numerous power lines and caused minor damage across the County *rain could not be documented with this event*
7/24/1996	11:51 a.m.	Metamora Washburn	n/a	n/a	n/a	n/a	n/a	winds blew down several trees
7/28/1996	6:30 p.m.	Benson^	n/a	n/a	n/a	n/a	n/a	- winds uprooted several large trees and knocked down numerous tree limbs - winds blew the roof off a shed
10/29/1996	4:59 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	- winds uprooted a large tree and blew down numerous tree limbs - several business signs were destroyed
10/30/1996	1:00 a.m.	countywide	57 kts	n/a	n/a	n/a	n/a	winds blew down trees, tree limbs and power lines _Roanoke_ the roof of a large storage building was blown off which damaged a small storage shed and a few trees when the roof landed on them *rain could not be documented with this event*
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 5 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4/5/1997	3:45 p.m.	countywide	n/a	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down throughout the area with some areas sustaining more serious damage
4/6/1997	9:15 a.m.	countywide	52 kts	n/a	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines *El Paso area* a semi was blown over on US Rte. 24 but no injuries were reported *rain could not be documented with this event*
4/30/1997	2:00 p.m.	countywide	61 kts	n/a	n/a	n/a	n/a	- hundreds of power lines were blown down across the area - numerous trees and tree limbs were blown down - widespread structural damage was reported - numerous sheds, grain bins and machine sheds were either blown over, damaged or destroyed
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 6 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/18/1997	9:26 p.m.	Benson	n/a	n/a	n/a	$80,000	n/a	- winds blew down a few trees and tree limbs - the grain leg was blown off a grain bin - several large sheds had their doors blown in - some siding damage was reported in the area
9/29/1997	10:00 a.m.	countywide	52 kts	n/a	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down *rain could not be documented with this event*
5/12/1998	7:00 p.m.	Goodfield^	n/a	n/a	n/a	n/a	n/a	a tree was blown down across a road
5/19/1998	5:40 p.m.	Roanoke^	n/a	n/a	n/a	n/a	n/a	- winds moved a grain bin off its foundation and caused another to cave in - a storage building had its north facing doors blown in - numerous tree limbs were blown down
6/14/1998	7:30 a.m.	Spring Bay	n/a	n/a	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines
6/18/1998	6:30 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	numerous large tree limbs were blown down
Subtotal:				**0**	**0**	**$80,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 7 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/29/1998	3:43 p.m.	countywide	52 kts	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Regionally - wind blew down or uprooted thousands of trees, tree limbs, power poles and power lines - hundreds of trees fell onto structures causing damage ranging from torn gutters to major roof and structural damage - hundreds of vehicles sustained damage from fallen trees and numerous outbuildings, sheds and silos were either damaged or destroyed - considerable crop damage was sustained in most areas								
11/10/1998	5:40 a.m.	El Paso Kappa	n/a	n/a	n/a	n/a	n/a	*El Paso/Kappa* several power poles were blown down *El Paso area* - a couple of outbuildings were destroyed - the top half of a barn was blown off - several power lines were blown down
11/10/1998	6:00 a.m.	countywide	n/a	n/a	n/a	n/a	n/a	winds downed thousands of power lines and tree limbs and blew over hundreds of trees across the region *rain could not be documented with this event*
2/11/1999	4:00 p.m.	Minonk^	n/a	n/a	n/a	n/a	n/a	a semi was blown over on I-39 just west of the City
6/1/1999	6:35 p.m.	Roanoke^	n/a	n/a	n/a	n/a	n/a	winds damaged a roof on a shed and caused minor damage to another one
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 8 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/4/1999	3:24 p.m.	Metamora	n/a	n/a	n/a	n/a	n/a	- several trees were uprooted and numerous tree limbs were blown down - one power pole was snapped off
6/6/1999	5:32 p.m.	Low Point	n/a	n/a	n/a	n/a	n/a	*Low Point* several trees and power lines were blown down *Low Point area* winds blew down a tree onto a house
6/10/1999	4:40 p.m.	Goodfield^	59 kts	n/a	n/a	n/a	n/a	several power poles were blown down
6/11/1999	2:14 p.m.	El Paso Secor^	n/a	n/a	n/a	n/a	n/a	*El Paso* several large tree limbs and power lines were blown down *Secor area* a roof was blown off a building at a campground and a semi was blown over
4/20/2000	5:24 a.m.	countywide	59 kts	n/a	n/a	$300,000	n/a	*Event Description Provided Below*
countywide - numerous power poles, power lines and trees were blown down - numerous sheds were destroyed *Metamora/Roanoke area* - 56 power poles were snapped off near the intersection of IL Routes 116 & 117						*Roanoke* - the roof of a business was blown off and it damaged 20 cars in the adjacent parking lot *Benson* - the legs of a grain elevator were damaged causing approx. $300,000 in damages - several outbuildings were destroyed - a large tree fell onto a home causing moderate damage		
Subtotal:				**0**	**0**	**$300,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 9 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/8/2000	8:55 p.m.	Bay View Gardens Germantown Hills Metamora Low Point Benson Minonk	70 kts	n/a	n/a	n/a	n/a	- numerous trees, power poles and power lines were blown down - several machine sheds were destroyed - homes affected along the path sustained only minor shingle and siding damage
5/18/2000	4:22 p.m.	Metamora^	n/a	n/a	n/a	n/a	n/a	a large tree was snapped off
9/11/2000	10:00 p.m.	Secor^	n/a	n/a	n/a	n/a	n/a	several large trees were blown down at a campground east of the Village
5/22/2001	1:00 p.m.	Germantown Hills Metamora	50 kts	n/a	n/a	n/a	n/a	a couple of trees, tree limbs and power lines were blown down
6/14/2001	6:28 p.m.	Spring Bay Oak Ridge Metamora	50 kts	n/a	n/a	n/a	n/a	*Spring Bay* a tree was blown down across the road *Metamora* several power lines were blown down
7/8/2001	1:45 p.m.	Woodford^	50 kts	n/a	n/a	n/a	n/a	a downburst flattened a large cornfield
8/22/2001	5:55 p.m.	Spring Bay Germantown Hills^ Metamora^ Eureka	51 kts	n/a	n/a	n/a	n/a	*Spring Bay* trees blocked roads in the Village
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 10 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8/30/2001	7:36 p.m.	Germantown Hills	52 kts	n/a	n/a	n/a	n/a	
3/9/2002	12:00 p.m.	countywide	53 kts	n/a	n/a	n/a	n/a	- numerous reports of downed power lines, power poles and trees - several sheds and barns were damaged *rain could not be documented with this event*
5/8/2002	11:18 p.m.	Eureka[^]	55 kts	n/a	n/a	n/a	n/a	
6/4/2002	4:40 p.m.	Metamora	55 kts	n/a	n/a	n/a	n/a	several large tree limbs were blown down around the Village
6/25/2002	6:34 p.m.	Metamora	50 kts	n/a	n/a	n/a	n/a	- several trees, tree limbs and power lines were blown down - a small shed was destroyed
2/11/2003	6:30 p.m.	Eureka Roanoke Benson Secor El Paso Panola Woodford Minonk	54 kts	n/a	n/a	n/a	n/a	winds blew down power lines in Eureka, Roanoke, Minonk & El Paso
Subtotal:				**0**	**0**	**$0**	**$0**	

[^] Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 11 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/10/2003	6:15 a.m.	countywide	52 kts	n/a	n/a	n/a	n/a	- winds blew down numerous trees, tree limbs and power lines - several reports of minor damage to roofs and storage sheds *rain could not be documented with this event*
6/25/2003	6:42 p.m.	Germantown Hills	54 kts	n/a	n/a	n/a	n/a	several trees were blown down
6/28/2003	3:57 p.m.	Congerville	63 kts	n/a	n/a	n/a	n/a	winds blew down several large tree limbs
7/8/2003	5:52 p.m.	Eureka	55 kts	n/a	n/a	n/a	n/a	winds blew down several power poles
7/21/2003	12:50 a.m.	Washburn Low Point Cazenovia Metamora Roanoke	55 kts	n/a	n/a	n/a	n/a	- winds blew down several large trees *Washburn area* - one large tree was blown down across IL Rte. 89 just south of the Village *Metamora* - a couple of the fallen trees and tree limbs were blown down onto homes causing minor roof damage - numerous power lines were blown down
5/7/2004	5:00 a.m.	Benson^	52 kts	n/a	n/a	n/a	n/a	winds blew down several large tree limbs
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 12 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
7/11/2004	4:05 p.m.	Germantown Hills Metamora Roanoke Benson Minonk	52 kts	n/a	n/a	n/a	n/a	several trees and power lines were blown down in Germantown Hills, Eureka and Minonk
7/13/2004	2:23 p.m.	Roanoke^	65 kts	n/a	n/a	n/a	n/a	a microburst caused extensive damage to a cornfield
3/30/2005	3:10 p.m.	Metamora^	50 kts	n/a	n/a	n/a	n/a	6 power poles were blown down
6/4/2005	11:06 a.m.	Roanoke	50 kts	n/a	n/a	n/a	n/a	a few trees and power lines were blown down
6/4/2005	11:25 a.m.	Minonk	60 kts	n/a	n/a	n/a	n/a	- a semi-trailer was blown over on Interstate 39 - power lines were downed along IL Rte. 251
7/26/2005	3:55 p.m.	Germantown Hills	50 kts	n/a	n/a	n/a	n/a	several trees were blown down
3/13/2006	3:00 a.m.	Minonk	50 kts	n/a	n/a	n/a	n/a	numerous large tree limbs were blown down
4/2/2006	6:10 p.m.	Roanoke^	55 kts	n/a	n/a	n/a	n/a	a hog barn was damaged
4/13/2006	10:10 p.m.	Roanoke	56 kts	n/a	n/a	n/a	n/a	
4/13/2006	10:15 p.m.	Washburn	52 kts	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 13 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4/13/2006	10:36 p.m.	Eureka Roanoke^	61 kts	n/a	n/a	n/a	n/a	*Roanoke area* - 114 power poles were blown down near a substation (7 miles worth) *Eureka area* - winds blew down power poles - minor structural damage was experienced
5/17/2006	4:45 p.m.	Metamora	50 kts	n/a	n/a	n/a	n/a	power lines were blown down
5/24/2006	2:56 p.m.	Eureka^	65 kts	n/a	n/a	n/a	n/a	numerous trees and power lines were blown down
5/24/2006	3:05 p.m.	Washburn	52 kts	n/a	n/a	n/a	n/a	several trees and power lines were blown down
5/24/2006	3:15 p.m.	Minonk	50 kts	n/a	n/a	n/a	n/a	a few large branches were blown down
5/24/2006	3:25 p.m.	Washburn^	60 kts	n/a	n/a	n/a	n/a	- an 18-foot diameter grain silo was destroyed - a large tree was blown down
7/19/2006	2:42 p.m.	Metamora	52 kts	n/a	n/a	n/a	n/a	several large tree limbs were blown down
7/17/2007	6:52 a.m.	Germantown Hills Metamora Roanoke	55 kts	n/a	n/a	$20,000	n/a	numerous trees and large tree limbs were blown down *Roanoke* an awning was damaged on a house
8/23/2007	1:36 p.m.	Spring Bay^	55 kts	n/a	n/a	n/a	n/a	a tree was blown down
Subtotal:				**0**	**0**	**$20,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 14 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/26/2008	1:10 a.m.	Goodfield^	56 kts	n/a	n/a	$9,000	n/a	- a large tree and power line were blown down - a roof sustained minor wind damage
6/15/2008	2:34 p.m.	Goodfield Eureka	61 kts	n/a	n/a	$30,000	n/a	numerous tree limbs and power lines were blown down
6/15/2008	2:49 p.m.	Secor^ El Paso^	61 kts	n/a	n/a	$40,000	n/a	numerous trees and tree limbs were blown down *El Paso area* a house had part of its roof blown off
7/21/2008	6:14 a.m.	Roanoke	70 kts	n/a	n/a	$30,000	n/a	numerous trees were blown down
7/21/2008	6:15 a.m.	Minonk	61 kts	n/a	n/a	$25,000	n/a	numerous trees and tree limbs were blown down across the City
8/5/2008	3:38 a.m.	Eureka^ Cruger	61 kts	n/a	n/a	$10,000	n/a	2 ½ to 3-foot diameter tree branches were blown down
8/5/2008	4:05 a.m.	Roanoke	61 kts	n/a	n/a	$10,000	n/a	3-foot diameter tree was blown down onto a house
8/5/2008	4:15 a.m.	Eureka	61 kts	n/a	n/a	$15,000	n/a	winds sheared off approx. 12 oak trees at Lake Eureka
3/8/2009	6:10 a.m.	Metamora	52 kts	n/a	n/a	$25,000	n/a	several houses experienced shingle and trim damage
3/8/2009	6:28 a.m.	Benson^	52 kts	n/a	n/a	$10,000	n/a	power lines were blown down south of the intersection of IL Routes 116 & 117
3/8/2009	11:15 a.m.	Eureka	52 kts	n/a	n/a	$10,000	n/a	power poles were blown down on the west side of the City
Subtotal:				**0**	**0**	**$214,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 15 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
3/24/2009	1:51 p.m.	countywide	52 kts	n/a	n/a	$6,000	n/a	Roanoke power lines were blown down across Douglas and East Woodford Streets *rain could not be documented with this event*
6/18/2009	4:29 a.m.	Congerville	52 kts	n/a	n/a	n/a	n/a	small tree branches were blown down
6/19/2009	2:38 p.m.	Metamora^	52 kts	n/a	n/a	$3,000	n/a	a 9-inch diameter tree was blown down across Morris Road north of the Village
6/27/2009	7:19 p.m.	Eureka^	52 kts	n/a	n/a	$20,000	n/a	power lines were blown down onto IL Rte. 24
8/4/2009	7:50 a.m.	Germantown Hills	61 kts	n/a	n/a	$2,000	n/a	a tree was blown down onto Old Germantown Hills Road
8/4/2009	8:15 a.m.	El Paso^	52 kts	n/a	n/a	$3,000	n/a	a large tree was blown down across a road just north of the City
8/19/2009	2:44 p.m.	Eureka	52 kts	n/a	n/a	$20,000	n/a	several trees and power lines were blown down
8/19/2009	2:45 p.m.	Woodford^	52 kts	n/a	n/a	$5,000	$30,000	- roofing material was stripped off a building - a nearby cornfield was flattened near Interstate 39
6/2/2010	12:30 a.m.	Spring Bay^	52 kts	n/a	n/a	$2,000	n/a	a tree was blown down across the road at the intersection of IL Rte. 26 & Lourdes Rd.
Subtotal:				**0**	**0**	**$61,000**	**$30,000**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 16 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/2/2010	12:35 a.m.	Eureka^	52 kts	n/a	n/a	$1,000	n/a	- a stop sign was bent over - construction barricades were scattered across the road at IL Rte. 24 and Dee-Mac Rd.
6/2/2010	12:42 a.m.	Roanoke^	52 kts	n/a	n/a	$3,000	n/a	a large tree was uprooted
6/2/2010	12:58 a.m.	Minonk	52 kts	n/a	n/a	$7,000	n/a	- shingles were blown off the Millennium Park Pavilion - a door was blown out at the Sewage Treatment Plant
6/12/2010	1:10 p.m.	Metamora^	52 kts	n/a	n/a	$10,000	n/a	power poles were blown down at 900E and 1200N
6/23/2010	5:51 p.m.	Minonk	52 kts	n/a	n/a	$3,000	n/a	a 10-inch diameter limb and a baseball diamond fence were blown down
9/21/2010	2:25 p.m.	Roanoke	61 kts	n/a	n/a	$170,000	n/a	- 8 large 64,000-volt power lines were blown down on the south edge of the Village - the entire town lost power for over 15 hours
10/26/2010	4:43 a.m.	Metamora^	52 kts	n/a	n/a	$4,000	n/a	- a metal chicken coop was destroyed - a large tree branch broke a window in a home
10/26/2010	5:05 a.m.	Minonk	52 kts	n/a	n/a	n/a	n/a	a semi-truck was blown over on Interstate 39
Subtotal:				**0**	**0**	**$198,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 17 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/29/2011	11:20 a.m.	El Paso	52 kts	n/a	n/a	$3,000	n/a	a 12 to 18-inch diameter rotted tree knocked down power lines at the intersection of US Rte. 24 and IL Rte. 251
5/3/2012	11:45 p.m.	Low Point^	52 kts	n/a	n/a	$8,000	n/a	power lines were blown down at 1950N and 1400E
5/20/2013	6:45 p.m.	Roanoke	52 kts	n/a	n/a	$12,000	n/a	a few small trees were blown down
5/29/2013	1:50 a.m.	El Paso^	61 kts	n/a	n/a	$14,000	n/a	- 5 trees were blown down - a power pole was damaged
5/30/2013	2:20 p.m.	El Paso	52 kts	n/a	n/a	$65,000	n/a	numerous trees and power lines were blown down
5/30/2013	2:32 p.m.	Minonk^	52 kts	n/a	n/a	$2,000	n/a	a large tree was blown down onto IL Rte. 116 at 3000E &1900N
5/30/2013	2:43 p.m.	Panola^	52 kts	n/a	n/a	$2,000	n/a	a tree was blown down
4/28/2014	4:30 p.m.	Washburn^	52 kts	n/a	n/a	$6,000	n/a	a power pole was blown down
5/11/2014	4:17 p.m.	Washburn^	52 kts	n/a	n/a	$22,000	n/a	- a machine shed was damaged - a power pole was blown over
5/11/2014	4:20 p.m.	Benson^	52 kts	n/a	n/a	$32,000	n/a	- a machine shed was damaged - a large tree and several power lines were blown down
5/11/2014	4:22 p.m.	Benson^	52 kts	n/a	n/a	$14,000	n/a	- the roof and doors of a machine shed were blown off - a power pole was snapped
Subtotal:				**0**	**0**	**$180,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 18 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/7/2015	3:10 p.m.	Benson	61 kts	n/a	n/a	$11,000	n/a	<u>*Benson*</u> a tree was blown down onto a power line <u>*Benson area*</u> a tree was blown onto a garage south of the Village
6/7/2015	3:15 p.m.	Eureka	61 kts	n/a	n/a	$20,000	n/a	several trees were damaged
6/7/2015	3:16 p.m.	Metamora	61 kts	n/a	n/a	$25,000	n/a	numerous trees limbs were blown down
6/10/2015	8:00 p.m.	Germantown Hills^	52 kts	n/a	n/a	$8,000	n/a	trees were blown down onto IL Rte. 116 southwest of the Village
8/18/2015	5:12 p.m.	Congerville	52 kts	n/a	n/a	$12,000	n/a	numerous 4 to 6-inch diameter tree branches were blown down
8/18/2015	5:15 p.m.	Goodfield^	52 kts	n/a	n/a	$45,000	n/a	- a few trees were blown down along Interstate 74 - damage was done to the roof of a barn/dinner theater
11/11/2015	7:50 p.m.	Goodfield^	52 kts	n/a	n/a	$15,000	n/a	2 power poles were blown down
11/11/2015	7:56 p.m.	Metamora^	52 kts	n/a	n/a	n/a	n/a	a 24-inch diameter tree was blown down
11/11/2015	8:09 p.m.	El Paso Panola Woodford Minonk	52 kts	n/a	n/a	$50,000	n/a	<u>*El Paso*</u> several power lines were blown down <u>*Minonk*</u> several power lines were blown down
Subtotal:				**0**	**0**	**$186,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 19 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
7/13/2016	3:58 p.m.	Metamora	61 kts	n/a	n/a	$12,000	n/a	a large tree was blown over onto a house
2/28/2017	10:25 p.m.	Goodfield^	61 kts	n/a	n/a	$15,000	n/a	a semi was blown over on Interstate 74 west of the Village
5/10/2017	5:51 p.m.	Washburn^	70 kts	n/a	n/a	$15,000	n/a	- winds damaged several trees - tree limbs were blown down on 2 farms - a gas grill and singles on a home were also damaged by winds
5/17/2017	9:55 p.m.	Secor^	52 kts	n/a	n/a	$27,000	n/a	several trees were blown down, including one that fell onto power lines
6/14/2017	2:42 p.m.	Spring Bay	n/a	n/a	n/a	$25,000	n/a	numerous trees were blown down
6/14/2017	2:45 p.m.	Washburn^	52 kts	n/a	n/a	$30,000	n/a	numerous trees were blown down along IL Rte. 26 from the Woodford-Marshall County line southward for about 3 miles
6/14/2017	3:00 p.m.	Metamora Low Point	52 kts	n/a	n/a	$50,000	n/a	numerous trees were blown down
Subtotal:				**0**	**0**	**$174,000**	**$0**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Woodford County

Figure 26
(Sheet 20 of 20)
Severe Storms – Thunderstorms with Damaging Winds
1966 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/17/2017	7:30 p.m.	Roanoke^	70 kts	n/a	n/a	n/a	n/a	- a detached garage was destroyed - a dairy barn was damaged - several 18 to 20-inch diameter trees were blown down near 1800N and 1700E
6/17/2017	7:49 p.m.	Secor^	70 kts	n/a	n/a	n/a	n/a	a garage was severely damaged
6/17/2017	7:56 p.m.	El Paso	70 kts	n/a	n/a	n/a	n/a	numerous trees and tree branches were blown down
10/14/2017	6:20 p.m.	Spring Bay^	61 kts	n/a	n/a	$12,000	n/a	- a power line was blown down closing IL Route 26 near the Village - numerous trees were blown down onto IL Route 26 about 5.5 miles northeast of the Village
Subtotal:				**0**	**0**	**$12,000**	**$0**	
GRAND TOTAL:				**2**	**0**	**$1,711,000**	**$30,000**	

^ Thunderstorm with damaging winds verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Woodford County Hazard Identification and Risk Assessment Packet.

Woodford County

Figure 27
(Sheet 1 of 4)
Severe Storms – Hail Events
1974 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
7/10/1974	5:00 p.m.	Roanoke^ Metamora^ Washburn^	1.75 in.	n/a	n/a	n/a	$2,500,000	<u>*Roanoke area*</u> - destroyed a three square-mile area of crops - severely damaged corn, wheat and bean crops
7/10/1974	5:25 p.m.	Benson Woodford	1.75 in.	n/a	n/a	n/a	n/a	
7/10/1974	5:30 p.m.	Washburn	1.50 in.	n/a	n/a	n/a	n/a	
6/13/1975	11:40 p.m.	Benson^	2.00 in.	n/a	n/a	n/a	n/a	
7/26/1978	2:00 p.m.	Metamora	2.00 in.	n/a	n/a	n/a	n/a	
5/21/1987	9:10 p.m.	Roanoke^	1.25 in.	n/a	n/a	n/a	n/a	
4/22/1988	2:00 a.m.	El Paso^	1.75 in.	n/a	n/a	n/a	n/a	golf ball-sized hail piled up 4 inches deep near the City
5/17/1991	6:14 p.m.	Minonk	2.00 in.	n/a	n/a	n/a	n/a	
6/13/1991	7:10 p.m.	Eureka	1.75 in.	3	0	n/a	n/a	a police car was damaged by falling tree limbs
10/23/1991	3:25 p.m.	Metamora	1.00 in.	n/a	n/a	n/a	n/a	
4/15/1992	1:40 a.m.	Eureka	1.50 in.	n/a	n/a	n/a	n/a	
5/13/1995	6:29 p.m.	El Paso^	1.75 in.	n/a	n/a	n/a	n/a	
4/14/1996	7:23 p.m.	Roanoke	1.00 in.	n/a	n/a	n/a	n/a	
4/7/1998	6:49 p.m.	Roanoke^	1.75 in.	n/a	n/a	n/a	n/a	
4/20/1998	3:30 p.m.	Benson^	1.75 in.	n/a	n/a	n/a	n/a	several windows in a car were broken
5/5/1999	8:13 p.m.	Benson^	1.75 in.	n/a	n/a	n/a	n/a	
Subtotal:				**3**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Woodford County

Figure 27
(Sheet 2 of 4)
Severe Storms – Hail Events
1974 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/4/1999	3:20 p.m.	Germantown Hills	1.75 in.	n/a	n/a	n/a	n/a	
5/12/2000	4:01 p.m.	Eureka^ Roanoke^	2.50 in.	n/a	n/a	$300,000	n/a	over 100 cars sustained hail damage in the Eureka/Roanoke area
5/18/2000	4:54 p.m.	Congerville^ El Paso	1.00 in.	n/a	n/a	n/a	n/a	*El Paso* 2 squad cars sustained damage
4/10/2001	12:35 a.m.	Minonk	1.75 in.	n/a	n/a	$100,000	n/a	- widespread damage was noted to vehicles in the area – at least 50 vehicles were reported to have between $2,000 and $4,000 in damage each - some minor roof damage was also reported
4/21/2001	4:30 p.m.	Metamora	1.00 in.	n/a	n/a	n/a	n/a	
5/9/2003	10:30 p.m.	Washburn^	1.75 in.	n/a	n/a	n/a	n/a	
5/28/2003	1:53 p.m.	Germantown Hills	1.75 in.	n/a	n/a	n/a	n/a	numerous buildings and vehicles were damaged
6/28/2003	4:00 p.m.	Germantown Hills^ Eureka^ Goodfield Congerville	1.50 in.	n/a	n/a	n/a	n/a	
9/26/2003	1:59 p.m.	Minonk	1.25 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$400,000**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Woodford County

Figure 27
(Sheet 3 of 4)
Severe Storms – Hail Events
1974 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
5/30/2004	4:00 p.m.	Metamora^ Roanoke Eureka Secor	4.00 in.	n/a	n/a	n/a	n/a	
7/13/2004	2:05 p.m.	El Paso Kappa	2.75 in.	n/a	n/a	n/a	n/a	
3/30/2005	3:02 p.m.	Germantown Hills	1.00 in.	n/a	n/a	n/a	n/a	
3/30/2005	6:24 p.m.	Secor^	1.75 in.	n/a	n/a	n/a	n/a	
6/9/2005	1:25 a.m.	Metamora	1.00 in.	n/a	n/a	n/a	n/a	
9/22/2006	4:08 p.m.	Roanoke	1.00 in.	n/a	n/a	n/a	n/a	
9/22/2006	4:10 p.m.	Roanoke	1.25 in.	n/a	n/a	n/a	n/a	
6/3/2008	9:07 p.m.	Goodfield	1.75 in.	n/a	n/a	n/a	n/a	
5/13/2009	4:53 p.m.	El Paso	1.00 in.	n/a	n/a	n/a	n/a	
6/1/2009	4:54 p.m.	Metamora	1.00 in.	n/a	n/a	n/a	n/a	
6/1/2009	5:15 p.m.	Spring Bay	1.00 in.	n/a	n/a	n/a	n/a	
6/1/2009	5:24 p.m.	Metamora^	1.75 in.	n/a	n/a	n/a	n/a	
5/22/2011	1:15 p.m.	Goodfield	1.00 in.	n/a	n/a	n/a	n/a	
5/22/2011	1:26 p.m.	Eureka	1.00 in.	n/a	n/a	n/a	n/a	
5/22/2011	1:31 p.m.	Secor	1.50 in.	n/a	n/a	n/a	n/a	
11/17/2013	11:10 p.m.	Metamora	1.00 in.	n/a	n/a	n/a	n/a	
4/3/2014	2:30 a.m.	Eureka	1.00 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Woodford County

Figure 27
(Sheet 4 of 4)
Severe Storms – Hail Events
1974 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4/8/2015	2:30 a.m.	Washburn	1.00 in.	n/a	n/a	n/a	n/a	
6/8/2015	3:55 p.m.	Congerville^	1.00 in.	n/a	n/a	n/a	n/a	
3/15/2016	8:07 p.m.	Secor	1.50 in.	n/a	n/a	n/a	n/a	
4/10/2017	3:20 p.m.	Panola^	1.00 in.	n/a	n/a	n/a	n/a	
5/17/2017	9:45 p.m.	Bay View Gardens	1.00 in.	n/a	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	**$0**	
GRAND TOTAL:				**0**	**0**	**$400,000**	**$0**	

^ Hail event verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Woodford County

Figure 28
Severe Storms – Lightning Events
1960 – 2017

Date(s)	Start Time	Location(s)	Injuries	Fatalities	Property Damage	Crop Damage	Description
6/16/1960	n/a	Roanoke	n/a	n/a	$2,500	n/a	lightning struck a transformer and switchboard at the feed mill
6/25/2008	3:50 a.m.	Germantown Hills	0	0	$300,000	$0	- lightning struck a house and started a fire which destroyed the house and its contents
5/12/2009	10:30 p.m.	Kappa	0	0	$45,000	$0	- lightning struck a tree near a house setting the power lines and part of the house on fire - the kitchen, staircase and room above the kitchen were damaged
7/6/2010	5:00 p.m.	Washburn^	1	0	n/a	n/a	- a road construction flagger on IL Rte. 89 between Washburn and Cazenovia was struck by lightning - the victim was struck in the left shoulder with the bolt exiting his left foot, where part of his boot was blown off - the individual was treated for burns
6/5/2011	8:31 a.m.	Secor^	n/a	n/a	$1,000	n/a	lightning struck a house knocking a hole in the roof and taking out the electrical service
GRAND TOTAL:			**1**	**0**	**$348,500**	**$0**	

^ Lightning strike event verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

3.1.3 PARTICIPATING PEORIA COUNTY MUNICIPALITIES

HAZARD PROFILE

The following identifies past occurrences of severe storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe storms occurred previously? What is the extent of these previous severe storms?

Figures 37, **38**, and **39** located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in the participating Peoria County municipalities. The severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning and heavy rain. Severe storms are the most frequently occurring natural hazard in the participating municipalities.

Thunderstorms with Damaging Winds

NOAA's Storm Events Database, NOAA's Storm Data Publications and information included in the 2010 Plan were used to document 173 reported occurrences of thunderstorms with damaging winds in the participating Peoria County municipalities between 1953 and 2017. Of the 173 occurrences, 120 had reported wind speeds of 50 knots or greater. There were 53 occurrences, however, where the wind speed was not recorded.

Severe Storms Fast Facts – Occurrences

Number of recorded Thunderstorms with Damaging Winds (1953 – 2017): ***173***

Number of recorded Severe Hail Events (1960 – 2017): ***57***

Number recorded of Lightning Strike Events (1955 – 2017): ***11***

Highest Recorded Wind Speed: ***83 knots (July 5,1953 at Peoria)***

Largest Hail Recorded: ***2.75 inches (June 2, 1980 at Peoria)***

Most Likely Month for Thunderstorms with Damaging Winds to Occur: ***June***

Most Likely Month for Severe Hail to Occur: ***June***

Most Likely Time for Thunderstorms with Damaging Winds to Occur: ***Afternoon/Early Evening***

Most Likely Time for Severe Hail to Occur: ***Afternoon/Early Evening***

The highest wind speed recorded in the participating municipalities occurred in Peoria on July 5, 1953 when winds reached 83 knots (95 mph) during a thunderstorm event. Thunderstorms with damaging winds have been *recorded* in every participating municipality on multiple occasions.

Figure 40 charts the reported occurrences of thunderstorms with damaging winds in the participating municipalities by month. Of the 173 events, 112 (65%) took place in May, June, and July making this the peak period for thunderstorms with damaging winds in participating municipalities. Of those 112 events, 52 (46%) occurred during June, making this the peak month for thunderstorms with damaging winds.

Figure 41 charts the reported occurrences of thunderstorms with damaging winds by hour. Of the 173 occurrences, start times were unavailable for six events. Of the remaining 167 severe storms events with recorded times, approximately 81% occurred during the p.m. hours, with 101 of the events (60%) taking place between 2 p.m. and 8 p.m.

Figure 40
Graph: Thunderstorms with Damaging Winds by Month
Participating Peoria County Municipalities: 1960 – 2017

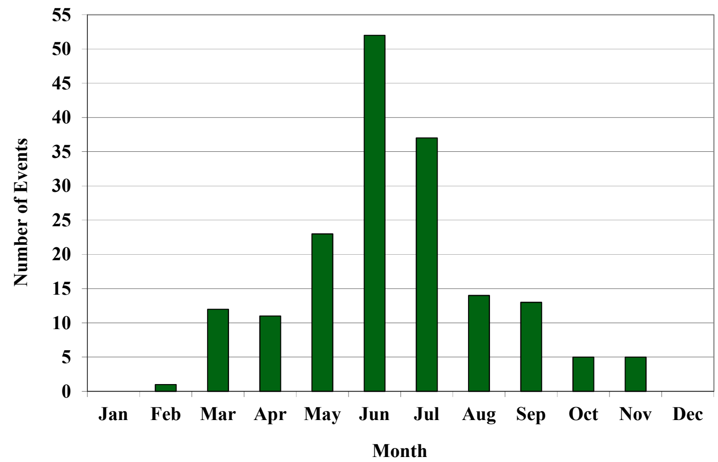
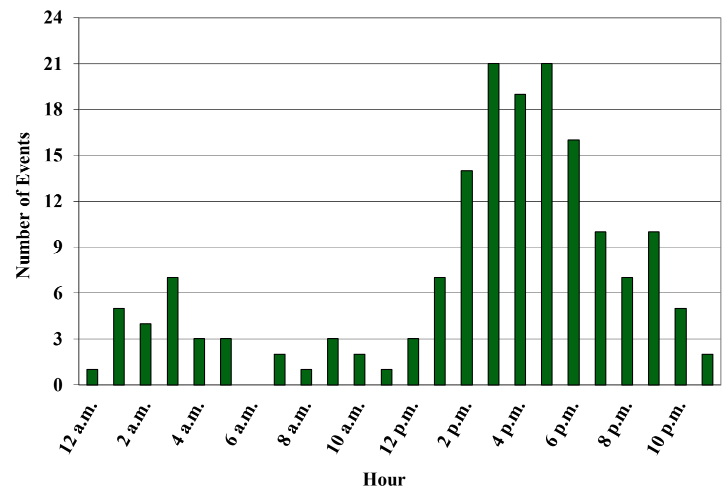


Figure 41
Graph: Thunderstorms with Damaging Winds by Hour
Participating Peoria County Municipalities: 1960 – 2017



Hail

NOAA's Storm Events Database and information included in the 2010 Plan were used to document 57 reported occurrences of severe storms with hail one (1) inch in diameter or greater in participating Peoria County municipalities between 1960 and 2017. Of the 57 occurrences, 23 produced hailstones 1.50 inches or larger in diameter.

The largest hail stones documented in participating municipalities measured 2.75 inches in diameter (baseball-sized) and fell on June 2, 1980 at Peoria. Hail one (1) inch in diameter or greater has been *recorded* in every participating municipality.

Figure 42 charts the reported occurrences of hail by month. Of the 57 occurrences, 34 (60%) took place in April, May and June making this the peak period for hail in participating municipalities. Of the 34 events, 14 (41%) occurred during June, making this the peak month for hail events.

Figure 42
Graph: Hail Events by Month Participating Peoria County Municipalities: 1960 – 2017

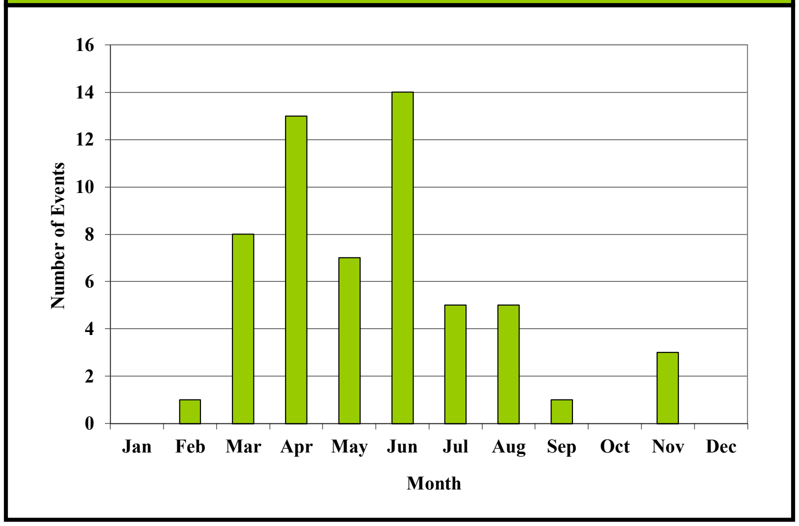
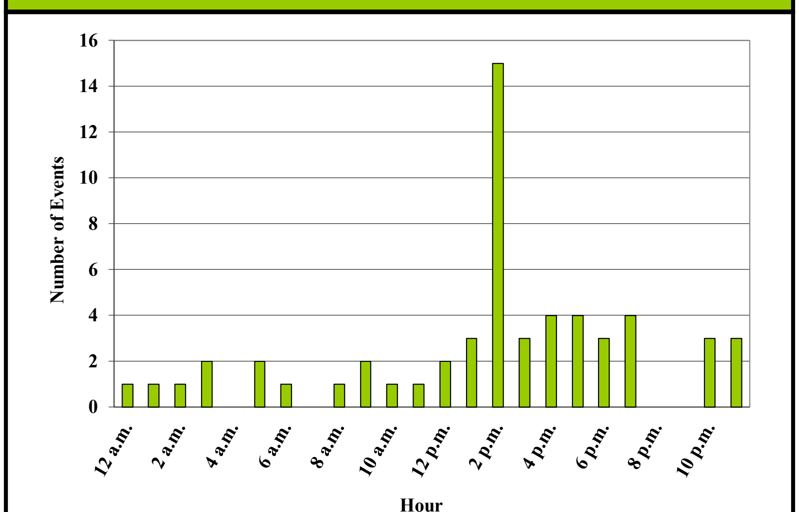


Figure 43 charts the reported occurrences of hail by hour. Approximately 77% of all the hail events occurred during the p.m. hours, with 33 of the events (58%) taking place between 2:00 p.m. and 8:00 p.m.

Figure 43
Graph: Hail Events by Hour Participating Peoria County Municipalities: 1960 – 2017



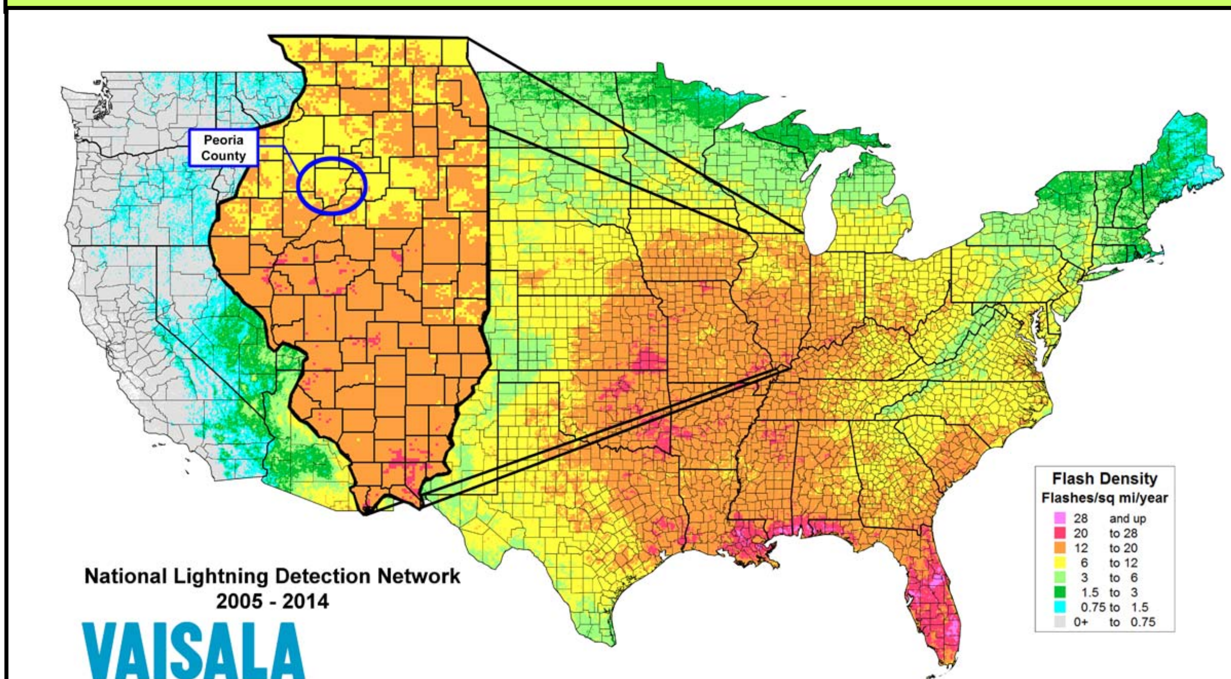
Lightning

While lightning strike events occur regularly across central Illinois, NOAA's Storm Events Database, NOAA's Storm Data Publications and information included in the 2010 Plan only identified 11 *recorded* occurrences of lightning strikes in the participating Peoria County municipalities between 1955 and 2017. Three of the events took place during August while the remaining events took place in May, June, July and September. Three of the five events with recorded times occurred during the p.m. hours.

These represent the ***reported occurrences*** of lightning strike events. The NWS acknowledges that lightning strike events area not well recorded, due in part to the rural nature of most Illinois counties. Only those events with impacts, such as property damage or injuries/fatalities, are reported. As a result, lightning strike events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

According to data from Vaisala's National Lightning Detection Network, Peoria County (including the participating municipalities) averaged at least 6 to 12 cloud-to-ground lightning flashes per square mile annually between 2005 and 2014. **Figure 44** illustrates the cloud-to-ground lightning flash density (number of cloud-to-ground flashes per square mile) by county for the continental United States. In comparison, Illinois averaged 14.1 cloud-to-ground lightning flashes per square mile between 2006 and 2015, ranking it eighth in the Country for lightning flash density.

Figure 44
Cloud-to-Ground Lightning Flash Density: Participating Peoria County Municipalities



Heavy Rain

While heavy rain events occur on a fairly regular basis across central Illinois, NOAA's Storm Events Database does not include any *recorded* heavy rain events for the participating municipalities. This may be due in part to a lack of uniform reporting guidelines for heavy rain events.

What locations are affected by severe storms?

Severe storms affect the entire County. A single severe storm event will generally extend across the entire County and affect multiple locations. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency (IEMA) classifies Peoria County's hazard rating for severe storms as "severe." (IEMA's hazard rating system has five levels: low, guarded, elevated, high and severe.)

What is the probability of future severe storm events occurring?

Thunderstorms with Damaging Winds

The participating Peoria County municipalities have had 173 verified occurrences of thunderstorms with damaging winds between 1953 and 2017. With 173 occurrences over the past 65 years, the participating municipalities should expect to experience at least two thunderstorms with damaging winds each year. There were 24 years over the last 65 years where multiple (three or more) thunderstorms with damaging winds occurred. This indicates that the probability that multiple thunderstorms with damaging winds may occur during any given year within the participating municipalities is 37%.

Hail

There have been 57 verified occurrences of hail one (1) inch in diameter or greater between 1960 and 2017. With 57 occurrences over the past 58 years, the participating municipalities should expect to experience approximately one severe hail event each year. There were 14 years over the last 58 years where two or more hail events occurred. This indicates that the probability that more than one severe storm with hail may occur during any given year within the participating municipalities is 24%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe storms.

Are the participating jurisdictions vulnerable to severe storms?

Yes. All of the participating municipalities are vulnerable to the dangers presented by severe storms due to the topography of the region and its location in relation to the movement of weather fronts across central Illinois. Since 2008, the participating Peoria County municipalities have recorded 55 thunderstorms with damaging winds, 28 severe storms with hail one (1) inch in diameter or greater and five verified lightning strike events.

Figure 45 details the number thunderstorms with damaging winds and hail events that were recorded in each participating municipality. Of the participating municipalities, Peoria has had more recorded occurrences of thunderstorms with damaging winds, severe hail events and lightning strikes than any of the other municipalities.

Figure 45
Verified Severe Storm Events by Participating Peoria County Municipalities

Participating Municipality	Number of Events		
	Thunderstorm & High Wind	Severe Hail	Lightning Strikes
Bartonville	36	16	1
Chillicothe	33	7	1
Hanna City	19	8	0
Peoria	144	29	9
Peoria Heights	38	2	0

What impacts resulted from the recorded severe storms?

Severe storms as a whole have caused an estimated $6.8 million in recorded property damages. The following provides a breakdown of impacts by category.

Thunderstorms with Damaging Winds

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and the 2010 Plan indicates that between 1953 and 2017, 51 of the 173 thunderstorms with damaging winds caused $5.2 million in property damages. Damage information was either unavailable or none was recorded for the remaining 122 reported occurrences.

NOAA's Storm Events Database and NOAA's Storm Data Publications documented 11 injuries as the result of four separate thunderstorm with damaging wind events. Detailed information on the injuries sustained was only available for two of the events. The following provides a brief description of each event.

- ❖ On July 20, 1994 a thunderstorm with damaging winds caused the brick façade of a building in Peoria to collapse on a car injuring the individual inside.
- ❖ A roofer was blown off a roof by a thunderstorm with damaging winds on June 8, 2005.

Severe Storms Fast Facts – Impacts/Risk

Thunderstorms with Damaging Winds Impacts
- ❖ Total Property Damage: ***$5,205,900***
- ❖ Infrastructure/Critical Facilities Damage*: ***n/a***
- ❖ Injuries: ***11***
- ❖ Fatalities: ***n/a***

Severe Hail Impacts
- ❖ Total Property Damage: ***$1,400,000***
- ❖ Infrastructure/Critical Facilities Damage*: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Lightning Strike Impacts
- ❖ Total Property Damage: ***$197,700***
- ❖ Infrastructure/Critical Facilities Damage*: ***n/a***
- ❖ Injuries: ***4***
- ❖ Fatalities: ***n/a***

Severe Storms Risk/Vulnerability to:
- ❖ Public Health & Safety: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Medium/High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

Hail

Data obtained from NOAA's Storm Events Database, the 2010 Plan and MAC member records indicates that between 1960 and 2017, two of the 57 severe hail events caused $1.4 million in property damages. Damage information was either unavailable or none was recorded for the remaining 55 reported occurrences. No injuries or fatalities were reported as a result of any of the hail events either.

Lightning

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and the 2010 Plan indicates that between 1955 and 2017, seven of the 11 lightning strike events caused $197,700 in property damages. Damage information was either unavailable or none was recorded for the remaining four reported occurrences.

NOAA's Storm Events Database and NOAA's Storm Data Publications documented four injuries as the result of three separate lightning strike events. Detailed information on the injuries sustained was only available for one of the events. On May 26, 2017 two individuals were injured when lightning struck an outdoor music festival in Chillicothe.

What other impacts can result from severe storms?

In Peoria County (including the participating municipalities), the greatest risk to health and safety from severe storms is vehicle accidents. Hazardous driving conditions resulting from severe storms (i.e., wet pavement, poor visibility, high winds, etc.) can contribute to accidents that result in injuries and fatalities. Traffic accident data assembled by the Illinois Department of Transportation from 2011 through 2015 indicates that wet road surface conditions were present for 12.8% to 16.5% of all crashes recorded annually in Peoria County.

While other circumstances cause wet road surface conditions (i.e., melting snow, condensation, light showers, etc.), law enforcement officials agree that hazardous driving conditions caused by severe storms add to the number of crashes. **Figure 46** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when wet road surface conditions were present.

Figure 46
Severe Weather Crash Data – Peoria County

Year	Total # of Crashes	Presence of Wet Road Surface Conditions		
		# of Crashes	# of Injuries	# of Fatalities
2011	4,896	810	296	0
2012	4,789	612	201	0
2013	4,438	712	232	1
2014	4,538	643	235	2
2015	4,454	707	232	2
Total:	**23,115**	**3,484**	**1,196**	**5**

Source: Illinois Department of Transportation.

What is the level of risk/vulnerability to public health and safety from severe storms?

For the participating municipalities the level of risk or vulnerability posed by severe storms to public health and safety is considered to be low. This assessment is based on the fact that despite their relative frequency, the number of injuries and fatalities is low. In addition, UnityPoint Health Methodist and OSF St. Francis Medical Center in Peoria as well as hospitals in Pekin (Tazewell County), Eureka (Woodford County), Galesburg (Knox County) and Canton (Fulton County) and regional health centers in Springfield (Sangamon County) and the Quad Cities area (Rock Island County) are equipped to provide care to persons injured during a severe storm.

Are existing buildings, infrastructure and critical facilities vulnerable to severe storms?

Yes. All existing buildings, infrastructure and critical facilities located in the participating municipalities are vulnerable to damage from severe storms. Structural damage to buildings is a relatively common occurrence with severe storms. Damage to roofs, siding, awnings and windows can occur from hail, flying and falling debris and high winds. Lightning strikes can damage electrical components and equipment (i.e., appliances, computers etc.) and can cause fires that consume buildings. If the roof is compromised or windows are broken, rain can cause additional damage to the structure and contents of a building.

Infrastructure and critical facilities tend to be just as vulnerable to severe storm damage as buildings. The infrastructure and critical facilities that are the most vulnerable to severe storms are related to power distribution and communications. High winds, lightning and flying and falling debris have the potential to cause damage to communication and power lines, power substations, transformers and poles, and communication antennas and towers.

The damage inflicted by severe storms often leads to disruptions in communication and creates power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service. Power outages and disruptions in communications can impair vital services, particularly when backup power generators are not available. Participating municipalities acknowledged the need for emergency backup generators to allow continued operation of critical facilities such as municipal buildings, storm shelters, police and fire stations, heating and cooling centers, and lift stations. Of the participating municipalities, Peoria does not have emergency backup generators at all of its fire stations which also serve as warming/cooling centers.

In addition to affecting power distribution and communications, debris and flooding from severe storms can block state and local roads hampering travel. When transportation is disrupted, emergency and medical services are delayed, rescue efforts are hindered and government services can be affected.

Based on the frequency with which severe storms occur in the participating municipalities, the amount of property damage previously reported and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe storms is medium to high.

Are future buildings, infrastructure and critical facilities vulnerable to severe storms?

Yes and No. All of the participating jurisdictions have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms. However, infrastructure such as new communication and power lines will continue to be vulnerable to severe storms as long as they are located above ground. High winds, lightning and flying and falling debris can disrupt power and communication. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from severe storms?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe storms. With only 60 of the 241 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. Since all existing structures within the participating municipalities are vulnerable to damage, it is highly probable that there will be future dollar losses from severe storms.

Participating Peoria County Municipalities Only

Figure 37
(Sheet 1 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
7/23/1953	n/a	Peoria	n/a	n/a	n/a	n/a	- winds caused damage at Heart of Illinois Fair - scattered power outages occurred
7/5/1953	8:15 p.m.	Peoria	83 kts	3	0	$1,500,000	- roof damaged sustained by Sacred Heart Church & White School - many planes sustained damage at the Airport
10/7/1955	1:00 p.m.	Peoria	n/a	n/a	n/a	n/a	
3/14/1957	n/a	Peoria Bartonville	n/a	n/a	n/a	n/a	*Peoria* - winds knocked out power and phone lines *Bartonville* - 250-foot length of roof was ripped off CECo Steel Products warehouse
8/18/1960	3:00 p.m.	Peoria	n/a	n/a	n/a	n/a	winds downed many trees and utility lines
7/22/1962	3:08 a.m.	Peoria	55 kts	n/a	n/a	n/a	
4/21/1964	4:30 a.m.	Peoria Peoria Heights	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- winds destroyed two houses and caused severe damage to 25 other houses - several homes under construction were leveled in the Wardcliffe Hamilton Park subdivision - wind downed a high voltage power line and knocked out phone service to 40 homes							
11/20/1964	n/a	Peoria	61 kts	6	0	n/a	- winds blew a garbage container into a gas pipe causing a gas leak - winds downed electric and utility lines
9/14/1965	2:28 p.m.	Peoria	63 kts	n/a	n/a	n/a	
5/7/1966	7:30 p.m.	Peoria	61 kts	n/a	n/a	n/a	
Subtotal:				**9**	**0**	**$1,500,000**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 2 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/10/1968	10:30 p.m.	Peoria	n/a	n/a	n/a	n/a	- winds overturned a mobile home - winds blew over the walls of a building under construction
4/29/1970	11:30 p.m.	Peoria	n/a	n/a	n/a	n/a	
7/3/1970	3:55 a.m.	Peoria	n/a	n/a	n/a	n/a	
9/28/1972	9:30 p.m.	Peoria	n/a	n/a	n/a	n/a	
6/16/1973	8:09 p.m.	Peoria Airport Peoria Bartonville	56 kts	n/a	n/a	n/a	
6/9/1974	5:00 p.m.	Peoria Peoria Heights	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #438)*** - wind gusts varying from 30-70 mph - minor property damage as well as damage to trees and power lines was reported
6/19/1974	n/a	Peoria Airport Peoria	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #438)*** Peoria Airport - a Cessna flipped while trying to land Peoria - roof of the Union Stockyards blew off - 12,000 homes without power
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 3 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/20/1974	6:20 p.m.	Peoria Airport Peoria Bartonville	55 kts	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #438)*** winds blew two aircraft over at the Airport
6/20/1974	6:15 p.m.	Chillicothe	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #438)***
7/10/1974	4:00 p.m.	Peoria Peoria Heights	52 kts	n/a	n/a	n/a	*Peoria* numerous trees were reported down
6/5/1975	2:30 a.m.	Peoria	n/a	n/a	n/a	n/a	
7/23/1975	5:40 p.m.	Peoria Airport Peoria Bartonville	74 kts	n/a	n/a	n/a	winds knocked over trees
3/26/1976	9:05 p.m.	Peoria Peoria Heights	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- winds uprooted trees, ripped the sides off a garage, broke windows and damage billboards - Jet City & Bartonville CILCO substation was knocked out, leaving 5,000 homes without power							
3/28/1977	n/a	Peoria	41 kts	n/a	n/a	n/a	- winds blew down billboards, utility poles and trees - the United Facilities Warehouse sustained wind damage - 200 homes were without power
5/4/1977	5:02 p.m.	Peoria	52 kts	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37 (Sheet 4 of 19) Severe Storms – Thunderstorms with Damaging Winds 1953 – 2017							
Date(s)	**Start Time**	**Location(s)**	**Magnitude (Knots)**	**Injuries**	**Fatalities**	**Property Damage**	**Description**
7/9/1978	2:23 a.m.	Peoria Airport Peoria Bartonville	50 kts	n/a	n/a	n/a	
7/5/1980	1:30 a.m.	Peoria	n/a	n/a	n/a	n/a	
7/5/1980	2:05 a.m.	Peoria Airport Peoria Bartonville	58 kts	n/a	n/a	n/a	
9/1/1980	1:22 a.m.	Peoria Airport Peoria Bartonville	50 kts	n/a	n/a	n/a	
9/16/1980	5:30 p.m.	Peoria	n/a	n/a	n/a	n/a	windows were blown in
6/24/1981	4:40 p.m.	Hanna City	61 kts	n/a	n/a	n/a	
6/24/1981	4:55 p.m.	Peoria Airport Peoria Bartonville	65 kts	n/a	n/a	n/a	
4/3/1982	n/a	Peoria	54 kts	n/a	n/a	n/a	8,000 homes without power
7/18/1982	10:12 p.m.	Peoria	n/a	n/a	n/a	n/a	
6/14/1983	4:30 p.m.	Peoria	n/a	n/a	n/a	n/a	winds downed power lines causing power failures in parts of the City
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 5 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
8/21/1983	11:00 p.m.	Peoria Peoria Heights	n/a	n/a	n/a	n/a	
7/2/1985	6:45 p.m.	Peoria	51 kts	n/a	n/a	n/a	winds blew down tree limbs
7/2/1985	8:45 p.m.	Hanna City Peoria Peoria Heights Bartonville	55 kts	n/a	n/a	n/a	winds caused widespread minor damage to trees, telephone and electric utilities
7/31/1986	1:25 a.m.	Peoria	n/a	n/a	n/a	n/a	widespread tree damage
5/20/1987	5:30 p.m.	Chillicothe	n/a	n/a	n/a	n/a	winds downed several trees
5/21/1987	9:15 p.m.	Chillicothe Peoria	57 kts	n/a	n/a	n/a	winds downed trees
5/8/1988	4:30 p.m.	Peoria Peoria Airport	n/a	n/a	n/a	n/a	the office building of WXCL lost part of its roof
10/17/1988	7:45 a.m.	Peoria	55 kts	n/a	n/a	n/a	- some homes were damaged by fallen trees in the north part of the City - many utility lines in the area were blown down
4/26/1989	6:42 p.m.	Peoria	60 kts	n/a	n/a	n/a	- winds knocked down some trees and power lines - 5,000 utility customers were without power for a time
3/27/1991	3:16 p.m.	Peoria Airport Peoria Bartonville	50 kts	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37 (Sheet 6 of 19) Severe Storms – Thunderstorms with Damaging Winds 1953 – 2017							
Date(s)	**Start Time**	**Location(s)**	**Magnitude (Knots)**	**Injuries**	**Fatalities**	**Property Damage**	**Description**
3/27/1991	4:51 p.m.	Peoria Airport Peoria Bartonville	59 kts	n/a	n/a	n/a	
5/31/1991	6:05 p.m.	Peoria	52 kts	n/a	n/a	n/a	
5/31/1991	6:10 p.m.	Chillicothe	n/a	n/a	n/a	$2,500	winds downed power lines
9/9/1991	7:09 p.m.	Peoria	64 kts	n/a	n/a	n/a	
5/4/1992	1:24 p.m.	Peoria	53 kts	n/a	n/a	$250	
7/2/1992	12:53 p.m.	Peoria	61 kts	n/a	n/a	$2,500,000	*Event Description Provided Below*
- winds caused widespread damage to structures and trees - trees and power lines were downed near Koerner Road - large trees were downed on Adams Street - a tree was blown onto a home on Wilcox Street							
7/2/1992	1:08 p.m.	Peoria	n/a	n/a	n/a	n/a	
7/2/1992	1:16 p.m.	Chillicothe	n/a	n/a	n/a	n/a	winds and falling trees demolished a home at 3rd & Sycamore Street
9/7/1992	9:17p.m.	Peoria	n/a	n/a	n/a	n/a	trees were blown down near the Bradley University Campus
9/7/1992	9:20 p.m.	Peoria	n/a	n/a	n/a	n/a	trees were blown down in the East Bluff area
9/9/1992	4:20 p.m.	Peoria	51 kts	n/a	n/a	n/a	
8/15/1993	7:05 p.m.	Chillicothe	n/a	n/a	n/a	$5,000	winds blew down large trees and power lines
8/23/1993	3:45 p.m.	Peoria	n/a	n/a	n/a	$50	tree limbs were blown down
5/24/1994	5:20 p.m.	Peoria	n/a	n/a	n/a	n/a	large tree branches were snapped by high winds
Subtotal:				**0**	**0**	**$2,507,800**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 7 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
7/20/1994	5:22 p.m.	Bartonville	n/a	n/a	n/a	$50	a tree was blown over in the Lake Camelot subdivision
7/20/1994	5:25 p.m.	Peoria	n/a	n/a	n/a	$50	a flag pole was blown over near Weaver Farms
7/20/1994	5:30 p.m.	Peoria	n/a	n/a	n/a	$5,000	- winds blew down numerous trees, some across roads and on cars - power lines were knocked down
7/20/1994	5:35 p.m.	Peoria	n/a	n/a	n/a	$50	a 2-foot diameter tree was blown down across Knoxville Ave. near the American Red Cross office
7/20/1994	5:39 p.m.	Peoria	n/a	1	0	$5,000	the brick façade of a building collapsed, injuring one person in a car
5/9/1995	5:25 p.m.	Bartonville	n/a	n/a	n/a	n/a	winds blew down numerous large tree branches
6/21/1995	5:30 p.m.	Chillicothe	52 kts	n/a	n/a	n/a	numerous trees and power lines were downed
3/25/1996	4:00 a.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	n/a	n/a	n/a	n/a	- winds blew down numerous power lines and caused minor damage across the County *rain could not be documented with this event*
6/23/1996	3:30 p.m.	Peoria	n/a	n/a	n/a	n/a	winds blew down a large tree
7/24/1996	11:45 a.m.	Chillicothe Peoria Peoria Heights	n/a	n/a	n/a	n/a	*Chillicothe/Peoria* - winds blew down numerous large trees, tree limbs and power lines *Peoria* - a tree fell onto the historic Scottish Rite Cathedral causing minor damage
Subtotal:				**1**	**0**	**$10,100**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 8 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
10/29/1996	4:42 p.m.	Peoria Heights	n/a	n/a	n/a	n/a	winds blew down a large tree causing minor damage to a home
10/30/1996	1:00 a.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	57 kts	n/a	n/a	n/a	winds blew down trees, tree limbs and power lines *<u>Peoria</u>* - 2 bus stop benches were blown over *<u>Peoria Heights</u>* - a tree fell onto an unoccupied car causing major damage *rain could not be documented with this event*
4/5/1997	3:30 p.m.	Peoria Peoria Heights Chillicothe	n/a	n/a	n/a	$3,000	- numerous trees, tree limbs and power lines were blown down - a wall on a boat warehouse was blown out and a garage door was buckled in - a tree fell onto a house causing minor roof damage
4/6/1997	9:15 a.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	52 kts	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines *rain could not be documented with this event*
4/30/1997	2:00 p.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	61 kts	n/a	n/a	n/a	- hundreds of power lines were blown down across the area - numerous trees and tree limbs were blown down - widespread structural damage was reported *rain could not be documented with this event*
Subtotal:				**0**	**0**	**$3,000**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 9 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
8/3/1997	4:55 p.m.	Peoria	n/a	n/a	n/a	n/a	winds blew down several large trees, numerous tree limbs and some power lines
9/16/1997	9:30 p.m.	Peoria	n/a	n/a	n/a	n/a	winds blew down numerous large tree limbs and a few power lines
9/29/1997	10:00 a.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	52 kts	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down *Chillicothe* a large tree fell down causing considerable damage to a garage and nearby shed *rain could not be documented with this event*
3/27/1998	6:43 p.m.	Hanna City Peoria	54 kts	n/a	n/a	n/a	numerous trees, tree limbs, power poles and power lines were blown down *Peoria* - a 200-foot by 75-foot section of the post office garage roof was blown off and curled into a ball - winds caused the second story of an abandoned business to collapse
6/14/1998	7:15 a.m.	Peoria	n/a	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines
6/14/1998	6:27 p.m.	Peoria	n/a	n/a	n/a	n/a	winds blew down a couple of trees, both of which fell onto several homes causing minor damage
6/18/1998	5:42 p.m.	Peoria	52 kts	n/a	n/a	n/a	- winds blew down numerous trees, tree limbs and power lines - some of the trees fell onto homes causing structural damage
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 10 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/29/1998	3:14 p.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	57 kts	n/a	n/a	n/a	*Event Description Provided Below*
- winds blew down or uprooted trees, tree limbs, power poles and power lines - many trees fell onto structures causing damage ranging from torn gutters to major roof and structural damage - vehicles sustained damage from fallen trees and numerous outbuildings and shed were either damage or destroyed							
11/10/1998	5:30 a.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	n/a	n/a	n/a	n/a	winds downed power lines and tree limbs and blew over trees *rain could not be documented with this event*
6/1/1999	6:00 p.m.	Peoria	n/a	n/a	n/a	n/a	- a large tree was blown over onto a house causing minor damage - several power lines were blown down
6/4/1999	3:09 p.m.	Peoria	n/a	n/a	n/a	n/a	- numerous trees and tree limbs were blown down - some caused minor damage to a few homes, mainly to porches and roofs
7/23/1999	6:30 p.m.	Peoria	n/a	n/a	n/a	n/a	- winds blew down numerous trees - one tree crushed a fence - another tree broke a street light - several power lines were knocked down by fallen trees
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 11 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
5/18/2000	4:26 p.m.	Peoria Peoria Heights	n/a	n/a	n/a	n/a	numerous large tree limbs were blown down
6/23/2000	3:50 p.m.	Peoria Heights	n/a	n/a	n/a	n/a	several 18-inch diameter trees were blown down
6/23/2000	4:25 p.m.	Peoria	n/a	n/a	n/a	n/a	many trees were damaged by winds throughout the City
5/22/2001	12:38 p.m.	Peoria	52 kts	n/a	n/a	n/a	shingles were blown off the roof of a restaurant
6/14/2001	5:45 p.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	51 kts	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down *Peoria* - the top 40 feet of a 120-foot communications tower was blown down - the section of tower caused roof damage to the building it was next to before landing on the road below
8/9/2001	7:00 p.m.	Bartonville Peoria Peoria Heights Chillicothe	52 kts	n/a	n/a	n/a	several tree limbs and power lines were blown down
8/22/2001	5:45 p.m.	Peoria	55 kts	n/a	n/a	n/a	trees and power lines were blown down
8/30/2001	7:20 p.m.	Peoria	50 kts	n/a	n/a	n/a	an 8 to 9 inch diameter branch was blown down blocking an alley
7/26/2002	4:05 p.m.	Peoria	50 kts	n/a	n/a	n/a	- winds blew over a small metal shed - several large tree limbs were blown down
2/11/2003	6:15 p.m.	Peoria	50 kts	n/a	n/a	n/a	several trees and large power poles were blown down on the west and south sides of the City
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 12 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
5/9/2003	10:05 p.m.	Peoria Airport Peoria Bartonville	57 kts	n/a	n/a	n/a	
6/25/2003	6:00 p.m.	Hanna City Bartonville Peoria Peoria Heights	61 kts	n/a	n/a	n/a	winds blew down numerous trees, tree limbs and power lines *Peoria* several unoccupied cars were destroyed due to fallen trees
6/28/2003	3:04 p.m.	Peoria	52 kts	n/a	n/a	n/a	
7/8/2003	2:20 p.m.	Peoria	65 kts	n/a	n/a	n/a	numerous trees, tree limbs and power lines were blown down
7/21/2003	12:30 a.m.	Bartonville Peoria Chillicothe	60 kts	n/a	n/a	n/a	- winds caused damage to trees and power lines - some of the fallen trees landed on a couple of homes causing minor roof damage
11/12/2003	3:00 p.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	n/a	n/a	n/a	n/a	winds downed numerous power lines, power poles, trees and tree limbs *rain could not be documented with this event*
3/5/2004	9:10 a.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	50 kts	n/a	n/a	n/a	winds downed trees, tree limbs, power lines, power poles and signs, some of which caused minor structural damage *rain could not be documented with this event*
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 13 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
5/18/2004	3:50 p.m.	Peoria	60 kts	n/a	n/a	n/a	numerous trees and power lines were blown down throughout the City
5/30/2004	8:39 a.m.	Chillicothe	55 kts	n/a	n/a	n/a	- winds blew an aluminum shed and a plastic storage shed into a nearby field - numerous tree limbs were blown down
5/30/2004	4:30 p.m.	Peoria	52 kts	n/a	n/a	n/a	
7/11/2004	3:11 p.m.	Peoria	52 kts	n/a	n/a	n/a	several trees and power lines were blown down
5/19/2005	5:00 p.m.	Peoria	55 kts	n/a	n/a	n/a	numerous trees and power lines were blown down
6/8/2005	2:00 p.m.	Peoria	50 kts	1	0	n/a	- a roofer was blown off a roof and injured - a large tree limb was blown down onto a van
7/26/2005	3:25 p.m.	Peoria	50 kts	n/a	n/a	n/a	numerous large tree branches were blown down
9/19/2005	2:20 p.m.	Peoria	50 kts	n/a	n/a	n/a	several large tree limbs were blown down on the Bradley University campus
4/13/2006	9:40 p.m.	Peoria	52 kts	n/a	n/a	n/a	- a billboard was blown down - wind blew down numerous trees and power lines
4/13/2006	10:13 p.m.	Peoria	60 kts	n/a	n/a	n/a	numerous trees, power poles and power lines were blown down
4/16/2006	2:09 p.m.	Peoria	50 kts	n/a	n/a	n/a	numerous tree limbs, 2 to 4 inches in diameter, were blown down
5/17/2006	4:41 p.m.	Peoria	50 kts	n/a	n/a	n/a	a tree was blown down
5/24/2006	2:30 p.m.	Hanna City	50 kts	n/a	n/a	n/a	numerous large tree limbs were blown down
7/19/2006	2:45 p.m.	Chillicothe Peoria Heights Peoria	56 kts	n/a	n/a	n/a	numerous trees and tree limbs were blown down
Subtotal:				**1**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 14 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/21/2007	8:55 p.m.	Peoria	50 kts	n/a	n/a	n/a	a 12-inch diameter tree was blown down as well as a few other smaller trees
6/13/2008	1:20 a.m.	Peoria Heights	50 kts	n/a	n/a	$15,000	numerous tree limbs were blown down
6/15/2008	2:08 p.m.	Peoria	52 kts	n/a	n/a	$2,000	a large tree was uprooted near the intersection of US Rte. 150 and IL Rte. 6
6/15/2008	2:15 p.m.	Bartonville	61 kts	n/a	n/a	$20,000	- several trees and power lines were blown down
7/21/2008	4:30 a.m.	Peoria	52 kts	n/a	n/a	$2,000	an 18-inch diameter tree limb was blown down at Bradley University
7/21/2008	5:55 a.m.	Peoria Heights Chillicothe	52 kts	n/a	n/a	$45,000	*Peoria Heights* - numerous trees and tree branches were blown down *Chillicothe* - a tree was blown over onto a house and 2 cars - numerous tree limbs were downed throughout the City
7/29/2008	5:20 p.m.	Peoria	52 kts	n/a	n/a	n/a	winds split a 10-inch diameter tree
8/5/2008	3:48 a.m.	Peoria	61 kts	n/a	n/a	$25,000	numerous trees were blown down around the City
8/5/2008	3:50 a.m.	Peoria Heights	61 kts	n/a	n/a	$2,000	winds split a 36-inch diameter tree
8/5/2008	3:55 a.m.	Bartonville	61 kts	n/a	n/a	$1,000	an aluminum flag pole was snapped
9/12/2008	9:40 p.m.	Peoria	52 kts	n/a	n/a	$5,000	a tree was blown down onto a house
3/8/2009	12:50 p.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	50 kts	n/a	n/a	n/a	*rain could not be documented with this event*
Subtotal:				**0**	**0**	**$117,000**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 15 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
3/8/2009	1:20 p.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	52 kts	n/a	n/a	$25,000	*Peoria* - numerous power lines were knocked down - a transformer was blown *rain could not be documented with this event*
3/24/2009	3:30 p.m.	Hanna City Bartonville Peoria Peoria Heights Chillicothe	52 kts	n/a	n/a	$4,000	*rain could not be documented with this event*
6/18/2009	3:50 a.m.	Peoria	61 kts	n/a	n/a	$15,000	large tree branches were blown down
6/18/2009	3:52 a.m.	Peoria	61 kts	n/a	n/a	$100,000	- multiple power outages were reported - winds snapped a 14-inch tree at US Rte. 150 & IL Rte. 6 - numerous other trees were blown down
6/19/2008	9:13 a.m.	Peoria	52 kts	n/a	n/a	n/a	several tree limbs were blown down
6/19/2009	2:40 p.m.	Chillicothe	52 kts	n/a	n/a	$10,000	numerous large tree branches were blown down
7/24/2009	9:20 p.m.	Peoria	52 kts	n/a	n/a	$5,000	winds blew down 8-inch diameter tree branches US Rte. 150 & IL Rte. 29
7/24/2009	9:30 p.m.	Peoria	52 kts	n/a	n/a	$25,000	several 6-inch diameter tree branches were blown down
8/19/2009	2:19 p.m.	Peoria	52 kts	n/a	n/a	$2,000	winds blew down a 9-inch diameter tree onto Grandview Drive
Subtotal:				**0**	**0**	**$186,000**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 16 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/12/2010	1:00 p.m.	Chillicothe	52 kts	n/a	n/a	$10,000	winds blew down power lines
6/12/2010	1:02 p.m.	Peoria Airport Bartonville Peoria	52 kts	n/a	n/a	$75,000	*Peoria Airport area* - numerous tree limbs and power lines were blown down - siding and shingles were stripped off several houses east of the Airport
6/18/2010	8:25 p.m.	Hanna City Peoria	52 kts	n/a	n/a	$15,000	numerous tree limbs were blown down
6/23/2010	5:40 p.m.	Peoria	52 kts	n/a	n/a	$65,000	- a fire truck was struck by a falling tree - numerous large tree branches were blown down
7/28/2010	4:20 p.m.	Peoria Heights	52 kts	n/a	n/a	$30,000	several 5-inch diameter tree branches were blown down
5/25/2011	4:52 p.m.	Peoria	52 kts	n/a	n/a	n/a	numerous trees and power lines were blown down
5/25/2011	4:55 p.m.	Peoria	52 kts	n/a	n/a	n/a	winds blew down a 10-inch diameter tree across a road
5/29/2011	10:55 a.m.	Peoria	52 kts	n/a	n/a	$60,000	numerous tree limbs were blown onto power lines throughout the City
8/8/2011	5:15 p.m.	Peoria	56 kts	n/a	n/a	$75,000	numerous trees were damaged and power lines were blown down
6/16/2012	7:00 p.m.	Peoria	52 kts	n/a	n/a	n/a	several power lines were blown down
5/20/2013	6:55 p.m.	Peoria	52 kts	n/a	n/a	$9,000	- winds blew an 18-inch diameter tree onto a house - several 8-inch diameter tree branches were broken off and landed on a roof
Subtotal:				**0**	**0**	**$339,000**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 17 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/23/2013	3:15 p.m.	Peoria	52 kts	n/a	n/a	$3,000	- a 12-inch diameter tree limb was blown down onto the road, blocking traffic on Glenwood & Columbia Terrace - winds snapped off an 18-inch diameter trees about 15 feet above the ground near the intersection of University & Gale
6/23/2013	3:20 p.m.	Peoria	52 kts	n/a	n/a	$4,000	- a 3-foot diameter tree was blown down in Laura Bradley Park - a 2-foot diameter tree was snapped at the base on West Ayers Avenue - a 10-inch diameter tree was blown down onto the 700 block of West Main Street
6/24/2013	3:56 p.m.	Peoria	52 kts	n/a	n/a	$1,000	winds blew down a six to eight-inch diameter tree limb onto Grand Boulevard north of War Memorial Drive
6/24/2013	4:00 p.m.	Chillicothe	52 kts	n/a	n/a	$20,000	- a 70-foot tall tree was blown down onto a car - numerous tree branches were knocked down
6/22/2014	4:45 p.m.	Peoria	52 kts	n/a	n/a	$20,000	several trees were snapped or uprooted in the Lynnhurst Subdivision
6/30/2014	8:32 p.m.	Peoria	52 kts	n/a	n/a	$5,000	wind blew down 4 eight to ten-inch diameter trees
9/9/2014	2:48 a.m.	Chillicothe	61 kts	n/a	n/a	n/a	several trees were blown down, including one that damaged a car and part of a house
4/9/2015	6:40 p.m.	Peoria	52 kts	n/a	n/a	n/a	a plastic panel was blown down
Subtotal:				**0**	**0**	**$53,000**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 18 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/7/2015	3:00 p.m.	Peoria Peoria Heights	70 kts	n/a	n/a	$200,000	numerous trees and limbs were blown down *Peoria* several trees up to two feet in diameter were blown into power lines ½ mile north of US Rte. 150 & Knoxville Avenue
6/7/2015	3:02 p.m.	Peoria	70 kts	n/a	n/a	n/a	a tree was blown down near Lake & University
6/7/2015	3:27 p.m.	Peoria	70 kts	n/a	n/a	n/a	winds snapped off a 10 to 11-inch diameter tree
6/15/2015	6:35 p.m.	Peoria	52 kts	n/a	n/a	$7,000	wind blew a tree onto a shed
6/20/2015	8:25 p.m.	Peoria	52 kts	n/a	n/a	$3,000	tree limbs were blown onto power lines at IL Rte. 40 and US Rte. 150 and at IL Rte. 40 and Glenn Avenue
11/11/2015	7:40 p.m.	Bartonville	52 kts	n/a	n/a	$4,000	- winds blew down a 2-foot diameter tree - power outages were reported
11/11/2015	7:35 p.m.	Peoria Peoria Heights	52 kts	n/a	n/a	n/a	*Peoria Heights* gutters were blown off the south side of a house
3/15/2016	7:15 p.m.	Peoria Heights	61 kts	n/a	n/a	$80,000	several trees and power lines were blown down
7/13/2016	3:45 p.m.	Peoria	61 kts	n/a	n/a	$50,000	numerous tree limbs were blown down
8/24/2016	11:20 p.m.	Peoria Airport Bartonville Peoria	52 kts	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$344,000**	

Participating Peoria County Municipalities Only

Figure 37
(Sheet 19 of 19)
Severe Storms – Thunderstorms with Damaging Winds
1953 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/14/2017	2:38 p.m.	Peoria Heights	52 kts	n/a	n/a	n/a	a large tree was snapped off at the base on Grandview Drive
6/14/2017	2:43 p.m.	Peoria Peoria Heights Chillicothe	52 kts	n/a	n/a	$90,000	*Peoria* numerous 10-inch diameter tree limbs were blown down on Westport Road *Peoria Heights* numerous tree limbs and power lines were blown down *Chillicothe* an 8-inch diameter tree branch was blown down
6/17/2017	7:22 p.m.	Peoria Heights	70 kts	n/a	n/a	n/a	numerous trees were blown down
6/19/2017	5:28 p.m.	Bartonville	61 kts	n/a	n/a	$60,000	numerous large trees and power lines were blown down
7/10/2017	5:00 a.m.	Peoria	52 kts	n/a	n/a	n/a	a few 6 to 8-inch diameter tree branches were blown down
10/14/2017	6:12 p.m.	Chillicothe	61 kts	n/a	n/a	n/a	a 12-inch diameter tree branch was blown down
Subtotal:				**0**	**0**	**$150,000**	

GRAND TOTAL:		**11**	**0**	**$5,205,900**

Sources: Peoria Emergency Services and Disaster Agency, City of Peoria Hazard Vulnerability Analysis.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Participating Peoria County Municipalities Only

Figure 38
(Sheet 1 of 4)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Description
6/4/1960	7:00 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
8/14/1971	2:50 p.m.	Hanna City	1.75 in.	n/a	n/a	n/a	
6/14/1974	6:10 p.m.	Peoria Airport Peoria Bartonville	1.00 in.	n/a	n/a	n/a	
7/10/1974	10:15 p.m.	Chillicothe	1.75 in.	n/a	n/a	n/a	
5/5/1977	6:03 p.m.	Peoria Airport Peoria Bartonville	1.50 in.	n/a	n/a	n/a	
6/2/1980	8:55 a.m.	Peoria	2.75 in.	n/a	n/a	n/a	
4/10/1981	11:06 a.m.	Peoria	1.75 in.	n/a	n/a	n/a	
4/10/1981	2:09 p.m.	Peoria Airport Bartonville	2.75 in.	n/a	n/a	n/a	hail lasted 14 minutes and damaged many parked cars
5/26/1982	4:23 p.m.	Chillicothe	1.00 in.	n/a	n/a	n/a	
11/1/1982	12:05 p.m.	Peoria	1.75 in.	n/a	n/a	n/a	
7/2/1985	6:30 p.m.	Peoria	1.75 in.	n/a	n/a	n/a	many vehicles were dented in the northeast part of the City at Galena Rd.
8/29/1990	12:22 a.m.	Peoria	1.75 in.	n/a	n/a	n/a	
8/24/1997	2:10 p.m.	Peoria	1.75 in.	n/a	n/a	n/a	
4/7/1998	2:41 p.m.	Hanna City	1.25 in.	n/a	n/a	n/a	
8/4/1998	4:34 p.m.	Peoria Peoria Heights	1.00 in.	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 38 (Sheet 2 of 4) Severe Storms – Hail Events 1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Description
4/20/2000	5:06 a.m.	Bartonville	1.00 in.	n/a	n/a	n/a	
6/23/2000	3:30 p.m.	Peoria	1.75 in.	n/a	n/a	n/a	
6/4/2002	4:09 p.m.	Bartonville	2.00 in.	n/a	n/a	n/a	
7/26/2002	3:45 a.m.	Peoria	2.00 in.	n/a	n/a	n/a	
7/8/2003	2:25 p.m.	Hanna City	1.50 in.	n/a	n/a	n/a	
7/17/2003	10:45 a.m.	Peoria	1.00 in.	n/a	n/a	n/a	
3/30/2005	2:29 p.m.	Peoria Airport Bartonville	1.00 in.	n/a	n/a	n/a	
3/30/2005	2:36 p.m.	Bartonville	1.00 in.	n/a	n/a	n/a	
3/30/2005	2:45 p.m.	Bartonville	1.50 in.	n/a	n/a	n/a	
9/19/2005	2:45 p.m.	Bartonville	1.00 in.	n/a	n/a	n/a	
4/13/2006	10:13 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
4/13/2006	10:55 p.m.	Chillicothe	2.00 in.	n/a	n/a	n/a	
4/13/2006	11:20 p.m.	Chillicothe	1.75 in.	n/a	n/a	n/a	
5/24/2006	2:52 p.m.	Peoria	1.25 in.	n/a	n/a	n/a	
5/13/2008	4:45 p.m.	Peoria Airport Bartonville Peoria Peoria Heights	1.00 in.	n/a	n/a	n/a	
3/8/2009	5:48 a.m.	Bartonville	1.00 in.	n/a	n/a	n/a	
6/1/2009	5:05 p.m.	Chillicothe	1.00 in.	n/a	n/a	n/a	
6/1/2009	5:10 p.m.	Chillicothe	1.25 in.	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$0**	

Participating Peoria County Municipalities Only

Figure 38
(Sheet 3 of 4)
Severe Storms – Hail Events
1960 – 2017

Date(s)	Start Time	Location(s)	Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Description
6/19/2009	9:08 a.m.	Peoria	1.00 in.	n/a	n/a	n/a	
6/19/2009	1:56 p.m.	Peoria Airport Bartonville	1.75 in.	n/a	n/a	n/a	
6/19/2009	2:07 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
5/22/2011	5:16 p.m.	Hanna City	1.00 in.	n/a	n/a	n/a	
8/13/2011	1:03 p.m.	Bartonville	1.00 in.	n/a	n/a	n/a	
6/23/2013	2:45 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
4/3/2014	1:46 a.m.	Peoria	1.00 in.	n/a	n/a	n/a	
4/8/2015	3:22 a.m.	Hanna City	1.00 in.	n/a	n/a	n/a	
4/9/2015	12:22 p.m.	Peoria	1.25 in.	n/a	n/a	n/a	
3/15/2016	6:58 p.m.	Hanna City	1.00 in.	n/a	n/a	n/a	
3/15/2016	7:00 p.m.	Peoria	1.50 in.	n/a	n/a	n/a	
3/15/2016	7:05 p.m.	Peoria	1.75 in.	n/a	n/a	n/a	
3/15/2016	7:07 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
11/2/2016	3:05 p.m.	Hanna City	1.25 in.	n/a	n/a	$500,000	numerous vehicles sustained hail damage
11/2/2016	3:19 p.m.	Peoria Airport Bartonville	1.00 in.	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$500,000**	

Participating Peoria County Municipalities Only

Figure 38 (Sheet 4 of 4) Severe Storms – Hail Events 1960 – 2017							
Date(s)	**Start Time**	**Location(s)**	**Magnitude (Diameter)**	**Injuries**	**Fatalities**	**Property Damage**	**Description**
2/28/2017	5:15 p.m.	Chillicothe	1.00 in.	n/a	n/a	n/a	
4/10/2017	2:25 p.m.	Hanna City	2.50 in.	n/a	n/a	$900,000	a MAC member from Hanna City identified $900,000 in damages sustained by roofs and cars within the Village
4/10/2017	2:30 p.m.	Peoria Airport Bartonville	1.50 in.	n/a	n/a	n/a	
4/10/2017	2:39 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
5/17/2017	11:38 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
5/17/2017	11:45 p.m.	Peoria	1.00 in.	n/a	n/a	n/a	
Subtotal:				**0**	**0**	**$900,000**	
GRAND TOTAL:				**0**	**0**	**$1,400,000**	

Sources: Peoria Emergency Services and Disaster Agency, City of Peoria Hazard Vulnerability Analysis.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Tri-County Mitigation Action Committee member responses to the Natural Hazard Events Questionnaire.

Participating Peoria County Municipalities Only

Figure 39
(Sheet 1 of 2)
Severe Storms – Lightning Events
1955 – 2017

Date(s)	Start Time	Location(s)	Injuries	Fatalities	Property Damage	Description
9/14/1955	n/a	Peoria	1	0	$10,700	- lightning caused 21 separate fires, mostly to homes and the Spaulding Institute - most of the City was without power - 350 telephones were out
6/4/1960	n/a	Peoria	n/a	n/a	$7,000	lightning set fire to an apartment house roof
8/18/1960	n/a	Peoria	n/a	n/a	n/a	lightning struck two homes and utility lines, leaving the City without power for 3 hours
7/18/1967	n/a	Peoria	1	0	$100,000	lightning started fires destroying 3 buildings and threatening Allied Chemical
5/4/1977	n/a	Peoria	n/a	n/a	n/a	lightning hit the roof of the Children's Home creating a 2-foot hole
9/19/1986	n/a	Peoria	n/a	n/a	n/a	lightning started a house fire
7/7/2008	4:05 a.m.	Peoria	0	0	$15,000	lightning struck an apartment complex near Bradley University setting fire to a third-floor apartment ceiling, the attic and roof
8/13/2008	6:23 p.m.	Peoria	0	0	$45,000	lightning struck two houses in the same neighborhood setting both on fire - one house had minor damage to the roof and siding - the other house lost its entire roof
Subtotal:			**2**	**0**	**$177,700**	

Participating Peoria County Municipalities Only

Figure 39
(Sheet 2 of 2)
Severe Storms – Lightning Events
1955 – 2017

Date(s)	Start Time	Location(s)	Injuries	Fatalities	Property Damage	Description
6/20/2011	4:30 a.m.	Peoria	0	0	$10,000	lightning struck a two-story house starting a fire on the upper floor
8/18/2015	4:30 p.m.	Bartonville	n/a	n/a	$10,000	a lightning strike caused a mobile home to catch fire
5/26/2017	1:15 p.m.	Chillicothe	2	0	n/a	lightning struck an outdoor music festival injuring two people
Subtotal:			**2**	**0**	**$20,000**	
GRAND TOTAL:			**4**	**0**	**$197,700**	

Sources: Peoria Emergency Services and Disaster Agency, City of Peoria Hazard Vulnerability Analysis.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

3.2 SEVERE WINTER STORMS & EXTREME COLD

HAZARD IDENTIFICATION

What is the definition of a severe winter storm?

A severe winter storm can range from moderate snow over a few hours to significant accumulations of sleet and/or ice to blizzard conditions with blinding, wind-driven snow that last several days. The amount of snow or ice, air temperature, wind speed and event duration all influence the severity and type of severe winter storm that results. In general, there are three types of severe winter storms: blizzards, heavy snow storms and ice storms. The following provides a brief description of each type as defined by the National Weather Service (NWS).

- **Blizzards.** Blizzards are characterized by strong winds of at least 35 miles per hour and are accompanied by considerable falling and/or blowing snow that reduces visibility to ¼ mile or less. Blizzards are the most dangerous of all winter storms.
- **Heavy Snow Storms.** Heavy snow storms are generally defined as producing snowfall accumulations of four inches or more in 12 hours or less or six inches or more in 24 hours or less.
- **Ice Storms.** An ice storm occurs when substantial accumulations of ice, generally ¼ inch or more, build up on the ground, trees and utility lines as a result of freezing rain.

While extreme cold (i.e., dangerously low temperatures and wind chill values) often accompanies or is left in the wake of a severe winter storm, the NWS does not use it to define a severe winter storm. However, a discussion of extreme cold is included in this section since it has the ability to cause property damage, injuries and even fatalities (whether or not it is accompanied by freezing rain, ice or snow).

What is snow?

Snow is precipitation in the form of ice crystals. These ice crystals are formed directly from the freezing of water vapor in wintertime clouds. As the ice crystals fall toward the ground, they cling to each other creating snowflakes. Snow will only fall if the temperature remains at or below 32°F from the cloud base to the ground.

What is sleet?

Sleet is precipitation in the form of ice pellets. These ice pellets are composed of frozen or partially frozen rain drops or refrozen partially melted snowflakes. Sleet typically forms in winter storms when snowflakes partially melt while falling through a thin layer of warm air. The partially melted snowflakes then refreeze and form ice pellets as they fall through the colder air mass closer to the ground. Sleet usually bounces after hitting the ground or other hard surfaces and does not stick to objects.

What is freezing rain?

Freezing rain is precipitation that falls in the form of a liquid (i.e., rain drops), but freezes into a glaze of ice upon contact with the ground or other hard surfaces. This occurs when snowflakes descend into a warmer layer of air and melt completely. When the rain drops that result from this melting fall through another thin layer of freezing air just above the surface they become "supercooled", but they do not have time to refreeze before reaching the ground. However, because the rain drops are "supercooled", they instantly refreeze upon contact with anything that is at or below 32°F (i.e., the ground, trees, utility lines, etc.).

What is wind chill?

Wind chill, or wind chill factor, is a measure of the rate of heat loss from exposed skin resulting from the combined effects of wind and temperature. As the wind increases, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature.

The unit of measurement used to describe the wind chill factor is known as the wind chill temperature. The wind chill temperature is calculated using a formula. **Figure 47** identifies the formula and calculates the wind chill temperatures for certain air temperatures and wind speeds.

Figure 47
Wind Chill Chart

Temperature (°F)

Wind (mph) / Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T = Air Temperature (°F) V = Wind Speed (mph)

Effective 11/01/01

Source: NOAA, National Weather Service.

As an example, if the air temperature is 5°F and the wind speed is 20 miles per hour, then the wind chill temperature would be -15°F. The wind chill temperature is only defined for air temperatures at or below 50°F and wind speeds above three miles per hour. In addition, the wind chill temperature does not take into consideration the effects of bright sunlight which may increase the wind chill temperature by 10°F to 18°F.

Use of the current Wind Chill Temperature (WCT) index was implemented by the NWS on November 1, 2001. The new WCT index was designed to more accurately calculate how cold air feels on human skin. The new index uses advances in science, technology and computer modeling to provide an accurate, understandable and useful formula for calculating the dangers from winter winds and freezing temperatures. The former index was based on research done in 1945 by Antarctic researchers Siple and Passel.

Exposure to extreme wind chills can be life threatening. As wind chills edge toward -19°F and below, there is an increased likelihood that exposure will lead to individuals developing cold-related illnesses.

What cold-related illnesses are associated with severe winter storms?

Frostbite and hypothermia are both cold-related illnesses that can result when individuals are exposed to dangerously low temperatures and wind chills that can accompany severe winter storms. The following provides a brief description of the symptoms associated with each.

- **Frostbite.** During exposure to extremely cold weather the body reduces circulation to the extremities (i.e., feet, hands, nose, cheeks, ears, etc.) in order to maintain its core temperature. If the extremities are exposed, then this reduction in circulation coupled with the cold temperatures can cause the tissue to freeze.

  Frostbite is characterized by a loss of feeling and a white or pale appearance. At a wind chill of -19°F, exposed skin can freeze in as little as 30 minutes. Seek medical attention immediately if frostbite is suspected. It can permanently damage tissue and in severe cases can lead to amputation.

- **Hypothermia.** Hypothermia occurs when the body's temperature begins to fall because it is losing heat faster than it can produce it. If an individual's body temperature falls below 95°F, then hypothermia has set in and immediate medical attention should be sought.

  Hypothermia is characterized by uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and exhaustion. Left untreated, hypothermia will lead to death. Hypothermia occurs most commonly at very cold temperatures, but can occur at cool temperatures (above 40°F) if an individual isn't properly clothed or becomes chilled.

Are alerts issued for severe winter storms?

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***winter storm watches*** and ***warning***s for Peoria, Tazewell and Woodford Counties depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** The following watches are issued when an event is likely to occur within the next 12 to 48 hours.
  - **Winter Storm Watch**. A winter storm watch is issued when conditions are favorable for the development of a hazardous winter weather event which has the potential to threaten life or property.

- **Blizzard Watch**. A blizzard watch is issued when conditions are favorable for the development of blizzard conditions:
  - sustained winds or frequent gust of 35 mph or higher and
  - reduced visibility of ¼ mile or less.

- **Advisories.** Winter advisories are issued for winter weather events that will cause significant inconvenience especially to motorist, but should not be life-threatening if caution is exercised. The following advisories will be issued when an event is occurring, is imminent or has a high probability of occurring.
  - **Freezing Rain Advisory.** A freezing rain advisory is issued when ice accumulations of less than ¼ inches are expected to inconvenience pedestrian and motorists within the next 24 hours.
  - **Winter Weather Advisory.** A winter weather advisory is issued for one or more of the following:
    - snow accumulations of 3.0 to 5.0 inches in 12 hours or less;
    - sleet accumulations up to ¼ inches;
    - blowing and/or drifting snow; or
    - freezing rain in combination with sleet and/or snow.
  - **Wind Chill Advisory.** A wind chill advisory is issued when the wind chill values are expected to reach -15°F and -24°F.

- **Warnings.** The following winter weather warnings are issued when severe winter weather conditions are imminent. Individuals are advised to avoid travel and stay indoors.
  - **Blizzard Warning.** A blizzard warning is issued when sustained winds or frequent gusts greater than or equal to 35 mph accompanied by falling and/or blowing, frequently reducing visibility to less than ¼ mile for three hours or more.
  - **Ice Storm Warning.** An ice storm warning is issued when freezing rain is expected to produce ice accumulations of ¼ inch or greater, or cause significant disruptions to travel or utilities.
  - **Winter Storm Warning.** A winter storm warning is issued when there is one or more of the following present:
    - heavy snow accumulations of 6.0 inches or greater in 12 hours, or a prolonged snowfall of 8.0 inches or greater in 24 hours; or
    - heavy sleet accumulations of ½ inch or greater.
  - **Wind Chill Warning.** A wind chill warning is issued when wind chill values are expected to be -25°F or below.

3.2.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of severe winter storms and extreme cold; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe winter storms and extreme cold occurred previously? What is the extent of these previous severe winter storms and extreme cold events?

Figures 48 and **49**, located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) and extreme cold events recorded in Tazewell County.

> **Severe Winter Storm Fast Facts – Occurrences**
>
> Number of Severe Winter Storm Events Reported (1950 – 2017): ***112***
>
> Number of Extreme Cold Events Reported (1996 – 2017): ***7***
>
> Maximum 24-Hour Snow Accumulation: ***16.0 inches (January 1 & 2, 1999 at Morton)***
>
> Most Likely Month for Severe Winter Storms to Occur: ***January***
>
> Most Likely Time for Severe Winter Storms to Occur: ***Early Morning***
>
> Most Likely Month for Extreme Cold Events to Occur: ***January***

Severe Winter Storms

NOAA's Storm Events Database, NWS's COOP Data and MAC member records were used to document 112 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in Tazewell County between 1950 and 2017. Of the 112 recorded occurrences there were:

- ❖ 85 heavy snow storms or blizzards;
- ❖ 17 combination events (freezing rain, sleet, ice and/or snow); and
- ❖ 10 ice storms.

Figure 50 charts the reported occurrences of severe winter storms by month. Of the 112 events, 84 (75%) took place in December, January and February. Of these 84 events, 35 (42%) occurred during January, making this the peak month for severe winter storms. There were three events that spanned two months; however, for illustration purposes only the month when the event started is graphed.

Figure 51 charts the reported occurrences of severe winter storms by hour. Of the 112 occurrences, start times were unavailable for four events. Of the remaining 108 severe winter storm events with recorded times, 66% began during the a.m. hours, with 39 (36%) beginning between 3 a.m. and 9 a.m.

According to the NWS's COOP Data logs, the maximum 24-hour snow accumulation total recorded in Tazewell County is 16.0 inches, which occurred on January 1 and 2, 1999 at Morton.

Figure 50
Graph: Severe Winter Storms by Month Tazewell County: 1950 – 2017

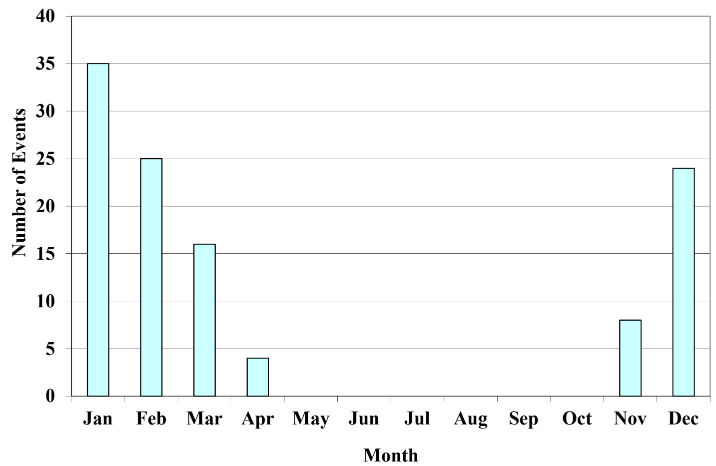
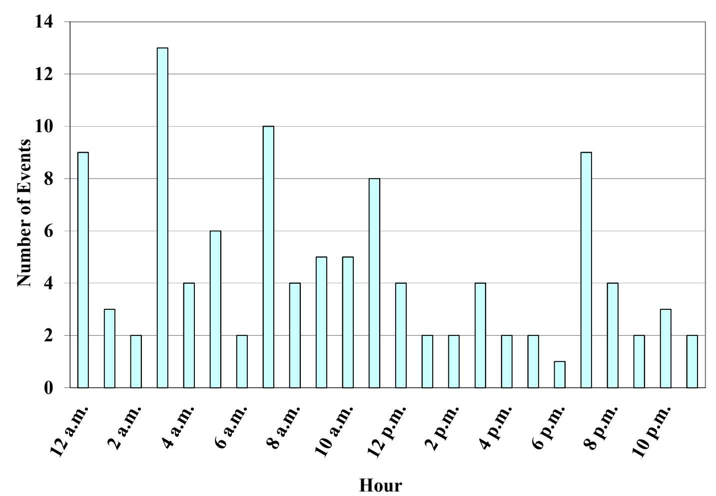


Figure 51
Graph: Severe Winter Storms by Hour Tazewell County: 1950 – 2017



<u>*Extreme Cold Events*</u>

While extreme cold events occur on a fairly regular basis across central Illinois, NOAA's Storm Events Database has only seven recorded occurrences of extreme cold (dangerously low temperatures and wind chill values) in Tazewell County between 1996 and 2017. These represent the ***reported occurrences*** of extreme cold. The NWS acknowledges that extreme cold events are not well recorded. Only those events with impacts are reported. As a result, extreme cold events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Six of the seven events (86%) took place in January, making this the peak month for extreme cold events. The remaining event took place in February. Approximately 83% of all the extreme cold events with recorded times began during the a.m. hours.

According to the Midwestern Regional Climate Center station information and confirmed by staff at the NWS Weather Forecast Office in Lincoln, temperature records either were not kept or are not available from any of the weather recording stations or networks in Tazewell County, with the exception of the COOP Observation Station east of South Pekin. Temperature data was recorded at this station from December, 2003 through July, 2005. During this period, ***the coldest temperature recorded at the South Pekin location was -11°F***.

What locations are affected by severe winter storms and extreme cold?

Severe winter storms and extreme cold events affect the entire County. All communities in Tazewell County have been affected by severe winter storms and extreme cold events. Severe winter storms and extreme cold events generally extend across the entire County and affect multiple locations. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Tazewell County's hazard rating for severe winter storms as "high."

Do any of the participating municipalities have designated warming centers?

Yes. Two of the five participating municipalities have designated warming centers. A "designated" warming center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during extreme cold events. **Figure 52** identifies the location of each warming center by jurisdiction. At this time Morton, Tremont and Washington do not have any warming centers designated within their municipalities.

Figure 52
Designated Warming Centers by Participating Municipality – Tazewell County

Name/Address	Name/Address
East Peoria	*Pekin*
Festival of Lights Building, 2200 E. Washington St.	City Hall, 111 N. Capitol St.

In addition to those designated warming centers identified by the participating municipalities, the Illinois Department of Human Services offices located in Pekin also serve as warming centers.

What is the probability of future severe winter storms occurring?

Severe Winter Storms

Tazewell County has had 112 verified occurrences of severe winter storms between 1950 and 2017. With 112 occurrences over the past 68 years, Tazewell County should expect at least one severe winter storm each year. There were 35 years over the past 68 years where two or more severe winter storms occurred. This indicates the probability that more than one severe winter storm may occur during any given year within the County is 51%.

Extreme Cold Events

Given the limited amount of data available for extreme cold events, it is difficult to establish a precise probability; however, Tazewell County should expect to experience additional extreme cold events in the future.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe winter storms and extreme cold.

Are the participating jurisdictions vulnerable to severe winter storms and extreme cold?

Yes. All of Tazewell County, including the participating municipalities, is vulnerable to the dangers presented by severe winter storms and extreme cold. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2008, Tazewell County has experienced 23 severe winter storms and four extreme cold events.

Severe winter storms have immobilized portions of the County, blocking roads; downing power lines, trees and branches; causing power outages and property damage; and contributing to vehicle accidents. In addition, the County and municipalities must budget for snow removal and de-icing of roads and bridges as well as for roadway repairs.

What impacts resulted from the recorded severe winter storms and extreme cold?

The following summarize the impacts of severe winter storms and extreme cold events recorded in Tazewell County.

Severe Winter Storms

Data obtained from NOAA's Storm Events Database indicates that between 1950 and 2017, three of the 112 severe winter storms caused $1.85 million in property damages. Property damage information was either unavailable or none was recorded for the remaining 109 reported occurrences.

In comparison, the State of Illinois has averaged an estimated $102 million annually in property damage losses from severe winter storms since 1950, ranking severe winter storms second only to flooding in terms of economic loss. While behind floods in terms of the amount of property damage caused, severe winter storms have a greater ability to immobilize larger areas, with rural areas being particularly vulnerable.

Severe Winter Storms & Extreme Cold Events Fast Facts – Impacts/Risk

Severe Winter Storm (Snow & Ice) Impacts
- Total Property Damage: ***$1,850,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Injuries: ***3***
- Fatalities: ***3***

Extreme Cold Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Severe Winter Storm Risk/Vulnerability to:
- Public Health & Safety: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

NOAA's Storm Events Database documented three injuries and three fatalities as a result of four separate severe winter storms. Detailed information on the injuries and fatalities sustained were only available for three of the events. The following provides a brief description of each event.

- ❖ During the November 24, 2004 winter storm, an individual died as the result of a traffic accident.
- ❖ An individual was killed when they lost control of their vehicle and slid into an oncoming semi during the January 20, 2010 ice storm. An injury was reported as a result of this event but detailed information was unavailable.
- ❖ During the January 12, 2012 winter storm, a 62-year old man died of cardiac arrest at his home in Morton after shoveling snow.

Extreme Cold

Damage information was either unavailable or none was recorded for any of the seven reported extreme cold events between 1996 and 2017. No injuries or fatalities were reported as a result of any of the recorded extreme cold events either.

What other impacts can result from severe winter storms?

In Tazewell County, vehicle accidents are the largest risk to health and safety from severe winter storms. Hazardous driving conditions (i.e., reduced visibility, icy road conditions, strong winds, etc.) contribute to the increase in accidents that result in injuries and fatalities. A majority of all severe winter storm injuries result from vehicle accidents.

Traffic accident data assembled by the Illinois Department of Transportation from 2011 through 2015 indicates that treacherous road conditions caused by snow/slush and ice were present for 6.4% to 16.1% of all crashes recorded annually in the County. **Figure 53** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when treacherous road conditions caused by snow and ice were present.

Figure 53
Severe Winter Weather Crash Data – Tazewell County

Year	Total # of Crashes	Presence of Treacherous Road Conditions caused by Snow/slush and Ice		
		# of Crashes	# of Injuries	# of Fatalities
2011	2,507	169	45	0
2012	2,502	161	33	0
2013	2,559	232	58	1
2014	2,567	413	92	0
2015	2,499	253	58	0
Total:	**12,634**	**1,228**	**286**	**1**

Source: Illinois Department of Transportation.

Persons who are outdoors during and immediately following severe winter storms and extreme cold events can experience other health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries. Treacherous walking conditions also lead to falls which can result in serious injuries, including fractures and broken bones, especially in the elderly. Over-exertion from shoveling driveways and walks can lead to life-threatening conditions such as heart attacks in middle-aged and older adults who are susceptible.

What is the level of risk/vulnerability to public health and safety from severe winter storms and extreme cold?

While severe winter storms and extreme cold occur regularly in Tazewell County, the number of injuries and fatalities is relatively low. Taking into consideration the potential for hazardous driving conditions; snow-removal related injuries; and power outages that could leave individuals vulnerable to hypothermia, the risk to public health and safety from severe winter storms is seen as low to medium.

Are existing buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?

Yes. All existing buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are vulnerable to damage from severe winter storms and extreme cold. The following summarize the vulnerabilities by severe winter storms and extreme cold events.

Based on the frequency with which severe winter storms and extreme cold events have occurred in Tazewell County; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe winter storms is medium.

Winter Storm

Structural damage to buildings caused by severe winter storms (snow and ice) is very rare, but can occur particularly to flat rooftops. Information gathered from Tazewell County residents indicates that snow and ice accumulations on communication and power lines as well as key roads presents the greatest vulnerability to infrastructure and critical facilities within the County. Snow and ice accumulations on lines often lead to disruptions in communications and create power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service.

Tony O'Neal, Ameren Illinois Emergency Response Specialist – Illinois Crisis Management, served on the MAC and was able to provide the Committee with information on the impacts and damages sustained by Ameren as the result of severe winter storms from 2010 to 2017. This information, while regional in nature, helps quantify the damages sustained by critical infrastructure in the Tri-County area and is summarized in **Figure 54**.

In addition to affecting communication and power lines, snow and ice accumulations on state and local roads hampers travel and can cause dangerous driving conditions. Blowing and drifting snow can lead to road closures and increases the risk of automobile accidents. Even small accumulations of ice can be extremely dangerous to motorists since bridges and overpasses freeze before other surfaces.

Figure 54
Ameren Illinois – Regional Power Outages Experienced in Tazewell County as a Result of Severe Winter Storm Events: 2010 – 2017

Event Date	Event Type	Customers without Power	Duration of Outage	Wires Downed	Poles Replaced	Individual Service Lines Damaged	Tree Orders*	Responding Personnel
1/20/2010 thru 1/21/2010	Ice Storm	50,000	3 days	157	27	13	7	488
1/11/2011	Heavy Snow	110,000	5 days	33	20	9	23	n/a
2/1/2011 thru 2/2/2011	Blizzard	14,000	3 days	1,494	104	470	718	1,144
12/20/2012	Blizzard	78,000	2 days	826	150	191	499	1,803
2/17/2014	Winter Storm	48,827	1.5 days	433	31	151	184	3,252
12/28/2015	Ice Storm	192,000	3.5 day	1,087	446	882	939	1,526

* Tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed.

When transportation is disrupted, schools close, emergency and medical services are delayed, some businesses close and government services can be affected. When a severe winter storm hits there is also an increase in cost to the County and municipalities for snow removal and de-icing. Road resurfacing and pothole repairs are additional costs incurred each year as a result of severe winter storms.

<u>*Extreme Cold*</u>
Extreme cold events can also have a detrimental impact on buildings, infrastructure and critical facilities. Pipes and water mains are especially susceptible to freezing during extreme cold events. This freezing can lead to cracks or ruptures in the pipes in buildings as well as in buried service lines and mains. As a result, flooding can occur as well as disruptions in service. Since most buried service lines and water mains are located under local streets and roads, fixing a break requires portions of the street or road to be blocked off, excavated and eventually repaired. These activities can be costly and must be carried out under less than ideal working conditions.

Are future buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?

Yes and No. All of the participating jurisdictions have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe winter storms and extreme cold. However, infrastructure such as new communication and power lines will continue to be vulnerable to severe winter storms, especially to ice accumulations, as long as they are located above ground. Rural areas of Tazewell County have experienced extended periods without power due to severe winter storms. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas. In terms of new roads and bridges, there is very little that can be done to reduce or eliminate their vulnerability to severe winter storms.

What are the potential dollar losses to vulnerable structures from severe winter storms and extreme cold?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms and extreme cold events. With only three of the 119 recorded events listing property damage numbers for severe winter storms and extreme cold, there is no way to accurately estimate future potential dollar losses. Since all existing structures within Tazewell County are vulnerable to damage, it is likely that there will be future dollar losses from severe winter storms and extreme cold.

Tazewell County

Figure 48
(Sheet 1 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/8/1951	2:00 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
11/6/1951	6:00 a.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
3/3/1954	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/21/1959 thru 1/22/1959	n/a	Heavy Snow	10.2 in.					COOP	n/a	n/a	n/a	
2/20/1960 thru 2/21/1960	3:30 p.m.	Heavy Snow	5.6 in.					COOP	n/a	n/a	n/a	
3/15/1960 thru 3/16/1960	9:00 p.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
2/2/1961 thru 2/3/1961	3:30 p.m.	Heavy Snow	5.1 in.					COOP	n/a	n/a	n/a	
1/5/1962 thru 1/6/1962	11:00 a.m.	Winter Storm	5.0 in.		X	X		COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Tazewell County

Figure 48 (Sheet 2 of 16) Severe Winter Storm Events 1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/14/1962	10:30 a.m.	Heavy Snow	5.1 in.					COOP	n/a	n/a	n/a	
2/23/1963	9:00 a.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
1/12/1964	2:00 a.m.	Winter Storm	5.0 in.				X	COOP	n/a	n/a	n/a	drifting with some roads blocked
12/2/1964	11:00 a.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
2/23/1965 thru 2/24/1965	5:00 p.m.	Winter Storm	5.0 in.				X	COOP	n/a	n/a	n/a	highways slick; drifting blocked highways
3/3/1965 thru 3/4/1965	10:00 p.m.	Heavy Snow	6.2 in.					COOP	n/a	n/a	n/a	
3/23/1965	12:00 a.m.	Winter Storm	4.0 in.	X	X	X		COOP	n/a	n/a	n/a	highways slick
1/26/1967 thru 1/27/1967	3:00 a.m.	Winter Storm	12.0 in.			X	X	COOP	n/a	n/a	n/a	roads blocked
12/6/1969 thru 12/7/1969	8:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 3 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/8/1970 thru 2/9/1970	7:30 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
3/25/1970	8:30 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
1/3/1971	4:00 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
3/29/1972	12:00 a.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
12/18/1973 thru 12/19/1973	7:00 a.m.	Heavy Snow	11.5 in.					COOP	n/a	n/a	n/a	
11/13/1974	9:30 p.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
12/1/1974	1:00 a.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
12/18/1974	7:00 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
11/26/1975	8:00 a.m.	Heavy Snow	7.5 in.					COOP	n/a	n/a	n/a	blowing snow
1/13/1976	9:00 a.m.	Heavy Snow	5.5 in.					COOP	n/a	n/a	n/a	
11/27/1977	12:30 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
2/13/1978	3:00 a.m.	Heavy Snow	6.5 in.					COOP	n/a	n/a	n/a	drifting snow, roads closed
12/7/1978	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/1/1979	3:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/13/1979	12:30 a.m.	Heavy Snow	12.5 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Tazewell County

Figure 48
(Sheet 4 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
3/9/1979	5:00 a.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
4/14/1980	1:00 a.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
11/27/1980	3:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/6/1981	12:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/10/1981	12:00 a.m.	Winter Storm	9.0 in.	X				COOP	n/a	n/a	n/a	
12/16/1981	12:00 p.m.	Heavy Snow	5.6 in.					COOP	n/a	n/a	n/a	
12/27/1981 thru 12/28/1981	11:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/31/1982	4:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
3/3/1982 thru 3/4/1982	7:00 p.m.	Winter Storm	4.0 in.	X	X	X		COOP	n/a	n/a	n/a	
4/5/1982	10:00 a.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
4/8/1982	7:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
3/20/1983	3:00 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
12/21/1983	10:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/10/1985	6:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/6/1986	7:00 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Tazewell County

Figure 48
(Sheet 5 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/20/1986 thru 2/21/1986	7:30 p.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
2/23/1986	8:30 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/9/1987	9:30 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
1/19/1987	3:00 a.m.	Heavy Snow	10.0 in.					COOP	n/a	n/a	n/a	
12/14/1987 thru 12/15/1987	8:00 p.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
2/10/1988 thru 2/11/1988	9:00 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
2/5/1989	7:00 a.m.	Heavy Snow	6.5 in.					COOP	n/a	n/a	n/a	
1/13/1992	4:00 p.m.	Heavy Snow	5.5 in.					COOP	n/a	n/a	n/a	
1/15/1992	7:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/15/1993 thru 2/16/1993	7:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/25/1994	5:00 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Tazewell County

Figure 48
(Sheet 6 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/8/1995 thru 12/9/1995	7:00 a.m.	Winter Storm	1-5 in.				20-30 mph	SED	n/a	n/a	n/a	*Event Description Provided Below*
- considerable blowing & drifting snow, especially in open spaces; - brisk winds & temperatures near zero created wind chills as low as -45°F												
12/18/1995 thru 12/19/1995	7:00 p.m.	Heavy Snow	1-6 in.	X			20-30 mph	SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous accidents were reported; - numerous power lines knocked down due to freezing rain & strong winds; - considerable blowing & drifting of snow closed some roads												
1/4/1996	3:00 a.m.	Winter Storm	2-7 in.					SED	n/a	n/a	n/a	numerous minor accidents were reported across the area
1/18/1996 thru 1/19/1996	10:00 a.m.	Winter Storm	X		X		25-35 mph	SED	n/a	n/a	n/a	- numerous power outages & minor accidents - gusty winds created wind chills near -40°F
1/15/1997 thru 1/17/1997	3:00 a.m.	Winter Storm	2.5 in.				20-30 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- after the snow stopped the winds picked up causing near whiteout conditions; - strong winds & cold temperatures caused wind chill readings to dip well below -40°F; - numerous accidents were reported												
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 7 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/24/1997	7:00 a.m.	Winter Storm	1 in.	X		X		COOP SED	n/a	n/a	n/a	numerous accidents were reported
1/26/1997 thru 1/27/1997	5:00 a.m.	Winter Storm	6.0 in.					COOP SED	n/a	n/a	n/a	numerous accidents were reported
4/10/1997 thru 4/11/1997	11:00 a.m.	Heavy Snow	7.0 in.					COOP SED	2	n/a	n/a	*Event Description Provided Below*
- numerous trees, tree branches & power lines collapsed due to the weight of the heavy, wet snow with some causing damage to vehicles & homes - numerous accidents occurred throughout the area with a few minor injuries reported												
1/14/1998	6:00 a.m.	Winter Storm	X	X	X	X		SED	n/a	n/a	n/a	several traffic accidents were reported across the area
3/8/1998 thru 3/9/1998	10:00 p.m.	Winter Storm	3.4 in.				50 mph	COOP SED	n/a	n/a	n/a	- numerous traffic accidents were reported with dozens of minor injuries - gusty winds created near white-out conditions
Subtotal:									**2**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 8 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum) Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]	Data Source[2]	Injuries	Fatalities	Property Damages	Description
1/1/1999 thru 1/3/1999	12:00 p.m.	Heavy Snow	16.0 in.					COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- after the snowfall winds increased from the northwest and temperatures dropped, causing dangerous wind chills and treacherous driving conditions with extensive blowing and drifting snow - the weight of the heavy snow caused many roofs and porches to collapse - many locations sustained temporary or extended power outages *Pekin* - a storage building roof collapsed												
3/8/1999 thru 3/9/1999	12:00 p.m.	Heavy Snow	9.0 in.					SED	n/a	n/a	n/a	dozens of accidents occurred throughout the area with numerous minor injuries
1/19/2000	11:30 a.m.	Winter Storm	4.1 in.			X		COOP	n/a	n/a	n/a	
2/17/2000	11:00 p.m.	Ice Storm			≤0.5 in.			SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous reports of downed power lines & tree limbs - extended power outage & traffic accidents were reported												
12/11/2000	3:00 a.m.	Winter Storm	8.0 in.	X		X	25-35 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- northwest winds produced considerable blowing & drifting snow along with wind chills of -30°F to -40°F - numerous minor vehicle accidents were reported												
1/25/2001	5:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48 (Sheet 9 of 16) Severe Winter Storm Events 1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/13/2001	3:00 a.m.	Heavy Snow	4.6 in.					COOP	n/a	n/a	n/a	
1/30/2002 thru 1/31/2002	10:00 a.m.	Ice Storm		X	≤0.75 in.	X		COOP SED	n/a	n/a	n/a	some tree damage & power outages
3/25/2002	5:00 a.m.	Winter Storm	2-4 in.				X	SED	n/a	n/a	n/a	significant blowing & drifting snow created near whiteout conditions
12/24/2002	n/a	Heavy Snow	4.2 in.					COOP	n/a	n/a	n/a	
2/14/2003 thru 2/15/2003	7:00 p.m.	Winter Storm	6.3 in.			X	30-50 mph	COOP SED	n/a	n/a	n/a	winds caused major blowing & drifting of snow, with drifts as high as 3 to 5 feet
3/15/2004	10:00 a.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
11/24/2004	3:00 p.m.	Winter Storm	7.4 in.				20-30 mph	COOP SED	n/a	1	n/a	*Event Description Provided Below*
- sustained winds with gust of 40 to 50 mph caused considerable blowing & drifting - the high winds & weight of the wet snow downed numerous trees & power lines - traffic accidents resulted in numerous injuries - one fatality was reported as the result of a traffic accident												
1/5/2005 thru 1/6/2005	1:00 p.m.	Ice Storm		X	≤0.5 in.	X		COOP SED	n/a	n/a	n/a	numerous reports of downed trees & power lines as well as traffic accidents
Subtotal:									**0**	**1**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 10 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
3/21/2006	12:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
11/30/2006 thru 12/1/2006	7:30 a.m.	Winter Storm	12.0 in.	X	X	X		COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- ***This event was part of a state-declared disaster*** - considerable tree & power line damage was caused by ice and heavy snow - the power was not restored across some locales for several days - snow- & ice-covered roads resulted in numerous vehicular accidents												
1/12/2007 thru 1/13/2007	3:00 p.m.	Ice Storm			≤0.5 in.			COOP SED	n/a	n/a	n/a	- modest tree limb & power line damage was reported - numerous vehicle accidents occurred
2/13/2007	1:00 a.m.	Blizzard	8.0 in.				35-45 mph	COOP SED	n/a	n/a	n/a	many locations reported snow drifts of 3 to 6 feet, prompting the closure of several area roads
2/24/2007	11:00 a.m.	Ice Storm		X	X	X		COOP SED	n/a	n/a	n/a	
12/1/2007	9:00 a.m.	Ice Storm		X	0.25 in.			COOP SED	n/a	n/a	n/a	numerous power outages & minor vehicle accidents occurred
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Tazewell County

Figure 48
(Sheet 11 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/8/2007 thru 12/9/2007	2:00 p.m.	Ice Storm		X	0.5 in.			COOP SED	n/a	n/a	n/a	- tree & power line damage occurred - many vehicle accidents were reported
1/31/2008 thru 2/1/2008	2:00 p.m.	Heavy Snow	10.5 in.					COOP SED	n/a	n/a	n/a	
11/30/2008 thru 12/1/2008	12:00 a.m.	Heavy Snow	7.7 in.					COOP SED	n/a	2	n/a	*Event Description Provided Below*
- two people were killed in a car accident near Tremont due to snow/ice covered roads - gusty northwesterly winds caused considerable blowing & drifting												
12/18/2008 thru 12/19/2008	8:00 p.m.	Ice Storm			≤0.75 in.			SED	n/a	n/a	$250,000	
1/13/2009	11:00 a.m.	Heavy Snow	4.6 in.					COOP	n/a	n/a	n/a	
3/28/2009	12:00 p.m.	Heavy Snow	5.7 in.					COOP	n/a	n/a	n/a	
1/6/2010 thru 1/7/2010	7:30 p.m.	Winter Storm	5.9 in.				X	COOP SED	n/a	n/a	n/a	gusty northwesterly wind created considerable blowing & drifting across the area
Subtotal:									**0**	**0**	**$250,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Tazewell County

Figure 48
(Sheet 12 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum) Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]	Data Source[2]	Injuries	Fatalities	Property Damages	Description
1/20/2010 thru 1/21/2010	7:00 a.m.	Ice Storm		X	0.25 in.		30 mph	AMRN COOP SED	1	1	n/a	*Event Description Provided Below*
Ameren (regional information, including Tazewell County) - 50,000 customers were without power for up to 3 days - 157 wires downed - 27 poles replaced - 13 service lines to individual customers damaged - 7 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 488 Ameren personnel responded to the event - numerous traffic accidents were reported - one individual was killed when they lost control of their vehicle and slid into an oncoming semi												
12/12/2010 thru 12/13/2010	7:00 a.m.	Blizzard	2.7 in.				35 mph	COOP SED	n/a	n/a	n/a	- strong northwesterly winds gusting over 50 mph at times created white-out conditions - wind chill values plunged well below zero
12/24/2010 thru 12/25/2010	11:00 a.m.	Heavy Snow	5.4 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported on Christmas Eve
Subtotal:									**1**	**1**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 13 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/11/2011	7:00 a.m.	Heavy Snow	4.3 in.					AMRN COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
Ameren (regional information, including Tazewell County) - 110,000 customers were without power for up to 5 days - 33 wires downed - 20 poles replaced - 23 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 9 service lines to individual customers damaged												
2/1/2011 thru 2/2/2011	11:00 a.m.	Blizzard	13.6 in.	X		X	50-60 mph	AMRN COOP SED	n/a	n/a	$400,000	*Event Description Provided Below*
- ***This event was part of a federally-declared disaster (Declaration #1960)*** - event created nearly impossible travel conditions at times and resulted in multiple accidents & injuries across the region - numerous county highways & several interstates were closed including I-74 & I-155 - all schools were closed for at least 3 days - tree limbs were blown down & several homes lost shingles *Ameren (regional information, including Tazewell County)* - 14,000 customers were without power for up to 3 days - 1,494 wires downed - 104 poles replaced - 470 service lines to individual customers damaged - 718 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,144 Ameren personnel responded to the event												
Subtotal:									**0**	**0**	**$400,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 14 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/12/2012 thru 1/13/2012	3:00 a.m.	Winter Storm	5.0 in.					COOP SED	n/a	1	n/a	- numerous traffic accidents occurred - a 62-year-old man died of cardiac arrest at his home in Morton after shoveling snow
12/20/2012	1:30 p.m.	Blizzard	2.5 in.				50 mph	AMRN COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
<u>*Ameren (regional information, including Tazewell County)*</u> - 78,000 customers were without power for 2 days - 826 wires downed - 150 poles replaced - 191 service lines to individual customers damaged - 499 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,803 Ameren personnel responded to the event - numerous traffic accidents were reported across the county - several accidents were reported on I-155 southeast of Delavan												
3/24/2013	4:00 a.m.	Heavy Snow	10.7 in.					COOP SED	n/a	n/a	n/a	- many area schools & businesses were closed - conditions led to numerous traffic accidents
Subtotal:									**0**	**1**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 15 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/13/2013 thru 12/14/2013	5:00 p.m.	Heavy Snow	8.8 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
12/21/2013 thru 12/22/2013	8:00 p.m.	Ice Storm		≤0.25 in.				SED	n/a	n/a	n/a	
1/5/2014	3:00 a.m.	Heavy Snow	9.4 in.				X	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- significant blowing & drifting caused numerous road closures and traffic accidents across the County - many schools, businesses & churches were closed												
2/1/2014	3:00 a.m.	Winter Storm	5.8 in.	X	0.2 in.	X		COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
2/17/2014	8:00 a.m.	Winter Storm	3.4 in.	X	X	X		AMRN COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
<u>*Ameren (regional information, including Tazewell County)*</u> - 48,827 customers were without power for up to 5 days - 433 wires downed - 31 poles replaced - 184 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 151 service lines to individual customers damaged - 3,252 Ameren personnel responded to the event												
Subtotal:									**0**	**0**	**$0**	

1 An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

2 Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 48
(Sheet 16 of 16)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/5/2015	4:00 p.m.	Heavy Snow	5.3 in.					COOP	n/a	n/a	n/a	
2/1/2015	4:00 a.m.	Heavy Snow	6.3 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents occurred
12/28/2015	5:30 a.m.	Ice Storm			≤0.25 in.		45-55 mph	COOP SED	n/a	n/a	$1,200,000	*Event Description Provided Below*
- ice combined with wind gusts caused extensive damage to trees, power poles & power lines - several homes were damaged by falling trees and tree branches												<u>*Ameren (regional information, including Tazewell County)*</u> - 192,000 customers were without power for up to 3.5 days - 1,087 wires downed - 445 poles replaced - 882 service lines to individual customers damaged - 939 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,526 Ameren personnel responded to the event
3/13/2017	12:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$1,200,000**	
GRAND TOTAL:									**3**	**3**	**$1,850,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Sources: Tony O'Neal, Emergency Response Specialist – Illinois Crisis Management, Ameren Illinois.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:
AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Tazewell County

Figure 49
Extreme Cold Events
1996 – 2017

Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
2/2/1996 thru 2/4/1996	12:00 a.m.	Extreme Cold	n/a	n/a	n/a	SED	n/a	n/a	n/a	many people experienced problems with frozen pipes and vehicles
1/16/1997 thru 1/17/1997	n/a	Wind Chill	n/a	n/a	-40°F	SED	n/a	n/a	n/a	temperatures fell below zero across the entire area
1/5/1999	5:00 a.m.	Extreme Cold	n/a	n/a	n/a	SED	n/a	n/a	n/a	bitterly cold morning temperatures were recorded across the region
1/15/2009 thru 1/16/2009	12:00 a.m.	Extreme Cold/ Wind Chill	-25°F	n/a	-35°F	SED	n/a	n/a	n/a	
1/6/2014 thru 1/7/2014	12:00 a.m.	Extreme Cold/ Wind Chill	-20°F	n/a	-45°F	SED	n/a	n/a	n/a	- schools & numerous businesses closed for the day - warming centers activated
1/27/2014 thru 1/28/2014	12:00 a.m.	Extreme Cold/ Wind Chill	-12°F	n/a	-30°F	SED	n/a	n/a	n/a	
1/7/2015 thru 1/8/2015	8:00 p.m.	Wind Chill	n/a	n/a	-30°F	SED	n/a	n/a	n/a	
GRAND TOTAL							**0**	**0**	**$0**	

[1] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center.

Source: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database
MRCC Midwestern Regional Climate Center

3.2.2 WOODFORD COUNTY

HAZARD PROFILE

The following identifies past occurrences of severe winter storms and extreme cold; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe winter storms and extreme cold occurred previously? What is the extent of these previous severe winter storms and extreme cold events?

Figures 55 and **56**, located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) and extreme cold events recorded in Woodford County.

Severe Winter Storm Fast Facts – Occurrences

Number of Severe Winter Storm Events Reported (1950 – 2017): ***132***

Number of Extreme Cold Events Reported (1996 – 2017): ***7***

Maximum 24-Hour Snow Accumulation: ***14.5 inches (February 1 & 2, 2011 at Germantown Hills)***

Coldest Temperature Recorded in the County: ***-36°F (January 5, 1999 near Congerville)***

Most Likely Month for Severe Winter Storms to Occur: ***December***

Most Likely Time for Severe Winter Storms to Occur: ***Late Evening/Early Morning***

Most Likely Month for Extreme Cold Events to Occur: ***January***

Severe Winter Storms

NOAA's Storm Events Database, NWS's COOP Data and MAC member records were used to document 132 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in Woodford County between 1950 and 2017. Of the 132 recorded occurrences there were:

- 102 heavy snow storms or blizzards;
- 24 combination events (freezing rain, sleet, ice and/or snow); and
- 6 ice storms.

Figure 57 charts the reported occurrences of severe winter storms by month. Of the 132 events, 105 (79.5%) took place in December, January and February. Of these 105 events, 40 (38%) occurred during December, making this the peak month for severe winter storms. There were four events that spanned two months; however, for illustration purposes only the month when the event started is graphed.

Figure 58 charts the reported occurrences of severe winter storms by hour. Of the 132 occurrences, start times were unavailable for 23 events. Of the remaining 109 severe winter storm events with recorded times, 58% began during the a.m. hours, with 36 (33%) beginning between 7 p.m. and 1 a.m.

According to the NWS's COOP Data logs, the maximum 24-hour snow accumulation total recorded in Woodford County is 14.5 inches, which occurred on February 1 and 2, 2011 at Germantown Hills.

Figure 57
Graph: Severe Winter Storms by Month Woodford County: 1950 – 2017

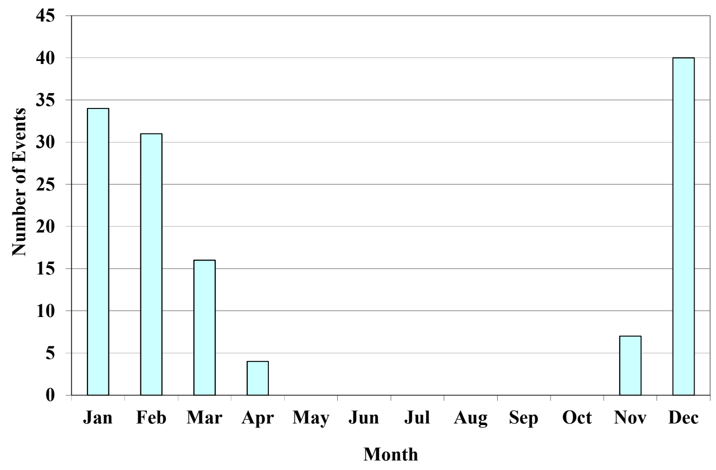
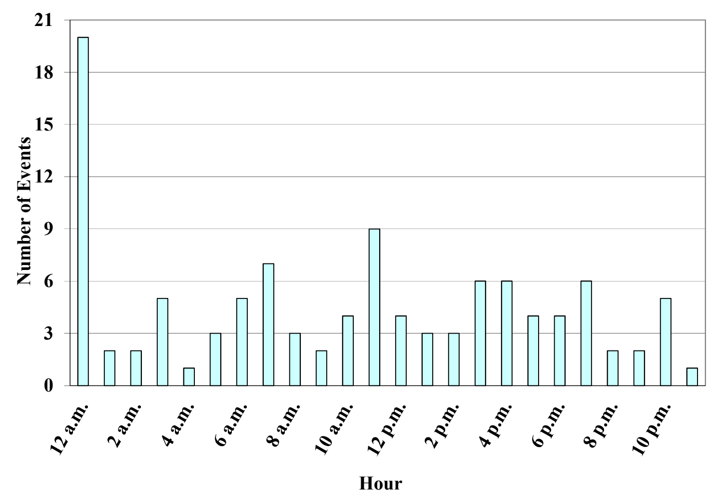


Figure 58
Graph: Severe Winter Storms by Hour Woodford County: 1950 – 2017



<u>*Extreme Cold Events*</u>

While extreme cold events occur on a fairly regular basis across central Illinois, NOAA's Storm Events Database has only seven recorded occurrences of extreme cold (dangerously low temperatures and wind chill values) in Woodford County between 1996 and 2017. These represent the ***reported occurrences*** of extreme cold. The NWS acknowledges that extreme cold events are not well recorded. Only those events with impacts are reported. As a result, extreme cold events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Six of the seven events (86%) took place in January, making this the peak month for extreme cold events. The remaining event took place in February. Approximately 83% of all the extreme cold events with recorded times began during the a.m. hours.

According to the Midwestern Regional Climate Center, continuous temperature records for Woodford County have been kept from 1896 to present by the NWS COOP Observer Station at Minonk and from 1996 to present by the COOP Observer Station northwest of Congerville. Based on the available records, the coldest temperature recorded in Woodford County was -36°F near Congerville on January 5, 1999. **Figure 59** lists the coldest days recorded at the Minonk observation station.

Figure 59
Coldest Days Recorded in Minonk

	Date	Temperature		Date	Temperature
1	02/13/1905	-28°F	5	01/17/1977	-24°F
2	01/20/1985	-25°F	6	12/28/1924	-24°F
3	01/21/1984	-25°F	7	01/15/1927	-23°F
4	01/11/1982	-25°F	8	02/09/1899	-23°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by severe winter storms and extreme cold?
Severe winter storms and extreme cold events affect the entire County. All communities in Woodford County have been affected by severe winter storms and extreme cold events. Severe winter storms and extreme cold events generally extend across the entire County and affect multiple locations. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Woodford County's hazard rating for severe winter storms as "high."

Do any of the participating municipalities have designated warming centers?

Yes. One of the three participating municipalities has designated warming centers. A "designated" warming center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during extreme cold events. Eureka designates centers as needed and indicated their locations vary due to event needs. There are no State of Illinois-designated warming centers in Woodford County.

What is the probability of future severe winter storms occurring?

Severe Winter Storms

Woodford County has had 132 verified occurrences of severe winter storms between 1950 and 2017. With 132 occurrences over the past 68 years, Woodford County should expect approximately two severe winter storm each year. There were 35 years over the past 68 years where two or more severe winter storms occurred. This indicates the probability that more than one severe winter storm may occur during any given year within the County is 51%.

Extreme Cold Events

Given the limited amount of data available for extreme cold events, it is difficult to establish a precise probability; however, Woodford County should expect to experience additional extreme cold events in the future.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe winter storms and extreme cold.

Are the participating jurisdictions vulnerable to severe winter storms and extreme cold?

Yes. All of Woodford County, including the participating municipalities, is vulnerable to the dangers presented by severe winter storms and extreme cold. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2008, Woodford County has experienced 29 severe winter storms and four extreme cold events.

Severe winter storms have immobilized portions of the County, blocking roads; downing power lines, trees and branches; causing power outages and property damage; and contributing to vehicle accidents. In addition, the County and municipalities must budget for snow removal and de-icing of roads and bridges as well as for roadway repairs.

What impacts resulted from the recorded severe winter storms and extreme cold?

The following summarize the impacts of severe winter storms and extreme cold events recorded in Woodford County.

Severe Winter Storms

Data obtained from NOAA's Storm Events Database indicates that between 1950 and 2017, five of the 132 severe winter storms caused $1.73 million in property damages. Property damage information was either unavailable or none was recorded for the remaining 127 reported occurrences.

In comparison, the State of Illinois has averaged an estimated $102 million annually in property damage losses from severe winter storms since 1950, ranking severe winter storms second only to flooding in terms of economic loss. While behind floods in terms of the amount of property damage caused, severe winter storms have a greater ability to immobilize larger areas, with rural areas being particularly vulnerable.

Severe Winter Storms & Extreme Cold Events
Fast Facts – Impacts/Risk

Severe Winter Storm (Snow & Ice) Impacts
- Total Property Damage: ***$1,730,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Injuries: ***2***
- Fatalities: ***1***

Extreme Cold Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Severe Winter Storm Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

NOAA's Storm Events Database documented two injuries and one fatality as a result of three separate severe winter storms. Detailed information on the injuries and fatality sustained were only available for one of the events. During the April 6, 2009 winter storm, a woman was killed near Low Point when she lost control of her car on a slushy road.

Extreme Cold
Damage information was either unavailable or none was recorded for any of the seven reported extreme cold events between 1996 and 2017. No injuries or fatalities were reported as a result of any of the recorded extreme cold events either.

What other impacts can result from severe winter storms?

In Woodford County, vehicle accidents are the largest risk to health and safety from severe winter storms. Hazardous driving conditions (i.e., reduced visibility, icy road conditions, strong winds, etc.) contribute to the increase in accidents that result in injuries and fatalities. A majority of all severe winter storm injuries result from vehicle accidents.

Traffic accident data assembled by the Illinois Department of Transportation from 2011 through 2015 indicates that treacherous road conditions caused by snow/slush and ice were present for 11.6% to 19.0% of all crashes recorded annually in the County. **Figure 60** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when treacherous road conditions caused by snow and ice were present.

Figure 60
Severe Winter Weather Crash Data – Woodford County

Year	Total # of Crashes	Presence of Treacherous Road Conditions caused by Snow/slush and Ice		
		# of Crashes	# of Injuries	# of Fatalities
2011	465	54	26	0
2012	447	64	14	0
2013	501	95	16	1
2014	525	87	24	1
2015	467	79	25	0
Total:	**2,405**	**379**	**105**	**2**

Source: Illinois Department of Transportation.

Persons who are outdoors during and immediately following severe winter storms and extreme cold events can experience other health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries. Treacherous walking conditions also lead to falls which can result in serious injuries, including fractures and broken bones, especially in the elderly. Over-exertion from shoveling driveways and walks can lead to life-threatening conditions such as heart attacks in middle-aged and older adults who are susceptible.

What is the level of risk/vulnerability to public health and safety from severe winter storms and extreme cold?

While severe winter storms and extreme cold occur regularly in Woodford County, the number of injuries and fatalities is low. Even taking into consideration the potential for hazardous driving conditions; snow-removal related injuries; and power outages that could leave individuals vulnerable to hypothermia, the risk to public health and safety from severe winter storms is seen as low.

Are existing buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?

Yes. All existing buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are vulnerable to damage from severe winter storms and extreme cold. The following summarize the vulnerabilities by severe winter storms and extreme cold events.

Based on the frequency with which severe winter storms and extreme cold events have occurred in Woodford County; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe winter storms is medium.

Winter Storm

Structural damage to buildings caused by severe winter storms (snow and ice) is very rare, but can occur particularly to flat rooftops. Information gathered from Woodford County residents indicates that snow and ice accumulations on communication and power lines as well as key roads presents the greatest vulnerability to infrastructure and critical facilities within the County. Snow and ice accumulations on lines often lead to disruptions in communications and create power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service.

Tony O'Neal, Ameren Illinois Emergency Response Specialist – Illinois Crisis Management, served on the MAC and was able to provide the Committee with information on the impacts and damages sustained by Ameren as the result of severe winter storms from 2010 to 2017. This information, while regional in nature, helps quantify the damages sustained by critical infrastructure in Woodford County and is summarized in **Figure 61**.

In addition to affecting communication and power lines, snow and ice accumulations on state and local roads hampers travel and can cause dangerous driving conditions. Blowing and drifting snow can lead to road closures and increases the risk of automobile accidents. Even small accumulations of ice can be extremely dangerous to motorists since bridges and overpasses freeze before other surfaces.

When transportation is disrupted, schools close, emergency and medical services are delayed, some businesses close and government services can be affected. When a severe winter storm hits there is also an increase in cost to the County and municipalities for snow removal and de-icing. Road resurfacing and pothole repairs are additional costs incurred each year as a result of severe winter storms.

Figure 61
Ameren Illinois – Regional Power Outages Experienced in Woodford County as a Result of Severe Winter Storm Events: 2010 – 2017

Event Date	Event Type	Customers without Power	Duration of Outage	Wires Downed	Poles Replaced	Individual Service Lines Damaged	Tree Orders*	Responding Personnel
1/20/2010 thru 1/21/2010	Ice Storm	50,000	3 days	157	27	13	7	488
2/1/2011 thru 2/2/2011	Blizzard	14,000	3 days	1,494	104	470	718	1,144
12/20/2012	Blizzard	78,000	2 days	826	150	191	499	1,803
12/28/2015	Ice Storm	192,000	3.5 day	1,087	446	882	939	1,526

* Tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed.

<u>*Extreme Cold*</u>
Extreme cold events can also have a detrimental impact on buildings, infrastructure and critical facilities. Pipes and water mains are especially susceptible to freezing during extreme cold events. This freezing can lead to cracks or ruptures in the pipes in buildings as well as in buried service lines and mains. As a result, flooding can occur as well as disruptions in service. Since most buried service lines and water mains are located under local streets and roads, fixing a break requires portions of the street or road to be blocked off, excavated and eventually repaired. These activities can be costly and must be carried out under less than ideal working conditions.

Are future buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?

Yes and No. While Eureka and Roanoke have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe winter storms and extreme cold, the County and Germantown Hills do not. In addition, infrastructure such as new communication and power lines will continue to be vulnerable to severe winter storms, especially to ice accumulations, as long as they are located above ground. Rural areas of Woodford County have experienced extended periods without power due to severe winter storms. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas. In terms of new roads and bridges, there is very little that can be done to reduce or eliminate their vulnerability to severe winter storms.

What are the potential dollar losses to vulnerable structures from severe winter storms and extreme cold?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms and extreme cold events. With only five of the 139 recorded events listing property damage numbers for severe winter storms and extreme cold, there is no way to accurately estimate future potential dollar losses. Since all existing structures within Woodford County are vulnerable to damage, it is likely that there will be future dollar losses from severe winter storms and extreme cold.

Woodford County

Figure 55
(Sheet 1 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/22/1950	n/a	Heavy Snow	4.9 in.					COOP	n/a	n/a	n/a	
2/24/1950 thru 2/25/1950	n/a	Heavy Snow	8.2 in.					COOP	n/a	n/a	n/a	
12/6/1950 thru 12/7/1950	n/a	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
12/14/1950	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
12/17/1950 thru 12/18/1950	n/a	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
12/21/1950 thru 12/22/1950	n/a	Winter Storm	4.0 in.				X	COOP	n/a	n/a	n/a	drifting snow, highways blocked
2/14/1952	n/a	Winter Storm	7.0 in.			X		COOP	n/a	n/a	n/a	blowing snow, roads blocked
1/2/1953	n/a	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
12/21/1953	3:00 p.m.	Winter Storm	4.5 in.				X	COOP	n/a	n/a	n/a	considerable drifting, roads blocked for a short time
Subtotal:									**0**	**0**	**$0**	

[1] An “X” in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service’s (NWS’s) COOP Observation Station records as well as other officially-designated sources identified in NOAA’s Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records

COOP NWS COOP Observation Station Records

SED NOAA’s Storm Events Database

Woodford County

Figure 55
(Sheet 2 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/7/1956 thru 12/8/1956	6:00 p.m.	Heavy Snow	6.5 in.		X			COOP	n/a	n/a	n/a	
12/27/1956	12:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/10/1957	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
3/25/1957	3:30 a.m.	Winter Storm	4.0 in.				X	COOP	n/a	n/a	n/a	blowing and drifting
12/31/1958	2:30 a.m.	Heavy Snow	5.8 in.					COOP	n/a	n/a	n/a	
1/21/1958	12:30 a.m.	Winter Storm	6.0 in.			X		COOP	n/a	n/a	n/a	
12/31/1958 thru 1/1/1959	n/a	Winter Storm	4.0 in.		X	X		COOP	n/a	n/a	n/a	
1/20/1959 thru 1/21/1959	12:00 a.m.	Winter Storm	8.0 in.			X	X	COOP	n/a	n/a	n/a	- drifting snow; all roads closed on 21st & 22nd - much damage to utilities because of ice
11/12/1959	9:00 a.m.	Winter Storm	7.2 in.		X	X		COOP	n/a	n/a	n/a	
2/20/1960 thru 2/21/1960	2:00 p.m.	Heavy Snow	6.1 in.					COOP	n/a	n/a	n/a	-
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Woodford County

Figure 55
(Sheet 3 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
3/15/1960 thru 3/16/1960	10:30 p.m.	Heavy Snow	9.5 in.					COOP	n/a	n/a	n/a	
2/3/1961	12:00 a.m.	Heavy Snow	4.1 in.					COOP	n/a	n/a	n/a	
12/23/1961	12:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
2/20/1962 thru 2/21/1962	10:00 p.m.	Winter Storm	4.1 in.			X		COOP	n/a	n/a	n/a	
2/12/1964 thru 2/13/1964	12:00 p.m.	Heavy Snow	6.9 in.					COOP	n/a	n/a	n/a	
2/23/1965 thru 2/24/1965	1:00 p.m.	Heavy Snow	6.6 in.					COOP	n/a	n/a	n/a	
3/3/965 thru 3/5/1965	10:30 p.m.	Heavy Snow	9.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55
(Sheet 4 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/26/1967 thru 1/27/1967	2:00 a.m.	Winter Storm	12.8 in.				X	COOP	n/a	n/a	n/a	strong winds – drifting
12/7/1969	12:00 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
12/23/1969	12:00 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	some roads were blocked
3/25/1970	10:00 a.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
3/28/1970	12:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/3/1971	1:00 a.m.	Winter Storm	4.0 in.			X		COOP	n/a	n/a	n/a	
3/29/1972	3:00 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
12/18/1973 thru 12/19/1973	8:00 p.m.	Winter Storm	8.0 in.				X	COOP	n/a	n/a	n/a	
1/8/1974 thru 1/9/1974	7:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
11/27/1975	n/a	Winter Storm	6.3 in.				X	COOP	n/a	n/a	n/a	blowing snow
12/6/1976	7:00 a.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55
(Sheet 5 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/9/1977 thru 1/10/1977	7:00 p.m.	Heavy Snow	4.3 in.					COOP	n/a	n/a	n/a	
12/5/1977	6:00 a.m.	Heavy Snow	5.8 in.					COOP	n/a	n/a	n/a	
12/8/1977	8:00 a.m.	Heavy Snow	4.6 in.					COOP	n/a	n/a	n/a	
2/13/1978	6:00 a.m.	Heavy Snow	5.3 in.					COOP	n/a	n/a	n/a	
12/31/1978	12:00 a.m.	Winter Storm	6.5 in.	X	X		X	COOP	n/a	n/a	n/a	
1/12/1979 thru 1/14/1979	12:00 a.m.	Heavy Snow	16.8 in.					COOP	n/a	n/a	n/a	
1/22/1979 thru 1/23/1979	4:00 p.m.	Heavy Snow	5.3 in.					COOP	n/a	n/a	n/a	
3/13/1980	4:00 a.m.	Heavy Snow	4.8 in.					COOP	n/a	n/a	n/a	
12/2/1981	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
12/16/1981 thru 12/17/1981	5:00 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
2/1/1982	12:00 a.m.	Winter Storm	7.0 in.				X	COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55
(Sheet 6 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/5/1982	6:00 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
2/8/1982 thru 2/9/1982	7:00 p.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
4/6/1982	10:00 a.m.	Winter Storm	6.0 in.		X			COOP	n/a	n/a	n/a	
4/9/1982	11:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
3/21/1983	9:00 p.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
12/13/1983 thru 12/14/1983	4:30 p.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
12/21/1983	12:00 p.m.	Winter Storm	4.5 in.		X			COOP	n/a	n/a	n/a	
1/29/1984 thru 1/30/1984	4:00 p.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
2/28/1984	12:00 a.m.	Winter Storm	6.0 in.				X	COOP	n/a	n/a	n/a	
1/10/1985	12:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/10/1985 thru 2/11/1985	4:00 p.m.	Winter Storm	4.0 in.		X			COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Woodford County

Figure 55
(Sheet 7 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/7/1986	12:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
1/10/1987	11:00 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
1/17/1987 thru 1/18/1987	3:00 p.m.	Heavy Snow	6.1 in.					COOP	n/a	n/a	n/a	
1/18/1987 thru 1/19/1987	10:30 p.m.	Heavy Snow	5.4 in.					COOP	n/a	n/a	n/a	
12/14/1987 thru 12/15/1987	6:30 p.m.	Blizzard	7.0 in.		X		50 mph	COOP	n/a	n/a	n/a	
2/11/1988	12:00 a.m.	Heavy Snow	8.0in.					COOP	n/a	n/a	n/a	
12/27/1988 thru 12/28/1988	7:30 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
2/4/1989 thru 2/5/1989	2:00 p.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
12/11/1989	1:00 p.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Woodford County

Figure 55
(Sheet 8 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum) Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]	Data Source[2]	Injuries	Fatalities	Property Damages	Description
1/5/1991	12:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
3/13/1991 thru 3/14/1991	12:00 a.m.	Winter Storm	10.0 in.			X		COOP	n/a	n/a	n/a	
1/9/1993 thru 1/10/1993	5:00 p.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
2/15/1993 thru 2/16/1993	6:30 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
2/22/1994 thru 2/23/1994	4:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/26/1994	7:30 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
12/18/1995 thru 12/19/1995	7:00 p.m.	Heavy Snow	1-6 in.	X			20-30 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous accidents were reported - numerous power lines knocked down due to freezing rain & strong winds - considerable blowing & drifting of snow closed some roads												
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
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Woodford County

Figure 55 (Sheet 9 of 20) Severe Winter Storm Events 1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/18/1996 thru 1/19/1996	10:00 a.m.	Winter Storm	X		X		25-35 mph	SED	n/a	n/a	n/a	- numerous power outages & minor accidents - gusty winds created wind chills near -40°F
1/8/1997 thru 1/9/1997	9:00 p.m.	Heavy Snow	6.0 in.					COOP SED	1	n/a	n/a	numerous accidents were reported
1/15/1997 thru 1/17/1997	3:00 a.m.	Winter Storm	5.0 in.				20-30 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- after the snow stopped the winds picked up causing near whiteout conditions - strong winds & cold temperatures caused wind chill readings to dip well below -40°F - numerous accidents were reported												
1/24/1997	7:00 a.m.	Winter Storm	2.0 in.	X		X		COOP SED	n/a	n/a	n/a	numerous accidents were reported
2/21/1997 thru 2/22/1997	11:30 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**1**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 55
(Sheet 10 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
4/10/1997 thru 4/11/1997	11:00 a.m.	Heavy Snow	11.0 in.					COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous trees, tree branches & power lines collapsed due to the weight of the heavy, wet snow with some causing damage to vehicles & homes - numerous accidents occurred throughout the area with a few minor injuries reported												
12/9/1997 thru 12/10/1997	3:00 p.m.	Heavy Snow	5.5 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
3/8/1998 thru 3/9/1998	10:00 p.m.	Winter Storm	4.0 in.				50 mph	COOP SED	n/a	n/a	n/a	- numerous traffic accidents were reported with dozens of minor injuries - gusty winds created near white-out conditions
1/1/1999 thru 1/3/1999	12:00 p.m.	Heavy Snow	15.0 in.					COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- after the snowfall winds increased from the northwest and temperatures dropped, causing dangerous wind chills and treacherous driving conditions with extensive blowing and drifting snow - the weight of the heavy snow caused many roofs and porches to collapse - many locations sustained temporary or extended power outages												
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55
(Sheet 11 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum) Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]	Data Source[2]	Injuries	Fatalities	Property Damages	Description
3/8/1999 thru 3/9/1999	12:00 p.m.	Heavy Snow	7.5 in.					COOP SED	n/a	n/a	n/a	dozens of accidents occurred throughout the area with numerous minor injuries
1/19/2000	10:00 a.m.	Winter Storm	7.5 in.				X	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- blowing & drifting snow was reported								- storm caused numerous road closures as well as accidents				
1/30/2000	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/17/2000	11:00 p.m.	Ice Storm			≤0.5 in.			SED	1	n/a	n/a	*Event Description Provided Below*
- numerous reports of downed power lines & tree limbs - extended power outage & traffic accidents were reported								- one traffic accident, attributed to an icy road, resulted in one serious injury				
12/11/2000	12:00 a.m.	Winter Storm	7.0 in.	X		X	25-35 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- northwest winds produced considerable blowing & drifting snow along with wind chills of -30°F to -40°F								- numerous minor vehicle accidents were reported				
12/29/2000	n/a	Heavy Snow	5.2 in.					COOP	n/a	n/a	n/a	
Subtotal:									**1**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55
(Sheet 12 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/30/2002 thru 1/31/2002	11:30 a.m.	Ice Storm	1.0 in.	X	≤1.0 in.	X		COOP SED	n/a	n/a	n/a	several trees & power lines were downed from ice accumulations with outages lasting several hours to a couple days
3/1/2002 thru 3/2/2002	5:00 p.m.	Heavy Snow	7.4 in.				40 mph	COOP SED	n/a	n/a	n/a	- significant blowing & drifting snow - numerous traffic accidents reported
3/25/2002	5:00 a.m.	Winter Storm	4.5 in.				X	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous accidents occurred as a result of the snow-covered roads & decreased visibility - significant blowing & drifting snow created near whiteout conditions												
12/24/2002	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/14/2003 thru 2/15/2003	7:00 p.m.	Winter Storm	10.0. in.		X	X	30-50 mph	COOP SED	n/a	n/a	n/a	winds caused major blowing & drifting of snow, with drifts as high as 3 to 5 feet
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 55
(Sheet 13 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
11/24/2004	3:00 p.m.	Winter Storm	5.7 in.				20-30 mph	COOP SED	n/a	1	n/a	*Event Description Provided Below*
- sustained winds with gusts of 40 to 50 mph caused considerable blowing & drifting - the high winds & weight of the wet snow downed numerous trees & power lines - traffic accidents resulted in numerous injuries - one fatality was reported as the result of a traffic accident												
1/5/2005 thru 1/6/2005	1:00 p.m.	Ice Storm	2.0 in.		≤0.5 in.			COOP SED	n/a	n/a	n/a	numerous reports of downed trees & power lines as well as traffic accidents
12/9/2005	n/a	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
11/30/2006 thru 12/1/2006	7:30 a.m.	Winter Storm	7.0 in.	X	X	X		COOP SED	n/a	n/a	$500,000	*Event Description Provided Below*
- ***This event was part of a federally-declared disaster (Declaration #1681)*** - considerable tree & power line damage was caused by ice and heavy snow - the power was not restored across some locales for several days - snow- & ice-covered roads resulted in numerous vehicular accidents												
2/6/2007	6:00 a.m.	Heavy Snow	4.7 in.					COOP	n/a	n/a	n/a	
2/13/2007	1:00 a.m.	Blizzard	9.0 in.				35-45 mph	COOP SED	n/a	n/a	n/a	many locations reported snow drifts of 3 to 6 feet, prompting the closure of several area roads
2/24/2007	10:00 a.m.	Ice Storm		X	X	X		COOP SED	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$500,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55
(Sheet 14 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/1/2007	9:30 a.m.	Ice Storm		X	0.25 in.			COOP SED	n/a	n/a	n/a	numerous power outages & minor vehicle accidents occurred
1/1/2008	6:00 a.m.	Heavy Snow	5.9 in.					COOP	n/a	n/a	n/a	
1/31/2008 thru 2/1/2008	3:00 p.m.	Heavy Snow	8.7 in.					COOP SED	n/a	n/a	n/a	
11/30/2008 thru 12/1/2008	12:00 a.m.	Heavy Snow	7.3 in.				X	COOP SED	n/a	n/a	n/a	gusty northwesterly winds caused considerable blowing & drifting
12/18/2008 thru 12/19/2008	8:30 p.m.	Ice Storm			≤0.75 in.			SED	n/a	n/a	$400,000	
1/13/2009	11:00 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
3/29/2009	n/a	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
4/6/2009	8:50 a.m.	Winter Storm	3.0 in.					COOP SED	n/a	1	n/a	a woman was killed near Low Point when she lost control of her car on a slushy road
Subtotal:									**0**	**1**	**$400,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55
(Sheet 15 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/26/2009 thru 12/27/2009	8:00 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
1/6/2010 thru 1/7/2010	7:30 p.m.	Winter Storm	7.0 in.				X	COOP SED	n/a	n/a	n/a	gusty northwesterly wind created considerable blowing & drifting across the area
1/20/2010 thru 1/21/2010	7:00 a.m.	Ice Storm		X	0.25 in.		X	AMRN COOP SED	n/a	n/a	$100,000	*Event Description Provided Below*
<u>*Ameren (regional information, including Woodford County)*</u> - 50,000 customers were without power for up to 3 days - 157 wires downed - 27 poles replaced - 13 service lines to individual customers damaged - 7 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 488 Ameren personnel responded to the event - numerous traffic accidents were reported - the thick ice, combined with gusty winds, caused damage to tree limbs & power lines - in Woodford County, power was out for about 12 hours for nearly 10,000 customers												
2/8/2010 thru 2/9/2010	2:00 p.m.	Winter Storm	5.0 in.				X	COOP SED	n/a	n/a	n/a	gusty northwesterly winds caused considerable blowing & drifting
Subtotal:									**0**	**0**	**$100,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 55
(Sheet 16 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
11/24/2010	5:00 a.m.	Winter Storm		X	<0.25 in.	X		COOP SED	n/a	n/a	n/a	multiple accidents occurred on I-39 near El Paso due to icy road conditions
12/3/2010 thru 12/4/2010	6:00 p.m.	Heavy Snow	8.6 in.					COOP SED	n/a	n/a	n/a	
12/12/2010 thru 12/13/2010	7:00 a.m.	Blizzard	3.2 in.				35 mph	COOP SED	n/a	n/a	n/a	- strong northwesterly winds gusting over 50 mph at times created white-out conditions - wind chill values plunged well below zero
12/24/2010 thru 12/25/2010	11:00 a.m.	Heavy Snow	6.0 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported on Christmas Eve
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Woodford County

Figure 55 (Sheet 17 of 20) Severe Winter Storm Events 1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/1/2011 thru 2/2/2011	11:30 a.m.	Blizzard	17.0 in.	X		X	50-60 mph	AMRN COOP SED	n/a	n/a	$200,000	*Event Description Provided Below*
- ***This event was part of a federally-declared disaster (Declaration #1960)*** - event created nearly impossible travel conditions at times and resulted in multiple accidents & injuries across the region - numerous county highways were closed - all schools were closed for at least 3 days - power was lost the Eureka water well, causing a loss of water service to the City for more than 24 hours								*Ameren (regional information, including Woodford County)* - 14,000 customers were without power for up to 3 days - 1,494 wires downed - 104 poles replaced - 470 service lines to individual customers damaged - 718 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,144 Ameren personnel responded to the event				
1/12/2012 thru 1/13/2012	n/a	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$200,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Woodford County

Figure 55
(Sheet 18 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum) Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]	Data Source[2]	Injuries	Fatalities	Property Damages	Description
12/20/2012	3:00 p.m.	Blizzard	2.7 in.				50 mph	AMRN COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
Ameren (regional information, including Woodford County) - 78,000 customers were without power for 2 days - 826 wires downed - 150 poles replaced - 191 service lines to individual customers damaged - 499 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,803 Ameren personnel responded to the event - numerous traffic accidents were reported across the county												
3/24/2013	n/a	Heavy Snow	6.2 in.					COOP	n/a	n/a	n/a	
12/13/2013 thru 12/14/2013	5:00 p.m.	Winter Storm	7.6 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
1/5/2014	12:00 a.m.	Heavy Snow	8.2 in.				X	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- significant blowing & drifting caused numerous road closures and traffic accidents across the County - many schools, businesses & churches were closed												
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 55
(Sheet 19 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/1/2014	3:00 a.m.	Heavy Snow	6.0 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
2/14/2014	n/a	Heavy Snow	4.9 in.					COOP	n/a	n/a	n/a	
1/5/2015 thru 1/6/2015	4:15 p.m.	Heavy Snow	5.0 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents occurred
2/1/2015 thru 2/2/2015	3:00 a.m.	Heavy Snow	9.0 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents occurred
11/21/2015 thru 11/22/2015	n/a	Heavy Snow	5.7 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 55
(Sheet 20 of 20)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum) Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]	Data Source[2]	Injuries	Fatalities	Property Damages	Description
12/28/2015	5:00 a.m.	Ice Storm	2.5 in.	X	≤0.3 in.		40-50 mph	AMRN COOP SED	n/a	n/a	$530,000	*Event Description Provided Below*
- ice combined with wind gusts caused extensive damage to trees, power poles & power lines - several homes were damaged by falling trees and tree branches - about 20,000 individuals lost power for up to 4 days in the County - Committee member from Eureka College identified $80,000 in damages and indicated that the College had no power for 3 days, several trees were downed and the fire alarm systems were offline								<u>*Ameren (regional information, including Woodford County)*</u> - 192,000 customers were without power for up to 3.5 days - 1,087 wires downed - 445 poles replaced - 882 service lines to individual customers damaged - 939 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,526 Ameren personnel responded to the event				
12/5/2016	n/a	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
3/13/2017	n/a	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$530,000**	
GRAND TOTAL:									**2**	**1**	**$1,730,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Tony O'Neal, Emergency Response Specialist – Illinois Crisis Management, Ameren Illinois.
Tri-County MAC member responses to Natural Hazard Events Questionnaire.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 56
Extreme Cold Events
1996 – 2017

Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
2/2/1996 thru 2/4/1996	12:00 a.m.	Extreme Cold	-20°F	1°F	n/a	COOP SED	n/a	n/a	n/a	many people experienced problems with frozen pipes and vehicles
1/16/1997 thru 1/17/1997	n/a	Wind Chill	-16°F	n/a	-40°F	COOP SED	n/a	n/a	n/a	temperatures fell below zero across the entire area
1/5/1999	5:00 a.m.	Extreme Cold	-36°F	n/a	n/a	COOP SED	n/a	n/a	n/a	***a new state record low temperature was set at Congerville***
1/15/2009 thru 1/16/2009	12:00 a.m.	Extreme Cold/ Wind Chill	-22°F	-5°F	-35°F	COOP SED	n/a	n/a	n/a	
1/6/2014 thru 1/7/2014	12:00 a.m.	Extreme Cold/ Wind Chill	-17°F	-4°F	-45°F	COOP SED	n/a	n/a	n/a	- schools & numerous businesses closed for the day - warming centers activated
1/27/2014 thru 1/28/2014	12:00 a.m.	Extreme Cold/ Wind Chill	-10°F	n/a	-30°F	SED	n/a	n/a	n/a	
1/7/2015 thru 1/8/2015	8:00 p.m.	Wind Chill	-11°F	6°F	-30°F	COOP SED	n/a	n/a	n/a	
GRAND TOTAL							**0**	**0**	**$0**	

[1] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database
MRCC Midwestern Regional Climate Center

3.2.3 PARTICIPATING PEORIA COUNTY MUNICIPALITIES

HAZARD PROFILE

The following identifies past occurrences of severe winter storms and extreme cold; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe winter storms and extreme cold occurred previously? What is the extent of these previous severe winter storms and extreme cold events?

Figures 62 and **63**, located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) and extreme cold events recorded in the participating Peoria County municipalities.

Severe Winter Storm Fast Facts – Occurrences

Number of Severe Winter Storm Events Reported (1950 – 2017): ***104***

Number of Extreme Cold Events Reported (1996 – 2017): ***9***

Maximum 24-Hour Snow Accumulation: ***12.2 inches (January 12 &13, 1979 at Peoria International Airport)***

Coldest Temperature Recorded in the County: ***-26°F (February 13, 1905 at Peoria International Airport)***

Most Likely Month for Severe Winter Storms to Occur: ***January***

Most Likely Time for Severe Winter Storms to Occur: ***Morning***

Most Likely Month for Extreme Cold Events to Occur: ***January***

Severe Winter Storms

NOAA's Storm Events Database, NWS's COOP Data and MAC member records were used to document 104 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in the participating Peoria County municipalities between 1950 and 2017. Of the 104 recorded occurrences there were:

- ❖ 84 heavy snow storms or blizzards;
- ❖ 13 combination events (freezing rain, sleet, ice and/or snow); and
- ❖ 7 ice storms.

Figure 64 charts the reported occurrences of severe winter storms by month. Of the 104 events, 96 (92%) took place in December, January, February and March. Of these 96 events, 29 (30%) occurred during January, making this the peak month for severe winter storms. There was one event that spanned two months; however, for illustration purposes only the month when the event started is graphed.

Figure 65 charts the reported occurrences of severe winter storms by hour. Of the 104 occurrences, start times were unavailable for 13 events. Of the remaining 91 severe winter storm events with recorded times, 57% began during the a.m. hours, with 32 (33%) beginning between 7 a.m. and 1 p.m.

According to the NWS's COOP Data logs, the maximum 24-hour snow accumulation total recorded in the participating municipalities is 12.2 inches, which occurred on January 12 and 13, 1979 at the Peoria International Airport.

Figure 64
Graph: Severe Winter Storms by Month Participating Peoria County Municipalities: 1950 – 2017

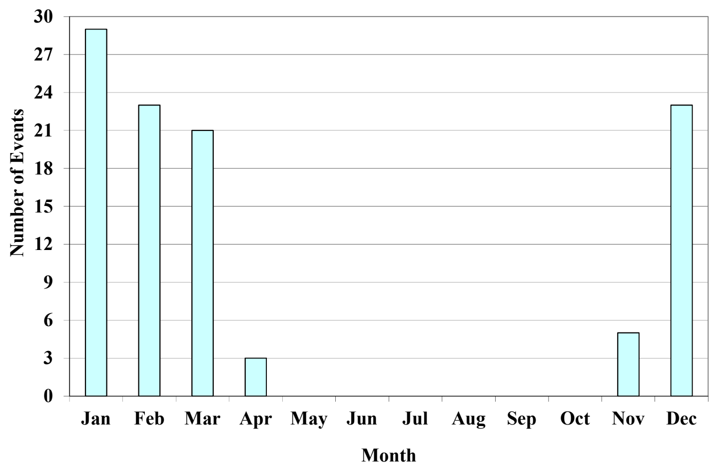
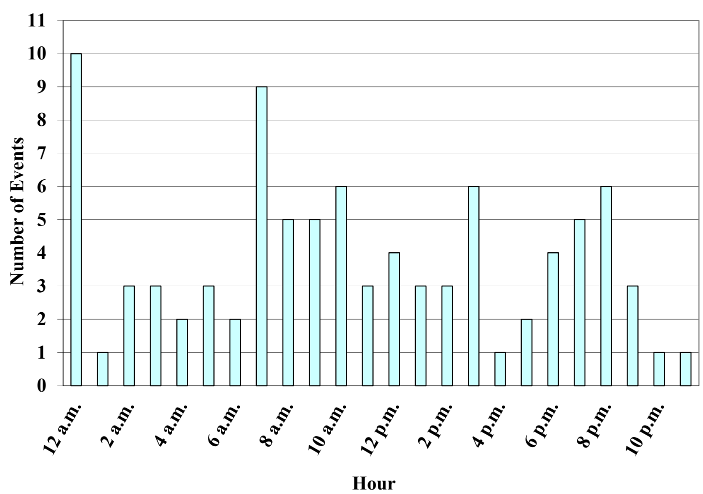


Figure 65
Graph: Severe Winter Storms by Hour Participating Peoria County Municipalities: 1950 – 2017



<u>*Extreme Cold Events*</u>

While extreme cold events occur on a fairly regular basis across central Illinois, NOAA's Storm Events Database has only nine recorded occurrences of extreme cold (dangerously low temperatures and wind chill values) in the participating Peoria County municipalities between 1996 and 2017. These represent the ***reported occurrences*** of extreme cold. The NWS acknowledges that extreme cold events are not well recorded. Only those events with impacts are reported. As a result, extreme cold events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Six of the nine events (67%) took place in January, making this the peak month for extreme cold events. Approximately 88% of all the extreme cold events with recorded times began during the a.m. hours.

According to the Midwestern Regional Climate Center, continuous temperature records have been kept from 1914 to present by the NWS COOP Observer Station at the Peoria International Airport. Based on the available records, the coldest temperature recorded at the Airport was -26°F on February 13, 1905. **Figure 66** lists the coldest days recorded at the Airport observation station.

Figure 66
Coldest Days Recorded at the Peoria International Airport

	Date	Temperature			Date	Temperature
1	02/13/1905	-26°F		5	12/23/1989	-22°F
2	01/17/1977	-25°F		6	01/20/1985	-22°F
3	12/28/1924	-24°F		7	01/15/1979	-22°F
4	12/22/1989	-23°F		8	02/09/1899	-22°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by severe winter storms and extreme cold?

Severe winter storms and extreme cold events affect the entire County, including the participating municipalities. All of the participating municipalities have been affected by severe winter storms and extreme cold events. Severe winter storms and extreme cold events generally extend across the entire County and affect multiple locations. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Peoria County's hazard rating for severe winter storms as "high."

What is the probability of future severe winter storms occurring?

Severe Winter Storms

The participating Peoria County municipalities have had 104 verified occurrences of severe winter storms between 1950 and 2017. With 104 occurrences over the past 68 years, the participating municipalities should expect at least one severe winter storm each year. There were 27 years over the past 68 years where two or more severe winter storms occurred. This indicates the probability that more than one severe winter storm may occur during any given year within the participating municipalities is 40%.

Extreme Cold Events

Given the limited amount of data available for extreme cold events, it is difficult to establish a precise probability; however, the participating municipalities should expect to experience additional extreme cold events in the future.

Do any of the participating municipalities have designated warming centers?

Yes. One of the five participating municipalities has designated warming centers. A "designated" warming center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events. The City of Peoria has designated the Police Station Lobby at 600 SW Adams Street as a designated warming center along with fire stations at various locations as available. At this time Bartonville, Chillicothe, Hanna City and Peoria Heights do not have any warming centers designated within their municipalities.

In addition to those designated warming centers identified by the participating municipalities, the Illinois Department of Human Services office located in Peoria also serves as warming center.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from severe winter storms and extreme cold.

Are the participating jurisdictions vulnerable to severe winter storms and extreme cold?

Yes. All of participating jurisdictions are vulnerable to the dangers presented by severe winter storms and extreme cold. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2008, the participating municipalities has experienced 23 severe winter storms and six extreme cold events.

Severe winter storms have immobilized portions of the participating municipalities, blocking roads; downing power lines, trees and branches; causing power outages and property damage; and contributing to vehicle accidents. In addition, the municipalities must budget for snow removal and de-icing of roads and bridges as well as for roadway repairs.

What impacts resulted from the recorded severe winter storms and extreme cold?

The following summarize the impacts of severe winter storms and extreme cold events recorded in participating Peoria County municipalities.

Severe Winter Storms

Data obtained from NOAA's Storm Events Database indicates that between 1950 and 2017, three of the 104 severe winter storms caused $2.95 million in property damages. Property damage information was either unavailable or none was recorded for the remaining 101 reported occurrences.

In comparison, the State of Illinois has averaged an estimated $102 million annually in property damage losses from severe winter storms since 1950, ranking severe winter storms second only to flooding in terms of economic loss. While behind floods in terms of the amount of property damage caused, severe winter storms have a greater ability to immobilize larger areas.

NOAA's Storm Events Database documented four injuries as a result of one severe winter storm. During the November 30, 2006 winter storm, four individuals were injured at a nursing home in Peoria when a portion of the roof collapsed under the weight of the snow.

Extreme Cold

Damage information was either unavailable or none was recorded for any of the nine reported extreme cold events between 1996 and 2017. NOAA's Storm Events Database documented four fatalities as the result of three separate extreme cold events. The following provides a brief description of each event.

- During the February 2, 1996 extreme cold event a 79-year old woman froze to death on her front porch in Peoria when she mistakenly thought she was locked out of her home.
- A Peoria man died of hypothermia after he was found lying on a sidewalk during the December 18, 2016 extreme cold event.
- During the December 20, 2017 extreme cold event an 86-year old woman fell outside of her home in Peoria and died of hypothermia.

Severe Winter Storms & Extreme Cold Events Fast Facts – Impacts/Risk

Severe Winter Storm (Snow & Ice) Impacts
- Total Property Damage: ***$2,950,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Injuries: ***4***
- Fatalities: ***0***

Extreme Cold Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***3***

Severe Winter Storm Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from severe winter storms?

In Peoria County (including the participating municipalities), vehicle accidents are the largest risk to health and safety from severe winter storms. Hazardous driving conditions (i.e., reduced visibility, icy road conditions, strong winds, etc.) contribute to the increase in accidents that result in injuries and fatalities. A majority of all severe winter storm injuries result from vehicle accidents.

Traffic accident data assembled by the Illinois Department of Transportation from 2011 through 2015 indicates that treacherous road conditions caused by snow/slush and ice were present for 6.0% to 15.1% of all crashes recorded annually in Peoria County. **Figure 67** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when treacherous road conditions caused by snow and ice were present.

Figure 67
Severe Winter Weather Crash Data – Peoria County

Year	Total # of Crashes	Presence of Treacherous Road Conditions caused by Snow/slush and Ice		
		# of Crashes	# of Injuries	# of Fatalities
2011	4,896	363	86	0
2012	4,789	287	67	1
2013	4,438	355	85	2
2014	4,538	684	111	0
2015	4,454	470	119	1
Total:	**23,115**	**2,159**	**468**	**4**

Source: Illinois Department of Transportation.

Persons who are outdoors during and immediately following severe winter storms and extreme cold events can experience other health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries. Treacherous walking conditions also lead to falls which can result in serious injuries, including fractures and broken bones, especially in the elderly. Over-exertion from shoveling driveways and walks can lead to life-threatening conditions such as heart attacks in middle-aged and older adults who are susceptible.

Are existing buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?

Yes. All existing buildings, infrastructure and critical facilities located in the participating municipalities are vulnerable to damage from severe winter storms and extreme cold. The following summarize the vulnerabilities by severe winter storms and extreme cold events.

Based on the frequency with which severe winter storms and extreme cold events have occurred in the participating municipalities; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe winter storms is medium.

Winter Storm

Structural damage to buildings caused by severe winter storms (snow and ice) is very rare, but can occur particularly to flat rooftops. Information gathered from residents indicates that snow and ice accumulations on communication and power lines as well as key roads presents the greatest vulnerability to infrastructure and critical facilities within the participating municipalities. Snow and ice accumulations on lines often lead to disruptions in communications and create power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service.

Tony O'Neal, Ameren Illinois Emergency Response Specialist – Illinois Crisis Management, served on the MAC and was able to provide the Committee with information on the impacts and damages sustained by Ameren as the result of severe winter storms from 2010 to 2017. This information, while regional in nature, helps quantify the damages sustained by critical infrastructure in Peoria County (including the participating municipalities) and is summarized in **Figure 68**.

In addition to affecting communication and power lines, snow and ice accumulations on state and local roads hampers travel and can cause dangerous driving conditions. Blowing and drifting snow can lead to road closures and increases the risk of automobile accidents. Even small accumulations of ice can be extremely dangerous to motorists since bridges and overpasses freeze before other surfaces.

When transportation is disrupted, schools close, emergency and medical services are delayed, some businesses close and government services can be affected. When a severe winter storm hits there is also an increase in cost to the County and municipalities for snow removal and de-icing. Road resurfacing and pothole repairs are additional costs incurred each year as a result of severe winter storms.

Figure 68
Ameren Illinois – Regional Power Outages Experienced in Peoria County as a Result of Severe Winter Storm Events: 2010 – 2017

Event Date	Event Type	Customers without Power	Duration of Outage	Wires Downed	Poles Replaced	Individual Service Lines Damaged	Tree Orders*	Responding Personnel
1/11/2011	Heavy Snow	110,000	5 days	33	20	9	23	n/a
2/1/2011 thru 2/2/2011	Blizzard	14,000	3 days	1,494	104	470	718	1,144
12/20/2012	Blizzard	78,000	2 days	826	150	191	499	1,803
2/17/2014	Winter Storm	48,827	1.5 days	433	31	151	184	3,252
12/28/2015	Ice Storm	192,000	3.5 day	1,087	446	882	939	1,526

* Tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed.

Extreme Cold

Extreme cold events can also have a detrimental impact on buildings, infrastructure and critical facilities. Pipes and water mains are especially susceptible to freezing during extreme cold events. This freezing can lead to cracks or ruptures in the pipes in buildings as well as in buried service lines and mains. As a result, flooding can occur as well as disruptions in service. Since most buried service lines and water mains are located under local streets and roads, fixing a break requires portions of the street or road to be blocked off, excavated and eventually repaired. These activities can be costly and must be carried out under less than ideal working conditions.

Are future buildings, infrastructure and critical facilities vulnerable to severe winter storms and extreme cold?

Yes and No. All of the participating municipalities have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe winter storms and extreme cold. However, infrastructure such as new communication and power lines will continue to be vulnerable to severe winter storms, especially to ice accumulations, as long as they are located above ground. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas. In terms of new roads and bridges, there is very little that can be done to reduce or eliminate their vulnerability to severe winter storms.

What are the potential dollar losses to vulnerable structures from severe winter storms and extreme cold?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms and extreme cold events. With only three of the 113 recorded events listing property damage numbers for severe winter storms and extreme cold, there is no way to accurately estimate future potential dollar losses. Since all existing structures within participating municipalities are vulnerable to damage, it is likely that there will be future dollar losses from severe winter storms and extreme cold.

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 1 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/24/1950 thru 2/25/1950	n/a	Heavy Snow	8.2 in.					COOP	n/a	n/a	n/a	
3/10/1951 thru 3/11/1951	2:30 p.m.	Heavy Snow	5.0 in.			X		COOP	n/a	n/a	n/a	
11/6/1951 thru 11/7/1951	3:14 a.m.	Heavy Snow	7.6 in.					COOP	n/a	n/a	n/a	
12/14/1951	12:30 a.m.	Heavy Snow	7.2 in.					COOP	n/a	n/a	n/a	
12/17/1951 thru 12/18/1951	12:30 a.m.	Heavy Snow	4.8 in.					COOP	n/a	n/a	n/a	
2/13/1952 thru 2/14/1952	7:30 p.m.	Heavy Snow	5.3 in.			X		COOP	n/a	n/a	n/a	
3/3/1952 thru 3/4/1952	8:00 p.m.	Heavy Snow	6.0 in.			X		COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Peoria County (Participating Municipalities Only)

Figure 62 (Sheet 2 of 19) Severe Winter Storm Events 1950 – 2017													
Date(s)	**Start Time**	**Event Type**	**Magnitude (Maximum)**					**Data Source[2]**	**Injuries**	**Fatalities**	**Property Damages**	**Description**
			Snow	**Freezing Rain[1]**	**Ice[1]**	**Sleet[1]**	**Strong Winds[1]**					
3/2/1954	10:38 a.m.	Heavy Snow	4.3 in.					COOP	n/a	n/a	n/a	
12/29/1954	7:12 a.m.	Heavy Snow	5.1 in.					COOP	n/a	n/a	n/a	
3/22/1955	7:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
3/14/1956	12:10 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
12/8/1956 thru 12/9/1956	4:14 a.m.	Heavy Snow	6.8 in.					COOP	n/a	n/a	n/a	
1/9/1957 thru 1/10/1957	3:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
3/24/1957 thru 3/26/1957	7:24 a.m.	Heavy Snow	8.2 in.					COOP	n/a	n/a	n/a	
12/30/1957 thru 12/31/1957	12:00 p.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
1/20/1958 thru 1/22/1958	2:20 a.m.	Heavy Snow	9.4 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62 (Sheet 3 of 19) Severe Winter Storm Events 1950 – 2017													
Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/20/1959	8:10 a.m.	Heavy Snow	10.0 in.					COOP	n/a	n/a	n/a	
3/15/1960 thru 3/16/1960	8:50 p.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
2/2/1961	3:15 p.m.	Heavy Snow	5.1 in.					COOP	n/a	n/a	n/a	
1/6/1962 thru 1/7/1962	9:15 p.m.	Heavy Snow	5.1 in.					COOP	n/a	n/a	n/a	
2/20/1962 thru 2/21/1962	9:30 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
1/11/1964 thru 1/12/1964	6:15 p.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
12/2/1964 thru 12/3/1964	9:45 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 4 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/27/1966 thru 12/28/1966	8:00 p.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
1/26/1967 thru 1/27/1967	2:35 a.m.	Heavy Snow	11.0 in.					COOP	n/a	n/a	n/a	
3/25/1970 thru 3/26/1970	8:24 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
3/29/1972	n/a	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
12/18/1973 thru 12/19/1973	n/a	Heavy Snow	11.0 in.					COOP	n/a	n/a	n/a	
1/8/1974 thru 1/9/1974	8:30 p.m.	Heavy Snow	4.3 in.					COOP	n/a	n/a	n/a	
2/8/1975	6:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
11/26/1975	8:30 a.m.	Heavy Snow	6.8 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62 (Sheet 5 of 19) Severe Winter Storm Events 1950 – 2017													
Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/30/1978 thru 12/31/1978	11:30 a.m.	Heavy Snow	7.2 in.					COOP	n/a	n/a	n/a	
1/12/1979 thru 1/13/1979	12:00 a.m.	Winter Storm	13.0 in.		X			COOP	n/a	n/a	n/a	
1/23/1979 thru 1/24/1979	3:00 p.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
3/9/1979	n/a	Heavy Snow	4.6 in.					COOP	n/a	n/a	n/a	
4/14/1980	12:30 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
2/10/1981 thru 211/1981	12:30 a.m.	Heavy Snow	7.3 in.					COOP	n/a	n/a	n/a	
2/5/1982	12:30 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
2/18/1982	9:00 a.m.	Heavy Snow	4.0 in.					COOP	n/a	n/a	n/a	
4/8/1982	7:00 a.m.	Heavy Snow	5.9 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 6 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
3/20/1983 thru 3/21/1983	n/a	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
1/29/1984 thru 1/30/1984	2:30 p.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
2/10/1985 thru 2/11/1985	6:00 p.m.	Heavy Snow	4.2 in.					COOP	n/a	n/a	n/a	
2/6/1986 thru 2/7/1986	9:30 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
1/4/1987 thru 1/5/1987	10:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
12/14/1987 thru 12/15/1987	7:00 p.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 7 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/10/1988 thru 2/11/1988	8:30 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
1/25/1990	12:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
2/14/1990 thru 2/15/1990	8:00 a.m.	Ice Storm			X	X		COOP	n/a	n/a	n/a	
1/4/1991 thru 1/5/1991	10:30 a.m.	Heavy Snow	6.0 in.					COOP	n/a	n/a	n/a	
3/12/1991 thru 3/13/1991	7:30 a.m.	Heavy Snow	7.0 in.					COOP	n/a	n/a	n/a	
12/2/1991 thru 12/3/1991	9:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
12/9/1992 thru 12/10/1992	3:00 p.m.	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN Ameren Illinois Weather Records
SED NOAA's Storm Events Database
COOP NWS COOP Observation Station Records

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 8 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/22/1994 thru 2/24/1994	6:00 p.m.	Heavy Snow	8.0 in.					COOP	n/a	n/a	n/a	
12/18/1995 thru 12/19/1995	7:00 p.m.	Winter Storm	1-6 in.	X	X		20-30 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous accidents were reported - numerous power lines knocked down due to freezing rain & strong winds - considerable blowing & drifting of snow closed some roads												
1/18/1996 thru 1/19/1996	10:00 a.m.	Winter Storm	X		X		25-35 mph	SED	n/a	n/a	n/a	- numerous power outages & minor accidents - gusty winds created wind chills near -40°F
1/8/1997 thru 1/9/1997	9:00 p.m.	Heavy Snow	5.3 in.					COOP SED	1	n/a	n/a	numerous accidents were reported
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62 (Sheet 9 of 19) Severe Winter Storm Events 1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/15/1997 thru 1/17/1997	3:00 a.m.	Winter Storm	6.0 in.				20-30 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- after the snow stopped the winds picked up causing near whiteout conditions - strong winds & cold temperatures caused wind chill readings to dip well below -40°F - numerous accidents were reported												
1/24/1997	7:00 a.m.	Winter Storm	1.8 in.	X		X		COOP SED	n/a	n/a	n/a	numerous accidents were reported
1/26/1997 thru 1/27/1997	5:00 a.m.	Winter Storm	4.6 in.					COOP SED	n/a	n/a	n/a	numerous accidents were reported
4/10/1997 thru 4/11/1997	11:00 a.m.	Heavy Snow	11.5 in.					COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous trees, tree branches & power lines collapsed due to the weight of the heavy, wet snow with some causing damage to vehicles & homes - numerous accidents occurred throughout the area with a few minor injuries reported												
12/9/1997 thru 12/10/1997	3:00 p.m.	Heavy Snow	5.7 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 10 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/14/1998	6:00 a.m.	Winter Storm	2.0 in.	X	X	X		COOP SED	n/a	n/a	n/a	several traffic accidents were reported across the area
3/8/1998 thru 3/9/1998	10:00 p.m.	Winter Storm	5.7 in.				50 mph	COOP SED	n/a	n/a	n/a	- numerous traffic accidents were reported with dozens of minor injuries - gusty winds created near white-out conditions
1/1/1999 thru 1/3/1999	12:00 p.m.	Heavy Snow	12.0 in.					COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- after the snowfall winds increased from the northwest and temperatures dropped, causing dangerous wind chills and treacherous driving conditions with extensive blowing and drifting snow - the weight of the heavy snow caused many roofs and porches to collapse - many locations sustained temporary or extended power outages												
3/8/1999 thru 3/9/1999	12:00 p.m.	Heavy Snow	7.5 in.					SED	n/a	n/a	n/a	dozens of accidents occurred throughout the area with numerous minor injuries
1/19/2000	10:00 a.m.	Winter Storm	4.2 in.					COOP SED	n/a	n/a	n/a	- blowing & drifting snow - numerous road closures as well as accidents
Subtotal:									**0**	**0**	**$0**	

[1] An “X” in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service’s (NWS’s) COOP Observation Station records as well as other officially-designated sources identified in NOAA’s Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA’s Storm Events Database

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 11 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/17/2000 thru 2/18/2000	11:00 p.m.	Ice Storm			≤0.5 in.			SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous reports of downed power lines & tree limbs - extended power outage & traffic accidents were reported												
12/11/2000	1:00 a.m.	Winter Storm	8.0 in.	X		X	25-35 mph	SED	n/a	n/a	n/a	*Event Description Provided Below*
- Peoria set a new daily snowfall record, nearly doubling the previous record of 4.4 inches set in 1932 - numerous minor vehicle accidents were reported - northwest winds produced considerable blowing & drifting snow along with wind chills of -30°F to -40°F												
1/30/2002 thru 1/31/2002	7:00 p.m.	Winter Storm	6.0 in.		≤0.5 in.			COOP SED	n/a	n/a	n/a	several trees & power lines were downed from ice accumulations with outages lasting several hours to a couple days
3/1/2002 thru 3/2/2002	5:00 p.m.	Heavy Snow	4.5 in.				40 mph	COOP SED	n/a	n/a	n/a	- significant blowing & drifting snow - numerous traffic accidents reported
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 12 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
3/25/2002	5:00 a.m.	Winter Storm	2.5 in.				X	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- numerous accidents occurred as a result of the snow-covered roads & decreased visibility - significant blowing & drifting snow created near whiteout conditions												
11/24/2004	3:00 p.m.	Winter Storm	5.0 in.				20-30 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- sustained winds with gusts of 40 to 50 mph caused considerable blowing & drifting - the high winds & weight of the wet snow downed numerous trees & power lines - traffic accidents resulted in numerous injuries												
1/5/2005 thru 1/6/2005	1:00 p.m.	Ice Storm		X	≤0.5 in.			SED	n/a	n/a	n/a	numerous reports of downed trees & power lines as well as traffic accidents
3/21/2006	n/a	Heavy Snow	5.3 in.					COOP	n/a	n/a	n/a	
11/30/2006 thru 12/1/2006	4:00 a.m.	Winter Storm	11.0 in.	X	X	X		COOP SED	4	n/a	n/a	*Event Description Provided Below*
- ***This event was part of a state-declared disaster*** - considerable tree & power line damage was caused by ice and heavy snow - the power was not restored across some locales for several days - snow- & ice-covered roads resulted in numerous vehicular accidents - 4 individuals were injured at a nursing home in Peoria when a portion of the roof collapsed under the weight of the snow												
Subtotal:									**4**	**n/a**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records
COOP	NWS COOP Observation Station Records
SED	NOAA's Storm Events Database

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 13 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum) Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]	Data Source[2]	Injuries	Fatalities	Property Damages	Description
1/12/2007 thru 1/13/2007	2:30 p.m.	Ice Storm		X	0.25 in.			COOP SED	n/a	n/a	n/a	- modest tree limb & power line damage was reported - numerous vehicle accidents occurred
2/6/2007	n/a	Heavy Snow	4.5 in.					COOP	n/a	n/a	n/a	
2/13/2007	12:00 a.m.	Blizzard	8.0 in.				35-45 mph	COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
- significant blowing & drifting occurred - many locations reported snow drifts of 3 to 6 feet, prompting the closure of several area roads												
2/24/2007	11:00 a.m.	Ice Storm		X	X	X		SED	n/a	n/a	n/a	
12/1/2007	9:00 a.m.	Ice Storm		X	0.25 in.	X		COOP SED	n/a	n/a	n/a	numerous power outages & minor vehicle accidents occurred
12/18/2008 thru 12/19/2008	8:00 p.m.	Ice Storm			≤0.6 in.			SED	n/a	n/a	$500,000	widespread tree damage & power outages reported
3/29/2009	12:00 a.m.	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$500,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 14 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/25/2009 thru 12/27/2009	6:00 p.m.	Heavy Snow	10.0 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
1/6/2010 thru 1/7/2010	7:00 p.m.	Winter Storm	7.2 in.				X	COOP SED	n/a	n/a	n/a	gusty northwesterly wind created considerable blowing & drifting across the area
2/8/2010 thru 2/9/2010	1:00 p.m.	Winter Storm	6.3 in.				X	COOP SED	n/a	n/a	n/a	gusty northwesterly winds caused considerable blowing & drifting
2/21/2010 thru 2/22/2010	7:00 a.m.	Winter Storm	5.0 in.					COOP SED	n/a	n/a	n/a	
12/12/2010 thru 12/13/2010	7:00 a.m.	Blizzard	0.6 in.				35 mph	SED	n/a	n/a	n/a	- strong northwesterly winds gusting over 50 mph at times created white-out conditions - wind chill values plunged well below zero
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 15 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/24/2010 thru 12/25/2010	10:30 a.m.	Heavy Snow	5.7 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported on Christmas Eve
1/11/2011 thru 1/12/2011	n/a	Heavy Snow	5.8 in.					COOP	n/a	n/a	n/a	*Event Description Provided Below*
Ameren (regional information, including Tazewell County) - 110,000 customers were without power for up to 5 days - 33 wires downed - 20 poles replaced - 23 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 9 service lines to individual customers damaged												
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 16 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/1/2011 thru 2/2/2011	12:00 p.m.	Blizzard	10.2 in.	X		X	45-55 mph	AMRN COOP SED	n/a	n/a	$750,000	*Event Description Provided Below*
- ***This event was part of a federally-declared disaster (Declaration #1960)*** - event created nearly impossible travel conditions at times and resulted in multiple accidents & injuries across the region - numerous county highways & several interstates were closed including I-74 - all schools were closed for at least 3 days - thundersnow was reported on the 1st *Ameren (regional information, including Peoria County)* - 14,000 customers were without power for up to 3 days - 1,494 wires downed - 104 poles replaced - 470 service lines to individual customers damaged - 718 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,144 Ameren personnel responded to the event												
1/12/2012 thru 1/13/2012	n/a	Heavy Snow	5.2 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$750,000**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 17 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/20/2012	1:00 p.m.	Blizzard	2.5 in.				50 mph	AMRN COOP SED	n/a	n/a	n/a	*Event Description Provided Below*
<u>*Ameren (regional information, including Peoria County)*</u> - 78,000 customers were without power for 2 days - 826 wires downed - 150 poles replaced - 191 service lines to individual customers damaged - 499 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,803 Ameren personnel responded to the event - numerous traffic accidents were reported across the county - several large, mainly-dead trees were blown down around Peoria												
3/5/2013	n/a	Heavy Snow	5.2 in.					COOP	n/a	n/a	n/a	
3/24/2013	n/a	Heavy Snow	4.6 in.					COOP	n/a	n/a	n/a	
12/13/2013 thru 12/14/2013	5:00 p.m.	Winter Storm	6.8 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents were reported
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:
AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 18 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/4/2014 thru 1/5/2014	8:00 p.m.	Heavy Snow	6.5 in.				X	SED	n/a	n/a	n/a	*Event Description Provided Below*
- significant blowing & drifting caused numerous road closures and traffic accidents across the County - many schools, businesses & churches were closed												
2/1/2014	3:00 a.m.	Heavy Snow	7.1 in.					SED	n/a	n/a	n/a	numerous traffic accidents were reported
2/17/2014	7:30 a.m.	Heavy Snow	3.2 in.			≤0.5 in.		COOP	n/a	n/a	n/a	*Event Description Provided Below*
- numerous traffic accidents were reported *Ameren (regional information, including Tazewell County)* - 48,827 customers were without power for up to 5 days - 433 wires downed - 31 poles replaced - 184 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 151 service lines to individual customers damaged - 3,252 Ameren personnel responded to the event												
1/5/2015 thru 1/6/2015	4:00 p.m.	Heavy Snow	6.0 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents occurred
2/1/2015	2:00 a.m.	Heavy Snow	7.0 in.					COOP SED	n/a	n/a	n/a	numerous traffic accidents occurred
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Acronyms:

AMRN	Ameren Illinois Weather Records	SED	NOAA's Storm Events Database
COOP	NWS COOP Observation Station Records		

Peoria County (Participating Municipalities Only)

Figure 62
(Sheet 19 of 19)
Severe Winter Storm Events
1950 – 2017

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
11/21/2015 thru 11/22/2015	n/a	Heavy Snow	5.0 in.					COOP	n/a	n/a	n/a	
12/28/2015	5:00 a.m.	Ice Storm	2.5 in.	X	≤0.5 in.		45-55 mph	AMRN COOP SED	n/a	n/a	$1,700,000	*Event Description Provided Below*
- ice combined with wind gusts caused extensive damage to trees, power poles & power lines - several homes were damaged by falling trees and tree branches - about 75,000 individuals lost power for up to 3 days in the County - numerous businesses were closed in Peoria due to power outages - Peoria OEM Coordinator indicated there were downed power lines & trees and flooded basements due to power outages in the City								Ameren (regional information, including Peoria County) - 192,000 customers were without power for up to 3.5 days - 1,087 wires downed - 445 poles replaced - 882 service lines to individual customers damaged - 939 tree orders received for trees/tree limbs that either fell on a line and caused an outage or were on a line and had to be removed - 1,526 Ameren personnel responded to the event				
3/13/2017	n/a	Heavy Snow	4.1 in.					COOP	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$1,700,000**	
GRAND TOTAL:									**4**	**0**	**$2,950,000**	

1 An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.

2 Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and weather records from Ameren.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Tony O'Neal, Emergency Response Specialist – Illinois Crisis Management, Ameren Illinois.
Tri-County MAC member responses to Natural Hazard Events Questionnaire.

Acronyms:

AMRN Ameren Illinois Weather Records
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Peoria County (Participating Municipalities Only)

Figure 63
(Sheet 1 of 2)
Extreme Cold Events
1996 – 2017

Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
2/2/1996 thru 2/4/1996	12:00 a.m.	Extreme Cold	-19°F	0°F	n/a	SED	n/a	1	n/a	*Event Description Provided Below*
- new record low temperature set at Peoria on the 3rd - new record high temperature was also set at Peoria when the temperature never went above zero on the 2nd and 3rd - many people experienced problems with frozen pipes and vehicles - a 79-year-old woman froze to death on her front porch in Peoria when she mistakenly thought she was locked out of her home										
1/16/1997 thru 1/17/1997	n/a	Wind Chill	-10°F	11°F	-40°F	MRCC SED	n/a	n/a	n/a	temperatures fell below zero across the entire area
1/5/1999	5:00 a.m.	Extreme Cold	-19°F	n/a	n/a	SED	n/a	n/a	n/a	bitterly cold morning temperatures were recorded across the region
1/15/2009 thru 1/16/2009	12:00 a.m.	Extreme Cold/ Wind Chill	-21°F	11°F	-35°F	MRCC SED	n/a	n/a	n/a	
1/6/2014 thru 1/7/2014	12:00 a.m.	Extreme Cold/ Wind Chill	-14°F	11°F	-45°F	MRCC SED	n/a	n/a	n/a	- schools & numerous businesses closed for the day - warming centers activated
Subtotal:							**0**	**1**	**$0**	

[1] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center.

Acronyms:

COOP	NWS COOP Observation Station Records	SED	NOAA's Storm Events Database
MRCC	Midwestern Regional Climate Center		

Peoria County (Participating Municipalities Only)

Figure 63 (Sheet 2 of 2) Extreme Cold Events 1996 – 2017										
Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
1/27/2014 thru 1/28/2014	12:00 a.m.	Extreme Cold/ Wind Chill	-5°F	13°F	-30°F	MRCC SED	n/a	n/a	n/a	
1/7/2015 thru 1/8/2015	8:00 p.m.	Wind Chill	-8°F	25°F	-30°F	MRCC SED	n/a	n/a	n/a	
12/18/2016 thru 12/19/2016	12:00 a.m.	Wind Chill	-6°F	17°F	-20°F	MRCC SED	n/a	1	n/a	a Peoria man died of hypothermia on the 18th after he was found lying on a sidewalk
12/30/2017 thru 12/31/2017	6:00 a.m.	Extreme Cold/ Wind Chill	-16°F	7°F	-15°F	MRCC SED	n/a	1	n/a	an 86-year old woman fell outside of her home and died of hypothermia in Peoria on the 30th
Subtotal:							**0**	**2**	**$0**	
GRAND TOTAL							**0**	**3**	**$0**	

[1] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center.

Sources: Midwestern Regional Climate Center, MRCC Application Tools Environment, cli-MATE Database.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database
MRCC Midwestern Regional Climate Center

3.3 FLOODS

HAZARD IDENTIFICATION

What is the definition of a flood?

The Federal Emergency Management Agency (FEMA) defines a "flood" as a general or temporary condition where two or more acres of normally dry land or two or more properties are inundated by:

- overflow of inland or tidal waters;
- unusual and rapid accumulation or runoff of surface waters from any source;
- mudflows; or
- a sudden collapse or subsidence of shoreline land.

The severity of a flooding event is determined by a combination of topography and physiography, ground cover, precipitation and weather patterns and recent soil moisture conditions. On average, flooding causes more than $5 billion in damages each year in the United States. Floods cause utility damage and outages, infrastructure damage (both to transportation and communication systems), structural damage to buildings, crop loss, decreased land values and impede travel.

What types of flooding occur in Tri-County area?

There are two main types of flooding that affect the Tri-County area: general flooding and flash flooding. General flooding can be broken down into two categories: riverine flooding and shallow flooding. The following provides a brief description of each type.

General Flooding – Riverine Flooding

Riverine flooding occurs when the water in a river or stream gradually rises and overflows its banks. This type of flooding affects low lying areas near rivers, streams, lakes and reservoirs and generally occurs when:

- persistent storm systems enter the area and remain for extended periods of time,
- winter and spring rains combine with melting snow to fill river basins with more water than the river or stream can handle,
- ice jams create natural dams which block normal water flow, and
- torrential rains from tropical systems make landfall.

General Flooding – Shallow Flooding

Shallow flooding occurs in flat areas where there are no clearly defined channels (i.e., rivers and streams) and water cannot easily drain away. There two main types of shallow flooding: sheet flow and ponding. If the surface runoff cannot find a channel, it may flow out over a large area at a somewhat uniform depth in what's called sheet flow. In other cases, the runoff may collect in depressions and low-lying areas where it cannot drain out, creating a ponding effect. Ponding floodwaters do not move or flow away, they remain in the temporary ponds until the water can infiltrate the soil, evaporate or are pumped out.

Flash Floods

Flash flooding occurs when there is a rapid rise of water along a stream or low-lying area. This type of flooding generally occurs within six hours of a significant rain event and is usually produced when heavy localized precipitation falls over an area in a short amount of time. Considered the most dangerous type of flood event, flash floods happen quickly with little or no warning. Typically, there is no time for the excess water to soak into the ground nor are the storm sewers able to handle the sheer volume of water. As a result, streams overflow their banks and low-lying (such as underpasses, basements etc.) areas can rapidly fill with water.

Flash floods are very strong and can tear out trees, destroy buildings and bridges and scour out new channels. Flash flood-producing rains can also weaken soil and trigger debris flows that damage homes, roads and property. A vehicle caught in swiftly moving water can be swept away in a matter of seconds. Twelve inches of water can float a car or small SUV and 18 inches of water can carry away large vehicles.

What is a base flood?

A base flood refers to any flood having a 1% chance of occurring in any given year. It is also known as the 100-year flood or the one percent annual chance flood. The base flood is the national standard used by the National Flood Insurance Program (NFIP) and the State of Illinois for the purposes of requiring the purchase of flood insurance and regulating new development.

Many individuals misinterpret the term “100-year flood”. This term is used to describe the risk of future flooding; it does not mean that it will occur once every 100 years. Statistically speaking, a 100-year flood has a 1/100 (1%) chance of occurring in any given year. In reality, a 100-year flood could occur two times in the same year or two years in a row, especially if there are other contributing factors such as unusual changes in weather conditions, stream channelization or changes in land use (i.e., open space land developed for housing or paved parking lots). It is also possible not to have a 100-year flood event over the course of 100 years.

While the base flood is the standard most commonly used for floodplain management and regulatory purposes in the United States, the 500-year flood is the national standard for protecting critical facilities, such as hospitals and power plants. A 500-year flood has a 1/500 (0.2%) chance of occurring in any given year.

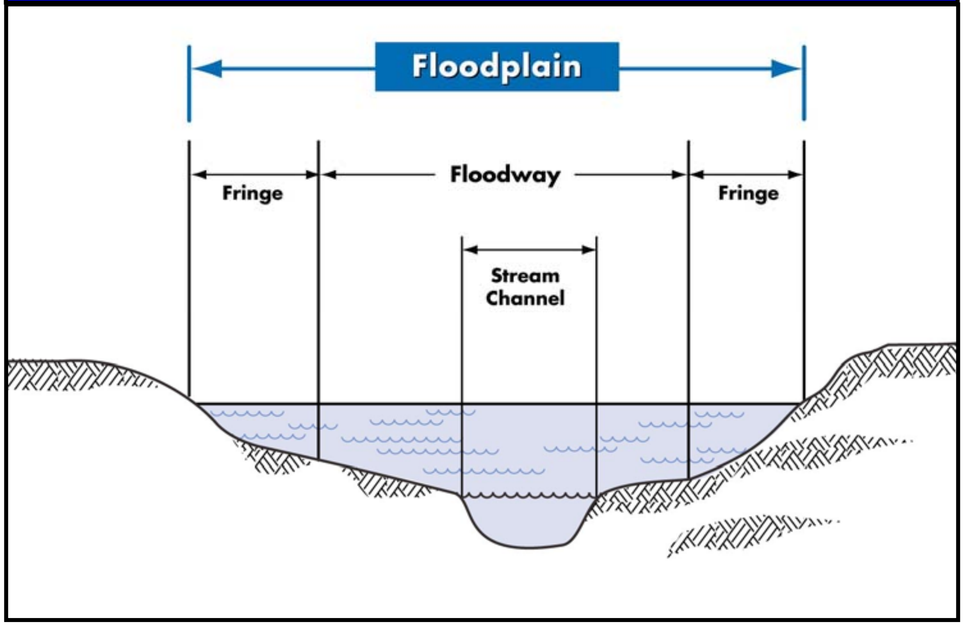
What is a floodplain?

The general definition of a floodplain is any land area susceptible to being inundated or flooded by water from any source (i.e., river, stream, lake, estuary, etc.). This general definition differs slightly from the regulatory definition of a floodplain.

A regulatory or base floodplain is defined as the land area that is covered by the floodwaters of the base flood. This land area is subject to a 1% chance of flooding in any given year. The base floodplain is also known as the 100-year floodplain or a Special Flood Hazard Area (SFHA). It is this second definition that is generally most familiar to people and the one that is used by the NFIP and the State of Illinois.

A base floodplain is divided into two parts: the floodway and the flood fringe. **Figure 69** illustrates the various components of a base floodplain.

Figure 69
Floodplain Illustration



Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

The floodway is the channel of a river or stream and the adjacent floodplain that is required to store and convey the base flood without increasing the water surface elevation. Typically, the floodway is the most hazardous portion of the floodplain because it carries the bulk of the base flood downstream and is usually the area where water is deepest and is moving the fastest. Floodplain regulations prohibit construction within the floodway that results in an increase in the floodwater's depth and velocity.

The flood fringe is the remaining area of the base floodplain, outside of the floodway, that is subject to shallow inundation and low velocity flows. In general, the flood fringe plays a relatively insignificant role in storing and discharging floodwaters. The flood fringe can be quite wide on large streams and quite small or nonexistent on small streams. Development within the flood fringe is typically allowed via permit if it will not significantly increase the floodwater's depth or velocity and the development is elevated above or otherwise protected to the base flood elevation.

What is a Special Flood Hazard Area?

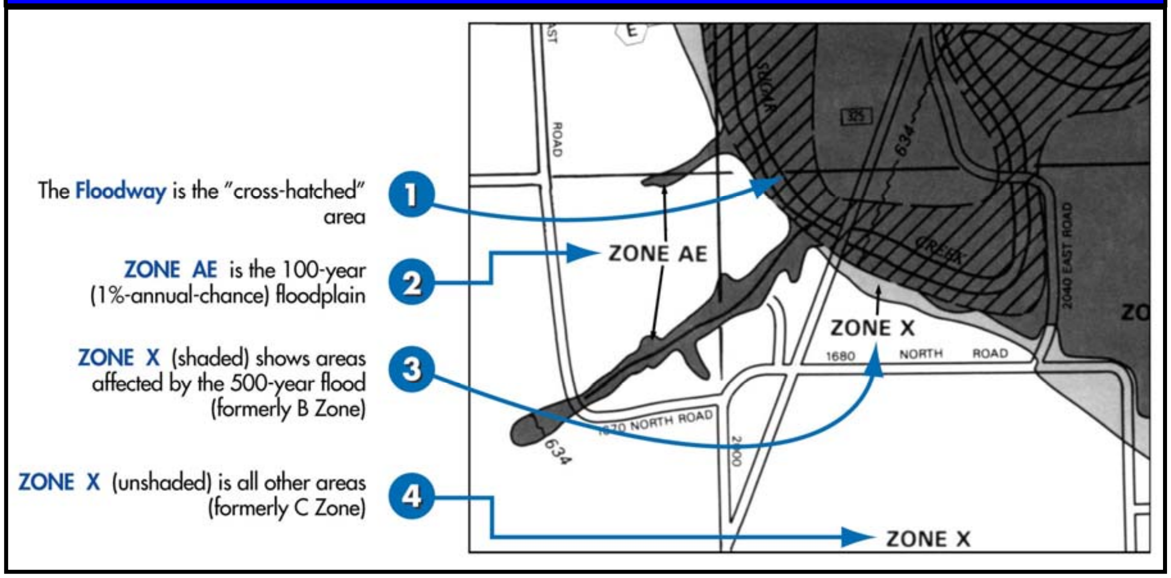
A Special Flood Hazard Area (SFHA) is the base floodplain. As discussed previously, this is the land area that is covered by the floodwaters of the base flood and has a 1% chance of flooding in any given year. The term SFHA is most commonly used when referring to the based floodplain on the Flood Insurance Rate Maps (FIRM) produced by FEMA. The SFHA is the area where floodplain regulations must be enforced by a community as a condition of participation in the

NFIP and the area where mandatory flood insurance purchase requirements apply. SFHA are delineated on the FIRMs and may be designated as Zones A, AE, A1-30, AO, AH, AR, and A99 depending on the amount of flood data available, the severity of the flood hazard or the age of the flood map.

What are Flood Insurance Rate Maps?

Flood Insurance Rate Maps (FIRMs) are maps that identify both the SFHA and the risk premium zones applicable to a community. These maps are produced by FEMA in association with the NFIP for floodplain management and insurance purposes. Digital versions of these maps are referred to as DFIRMs. **Figure 70** shows an example of a FIRM.

Figure 70
Example of a Flood Insurance Rate Map (FIRM)



Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

A FIRM will generally show a community's base flood elevations, flood zones and floodplain boundaries. The information presented on a FIRM is based on historic, meteorological, hydrologic and hydraulic data as well as open-space conditions, flood-control projects and development. ***These maps only define flooding that occurs when a creek or river becomes overwhelmed. They do not define overland flooding that occurs when an area receives extraordinarily intense rainfall and storm sewers and roadside ditches are unable to handle the surface runoff.***

What are flood zones?

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk and type of flooding. These zones are depicted on a community's FIRM. The following provides a brief description of each flood zone.

- **Zone A.** Zone A, also known as the Special Flood Hazard Area (SFHA) or base floodplain, is defined as the floodplain area that has a 1% chance of flooding in any given year. There are multiple Zone A designations, including Zones A, AO, AH, A1-30, AE, AR or A99. Land areas located within Zone A are at a high risk for flooding.

  During a 30-year period, the length of many mortgages, there is at least a 1 in 4 chance that a base flood will occur in a SFHA. All home and business owners in SFHAs with mortgages from federally regulated or insured lenders are required to purchase flood insurance.

- **Zone X (shaded).** Zone X (shaded), formerly known as Zone B, is defined as the floodplain area between the limits of the base flood (Zone A) and the 500-year flood. Land areas located within Zone X (shaded) are affected by the 500-year flood and are considered at a moderate risk for flooding.

  Zone X (shaded) is also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, shallow flooding areas with average depths of less than one foot or drainage areas less than one square mile. While flood insurance is not federally required in Zone X (shaded), it is recommended for all property owners and renters.

- **Zone X (unshaded).** Zone X (unshaded), formerly known as Zone C, is defined as all other land areas outside of Zone A and Zone X (shaded). Land areas located in Zone X (unshaded) are considered to have a low or minimal risk of flooding. While flood insurance is not federally required in Zone X (unshaded), it is recommended for all property owners and renters.

What is a Repetitive Loss Structure or Property?

FEMA defines a "repetitive loss structure" as a National Flood Insurance Program-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978. These structures/properties account for approximately one-fourth of all National Flood Insurance Program (NFIP) insurance claim payments since 1978.

Currently, repetitive loss properties make up 1.3% of all policies, but are expected to account for 15% to 20% of future losses. These structures not only increase the NFIP's annual losses, they drain funds needed to prepare for catastrophic events. As a result, FEMA and the NFIP are working with states and local governments to mitigate these properties.

What is floodplain management?

Floodplain management is the administration of an overall community program of corrective and preventative measures to reduce flood damage. These measures take a variety of forms and generally include zoning, subdivision or building requirements, special-purpose floodplain ordinances, flood control projects, education and planning. Where floodplain development is permitted, floodplain management provides a framework that minimizes the risk to life and property from floods by maintaining a floodplain's natural function. Floodplain management is a key component of the National Flood Insurance Program.

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) is a federal program, administered by FEMA, that:

- mitigates future flood losses nationwide through community-enforced building and zoning ordinances; and
- provides access to affordable, federally-backed insurance protection against losses from flooding to property owners in participating communities.

It is designed to provide an insurance alternative to disaster assistance to meet escalating costs of repairing damage to buildings and their contents due to flooding. The U.S. Congress established the NFIP on August 1, 1968 with the passage of the National Flood Insurance Act of 1968. This Program has been broadened and modified several times over the years, most recently with the passage of the Flood Insurance Reform Act of 2004.

Prior to the creation of the NFIP, the national response to flood disasters was generally limited to constructing flood-control projects such as dams, levees, sea-walls, etc. and providing disaster relief to flood victims. While flood-control projects were able to initially reduce losses, their gains were offset by unwise and uncontrolled development practices within floodplains. In light of the continued increase in flood losses and the escalating costs of disaster relief to taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for protection.

Participation in the NFIP is voluntary and based on an agreement between local communities and the federal government. If a community agrees to adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in a SFHA (base floodplain), then the government will make flood insurance available within the community as a financial protection against flood losses.

If a community chooses not to participate in the NFIP or a participating community decides not to adopt new floodplain management regulations or amend its existing regulations to reference new flood hazard data provided by FEMA, then the following sanctions will apply.

- Property owners will not be able to purchase NFIP flood insurance policies and existing policies will not be renewed.
- Federal disaster assistance will not be provided to repair or reconstruct insurable buildings located in identified flood hazard areas for presidentially-declared disasters that occur as a result of flooding.
- Federal mortgage insurance and loan guarantees, such as those written by the Federal Housing Administration and the Department of Veteran Affairs, will not be provided for acquisition or construction purposes within an identified flood hazard area. Federally-insured or regulated lending institutions, such as banks and credit unions, are allowed to make conventional loans for insurable buildings in identified flood hazard areas of non-participating communities. However, the lender must notify applicants that

the property is in an identified flood hazard area and that it is not eligible for federal disaster assistance.

- Federal grants or loans for development will not be available in identified flood hazard areas under programs administered by federal agencies such as the Environmental Protection Agency, Small Business Administration and the Department of Housing and Urban Development.

What is the NFIP's Community Rating System?

The NFIP's Community Rating System (CRS) is a voluntary program developed by FEMA to provide incentives (in the form of flood insurance premium discounts) for NFIP participating communities that have gone beyond the minimum NFIP floodplain management requirements to develop extra measures to provide protection from flooding. CRS discounts on flood insurance premiums range from 5% up to 45%. Those discounts provide an incentive for new flood protection activities that can help save lives and property in the event of a flood.

Are alerts issued for flooding?

Yes. The National Weather Service Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***flood watches*** and ***warnings*** for Peoria, Tazewell and Woodford Counties depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watches.** A flood watch is issued when flooding or flash flooding is possible. It does not mean that flooding is imminent, just that individuals need to be alert and prepared.
- **Warnings.** Warnings indicate imminent danger to life and property for those who are in the area of the flooding.
  - **Flood Warning**. A flood warning is issued when flooding is occurring or will occur soon and is expected to last for several days or weeks.
  - **Flash Flood Warning.** A flash flood warning is issued when flash flooding is occurring or is imminent.

3.3.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of floods; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When has flooding occurred previously? What is the extent of these previous floods?

Figures 71 and **72**, located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of flood events recorded in Tazewell County. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

General Floods

NOAA's Storm Events Database, NOAA's Storm Data Publications and the U.S. Army Corps of Engineers' river gauge data have documented 24 occurrences of general flooding in Tazewell County between 1950 and 2017. Included in the 24 general flood events are seven events that contributed to six separate federally-declared disasters for Tazewell County. One declared disaster, Declaration #4116, included both general and flash flooding events.

Flood Fast Facts – Occurrences

Number of General Floods Reported (1950 – 2017): ***24***

Number of Flash Floods Reported (1990 – 2017): ***30***

Most Likely Month for General Floods to Occur: ***April***

Most Likely Month for Flash Floods to Occur: ***June***

Most Likely Time for Flash Floods to Occur: ***Afternoon***

Number of Federal Disaster Declarations Related to General and Flash Flooding: ***7***

Based on historical gauge data, the record setting Illinois River flood in this area occurred on April 23, 2013 when the Illinois River crested at 29.32 feet at Peoria. The second and third highest crest at this location occurred in 1943 and 1979 respectively.

Flash Floods

NOAA's Storm Events Database and NOAA's Storm Data Publications documented 30 reported occurrences of flash flooding in Tazewell County between 1990 and 2017. Included in the 30 flash flood events are four events that contributed to two separate federally-declared disasters in Tazewell County. One declared disaster, Declaration #4116, included both general and flash flooding events.

Figure 73 charts the reported occurrences of flooding by month. Of the 24 general flood events, 19 (79%) began in February, March, April and May making this the peak period for general floods in Tazewell County. Of the 19 events, six (31.5%) began in April making this the peak month for general flooding. There were 20 events that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

In comparison, 21 of the 30 flash flood events (70%) took place between May and June making this the peak period for flash floods. Of the 21 events, 12 (57%) occurred in June making this the peak month for flash flooding.

Figure 74 charts the reported occurrences of flash flood events by hour. Approximately 63% of the 30 flash flood events began during the p.m. hours, with 14 of the events (47%) taking place between 3:00 p.m. and 9:00 p.m. In comparison 67% of general flood events with recorded times began during the p.m. hours.

What locations are affected by floods?

While specific locations are affected by general flooding, most areas of the County can be impacted by overland and flash flooding because of the topography and seasonally high-water table of the area. Nine percent of the area in Tazewell County is designated as being within the base floodplain and susceptible to riverine floods. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Tazewell County's hazard rating for floods as "high."

Figure 73
Graph: Flood Events by Month Tazewell County

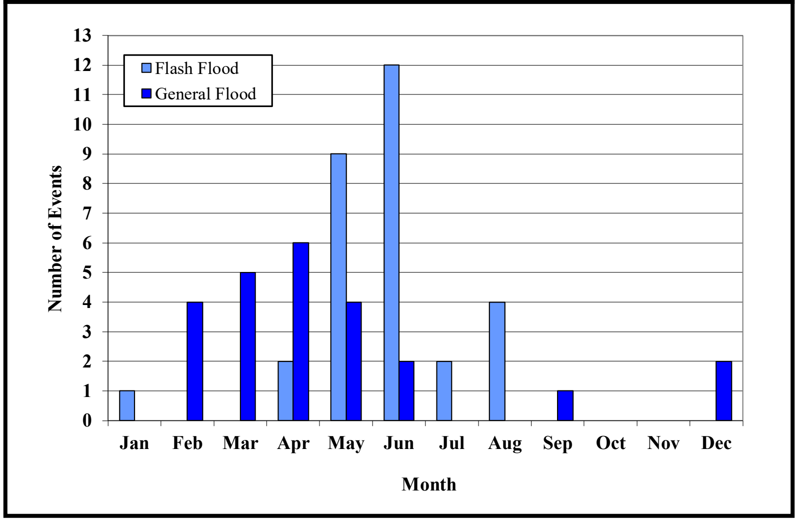


Figure 74
Graph: Flash Flood Events by Hour Tazewell County

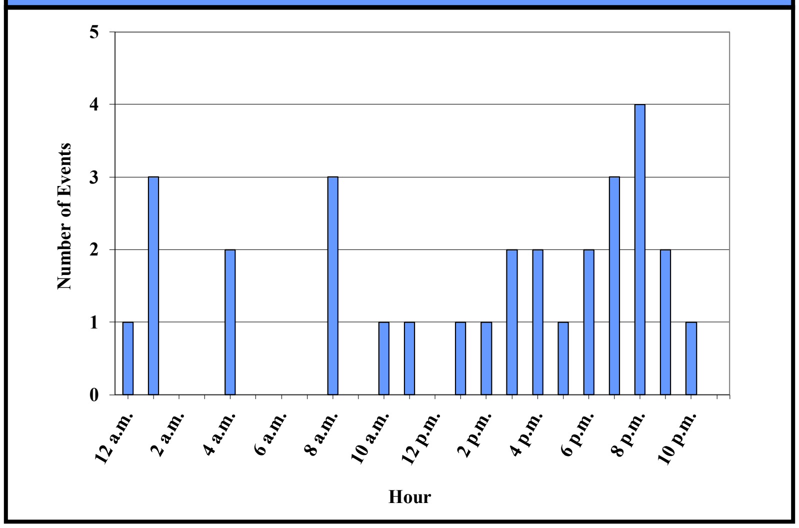


Figure 75 identifies the floodplains in Tazewell County as well as the participating jurisdictions. This map is based on the Tazewell County DFIRMs that became effective in February 17, 2017. **Appendix J** contains maps identifying the floodplains located in the participating municipalities. While a large portion of the area prone to riverine flooding is in unincorporated portions of the County, Pekin, East Peoria, Morton, Pekin and Washington are also susceptible to riverine flooding because of their proximity to floodplains.

Figure 75
Floodplain Areas in Tazewell County

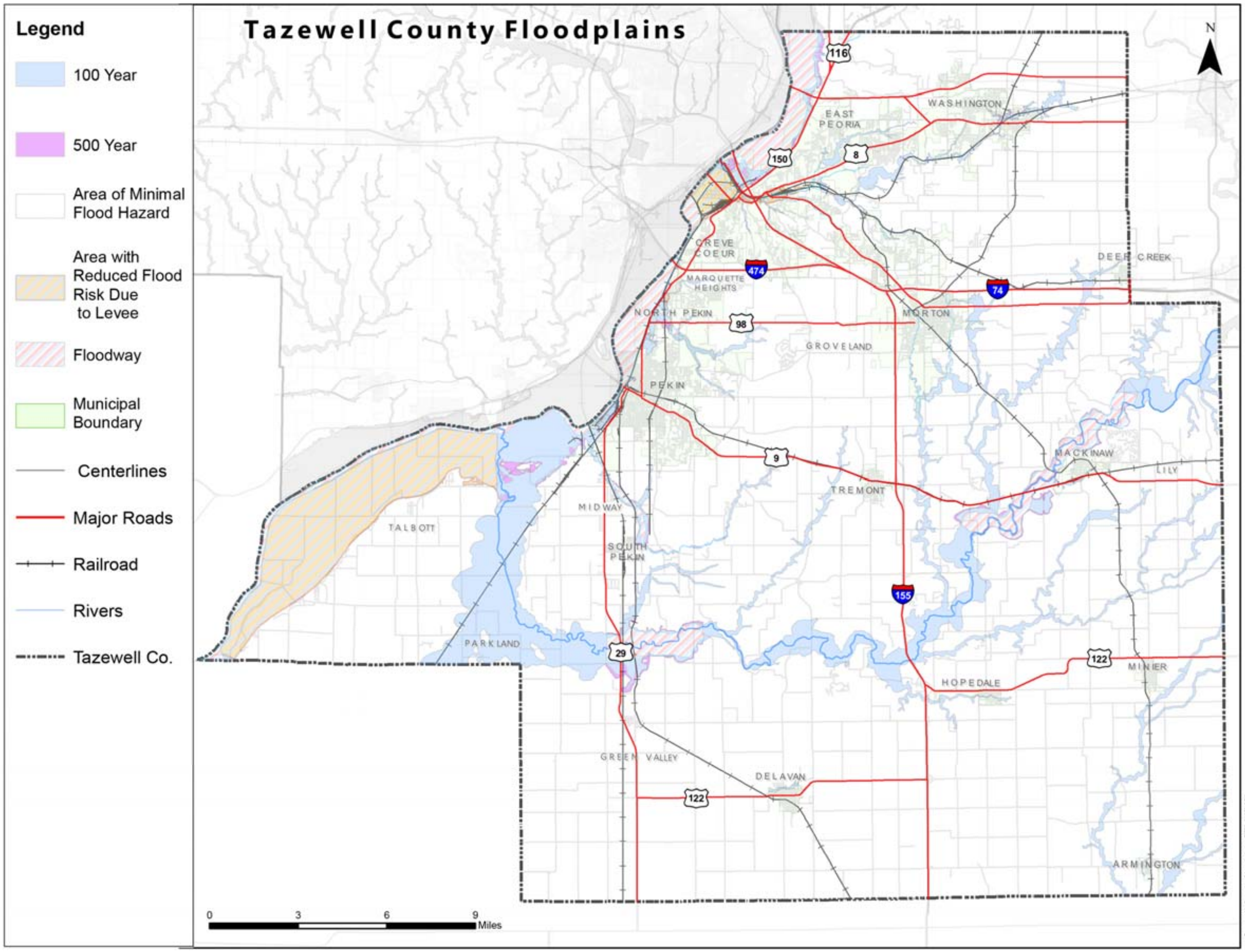


Figure 76 identifies the bodies of water within or immediately adjacent to participating jurisdictions that are known to cause flooding or have the potential to flood. Water bodies with Special Flood Hazard Areas located within a participating jurisdiction (as identified on the DFIRMs) are identified in bold.

Figure 76
Bodies of Water Subject to Flooding – Tazewell County

Participating Jurisdiction	Water Bodies
East Peoria	**Ackerman Creek, Cole Creek, Dempsey Creek, Farm Creek, Farm Creek Diversion Channel, Fond Du Lac Creek, Illinois River, Kerfoot Creek, Peoria Lake, School Creek, Tributary No. 3**
Morton	**Ackerman Creek, Bull Run Creek, Prairie Creek, Tributary Bull Run Creek**
Pekin	**Illinois River, Lick Creek, Pekin Lake, Tributary Lick Creek, Worley Lake**
Tremont	---
Washington	**Farm Creek, Tributary Farm Creek, Tributary No. 1, Tributary No. 1A, Tributary No. 2, Tributary No.3**
Unincorporated Tazewell County	**Ackerman Creek, Alloway Creek**, Breedlove Ditch, Brock Lake, **Bull Run Creek, Cole Creek**, Crane Creek, Day Ditch, **Deer Creek, Dempsey Creek, Dillon Creek**, Dry Creek, **Farm Creek Diversion Channel, Farm Creek, Fond Du Lac Creek, Funks Branch**, Heritage Lake, Hickory Grove Ditch, **Hollands Creek, Illinois River, Indian Creek, Kerfoot Creek, Little Lick Creek, Little Mackinaw River, Lost Creek, Mackinaw River**, Main Ditch, Main Ditch, **Middle Fork Sugar Creek**, Minier Lake, **Mud River**, Northern Oaks Lake, **Pekin Lake, Peoria Lake**, Powerton Lake, **Prairie Creek, Rock Creek, Sargent Slough, School Creek**, Spring Creek, Spring Lake Canal, Spring Lake, **Ten Mile Creek, Tributary Bull Run Creek, Tributary Indian Creek, Tributary Lick Creek, Tributary Mackinaw River, Tributary Middle Fork Sugar Creek, Tributary No. 1, Tributary No. 2, Tributary No.3**, Tributary Walnut Creek, **Tributary West Fork Sugar Creek, Upper Peoria** Lake, Walnut Creek, **West Fork Sugar Creek**, West Lake, **Whitten Branch, Willow Creek**

Source: FEMA DFIRMs

Municipal and County officials have reported overland flood issues outside of the base floodplain in most of the participating municipalities and many unincorporated portions of the County. This overland flooding is known to impair travel.

What jurisdictions within the County take part in the NFIP?

Participating Jurisdictions

All of the participating jurisdictions take part in the NFIP. **Figure 77** provides information about each jurisdiction's participation in the NFIP, including the date each participant joined, the date of their most recent FIRM, their status in the Community Rating System and the year of their most recently adopted floodplain zoning ordinance.

Non-Participating Jurisdictions

Figure 78 provides information on those incorporated municipalities within the County that chose not to participate in the planning process but also take part in the NFIP. Green Valley and South Pekin have no identified flood hazard boundaries within their corporate limits and are not required to participate.

Figure 77 Participating Jurisdictions' NFIP Status – Tazewell County				
Participating Jurisdictions	**Participation Date**	**Current Effective FIRM Date**	**CRS Participation**	**Most Recently Adopted Floodplain Zoning Ordinance**
Tazewell County	08/01/1980	02/17/2017	No	2017
East Peoria	12/04/1979	02/17/2017	No	2017
Morton	09/02/1988	02/17/2017	No	2017
Pekin	06/04/1980	02/17/2017	No	2016
Tremont	11/27/2017	02/17/2017	No	2017
Washington	02/05/2017	02/17/2017	No	2016

Sources: FEMA, Community Status Book.
FEMA, National Flood Insurance Program Flood Insurance Manual.
MAC member responses to List of Existing Planning Documents Questionnaire.

Figure 78 Non-Participating Jurisdictions' NFIP Status – Tazewell County							
Jurisdiction	**Participation Date**	**Current Effective FIRM Date**	**CRS Participation**	**Jurisdiction**	**Participation Date**	**Current Effective FIRM Date**	**CRS Participation**
Armington	07/03/1985	02/17/2017	No	Mackinaw	07/03/2017	02/17/2017	No
Creve Coeur	07/23/1981	02/17/2017	No	Marquette Heights	07/03/1985	02/17/2017	No
Deer Creek	07/03/1985	02/17/2017	No	Minier	11/05/1986	02/17/2017	No
Delavan	05/28/2002	02/17/2017	No	North Pekin	06/04/1980	02/17/2017	No
Hopedale	07/18/1985	02/17/2017	No				

Sources: FEMA, Community Status Book.
FEMA, National Flood Insurance Program Flood Insurance Manual.

Jurisdictions that participate in the NFIP are expected to adopt and enforce floodplain management regulations. In Tazewell County, all the NFIP participating jurisdictions have adopted the State of Illinois model floodplain ordinance. This ordinance goes above and beyond NFIP minimum standards and has much more restrictive floodway regulations. As a result, all of the NFIP participating jurisdictions are in compliance with NFIP requirements.

Participating jurisdictions will continue to comply with the NFIP through the implementation of mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within SFHAs. At this time no new construction is planned within the base floodplain. Continued compliance with NFIP requirements for those jurisdictions that participated in the Plan update are addressed in the Mitigation Action Tables found in Section 4.7.

What is the probability of future flood events occurring?

General Floods

Tazewell County has had 24 verified occurrences of general flooding between 1950 and 2017. With 24 occurrences over the past 68 years, the probability or likelihood of a general flood event occurring in Tazewell County in any given year is 35%. However, gaps in the flood data between 1950 and 1995 cause a distortion in this probability. If only the events recorded in NOAA's Storm Events Database and supplemented by U.S. Army Corps of Engineer river gauge data are analyzed, then there have been 11 verified occurrences of general flooding between 1995 and 2017. With 11 events in 23 years, the probability of a general flood event occurring in any given year goes up to 48%. There was three years over the past 23 years where two or more general flood events occurred. This indicates that the probability or likelihood that more than one general flood event may occur during any given year within the County 13%.

Flash Floods

There have been 30 verified flash flood events between 1990 and 2017. With 30 occurrences over the past 28 years, Tazewell County should expect at least one flash flood event each year. There were 10 years over the past 28 years where two or more flash flood events occurred. This indicates that the probability that more than one flash flood event may occur during any given year within the County is approximately 36%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from floods.

Several factors including topography, precipitation and an abundance of rivers and streams make Illinois especially vulnerable to flooding. According to the Illinois State Water Survey's Climate Atlas of Illinois, since the 1940s Illinois climate records have shown an increase in heavy precipitation which has led to increased flood peaks on Illinois rivers.

Are the participating jurisdictions vulnerable to flooding?

Yes. Tazewell County and the participating municipalities are vulnerable to the dangers presented by flooding. Precipitation levels and topography are factors that cumulatively make virtually the entire County susceptible to some form of flooding. Flooding occurs along the floodplains of all the streams within the County as well as outside of the floodplains in low-lying areas where drainage problems occur. Since 2008, Tazewell County has experienced eight general floods and 18 flash flood events.

Figure 79 details the number of *recorded* flash flood events by participating jurisdiction. All of the general flood events impacted either the entire County or a large portion of it and were not location specific.

Vulnerability to flooding can change depending on several factors, including land use. As land used primarily for agricultural and open space purposes is converted for residential and commercial/industrial uses, the number of buildings and impervious surfaces (i.e., parking lots, roads, sidewalks, etc.) increases. As the number of buildings and impervious surfaces increases, so too does the potential for flash flooding. Rather than infiltrating the ground slowly, rain and snowmelt that falls on impervious surfaces runs off and fills ditches and storm drains quickly creating drainage problems and flooding.

Figure 79
Verified Flash Flood Events by Participating Jurisdiction – Tazewell County

Participating Municipality	Number	Year
East Peoria	2	2004, 2016
Morton	3	1990, 2004, 2016
Pekin	3	1990, 2001, 2004
Tremont	---	
Washington	2	2002, 2016
countywide	7	1990, 1990, 1993, 1993, 2001, 2008, 2015
western portion of the County	4	2010, 2010, 2013, 2017
northern portion of the County	4	2010, 2013, 2013, 2017
northeastern portion of the County	1	2011
eastern portion of the County	4	2011, 2013, 2013, 2016
southern portion of the County	4	2013, 2015,2015, 2016
southwestern portion of the County	2	2011, 2015
central portion of the County	1	2015

As described in Section 1.3 Land Use and Development Trends, substantial changes in land use (from forested, open and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No substantial increases in residential or commercial/industrial developments are expected within the next five years.

What impacts resulted from the recorded floods?

Floods as a whole have caused a *minimum* of $54.7 million in property damages and $8 million in crop damages. The following provides a breakdown by category.

In comparison, the State of Illinois averages an estimated $257 million annually in property damage losses and four fatalities per year, making flooding the single most financially damaging natural hazard in Illinois.

Flood Fast Facts – Impacts/Risk

General Flood Impacts
- Total Property Damage: ***$25,581,000***^
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***$8,250,000***^
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flash Flood Impacts
- Total Property Damage: ***$31,640,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flood Risk/Vulnerability to:
- Public Health & Safety – General Flooding: ***Low***
- Public Health & Safety – Flash Flooding: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium/High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

^ Includes $2.5 million in property damages and $250,000 in crop damages sustained as a result of the 1974 flood event and represents losses incurred by Tazewell, Woodford & Peoria counties. A breakdown by county was not available.

General Floods

Data obtained from NOAA's Storm Events Database and NOAA's Storm Data Publications indicates that between 1950 and 2017, four of the 24 general flood events caused approximately $25.5 million in property damages and $8.25 million in crop damages. Included in the totals are $2.5 million in property damages and $250,000 in crop damages sustained as a result of the 1974 flood event and represents losses sustained in Tazewell, Woodford and Peoria counties. A breakdown by county was unavailable. Damage information was either unavailable or none was recorded for the remaining 20 reported occurrences.

No injuries or fatalities were reported as a result of any of the recorded events.

Flash Floods
Data obtained from NOAA's Storm Events Database and NOAA's Storm Data Publications indicates that between 1990 and 2017, three of the 30 flash flood events caused approximately $31.6 million in property damages. Damage information was either unavailable or none was recorded for the remaining 27 reported occurrences.

No injuries or fatalities were reported as a result of any of the recorded events.

What impacts have resulted from historic floods?

Historic flood events documented in the City of Peoria's 1983 Hazard Vulnerability Analysis and contained in the 2010 Plan indicate that flooding occurred in Tazewell County in 1933, 1943 and 1944. **Appendix K** details the impacts associated with these historic floods.

What other impacts can result from flooding?

One of the primary threats from flooding is drowning. Nearly half of all flash flood fatalities occur in vehicles as they are swept downstream. Most of these fatalities take place when people drive into flooded roadway dips and low drainage areas. It only takes two feet of water to carry away most vehicles.

Floodwaters also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto streets and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during a flood event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

Structural damage, such as cracks forming in a foundation, can also result from flooding. In most cases, however, the structural damage sustained during a flood occurs to the flooring, drywall and wood framing. In addition to structural damage, a flood can also cause serious damage to a building's content.

Infrastructure and critical facilities are also vulnerable to flooding. Roadways, culverts and bridges can be weakened by floodwaters and have been known to collapse under the weight of a vehicle. Buried power and communication lines are also vulnerable to flooding. Water can infiltrate lines and cause disruptions in power and communication.

What is the level of vulnerability to public health and safety from floods?

While both general and flash floods occur on a fairly regular basis within the County, the number of injuries and fatalities is very low. In terms of the risk or vulnerability to public health and safety from *general floods*, the risk is seen as low. However, over half of the recorded flood events were the result of flash flooding. Since there is very little warning associated with flash flooding the risk to public health and safety from *flash floods* is elevated to medium.

Are there any repetitive loss structures within Tazewell County?

Yes. According to information obtained from IEMA, there is one repetitive loss structure located in North Pekin and five severe repetitive loss structures located in East Peoria, North Pekin and unincorporated Tazewell County. As described previously, FEMA defines a "repetitive loss structure" as an NFIP-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978. A "severe repetitive loss structure" as defined by FEMA is an NFIP-insured structure that has received four or more flood insurance claim payments of more than $5,000 each or two flood insurance claim payments that exceed the fair market value of the insured structure on the day before each loss.

Figure 80 identifies the repetitive flood loss structures by participating jurisdiction and provides the total flood insurance claim payments. The exact location and/or address of the insured structures are not included in this Plan to protect the owners' privacy. According to IEMA, there have been 34 flood insurance claim payments totaling $665,622.56 for the six repetitive flood loss structures.

Figure 80
Repetitive Flood Loss Structures – Tazewell County

Participating Jurisdiction	Structure Type	Number of Structures	Number of Claim Payments	Flood Insurance Claim Payments		Total Flood Insurance Claim Payments
				Structure	Content	
Repetitive Loss Properties						
North Pekin	single family	1	2	$208,532.92	$3,971.64	$212,504.56
Severe Repetitive Loss Properties						
East Peoria	single family	1	7	$115,913.43	$209.00	$116,122.43
North Pekin	single family	1	9	$64,799.47	$18,084.75	$82,884.22
Unincorp. Tazewell County	single family	2	10	$119,931.10	$66,742.03	$186,673.13
	non-residential	1	6	$51,707.22	$15,731.00	$67,438.22
Total:		**6**	**34**	**$560,884.14**	**$104,738.42**	**$665,622.56**

Source: Illinois Emergency Management Agency

Are existing buildings, infrastructure and critical facilities vulnerable to flooding?

Yes. **Figure 81** identifies the number of existing residential structures by participating jurisdiction located within the base floodplain, levee-protected floodplain and 500-year floodplain. These counts were prepared by Tri-County Regional Planning Commission's GIS staff in consultation with the Consultant using the effective DFIRMs.

Aside from key roads and bridges and buried power and communication lines, East Peoria, Morton, Pekin and Washington have specific infrastructure/critical facilities located within or adjacent to a floodplain. The following provides a description of each.

Figure 81
Existing *Residential Structures* Located within a Floodplain of a Participating Municipality – Tazewell County

Participating Jurisdiction	Number of Residential Structures		
	Base/500-Year Floodplain	Levee-Protected Floodplain	Total
East Peoria	67	645	712
Morton	20	0	20
Pekin	110	81	191
Tremont	0	0	0
Washington	167	0	167
Unincorp. Tazewell County	126	219	345

Source: FEMA DFIRMs

- *East Peoria*: The City's wastewater treatment plant #3 is located in the base floodplain of the Illinois River. The City Hall, Central House fire station, police department, and wastewater treatment plant #1 are protected from the 1% annual chance flood of the Illinois River by a levee system that has been provisionally accredited while drinking water wells #8 and Catherine, Central Junior High School and part of the East Peoria Community High School are also protected from the 1% annual chance flood of Farm Creek by a provisionally-accredited levee system. While protected, overtopping or failure of any levee system is possible, leaving these critical facilities with a moderate flood risk according to FEMA. The Oakwood drinking water treatment plant is located adjacent to the floodway of Fondulac Creek while the Meadow drinking water treatment plant is located adjacent to the floodway of Dempsey Creek.
- *Morton*: The Village's wastewater treatment plant #2 is located adjacent to the Prairie Creek floodway and the base floodplain of Bull Run Creek. Wastewater treatment plant #3 is located adjacent to the base floodplain of Ackerman Creek.
- *Pekin*: The City's wastewater treatment plant is located in the base floodplain of the Illinois River.
- *Washington*: The City's drinking water treatment plant #1 and Jefferson maintenance shop are both located in the base floodplain/500-year floodplain of Farm Creek while the police station is partially located in the 500-year floodplain of Farm Creek. Both sewer treatment plant # 1 and #2 are located adjacent to the base floodplain of Farm Creek while water tower #1 is located adjacent to the 500-year floodplain of Farm Creek.

While nine percent of the land area in Tazewell County lies within the base floodplain and is susceptible to riverine flooding, topography makes almost the entire County vulnerable to flash flooding. As a result, a majority of the buildings, infrastructure and critical facilities that may be impacted by flooding are located outside of a floodplain and are not easily identifiable.

The risk or vulnerability of existing buildings, infrastructure and critical facilities to all forms of flooding is considered to be medium to high based on: (a) the frequency and severity of recorded flood events within the County; (b) the County's proximity to the Illinois River; (c) the fact that most of the County is vulnerable to flash flooding; and (d) a majority of the buildings, infrastructure and critical facilities that may be impacted are located outside of a floodplain.

Are future buildings, infrastructure and critical facilities vulnerable to flooding?

The answer to this question depends on the type of flooding being discussed.

Riverine Flooding

In terms of riverine flooding, the vulnerability of future buildings, infrastructure and critical facilities located within NFIP-participating jurisdictions is low as long as the existing floodplain ordinances are enforced. Enforcement of the floodplain ordinance is the mechanism that ensures that new structures either are not built in flood-prone areas or are elevated or protected to the base flood elevation.

Flash Flooding

In terms of flash flooding, all future buildings, infrastructure and critical facilities are still vulnerable depending on the amount of precipitation that is received, the topography and any land use changes undertaken within the participating jurisdictions.

What are the potential dollar losses to vulnerable structures from flooding?

An estimate of the potential dollar losses to vulnerable *residential structures* located within the *participating municipalities* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in Tazewell County.

The purpose of providing an estimate is to help residents and municipal officials make informed decisions about how they can better protect themselves and their communities. These estimates are meant to provide a ***general idea of the magnitude of the potential damage*** that could occur from a flood event in each of the municipalities.

Assumptions

To calculate the overall potential dollar losses to vulnerable residential structures from a flood, a set of decisions/assumptions must be made regarding:

- type of flood event;
- scope of the flood event;
- number of potentially-damaged housing units;
- value of the potentially-damaged housing units; and
- percent damage sustained by the potentially-damaged housing units (i.e., damage scenario.)

The following provides a detailed discussion of each decision/assumption.

Assumption #1

A riverine flood event will impact vulnerable residential structures within each municipality.

Type of Flood Event. The first step towards calculating the potential dollar losses to vulnerable residential structures is to determine the type of flood event that will be used for this scenario. While flash flooding has occurred more frequently and has caused more recorded flood damages in the County than riverine flooding, identifying residential structures vulnerable to flash flooding is problematic because most are located outside of the floodplain and the number of structures impacted can change with each event depending on the amount of precipitation received, the topography and the land use of the area.

Therefore, a riverine flood event will be used since it is (a) relatively easy to identify vulnerable residential structures within each municipality (i.e., those structures located within the floodplain of any river, stream or creek); and (b) the number of structures impacted is generally the same from event to event.

Assumption #2

All base floodplains within a municipality will flood and experience the same degree of flooding.

Scope of the Flood Event. To establish the number of vulnerable residential structures (potentially-damaged housing units), the scope of the riverine flood event within each municipality must first be determined. In this scenario, the scope refers to the number of rivers, streams and creeks that overflow their banks and the degree of flooding experienced along the floodplains for each river, stream and creek.

Generally speaking, a riverine flood event only affects one or two rivers or streams at a time depending on the cause of the event (i.e., precipitation, snow melt, ice jam, etc.) and usually does not produce the same degree of flooding along the entire length of the river, stream or creek. However, for this scenario, it was decided that:

❖ all rivers, streams and creeks with floodplains would overflow their banks, and

❖ the floodplains of each river, stream and/or creek located within the corporate limits of each municipality would experience the same degree of flooding.

These assumptions result in the following conditions for each participating municipality:

➢ Tremont: No rivers, streams or creeks are located within or adjacent to the village boundaries and therefore no residential flooding would occur;

➢ East Peoria: The Illinois River, Farm Creek, Farm Creek Diversion Channel, Fondulac Creek, School Creek, Dempsey Creek, Tributary No. 3, Cole Creek, Kerfoot Creek, Ackerman Creek and their tributaries would overflow their banks and flood portions of the City;

➢ Morton: Prairie Creek, Bull Run Creek, Ackerman Creek and their tributaries would overflow their banks and flood portions of the Village;

- *Pekin*: The Illinois River, Lick Creek and their tributaries would overflow their banks and flood portions of the City; and
- *Washington*: Farm Creek, Tributary No. 1, Tributary 1A, Tributary No. 2, Tributary No. 3 and their tributaries would overflow their banks and flood portions of the City.

Assumption #3

The number of existing residential structures located within the base floodplain(s) in each municipality will be used to determine the number of potentially-damaged housing units.

Number of Potentially-Damaged Housing Units. Since this scenario assumes that all the floodplains within a municipality will experience the same degree of flooding, the number of existing residential structures located within the floodplain(s) of each municipality can be used to determine the number of potentially-damaged housing units. **Figure 81** identifies the total number of existing residential structures located within the floodplains(s) of each municipality. These counts were prepared by the Tri-County Regional Planning Commission's GIS staff in consultation with the Consultant.

While accredited and provisionally-accredited levees provide protection from the 1% annual chance flood (100-year flood) and reduce the risk of flooding, they cannot eliminate all flood risk. There is always the chance a flood will overtop or breach a levee allowing floodwaters to inundate the protected areas behind. As a result, it was decided that those structures located in the levee-protected floodplains would be included in the number of potentially-damaged housing units.

Assumption #4

The average market value for a residential structure in each municipality will be used to determine the value of potentially-damaged housing units.

Value of Potentially-Damaged Housing Units. Now that the number of potentially-damaged housing units has been determined, the monetary value of the units must be calculated. Typically, when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure in each municipality will be used.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the averaged assessed value and multiplying that number by three (the assessed value of a structure in Tazewell County is approximately one-third of the market value). **Figure 82** provides a sample calculation. The total assessed value is based on 2016 tax assessment information provided by the Tazewell County Assessment Office. **Figure 83** provides the average assess value and average market value for each participating municipality.

Figure 82
Sample Calculation of Average Assessed Value & Average Market Value – East Peoria

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

East Peoria: $307,711,479 ÷ 10,590 housing units = $29,056.79688

Average Market Value

Average Assessed Value x 3 = Average Market Value (Rounded to the Nearest Dollar)

East Peoria: $29,056.79688 x 3 = $87,170.39065
($87,170)

Figure 83
Average Market Value of Housing Units by Participating Municipality – Tazewell County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
East Peoria	$307,711,479	10,590	$29,056.79688	$87,170.39064	$87,170
Morton	$345,125,877	6,973	$49,494.60447	$148,483.81341	$148,484
Pekin	$318,602,708	14,714	$21,653.03167	$64,959.09501	$64,959
Tremont	$34,645,060	942	$36,778.19533	$110,334.58599	$110,335
Washington	$289,130,261	6,189	$46,716.79771	$140,150.39313	$140,150
Unincorp. County	$408,622,464	10,285	$39,729.94302	$119,189.82906	$119,190
County	$1,866,670,119	57,516	$32,454.79726	$97,364.39178	$97,364

Source: Tazewell County Assessments Office.

Damage Scenario. The final decision that must be made to calculate potential dollar losses is to determine the percent damage sustained by the structure and the structure's contents during the flood event. In order to determine the percent damage using FEMA's flood loss estimation tables, assumptions must be made regarding (a) the type of residential structure flooded (i.e., manufactured home, one-story home without a basement, one or two-story home with a basement, etc.) and (b) the flood depth. **Figure 84** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

Assumption #5

The potentially-damaged housing units are one or two-story homes with basements and the flood depth is two foot.
Structural Damage = 20%
Content Damage = 30%

For this scenario it is assumed that the potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet. With these assumptions the expected percent damage sustained by the ***structure*** is estimated to be 20% and the expected percent damage sustained by the structure's ***contents*** is estimated to be 30%.

Figure 84
FEMA Flood Loss Estimation Tables

Flood Building Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Building Damage)	Two Story No Basement (% Building damage)	One or Two Story With Basement (% Building damage)	Manufactured Home (% Building damage)
-2	0	0	4	0
-1	0	0	8	0
0	9	5	11	8
1	14	9	15	44
2	22	13	20	63
3	27	18	23	73
4	29	20	28	78
5	30	22	33	80
6	40	24	38	81
7	43	26	44	82
8	44	29	49	82
>8	45	33	51	82

Flood Content Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Contents Damage)	Two Story No Basement (% Contents damage)	One or Two Story With Basement (% Contents damage)	Manufactured Home (% Contents damage)
-2	0	0	6	0
-1	0	0	12	0
0	13.5	7.5	16.5	12
1	21	13.5	22.5	66
2	33	19.5	30	90
3	40.5	27	34.5	90
4	43.5	30	42	90
5	45	33	49.5	90
6	60	36	57	90
7	64.5	39	66	90
8	66	43.5	73.5	90
>8	67.5	49.5	76.5	90

Source: FEMA, Understanding Your Risks: Identifying Hazards and Estimating Losses

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying that by the percent damage (20%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 85** provides a sample calculation.

Figure 85
Structure: **Potential Dollar Loss Sample Calculation – East Peoria**

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage =
Average Structural Damage per Housing Unit
East Peoria: $87,170 x 20% = $17,434.00 per housing unit

Average Structural Damage x Number of Potentially-Damaged Housing
Units within the Jurisdiction = *Structure* Potential Dollar Losses
(Rounded to the Nearest Dollar)

East Peoria: $17,434.00 per housing unit x 692 housing unit = $12,064,328.00
($12,064,328)

Next the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply that by the percent damage (30%) to get the average content damage per unit. Then take the average content damage per unit and multiply that by the number of potentially-damaged housing units. **Figure 86** provides a sample calculation.

Figure 86
Content: **Potential Dollar Loss Sample Calculation – East Peoria**

½ (Average Market Value of a Housing Unit with the Jurisdiction) x Percent Damage = Average Content Damage per Housing Unit

East Peoria: ½ ($87,170) x 30% = $13,075.50 per housing unit

Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)

East Peoria: $13,075.50 per housing unit x 692 housing unit = $9,048,246.00
($9,048,246)

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figure 87** provides a breakdown of the total potential dollar losses by municipality.

Figure 87
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Municipality – Tazewell County

Participating Jurisdiction	Average Market Value (2016)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
East Peoria	$87,170	712	$12,413,008	$9,309,756	$21,722,764
Morton	$148,484	20	$593,936	$445,452	$1,039,388
Pekin	$64,959	191	$2,481,434	$1,861,075	$4,342,509
Tremont	$110,335	0	$ 0	$ 0	$ 0
Washington	$140,150	167	$4,681,010	$3,510,758	$8,191,768

This assessment illustrates the potential residential dollar losses that should be considered when municipalities are deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences within the participating municipalities would be expected to ***range from $1 million to $21.7 million***. Tremont does not have any residences considered vulnerable to riverine flooding in this scenario.

Vulnerability of Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of a large riverine flood event in dollars. These calculations do not include the physical damages sustained by businesses or other infrastructure and critical facilities.

In terms of businesses, the impacts from a flood event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the flood event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. ***As a result, the cumulative monetary impacts to businesses and infrastructure can far exceed the cumulative monetary impacts to residences***. While average dollar amounts cannot be supplied for these items at this time, they should be taken into account when discussing the overall impacts that a large-scale riverine flood event could have on the participating jurisdictions.

In terms of specific infrastructure vulnerability, the following are located within a ***base floodplain***:

- *East Peoria*: wastewater treatment plant #3;
- *Pekin*: wastewater treatment plant; and
- *Washington*: drinking water treatment plant #1 and Jefferson Street maintenance shop.

No other above-ground infrastructure within the participating jurisdictions, other than key roads and bridges, were identified as being vulnerable to riverine flooding.

Considerations

While the potential dollar loss scenario was only for a riverine flood event, the participating jurisdictions have been made aware through the planning process of the impacts that can result from flash flood events. Tazewell County has experienced multiple events over the last 20 to 30 years as have adjoining and nearby counties. These events illustrate the need for officials to consider the overall monetary impacts of all forms of flooding on their communities. All participants should carefully consider the types of activities and projects that can be taken to minimize their vulnerability.

Tazewell County

Figure 71
(Sheet 1 of 8)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude: Flood Crest Illinois River Peoria[1]	Magnitude: Impacted Homes	Magnitude: Impacted Business	Magnitude: Impacted Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Description
4/6/1950 thru 5/13/1950	n/a	Illinois River	western portion of the county	25.0 feet 4/29/1950	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
3/15/1962 thru 4/14/1962	n/a	Illinois River	western portion of the county	23.7 feet 3/26/1962	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
4/23/1970 thru 6/27/1970	n/a	Illinois River	western portion of the county	25.9 feet 5/19/1970	n/a	n/a	n/a	n/a	n/a	n/a	n/a	heavy rain fell over much of central Illinois for 3 to 8 consecutive days washing out crops and causing extreme soil erosion & ponding
3/14/1973 thru 5/19/1973	n/a	Illinois River	western portion of the county	24.4 feet 4/25/1973	n/a	n/a	n/a	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #373)***
Subtotal:								**0**	**0**	**0**	**0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Tazewell County

Figure 71 (Sheet 2 of 8) General Flood Events 1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
5/19/1974 thru 7/8/1974	n/a	Illinois River area rivers, streams & creeks	countywide	22.2 feet 6/26/1974	n/a	n/a	n/a	n/a	n/a	$2,500,000[§]	$250,000[§]	***this event was part of a federally-declared disaster (Declaration #438)***
2/25/1976 thru 3/23/1976	n/a	Illinois River	western portion of the county	23.6 feet 3/9/1976	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
3/7/1979 thru 5/17/1979	n/a	Illinois River area rivers, streams & creeks	countywide	28.7 feet 3/23/1979 3rd highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #583)***
5/28/1980 thru 6/5/1980	n/a	area rivers, streams & creeks	countywide	n/a	n/a	n/a	n/a	n/a	n/a	n/a	$8,000,000	*Event Description Provided Below*
Subtotal:								**0**	**0**	**$2,500,000[§]**	**$8,250,000[§]**	

- ***this event was part of a state-declared disaster***
- 14 inches of rain fell in a week flooding farm fields, buildings & roads
- at the north end of the County 20 square miles of land (approx. 12,800 acres) was under water and caused extensive damage to crops and buildings

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

[§] The property damage total of $2.5 million and the crop damage total of $250,000 for the 1974 flood event represent losses sustained in Peoria, Tazewell and Woodford counties. A detailed breakdown by county was not available.

Tazewell County

Figure 71
(Sheet 3 of 8)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
2/24/1982 thru 5/2/1982	n/a	Illinois River	western portion of the county	27.1 feet 3/23/1982 7th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
12/5/1982 thru 1/7/1983	n/a	Illinois River Mackinaw River area rivers, streams & creeks	countywide	27.4 feet 12/9/1982 6th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #674)*** the Mackinaw River overflowed flooding about 40,000 acres of land and damaging homes at Mackinaw Valley Park
4/3/1983 thru 5/22/1983	n/a	Illinois River area rivers, streams & creeks	countywide	25.7 feet 4/17/1983	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$0**	**0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Tazewell County

Figure 71
(Sheet 4 of 8)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
2/26/1985 thru 4/15/1985	n/a	Illinois River Mackinaw River area rivers, streams & creeks	countywide	28.4 feet 3/7/1985 4th highest crest on record	n/a	n/a	n/a	n/a	n/a	$1,381,000	n/a	***this event was part of a federally-declared disaster (Declaration #735)***
3/24/1993 thru 5/10/1993	n/a	Illinois River	western portion of the county	23.16 feet 4/24/1993	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
5/14/1995 thru 6/15/1995	n/a	Illinois River area rivers, streams & creeks	countywide	24.91 feet 6/2/1995	n/a	n/a	n/a	n/a	n/a	n/a	n/a	numerous homes were damaged or destroyed by flooding along the Illinois River
2/21/1997 thru 3/6/1997	6:00 p.m.	Illinois River	western portion of the county	26.85 feet 3/3/1997 10th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$1,381,000**	**0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Tazewell County

Figure 71 (Sheet 5 of 8) General Flood Events 1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude: Flood Crest Illinois River Peoria[1]	Magnitude: Impacted Homes	Magnitude: Impacted Business	Magnitude: Impacted Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Description
5/14/2002 thru 5/27/2002	11:00 p.m.	Illinois River Mackinaw River	countywide	25.25 feet 5/18/2002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
9/16/2008 thru 10/5/2008	n/a	Illinois River	western portion of the county	26.99 feet 9/20/2008 9th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
3/2/2009 thru 6/6/2009	n/a	Illinois River	western portion of the county	27.92 feet 3/14/2009 5th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$0**	**0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Tazewell County

Figure 71
(Sheet 6 of 8)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
4/18/2013 thru 4/22/2013	9:00 a.m.	area rivers, streams & creeks	western & northern portion of the county	n/a	See Event Description	See Event Description	See Event Description	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** - very heavy rainfall produced 3 to 5 inches of rain causing both flash flooding & general flooding - nearly every road in the flooded area was impassable, including parts of Interstate 74 - most of the creeks and streams stayed in flood and most roads remained closed until the afternoon of the 22nd												
4/19/2013 thru 5/8/2013	10:00 a.m.	Illinois River	western portion of the county	29.32 feet 4/23/2013 highest crest - flood of record at this gauge	several (See Event Description)	several (See Event Description)	n/a	n/a	n/a	$21,700,000	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #4116) several homes and businesses along the Illinois River suffered damage due to record river levels												
6/15/2015 thru 7/31/2015	n/a	Illinois River	western portion of the county	27.06 feet 7/1/2015 8th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$21,700,000**	**0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Tazewell County

Figure 71
(Sheet 7 of 8)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
12/27/2015 thru 1/20/2016	n/a	Illinois River	western portion of the county	26.46 feet 1/3/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
4/29/2017 thru 4/30/2017	10:45 p.m.	area rivers, streams & creeks	western portion of the county	n/a	n/a	n/a	numerous streets, roads & highways	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Subtotal:								0	0	$0	0	

- heavy rainfall of 2.5 to 4 inches in a two-hour period during the evening on already saturated ground caused both flash flooding & general flooding
- numerous streets in Pekin and East Peoria were impassable as well as numerous rural roads and highways in the county, including parts of IL Route 29 from Green Valley to South Pekin
- an additional 0.5 to 1 inch during the early morning hours of the 30th kept many roads flooded
- flood waters subsided by early afternoon on the 30th

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Tazewell County

Figure 71
(Sheet 8 of 8)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
6/17/2017 thru 6/18/2017	10:45 p.m.	area rivers, streams & creeks	northern portion of the county	n/a	n/a	n/a	numerous streets, roads & highways	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Subtotal:								**0**	**0**	**$0**	**0**	
GRAND TOTAL								**0**	**0**	**$25,581,000[§]**	**$8,250,000[§]**	

- torrential rainfall of 2 to 3 inches in 90 minutes caused both flash flooding & general flooding
- some streets in Washington were flooded
- US Route 24 from Washington to the County Line was impassable as well as portions of Dee-Mac Road
- additional rainfall during the late evening/early morning hours kept many roads flooded
- flood waters subsided by daybreak on the 18th

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

[§] The property damage total includes $2.5 million and the crop damage total includes $250,000 from the 1974 flood event and represents losses sustained in Peoria, Tazewell and Woodford counties. A detailed breakdown by county was not available.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Weather Service, River Observations, North Central River Forecast Center, Illinois River at Peoria.
United States Army Corps of Engineers, RiverGages.com, Data Mining.

Tazewell County

Figure 72
(Sheet 1 of 5)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
6/8/1990	1:00 a.m.	Morton Pekin	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #871)***
6/20/1990	4:00 a.m.	countywide	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #871)***
6/29/1990	8:30 a.m.	countywide	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #871)***
8/15/1993	8:45 p.m.	countywide	n/a	n/a	n/a	n/a	numerous road and basements were flooded
8/23/1993	5:45 p.m.	countywide	n/a	n/a	n/a	n/a	street flooding occurred
5/18/2001	12:40 a.m.	countywide	n/a	n/a	n/a	n/a	- numerous reports of flooded roads with the most extensive flooding occurring in Pekin, Delavan & Tremont *Tremont* - IL Rte. 9 was covered with flowing floodwaters
6/6/2001	1:58 a.m.	Pekin	n/a	n/a	n/a	n/a	- flooding closed several roads/bridges that crossed a local drainage ditch - a few adjacent city roads were also closed
5/11/2002	11:00 a.m.	Washington	n/a	n/a	n/a	n/a	several roads and basements in the Deer Ridge Subdivision were flooded
7/9/2003	8:10 a.m.	Green Valley^	n/a	n/a	n/a	n/a	many streets and roads were flooded around the Green Valley area
5/18/2004	4:20 p.m.	East Peoria	n/a	n/a	n/a	n/a	- very heavy rainfall caused street flooding - one motorist was stranded on Washington St. with water up to the door of their car
5/30/2004	3:27 p.m.	Morton Pekin	n/a	n/a	n/a	n/a	numerous streets were flooded
1/12/2005 thru 1/13/2005	9:30 p.m.	Minier^	n/a	n/a	n/a	n/a	Stringtown Road was closed west of the Village due to water flowing over the road
5/30/2008	2:10 p.m.	countywide	n/a	n/a	n/a	n/a	heavy rains caused flooding across many roads in the County
Subtotal:			**0**	**0**	**$0**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Tazewell County

Figure 72
(Sheet 2 of 5)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
5/25/2010	1:00 p.m.	western portion of the county	n/a	n/a	n/a	n/a	- many area roads were closed and vehicles stranded due to flowing water 6 to 12 inches deep *Delavan area* - hardest hit area was along Springfield Rd. from the intersection of Muller Rd. to near Delavan *Tremont* - most of the streets in the Village were flooded
6/23/2010	6:30 p.m.	western & northern portions of the county	n/a	n/a	n/a	n/a	- many rural roads were impassable as well as portions of IL Rte. 9 & IL Rte. 29 *Pekin/East Peoria/Morton* - many streets were flooded, causing vehicles to become stranded
5/13/2011	7:00 p.m.	eastern portion of the county	n/a	n/a	n/a	n/a	- many streets, rural roads and creeks were flooded - the most affected areas extended from Washington to east of Morton, through Mackinaw to just north of Hopedale
6/15/2011	1:00 a.m.	southwestern portion of the county	n/a	n/a	n/a	n/a	numerous rural roads were impassable
6/21/2011 thru 6/22/2011	7:15 p.m.	northeastern portion of the county	n/a	n/a	n/a	n/a	several rural roads were impassable
Subtotal:			**0**	**0**	**$0**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Tazewell County

Figure 72
(Sheet 3 of 5)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
4/17/2013 thru 4/18/2013	9:15 p.m.	western & northern portions of the county	n/a	n/a	$31,400,000	n/a	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** - very heavy rainfall of 3 to 5 inches resulted in damage to thousands of homes and businesses in the county, which included the cities of East Peoria, Pekin, Washington & Morton - every creek & stream in the western & northern part of the county was flooded - nearly every road in the flooded area was impassable, including parts of Interstate 74 which had to be closed - numerous water rescues were made - mudslides were also reported on the bluffs along the Illinois River which did damage to a gas station & covered US Rte. 150 with several inches of mud							
5/30/2013 thru 5/31/2013	8:00 p.m.	eastern portion of the county	n/a	n/a	n/a	n/a	- many rural roads were flooded - greatest impact was from Hopedale to Minier
5/31/2013	3:40 p.m.	southern & eastern portions of the county	n/a	n/a	n/a	n/a	numerous roads were flooded and one vehicle rescue was made
6/24/2013	4:30 a.m.	northern portion of the county	n/a	n/a	n/a	n/a	the main impact was the flooding of several rural roads north of US Rte. 24
6/7/2015 thru 6/8/2015	8:00 p.m.	countywide	n/a	n/a	n/a	n/a	*Pekin & East Peoria* - many streets were impassable with water a foot deep in some spots *Tazewell/Logan County Line area* - biggest impacts were in the southern part of the County where the water was 3 to 4 feet deep - at least 2 water rescues had to be made for stranded motorists
Subtotal:			**0**	**0**	**$31,400,000**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Tazewell County

Figure 72
(Sheet 4 of 5)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
6/26/2015	10:15 a.m.	southern portion of the county	n/a	n/a	n/a	n/a	numerous rural roads were impassable from south of Pekin through Hopedale and Delavan to the Spring Lake area
6/28/2015	7:15 p.m.	southwestern portion of the county	n/a	n/a	n/a	n/a	rural roads were flooded in the Spring Lake area and near the Mason/Tazewell County line south of Parkland
7/16/2015 thru 7/17/2015	10:30 p.m.	central and southern portions of the county	n/a	n/a	n/a	n/a	- parts of Interstate 155 from mile post 15 to 22 were impassable - numerous rural roads were closed from South Pekin to Hopedale to Armington - flooding of these roads hampered rescue efforts in the immediate aftermath of the EF 2 tornado that hit Delavan
8/12/2016	4:00 p.m.	southern & eastern portions of the county	n/a	n/a	$240,000	n/a	- numerous roads were flooded including parts of Interstate 155 two to four miles north of the Tazewell/Logan County Line - cars which hydroplaned on the water-covered roads slid into ditches along the interstate - Parts of IL Rte. 122 were also impassable from Delavan through Hopedale to Minier
8/30/2016	8:30 a.m.	East Peoria Morton Washington	n/a	n/a	n/a	n/a	- numerous streets were flooded - several roads were closed for a short period of time - cars became stalled in the high water
Subtotal:			**0**	**0**	**$240,000**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Tazewell County

Figure 72
(Sheet 5 of 5)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
4/29/2017	6:30 p.m.	western portion of the county	n/a	n/a	n/a	n/a	- numerous rural roads and highways, including parts of IL Rte. 29 from Green Valley to South Pekin were impassable *Pekin & East Peoria* - numerous streets were impassable
6/17/2017	8:30 p.m.	northern portion of the county	n/a	n/a	n/a	n/a	- parts of US Rte. 24 were impassable from Washington to the Tazewell/Woodford County Line - most of Dee-Mac Rd. was also flooded *Washington* - some streets were flooded
Subtotal:			**0**	**0**	**$0**	**$0**	
GRAND TOTAL:			**0**	**0**	**$31,640,000**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

3.3.2 Woodford County

Hazard Profile

The following identifies past occurrences of floods; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When has flooding occurred previously? What is the extent of these previous floods?

Figures 88 and **89**, located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of flood events recorded in Woodford County. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

Flood Fast Facts – Occurrences

Number of General Floods Reported (1950 – 2017): ***27***

Number of Flash Floods Reported (1990 – 2017): ***28***

Most Likely Month for General Floods to Occur: ***March/April/May***

Most Likely Month for Flash Floods to Occur: ***June***

Most Likely Time for Flash Floods to Occur: ***Evening***

Number of Federal Disaster Declarations Related to General and Flash Flooding: ***6***

General Floods

NOAA's Storm Events Database, NOAA's Storm Data Publications, the U.S. Army Corps of Engineers' river gauge data and information included in the 2010 Plan have documented 27 occurrences of general flooding Woodford County between 1950 and 2017. Included in the 27 general flood events are six events that contributed to five separate federally-declared disasters for Woodford County. One declared disaster, Declaration #4116, included both general and flash flooding events.

Based on historical gauge data, the record setting Illinois River flood in this area occurred on April 23, 2013 when the Illinois River crested at 29.32 feet at Peoria. The second and third highest crest at this location occurred in 1943 and 1979 respectively.

Flash Floods

NOAA's Storm Events Database, NOAA's Storm Data Publications and information included in the 2010 Plan documented 28 reported occurrences of flash flooding in Woodford County between 1990 and 2017. Included in the 28 flash flood events are five events that contributed to two separate federally-declared disasters in Woodford County. One declared disaster, Declaration #4116, included both general and flash flooding events.

Figure 90 charts the reported occurrences of flooding by month. Of the 27 general flood events, 18 (67%) began in March, April and May making this the peak period for general floods in Woodford County. The 18 events were split equally between March, April and May (six events each) making them all peak months for general flooding. There were 20 events that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

In comparison, 17 of the 28 flash flood events (61%) took place between May and June making this the peak period for flash floods. Of the 17 events, 11 (65%) occurred in June making this the peak month for flash flooding.

Figure 90
Graph: Flood Events by Month Woodford County

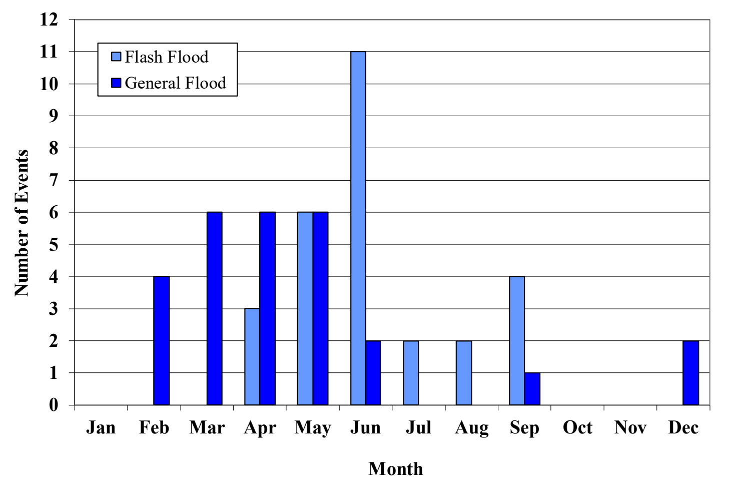
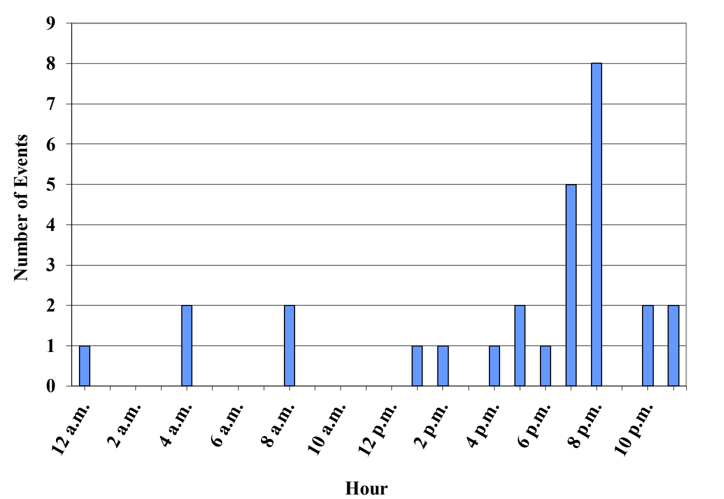


Figure 91 charts the reported occurrences of flash flood events by hour. Approximately 82% of the 28 flash flood events began during the p.m. hours, with 17 of the events (61%) taking place between 4:00 p.m. and 9:00 p.m. In comparison 55% of general flood events with recorded times began during the p.m. hours.

Figure 91
Graph: Flash Flood Events by Hour Woodford County



What locations are affected by floods?

While specific locations are affected by general flooding, most areas of the County can be impacted by overland and flash flooding because of the topography and seasonally high-water table of the area. In Woodford County 6.8% of the area is designated as being within the base floodplain and susceptible to riverine floods. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Woodford County's hazard rating for floods as "elevated."

Figure 92 identifies the floodplains in Woodford County as well as the participating jurisdictions. This map is based on the Woodford County DFIRMs that became effective in September 17, 2010. **Appendix J** contains maps identifying the floodplains located in the participating municipalities. While a large portion of the area prone to riverine flooding is in unincorporated portions of the County, Eureka and Roanoke are also susceptible to riverine flooding because of their proximity to floodplains.

Figure 93 identifies the bodies of water within or immediately adjacent to participating jurisdictions that are known to cause flooding or have the potential to flood. Water bodies with Special Flood Hazard Areas located within a participating jurisdiction (as identified on the DFIRMs) are identified in bold.

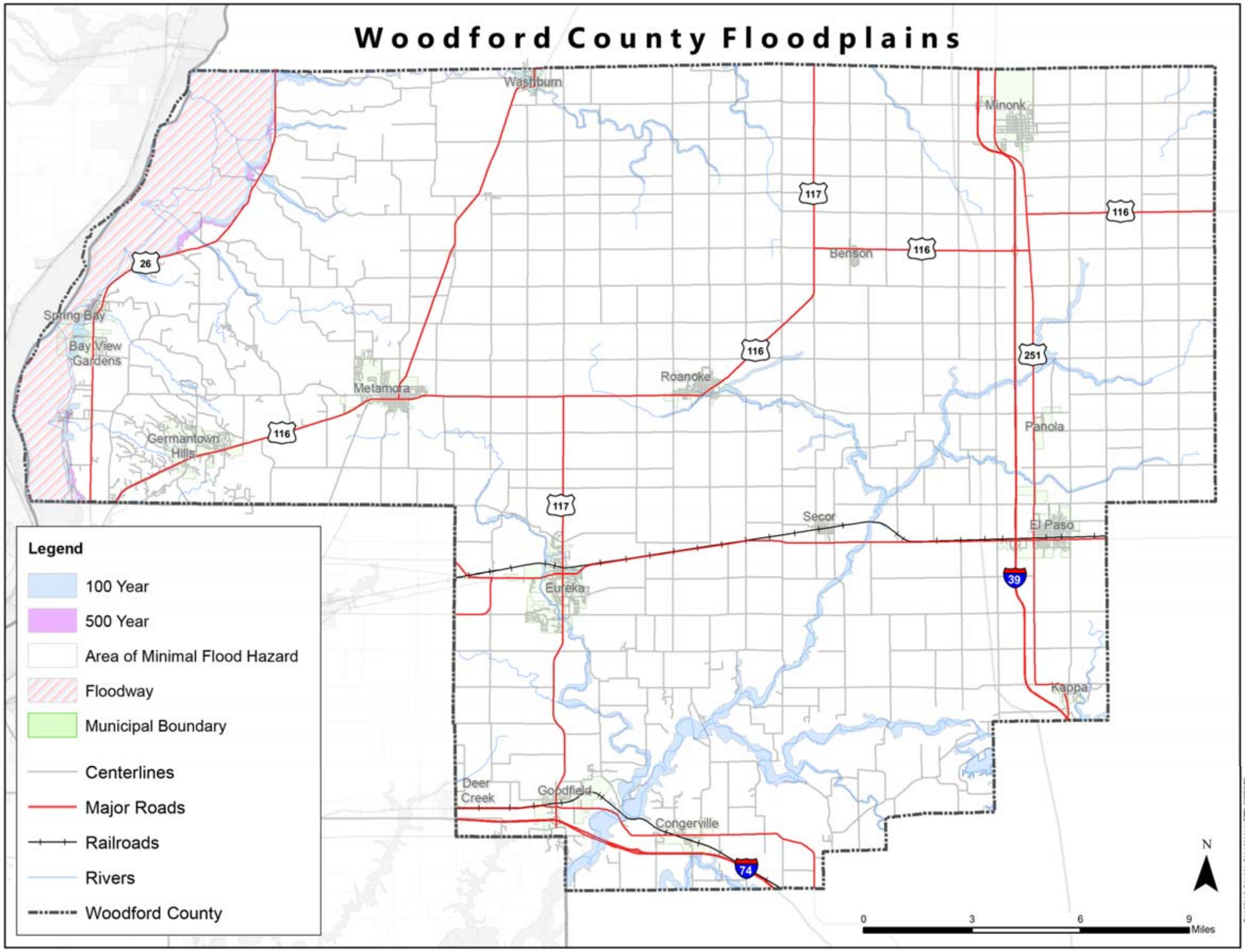
Figure 93
Bodies of Water Subject to Flooding – Woodford County

Participating Jurisdiction	Water Bodies
Eureka	Eureka Lake, **Tributary Walnut Creek, Walnut Creek**
Germantown Hills	Unnamed Tributary, White Oaks Lake
Roanoke	**Tributary West Branch Panther Creek, West Branch Panther Creek**
Unincorporated Woodford County	**Alloway Creek**, Barwell Lake, **Blalock Creek, Blue Creek, Burkett Hollow**, Coon Creek, Crow Creek, **Derman Creek**, Diamond Creek, **Douglas Lake, Dry Creek, East Branch Panther Creek, Evergreen Lake,** Funks Run, **Goose Lake, Hallenback Creek, Illinois River**, Izaak Walton Lake, Lake Sante Fe, **Little Panther Creek, Mackinaw River, Mill Creek, Mole Creek, Mud Creek**, Mundinger Creek, **Olive Branch, Panther Creek, Partridge Creek**, Red River, Rich Lake, **Richland Creek, Rock Creek**, Short Point Creek, **Six Mile Creek, Snag Creek, Snake Creek, South Branch Crow Creek, Ten Mile Creek**, Tributary Diamond Creek, Tributary East Branch Panther Creek, Tributary Long Point Creek, Tributary Mole Creek, **Tributary Panther Creek, Tributary Rock Creek, Tributary Walnut Creek**, Tributary West Branch Panther Creek, Tributary Wolf Creek, **Vincent Run, Walnut Creek, West Branch Panther Creek,** Wolf Creek, **Wolf Creek**

Source: FEMA DFIRMs

Municipal and County officials have reported overland flood issues outside of the base floodplain in most of the participating municipalities and many unincorporated portions of the County. This overland flooding is known to impair travel.

Figure 92
Floodplain Areas in Woodford County



What jurisdictions within the County take part in the NFIP?

Participating Jurisdictions

Woodford County, Eureka and Roanoke all take part in the NFIP. **Figure 94** provides information about each jurisdiction's participation in the NFIP, including the date each participant joined, the date of their most recent FIRM, their status in the Community Rating System and the year of their most recently adopted floodplain zoning ordinance. Germantown Hills has no identified flood hazard boundaries within its corporate limits and is not required to participate.

Non-Participating Jurisdictions

Figure 95 provides information on those incorporated municipalities within the County that chose not to participate in the planning process but also take part in the NFIP. Benson, El Paso, Goodfield, Metamora, Minonk, Panola and Secor have no identified flood hazard boundaries within their corporate limits and are not required to participate.

Figure 94
Participating Jurisdictions' NFIP Status – Woodford County

Participating Jurisdictions	Participation Date	Current Effective FIRM Date	CRS Participation	Most Recently Adopted Floodplain Zoning Ordinance
Woodford County	02/01/1984	09/17/2010	No	2010
Eureka	07/18/1985	09/17/2010	No	2009
Germantown Hills	---	NSFHA	No	---
Roanoke	09/04/1987	09/17/2010	No	2016

Sources: FEMA, Community Status Book.
FEMA, National Flood Insurance Program Flood Insurance Manual.
MAC member responses to List of Existing Planning Documents Questionnaire.

Figure 95
Non-Participating Jurisdictions' NFIP Status – Woodford County

Jurisdiction	Participation Date	Current Effective FIRM Date	CRS Participation		Jurisdiction	Participation Date	Current Effective FIRM Date	CRS Participation
Bay View Gardens	09/17/2011	09/17/2010	No		Spring Bay	06/04/1980	09/17/2010	No
Congerville	01/07/2011	09/17/2010	No		Washburn	07/02/1987	11/04/2010	No
Kappa	04/30/2014	09/17/2010	No					

Sources: FEMA, Community Status Book.
FEMA, National Flood Insurance Program Flood Insurance Manual.

Jurisdictions that participate in the NFIP are expected to adopt and enforce floodplain management regulations. In Woodford County, all the NFIP participating jurisdictions have adopted the State of Illinois model floodplain ordinance. This ordinance goes above and beyond NFIP minimum standards and has much more restrictive floodway regulations. As a result, all of the NFIP participating jurisdictions are in compliance with NFIP requirements.

Participating jurisdictions will continue to comply with the NFIP through the implementation of mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within SFHAs. At this time no new construction is planned within the base floodplain. Continued compliance with NFIP requirements for those jurisdictions that participated in the Plan update are addressed in the Mitigation Action Tables found in Section 4.7.

What is the probability of future flood events occurring?

General Floods

Woodford County has had 27 verified occurrences of general flooding between 1950 and 2017. With 27 occurrences over the past 68 years, the probability or likelihood of a general flood event occurring in Woodford County in any given year is 40%. However, gaps in the flood data between 1950 and 1995 cause a distortion in this probability. If only the events recorded in NOAA's Storm Events Database and supplemented by U.S. Army Corps of Engineer river gauge data are analyzed, then there have been 14 verified occurrences of general flooding between 1995 and 2017. With 14 events in 23 years, the probability of a general flood event occurring in any given year goes up to 61%. There was five years over the past 23 years where two or more general flood events occurred. This indicates that the probability or likelihood that more than one general flood event may occur during any given year within the County 22%.

Flash Floods

There have been 28 verified flash flood events between 1990 and 2017. With 28 occurrences over the past 28 years, Woodford County should expect at least one flash flood event each year. There were 9 years over the past 28 years where two or more flash flood events occurred. This indicates that the probability that more than one flash flood event may occur during any given year within the County is approximately 32%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from floods.

Several factors including topography, precipitation and an abundance of rivers and streams make Illinois especially vulnerable to flooding. According to the Illinois State Water Survey's Climate Atlas of Illinois, since the 1940s Illinois climate records have shown an increase in heavy precipitation which has led to increased flood peaks on Illinois rivers.

Are the participating jurisdictions vulnerable to flooding?

Yes. Woodford County and the participating municipalities are vulnerable to the dangers presented by flooding. Precipitation levels and topography are factors that cumulatively make virtually the entire County susceptible to some form of flooding. Flooding occurs along the floodplains of all the streams within the County as well as outside of the floodplains in low-lying areas where drainage problems occur. Since 2008, Woodford County has experienced 10 general floods and 20 flash flood events.

Figure 96 details the number of *recorded* flash flood events by participating jurisdiction. Twenty-six of the 27 general flood events impacted either the entire County or a large portion of it and were not location specific. The remaining general flood event took place in Roanoke.

Figure 96
Verified Flash Flood Events by Participating Jurisdiction – Woodford County

Participating Municipality	Number	Year
Eureka	---	
Germantown Hills	1	2008
Roanoke	2	2008, 2008
countywide	6	1990, 1990, 1993, 1993, 2002, 2003
western portion of the County	5	2010, 2013, 2013, 2015, 2017
northern portion of the County	2	2013, 2015
northeastern portion of the County	4	2010, 2011, 2013, 2013
eastern portion of the County	2	2009, 2015
southern portion of the County	2	2013, 2017
southeastern portion of the County	1	2014
central portion of the County	4	2010, 2011, 2013, 2015

Vulnerability to flooding can change depending on several factors, including land use. As land used primarily for agricultural and open space purposes is converted for residential and commercial/industrial uses, the number of buildings and impervious surfaces (i.e., parking lots, roads, sidewalks, etc.) increases. As the number of buildings and impervious surfaces increases, so too does the potential for flash flooding. Rather than infiltrating the ground slowly, rain and snowmelt that falls on impervious surfaces runs off and fills ditches and storm drains quickly creating drainage problems and flooding.

As described in Section 1.3 Land Use and Development Trends, substantial changes in land use (from forested, open and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No substantial increases in residential or commercial/industrial developments are expected within the next five years.

What impacts resulted from the recorded floods?

Floods as a whole have caused a *minimum* of $36.9 million in property damages. The following provides a breakdown by category.

Flood Fast Facts – Impacts/Risk

General Flood Impacts

- Total Property Damage: ***$18,320,000***^
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***$250,000***^
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flash Flood Impacts

- Total Property Damage: ***$21,155,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flood Risk/Vulnerability to:

- Public Health & Safety – General Flooding: ***Low***
- Public Health & Safety – Flash Flooding: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium/High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

^ Includes $2.5 million in property damages and $250,000 in crop damages sustained as a result of the 1974 flood event and represents losses incurred by Tazewell, Woodford & Peoria counties. A breakdown by county was not available.

In comparison, the State of Illinois averages an estimated $257 million annually in property damage losses and four fatalities per year, making flooding the single most financially damaging natural hazard in Illinois.

General Floods

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and the 2010 Plan indicates that between 1950 and 2017, four of the 27 general flood events caused approximately $18.3 million in property damages and $250,000 in crop damages. Included in the totals are $2.5 million in property damages and $250,000 in crop damages sustained as a result of the 1974 flood event and represents losses sustained in Woodford, Woodford and Peoria counties. A breakdown by county was unavailable. Damage information was either unavailable or none was recorded for the remaining 23 reported occurrences.

No injuries or fatalities were reported as a result of any of the recorded events.

Flash Floods

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and the 2010 Plan indicates that between 1990 and 2017, six of the 28 flash flood events caused approximately $21.1 million in property damages. Damage information was either unavailable or none was recorded for the remaining 21 reported occurrences.

No injuries or fatalities were reported as a result of any of the recorded events.

What impacts have resulted from historic floods?

Historic flood events documented in the City of Peoria's 1983 Hazard Vulnerability Analysis and contained in the 2010 Plan indicate that flooding occurred in Woodford County in 1933, 1943 and 1944. **Appendix K** details the impacts associated with these historic floods.

What other impacts can result from flooding?

One of the primary threats from flooding is drowning. Nearly half of all flash flood fatalities occur in vehicles as they are swept downstream. Most of these fatalities take place when people drive into flooded roadway dips and low drainage areas. It only takes two feet of water to carry away most vehicles.

Floodwaters also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto streets and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during a flood event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

Structural damage, such as cracks forming in a foundation, can also result from flooding. In most cases, however, the structural damage sustained during a flood occurs to the flooring, drywall and wood framing. In addition to structural damage, a flood can also cause serious damage to a building's content.

Infrastructure and critical facilities are also vulnerable to flooding. Roadways, culverts and bridges can be weakened by floodwaters and have been known to collapse under the weight of a vehicle. Buried power and communication lines are also vulnerable to flooding. Water can infiltrate lines and cause disruptions in power and communication.

What is the level of vulnerability to public health and safety from floods?

While both general and flash floods occur on a fairly regular basis within the County, the number of injuries and fatalities is very low. In terms of the risk or vulnerability to public health and safety from *general floods*, the risk is seen as low. However, over half of the recorded flood events were the result of flash flooding. Since there is very little warning associated with flash flooding the risk to public health and safety from *flash floods* is elevated to medium.

Are there any repetitive loss structures within Woodford County?

Yes. According to information obtained from IEMA, there are two repetitive loss structure located in unincorporated Woodford County and eleven severe repetitive loss structures located in Spring Bay and unincorporated Woodford County. As described previously, FEMA defines a "repetitive loss structure" as an NFIP-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978. A "severe repetitive loss structure" as defined by FEMA is an NFIP-insured structure that has received four or more flood insurance claim payments of more than $5,000 each or two flood insurance claim payments that exceed the fair market value of the insured structure on the day before each loss.

Figure 97 identifies the repetitive flood loss structures by participating jurisdiction and provides the total flood insurance claim payments. The exact location and/or address of the insured structures are not included in this Plan to protect the owners' privacy. According to IEMA, there have been 66 flood insurance claim payments totaling $1.5 million for the 13 repetitive flood loss structures.

Figure 97
Repetitive Flood Loss Structures – Woodford County

Participating Jurisdiction	Structure Type	Number of Structures	Number of Claim Payments	Flood Insurance Claim Payments		Total Flood Insurance Claim Payments
				Structure	Content	
Repetitive Loss Properties						
Unincorporated Woodford County	single family	2	4	$143,523.56	$1,430.00	$144,953.56
Severe Repetitive Loss Properties						
Spring Bay	single family	1	6	$95,214.73	$0.00	$95,214.73
Unincorporated Woodford County	single family	10	56	$1,176,996.72	$93,810.68	$1,270,807.40
Total:		**13**	**66**	**$1,415,735.01**	**$95,240.68**	**$1,510,975.69**

Source: Illinois Emergency Management Agency

Are existing buildings, infrastructure and critical facilities vulnerable to flooding?
Yes. **Figure 98** identifies the number of existing residential structures by participating jurisdiction located within a base or 500-year floodplain. These counts were prepared by Tri-County Regional Planning Commission's GIS staff in consultation with the Consultant using the effective DFIRMs.

Figure 98
Existing *Residential Structures* Located within a Floodplain of a Participating Municipality – Woodford County

Participating Jurisdiction	Number of Residential Structures	Participating Jurisdiction	Number of Residential Structures
Eureka	12	Roanoke	11
Germantown Hills	0	Unincorp. Woodford County	213

Source: FEMA DFIRMs

Aside from key roads and bridges and buried power and communication lines, Eureka and Roanoke both have specific infrastructure/critical facilities located within or adjacent to a floodplain. The following provides a description of each.

- *Eureka*: A majority of the City's wastewater treatment plant and part of the City's drinking water facility are located in the Walnut Creek base floodplain while Eureka Middle School is located adjacent to the Walnut Creek base floodplain.
- *Roanoke*: The village hall/ambulance building is located in the West Branch Panther Creek base floodplain.

The original water treatment plant for Roanoke was located in the base floodplain of West Branch Panther Creek. However, in 2018 the Village constructed a new treatment plant outside of any floodplains.

While approximately seven percent of the land area in Woodford County lies within the base floodplain and is susceptible to riverine flooding, topography makes almost the entire County vulnerable to flash flooding. As a result, a majority of the buildings, infrastructure and critical facilities that may be impacted by flooding are located outside of a floodplain and are not easily identifiable.

The risk or vulnerability of existing buildings, infrastructure and critical facilities to all forms of flooding is considered to be medium to high based on: (a) the frequency and severity of recorded flood events within the County; (b) the County's proximity to the Illinois River; (c) the fact that most of the County is vulnerable to flash flooding; and (d) a majority of the buildings, infrastructure and critical facilities that may be impacted are located outside of a floodplain.

Are future buildings, infrastructure and critical facilities vulnerable to flooding?
The answer to this question depends on the type of flooding being discussed.

Riverine Flooding
In terms of riverine flooding, the vulnerability of future buildings, infrastructure and critical facilities located within NFIP-participating jurisdictions is low as long as the existing floodplain

ordinances are enforced. Enforcement of the floodplain ordinance is the mechanism that ensures that new structures either are not built in flood-prone areas or are elevated or protected to the base flood elevation.

Flash Flooding

In terms of flash flooding, all future buildings, infrastructure and critical facilities are still vulnerable depending on the amount of precipitation that is received, the topography and any land use changes undertaken within the participating jurisdictions.

What are the potential dollar losses to vulnerable structures from flooding?

An estimate of the potential dollar losses to vulnerable *residential structures* located within the *participating municipalities* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in Woodford County.

The purpose of providing an estimate is to help residents and municipal officials make informed decisions about how they can better protect themselves and their communities. These estimates are meant to provide a ***general idea of the magnitude of the potential damage*** that could occur from a flood event in each of the municipalities.

Assumptions

To calculate the overall potential dollar losses to vulnerable residential structures from a flood, a set of decisions/assumptions must be made regarding:

- type of flood event;
- scope of the flood event;
- number of potentially-damaged housing units;
- value of the potentially-damaged housing units; and
- percent damage sustained by the potentially-damaged housing units (i.e., damage scenario.)

The following provides a detailed discussion of each decision/assumption.

> **Assumption #1**
>
> A riverine flood event will impact vulnerable residential structures within each municipality.

Type of Flood Event. The first step towards calculating the potential dollar losses to vulnerable residential structures is to determine the type of flood event that will be used for this scenario. While flash flooding has occurred more frequently and has caused more recorded flood damages in the County than riverine flooding, identifying residential structures vulnerable to flash flooding is problematic because most are located outside of the floodplain and the number of structures impacted can change with each event depending on the amount of precipitation received, the topography and the land use of the area.

Therefore, a riverine flood event will be used since it is (a) relatively easy to identify vulnerable residential structures within each municipality (i.e., those structures located within the floodplain of any river, stream or creek); and (b) the number of structures impacted is generally the same from event to event.

Assumption #2

All base floodplains within a municipality will flood and experience the same degree of flooding.

Scope of the Flood Event. To establish the number of vulnerable residential structures (potentially-damaged housing units), the scope of the riverine flood event within each municipality must first be determined. In this scenario, the scope refers to the number of rivers, streams and creeks that overflow their banks and the degree of flooding experienced along the floodplains for each river, stream and creek.

Generally speaking, a riverine flood event only affects one or two rivers or streams at a time depending on the cause of the event (i.e., precipitation, snow melt, ice jam, etc.) and usually does not produce the same degree of flooding along the entire length of the river, stream or creek. However, for this scenario, it was decided that:

- all rivers, streams and creeks with floodplains would overflow their banks, and
- the floodplains of each river, stream and/or creek located within the corporate limits of each municipality would experience the same degree of flooding.

These assumptions result in the following conditions for each participating municipality:

- *Germantown Hills*: No rivers, streams or creeks are located within or adjacent to the village boundaries and therefore no residential flooding would occur;
- *Eureka*: Walnut Creek and its tributaries would overflow their banks and flood portions of the City.;
- *Roanoke*: West Branch Panther Creek and its tributaries would overflow their banks and flood portions of the Village.

Assumption #3

The number of existing residential structures located within the base floodplain(s) in each municipality will be used to determine the number of potentially-damaged housing units.

Number of Potentially-Damaged Housing Units. Since this scenario assumes that all the floodplains within a municipality will experience the same degree of flooding, the number of existing residential structures located within the floodplain(s) of each municipality can be used to determine the number of potentially-damaged housing units. **Figure 98** identifies the total number of existing residential structures located within the floodplains(s) of each municipality. These counts were prepared by the Tri-County Regional Planning Commission's GIS staff in consultation with the Consultant.

Assumption #4

The average market value for a residential structure in each municipality will be used to determine the value of potentially-damaged housing units.

Value of Potentially-Damaged Housing Units. Now that the number of potentially-damaged housing units has been determined, the monetary value of the units must be calculated. Typically, when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure in each municipality will be used.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the averaged assessed value and multiplying that number by three (the assessed value of a structure in Woodford County is approximately one-third of the market value). **Figure 99** provides a sample calculation. The total assessed value is based on 2016 tax assessment information provided by the Woodford County Supervisor of Assessments. **Figure 100** provides the average assess value and average market value for each participating municipality.

Figure 99
Sample Calculation of Average Assessed Value & Average Market Value - Eureka

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Eureka: $58,089,549 ÷ 2,023 housing units = $28,714.55709

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Eureka: $28,714.55709 x 3 = $86,143.67128
($86,144)

Figure 100
Average Market Value of Housing Units by
Participating Municipality – Woodford County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
Eureka	$58,089,549	2,023	$28,714.55709	$86,143.67127	$86,144
Germantown Hills	$81,900,782	1,218	$67,242.02135	$201,726.06405	$201,726
Roanoke	$22,289,797	867	$25,709.10842	$77,127.32526	$77,127

Source: Woodford County Supervisor of Assessments.

Assumption #5

The potentially-damaged housing units are one or two-story homes with basements and the flood depth is two foot.
Structural Damage = 20%
Content Damage = 30%

Damage Scenario. The final decision that must be made to calculate potential dollar losses is to determine the percent damage sustained by the structure and the structure's contents during the flood event. In order to determine the percent damage using FEMA's flood loss estimation tables, assumptions must be made regarding (a) the type of residential structure flooded (i.e., manufactured home, one-story home without a basement, one or two-story home with a basement, etc.) and (b) the flood depth. **Figure 101** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

Figure 101
FEMA Flood Loss Estimation Tables

Flood Building Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Building Damage)	Two Story No Basement (% Building damage)	One or Two Story With Basement (% Building damage)	Manufactured Home (% Building damage)
-2	0	0	4	0
-1	0	0	8	0
0	9	5	11	8
1	14	9	15	44
2	22	13	20	63
3	27	18	23	73
4	29	20	28	78
5	30	22	33	80
6	40	24	38	81
7	43	26	44	82
8	44	29	49	82
>8	45	33	51	82

Flood Content Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Contents Damage)	Two Story No Basement (% Contents damage)	One or Two Story With Basement (% Contents damage)	Manufactured Home (% Contents damage)
-2	0	0	6	0
-1	0	0	12	0
0	13.5	7.5	16.5	12
1	21	13.5	22.5	66
2	33	19.5	30	90
3	40.5	27	34.5	90
4	43.5	30	42	90
5	45	33	49.5	90
6	60	36	57	90
7	64.5	39	66	90
8	66	43.5	73.5	90
>8	67.5	49.5	76.5	90

Source: FEMA, Understanding Your Risks: Identifying Hazards and Estimating Losses

For this scenario it is assumed that the potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet. With these assumptions the expected percent damage sustained by the ***structure*** is estimated to be 20% and the expected percent damage sustained by the structure's ***contents*** is estimated to be 30%.

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying that by the percent damage (20%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 102** provides a sample calculation.

Figure 102 ***Structure:*** **Potential Dollar Loss Sample Calculation - Eureka**
Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit Eureka: \$86,144 x 20% = \$17,228.80 per housing unit Average Structural Damage x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar) Eureka: \$17,228.80 per housing unit x 12 housing unit = \$206,745.60 **(\$206,746)**

Next the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply that by the percent damage (30%) to get the average content damage per unit. Then take the average content damage per unit and multiply that by the number of potentially-damaged housing units. **Figure 103** provides a sample calculation.

Figure 103 ***Content*** **– Potential Dollar Loss Sample Calculation - Eureka**
½ (Average Market Value of a Housing Unit with the Jurisdiction) x Percent Damage = Average Content Damage per Housing Unit Eureka: ½ (\$86,144) x 30% = \$12,921.60 per housing unit Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar) Eureka: \$12,921.60 per housing unit x 12 housing unit = \$155,059.20 **(\$155,059)**

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figure 104** provides a breakdown of the total potential dollar losses by municipality.

This assessment illustrates the <u>*potential residential dollar losses*</u> that should be considered when municipalities are deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences within Eureka and Roanoke would be expected to ***range from \$297,000 to \$361,800***. Germantown Hills does not have any residences considered vulnerable to riverine flooding in this scenario.

Figure 104
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Municipality – Woodford County

Participating Jurisdiction	Average Market Value (2016)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Eureka	$86,144	12	$206,746	$155,059	$361,805
Germantown Hills	$201,726	0	$ 0	$ 0	$ 0
Roanoke	$77,127	11	$169,679	$127,260	$296,939

Vulnerability of Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of a large riverine flood event in dollars. These calculations do not include the physical damages sustained by businesses or other infrastructure and critical facilities.

In terms of businesses, the impacts from a flood event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the flood event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. ***As a result, the cumulative monetary impacts to businesses and infrastructure can far exceed the cumulative monetary impacts to residences***. While average dollar amounts cannot be supplied for these items at this time, they should be taken into account when discussing the overall impacts that a large-scale riverine flood event could have on the participating jurisdictions.

In terms of specific infrastructure vulnerability, Eureka's wastewater treatment plant and drinking water facility are partially located in the ***base floodplain*** of Walnut Creek.
In terms of specific infrastructure vulnerability, the following are located within a ***base floodplain***:

- *Eureka*: wastewater treatment and drinking water facility; and
- *Roanoke*: village hall/ambulance building.

It should be noted that in 2018 Roanoke constructed a new water treatment plant located outside of any floodplains. No other above-ground infrastructure within the participating jurisdictions, other than key roads and bridges, were identified as being vulnerable to riverine flooding.

Considerations

While the potential dollar loss scenario was only for a riverine flood event, the participating jurisdictions have been made aware through the planning process of the impacts that can result from flash flood events. Woodford County has experienced multiple events over the last 20 to 30 years as have adjoining and nearby counties. These events illustrate the need for officials to consider the overall monetary impacts of all forms of flooding on their communities. All participants should carefully consider the types of activities and projects that can be taken to minimize their vulnerability.

Woodford County

Figure 88
(Sheet 1 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
4/6/1950 thru 5/13/1950	n/a	Illinois River	western portion of the county	25.0 feet 4/29/1950	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
3/15/1962 thru 4/14/1962	n/a	Illinois River	western portion of the county	23.7 feet 3/26/1962	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
4/23/1970 thru 6/27/1970	n/a	Illinois River	western portion of the county	25.9 feet 5/19/1970	n/a	n/a	n/a	n/a	n/a	n/a	n/a	heavy rain fell over much of central Illinois for 3 to 8 consecutive days washing out crops and causing extreme soil erosion & ponding
3/14/1973 thru 5/19/1973	n/a	Illinois River	western portion of the county	24.4 feet 4/25/1973	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$0**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Woodford County

Figure 88 (Sheet 2 of 9) General Flood Events 1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
5/19/1974 thru 7/8/1974	n/a	Illinois River area rivers, streams & creeks	countywide	22.2 feet 6/26/1974	n/a	n/a	n/a	n/a	n/a	$143,000 $2,500,000[§]	$250,000[§]	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #438)								2 bridges in Woodford County were damaged beyond repair and had to be replaced				
2/25/1976 thru 3/23/1976	n/a	Illinois River	western portion of the county	23.6 feet 3/9/1976	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
3/7/1979 thru 5/17/1979	n/a	Illinois River area rivers, streams & creeks	countywide	28.7 feet 3/23/1979 3rd highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #583)***
5/28/1980 thru 6/5/1980	n/a	area rivers, streams & creeks	countywide	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- 14 inches of rain fell in a week flooding farm fields, buildings & roads - on a farm near Eureka about 300 pigs had to swim to safety								- many bridges and road were washed out in the County				
Subtotal:								**0**	**0**	**$2,823,000[§]**	**$250,000[§]**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

[§] The property damage total of $2.5 million and the crop damage total of $250,000 for the 1974 flood event represent losses sustained in Peoria, Tazewell and Woodford counties. A detailed breakdown by county was not available.

Woodford County

Figure 88
(Sheet 3 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
2/24/1982 thru 5/2/1982	n/a	Illinois River	western portion of the county	27.1 feet 3/23/1982 7th highest crest on record	67	n/a	n/a	n/a	n/a	$180,000	n/a	
12/5/1982 thru 1/7/1983	n/a	Illinois River Mackinaw River area rivers, streams & creeks	countywide	27.4 feet 12/9/1982 6th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #674)***
4/3/1983 thru 5/22/1983	n/a	Illinois River area rivers, streams & creeks	countywide	25.7 feet 4/17/1983	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$0**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Woodford County

Figure 88
(Sheet 4 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
2/26/1985 thru 4/15/1985	n/a	Illinois River Mackinaw River area rivers, streams & creeks	countywide	28.4 feet 3/7/1985 4th highest crest on record	600+	100+	roads closed	n/a	n/a	$1,297,000	n/a	***this event was part of a federally-declared disaster (Declaration #735)***
3/24/1993 thru 5/10/1993	n/a	Illinois River	western portion of the county	23.16 feet 4/24/1993	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
5/14/1995 thru 6/15/1995	n/a	Illinois River area rivers, streams & creeks	countywide	24.91 feet 6/2/1995	n/a	n/a	n/a	n/a	n/a	n/a	n/a	numerous homes were damaged or destroyed by flooding ***along the Illinois River***
2/21/1997 thru 3/6/1997	6:00 p.m.	Illinois River	western portion of the county	26.85 feet 3/3/1997 10th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	several homes just south of Spring Bay were flooded
Subtotal:								**0**	**0**	**$1,297,000**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Woodford County

Figure 88
(Sheet 5 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
5/11/2002 thru 5/13/2002	9:00 p.m.	area rivers, streams & creeks	countywide	n/a	2	n/a	n/a	n/a	n/a	n/a	n/a	- runoff caused flood problems countywide, especially in the Eureka & Roanoke areas - 2 families were evacuated from their homes due to rising waters
5/14/2002 thru 5/27/2002	11:00 p.m.	Illinois River Mackinaw River	countywide	25.25 feet 5/18/2002	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
9/16/2008 thru 10/5/2008	n/a	Illinois River	western portion of the county	26.99 feet 9/20/2008 9th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #1800)***
3/2/2009 thru 6/6/2009	n/a	Illinois River	western & northern portion of the county	27.92 feet 3/14/2009 5th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$0**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Woodford County

Figure 88
(Sheet 6 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
3/10/2009	12:00 a.m.	area rivers, streams & creeks	Roanoke	n/a	n/a	n/a	several streets covered with water	n/a	n/a	n/a	n/a	
4/18/2013 thru 4/19/2013	9:00 a.m.	area rivers, streams & creeks	northwest & western portions of the county	n/a	n/a	n/a	See Event Description	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** - very heavy rainfall produced up to 8 inches of rain causing both flash flooding & general flooding - nearly every road in the flooded area was impassable - most of the creeks and streams stayed in flood and most roads remained closed until the 19th												
Subtotal:								**0**	**0**	**$0**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Woodford County

Figure 88
(Sheet 7 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
4/19/2013 thru 5/8/2013	10:00 a.m.	Illinois River	western portion of the county	29.32 feet 4/23/2013 highest crest - flood of record at this gauge	276 (See Event Description)	2 (See Event Description)	fire station, numerous roads (See Event Description)	n/a	n/a	$14,200,000	n/a	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** - 276 homes, 2 businesses, a fire station and numerous roads along the Illinois River in Spring Bay and Bay View Gardens were inundated and suffered damage due to record river levels - The Woodford County EMA Director identified $500,000 in damages to homes and businesses as a result of the flooding												
5/27/2013	6:30 a.m.	area rivers, streams & creeks	northeast portion of the county	n/a	n/a	n/a	numerous roads	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- torrential rainfall produced 2.5 to 4 inches of rain causing flash flooding and general flooding of streets in Minonk, parts of Interstate 39 and numerous rural roads - most roads were impassable and closed through the morning with flooding subsiding by early afternoon												
6/15/2015 thru 7/31/2015	n/a	Illinois River	western portion of the county	27.06 feet 7/1/2015 8th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$14,200,000**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Woodford County

Figure 88
(Sheet 8 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Crop Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted							
					Homes	Business	Infra-structure					
12/27/2015 thru 1/20/2016	n/a	Illinois River	western portion of the county	26.46 feet 1/3/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
4/29/2017 thru 4/30/2017	10:45 p.m.	area rivers, streams & creeks	western portion of the county	n/a	n/a	n/a	numerous streets, roads & highways	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- heavy rainfall of 2.75 to 4 inches in a two-hour period during the evening on already saturated ground caused both flash flooding & general flooding - streets in Germantown Hills, Metamora & Roanoke were impassable as well as numerous rural roads and highways in the county, including parts of IL Route 89 southwest of Washburn which was closed due to high water and flood debris - an additional 0.5 to 1 inch during the early morning hours of the 30th kept many roads flooded - flood waters subsided by early afternoon on the 30th												
Subtotal:								**0**	**0**	**$0**	**0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Woodford County

Figure 88 (Sheet 9 of 9) General Flood Events 1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude: Flood Crest Illinois River Peoria[1]	Magnitude: Impacted Homes	Magnitude: Impacted Business	Magnitude: Impacted Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Description
6/17/2017 thru 6/18/2017	10:45 p.m.	area rivers, streams & creeks	southern portion of the county	n/a	n/a	n/a	numerous streets, roads & highways	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- torrential rainfall of 3 to 5 inches fell within a 90-minute period causing both flash flooding & general flooding - most county highways were impassable - additional rainfall during the late evening/early morning hours kept many roads flooded - flood waters subsided by daybreak on the 18th												
Subtotal:								**0**	**0**	**$0**	**0**	
GRAND TOTAL								**0**	**0**	**$18,320,000§**	**$250,000§**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

§ The property damage total includes $2.5 million and the crop damage total includes $250,000 from the 1974 flood event and represents losses sustained in Peoria, Tazewell and Woodford counties. A detailed breakdown by county was not available.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Weather Service, River Observations, North Central River Forecast Center, Illinois River at Peoria.
Tri-County Mitigation Action Committee member responses to the Natural Hazard Events Questionnaire.
United States Army Corps of Engineers, RiverGages.com, Data Mining.
Woodford County Hazard Identification and Risk Assessment Packet.

Woodford County

Figure 89
(Sheet 1 of 4)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
6/20/1990	4:00 a.m.	countywide	n/a	n/a	n/a	n/a	
6/29/1990	8:30 a.m.	countywide	n/a	n/a	n/a	n/a	
8/15/1993	8:45 p.m.	countywide	n/a	n/a	n/a	n/a	numerous road and basements were flooded
8/23/1993	5:45 p.m.	countywide	n/a	n/a	n/a	n/a	street flooding occurred
7/21/2001	8:32 a.m.	Low Point Cazenovia	n/a	n/a	n/a	n/a	- a section of IL Rte. 89 from Cazenovia to Low Point was flooded
5/11/2002	8:00 p.m.	countywide	n/a	n/a	n/a	n/a	numerous roads were flooded and several creeks went out of their banks
6/26/2002	12:30 a.m.	Minonk	n/a	n/a	n/a	n/a	numerous streets and basements were flooded
7/9/2003 thru 7/10/2003	11:00 p.m.	countywide	n/a	n/a	n/a	n/a	many streets and roads were flooded
9/13/2008	5:43 p.m.	Roanoke^	n/a	n/a	n/a	n/a	- ***this event was part of a federally-declared disaster (Declaration #1800)*** - County Highway 13 one mile south of the Village was closed due to high water
9/13/2008	8:00 p.m.	Spring Bay	n/a	n/a	$90,000	n/a	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #1800)*** - several homes flooded, prompting boat evacuations - Funks Run Creek overflowed its banks and flooded streets in the Village near Mill Point Park - some small levees along the creek also gave way, aggravating the flooding in that area							
9/13/2008	8:00 p.m.	Roanoke	n/a	n/a	$55,000	n/a	- *Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #1800)*** - Panther Creek rose out of its banks and flooded Main St. and Mill St. - 1.5 feet of water came into the American Legion - numerous other homes and businesses had water in their basements							
9/13/2008	8:26 p.m.	Germantown Hills Metamora	n/a	n/a	n/a	n/a	- ***this event was part of a federally-declared disaster (Declaration #1800)*** - numerous roads had water flowing across them
5/13/2009 thru 5/14/2009	11:00 p.m.	eastern portion of the county	n/a	n/a	n/a	n/a	most roads in the eastern part of the County were flooded
Subtotal:			**0**	**0**	**$145,000**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Woodford County

Figure 89 (Sheet 2 of 4) Flash Flood Events 1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
5/25/2010	1:00 p.m.	northeast portion of the county	n/a	n/a	n/a	n/a	- most rural roads were inundated, particularly near Minonk and north of Benson, including IL Rte. 117
6/23/2010	6:45 p.m.	western & central portions of the county	n/a	n/a	n/a	n/a	- many rural roads were impassable, including portions of IL Rte. 116 & IL Rte. 117 _Metamora/Eureka/Roanoke_ - many streets were flooded
6/21/2011 thru 6/22/2011	7:15 p.m.	central portion of the county	n/a	n/a	n/a	n/a	- several rural roads were impassable during the late evening _Eureka/Roanoke_ - significant street flooding was reported, including parts of IL Rte. 117 & US Rte. 24 in Eureka & IL Rte. 116 in Roanoke
6/22/2011	8:00 p.m.	northeastern portion of the county	n/a	n/a	n/a	n/a	- nearly all rural roads were impassable - parts of Interstate 39 between Minonk & El Paso had standing water
4/17/2013 thru 4/18/2013	7:15 p.m.	northeastern & central portions of the county	n/a	n/a	$13,000,000	n/a	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** - every road from the central to northeast part of the County was impassable _Minonk area_ - roads near Minonk were flooded with more than a foot of flowing water _Eureka/Roanoke/Metamora_ - hundreds of homes and businesses in Roanoke, Eureka and Metamora were flooded - several water rescues had to be made							
Subtotal:			**0**	**0**	**$13,000,000**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Woodford County

Figure 89
(Sheet 3 of 4)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
4/17/2013 thru 4/18/2013	10:00 p.m.	western portion of the county	n/a	n/a	$5,000,000	n/a	- ***this event was part of a federally-declared disaster (Declaration #4116)*** - hundreds of homes were damaged in northwest & western parts of the County - all roads were impassable - water rescues were made
5/26/2013 thru 5/27/2013	10:30 p.m.	northern and northeastern portion of the county	n/a	n/a	n/a	n/a	- numerous rural roads and parts of Interstate 39 were impacted by flooding with most roads impassable and closed through the night *Minonk* - streets were flooded
5/31/2013	4:00 p.m.	southern portion of the county	n/a	n/a	n/a	n/a	numerous rural roads were inundated and impassable as a result of the flash flooding
6/24/2013	4:00 a.m.	western portion of the county	n/a	n/a	$3,000,000	n/a	- several state highways were impassable, including IL Routes 26, 89 & 116 *Spring Bay/Germantown Hills* - streets and houses were flooded
5/11/2014	7:00 p.m.	southeastern portion of the county	n/a	n/a	n/a	n/a	- IL Rte. 251 and County Road 9 west of Kappa were inundated with water 12 to 18 inches deep - roads were closed for nearly 3 hours
6/7/2015	8:00 p.m.	western portion of the county	n/a	n/a	n/a	n/a	- secondary roads from Low Point to Benson and near Bay View Gardens were impassable - parts of IL Route 26 were also flooded
6/10/2015 thru 6/11/2015	7:30 p.m.	northern portion of the county	n/a	n/a	n/a	n/a	- IL Route 89 from Low Point through Washburn to the Tazewell/Marshall County Line were closed due to high water - most rural roads in the northern part of the County were impassable
Subtotal:			**0**	**0**	**$8,000,000**	**$0**	

^ Flash flood event verified in the vicinity of this location(s).

Woodford County

Figure 89
(Sheet 4 of 4)
Flash Flood Events
1990 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Crop Damages	Magnitude/Description
6/18/2015	2:30 p.m.	central & eastern portions of the county	n/a	n/a	$10,000	n/a	- many rural roads were impassable - a section of railroad track of the Toledo, Peoria & Western Railway east of Eureka was washed out
4/29/2017	7:15 p.m.	western portion of the county	n/a	n/a	n/a	n/a	- numerous rural roads were impassable *Germantown Hills/Roanoke/Metamora* - streets were impassable *Washburn area* - IL Route 89 south of the Village was closed due to high water and flood debris
6/17/2017	8:40 p.m.	southern portion of the county	n/a	n/a	n/a	n/a	most county highways were impassable
Subtotal:			**0**	**0**	**$10,000**	**$0**	
GRAND TOTAL:			**0**	**0**	**$21,155,000**	**$0**	

ᐞ Flash flood event verified in the vicinity of this location(s).

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

3.3.3 PARTICIPATING PEORIA COUNTY MUNICIPALITIES

HAZARD PROFILE

The following identifies past occurrences of floods; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When has flooding occurred previously? What is the extent of these previous floods?

Figures 105 and **106**, located at the end of this subsection, summarize the previous occurrences as well as the extent or magnitude of flood events recorded in the participating Peoria County municipalities. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

Flood Fast Facts – Occurrences

Number of General Floods Reported (1950 – 2017): ***29***

Number of Flash Floods Reported (1960 – 2017): ***21***

Most Likely Month for General Floods to Occur: ***March***

Most Likely Month for Flash Floods to Occur: ***June***

Most Likely Time for Flash Floods to Occur: ***Evening***

Number of Federal Disaster Declarations Related to General and Flash Flooding: ***7***

General Floods

NOAA's Storm Events Database, NOAA's Storm Data Publications, the U.S. Army Corps of Engineers' river gauge data and information included in the 2010 Plan have documented 29 occurrences of general flooding in the participating Peoria County municipalities between 1950 and 2017. Included in the 29 general flood events are seven events that contributed to six separate federally-declared disasters for Peoria County. One declared disaster, Declaration #4116, included both general and flash flooding events.

Based on historical gauge data, the record setting Illinois River flood in this area occurred on April 23, 2013 when the Illinois River crested at 29.32 feet at Peoria. The second and third highest crest at this location occurred in 1943 and 1979 respectively.

Flash Floods

NOAA's Storm Events Database, NOAA's Storm Data Publications and information included in the 2010 Plan documented 21 reported occurrences of flash flooding in the participating Peoria County municipalities between 1960 and 2017. Included in the 21 flash flood events are two events that contributed to two separate federally-declared disasters in Peoria County. One declared disaster, Declaration #4116, included both general and flash flooding events.

Figure 107 charts the reported occurrences of flooding by month. Of the 29 general flood events, 16 (55%) began in March, April and May making this the peak period for general floods in the participating Peoria County municipalities. Of the 16 events, six (37.5%) began in March making this the peak month for general flooding. There were 20 events that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

In comparison, 14 of the 21 flash flood events (67%) took place April, May and June making this the peak period for flash floods. Of the 14 events, nine (64%) occurred in June making this the peak month for flash flooding.

Figure 107
Graph: Flood Events by Month
Participating Peoria County Municipalities

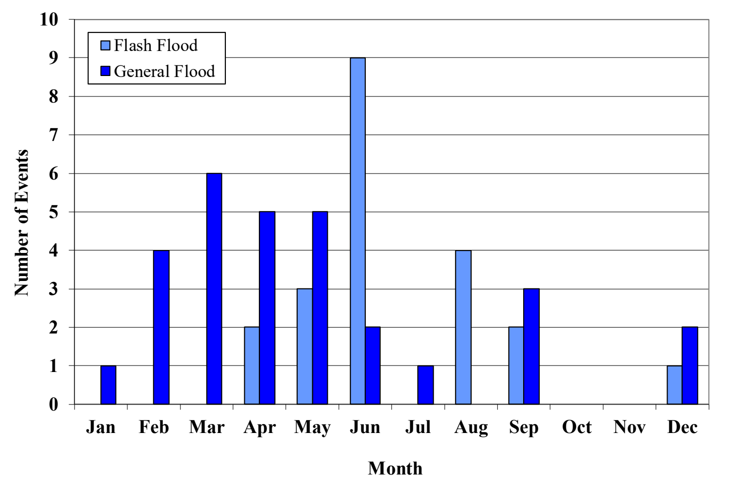
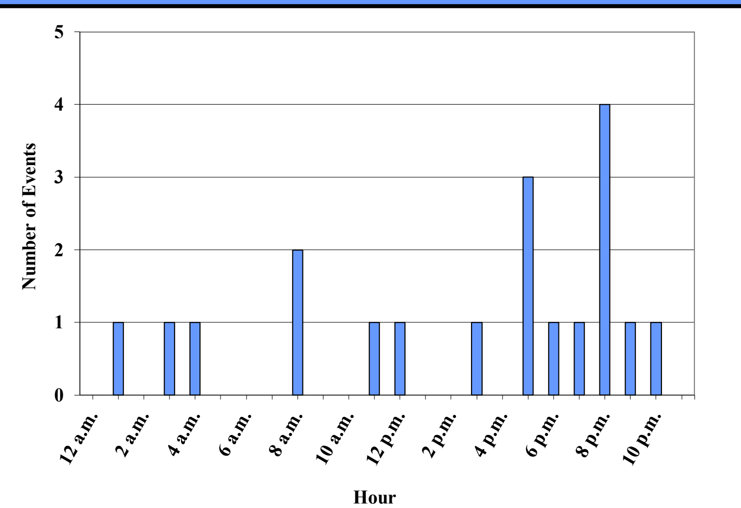


Figure 108 charts the reported occurrences of flash flood events by hour. Of the 21 occurrences, start times were unavailable for two events. Of the remaining 19 flash flood events with recorded times, approximately 68% occurred during the p.m. hours, with 11 of the events (52%) taking place between 5:00 p.m. and 11:00 p.m. In comparison 60% of general flood events with recorded times began during the p.m. hours.

Figure 108
Flash Flood Events by Hour
Participating Peoria County Municipalities



What locations are affected by floods?

While only Bartonville, Chillicothe, Peoria and Peoria Heights are affected by general flooding, all of the participating Peoria County municipalities can be impacted by overland and flash flooding because of the topography and seasonally high water table of the area. In Peoria County 8.5% of the area in the County is designated as being within the base floodplain and susceptible to riverine floods (a breakdown by municipality was not available.) The *2013 Illinois Natural Hazard Mitigation Plan* classifies Peoria County's hazard rating for floods as "high."

Figure 109 identifies the floodplains in Peoria County, including the participating jurisdictions. This map is based on the available FIRMs that became effective between 1977 and 1983. A FIRM has not yet been developed for Hanna City. **Appendix J** contains the FIRMs for the participating municipalities. Bartonville, Chillicothe, Peoria and Peoria Heights are susceptible to riverine flooding because of their proximity to floodplains.

Figure 110 identifies the bodies of water within or immediately adjacent to participating municipalities that are known to cause flooding or have the potential to flood. Water bodies with Special Flood Hazard Areas located within a participating jurisdiction (as identified on the DFIRMs) are identified in bold.

Figure 110
Bodies of Water Subject to Flooding – Participating Peoria County Municipalities

Participating Jurisdiction	Water Bodies
Bartonville	**Illinois River, Kickapoo Creek, LaMarsh Creek Tributary, Unnamed Tributary B, Unnamed Tributary Kickapoo Creek**
Chillicothe	**Illinois River**
Hanna City	Johnson Run
Peoria	**Big Hollow Creek, Boyd's Hollow Creek, Dry Run Creek, East Peoria Dry Run Creek, Illinois River, Kickapoo Creek, North Fork Tributary Big Hollow Creek, Poppet Hollow Creek, Tributary Big Hollow Creek**
Peoria Heights	**Illinois River**

Source: FEMA DFIRMs

Municipal officials have reported overland flood issues outside of the base floodplain in most of the participating municipalities. This overland flooding is known to impair travel.

What jurisdictions take part in the NFIP?

Participating Municipalities

Bartonville, Chillicothe, Peoria and Peoria Heights all take part in the NFIP. **Figure 111** provides information about each jurisdiction's participation in the NFIP, including the date each participant joined, the date of their most recent FIRM, their status in the Community Rating System and the year of their most recently adopted floodplain zoning ordinance. Hanna City has no identified flood hazard boundaries within its corporate limits and is not required to participate.

Figure 109
Floodplain Areas in Peoria County

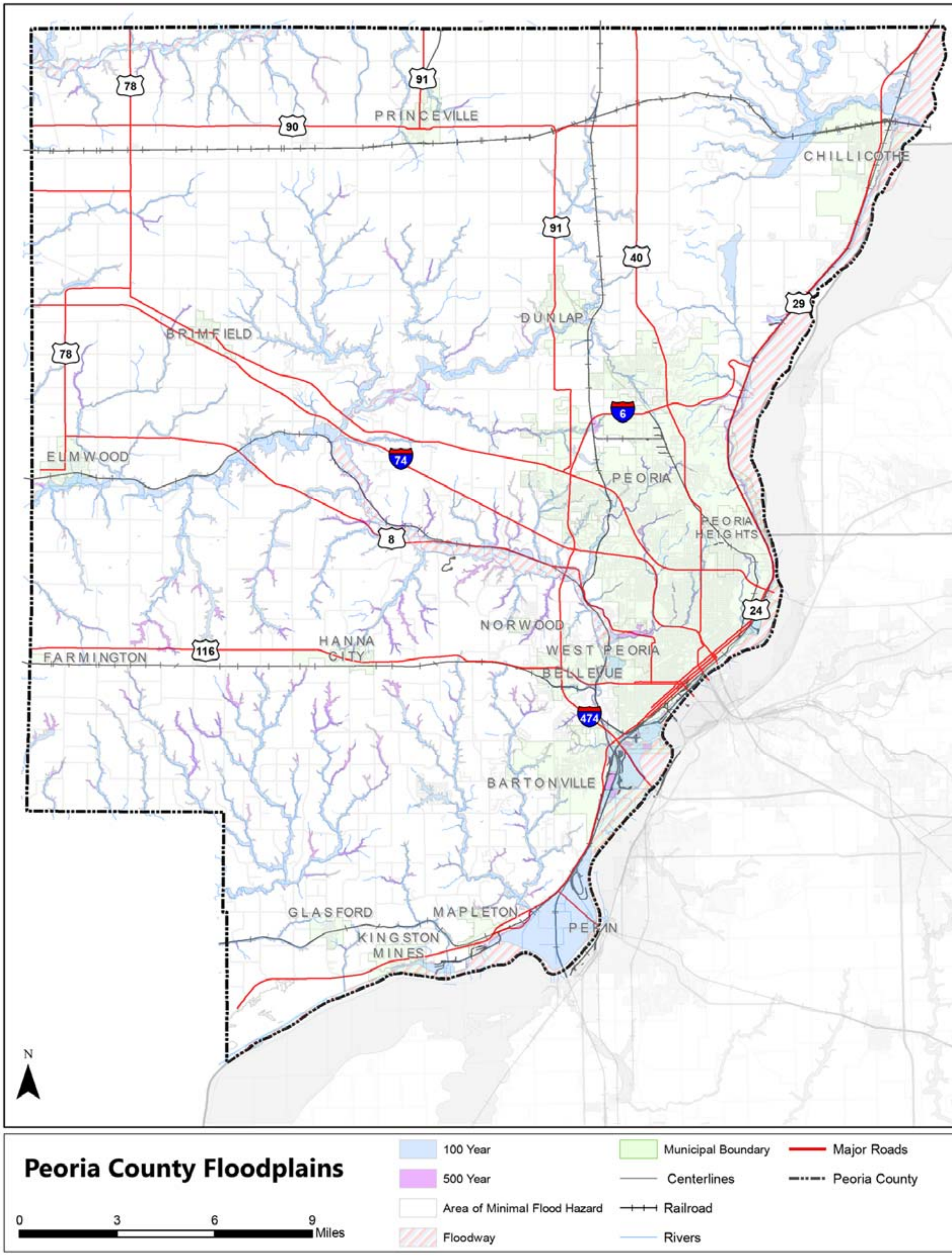


Figure 111
Participating Peoria County Jurisdictions' NFIP Status

Participating Jurisdictions	Participation Date	Current Effective FIRM Date	CRS Participation	Most Recently Adopted Floodplain Zoning Ordinance
Bartonville	03/16/1981	11/02/1983	No	2000
Chillicothe	02/02/1977	02/02/1977	No	1977
Hanna City	---	n/a	No	---
Peoria	02/01/1980	02/01/1980	No	1995
Peoria Heights	11/01/1979	11/01/1979 02/17/2017	No	2017

Sources: FEMA, Community Status Book.
FEMA, National Flood Insurance Program Flood Insurance Manual.
MAC member responses to List of Existing Planning Documents Questionnaire.

Non-Participating Jurisdictions

Figure 112 provides information on Peoria County and those incorporated municipalities within the County that chose not to participate in the planning process but also take part in the NFIP. Maps have not yet been developed for Bellevue, Brimfield, Elmwood, Glasford, Norwood or Princeville. As a result, they have no identified flood hazard boundaries within their corporate limits and are not required to participate.

At this time Mapleton is not a participant in the NFIP. Since the current effective FIRM identifies Special Flood Hazard Areas within Mapleton's corporate limits, it is presently sanctioned by the Program.

Figure 112
Non-Participating Jurisdictions' NFIP Status – Peoria County

Jurisdiction	Participation Date	Current Effective FIRM Date	CRS Participation		Jurisdiction	Participation Date	Current Effective FIRM Date	CRS Participation
Peoria County	02/15/1980	06/01/1983	Yes		Kingston Mines	11/16/1983	11/16/1983	No
Dunlap	03/18/1993	n/a	No		West Peoria	09/29/1994	06/01/1983	No

Sources: FEMA, Community Status Book.
FEMA, National Flood Insurance Program Flood Insurance Manual.

Jurisdictions that participate in the NFIP are expected to adopt and enforce floodplain management regulations. With the exception of Chillicothe and possibly Kingston Mines, all of the NFIP participating jurisdictions have adopted the State of Illinois model floodplain ordinance. This ordinance goes above and beyond NFIP minimum standards and has much more restrictive floodway regulations. Chillicothe and Kingston Mines both have floodplain ordinances in place and will most likely adopt the model ordinance when the updated FIRMs become available. As a result, all of the NFIP participating jurisdictions are considered in compliance with NFIP requirements.

Participating jurisdictions will continue to comply with the NFIP through the implementation of mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within SFHAs. At this time no new construction is planned within the base floodplain. Continued compliance with NFIP requirements for those jurisdictions that participated in the Plan update are addressed in the Mitigation Action Tables found in Section 4.7.

What is the probability of future flood events occurring?

General Floods

Twenty-two of the 29 general flood events that took place between 1950 and 2017 impacted those participating municipalities located adjacent to the Illinois River (Bartonville, Chillicothe, Peoria & Peoria Heights). With 22 occurrences over the past 68 years, the probability or likelihood of a general flood event occurring in these municipalities in any given year is 32%. However, gaps in the data between 1950 and 1995 have the potential to cause a distortion in this probability. If only the events recorded in NOAA's Storm Events Database and supplemented by U.S. Army Corps of Engineer river gauge data are analyzed, then nine of the ten verified occurrences of general flooding between 1995 and 2017 impacted the participating municipalities located adjacent to the Illinois River. With nine events in 23 years, the probability of a general flood event occurring in any given year goes up slightly to 39%. There were two years over the past 23 years where two or more general flood events occurred. This indicates that the probability or likelihood that more than one general flood event may occur during any given year within the municipalities adjacent to Illinois River is 8%.

Given the fact that there are no major rivers, streams or creeks located within or adjacent to Hanna City and only one of the general flood events indicated that it impacted the Village, it is difficult to specifically establish the probability of general flood events occurring in any given year; however, it is estimated to be relatively low.

Flash Floods

There have been 21 verified flash flood events between 1960 and 2017. With 21 occurrences over the past 68 years, the probability or likelihood of a flash flood event occurring in any of the participating Peoria County municipalities in any given year is 31%. However, gaps in the data between 1960 and 2002 cause a distortion in this probability. If only the events recorded in NOAA's Storm Events Database are analyzed, then there have been 15 verified occurrences of flash flooding between 2002 and 2017. With 15 events in 16 years, the probability of a flash flood event occurring in any given year goes up to 94%. There were five years over the past 16 years where two or more flash flood events occurred. This indicates that the probability that more than one flash flood event may occur during any given year within the participating municipalities is approximately 56%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from floods.

Several factors including topography, precipitation and an abundance of rivers and streams make Illinois especially vulnerable to flooding. According to the Illinois State Water Survey's Climate Atlas of Illinois, since the 1940s Illinois climate records have shown an increase in heavy precipitation which has led to increased flood peaks on Illinois rivers.

Are the participating jurisdictions vulnerable to flooding?

Yes. The participating Peoria County municipalities are vulnerable to the dangers presented by flooding. Precipitation levels and topography are factors that cumulatively make virtually all the participating municipalities susceptible to some form of flooding. Flooding occurs along the floodplains of all the streams within the municipalities as well as outside of the floodplains in low-lying areas where drainage problems occur. **Figure 113** details the number of *recorded* general and flash flood events by participating municipality. Since 2008, the participating municipalities have experienced seven general floods and 12 flash flood events.

Vulnerability to flooding can change depending on several factors, including land use. As land used primarily for agricultural and open space purposes is converted for residential and commercial/industrial uses, the number of buildings and impervious surfaces (i.e., parking lots, roads, sidewalks, etc.) increases. As the number of buildings and impervious surfaces increases, so too does the potential for flash flooding. Rather than infiltrating the ground slowly, rain and snowmelt that falls on impervious surfaces runs off and fills ditches and storm drains quickly creating drainage problems and flooding.

Figure 113
Verified Flood Events by Participating Peoria County Municipalities

Participating Municipality	Number of Events	
	General Floods	Flash Floods
Bartonville	23	11
Chillicothe	23	11
Hanna City	1	8
Peoria	28	20
Peoria Heights	21	9

As described in Section 1.3 Land Use and Development Trends, substantial changes in land use (from forested, open and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No substantial increases in residential or commercial/industrial developments are expected within the next five years.

What impacts resulted from the recorded floods?

Floods as a whole have caused a *minimum* of $4.7 million in property damages, two injuries and four fatalities. The following provides a breakdown by category.

In comparison, the State of Illinois averages an estimated $257 million annually in property damage losses and four fatalities per year, making flooding the single most financially damaging natural hazard in Illinois.

General Floods

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and the 2010 Plan indicates that between 1950 and 2017, seven of the 29 general flood events caused approximately $34 million in property damages. Included in the property damage total is $29.4 million sustained as a result of the 1985 and 2013 flood events and represents losses sustained by

Peoria County as a whole (including the participating municipalities.) A breakdown by municipality was unavailable. Damage information was either unavailable or none was recorded for the remaining 22 reported occurrences.

NOAA's Storm Events Database documented one fatality as a result of the April, 2013 general flood event. A man drowned on May 4, 2013 when he drove his vehicle into floodwaters northeast of downtown Peoria.

Flash Floods

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and the 2010 Plan indicates that between 1960 and 2017, three of the 21 flash flood events caused $130,025,000 in property damages. Included in the property damage total is $130 million sustained as a result of the April and June, 2013 flood events and represents losses sustained by Peoria County as a whole (including the participating municipalities.) A breakdown by municipality was unavailable. Damage information was either unavailable or none was recorded for the remaining 18 reported occurrences.

Flood Fast Facts – Impacts/Risk

General Flood Impacts
- ❖ Total Property Damage: ***$34,070,000***^
- ❖ Infrastructure/Critical Facilities Damage*: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***1***

Flash Flood Impacts
- ❖ Total Property Damage: ***$130,025,000***†
- ❖ Infrastructure/Critical Facilities Damage*: ***n/a***
- ❖ Injuries: ***2***
- ❖ Fatalities: ***3***

Flood Risk/Vulnerability to:
- ❖ Public Health & Safety – General Flooding: ***Low***
- ❖ Public Health & Safety – Flash Flooding: ***Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Medium/High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

^ Includes $29.4 million in property damages sustained as a result of two separate flood events and represents losses incurred by all of Peoria County (including the participating municipalities.) A breakdown by municipality was not available.

† Includes $130 million in property damages sustained as a result of two separate flood events and represents losses incurred by all of Peoria County (including the participating municipalities.) A breakdown by municipality was not available.

NOAA's Storm Events Database, NOAA's Storm Data Publications and information from the 2010 Plan documented two injuries and three fatalities as the result of two separate flash flood events. The following provides a brief description of each.

- ❖ On August 18, 1960 flash flooding claimed the lives of three children in Peoria. Two children drowned while playing in Kickapoo Creek and the other child drowned after being pulled 575 feet down a drainage conduit.
- ❖ Two individuals were injured on April 17, 2013 when two houses collapsed into basement.

What impacts have resulted from historic floods?

Historic flood events documented in the City of Peoria's 1983 Hazard Vulnerability Analysis and contained in the 2010 Plan indicate that flooding occurred in one or more of the participating municipalities in 1933, 1935, 1938, 1943 and 1944. Several of these events involved flooding along the Illinois River. **Appendix K** details the impacts associated with these historic floods.

What other impacts can result from flooding?

One of the primary threats from flooding is drowning. Nearly half of all flash flood fatalities occur in vehicles as they are swept downstream. Most of these fatalities take place when people drive into flooded roadway dips and low drainage areas. It only takes two feet of water to carry away most vehicles.

Floodwaters also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto streets and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during a flood event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

Structural damage, such as cracks forming in a foundation, can also result from flooding. In most cases, however, the structural damage sustained during a flood occurs to the flooring, drywall and wood framing. In addition to structural damage, a flood can also cause serious damage to a building's content.

Infrastructure and critical facilities are also vulnerable to flooding. Roadways, culverts and bridges can be weakened by floodwaters and have been known to collapse under the weight of a vehicle. Buried power and communication lines are also vulnerable to flooding. Water can infiltrate lines and cause disruptions in power and communication.

What is the level of vulnerability to public health and safety from floods?

While both general and flash floods occur on a fairly regular basis within the participating municipalities, the number of injuries and fatalities is very low. In terms of the risk or vulnerability to public health and safety from *general floods*, the risk is seen as low. However, nearly half of the recorded flood events were the result of flash flooding. Since there is very little warning associated with flash flooding the risk to public health and safety from *flash floods* is elevated to medium.

Are there any repetitive loss structures within the participating municipalities?

Yes. According to information obtained from IEMA, there are four repetitive loss structure located in Chillicothe, Peoria and Peoria Heights and 15 severe repetitive loss structures located in Chillicothe, Peoria and Peoria Heights. As described previously, FEMA defines a "repetitive loss structure" as an NFIP-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978. A "severe repetitive loss structure" as defined by FEMA is an NFIP-insured structure that has received four or more flood insurance claim payments of more than $5,000 each or two flood insurance claim payments that exceed the fair market value of the insured structure on the day before each loss.

Figure 114 identifies the repetitive flood loss structures by participating jurisdiction and provides the total flood insurance claim payments. The exact location and/or address of the insured structures are not included in this Plan to protect the owners' privacy. According to IEMA, there have been 148 flood insurance claim payments totaling $2.3 million for the 19 repetitive flood loss structures.

Are there any repetitive loss structures within the non-participating jurisdictions?

Yes. According to information obtained from IEMA, there are 42 repetitive/severe repetitive loss structures located in West Peoria and unincorporated Peoria County that have had 190 flood insurance claim payments totaling approximately $4.39 million. The following provides a description by type.

- ❖ There are two repetitive loss structures located in unincorporated Peoria County (one single family home and one condo unit) that have had five flood insurance claim payments totaling $260,593.72.
- ❖ There are 39 severe repetitive loss structures located in West Peoria (two non-residences) and unincorporated Peoria County (34 single family homes, two non-residences and one multi-family home) that have had 185 flood insurance claim payments totaling $4,129,303.84,

Figure 114
Repetitive Flood Loss Structures by Participating Peoria County Municipalities

Participating Jurisdiction	Structure Type	Number of Structures	Number of Claim Payments	Flood Insurance Claim Payments		Total Flood Insurance Claim Payments
				Structure	Content	
Repetitive Loss Properties						
Chillicothe	single family	1	2	$98,926.07	$28,873.31	$127,799.38
Peoria	single family	2	4	$75,071.67	$2,308.25	$77,379.92
Peoria Heights	non-resident	1	2	$44,908.61	$0.00	$44,908.61
Subtotal:		**4**	**8**	**$218,906.35**	**$31,181.56**	**$250,087.91**
Severe Repetitive Loss Properties						
Chillicothe	single family	2	11	$85,141.75	$6,198.53	$91,340.28
Peoria	single family	4	25	$364,441.85	$21,471.23	$385,913.08
	non-resident	1	7	$49,420.07	$19,650.38	$69,070.45
Peoria Heights	single family	6	66	$764,096.64	$62,574.56	$826,671.20
	non-resident	2	31	$635,869.24	$108,320.18	$744,189.42
Subtotal:		**15**	**140**	**$1,898,969.55**	**$218,214.88**	**$2,117,184.43**
Total:		**19**	**148**	**$2,117,875.90**	**$249,396.44**	**$2,367,272.34**

Source: Illinois Emergency Management Agency

Are existing buildings, infrastructure and critical facilities vulnerable to flooding?

Yes. **Figure 115** identifies the number of existing residential structures by participating jurisdiction located within a base or 500-year floodplain. These counts were prepared by Tri-County Regional Planning Commission's GIS staff in consultation with the Consultant using the effective DFIRMs.

Aside from key roads and bridges and buried power and communication lines, Peoria is the only participating municipality that has specific infrastructure/critical facilities located within or adjacent to a floodplain. In addition, there are two sanitary districts that serve multiple participating municipalities that are located within a floodplain. The following provides a description of each.

- *Peoria*: The Peoria Fire Training Academy is partially located in the base floodplain/500-year floodplain of the Illinois River while Firehouse 17 is located adjacent to the 500-year floodplain of the Illinois River. The Peoria Public Works building is located adjacent to the base floodplain of Dry Run Creek.
- *Greater Chillicothe Sanitary District*: The Greater Chillicothe Sanitary District's sewage treatment plant, which serves Chillicothe and surrounding areas, is located in the base floodplain of the Illinois River.
- *Greater Peoria Sanitary District*: The Greater Peoria Sanitary District wastewater treatment facility, which serves Peoria, Peoria Heights, Bartonville and several other municipalities, is located in the base floodplain of the Illinois River.
- *Illinois American Water*: Illinois American Water Company's Peoria drinking water facility and one of its three well fields, which serves Peoria and the surrounding area, are located in the base floodplain of the Illinois River.

Figure 115
Existing *Residential Structures* Located within a Floodplain of Participating Peoria County Municipalities

Participating Jurisdiction	Number of Residential Structures	Participating Jurisdiction	Number of Residential Structures
Bartonville	85	Peoria	560
Chillicothe	38	Peoria Heights	24
Hanna City	0		

Source: FEMA DFIRMs

While a small portion of the land area within the participating municipalities lies within a floodplain and is susceptible to riverine flooding, topography makes almost all of the land area in the participating municipalities is vulnerable to flash flooding. As a result, a majority of the buildings, infrastructure and critical facilities that may be impacted by flooding are located outside of a floodplain and are not easily identifiable.

The risk or vulnerability of existing buildings, infrastructure and critical facilities to all forms of flooding is considered to be medium to high based on: (a) the frequency and severity of recorded flood events; (b) the proximity to the Illinois River; (c) the fact that most of the participating municipalities are vulnerable to flash flooding; and (d) a majority of the buildings, infrastructure and critical facilities that may be impacted are located outside of a floodplain.

Are future buildings, infrastructure and critical facilities vulnerable to flooding?

The answer to this question depends on the type of flooding being discussed.

Riverine Flooding

In terms of riverine flooding, the vulnerability of future buildings, infrastructure and critical facilities located within NFIP-participating jurisdictions is low as long as the existing floodplain ordinances are enforced. Enforcement of the floodplain ordinance is the mechanism that ensures that new structures either are not built in flood-prone areas or are elevated or protected to the base flood elevation.

Flash Flooding

In terms of flash flooding, all future buildings, infrastructure and critical facilities are still vulnerable depending on the amount of precipitation that is received, the topography and any land use changes undertaken within the participating jurisdictions.

What are the potential dollar losses to vulnerable structures from flooding?

An estimate of the potential dollar losses to vulnerable *residential structures* located within the *participating municipalities* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in the participating jurisdictions.

The purpose of providing an estimate is to help residents and municipal officials make informed decisions about how they can better protect themselves and their communities. These estimates are meant to provide a ***general idea of the magnitude of the potential damage*** that could occur from a flood event in each of the municipalities.

Assumptions

To calculate the overall potential dollar losses to vulnerable residential structures from a flood, a set of decisions/assumptions must be made regarding:

- type of flood event;
- scope of the flood event;
- number of potentially-damaged housing units;
- value of the potentially-damaged housing units; and
- percent damage sustained by the potentially-damaged housing units (i.e., damage scenario.)

The following provides a detailed discussion of each decision/assumption.

Assumption #1

A riverine flood event will impact vulnerable residential structures within each municipality.

Type of Flood Event. The first step towards calculating the potential dollar losses to vulnerable residential structures is to determine the type of flood event that will be used for this scenario. While flash flooding has occurred more frequently and has caused more recorded flood damages in the participating municipalities than riverine flooding, identifying residential structures vulnerable to flash flooding is problematic because most are located outside of the floodplain and the number of structures impacted can change with each event depending on the amount of precipitation received, the topography and the land use of the area.

Therefore, a riverine flood event will be used since it is (a) relatively easy to identify vulnerable residential structures within each municipality (i.e., those structures located within the floodplain of any river, stream or creek); and (b) the number of structures impacted is generally the same from event to event.

Assumption #2

All base floodplains within a municipality will flood and experience the same degree of flooding.

Scope of the Flood Event. To establish the number of vulnerable residential structures (potentially-damaged housing units), the scope of the riverine flood event within each municipality must first be determined. In this scenario, the scope refers to the number of rivers, streams and creeks that overflow their banks and the degree of flooding experienced along the floodplains for each river, stream and creek.

Generally speaking, a riverine flood event only affects one or two rivers or streams at a time depending on the cause of the event (i.e., precipitation, snow melt, ice jam, etc.) and usually does not produce the same degree of flooding along the entire length of the river, stream or creek. However, for this scenario, it was decided that:

- ❖ all rivers, streams and creeks with floodplains would overflow their banks, and
- ❖ the floodplains of each river, stream and/or creek located within the corporate limits of each municipality would experience the same degree of flooding.

These assumptions result in the following conditions for each participating municipality:

- ➢ *Hanna City*: No rivers, streams or creeks are located within or adjacent to the village boundaries and therefore no residential flooding would occur;
- ➢ *Bartonville*: The Illinois River, Kickapoo Creek, LaMarsh Creek Tributary, Unnamed Tributary B and an Unnamed Tributary Kickapoo Creek would overflow their banks and flood portions of the Village;
- ➢ *Chillicothe*: The Illinois River would overflow its banks and flood the eastern edge of the City;
- ➢ *Peoria*: The Illinois River, Kickapoo Creek, Dry Run Creek, East Branch Dry Run Creek, Big Hollow Creek, North Fork Tributary Big Hollow Creek, Tributary Big Hollow Creek, Boyds Hollow Creek and Poppet Hollow Creek would overflow their banks and flood portions of the City; and
- ➢ *Peoria Heights*: The Illinois River would overflow its banks and flood the eastern edge of the Village.

Assumption #3

The number of existing residential structures located within the base floodplain(s) in each municipality will be used to determine the number of potentially-damaged housing units.

Number of Potentially-Damaged Housing Units. Since this scenario assumes that all the floodplains within a municipality will experience the same degree of flooding, the number of existing residential structures located within the floodplain(s) of each municipality can be used to determine the number of potentially-damaged housing units. **Figure 115** identifies the total number of existing residential structures located within the floodplains(s) of each municipality. These counts were prepared by the Tri-County Regional Planning Commission's GIS staff in consultation with the Consultant.

Value of Potentially-Damaged Housing Units. Now that the number of potentially-damaged housing units has been determined, the monetary value of the units must be calculated. Typically, when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure in each municipality will be used.

Assumption #4

The average market value for a residential structure in each municipality will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the averaged assessed value and multiplying that number by three (the assessed value of a structure in the participating Peoria County municipalities is approximately one-third of the market value). **Figure 116** provides a sample calculation. The total assessed value is based on 2016 tax assessment information provided by the Peoria County Supervisor of Assessments. **Figure 117** provides the average assess value and average market value for each participating municipality.

Figure 116
Sample Calculation of Average Assessed Value & Average Market Value - Bartonville

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Bartonville: $71,993,160 ÷ 2,812 housing units = $25,602.11949

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Bartonville: $25,602.11949 x 3 = $76,806.35846
($76,806)

Figure 117
Average Market Value of Housing Units by Participating Peoria County Municipality

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
Bartonville	$71,993,160	2,812	$25,602.11949	$76,806.35847	$76,806
Chillicothe	$75,928,298	2,719	$27,925.08202	$83,775.24606	$83,775
Hanna City	$15,185,830	584	$26,003.13356	$78,009.40068	$78,009
Peoria	$1,372,986,619	52,621	$26,091.99025	$78,275.97075	$78,276
Peoria Heights	$72,652,006	3,093	$23,489.17103	$70,467.51309	$70,468

Source: Peoria County Supervisor of Assessments.

Assumption #5

The potentially-damaged housing units are one or two-story homes with basements and the flood depth is two foot.
Structural Damage = 20%
Content Damage = 30%

Damage Scenario. The final decision that must be made to calculate potential dollar losses is to determine the percent damage sustained by the structure and the structure's contents during the flood event. In order to determine the percent damage using FEMA's flood loss estimation tables, assumptions must be made regarding (a) the type of residential structure flooded (i.e., manufactured home, one-story home without a basement, one or two-story home with a basement, etc.) and (b) the flood depth. **Figure 118** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

Figure 118
FEMA Flood Loss Estimation Tables

Flood Building Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Building Damage)	Two Story No Basement (% Building damage)	One or Two Story With Basement (% Building damage)	Manufactured Home (% Building damage)
-2	0	0	4	0
-1	0	0	8	0
0	9	5	11	8
1	14	9	15	44
2	22	13	20	63
3	27	18	23	73
4	29	20	28	78
5	30	22	33	80
6	40	24	38	81
7	43	26	44	82
8	44	29	49	82
>8	45	33	51	82

Flood Content Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Contents Damage)	Two Story No Basement (% Contents damage)	One or Two Story With Basement (% Contents damage)	Manufactured Home (% Contents damage)
-2	0	0	6	0
-1	0	0	12	0
0	13.5	7.5	16.5	12
1	21	13.5	22.5	66
2	33	19.5	30	90
3	40.5	27	34.5	90
4	43.5	30	42	90
5	45	33	49.5	90
6	60	36	57	90
7	64.5	39	66	90
8	66	43.5	73.5	90
>8	67.5	49.5	76.5	90

Source: FEMA, Understanding Your Risks: Identifying Hazards and Estimating Losses

For this scenario it is assumed that the potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet. With these assumptions the expected percent damage sustained by the ***structure*** is estimated to be 20% and the expected percent damage sustained by the structure's ***contents*** is estimated to be 30%.

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying that by the percent damage (20%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 119** provides a sample calculation.

Next the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply that by the percent damage (30%) to get the average content damage per unit. Then take the average content damage per unit and multiply that by the number of potentially-damaged housing units. **Figure 120** provides a sample calculation.

Figure 119
Structure: **Potential Dollar Loss Sample Calculation – Bartonville**

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit

Bartonville: $76,806 x 20% = $15,361.20 per housing unit

Average Structural Damage x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)

Bartonville: $15,361.20 per housing unit x 85 housing unit = $1,305,702.00
($1,305,702)

Figure 120
Content **– Potential Dollar Loss Sample Calculation - Bartonville**

½ (Average Market Value of a Housing Unit with the Jurisdiction) x Percent Damage = Average Content Damage per Housing Unit

Bartonville: ½ ($76,806) x 30% = $11,520.90 per housing unit

Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)

Bartonville: $11,520.90 per housing unit x 85 housing unit = $979,276.50
($979,277)

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figure 121** provides a breakdown of the total potential dollar losses by municipality.

Figure 121
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Peoria County Municipality

Participating Jurisdiction	Average Market Value (2016)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Bartonville	$76,806	85	$1,305,702	$979,277	$2,284,979
Chillicothe	$83,775	38	$636,690	$477,518	$1,114,208
Hanna City	$78,009	0	$ 0	$ 0	$ 0
Peoria	$78,276	560	$8,766,912	$6,575,184	$15,342,096
Peoria Heights	$70,468	24	$338,246	$253,685	$591,931

This assessment illustrates the *potential residential dollar losses* that should be considered when municipalities are deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences within the participating municipalities would be expected to ***range from $591,931 to $15.3 million***. Hanna City does not have any residences considered vulnerable to riverine flooding in this scenario.

Vulnerability of Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of a large riverine flood event in dollars. These calculations do not include the physical damages sustained by businesses or other infrastructure and critical facilities.

In terms of businesses, the impacts from a flood event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the flood event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. ***As a result, the cumulative monetary impacts to businesses and infrastructure can far exceed the cumulative monetary impacts to residences***. While average dollar amounts cannot be supplied for these items at this time, they should be taken into account when discussing the overall impacts that a large-scale riverine flood event could have on the participating jurisdictions.

In terms of specific infrastructure vulnerability, the following are located within a ***base floodplain***:

- ❖ Greater Chillicothe Sanitary District;
- ❖ Greater Peoria Sanitary District; and
- ❖ Illinois American Water Company.

No other above-ground infrastructure within the participating jurisdictions, other than key roads and bridges, were identified as being vulnerable to riverine flooding.

Considerations

While the potential dollar loss scenario was only for a riverine flood event, the participating jurisdictions have been made aware through the planning process of the impacts that can result from flash flood events. The participating Peoria County municipalities have experienced multiple events over the last 20 to 30 years as have adjoining and nearby counties. These events illustrate the need for officials to consider the overall monetary impacts of all forms of flooding on their communities. All participants should carefully consider the types of activities and projects that can be taken to minimize their vulnerability.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 1 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted						
					Homes	Business	Infra-structure				
4/6/1950 thru 5/13/1950	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	25.0 feet 4/29/1950	n/a	n/a	n/a	n/a	n/a	n/a	
7/22/1951 thru 7/28/1951	n/a	Kickapoo Creek	Bartonville Hanna City Peoria	n/a	yes	stores flooded (Bartonville)	RR tracks covered	n/a	n/a	$1,000,000 (Peoria)	*Event Description Provided Below*
Bartonville the roundhouse and switchyard, as well as the bus station were flooded							*Hanna City* power was knocked out				
3/30/1960	n/a	Kickapoo Creek	Peoria	n/a	3	n/a	Farmington Rd. closed	n/a	n/a	$100,000	
3/15/1962 thru 4/14/1962	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	23.7 feet 3/26/1962	n/a	n/a	RR tracks twisted (Peoria)	n/a	n/a	$310,000 (Peoria)	*Event Description Provided Below*
Peoria - on the 20th 50 mph winds loosened 24 barges from their mooring & blew them into the Franklin St. bridge damaging steel sections & walkway							- a boathouse collapsed - 700 foot of dock was swept away				
1/1/1965	n/a	Kickapoo Creek	Peoria	n/a	41	n/a	n/	n/a	n/a	n/a	4.44 inches of rain fell in 27 hours
Subtotal:								**0**	**0**	**$1,410,000**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 2 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted						
					Homes	Business	Infra-structure				
9/14/1965	n/a	area streams & creek	Peoria	n/a	3 (content)	3 industrial buildings & stockyards (content)	school (content)	n/a	n/a	n/a	following an F3 tornado heavy rains caused local flooding and further damaged the contents of the buildings struck by the tornado
4/23/1970 thru 6/27/1970	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	25.9 feet 5/19/1970	n/a	Bemis Bag Co. closed & animal shelter evacuated (Peoria)	trains placed on RR tracks to weigh them down (Peoria)	n/a	n/a	n/a	heavy rain fell over much of central Illinois for 3 to 8 consecutive days causing extreme soil erosion & ponding
3/14/1973 thru 5/19/1973	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	24.4 feet 4/25/1973	n/a	Sears parking deck flooded (Peoria)	GPSD forced to close (Peoria)	n/a	n/a	$3,000,000 (Peoria)	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #373)							<u>Peoria</u> the Greater Peoria Sanitary District (GPSD) was forced to close resulting in the release of 35 million gallons of untreated raw sewage				
Subtotal:								**0**	**0**	**$3,000,000**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 3 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude: Flood Crest Illinois River Peoria[1]	Magnitude: Impacted Homes	Magnitude: Impacted Business	Magnitude: Impacted Infra-structure	Injuries	Fatalities	Property Damages	Description
5/19/1974 thru 7/8/1974	n/a	Illinois River Kickapoo Creek area rivers, streams & creek	Bartonville Chillicothe Peoria Peoria Heights	22.2 feet 6/26/1974	n/a	n/a	n/a	n/a	n/a	$0	- ***this event was part of a federally-declared disaster (Declaration #438)*** - property damages of $2.5 million were sustained in Peoria, Tazewell and Woodford counties. A detailed breakdown by county/municipality was not available
2/25/1976 thru 3/23/1976	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	23.6 feet 3/9/1976	n/a	n/a	n/a	n/a	n/a	n/a	<u>*Peoria*</u> 4,00-5,000 sandbags were given out
Subtotal:								**0**	**0**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Peoria County (Participating Municipalities Only)

Figure 105 (Sheet 4 of 9) General Flood Events 1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude: Flood Crest Illinois River Peoria[1]	Magnitude: Impacted Homes	Magnitude: Impacted Business	Magnitude: Impacted Infra-structure	Injuries	Fatalities	Property Damages	Description
3/7/1979 thru 5/17/1979	n/a	Illinois River Kickapoo Creek area rivers, streams & creeks	Bartonville Chillicothe Peoria Peoria Heights	28.7 feet 3/23/1979 3rd highest crest on record	n/a	Bemis Bag Co. & Keystone closed; animal shelter evacuated (Peoria)	Coast Guard closed the Illinois River; multiple roads closed including Franklin St. bridge (Peoria)	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #583)***
5/28/1980 thru 6/5/1980	n/a	area rivers, streams & creeks	Bartonville Chillicothe Peoria Peoria Heights	n/a	n/a	n/a	See Event Description	n/a	n/a	$200,000 (Peoria)	*Event Description Provided Below*
- ***this event was part of a state-declared disaster*** - 14 inches of rain fell in a week flooding buildings & roads							*Peoria* - Franklin Street bridge was closed and many streets were flooded - the Hospital lost power briefly				
2/24/1982 thru 5/2/1982	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	27.1 feet 3/23/1982 7th highest crest on record	50 (Peoria)	n/a	n/a	n/a	n/a	$60,000 (Peoria)	*Peoria* 7,400 sandbags were given out
Subtotal:								**0**	**0**	**$260,000**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 5 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted						
					Homes	Business	Infra-structure				
5/26/1982	n/a	area rivers, streams & creeks	Chillicothe	n/a	n/a	n/a	streets flooded	n/a	n/a	n/a	
12/5/1982 thru 1/7/1983	n/a	Illinois River area rivers, streams & creeks	Bartonville Chillicothe Peoria Peoria Heights	27.4 feet 12/9/1982 6th highest crest on record	n/a	animal shelter & river station closed (Peoria)	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #674)*** <u>Peoria</u> 30,000 sandbags were given out
4/3/1983 thru 5/22/1983	n/a	Illinois River area rivers, streams & creeks	Bartonville Chillicothe Peoria Peoria Heights	25.7 feet 4/17/1983	n/a	n/a	n/a	n/a	n/a	n/a	
2/26/1985 thru 4/15/1985	n/a	Illinois River area rivers, streams & creeks	Bartonville Chillicothe Peoria Peoria Heights	28.4 feet 3/7/1985 4th highest crest on record	n/a	n/a	n/a	n/a	n/a	$1,400,000†	***this event was part of a federally-declared disaster (Declaration #735)***
Subtotal:								**0**	**0**	**$1,400,000†**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

† The property damage total of $1.4 million for the 1985 flood event represent losses sustained in Peoria County (including the participating municipalities). A detailed breakdown by municipality was not available.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 6 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted						
					Homes	Business	Infra-structure				
9/19/1986	n/a	n/a	Peoria	n/a	many basements flooded	n/a	many streets flooded	n/a	n/a	n/a	
3/24/1993 thru 5/10/1993	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	23.16 feet 4/24/1993	n/a	n/a	n/a	n/a	n/a	n/a	
5/14/1995 thru 6/15/1995	n/a	Illinois River area rivers, streams & creeks	Bartonville Chillicothe Peoria Peoria Heights	24.91 feet 6/2/1995	n/a	n/a	n/a	n/a	n/a	n/a	
2/21/1997 thru 3/6/1997	6:00 p.m.	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	26.85 feet 3/3/1997 10th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	_Peoria_ some homes immediately adjacent to the river experienced minor property damage
5/14/2002 thru 5/27/2002	11:00 p.m.	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	25.25 feet 5/18/2002	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**0**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 7 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude: Flood Crest Illinois River Peoria[1]	Magnitude: Impacted Homes	Magnitude: Impacted Business	Magnitude: Impacted Infra-structure	Injuries	Fatalities	Property Damages	Description
9/16/2008 thru 10/5/2008	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	26.99 feet 9/20/2008 9th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	***this event was part of a federally-declared disaster (Declaration #1800)***
3/2/2009 thru 6/6/2009	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	27.92 feet 3/14/2009 5th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	
4/18/2013 thru 4/19/2013	9:00 a.m.	area rivers, streams & creeks	Bartonville Chillicothe Peoria Peoria Heights	n/a	n/a	n/a	See Event Description	n/a	n/a	n/a	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** - torrential rainfall of 4 to 8 inches caused both flash flooding & general flooding - nearly every road was impassable, including part of Interstate 74 which had to be closed - most of the creeks and streams stayed in flood and most roads remained closed until the afternoon of the 22nd											
Subtotal:								**0**	**0**	**$0**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 8 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude: Flood Crest Illinois River Peoria[1]	Magnitude: Impacted Homes	Magnitude: Impacted Business	Magnitude: Impacted Infra-structure	Injuries	Fatalities	Property Damages	Description
4/19/2013 thru 5/8/2013	10:00 a.m.	Illinois River	Chillicothe Peoria	29.32 feet 4/23/2013 highest crest - flood of record at this gauge	numerous (See Event Description)	several (See Event Description)	n/a	n/a	1	$28,000,000‡	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** Chillicothe - numerous homes along the Illinois River in Chillicothe suffered damage due to record river levels Peoria - several businesses along the Illinois River in downtown Peoria were also damaged - on May 4th a man drowned when he drove his vehicle into floodwaters northeast of downtown - According to the MAC member representing the Greater Peoria Sanitary District, the levee protected the treatment plant and very little damage occurred											
6/15/2015 thru 7/31/2015	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	27.06 feet 7/1/2015 8th highest crest on record	n/a	n/a	n/a	n/a	n/a	n/a	
Subtotal:								**0**	**1**	**$28,000,000‡**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

‡ The property damage total of $28 million for the 2013 flood event represent losses sustained in Peoria County (including the participating municipalities). A detailed breakdown by municipality was not available.

Peoria County (Participating Municipalities Only)

Figure 105
(Sheet 9 of 9)
General Flood Events
1950 – 2017

Date(s)	Start Time	Body of Water	Location(s) Impacted	Magnitude				Injuries	Fatalities	Property Damages	Description
				Flood Crest Illinois River Peoria[1]	Impacted						
					Homes	Business	Infra-structure				
12/27/2015 thru 1/20/2016	n/a	Illinois River	Bartonville Chillicothe Peoria Peoria Heights	26.46 feet 1/3/2016	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6/17/2017 thru 6/18/2017	10:45 p.m.	area rivers, streams & creeks	Chillicothe Peoria	n/a	n/a	n/a	numerous streets	n/a	n/a	n/a	
- torrential rainfall of 2 to 3 inches fell within a 90-minute period causing both flash flooding & general flooding - numerous streets on the northwest side of Peoria and in Chillicothe were flooded - additional rainfall during the late evening/early morning hours kept many roads flooded - flood waters subsided by daybreak on the 18th											
Subtotal:								**0**	**0**	**$0**	
GRAND TOTAL								**0**	**1**	**$34,070,000§**	

[1] Flood stage at the Peoria gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 28.0 feet. At 18.0 feet flooding of unprotected bottomlands not protected by levees occurs; at 22.7 feet flooding begins to low lying areas in Peoria Heights & Peoria's Riverfront Park; at 24.0 feet water begins covering streets in East Peoria; at 25.0 feet damage begins at Pekin sewage treatment plant and minor property damage occurs in Peoria by the River; at 28.0 feet water entire length of Lake Street in Spring Bay is inundated; and at 30.6 feet water overtops the levee at the Peoria Sanitary District Levee.

§ The property damage total includes $1.4 million from the 1985 flood event and $28 million from the 2013 flood event that represent losses sustained in Peoria County (including the participating municipalities). A detailed breakdown by municipality was not available.

Sources: Peoria Emergency Services and Disaster Agency, City of Peoria Hazard Vulnerability Analysis.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Weather Service, River Observations, North Central River Forecast Center, Illinois River at Peoria.
Tri-County Mitigation Action Committee member responses to the Natural Hazard Events Questionnaire.
United States Army Corps of Engineers, RiverGages.com, Data Mining.

Peoria County (Participating Municipalities Only)

Figure 106
(Sheet 1 of 3)
Flash Flood Events
1960 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Magnitude/Description
8/18/1960	n/a	Peoria	0	3	$25,000	- heavy rains flooded sewers, basements and streets - a child was drowned when pulled 575 feet down a drainage conduit - 2 children drowned playing in the flooded Kickapoo Creek
8/24/1982	11:00 a.m.	Peoria	n/a	n/a	n/a	intersections were flooded
6/20/1990	4:00 a.m.	all participating municipalities	n/a	n/a	n/a	
6/29/1990	8:30 a.m.	all participating municipalities	n/a	n/a	n/a	
8/15/1993	8:45 p.m.	all participating municipalities	n/a	n/a	n/a	numerous road and basements were flooded
8/23/1993	5:45 p.m.	all participating municipalities	n/a	n/a	n/a	street flooding occurred
5/11/2002	12:00 p.m.	all municipalities	n/a	n/a	n/a	
5/18/2004	3:35 p.m.	Bartonville Peoria	n/a	n/a	n/a	- numerous roads became flooded including IL Rte. 116 - several people drove into floodwaters in Peoria and had to be rescued
5/30/2004	8:30 a.m.	Peoria	n/a	n/a	n/a	several roads flooded
9/12/2008	10:00 p.m.	Peoria	n/a	n/a	n/a	- numerous streets had water flowing over them - many basements were flooded across the City
Subtotal:			**0**	**3**	**$25,000**	

Peoria County (Participating Municipalities Only)

Figure 106
(Sheet 2 of 3)
Flash Flood Events
1960 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Magnitude/Description
9/13/2008	6:00 p.m.	Peoria	n/a	n/a	n/a	- ***this event was part of a federally-declared disaster (Declaration #1800)*** - Interstate 74 near the North University Street exit was flooded and a vehicle became stranded in the high water - The MAC member from the Greater Peoria Sanitary District indicated that the heavy rainfall caused manholes to overflow, damaged manholes and led to backups on private property
6/23/2010	5:45 p.m.	all participating municipalities	n/a	n/a	n/a	*Peoria* many streets in Peoria were flooded which caused vehicles to become stranded and forced up manhole covers
6/15/2011	1:00 a.m.	Bartonville Chillicothe Peoria Peoria Heights	n/a	n/a	n/a	*Peoria* many streets in the City were flooded
4/17/2013 thru 4/18/2013	9:15 p.m.	all participating municipalities	2 (Peoria)	n/a	$100,000,000†	*Event Description Provided Below*
- ***this event was part of a federally-declared disaster (Declaration #4116)*** - torrential rainfall of 4 to 8 inches resulted in damage to thousands of houses and businesses in Peoria County (including the participating municipalities) - nearly every road was impassable, including parts of Interstate 74 which had to be closed - numerous water rescues were made - mudslides were reported along the eastern bluffs of the Illinois River *Peoria* - two houses collapsed into the basements injuring 2 individuals						
6/24/2013	3:15 a.m.	Chillicothe Peoria	n/a	n/a	$30,000,000†	- multiple roads were closed, including IL Routes 6, 29 and 40 - motorists were stranded by the high water - homes were flooded
Subtotal:			**2**	**0**	**$130,000,000†**	

† The property damage total of $100 million for the April, 2013 flood event and $30 million for the June, 2013 flood event represent losses sustained in Peoria County (including the participating municipalities). A detailed breakdown by municipality was not available.

Peoria County (Participating Municipalities Only)

Figure 106
(Sheet 3 of 3)
Flash Flood Events
1960 – 2017

Date(s)	Start Time	Location(s) Impacted	Injuries	Fatalities	Property Damages	Magnitude/Description
6/7/2014 thru 6/8/2014	8:30 p.m.	Hanna City Peoria	n/a	n/a	n/a	<u>Hanna City</u> - sections of IL Rte. 116 were closed <u>Peoria</u> - roads in the northern suburbs of the City, toward Alta and Dunlap were impassable
6/7/2015	7:30 p.m.	Bartonville Peoria	n/a	n/a	n/a	<u>Bartonville</u> - US Rte. 24 was impassable and most secondary roads were inundated <u>Peoria</u> - many streets were impassable on the south side of the City
6/10/2015 thru 6/11/2015	8:00 p.m.	Chillicothe	n/a	n/a	n/a	streets were flooded
12/27/2015	n/a	Bartonville Peoria Peoria Heights	n/a	n/a	n/a	The MAC member from the Greater Peoria Sanitary District indicated that the treatment plant experienced record flows and that private property owners within the District suffered sewer backups in their basements and basement flooding from storm water
4/29/2017	5:45 p.m.	Peoria	n/a	n/a	n/a	- numerous streets in the City were impassable - IL Rte. 29 north of the McClugage Bridge was closed for 1 mile due to a mudslide
6/17/2017	8:15 p.m.	Chillicothe Peoria	n/a	n/a	n/a	numerous streets were flooded on the northwest side of Peoria and in Chillicothe
Subtotal:			**0**	**0**	**$0**	
GRAND TOTAL:			**2**	**3**	**$130,025,000†**	

† The property damage total included $100 million from the April, 2013 flood event and $30 million from the June, 2013 flood event that represent losses sustained in Peoria County (including the participating municipalities). A detailed breakdown by municipality was not available.

Sources: Peoria Emergency Services and Disaster Agency, City of Peoria Hazard Vulnerability Analysis.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Tri-County Mitigation Action Committee member responses to the Natural Hazard Events Questionnaire.

3.4 TORNADOES

HAZARD IDENTIFICATION

What is the definition of a tornado?

A tornado is a violently rotating column of air, usually characterized by a twisting, funnel-shaped cloud that extends from the cloud formation of a thunderstorm to the ground. The strongest tornadoes have rotating wind speeds of more than 200 miles per hour and can create damage paths in excess of one mile wide and 50 miles long.

Not all tornadoes have a visible funnel cloud. Some may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. Generally, tornadoes move from southwest to northeast, but they have been known to travel in any direction, even backtracking. The average forward speed of a tornado is 30 mile per hour, but this may vary from nearly stationary to 70 miles per hour.

About 1,200 tornadoes hit the United States yearly. On average, 49 tornadoes occur each year in Illinois. The destruction caused by a tornado may range from light to catastrophic depending on the intensity, size and duration of the storm. Tornadoes cause crop and property damage, power outages, environmental degradation, injuries and fatalities. Tornadoes are known to blow off roofs, move cars and tractor trailers and demolish homes. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes. On average, tornadoes cause 60 to 65 facilities and 1,500 injuries in the United States annually.

How are tornadoes rated?

Originally tornadoes were rated using the Fujita Scale (F-Scale), which related the degree of damage caused by a tornado to the intensity of the tornado's wind speed. The Scale identified six categories of damage, F0 through F5. **Figure 122** gives a brief description of each category.

Use of the original Fujita Scale was discontinued on February 1, 2007 in favor of the Enhanced Fujita Scale. The original scale had several flaws including basing a tornado's intensity and damages on wind speeds that were never scientifically tested and proven. It also did not take into consideration that a multitude of factors (i.e. structure construction, wind direction and duration, flying debris, etc.) affect the damage caused by a tornado. In addition, the process of rating the damage itself was based on the judgment of the damage assessor. In many cases, meteorologists and engineers highly experienced in damage survey techniques often came up with different F-scale ratings for the same damage.

The Enhanced Fujita Scale (EF-Scale) was created to remedy the flaws in the original scale. It continues to use the F0 through F5 categories, but it classifies the level of damage (one through eight) as calibrated by engineers and meteorologists to 28 different types of damage indicators (mainly various building types, towers/poles and trees.) The wind speeds assigned to each category are estimates, not measurements, based on the damage assessment. **Figure 122** identifies the Enhanced Fujita Scale.

Figure 122 Fujita & Enhanced Fujita Tornado Measurement Scales				
F-Scale		EF-Scale		Description
Category	Wind Speed (mph)	Category	Wind Speed (mph)	
F0	40 – 72	EF0	65 – 85	Light damage – some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; damage to sign boards
F1	73 – 112	EF1	86 – 110	Moderate damage – peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads
F2	113 – 157	EF2	111 – 135	Considerable damage – roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground
F3	158 – 207	EF3	136 – 165	Severe damage – roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown
F4	208 – 260	EF4	166 – 200	Devastating damage – well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated
F5	261 – 318	EF5	Over 200	Incredible damage – strong frame houses lifted off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena will occur

Source: National Oceanic and Atmospheric Administration, Storm Prediction Center.

The idea behind the EF-Scale is that a tornado scale needs to take into account the typical strengths and weaknesses of different types of construction, instead of applying a "one size fits all" approach. This is due to the fact that the same wind speed can cause different degrees of damage to different kinds of structures. In a real-life application, the degree of damage to each of the 28 indicators can be mapped together to create a comprehensive damage analysis. As with the original scale, the EF-Scale rates the tornado as a whole based on the most intense damage within the tornado's path.

While the EF-Scale is currently in use, ***the historical data presented in this report is based on the original F-Scale***. None of the tornadoes rated before February 1, 2007 will be re-evaluated using the EF-Scale.

Are alerts issued for tornadoes?

Yes. The National Weather Service Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***tornado watches*** and ***warnings*** for Peoria, Tazewell and Woodford Counties depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A tornado watch is issued when tornadoes are possible in the area. It does not mean that a tornado is imminent, just that individuals need to be alert and prepared.
- **Warning.** A tornado warning is issued when a tornado has been spotted or indicated by radar. Warnings indicate imminent danger to life and property for those who are in the path of the tornado. Individuals should see shelter immediately.

3.4.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

Figure 123, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in Tazewell County. NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln have documented 61 occurrences of tornadoes in Tazewell County between 1950 and 2017. In comparison, there have been 2,199 tornadoes statewide between 1950 and 2012 according to the most recent Illinois Natural Hazard Mitigation Plan.

<u>Tornado Fast Facts – Occurrences</u>

Number of Tornadoes Reported (1950 – 2017): ***61***

Highest F-Scale Rating Recorded: ***EF4 (November 17, 2013)***

Most Likely Month for Tornadoes to Occur: ***May***

Most Likely Time for Tornadoes to Occur: ***Afternoon / Early Evening***

Average Length of a Tornado: ***2.75 miles***

Average Width of a Tornado: ***121 yards***

Average Damage Pathway of a Tornado: ***0.19 sq. mi.***

Longest Tornado Path in the County: ***21.1 miles (F3 May 13, 1995)***

Widest Tornado Path in the County: ***880 yards (F3 May 13, 1995 & EF4 November 17, 2013)***

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

Figure 124 charts the reported occurrences of tornadoes by magnitude. Of the 61 reported occurrences there was: one – EF4, four – F3s, nine – F2s, four – EF2s, fourteen – F1s, two – EF1s, twenty-four – F0s, and three – EF0s.

Figure 125 charts the reported tornadoes by month. Of the 61 events, 32 (52%) took place in May and June making this the peak period for tornadoes in Tazewell County. Of those 32 events, 20 (62.5%) occurred during May making this the peak month for tornadoes. In comparison, 1,457 of the 2,199 tornadoes (66%) recorded in Illinois since 1950 took place in April, May and June.

Figure 124
Graph: Tornadoes by Magnitude Tazewell County: 1950 – 2017

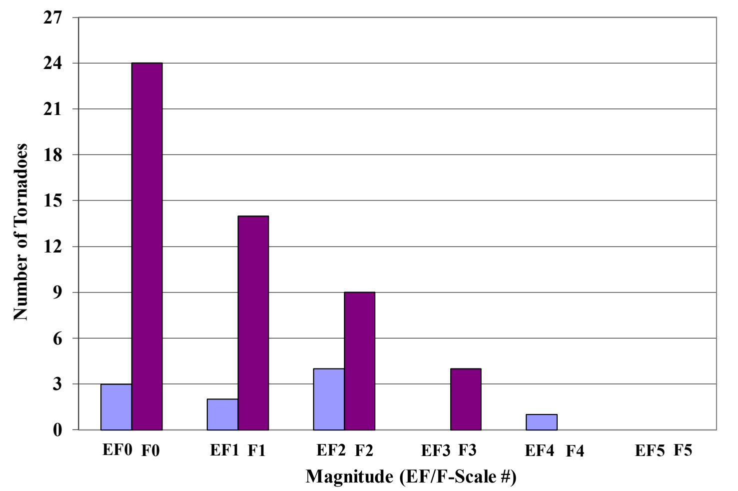


Figure 125
Graph: Tornadoes by Month Tazewell County:1950 – 2017

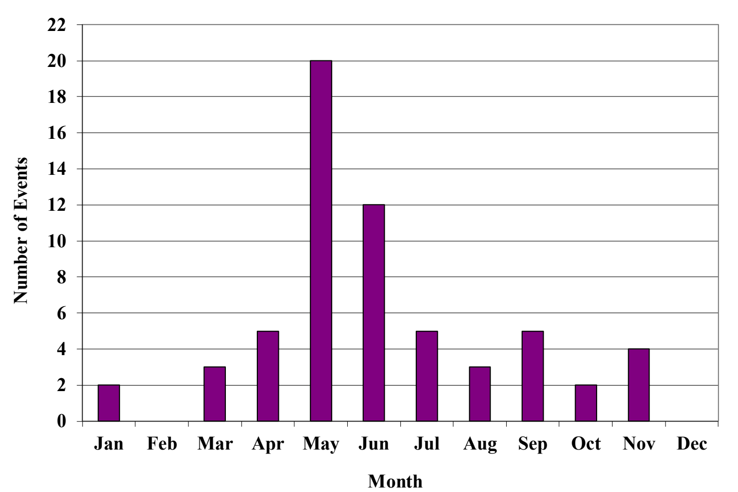
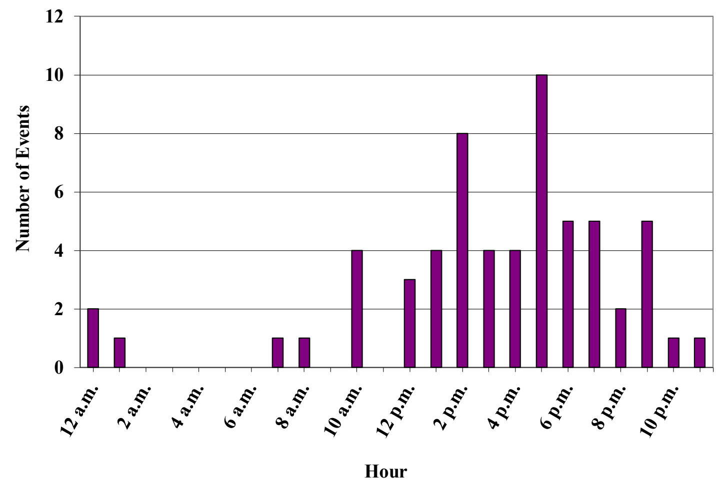


Figure 126 charts the reported tornadoes by hour. Approximately 85% of all tornadoes occurred during the p.m. hours, with 31 of the p.m. events (60%) taking place between 2 p.m. and 7 p.m. In comparison, more than half of all Illinois tornadoes occur between 3 p.m. and 7 p.m.

The tornadoes that have impacted Tazewell County have varied from 0.1 miles to 21.1miles in length and from 10 yards to 880 yards in width. The average length of a tornado in Tazewell County is 2.75 miles and the average width is 121 yards (0.069 miles).

Figure 126
Graph: Tornadoes by Hour Tazewell County: 1950 – 2017



Figures 127, **128** and **129** shows the pathway of each reported tornado by F/EF rating. The numbers by each tornado correspond with the tornado description in **Figure 123**. Records indicate that most of these tornadoes generally moved from southwest to northeast across the County. Unlike other natural hazards (i.e., severe winter storms, drought and excessive heat), tornadoes impact a relatively small area. Typically, the area impacted by a tornado is less than four square miles. In Tazewell County, the average damage pathway or area impacted by a tornado is 0.19 square miles.

The longest and widest tornado recorded in Tazewell County occurred on May 13, 1995. This F3 tornado, measuring 25.0 miles in length and 880 yards in width, touched down in Mason County north of Goofy Ridge in Sand Ridge State Park and traveled east-northeast into Tazewell County before lifting off east of Tremont. The tornado was on the ground in Tazewell County for approximately 21.1 miles. The damage pathway of this tornado covered 12.5 square miles, with approximately 10.5 square miles occurring in Tazewell County.

The EF4 tornado that occurred on November 17, 2013 also measured 880 yards wide, tying with the May 13, 1995 F3 tornado for the widest tornado recorded in Tazewell County.

What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. All of the participating municipalities have had reported occurrences of tornadoes within their corporate limits. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Tazewell County's hazard rating for tornadoes as "high."

Figure 127
F0 & EF0 Tornado Touchdowns in Tazewell County

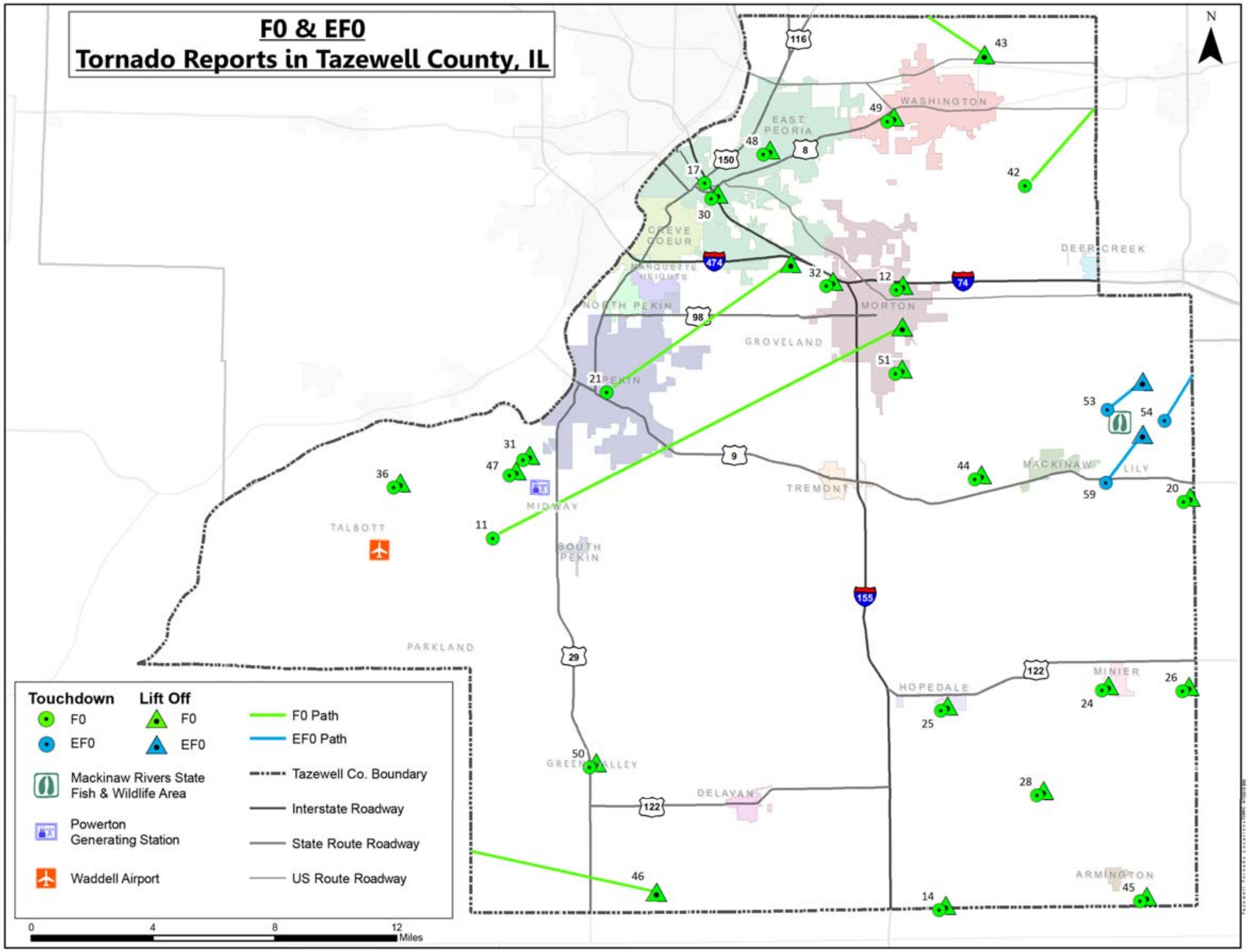


Figure 128
F1 & EF1 Tornado Touchdowns in Tazewell County

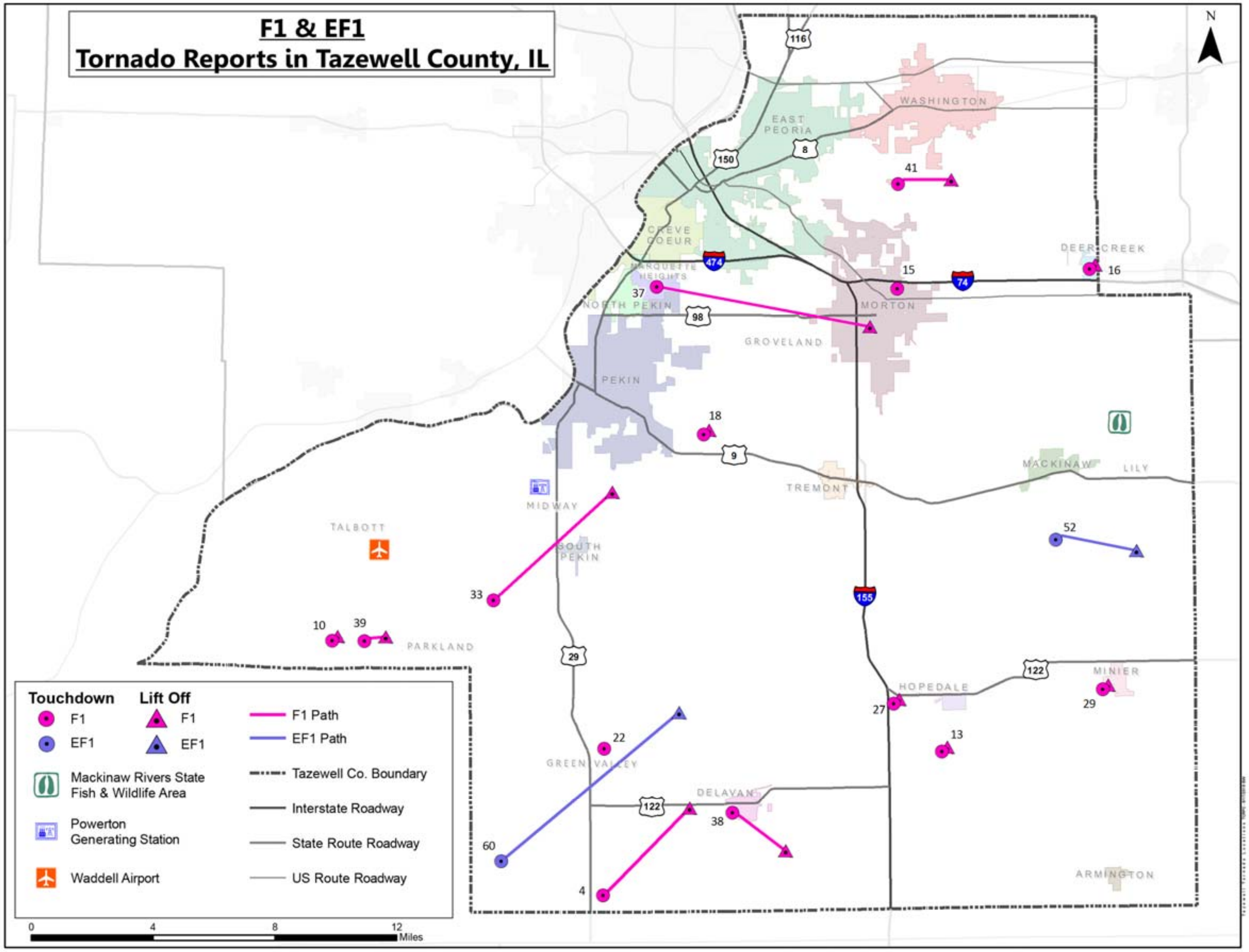
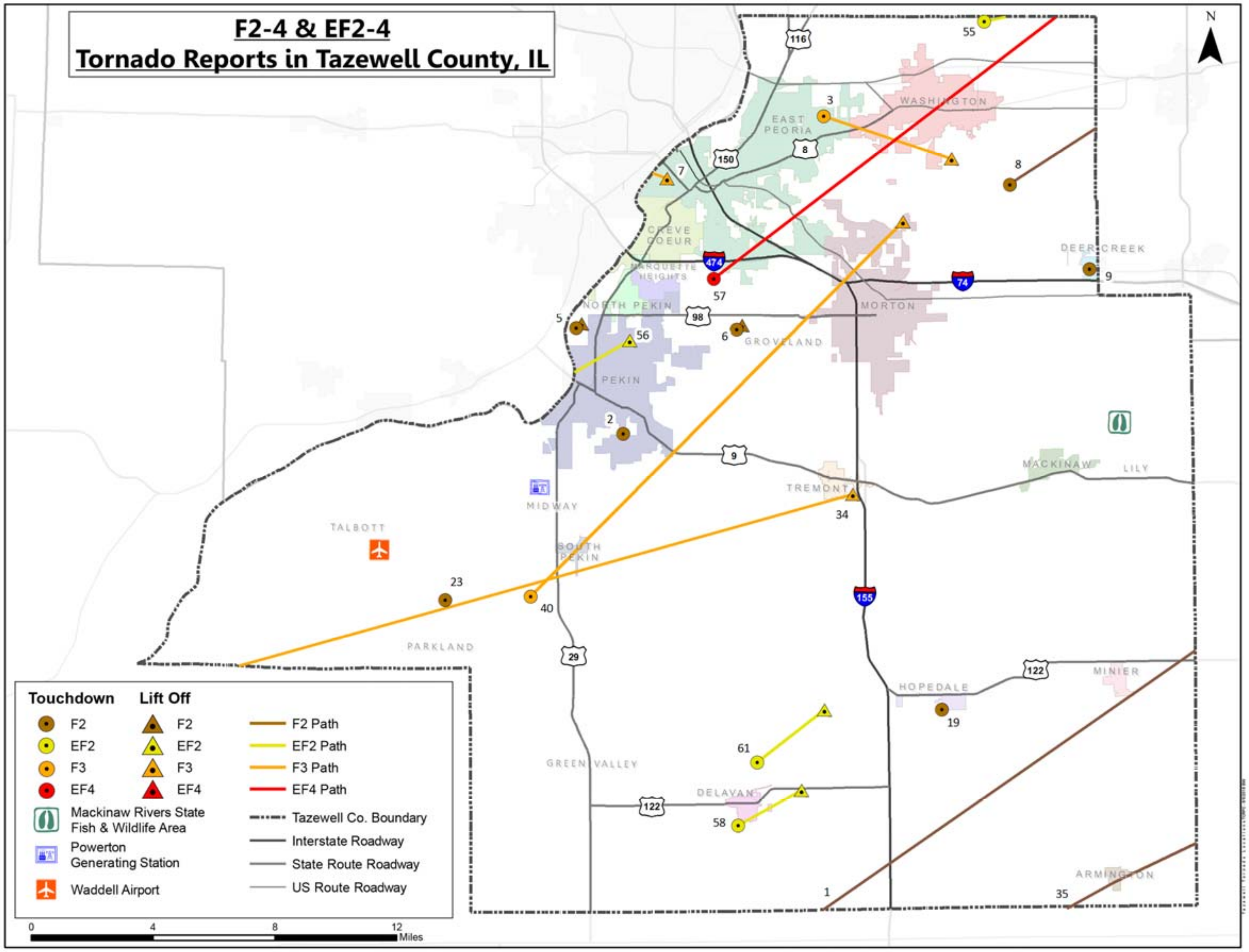


Figure 129
F2 – F4 & EF2 – EF4 Tornado Touchdowns in Tazewell County



What is the probability of future tornadoes occurring?

Tazewell County has had 61 verified occurrences of tornadoes between 1950 and 2017. With 61 tornadoes over the past 68 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is approximately 90%. There were 12 years over the last 68 years where more than one tornado occurred. This indicates that the probability that more than one tornado may occur during any given year within the County is approximately 18%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from tornadoes.

Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of Tazewell County is vulnerable to the dangers presented by tornadoes. According to NOAA's Storm Events Database and the NWS Weather Forecast Office in Lincoln, a majority of the tornadoes have touched down or passed through the northern and central portions of the County. Since 2008, 10 tornadoes have been recorded in Tazewell County.

All of the participating municipalities have had a tornado touch down or pass through their municipal boundaries. **Figure 130** lists the verified tornadoes that have touched down in or near or passed through each participating municipality.

Figure 130
Verified Tornadoes in or Near Participating Municipalities – Tazewell County

Participating Municipality	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Municipality	Touched Down/Passed Near Municipality
East Peoria	7	1956, 1965, 1980, 1990, 1994, 2004, 2013	---
Morton	8	1973, 1976, 1998, 2003	1974, 1994, 2003, 2006
Pekin	7	1955, 1973, 1990, 2013	1981, 1995, 2003
Tremont	2	1995	1981
Washington	8	1956, 2004, 2013	1967, 2003, 2003, 2003, 2010

In terms of unincorporated areas vulnerable to tornadoes, Groveland and the Mackinaw River State Fish and Wildlife Area have had more tornadoes touch down in or near their vicinity than any other area. **Figure 131** details the verified tornadoes that have touched down in or near unincorporated areas of Tazewell County.

Figure 131 Verified Tornadoes in or near Unincorporated Areas of Tazewell County			
Unincorporated Area	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Unincorporated Area	Touched Down/Passed Near Unincorporated Area
Groveland	3	1998, 2003	1960
Lilly	2	---	2008, 2015
Mackinaw River SF&WA	3	2008	2008, 2015
Midway	1	1973	---
Parkland	1	---	2000
Pekin Lake	1	1960	---
Powerton Generation Station	2	1994	2003
Talbott	2	---	1972, 1990
Wadell Airport	1	1990	---

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln indicates that between 1950 and 2017, 34 of the 61 tornadoes caused $978 million in property damages and $75,500 in crop damages. Included in the property damage total is $955 million in damages sustained as a result of the November 17, 2013 EF2 tornado in Pekin ($45 million) and the EF4 tornado that devastated portion of East Peoria ($110 million) and Washington ($800 million).

Ten of the tornadoes have property damage totals of at least $1 million. Property damage information was either unavailable or none was recorded for the remaining 27 reported occurrences.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts
- Total Property Damage: ***$978,130,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***$75,500***
- Injuries: ***172***
- Fatalities: ***3***

Tornado Risk/Vulnerability to:
- Public Health & Safety – Rural Areas: ***Low to Medium***
- Public Health & Safety – Municipalities: ***High***
- Buildings/Infrastructure/Critical Facilities – Rural Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities – Municipalities/Populated Unincorp. Areas: ***High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

NOAA's Storm Events Database documented three fatalities and 172 injuries as a result of nine tornado events. Detailed information on the injuries and fatalities sustained was only available for four of the events. The following provides a brief description of each.

- A worker was slightly injured when an F1 tornado destroyed the railroad barracks in South Pekin on May 9, 1995. Another injury was reported as a result of this tornado but detailed information was unavailable.
- During the May 13, 1995 F3 tornado, two individuals sustained minor injuries when a subdivision one mile south of South Pekin was destroyed.

- A man sustained minor injuries when a piece of sheetrock hit him on the head as he was taking cover from an F0 tornado that hit the Country View Estates subdivision near South Pekin on April 30, 1997.
- During the May 10, 2003 F3 tornado, an individual suffered injuries when a car was overturned by the tornado on Interstate 74 at Morton.

In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

What is the level of risk/vulnerability to public health and safety from tornadoes?

According to the *2013 Illinois Natural Hazard Mitigation Plan*, **Tazewell County ranks in the top 10 counties in Illinois in terms of tornado frequency**. This fact alone suggests that the overall risk posed by tornadoes to public health and safety is relatively high. While frequency is important, other factors must be examined when assessing vulnerability including population distribution and density, the ratings and pathways of previously recorded tornadoes, the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.) and adequate access to health care for those injured following a tornado.

Tazewell County

Unlike several of the neighboring counties in the area, Tazewell County has very distinct differences in its population distribution and density. This coupled with the ratings and pathways of previously reported tornadoes make it difficult to assign the County as a whole a single rating level of risk or vulnerability. Instead the public health and safety risk to Tazewell County is discussed in terms of areas within the County.

For the more densely-populated ***Metro area*** in the northern portion of the County the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be medium to high. In this area the population and housing unit density is higher and there are not large expanses of open spaces between municipalities. In addition, a greater number of tornadoes have either touched down or passed through this area, including higher rated tornadoes (F2/EF2 and above). Most of the injuries and fatalities have also taken place in this area. These factors suggest that a tornado that touches down or passes through will have a greater likelihood of causing injuries and fatalities.

For the ***southern and central rural/agricultural portions*** of the County the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be low. In these areas the municipalities are small in size and separated by miles of open space. A majority of the tornadoes that have tracked through this area have largely occurred in open spaces such as farm fields. In addition, most of the tornadoes that have occurred in these portions of the County have had a lower F/EF rating. As a result, there is less likelihood that a tornado that touches down or passes through will cause injuries or fatalities.

In terms of adequate access to health care, the County is served by UnityPoint Health – Pekin which is equipped to provide continuous care to persons injured by a tornado assuming that it is not directly impacted. In addition, there are hospitals in Peoria (Peoria County), Eureka (Woodford County), Bloomington/Normal (McLean County), Lincoln (Logan County), Havana (Mason County) and Canton (Fulton County) as well as regional centers in Springfield (Sangamon County) and the Quad Cities area (Rock Island County) which are equipped to provide care and have sufficient capacity for the influx of additional patients from one or more counties.

Participating Municipalities

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to the public health and safety would be considered high. This is based on the size and relatively dense and evenly distributed populations within the participating municipalities. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

Are existing buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure and critical facilities located within the County and participating municipalities are vulnerable to damage from tornadoes. Buildings, infrastructure and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding and windows. In addition, mobile homes, homes on crawlspaces and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

Assessing the Vulnerability of Existing Residential Structures

One way to assess the vulnerability of existing residential structures is to estimate the number of housing units that may be potentially damaged if a tornado were to touchdown or pass through any of the participating municipalities or the County. In order to accomplish this, a set of decisions/assumptions must be made regarding:

- the size (area impacted) by the tornado;
- the method used to estimate the area impacted by the tornado within each jurisdiction; and
- the method used to estimate the number of potentially-damaged housing units.

The following provides a brief discussion of each decision/assumption.

Assumption #1

The area impacted by an average tornado in Tazewell County = 0.19 sq. miles

Size of Tornado: To calculate the number of existing residential structures vulnerable to a tornado, the size (area impacted) by the tornado must first be determined. There are several scenarios that can be used to calculate the size, including the worst case and the average. For this analysis the area impacted by an average-sized tornado in Tazewell County will be used since it has a higher probability of recurring. In Tazewell County the area impacted by an average-sized tornado is 0.19 square miles. This average is based on over 60 years of data.

Assumption #2

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

Method for Estimating the Area Impacted: Next, a method for determining the area within each jurisdiction impacted by the average-sized tornado needs to be chosen. There are several methods that can be used including creating an outline of the area impacted by the average-sized tornado and overlaying it on a map of each jurisdiction (most notably the municipalities) to see if any portion of the area falls outside of the corporate limits (which would require additional calculations) or just assume that the entire area of the average-sized tornado falls within the limits of each jurisdiction. For this discussion, it is assumed that the entire area of the average-sized tornado will fall within the limits of the participating jurisdictions.

This method is quicker, easier and more likely to produce consistent results when the Plan is updated again. There is, however, a greater likelihood that the number of potentially-damaged housing units will be overestimated for those municipalities that have irregular shaped boundaries or occupy less than one square mile.

Assumption #3

The average housing unit density for each municipality will be used to determine the number of potentially-damaged housing units.

Method for Estimating Potentially-Damaged Housing Units: With the size of the tornado calculated and a method for estimating the area impacted chosen, a decision must be made on an approach for estimating the number of potentially-damaged housing units. There are several methods that can be used including overlaying the average-sized tornado on a map of each jurisdiction and counting the impacted housing units or calculating the average housing unit density to estimate the number of potentially-damaged housing units.

For this analysis, the average housing unit density will be used since it provides a realistic perspective on potential residential damages without conducting extensive counts. Using the average housing unit density also allows future updates to the Plan to be easily recalculated and provides an exact comparison to previous estimates.

The average housing unit density can be calculated by taking the number of housing units in a jurisdiction and dividing that by the land area within the jurisdiction. **Figure 132** provides a sample calculation.

Figure 132 **Calculation of Average Housing Unit Density – Tazewell County**
Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction = Average Housing Unit Density (Rounded Up to the Nearest Whole Number)
Tazewell County: 57,516 housing units ÷ 648.973 sq. miles = 88.62618 housing units/sq. miles **(89 housing units)**

Figure 133 provides a breakdown of housing unit densities by participating municipality as well as for the unincorporated areas of the County and the County as a whole.

Figure 133
Average Housing Unit Density by Participating Municipality – Tazewell County

Jurisdiction	Total Housing Units (2010)	Mobile Homes (2017)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
East Peoria	10,590	24	19.957	530.64088
Morton	6,973	495	12.953	538.33089
Pekin	14,714	44	14.559	1,010.64634
Tremont	942	0	0.944	---
Washington	6,189	8	8.175	757.06422
Unincorp. County	10,285	127	580.575	17.71520
County	57,516	1,002	648.973	88.62618

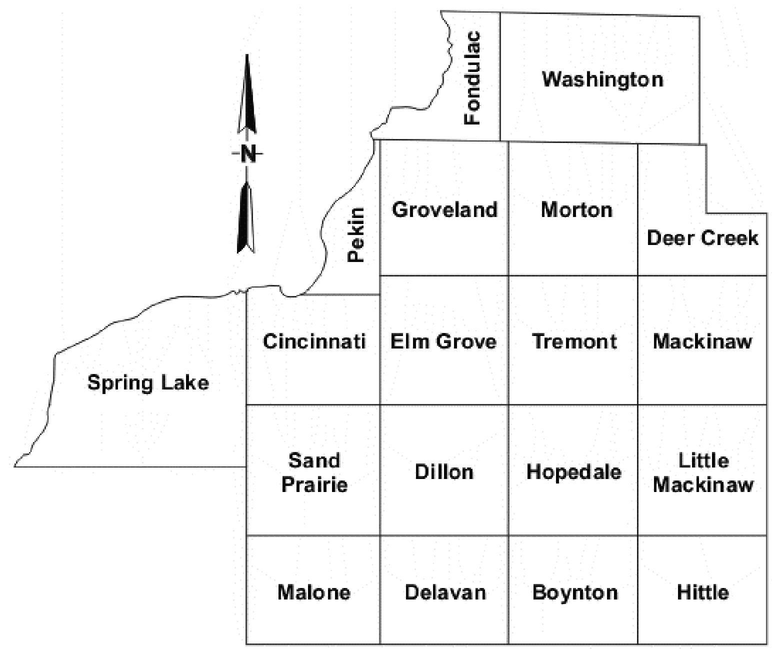
Sources: U. S. Census Bureau.
Tazewell County Community Development Office.

* The total number of mobile homes present in the County was provided by the Tazewell County Community Development and Assessment Offices and based on 2017 tax assessment figures. While a breakdown by participating jurisdiction was not requested, the number was extrapolated from U.S. Census Bureau figures and the information provided by the County.

While the average housing unit density provides an adequate assessment of the number of housing units in areas where the housing density is fairly constant, such as municipalities, it does not provide a realistic assessment for those counties with large, sparsely populated rural areas such as Tazewell County.

In Tazewell County, as well as many other central Illinois counties, there are pronounced differences in housing unit densities within the County. Approximately 84% of all housing units are located in six of the County's 19 townships (Cincinnati, Fondulac, Groveland, Morton, Pekin and Washington) while approximately 84% of all mobile homes are located in three of the County's 19 townships (Fondulac, Groveland and Morton). **Figure 134** identifies the township boundaries. Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in these more densely populated townships is likely to be greater than in the rest of the County.

Figure 134
Township Boundaries Tazewell County



Source: Illinois Secretary of State

This substantial difference in density skews the average *county* housing unit density in Tazewell County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure 135** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

For 13 of the 19 townships, the *average county* housing unit density is greater (in some cases considerably greater) than the *average township* housing unit densities. However, the *average county* housing unit density is considerably less than the housing unit densities for five of the six most populated townships.

Estimating the Number of Potentially-Damaged Housing Units

With the average housing unit densities calculated it is relatively simple to provide an estimate of the number of existing potentially-damaged housing units. This can be done by multiplying the average housing unit density by the area impacted by the average-sized tornado. **Figure 136** provides a sample calculation.

For those municipalities that cover less than one square mile, the average housing unit density cannot be used to calculate the number of potentially-damaged housing units. The average housing unit density assumes that the land area within the municipality is at least one square mile and as a result distorts the number of potentially-damaged housing units for very small municipalities.

Figure 135
Average Housing Unit Density by Township – Tazewell County

Township	Total Housing Units (2010)	Mobile Homes (2017)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
Boynton	94	0	29.589	3.17686
Cincinnati	3,436	0	30.037	114.39225
Deer Creek	573	0	27.651	20.72258
Delavan	902	6	30.165	29.90220
Dillon	382	0	35.932	10.63119
Elm Grove	1,253	0	36.012	34.79396
Fondulac	6,099	124	17.703	344.51788
Groveland	8,441	333	38.082	221.65327
Hittle	254	7	30.254	8.39558
Hopedale	806	0	35.187	22.90619
Little Mackinaw	678	41	36.383	18.63508
Mackinaw	1,675	43	36.153	46.33087
Malone	95	0	29.682	3.20059
Morton	7,246	385	35.694	203.00331
Pekin	13,321	43	12.495	1,066.10644
Sand Prairie	582	0	35.459	16.41332
Spring Lake	887	0	62.683	14.15057
Tremont	1,043	0	34.957	29.83666
Washington	9,749	20	54.855	177.72309
County	57,516	1,002	648.973	88.62618
Townships – 6 Most Populated	48,292	906	188.866	255.69451
Townships – 13 Least Populated	9,224	96	460.107	20.04751

Sources: U.S. Census Bureau.
Tazewell County Community Development Office.

* The total number of mobile homes present in the County was provided by the Tazewell County Community Development and Assessment Offices and based on 2017 tax assessment figures. While a breakdown by participating jurisdiction was not requested, the number was extrapolated from U.S. Census Bureau figures and the information provided by the County.

Figure 136
Calculation of Potentially-Damaged Existing Housing Units – Tazewell County

Average Housing Unit Density x Area Impacted by the Average-Sized Tazewell County Tornado = Potentially-Damaged Housing Units
(Rounded Up to the Nearest Whole Number)

Tazewell County: 88.62618 housing units/sq. mile x 0.19 sq. miles = 16.83897 housing units
(17 housing units)

To calculate the number of potentially-damaged housing units for these municipalities, take the area impacted by the average-sized Tazewell County tornado and divide that by the land area within the municipality to get the impacted land area. The impacted land area is then multiplied by the total number of housing units within the municipality to get the number of potentially-damaged housing units. **Figure 137** provides a sample calculation.

Figure 137 **Sample Calculation of Potentially-Damaged Housing Units** **for Municipalities Covering Less Than One Square Mile - Tremont**
Area Impacted by the Average-Sized Tazewell County Tornado ÷ Land Area within the Jurisdiction = Impacted Land Area
Tremont: 0.19 sq. mile ÷ 0.944 sq. miles = 0.201271186 sq. miles
Impacted Land Area x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number)
Tremont: 0.201271186 sq. miles x 942 housing units = 189.59746 housing units **(190 housing units)**

Occasionally villages and cities will annex large tracts of undeveloped land or have commercial/industrial parks within their corporate limits. In many cases these large tracts of land include very few residential structures. Consequently, including these tracts of land in the calculations to determine the number of potentially-damaged housing units skews the results, especially for very small municipalities. Therefore, to provide a more realistic assessment of the number of potentially-damaged housing units, these areas need to be subtracted from the land area figures obtained from the U.S. Census Bureau.

In Tazewell County there are three municipalities, East Peoria, Morton and Pekin, that have large, commercial/industrial and undeveloped land areas within their municipal boundaries. These areas account for approximately one-quarter to one-half of the land area in these municipalities. If these areas are subtracted from the U.S. Census Bureau land area figures, then the remaining land areas have fairly consistent housing unit densities and contain a majority of the housing units. Therefore, the refined land area figures will be used to calculate the potentially-damages housing units. **Figure 138** provides a breakdown of the land area by municipality.

Figures 139 and **140** provide a breakdown of the number of potentially-damaged housing units by participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole. It is important to note that for the six most densely populated townships, the estimated number of potentially-damaged housing units would only be reached if a tornado's pathway included the major municipality within the township. If the tornado remained in the rural portion of the township, then the number of potentially-damaged housing units would be considerably lower.

Figure 138 **Refined Land Area Figures for Participating Municipalities with Large Commercial/Industrial and Undeveloped Land Areas – Tazewell County**			
Jurisdiction	**Land Area (Sq. Miles) (2010)**	**Estimated Commercial/Industrial & Open Land Area (Sq. Miles)**	**Refined Land Area (Sq. Miles)**
East Peoria	19.957	6.370	13.587
Morton	12.653	6.130	6.823
Pekin	14.559	3.930	10.619

Figure 139 **Estimated Number of Housing Units by Participating Municipality Potentially Damaged by a Tornado – Tazewell County**					
Participating Municipality	**Total Housing Units (2010)**	**Land Area (Sq. Miles) (2010)**	**Average Housing Unit Density (Units/Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.19 Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)**
East Peoria*	10,590	13.587	779.42151	148.09009	149
Morton*	6,973	6.823	1,021.98446	194.17705	195
Pekin*	14,714	10.619	1,385.62953	263.26961	264
Tremont	942	0.944	---	189.59746	190
Washington	6,189	8.175	757.06422	143.84220	144
Unincorp. County	10,285	580.575	17.71520	3.36589	4
County	57,516	648.973	88.62618	16.83897	17

* East Peoria, Morton and Pekin contain large commercial/industrial and undeveloped areas within their municipal boundaries. These areas account for between ¼ and ½ of the land area in the municipalities and skew the potentially-damaged housing unit calculations. In order to provide a more realistic assessment of potentially-damage housing units, these undeveloped areas were subtracted from the land area figure obtained from the U.S. Census Bureau and the refined land area figures are used to calculate potentially-damaged housing units.

What is the level of risk/vulnerability to existing buildings, infrastructure and critical facilities vulnerable from tornadoes?

There are several factors that must be examined when assessing the vulnerability of existing buildings, infrastructure and critical facilities to tornadoes. These factors include tornado frequency, population distribution and density, the ratings and pathways of previously recorded tornadoes, and the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.)

Tazewell County

For Tazewell County the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is consider to be low to medium. This assessment is based on the frequency with which tornadoes have occurred in the County and the amount of damage that has been sustained tempered by the differences in population density between the metro area and the rural/agricultural portions of the County and the relative absence of high-risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have caused significant damage on several occasions.

Figure 140
Estimated Number of Housing Units by Township Potentially Damaged by a Tornado – Tazewell County

Township	Total Housing Units (2010)	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.19 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)
Boynton	94	29.589	3.17686	0.60360	1
Cincinnati	3,436	30.037	114.39225	21.73453	22
Deer Creek	573	27.651	20.72258	3.93729	4
Delavan	902	30.165	29.90220	5.68142	6
Dillon	382	35.932	10.63119	2.01993	3
Elm Grove	1,253	36.012	34.79396	6.61085	7
Fondulac	6,099	17.703	344.51788	65.45840	66
Groveland	8,441	38.082	221.65327	42.11412	43
Hittle	254	30.254	8.39558	1.59516	2
Hopedale	806	35.187	22.90619	4.35218	5
Little Mackinaw	678	36.383	18.63508	3.54067	4
Mackinaw	1,675	36.153	46.33087	8.80287	9
Malone	95	29.682	3.20059	0.60811	1
Morton	7,246	35.694	203.00331	38.57063	39
Pekin	13,321	12.495	1,066.10644	202.56022	203
Sand Prairie	582	35.459	16.41332	3.11853	4
Spring Lake	887	62.683	14.15057	2.68861	3
Tremont	1,043	34.957	29.83666	5.66897	6
Washington	9,749	54.855	177.72309	33.76739	34
County	57,516	648.973	88.62618	16.83897	17
Townships – 6 Most Populated	48,292	188.866	255.69451	48.58196	49
Townships – 13 Least Populated	9,224	460.107	20.04751	3.80903	4

Participating Municipalities

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to existing buildings, infrastructure and critical facilities would be considered high. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within any of the municipalities it will have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes and No. All of the participating jurisdictions have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes.

However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a high rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. However, a *rough estimate* of potential dollar losses to the *potentially-damaged housing units* determined previously can be calculated if several additional decisions/assumptions are made regarding:

- the value of the potentially-damaged housing units; and
- the percent damage sustained by the potentially-damaged housing units (i.e., damage scenario).

These assumptions represent a ***probable scenario*** based on the reported historical occurrences of tornadoes in Tazewell County. The purpose of providing a rough estimate is to help residents and municipal/county officials make informed decisions to better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur. The following provides a brief discussion of each decision/assumption.

Assumption #4

The average market value for residential structures in each participating jurisdiction will be used to determine the value of potentially-damaged housing units.

Value of Potentially-Damaged Housing Units: In order to determine the potential dollar losses to the potentially-damaged housing units, the monetary value of the units must first be calculated. Typically, when damage estimates are prepared after a natural disaster such as a tornado, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value of residential structures in each municipality will be used.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is calculated by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the average assessed value and multiplying that number by three (the assessed value of a structure in Tazewell County is approximately one-third of the market value). **Figure 141** provides a sample calculation. The total assessed value is based on 2016 tax assessment information provided by the Tazewell County Assessment Office.

There are two villages/cities that straddle the Tazewell-Woodford County Line. For the purposes of this report, these villages/cities will be included in the County where a majority of the municipality resides. Therefore, the assessed value for the portion of Deer Creek that lies within Woodford County was included in the Tazewell County figure and the assessed value for the portion of Goodfield that lies within Tazewell County was included in the Woodford County figures.

Figure 141
Sample Calculation of Average Assessed Value & Average Market Value – East Peoria

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

East Peoria: $307,711,479 ÷ 10,590 housing units = $29,056.79688

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

East Peoria: $29,056.79688 x 3 = $87,170.39065
($87,170)

Figures 142 and **143** provides the average assessed value and average market value for each participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole.

Figure 142
Average Market Value of Housing Units by Participating Municipality – Tazewell County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
East Peoria	$307,711,479	10,590	$29,056.79688	$87,170.39064	$87,170
Morton	$345,125,877	6,973	$49,494.60447	$148,483.81341	$148,484
Pekin	$318,602,708	14,714	$21,653.03167	$64,959.09501	$64,959
Tremont	$34,645,060	942	$36,778.19533	$110,334.58599	$110,335
Washington	$289,130,261	6,189	$46,716.79771	$140,150.39313	$140,150
Unincorp. County	$408,622,464	10,285	$39,729.94302	$119,189.82906	$119,190
County	$1,866,670,119	57,516	$32,454.79726	$97,364.39178	$97,364

Source: Tazewell County Assessments Office.

Assumption #5

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

Damage Scenario: Finally, a decision must be made regarding the percent damage sustained by the potentially-damaged housing units and their contents. For this scenario, the expected percent damage sustained by the structure and its contents is 100%; in other words, all of the potentially-damaged housing units would be completely destroyed. While it is highly unlikely that each and every housing unit would sustain the maximum percent damage, identifying and calculating different degrees of damage within the average area impacted gets complex and provides an additional complication when updating the Plan.

Figure 143
Average Market Value of Housing Units by Township – Tazewell County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
Boynton	$1,877,580	94	$19,974.25532	$59,922.76596	$59,923
Cincinnati	$102,880,387	3,436	$29,941.90541	$89,825.71623	$89,826
Deer Creek	$12,130,393	573	$21,169.97033	$63,509.91099	$63,510
Delavan	$18,245,352	902	$20,227.66297	$60,682.98891	$60,683
Dillon	$13,671,699	382	$35,789.78796	$107,369.36388	$107,369
Elm Grove	$49,146,183	1,253	$39,222.81165	$117,668.43495	$117,668
Fondulac	$162,449,213	6,099	$26,635.38498	$79,906.15494	$79,906
Groveland	$275,135,163	8,441	$32,595.09098	$97,785.27294	$97,785
Hittle	$4,977,444	254	$19,596.23622	$58,788.70866	$58,789
Hopedale	$24,836,778	806	$30,814.86104	$92,444.58312	$92,445
Little Mackinaw	$17,868,273	678	$26,354.38496	$79,063.15488	$79,063
Mackinaw	$65,778,770	1,675	$39,270.90746	$117,812.72238	$117,813
Malone	$1,729,220	95	$18,202.31579	$54,606.94737	$54,607
Morton	$361,126,478	7,246	$49,838.04554	$149,514.13662	$149,514
Pekin	$250,040,104	13,321	$18,770.37039	$56,311.11117	$56,311
Sand Prairie	$14,593,773	582	$25,075.21134	$75,225.63402	$75,226
Spring Lake	$21,810,232	887	$24,588.76212	$73,766.28636	$73,766
Tremont	$41,987,072	1,043	$40,256.06136	$120,768.18408	$120,768
Washington	$426,386,005	9,749	$43,736.38373	$131,209.15119	$131,209
Townships – 6 Most Populated	$1,578,017,350	48,292	$32,676.57894	$98,029.73682	$98,030
Townships – 13 Least Populated	$288,652,769	9,224	$31,293.66533	$93,880.99599	$93,881

Source: Tazewell County Assessments Office.

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First, the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying it by the percent damage (100%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 144** provides a sample calculation.

Next, the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply by the percent damage (100%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 145** provides a sample calculation.

Figure 144 ***Structure:*** **Potential Dollar Loss Sample Calculation – East Peoria**
Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit East Peoria: $87,170 x 100% = $87,170 per housing unit
Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar) East Peoria: $87,170 per housing unit x 101 housing units = $8,804,170

Figure 145 ***Content:*** **Potential Dollar Loss Sample Calculation – East Peoria**
½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit East Peoria: ½ ($87,170) x 100% = $43,585 per housing unit
Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar) East Peoria: $43,585 per housing unit x 101 housing units = $4,402,085

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and content. **Figures 146** and **147** gives a breakdown of the total potential dollar losses by municipality and township.

This assessment illustrates why potential residential dollar losses should be considered when jurisdictions are deciding which mitigation projects to pursue. ***Potential dollar losses caused by an average tornado in Tazewell County would be expected to exceed at least $13 million in any of the participating municipalities.***

Vulnerability of Commercial/Industrial Businesses and Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of an average-sized tornado in term of residential dollar losses. These calculations do not include damages sustained by businesses or other infrastructure and critical facilities within the participating jurisdictions.

In terms of businesses, the impacts from an average-sized tornado event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. ***While average dollar amounts cannot be supplied for these items at this time, they should be taken into account*** when discussing the impacts that an average-sized tornado could have on the participating jurisdictions.

Figure 146
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Municipality – Tazewell County

Participating Jurisdiction	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
East Peoria	$87,170	101	$8,804,170	$4,402,085	$13,206,255
Morton	$148,484	195	$28,954,380	$14,477,190	$43,431,570
Pekin	$64,959	264	$17,149,176	$8,574,588	$25,723,764
Tremont	$110,335	190	$20,963,650	$10,481,825	$31,445,475
Washington	$140,150	144	$20,181,600	$10,090,800	$30,272,400
Unincorp. County	$119,190	4	$476,760	$238,380	$715,140
County	$97,364	17	$1,655,188	$827,594	$2,482,782

Figure 147
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township – Tazewell County

Township	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Boynton	$59,923	1	$59,923	$29,962	$89,885
Cincinnati	$89,826	22	$1,976,172	$988,086	$2,964,258
Deer Creek	$63,510	4	$254,040	$127,020	$381,060
Delavan	$60,683	6	$364,098	$182,049	$546,147
Dillon	$107,369	3	$322,107	$161,054	$483,161
Elm Grove	$117,668	7	$823,676	$411,838	$1,235,514
Fondulac	$79,906	66	$5,273,796	$2,636,898	$7,910,694
Groveland	$97,785	43	$4,204,755	$2,102,378	$6,307,133
Hittle	$58,789	2	$117,578	$58,789	$176,367
Hopedale	$92,446	5	$462,230	$231,115	$693,345
Little Mackinaw	$79,063	4	$316,252	$158,126	$474,378
Mackinaw	$117,813	9	$1,060,317	$530,159	$1,590,476
Malone	$54,607	1	$54,607	$27,304	$81,911
Morton	$149,514	39	$5,831,046	$2,915,523	$8,746,569
Pekin	$56,607	203	$11,491,221	$5,745,611	$17,236,832
Sand Prairie	$75,226	4	$300,904	$150,452	$451,356
Spring Lake	$73,766	3	$221,298	$110,649	$331,947
Tremont	$120,768	6	$724,608	$362,304	$1,086,912
Washington	$131,209	34	$4,461,106	$2,230,553	$6,691,659
Townships – 6 Most Populated	$98,030	49	$4,803,470	$2,401,735	$7,205,205
Townships – 13 Least Populated	$93,881	4	$375,524	$187,762	$563,286

Tazewell County

Figure 123 (Sheet 1 of 12) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
1	11/13/1951	1:15 p.m.	Delavan^ Hopedale^ Minier^	F2	14.9	50	n/a	n/a	$40,000	$25,000	
2	5/26/1955	2:49 p.m.	Pekin	F2	1.5	100	1	n/a	$250,000	n/a	
3	8/13/1956	1:15 a.m.	East Peoria Sunnyland Washington	F3	3.8	27	n/a	n/a	$25,000	n/a	Sunnyland - destroyed a building - 2 stores lost their roofs
4	4/16/1960	12:05 p.m.	Delavan^	F1	2.7	60	n/a	n/a	$2,500	n/a	damaged 2 or 3 farmsteads
5	5/16/1960	4:45 p.m.	Pekin Lake North Pekin	F2	0.1	10	n/a	n/a	$25,000	n/a	North Pekin - damaged homes
6	5/25/1960	3:10 p.m.	Groveland^	F2	0.1	10	n/a	n/a	$25,000	n/a	took the roofs off several homes
7	9/14/1965	2:40 p.m.	East Peoria	F3	0.5	200	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Peoria County just south of Norwood near the grade school and traveled southeast crossing the Illinois river into Tazewell County before lifting off in East Peoria near the Caterpillar Plant – total length: 5.7 miles							damage and injury information were unavailable				
8	1/24/1967	6:30 p.m.	Washington^	F2	3.3	77	n/a	n/a	$2,500	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Tazewell County southeast of Washington and traveled northeast before lifting off west of Eureka in Woodford County – total length: 3.8 miles							caused some tree and roof damage, especially to farm buildings				
Subtotal:							**1**	**0**	**$370,000**	**$25,000**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123 (Sheet 2 of 12) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
9	10/10/1969	8:00 p.m.	Deer Creek	F2	0.2	200	n/a	n/a	$150,000	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> touched down in Deer Creek in Tazewell County and traveled east into Woodford County before dissipating – total length: 1.0 miles greatest damage was done to a two-block area in Deer Creek											
10	7/12/1972	9:40 p.m.	Talbott^	F1	0.5	130	n/a	n/a	n/a	$2,500	localized damage sustained
11	9/4/1973	12:20 p.m.	South Pekin^ Midway Pekin Morton	F0	14.6	33	n/a	n/a	n/a	n/a	
12	6/19/1974	6:30 p.m.	Morton^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado was sighted by a pilot near the Village
13	4/18/1975	3:20 p.m.	Hopedale^	F1	0.5	50	n/a	n/a	$25,000	n/a	*Event Description Provided Below*
- destroyed 2 machine sheds on a farm south of the Village - scattered the wreckage of one shed over a large field - carried the other shed about 75 to 100 feet before dropping it and causing little damage											
14	4/30/1975	12:13 p.m.	Armington^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down in a field about 5 ½ miles west-southwest of the Village
15	3/26/1976	9:05 p.m.	Morton	F1	1.5	600	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
<u>*Morton*</u> - several buildings sustained extensive damage, including having large sections of roof torn off in the northwest portion of the Village <u>*Morton area*</u> - several farm gravity wagon boxes were overturned or blown up to 400 feet away onto adjacent properties											
Subtotal:							**0**	**0**	**$425,000**	**$2,500**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 3 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
16	9/7/1977	4:00 p.m.	Deer Creek	F1	0.2	145	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
- approx. 30 homes were damaged in the Westview subdivision on the western edge of the Village - a house under construction was lifted off its foundation, moved slightly and set down again - another residence sustained damage when the attached garage was ripped off and carried across the adjoining yard											
17	9/16/1980	5:25 p.m.	East Peoria Sunnyland	F0	0.8	17	n/a	n/a	n/a	n/a	- about 20 trees were uprooted - the tornado made a 6 ft. high dirt hill
18	6/8/1981	7:18 p.m.	Pekin^ Tremont^	F1	0.1	10	n/a	n/a	$25,000	n/a	tornado touched down between Pekin and Tremont – no damage was reported
19	9/29/1986	2:58 p.m.	Hopedale	F2	2.0	50	n/a	n/a	$275,000	n/a	- destroyed the Hopedale Fire Station - damaged 30 homes - destroyed a garage - toppled or uprooted 100 trees
20	6/2/1987	1:30 p.m.	Mackinaw^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down briefly in open country but caused no damage
21	6/13/1990	7:13 p.m.	Pekin East Peoria	F0	7.0	20	n/a	n/a	$2,500	n/a	- ***this event was part of a federally-declared disaster (Declaration #871)*** - blew down trees one of which fell onto a car
22	6/19/1990	11:20 p.m.	Green Valley	F1	1.0	100	n/a	n/a	$2,500,000	n/a	- ***this event was part of a federally-declared disaster (Declaration #871)*** - several stores in a shopping center were damaged by a fire resulting from the tornado
Subtotal:							**0**	**0**	**$3,052,500**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.
^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 4 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
23	11/27/1990	2:13 p.m.	Waddell Airport Talbott^	F2	1.0	200	2	0	$1,500,000	n/a	_Waddell Airport_ 32 airplanes and 4 hangers were destroyed and others damaged
24	5/14/1991	10:15 a.m.	Minier	F0	0.1	20	n/a	n/a	n/a	n/a	
25	5/14/1991	10:30 a.m.	Hopedale	F0	0.1	20	n/a	n/a	n/a	n/a	
26	5/31/1991	6:42 p.m.	Minier^	F0	0.2	50	n/a	n/a	n/a	n/a	
27	10/4/1991	5:09 p.m.	Hopedale^	F1	0.4	20	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
- ripped the roofs off of several homes - a camping trailer was smashed by an uprooted tree									- destroyed a farm machinery shop - ripped the roof off a warehouse in the Indian Creek Industrial Park and damaged a medical building		
28	5/4/1992	1:50 p.m.	Hopedale^	F0	0.1	30	n/a	n/a	$2,500	n/a	damaged trees, power lines and outbuildings
29	8/23/1993	5:45 p.m.	Minier^	F1	0.3	20	n/a	n/a	n/a	n/a	a woman photographed a narrow tornado on the ground in an open field
30	6/26/1994	5:33 p.m.	East Peoria	F0	0.25	20	n/a	n/a	n/a	n/a	a TV crew taped a brief tornado touchdown at Spring St.
31	7/20/1994	5:22 p.m.	Powerton Generating Station	F0	0.25	20	n/a	n/a	n/a	n/a	a tornado touched down briefly but caused no damage
32	7/20/1994	5:45 p.m.	Morton^	F0	0.25	20	n/a	n/a	n/a	n/a	tornado touched down briefly near I-74 west of the Village
Subtotal:							**2**	**0**	**$1,752,500**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 5 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
33	5/9/1995	5:04 p.m.	South Pekin Pekin[^]	F1	4.0	220	2	0	$1,000,000	n/a	*Event Description Provided Below*
<u>*South Pekin area – south of the Village*</u> - several barns were destroyed - one house sustained minor damage - the grill of a pickup truck was impaled by a 2” x 4” <u>*South Pekin*</u> - destroyed a railroad workers’ barracks slightly injuring one worker - blew over four empty rail cars - numerous trees were blown over - several cars were smashed by fallen trees - three people were trapped in a smashed car but no one was injured - 4 or 5 garages were destroyed - part of the roof was missing from a Lutheran church											
34	5/13/1995	5:15 p.m.	South Pekin[^] Tremont	F3	21.1	880	2	0	$2,000,000	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Two Counties*</u> touched down in Mason County north of Goofy Ridge in Sand Ridge State Park and traveled east-northeast into Tazewell County before lifting off east of Tremont – total length: 25.0 miles - 25 homes were either damaged or destroyed with 7 of the homes destroyed in a subdivision 1 mile south of South Pekin - 2 people suffered minor injuries from the destruction sustained in a subdivision 1 mile south of South Pekin - numerous silos and machine sheds were destroyed											
35	4/19/1996	6:00 p.m.	Armington	F2	4.4	440	n/a	n/a	$1,000,000	n/a	*Event Description Provided Below*
<u>*Touchdown/Liftoff – Multiple Counties*</u> touched down in Logan County just south of the Logan/Tazewell County Line (on 1350E) and traveled northeast into Tazewell County and through the south side of Armington before turned southeast and lifting off in McLean County northwest of McLean – total length: 5.2 miles <u>*Armington*</u> - 1 home as well as several outbuildings were destroyed - 2 homes sustained major damage while 5 homes sustained minor damage											
Subtotal:							**4**	**0**	**$4,000,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.
[^] Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

<table>
<tr><th colspan="12">Figure 123
(Sheet 6 of 12)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>36</td><td>4/30/1997</td><td>2:15 p.m.</td><td>South Pekin^</td><td>F0</td><td>0.5</td><td>50</td><td>1</td><td>0</td><td>$115,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Country View Estates Subdivision</u>
- severely damaged a home under construction causing around $90,000 in damage
- 4 other homes in the area sustained minor roof damage with shingles missing and a garage was damaged
- a 20-inch diameter tree was blown down blocking Bass Road
- a man sustained minor injuries when a piece of sheetrock hit him in the head as he took cover</td></tr>
<tr><td>37</td><td>6/29/1998</td><td>3:45 p.m.</td><td>Marquette Heights
Groveland
Morton</td><td>F1</td><td>9.5</td><td>100</td><td>n/a</td><td>n/a</td><td>$1,000,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Marquette Heights</u>
- blew down numerous trees and power lines
<u>Groveland area</u>
- numerous homes sustained minor to moderate damage
part of the canopy over the gas pumps at a convenience storm was blown down
<u>Morton (southwest portion)</u>
- a 30-store shopping center sustained considerable damage, with broken windows and half the roof torn off
- a cinema, several restaurants and other businesses sustained moderate damage
- 24 homes sustained moderate damage, mainly to roofs</td></tr>
<tr><td>38</td><td>6/4/1999</td><td>3:25 p.m.</td><td>Delavan</td><td>F1</td><td>2.5</td><td>200</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12"><u>Delavan</u>
- blew a small outdoor amphitheater into a nearby creek
- knocked down numerous trees
- one tree fell onto an unoccupied truck, another fell onto the roof of a house and still another fell onto a mobile home
- several other homes sustained minor damage to their roofs
- the siding on a few homes was ripped off
<u>Delavan area</u>
- uprooted several more trees and knocked down branches
- destroyed a small shed</td></tr>
<tr><td colspan="7">Subtotal:</td><td>1</td><td>0</td><td>$1,115,000</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

<table>
<tr><th colspan="12">Figure 123
(Sheet 7 of 12)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>39</td><td>5/8/2000</td><td>9:12 p.m.</td><td>Parkland^</td><td>F1</td><td>0.5</td><td>100</td><td>n/a</td><td>n/a</td><td>$275,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7">- destroyed 4 large grain bins
- blew a machine shed 100 yards from where it had been</td><td colspan="5">- a nearby garage sustained minor damage with siding and a door blown off</td></tr>
<tr><td>40</td><td>5/10/2003</td><td>8:45 p.m.</td><td>South Pekin
Pekin^
Groveland
Morton</td><td>F3</td><td>17.5</td><td>440</td><td>32</td><td>0</td><td>$10,000,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7">this event was part of a federally-declared disaster (Declaration #1469)
<u>South Pekin area (southwest of the Village)</u>
- several homes were destroyed
<u>South Pekin (eastern portion)</u>
- 50 homes were destroyed
- 80 homes sustained minor to moderate damage</td><td colspan="5"><u>Morton</u>
- 8 vehicles were damaged as the tornado crossed the highways
- 1 injury was sustained when a car was overturned by the tornado as it crossed I-74
- several 3-story apartment buildings were destroyed and several others were severely damaged in the complex
- a couple of businesses were destroyed
- over 100 homes were damaged in several subdivisions, some severely</td></tr>
<tr><td>41</td><td>5/10/2003</td><td>9:16 p.m.</td><td>Morton^
Washington^</td><td>F1</td><td>1.5</td><td>100</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7">this event was part of a federally-declared disaster (Declaration #1469)</td><td colspan="5">3 homes and a business sustained major damage</td></tr>
<tr><td>42</td><td>5/10/2003</td><td>9:18 p.m.</td><td>Washington^</td><td>F0</td><td>2.0</td><td>100</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7">this event was part of a federally-declared disaster (Declaration #1469)
<u>Touchdown/Liftoff – Two Counties</u>
touched down in Tazewell County southeast of Washington and traveled east into Woodford County where it turned and traveled northeast lifting off north of Roanoke – total length: 12.5 miles</td><td colspan="5">- damage a couple of homes and businesses
- blew down numerous trees, power poles and power lines</td></tr>
<tr><td colspan="7">Subtotal:</td><td>32</td><td>0</td><td>$10,275,000</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 8 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
43	5/28/2003	1:40 p.m.	Washington^	F0	1.5	40	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties - touched down in Woodford County in Germantown Hills and traveled southeast into Woodford County lifting off north of Washington – total length: 3.5 miles - blew down numerous trees and power lines - destroyed a shed											
44	5/28/2003	2:10 p.m.	Mackinaw^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field
45	5/28/2003	2:41 p.m.	Armington^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field
46	5/30/2003	6:56 p.m.	Delavan^	F0	6.0	50	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Mason County west of Forest City and traveled southeast into Tazewell County lifting off southwest of Delavan – total length: 14.0 miles - blew down trees and power lines - destroyed several sheds											
47	7/8/2003	2:34 p.m.	Powerton Generating Station^	F0	0.3	20	n/a	n/a	$25,000	n/a	- threw chunks of coal into the air near the power plant - destroyed the roofs on a couple of sheds
48	5/18/2004	4:06 p.m.	East Peoria	F0	0.3	50	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- tornado touched down about ½ mile west of Fondulac dam and traveled down Coventry Lane for about ¼ mile - damaged large trees with a number of them falling on homes - 2 homes had their roofs lifted off while several others had minor roof damage											
49	5/18/2004	4:12 p.m.	Washington	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down in a field
50	5/30/2004	8:37 a.m.	Green Valley^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field south of Green Valley
51	6/22/2006	7:13 a.m.	Morton^	F0	0.1	30	n/a	n/a	n/a	n/a	tornado briefly touched down in a field 3 miles south of the Village
Subtotal:							**0**	**0**	**$25,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 9 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
52	1/7/2008	5:22 p.m.	Mackinaw[^]	EF1	3.0	100	n/a	n/a	$30,000	n/a	*Event Description Provided Below*
- destroyed a pole barn - damaged a house and a few other buildings - blew down a chain link fence and a few tree limbs											
53	6/4/2008	7:18 p.m.	Mackinaw River State Fish & Wildlife Area Lilly[^]	EF0	1.5	30	n/a	n/a	n/a	n/a	tornado touched down in open fields
54	6/4/2008	7:24 p.m.	Mackinaw River State Fish & Wildlife Area[^]	EF0	1.75	150	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Multiple Counties touched down in Tazewell County just east of the Mackinaw River State Fish & Wildlife Area and traveled northeast to the Tazewell/McLean County line where it turned to the east-northeast and traveled through the northwest corner of McLean County and into Woodford County before lifting off south-southeast of Congerville – total length: 6.14 miles tornado touched down in open fields and no damage was reported											
Subtotal:							**0**	**0**	**$30,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

[^] Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 10 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
55	6/5/2010	7:51 p.m.	Washington^	EF2	0.8	250	n/a	n/a	$560,000	$30,000	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Tazewell County approx. 3 miles north of Washington and traveled east-northeast into Woodford County lifting off 2 miles south-southeast of Metamora – total length: 3.08 miles							- numerous trees and power poles were snapped along the path of the tornado - 3 large outbuildings and 2 hog sheds were destroyed - the roof of a farm house was lifted off - the roof of another house was severely damaged - a garage was destroyed - a grain bin was blown ¼ mile into a field				
56	11/17/2013	10:53 a.m.	Pekin	EF2	2.1	100	10	0	$45,000,000	n/a	*Event Description Provided Below*
this event was part of a federally-declared disaster (Declaration #4157) *Touchdown/Liftoff – Two Counties* touched down in Peoria County 4 miles east-northeast of Mapleton along the Illinois River and traveled northeast into Tazewell County lifting off in Pekin – total length: 2.26 miles							- tornado tracked through the northwest side of the City - approx. 179 houses and 6 businesses suffered major damage - 182 houses experienced minor roof damage - 3 apartment buildings lost their roofs - a power substation experienced minor damage - hundreds of cars sustained damage				
Subtotal:							**10**	**0**	**$45,560,000**	**$30,000**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123 (Sheet 11 of 12) Tornado Events 1950 – 2017											
Map No.	**Date(s)**	**Start Time**	**Location(s)**	**Magnitude (Fujita Scale)**	**Length[1] (Miles)**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damage**	**Crop Damage**	**Description**
57	11/17/2013	10:59 a.m.	East Peoria Washington	EF4	14.16	880	121	3	$910,000,000	n/a	*Event Description Provided Below*
Subtotal:							**121**	**3**	**$910,000,000**	**$0**	

this event was part of a federally-declared disaster (Declaration #4157)

Touchdown/Liftoff – Multiple Counties
touched down in Tazewell County southeast of East Peoria and traveled northeast through Woodford and LaSalle Counties and into Livingston County before lifting off east of Long Point – total length: 46.36 miles

Fatalities/Injuries
- a man in Washington was killed by the tornado
- a woman from Washington died 11 days after the event from multiple serious injuries sustained during the tornado
- a man died six weeks after the event from injuries sustained by the tornado
- 121 people sustained injuries (a breakdown by jurisdiction was not available)
- 5,000 individuals were in the path of the tornado; however, the injuries and fatalities were relatively low due to early warning and the fact that people were either in church or out of town at the time

East Peoria
- estimated damages totaled $110 million
- 20 homes were destroyed
- 75 homes, 7 businesses and 5 apartment buildings suffered major damage
- 137 homes and 3 businesses sustained minor damage
- approx. 400 vehicles were damaged
- thousands of trees and numerous power poles were destroyed

Washington
- estimated damages totaled $800 million
- 633 homes, 7 businesses, 7 apartment buildings and 2,500 vehicles were destroyed
- 280 homes, 2 businesses, several outbuildings and the roof of a school sustained major damage
- 190 homes suffered minor damage
- thousands of trees and power poles snapped

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.
^ Tornado touchdown verified in the vicinity of this location(s).

Tazewell County

Figure 123
(Sheet 12 of 12)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
58	7/16/2015	10:39 p.m.	Delavan	EF2	2.39	250	1	0	$1,200,000	$10,000	*Event Description Provided Below*
- 15 homes sustained severe damage, including either the roofs being completely torn off or the majority of the roof deck being lifted off - 36 homes sustained minor to moderate damage - numerous garages, outbuildings and trees were damaged - grave markers and several trees were damaged in the Prairie Rest Cemetery											
59	8/18/2015	5:09 p.m.	Lilly^ Mackinaw River State Fish & Wildlife Area^	EF0	2.01	75	n/a	n/a	$30,000	$8,000	- damaged several pine trees - downed tree limbs onto 3 houses - damaged crops in a path 50 to 75 yards wide
60	3/7/2017	12:00 a.m.	Green Valley^	EF1	7.38	150	n/a	n/a	$175,000	n/a	*Event Description Provided Below*
- destroyed an outbuilding and an historic single-room schoolhouse 4 miles southwest of Green Valley - damaged 2 grain bins, a barn and several trees along Towerline Road east of Green Valley											
61	3/7/2017	12:09 a.m.	Delavan^	EF2	2.8	200	n/a	n/a	$120,000	n/a	damaged several outbuildings and trees
Subtotal:							**1**	**0**	**$1,525,000**	**$18,000**	
GRAND TOTAL:							**172**	**3**	**$978,130,000**	**$75,500**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Tazewell County.

^ Tornado touchdown verified in the vicinity of this location(s).

Sources: Chris Miller, Warning Coordination Meteorologist, National Weather Service, Weather Forecast Office Lincoln, Illinois.
NOAA, National Weather Service, Storm Prediction Center, Weather Coordination Meteorologist's Page, Severe Weather Database Files (1950-2017).
NOAA, National Weather Service, Weather Forecast Office Lincoln, Illinois, Tornado Climatology for Central and Southeast Illinois, Tazewell County.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

3.4.2 WOODFORD COUNTY

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

Figure 148, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in Woodford County. NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln have documented 43 occurrences of tornadoes in Woodford County between 1950 and 2017. In comparison, there have been 2,199 tornadoes statewide between 1950 and 2012 according to the most recent Illinois Natural Hazard Mitigation Plan.

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 – 2017): ***43***

Highest F-Scale Rating Recorded: ***F4 (July 13, 2004)***

Most Likely Month for Tornadoes to Occur: ***May***

Most Likely Time for Tornadoes to Occur: ***Afternoon / Early Evening***

Average Length of a Tornado: ***2.8 miles***

Average Width of a Tornado: ***107 yards***

Average Damage Pathway of a Tornado: ***0.17 sq. mi.***

Longest Tornado Path in the County: ***20.7 miles (EF 3 November 17, 2013)***

Widest Tornado Path in the County: ***880 yards (EF 3 November 17, 2013***

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

Figure 149 charts the reported occurrences of tornadoes by magnitude. Of the 43 reported occurrences there was: one – F4, two – EF3s, eight – F2s, one – EF2, eight – F1s, eighteen – F0s, and five – EF0s.

Figure 150 charts the reported tornadoes by month. Of the 43 events, 27 (63%) took place in May and June making this the peak period for tornadoes in Woodford County. Of those 27 events, 15 (55.5%) occurred during May making this the peak month for tornadoes. In comparison, 1,457 of the 2,199 tornadoes (66%) recorded in Illinois since 1950 took place in April, May and June.

Figure 149
Graph: Tornadoes by Magnitude Woodford County: 1950 – 2017

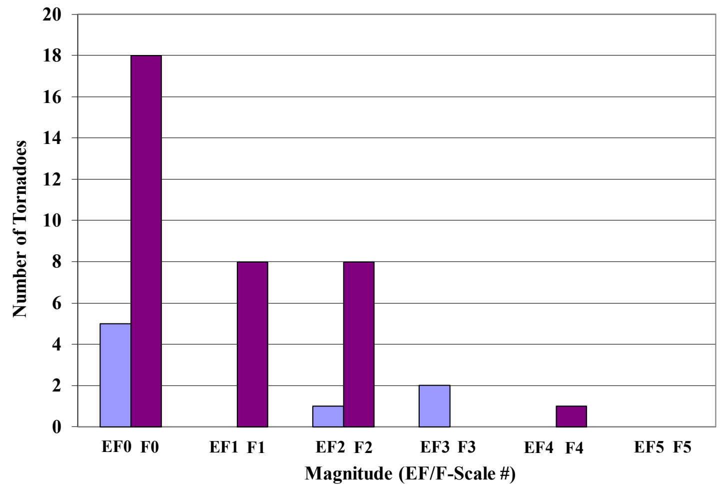


Figure 150
Graph: Tornadoes by Month Woodford County: 1950 – 2017

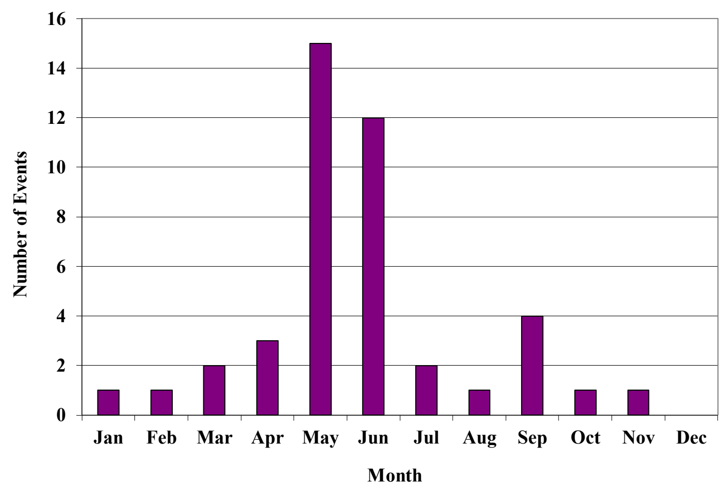
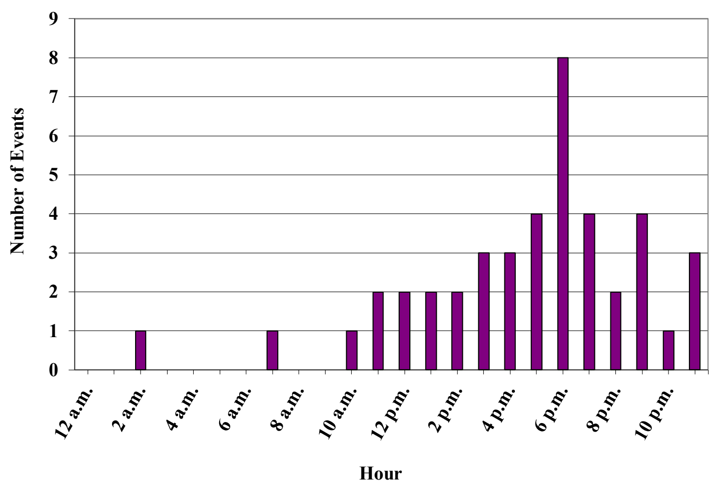


Figure 151 charts the reported tornadoes by hour. Approximately 88% of all tornadoes occurred during the p.m. hours, with 22 of the p.m. events (58%) taking place between 3 p.m. and 8 p.m. In comparison, more than half of all Illinois tornadoes occur between 3 p.m. and 7 p.m.

The tornadoes that have impacted Woodford County have varied from 0.1 miles to 20.7 miles in length and from 10 yards to 880 yards in width. The average length of a tornado in Woodford County is 2.8 miles and the average width is 107 yards (0.061 miles).

Figure 151
Graph: Tornadoes by Hour Woodford County: 1950 – 2017



Figures 152, **153** and **154** shows the pathway of each reported tornado by F/EF rating. The numbers by each tornado correspond with the tornado description in **Figure 148**. Records indicate that most of these tornadoes generally moved from southwest to northeast across the County. Unlike other natural hazards (i.e., severe winter storms, drought and excessive heat), tornadoes impact a relatively small area. Typically, the area impacted by a tornado is less than four square miles. In Woodford County, the average damage pathway or area impacted by a tornado is 0.17 square miles.

The longest and widest tornado recorded in Woodford County occurred on November 17, 2013. This EF3 tornado, measuring 46.4 miles in length and 880 yards in width, touched down in Tazewell County southeast of East Peoria and traveled northeast through Woodford and LaSalle Counties before lifting off east of Long Point in Livingston County. The tornado was on the ground in Woodford County for approximately 20.7 miles. The damage pathway of this tornado covered 23.3 square miles, with approximately 10.4 square miles occurring in Woodford County.

What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. All of the participating municipalities have had reported occurrences of tornadoes within their corporate limits. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Woodford County's hazard rating for tornadoes as "elevated."

What is the probability of future tornadoes occurring?

Woodford County has had 43 verified occurrences of tornadoes between 1950 and 2017. With 43 tornadoes over the past 68 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is approximately 63%. There were seven years over the last 68 years where more than one tornado occurred. This indicates that the probability that more than one tornado may occur during any given year within the County is approximately 10%.

Figure 152
F0 & EF0 Tornado Touchdowns in Woodford County

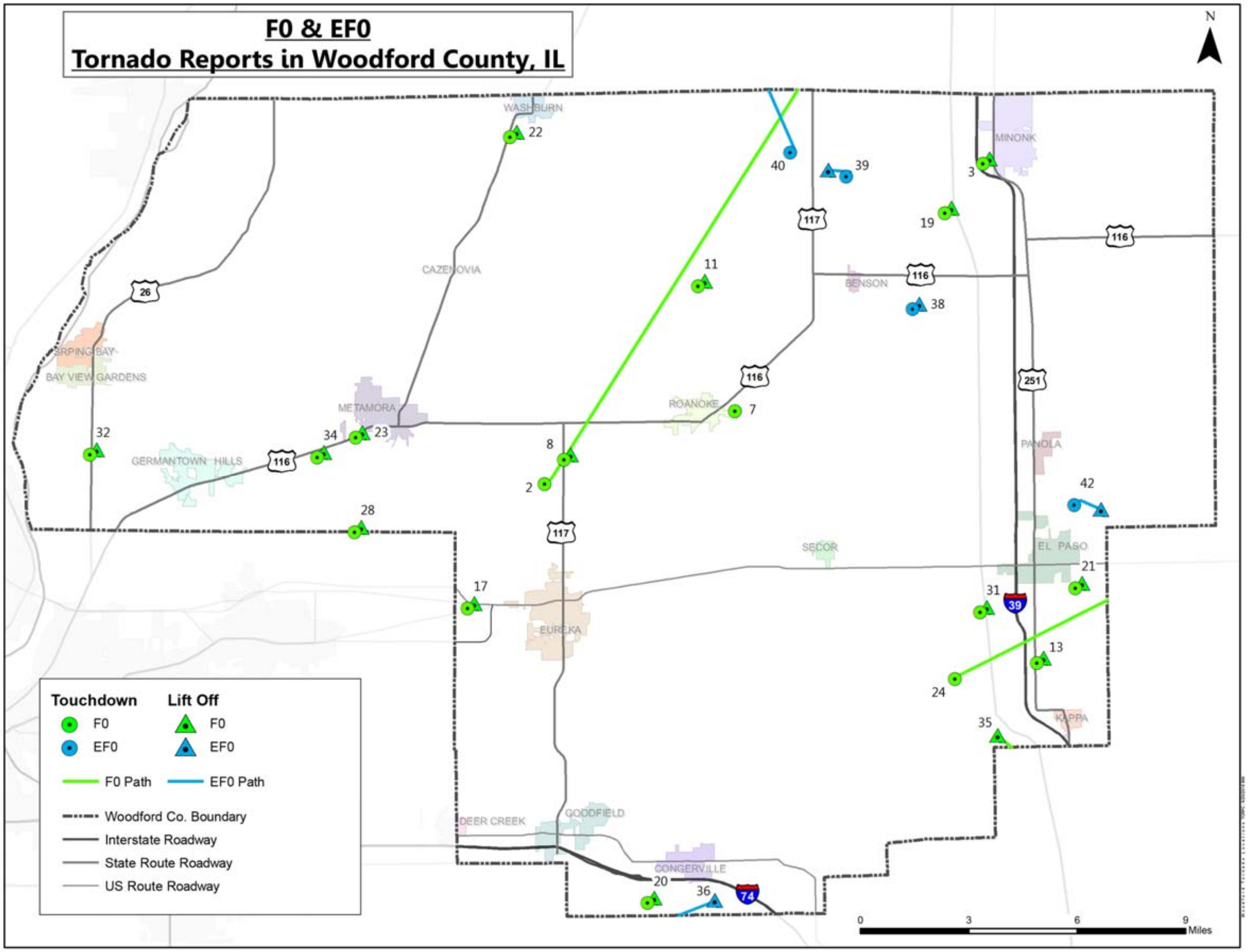


Figure 153
F1 & EF1 Tornado Touchdowns in Woodford County

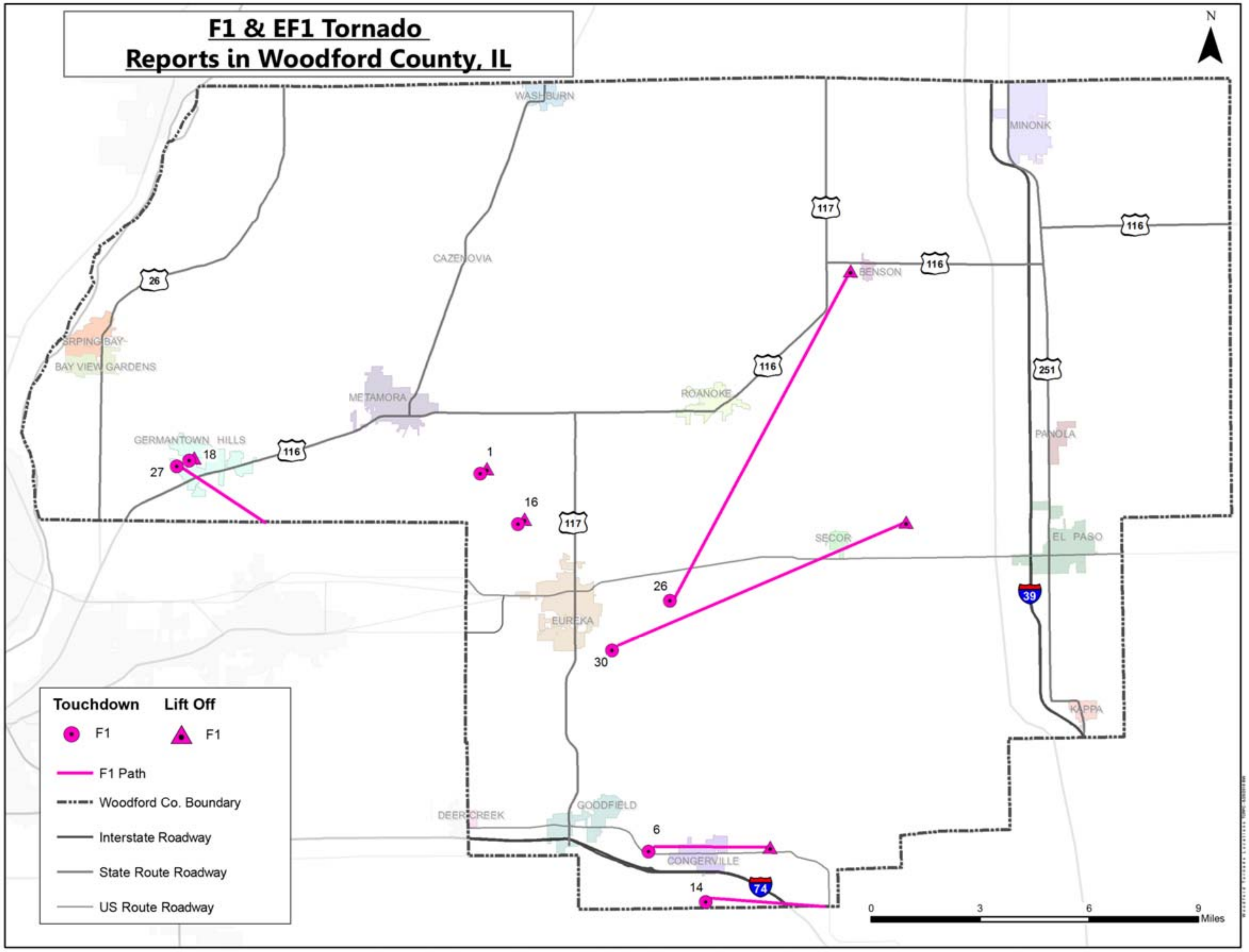
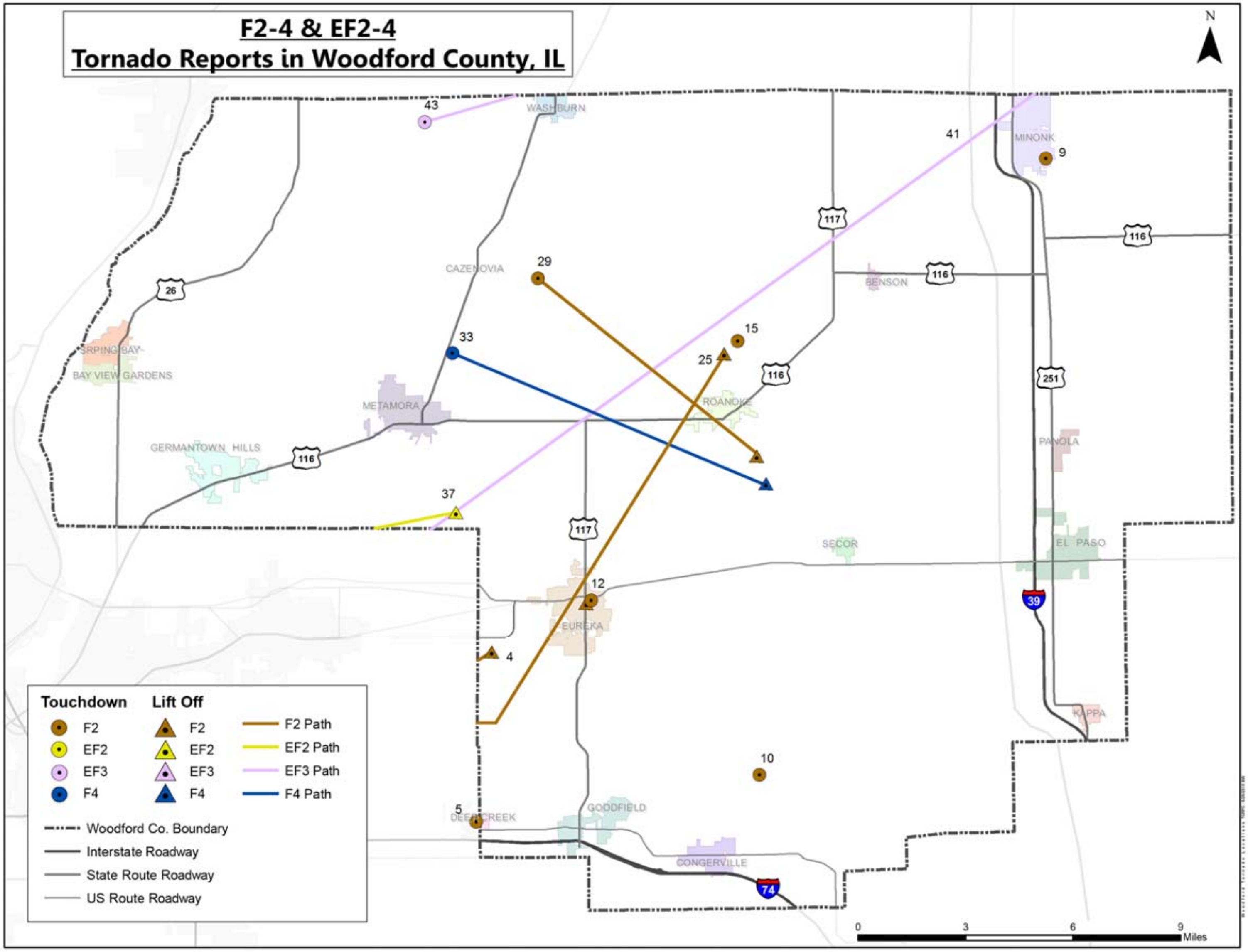


Figure 154
F2 – F4 & EF2 – EF4 Tornado Touchdowns in Woodford County



HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from tornadoes.

Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of Woodford County is vulnerable to the dangers presented by tornadoes. According to NOAA's Storm Events Database and the NWS Weather Forecast Office in Lincoln, a majority of the tornadoes have touched down or passed through the northern and central portion of the County. Since 2008, eight tornadoes have been recorded in Woodford County.

All of the participating municipalities have had a tornado touch down or pass through their municipal boundaries. **Figure 155** lists the verified tornadoes that have touched down in or near or passed through each participating municipality. In terms of unincorporated areas vulnerable to tornadoes, Cazenovia has had one tornado touch down in its vicinity.

Figure 155
Verified Tornadoes in or near Participating Municipalities – Woodford County

Participating Municipality	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Municipality	Touched Down/Passed Near Municipality
Eureka	8	1976, 2003	1961, 1967, 1987, 1990, 2003, 2004
Germantown Hills	2	1990, 2003	---
Roanoke	10	2003, 2003	1961, 1971, 1973 1975, 1986, 2003, 2004, 2013

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center, the NWS Weather Forecast Office in Lincoln and Committee member records indicates that between 1950 and 2017, 17 of the 43 tornadoes caused \$30.9 million in property damages and \$14,250 in crop damages. Included in the property damage total is \$2.5 million in damages sustained as a result of the April 13, 1981 tornado and represents losses incurred in two counties (including Woodford County). A breakdown by county was not available. A majority of the property damage total, \$25 million, was sustained as a result of the November 17, 2013 EF3 tornado.

Six of the tornadoes have property damage totals of at least \$250,000. Property damage information was either unavailable or none was recorded for the remaining 26 reported occurrences.

NOAA's Storm Events Database documented 12 injuries as a result of four tornado events. Detailed information on the injuries and fatalities sustained was only available for two of the events. The following provides a brief description of each.

- ❖ A teenage boy suffered cuts and bruises when an F0 tornado flipped the car he was driving into a field on May 18, 2000.

- During the November 17, 2013 EF3 tornado, three individuals were injured in overturned semis in the County. Another injury was reported as a result of this tornado but detailed information was unavailable.

In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts
- Total Property Damage: ***$30,904,250^***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***$14,250***
- Injuries: ***12***
- Fatalities: ***n/a***

Tornado Risk/Vulnerability to:
- Public Health & Safety – Rural Areas: ***Low to Medium***
- Public Health & Safety – Municipalities: ***High***
- Buildings/Infrastructure/Critical Facilities – Rural Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities – Municipalities/Populated Unincorp. Areas: ***High***

^ Included in the property damage total is $2.5 million in damages sustained as the result of April 13. 1981 tornado and represents losses incurred in two counties (including Woodford County). A breakdown by county was not available.

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

What is the level of risk/vulnerability to public health and safety from tornadoes?

According to the *2013 Illinois Natural Hazard Mitigation Plan*, Woodford **County ranks in the top 15 counties in Illinois in terms of tornado frequency**. This fact alone suggests that the overall risk posed by tornadoes to public health and safety is relatively high. While frequency is important, other factors must be examined when assessing vulnerability including population distribution and density, the ratings and pathways of previously recorded tornadoes, the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.) and adequate access to health care for those injured following a tornado.

Woodford County

For Woodford County the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be low to medium. This assessment is based on the fact that despite their relative frequently, a large majority of the tornadoes that have impacted the County have touched down in rural areas away from concentrated populations. This has contributed to a low number of injuries and fatalities. In addition, the County is not densely populated and there is not a large number of high-risk living accommodations present.

In terms of adequate access to health care, the County is served by Advocate Eureka Hospital in Eureka which is equipped to provide continuous care to persons injured by a tornado assuming that it is not directly impacted. In addition, there are hospitals in Peru and Ottawa (LaSalle County), Pontiac (Livingston County), Bloomington/Normal (McLean County), the Peoria area

(Tazewell and Peoria Counties) as well as regional centers in Springfield (Sangamon County) and the Quad Cities area (Rock Island County) which are equipped to provide care and have sufficient capacity for the influx of additional patients from one or more counties.

Participating Municipalities
In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to the public health and safety would be considered high. This is based on the fact that the participating jurisdictions are smaller in size and have relatively dense and evenly distributed populations within their municipal boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

Are existing buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure and critical facilities located within the County and participating municipalities are vulnerable to damage from tornadoes. Buildings, infrastructure and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding and windows. In addition, mobile homes, homes on crawlspaces and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

Assessing the Vulnerability of Existing Residential Structures
One way to assess the vulnerability of existing residential structures is to estimate the number of housing units that may be potentially damaged if a tornado were to touchdown or pass through any of the participating municipalities or the County. In order to accomplish this, a set of decisions/assumptions must be made regarding:

- the size (area impacted) by the tornado;
- the method used to estimate the area impacted by the tornado within each jurisdiction; and
- the method used to estimate the number of potentially-damaged housing units.

The following provides a brief discussion of each decision/assumption.

Assumption #1

The area impacted by an average tornado in Tazewell County = 0.17 sq. miles

Size of Tornado: To calculate the number of existing residential structures vulnerable to a tornado, the size (area impacted) by the tornado must first be determined. There are several scenarios that can be used to calculate the size, including the worst case and the average. For this analysis the area impacted by an average-sized tornado in Woodford County will be used since it has a higher probability of recurring. In Woodford County the area impacted by an average-sized tornado is 0.17 square miles. This average is based on over 60 years of data.

Assumption #2

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

Method for Estimating the Area Impacted: Next, a method for determining the area within each jurisdiction impacted by the average-sized tornado needs to be chosen. There are several methods that can be used including creating an outline of the area impacted by the average-sized tornado and overlaying it on a map of each jurisdiction (most notably the municipalities) to see if any portion of the area falls outside of the corporate limits (which would require additional calculations) or just assume that the entire area of the average-sized tornado falls within the limits of each jurisdiction. For this discussion, it is assumed that the entire area of the average-sized tornado will fall within the limits of the participating jurisdictions.

This method is quicker, easier and more likely to produce consistent results when the Plan is updated again. There is, however, a greater likelihood that the number of potentially-damaged housing units will be overestimated for those municipalities that have irregular shaped boundaries or occupy less than one square mile.

Assumption #3

The average housing unit density for each municipality will be used to determine the number of potentially-damaged housing units.

Method for Estimating Potentially-Damaged Housing Units: With the size of the tornado calculated and a method for estimating the area impacted chosen, a decision must be made on an approach for estimating the number of potentially-damaged housing units. There are several methods that can be used including overlaying the average-sized tornado on a map of each jurisdiction and counting the impacted housing units or calculating the average housing unit density to estimate the number of potentially-damaged housing units.

For this analysis, the average housing unit density will be used since it provides a realistic perspective on potential residential damages without conducting extensive counts. Using the average housing unit density also allows future updates to the Plan to be easily recalculated and provides an exact comparison to previous estimates.

The average housing unit density can be calculated by taking the number of housing units in a jurisdiction and dividing that by the land area within the jurisdiction. **Figure 156** provides a sample calculation.

Figure 157 provides a breakdown of housing unit densities by participating municipality as well as for the unincorporated areas of the County and the County as a whole.

While the average housing unit density provides an adequate assessment of the number of housing units in areas where the housing density is fairly constant, such as municipalities, it does not provide a realistic assessment for those counties with large, sparsely populated rural areas such as Woodford County.

Figure 156
Calculation of Average Housing Unit Density – Woodford County

Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction =
Average Housing Unit Density
(Rounded Up to the Nearest Whole Number)

Woodford County: 15,145 housing units ÷ 527.801 sq. miles = 28.69453 housing units/sq. miles
(29 housing units)

Figure 157
Average Housing Unit Density by Participating Municipality – Woodford County

Jurisdiction	Total Housing Units (2010)	Mobile Homes (2012-2016 Estimate)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
Eureka	2,023	70	3.023	669.20278
Germantown Hills	1,218	38	1.626	749.07749
Roanoke	867	12	0.924	---
Unincorp. County	5,755	226	509.649	11.29209
County	15,145	486	527.801	28.69453

Source: U.S. Census Bureau.

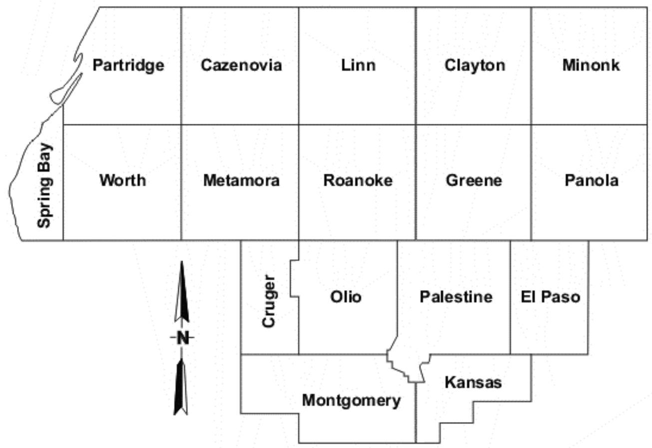
* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The 2012-2016 5-year estimate is the most recent year for which estimates were available.

In Woodford County, as well as many other central Illinois counties, there are pronounced differences in housing unit densities within the County. Approximately 75% of all housing units are located in seven of the County's 17 townships (El Paso, Metamora, Minonk, Olio, Roanoke, Spring Bay and Worth) while approximately 82% of all mobile homes are located in four of the County's 17 townships (El Paso, Olio, Spring Bay and Worth). **Figure 158** identifies the township boundaries. Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in these more densely populated townships is likely to be greater than in the rest of the County.

This substantial difference in density skews the average *county* housing unit density in Woodford County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure 159** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

For 11 of the 17 townships, the *average county* housing unit density is greater (in some cases considerably greater) than the *average township* housing unit densities. However, the *average county* housing unit density is considerably less than the housing unit densities for five of the seven most populated townships.

Figure 158
Township Boundaries Woodford County



Source: Illinois Secretary of State

Figure 159
Average Housing Unit Density by Township – Woodford County

Township	Total Housing Units (2010)	Mobile Homes (2012-2016 Estimate)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mile) (Raw)
Cazenovia	721	0	36.151	19.94412
Clayton	300	3	35.813	8.37685
Cruger	593	0	17.041	34.79843
El Paso	1,387	78	24.218	57.27145
Greene	164	0	35.777	4.58395
Kansas	172	0	18.020	9.54495
Linn	117	0	36.618	3.19515
Metamora	1,741	0	36.464	47.74572
Minonk	998	14	36.643	27.23576
Montgomery	873	48	36.189	24.12335
Olio	1,879	70	31.413	59.81600
Palestine	424	11	37.509	11.30395
Panola	144	0	36.445	3.95116
Partridge	243	0	26.214	9.26986
Roanoke	1,044	12	36.812	28.36032
Spring Bay	1,133	99	10.280	110.21401
Worth	3,212	151	36.194	88.74399
County	15,145	486	527.801	28.69453
Townships – 7 Most Populated	11,394	424	212.024	53.73920
Townships – 10 Least Populated	3,751	62	315.777	11.87864

Source: U.S. Census Bureau.

* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The 2012-2016 5-year estimate is the most recent year for which estimates were available.

Estimating the Number of Potentially-Damaged Housing Units

With the average housing unit densities calculated it is relatively simple to provide an estimate of the number of existing potentially-damaged housing units. This can be done by multiplying the average housing unit density by the area impacted by the average-sized tornado. **Figure 160** provides a sample calculation.

Figure 160
Calculation of Potentially-Damaged Existing Housing Units – Woodford County

Average Housing Unit Density x Area Impacted by the Average-Sized Woodford County Tornado = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number)

Woodford County: 28.69453 housing units/sq. mile x 0.17 sq. miles = 4.87807 housing units
(5 housing units)

For those municipalities that cover less than one square mile, the average housing unit density cannot be used to calculate the number of potentially-damaged housing units. The average housing unit density assumes that the land area within the municipality is at least one square mile and as a result distorts the number of potentially-damaged housing units for very small municipalities.

To calculate the number of potentially-damaged housing units for these municipalities, take the area impacted by the average-sized Woodford County tornado and divide that by the land area within the municipality to get the impacted land area. The impacted land area is then multiplied by the total number of housing units within the municipality to get the number of potentially-damaged housing units. **Figure 161** provides a sample calculation.

Figure 161
Sample Calculation of Potentially-Damaged Housing Units
for Municipalities Covering Less Than One Square Mile – Roanoke

Area Impacted by the Average-Sized Tazewell County Tornado ÷ Land Area within the Jurisdiction = Impacted Land Area

Roanoke: 0.17 sq. mile ÷ 0.924 sq. miles = 0.18398268 sq. miles

Impacted Land Area x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units
(Rounded Up to the Nearest Whole Number)

Roanoke: 0.18398268sq. miles x 867 housing units = 159.51299 housing units
(160 housing units)

Occasionally villages and cities will annex large tracts of undeveloped land into their corporate limits. In many cases these large tracts of land are often sparsely populated. Consequently, including these tracts of land in the calculations to determine the number of potentially-damaged housing units skews the results, especially for very small municipalities. Therefore, to provide a more realistic assessment of the number of potentially-damaged housing units, these undeveloped areas need to be subtracted from the land area figures obtained from the U.S. Census Bureau.

In Woodford County Eureka and Roanoke have large sparsely populated open areas within their municipal boundaries. These areas account for approximately one-fifth to one-third of the land area in these municipalities. If these areas are subtracted from the U.S. Census Bureau land area figures, then the remaining land areas have fairly consistent housing unit densities and contain a majority of the housing units. Therefore, the refined land area figures will be used to calculate the potentially-damages housing units. **Figure 162** provides a breakdown of the land area by municipality.

Figure 162
Refined Land Area Figures for Participating Municipalities with Large Tracts of Undeveloped Land – Woodford County

Jurisdiction	Land Area (Sq. Miles) (2010)	Estimated Commercial/Industrial & Open Land Area (Sq. Miles)	Refined Land Area (Sq. Miles)
Eureka	3.023	0.670	2.353
Roanoke	0.924	0.320	0.604

Figures 163 and **164** provide a breakdown of the number of potentially-damaged housing units by participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole. It is important to note that for the six most densely populated townships, the estimated number of potentially-damaged housing units would only be reached if a tornado's pathway included the major municipality within the township. If the tornado remained in the rural portion of the township, then the number of potentially-damaged housing units would be considerably lower.

Figure 163
Estimated Number of Housing Units by Participating Municipality Potentially Damaged by a Tornado – Woodford County

Participating Municipality	Total Housing Units (2010)	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.17 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)
Eureka*	2,023	2.353	859.75351	146.15810	147
Germantown Hills	1,218	1.626	749.07749	127.34317	128
Roanoke*	867	0.604	---	244.02318	245
Unincorp. County	5,755	509.649	11.29209	1.91966	2
County	15,145	527.801	28.69453	4.87807	5

* Eureka and Roanoke contain large, sparsely populated open areas within its municipal boundaries. These areas account for approximately ⅕ to ⅓ of the land area in the municipalities and skews the potentially-damaged housing unit calculations. In order to provide a more realistic assessment of potentially-damage housing units, these undeveloped areas were subtracted from the land area figure obtained from the U.S. Census Bureau and the refined land area figures are used to calculate potentially-damaged housing units.

Figure 164 Estimated Number of Housing Units by Township Potentially Damaged by a Tornado – Woodford County					
Township	**Total Housing Units (2010)**	**Land Area (Sq. Miles) (2010)**	**Average Housing Unit Density (Units/Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.17 Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/ Sq. Mi.) (Rounded Up)**
Cazenovia	721	36.151	19.94412	3.39050	4
Clayton	300	35.813	8.37685	1.42406	2
Cruger	593	17.041	34.79843	5.91573	6
El Paso	1,387	24.218	57.27145	9.73615	10
Greene	164	35.777	4.58395	0.77927	1
Kansas	172	18.020	9.54495	1.62264	2
Linn	117	36.618	3.19515	0.54318	1
Metamora	1,741	36.464	47.74572	8.11677	9
Minonk	998	36.643	27.23576	4.63008	5
Montgomery	873	36.189	24.12335	4.10097	5
Olio	1,879	31.413	59.81600	10.16872	11
Palestine	424	37.509	11.30395	1.92167	2
Panola	144	36.445	3.95116	0.67170	1
Partridge	243	26.214	9.26986	1.57588	2
Roanoke	1,044	36.812	28.36032	4.82125	5
Spring Bay	1,133	10.280	110.21401	18.73638	19
Worth	3,212	36.194	88.74399	15.08648	16
County	15,145	527.801	28.69453	4.87807	5
Townships – 7 Most Populated	11,394	212.024	53.73920	9.13566	10
Townships – 10 Least Populated	3,751	315.777	11.87864	2.01937	3

What is the level of risk/vulnerability to existing buildings, infrastructure and critical facilities vulnerable from tornadoes?

There are several factors that must be examined when assessing the vulnerability of existing buildings, infrastructure and critical facilities to tornadoes. These factors include tornado frequency, population distribution and density, the ratings and pathways of previously recorded tornadoes, and the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.)

Woodford County

For Woodford County the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is consider to be low to medium. This assessment is based on the frequency with which tornadoes have occurred in the County and the amount of damage that has been sustained tempered by the low population density throughout most of the County and the relative absence of high-risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have on occasion caused significant damage.

Participating Municipalities

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to existing buildings, infrastructure and critical facilities would be considered high. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within any of the municipalities it will have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes and No. While Eureka and Roanoke have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes, the County and Germantown Hills do not. However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a high rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. However, a *rough estimate* of potential dollar losses to the *potentially-damaged housing units* determined previously can be calculated if several additional decisions/assumptions are made regarding:

- the value of the potentially-damaged housing units; and
- the percent damage sustained by the potentially-damaged housing units (i.e., damage scenario).

These assumptions represent a ***probable scenario*** based on the reported historical occurrences of tornadoes in Woodford County. The purpose of providing a rough estimate is to help residents and municipal/county officials make informed decisions to better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur. The following provides a brief discussion of each decision/assumption.

Value of Potentially-Damaged Housing Units: In order to determine the potential dollar losses to the potentially-damaged housing units, the monetary value of the units must first be calculated. Typically, when damage estimates are prepared after a natural disaster such as a tornado, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value of residential structures in each municipality will be used.

Assumption #4

The average market value for residential structures in each participating jurisdiction will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is calculated by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the average assessed value and multiplying that number by three (the assessed value of a structure in Woodford County is approximately one-third of the market value). **Figure 165** provides a sample calculation. The total assessed value is based on 2016 tax assessment information provided by the Woodford County Supervisor of Assessments.

Figure 165
Sample Calculation of Average Assessed Value &
Average Market Value – Germantown Hills

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Germantown Hills: $81,900,782 ÷ 1,218 housing units = $67,242.02135

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Germantown Hills: $67,242.02135 x 3 = $201,726.06404
($201,726)

There are two villages/cities that straddle the Woodford-Tazewell County Line. For the purposes of this report, these villages/cities will be included in the County where a majority of the municipality resides. Therefore, the assessed value for the portion of Deer Creek that lies within Woodford County was included in the Tazewell County figure and the assessed value for the portion of Goodfield that lies within Tazewell County was included in the Woodford County figures.

Figures 166 and **167** provides the average assessed value and average market value for each participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole.

Assumption #5

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

Damage Scenario: Finally, a decision must be made regarding the percent damage sustained by the potentially-damaged housing units and their contents. For this scenario, the expected percent damage sustained by the structure and its contents is 100%; in other words, all of the potentially-damaged housing units would be completely destroyed. While it is highly unlikely that each and every housing unit would sustain the maximum percent damage, identifying and calculating different degrees of damage within the average area impacted gets complex and provides an additional complication when updating the Plan.

Figure 166
Average Market Value of Housing Units by Participating Municipality – Woodford County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
Eureka	$58,089,549	2,023	$28,714.55709	$86,143.67127	$86,144
Germantown Hills	$81,900,782	1,218	$67,242.02135	$201,726.06405	$201,726
Roanoke	$22,289,797	867	$25,709.10842	$77,127.32526	$77,127
Unincorp. County	$260,938,760	5,755	$45,341.22676	$136,023.68028	$136,024
County	$585,301,045	15,145	$38,646.48696	$115,939.46088	$115,939

Source: Woodford County Supervisor of Assessments.

Figure 167
Average Market Value of Housing Units by Township – Woodford County

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2016)	Total Housing Units (2010)	Average Assessed Value (Raw)	Average Market Value (Raw)	Average Market Value (Rounded)
Cazenovia	$12,075,920	721	$16,748.84882	$50,246.54646	$50,247
Clayton	$6,762,354	300	$22,541.18000	$67,623.54000	$67,624
Cruger	$30,772,391	593	$51,892.73356	$155,678.20068	$155,678
El Paso	$43,124,925	1,387	$31,092.23143	$93,276.69429	$93,277
Greene	$4,897,161	164	$29,860.73780	$89,582.21340	$89,582
Kansas	$7,799,712	172	$45,347.16279	$136,041.48837	$136,041
Linn	$1,625,165	117	$13,890.29915	$41,670.89745	$41,671
Metamora	$66,562,090	1,741	$38,232.10224	$114,696.30672	$114,696
Minonk	$21,466,940	998	$21,509.95992	$64,529.87976	$64,530
Montgomery	$44,562,588	873	$51,045.34708	$153,136.04124	$153,136
Olio	$46,441,522	1,879	$24,716.08409	$74,148.25227	$74,148
Palestine	$12,365,574	424	$29,164.08962	$87,492.26886	$87,492
Panola	$3,281,466	144	$22,787.95833	$68,363.87499	$68,364
Partridge	$9,555,923	243	$39,324.78601	$117,974.35803	$117,974
Roanoke	$26,686,040	1,044	$25,561.34100	$76,684.02300	$76,684
Spring Bay	$41,468,991	1,133	$36,601.05119	$109,803.15357	$109,803
Worth	$205,852,283	3,212	$64,088.50654	$192,265.51962	$192,266
Townships – 7 Most Populated	$451,602,791	11,394	$39,635.14051	$118,905.42153	$118,905
Townships – 10 Least Populated	$133,698,254	3,751	$35,643.36284	$106,930.08852	$106,930

Source: Woodford County Supervisor of Assessments.

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First, the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying it by the percent damage (100%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 168** provides a sample calculation.

Figure 168 ***Structure:*** **Potential Dollar Loss Sample Calculation – Germantown Hills**
Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit Germantown Hills: $201,726 x 100% = $201,726 per housing unit
Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)
Germantown Hills: $201,726 per housing unit x 128 housing units = $25,820,928

Next, the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply by the percent damage (100%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 169** provides a sample calculation.

Figure 169 ***Content:*** **Potential Dollar Loss Sample Calculation – Germantown Hills**
½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit Germantown Hills: ½ ($201,726) x 100% = $100,863 per housing unit
Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)
Germantown Hills: $100,863 per housing unit x 128 housing units = $12,910,464

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and content. **Figures 170** and **171** gives a breakdown of the total potential dollar losses by municipality and township.

This assessment illustrates why potential residential dollar losses should be considered when jurisdictions are deciding which mitigation projects to pursue. ***Potential dollar losses caused by an average tornado in Woodford County would be expected to exceed at least $18 million in either of the participating municipalities***.

Figure 170
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Municipality – Woodford County

Participating Jurisdiction	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Eureka	$86,144	147	$12,663,168	$6,331,584	$18,994,752
Germantown Hills	$201,726	128	$25,820,928	$12,910,464	$38,731,392
Roanoke	$77,127	245	$18,896,115	$9,448,058	$28,344,173
Unincorp. County	$136,024	2	$272,048	$136,024	$408,072
County	$115,939	5	$579,695	$289,848	$869,543

Figure 171
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township – Woodford County

Township	Average Market Value (2016)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Cazenovia	$50,247	4	$200,988	$100,494	$301,482
Clayton	$67,624	2	$135,248	$67,624	$202,872
Cruger	$155,678	6	$934,068	$467,034	$1,401,102
El Paso	$93,277	10	$932,770	$466,385	$1,399,155
Greene	$89,582	1	$89,582	$44,791	$134,373
Kansas	$136,041	2	$272,082	$136,041	$408,123
Linn	$41,671	1	$41,671	$20,836	$62,507
Metamora	$114,696	9	$1,032,264	$516,132	$1,548,396
Minonk	$64,530	5	$322,650	$161,325	$483,975
Montgomery	$153,136	5	$765,680	$382,840	$1,148,520
Olio	$74,148	11	$815,628	$407,814	$1,223,442
Palestine	$87,492	2	$174,984	$87,492	$262,476
Panola	$68,364	1	$68,364	$34,182	$102,546
Partridge	$117,974	2	$235,948	$117,974	$353,922
Roanoke	$76,684	5	$383,420	$191,710	$575,130
Spring Bay	$109,803	19	$2,086,257	$1,043,129	$3,129,386
Worth	$192,266	16	$3,076,256	$1,538,128	$4,614,384
Townships – 7 Most Populated	$118,905	10	$1,189,050	$594,525	$1,783,575
Townships – 10 Least Populated	$106,930	3	$320,790	$160,395	$481,185

Vulnerability of Commercial/Industrial Businesses and Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of an average-sized tornado in term of residential dollar losses. These calculations do not include damages sustained by businesses or other infrastructure and critical facilities within the participating jurisdictions.

In terms of businesses, the impacts from an average-sized tornado event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. ***While average dollar amounts cannot be supplied for these items at this time, they should be taken into account*** when discussing the impacts that an average-sized tornado could have on the participating jurisdictions.

Woodford County

Figure 148 (Sheet 1 of 10) Tornado Events 1950 – 2017											
Map No.	**Date(s)**	**Start Time**	**Location(s)**	**Magnitude (Fujita Scale)**	**Length[1] (Miles)**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damage**	**Crop Damage**	**Description**
1	5/28/1954	6:15 p.m.	Metamora^	F1	0.1	10	n/a	n/a	$25,000	n/a	
2	5/14/1961	8:15 p.m.	Eureka^ Roanoke^	F0	12.8	10	n/a	n/a	$250	n/a	
3	8/1/1961	12:44 p.m.	Minonk^	F0	0.1	10	n/a	n/a	n/a	$2,500	tornado leveled about 60 rows of corn
4	1/24/1967	6:30 p.m.	Eureka^	F2	0.5	77	n/a	n/a	n/a	n/a	*Touchdown/Liftoff – Two Counties* touched down in Tazewell County southeast of Washington and traveled northeast before lifting off west of Eureka in Woodford County – total length: 3.8 miles
5	10/10/1969	8:00 p.m.	Goodfield^	F2	0.8	200	n/a	n/a	n/a	n/a	*Touchdown/Liftoff – Two Counties* touched down in Deer Creek in Tazewell County and traveled east into Woodford County before dissipating – total length: 1.0 miles
6	5/9/1970	7:20 p.m.	Congerville^	F1	2.7	200	n/a	n/a	$250,000	n/a	damaged trees, utility lines, barns, silos and one mobile home
7	6/15/1971	6:20 p.m.	Roanoke^	F0	1.5	30	n/a	n/a	$250	$250	tornado moved west-northwest touching the ground briefly and disturbing crops in a few places
Subtotal:							**0**	**0**	**$275,500**	**$2,750**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148
(Sheet 2 of 10)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
8	6/18/1973	2:10 p.m.	Roanoke[^]	F0	0.1	10	n/a	n/a	$5,000	n/a	*Roanoke area* - tore the roof from a shed - struck the top of a grain elevator
9	6/19/1974	2:30 a.m.	Minonk	F2	1.0	20	n/a	n/a	$250	n/a	*Event Description Provided Below*
- one building suffered structural damage - damaged windows and trees in a narrow area - lifted 3 grain bins off their concrete foundations											
10	6/22/1974	7:08 a.m.	Congerville[^]	F2	0.8	100	n/a	n/a	$25,000	$2,500	- tornado touched down northeast of the Village and moved northeast - destroyed a barn - damaged farm buildings and crops
11	5/25/1975	10:25 p.m.	Roanoke[^]	F0	0.1	10	n/a	n/a	n/a	n/a	tornado touched down briefly in an open field but no damage occurred
12	3/26/1976	9:30 p.m.	Eureka	F2	0.5	33	n/a	n/a	$250,000	n/a	*Event Description Provided Below*
- damaged roofs and windows on a number of homes - uprooted and snapped several trees - the roof of a home was lifted and carried over to the next block and the walls were bowed out											
13	6/29/1976	3:00 p.m.	El Paso[^]	F0	0.5	50	n/a	n/a	n/a	$2,500	- tornado cut a swath through corn and soybean fields 2 miles south of the City - crops were torn up and flattened
Subtotal:							**0**	**0**	**$280,250**	**$5,000**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

[^] Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148 (Sheet 3 of 10) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
14	4/13/1981	11:10 p.m.	Congerville[ʌ]	F1	8.3	150	n/a	n/a	$2,500,000[‡]	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Woodford County south-southeast of Congerville and traveled east-southeast before lifting off at Colfax in McLean County – total length: 34.5 miles - damaged barns, outbuildings and homes - pulled electrical poles out of the ground											
15	9/24/1986	5:15 p.m.	Roanoke[ʌ]	F2	2.5	75	n/a	n/a	$250,000	$2,500	- damaged 3 farm houses and several rural structures - severed seven, 65-foot power poles along the tornado's path
16	5/20/1987	5:43 p.m.	Eureka[ʌ]	F1	0.5	50	n/a	n/a	$2,500	n/a	- destroyed a barn, scattering lumber across fields - flying debris damaged a nearby farm house
17	6/13/1990	7:57 p.m.	Eureka[ʌ]	F0	0.1	50	n/a	n/a	n/a	n/a	tornado touched down briefly
18	6/22/1990	6:00 p.m.	Germantown Hills	F1	0.5	50	n/a	n/a	$25,000	n/a	damaged the water district building and a garage roof
19	4/29/1991	6:45 p.m.	Minonk[ʌ]	F0	0.2	100	n/a	n/a	n/a	n/a	
20	5/13/1995	6:10 p.m.	Congerville[ʌ]	F0	0.1	10	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- damaged 1 home and 5 outbuildings - the roof was blown off a mobile home - several trees and power lines were blown over											
Subtotal:							**0**	**0**	**$2,777,500[‡]**	**$2,500**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

[ʌ] Tornado touchdown verified in the vicinity of this location(s).

[‡] The $2.5 million in property damages sustained as a result of the April 13, 1981 tornado represent losses sustained in two counties (including Woodford County). A detailed breakdown by county was not available.

Woodford County

Figure 148 (Sheet 4 of 10) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
21	6/26/1995	5:27 p.m.	El Paso^	F0	0.1	10	n/a	n/a	n/a	n/a	- twisted a trampoline around a tree - threw a swing set 40 to 50 feet - blew down a tree
22	6/4/1999	3:23 p.m.	Washburn^	F0	0.3	20	n/a	n/a	n/a	n/a	- a home sustained extensive roof damage when several nearby trees fell onto it - blew down several trees at the Snag Creek Golf Course
23	5/18/2000	4:18 p.m.	Metamora^	F0	0.2	20	1	0	$5,000	n/a	*Event Description Provided Below*
- tornado touched down west of the Village just south of IL Rte. 116 - flipped the car of a teenage boy driving through the area several times into a field - the driver only suffered cuts and bruises but his 1997 Cavalier was totaled											
24	5/8/2002	11:32 p.m.	El Paso^	F0	4.5	50	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties touched down in Woodford County near the intersection of County Road 700N and 2500E southwest of El Paso and traveled northeast before lifting off in the extreme northwestern corner of McLean County southwest of Gridley – total length: 5.5 miles - knocked power poles down											
Subtotal:							**1**	**0**	**$5,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148
(Sheet 5 of 10)
Tornado Events
1950 – 2017

<table>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>25</td><td>5/10/2003</td><td>9:21 p.m.</td><td>Eureka
Roanoke</td><td>F2</td><td>10.5</td><td>300</td><td>4</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7"><u>Touchdown/Liftoff – Two Counties</u>
touched down in Tazewell County southeast of Washington and traveled east into Woodford County where it turned to the northeast and traveled through the northwestern portions of Eureka and Roanoke before lifting off north of Roanoke – total length: 12.5 miles
<u>Eureka area</u>
- destroyed several homes, outbuildings and businesses along US 24</td><td colspan="5"><u>Eureka</u>
- clipped the northwestern side of the City damaging several homes
<u>Unincorporated Woodford County</u>
- additional homes sustained damage as well as shed and outbuildings
- trees, power lines and power poles sustained damage
<u>Roanoke area</u>
- several homes suffered damage</td></tr>
<tr><td>26</td><td>5/10/2003</td><td>9:25 p.m.</td><td>Eureka^
Secor^
Roanoke^
Benson^</td><td>F1</td><td>8.0</td><td>200</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>- blew down numerous trees and power lines
- destroyed several barns and outbuildings
- a couple of homes sustained minor damage</td></tr>
<tr><td>27</td><td>5/28/2003</td><td>1:40 p.m.</td><td>Germantown Hills</td><td>F1</td><td>2.0</td><td>100</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7">this event was part of a federally-declared disaster (Declaration #1469)
<u>Touchdown/Liftoff – Two Counties</u>
touched down in Woodford County in Germantown Hills and traveled southeast into Woodford County lifting off north of Washington – total length: 3.5 miles</td><td colspan="5">- damaged a house, pushing the front door open and blowing the back wall of the house out about 15 inches
- blew down numerous trees and power lines</td></tr>
<tr><td colspan="7">Subtotal:</td><td>4</td><td>0</td><td>$0</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.
^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148 (Sheet 6 of 10) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
28	5/28/2003	1:58 p.m.	Metamora^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field 3 miles southwest of Metamora near the Woodford/Tazewell County Line
29	5/30/2003	6:53 p.m.	Cazenovia^ Roanoke	F2	7.3	150	n/a	n/a	n/a	n/a	*Event Description Provided Below*
Unincorporated Woodford County (southeast of Cazenovia) - several homes sustained major damage - several sheds were destroyed - numerous trees, tree limbs, power lines and power poles were blown down *Roanoke* - the tornado weakened quite a bit by the time it approached the Village and only minor tree damage was reported											
30	5/30/2004	4:05 p.m.	Eureka^ Secor	F1	9.0	75	n/a	n/a	n/a	n/a	*Event Description Provided Below*
southwest of Secor 3 miles - destroyed 2 farm buildings, a grain bin and a corn crib - blew down numerous trees - destroyed 2 old farm buildings - moved hay bales and threw a medium-sized gas tank ½ mile into a field											
31	6/10/2004	4:55 p.m.	El Paso^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field 2 miles southwest of the City and no damage or injuries were reported
32	7/5/2004	9:40 p.m.	Bay View Gardens^	F0	0.1	10	n/a	n/a	n/a	n/a	tornado briefly touched down in a field 2 miles south of the Village and no damages or injuries were reported
Subtotal:							**0**	**0**	**$0**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

<table>
<tr><th colspan="12">Figure 148
(Sheet 7 of 10)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>33</td><td>7/13/2004</td><td>2:34 p.m.</td><td>Metamora^
Roanoke^</td><td>F4</td><td>9.6</td><td>440</td><td>3</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7"><u>CR 1400E & IL Rte. 116/117</u>
- struck the Parson’s Company severely damaging the manufacturing plant
- approx. 140 people were in the plant at the time, but all personnel made it to storm shelters in time
- steel beams and metal siding from the plant were found approx. ¾ mile east in a farm field
<u>south of IL Rte. 116/117 & east of CR 1400E</u>
- destroyed two 2-story houses on 2 separate farmsteads, with only debris remaining in the basements and nearby property
- significantly damaged two 2-story houses on another 2 farmsteads and demolished outbuildings</td><td colspan="5"><u>CR 1300 N & 1600E intersection</u>
- significantly damaged a barn
<u>near CR 1300N and 1700E intersection</u>
- damaged a house</td></tr>
<tr><td>34</td><td>3/30/2005</td><td>3:06 p.m.</td><td>Metamora^</td><td>F0</td><td>0.1</td><td>10</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado briefly touched down in a field and no damages or injuries were reported</td></tr>
<tr><td>35</td><td>4/2/2006</td><td>6:13 p.m.</td><td>Kappa^</td><td>F0</td><td>0.3</td><td>50</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td><u>Touchdown/Liftoff – Two Counties</u>
touched down in McLean County north-northwest of Hudson and traveled into Woodford County lifting off southwest of Kappa – total length: 0.5 miles</td></tr>
<tr><td colspan="7">Subtotal:</td><td>3</td><td>0</td><td>$0</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148
(Sheet 8 of 10)
Tornado Events
1950 – 2017

<table>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>36</td><td>6/4/2008</td><td>7:39 p.m.</td><td>Congerville^</td><td>EF0</td><td>0.71</td><td>150</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7"><u>Touchdown/Liftoff – Two Counties</u>
touched down in Tazewell County approx. 3 miles north of Washington and traveled east-northeast into Woodford County lifting off 2 miles south-southeast of Metamora – total length: 3.08 miles</td><td colspan="5">- several trees were snapped
- 5 power poles were damaged
- the metal roof of a barn was lifted off
- windows were broken on a house</td></tr>
<tr><td>37</td><td>6/5/2010</td><td>7:53 p.m.</td><td>Metamora^</td><td>EF2</td><td>2.28</td><td>250</td><td>n/a</td><td>n/a</td><td>$70,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td>38</td><td>9/1/2012</td><td>10:48 a.m.</td><td>Benson^</td><td>EF0</td><td>0.06</td><td>20</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado briefly touched down in a field 2 miles east-southeast of the Village and no damage was reported</td></tr>
<tr><td>39</td><td>9/1/2012</td><td>11:03 p.m.</td><td>Benson^</td><td>EF0</td><td>0.69</td><td>20</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado touched down in a field 3 miles north of the Village and traveled west across CR 2200E before dissipating and no damage was reported</td></tr>
<tr><td>40</td><td>9/1/2012</td><td>11:05 a.m.</td><td>Benson^</td><td>EF0</td><td>1.75</td><td>75</td><td>n/a</td><td>n/a</td><td>$1,000</td><td>$4,000</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="7"><u>Touchdown/Liftoff – Two Counties</u>
touched down in Tazewell County approx. 4 miles north-northwest of Benson and traveled northwest into Marshall County lifting off ¾ mile southeast of Pattonsburg – total length: 2.25 miles</td><td colspan="5">- tore the tin roof off a shed
- caused minor damage to a corn field</td></tr>
<tr><td colspan="7">Subtotal:</td><td>0</td><td>0</td><td>$71,000</td><td>$4,000</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

<table>
<tr><th colspan="12">Figure 148
(Sheet 9 of 10)
Tornado Events
1950 – 2017</th></tr>
<tr><th>Map No.</th><th>Date(s)</th><th>Start Time</th><th>Location(s)</th><th>Magnitude (Fujita Scale)</th><th>Length[1] (Miles)</th><th>Width (Yards)</th><th>Injuries</th><th>Fatalities</th><th>Property Damage</th><th>Crop Damage</th><th>Description</th></tr>
<tr><td>41</td><td>11/17/2013</td><td>11:12 a.m.</td><td>Metamora^
Roanoke^
Benson^
Minonk^</td><td>EF3</td><td>20.7</td><td>880</td><td>4</td><td>0</td><td>$25,000,000</td><td>n/a</td><td>Event Description Provided Below</td></tr>
<tr><td colspan="12">this event was part of a federally-declared disaster (Declaration #4157)
<u>Touchdown/Liftoff – Multiple Counties</u>
touched down in Tazewell County southeast of East Peoria and traveled northeast through Woodford and LaSalle Counties and into Livingston County before lifting off east of Long Point – total length: 46.36 miles
- during much of the time the tornado was on the ground in Woodford County, it traveled across open field, impacting dozens of farmsteads
- destroyed 7 homes and nearly 70 farm buildings
- 17 homes sustained major damage
- 23 others suffered minor damage
- approx. 100 vehicles were damaged, including several semi-trucks at a truck stop north of Minonk
- 3 individuals were injured in overturned semi-trucks
- a cell tower was toppled and hundreds of power poles and trees were snapped</td></tr>
<tr><td>42</td><td>5/28/2014</td><td>12:40 p.m.</td><td>El Paso^</td><td>EF0</td><td>0.61</td><td>100</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>tornado touched down in a field 1.9 miles north-northeast of El Paso traveling southeast and no damage was reported</td></tr>
<tr><td colspan="7">Subtotal:</td><td>4</td><td>0</td><td>$25,000,000</td><td>$0</td><td></td></tr>
</table>

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

Woodford County

Figure 148 (Sheet 10 of 10) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
43	2/28/2017	5:26 p.m.	Washburn^	EF3	3.36	400	n/a	n/a	$2,250,000	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Multiple Counties touched down in Tazewell County 3 ½ miles west of Washburn and traveled northeast through Marshall County and into LaSalle County before lifting off at Rutland – total length: 17.76 miles - MAC member identified $750,000 in damages to 4 homes and outbuildings as a result of this event							*approx. 2 ½ miles west of Washburn* - destroyed a house - destroyed several outbuildings - broke windows and did roof damage to a house *approx. 1 ½ miles west of Washburn* - tore the roof off a house *Washburn* - damaged 8 houses - roofs, garages, vehicles and trees sustained significant damage				
Subtotal:							**0**	**0**	**$2,250,000**	**$0**	
GRAND TOTAL:							**12**	**0**	**$30,904,250‡**	**$14,250**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Woodford County.

^ Tornado touchdown verified in the vicinity of this location(s).

‡ There was one event that occurred on April 13, 1981 where $2.5 million in property damages was sustained and represent losses sustained in two counties (including Woodford County). A detailed breakdown by county was not available.

Sources: Chris Miller, Warning Coordination Meteorologist, National Weather Service, Weather Forecast Office Lincoln, Illinois.
NOAA, National Weather Service, Storm Prediction Center, Weather Coordination Meteorologist's Page, Severe Weather Database Files (1950-2017).
NOAA, National Weather Service, Weather Forecast Office Lincoln, Illinois, Tornado Climatology for Central and Southeast Illinois, Woodford County.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Tri-County MAC Member responses to the Natural Hazard Events Questionnaire.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

3.4.3 PARTICIPATING PEORIA COUNTY MUNICIPALITIES

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

> **Tornado Fast Facts – Occurrences**
>
> Number of Tornadoes Reported (1950 – 2017): ***4***
>
> Highest F-Scale Rating Recorded: ***F3 (September 14, 1965)***
>
> Most Likely Month for Tornadoes to Occur: ***June***
>
> Longest Tornado Path in the County: ***5.2 miles (F 3 September 14, 1965)***
>
> Widest Tornado Path in the County: ***200 yards (F 3 September 14, 1965)***

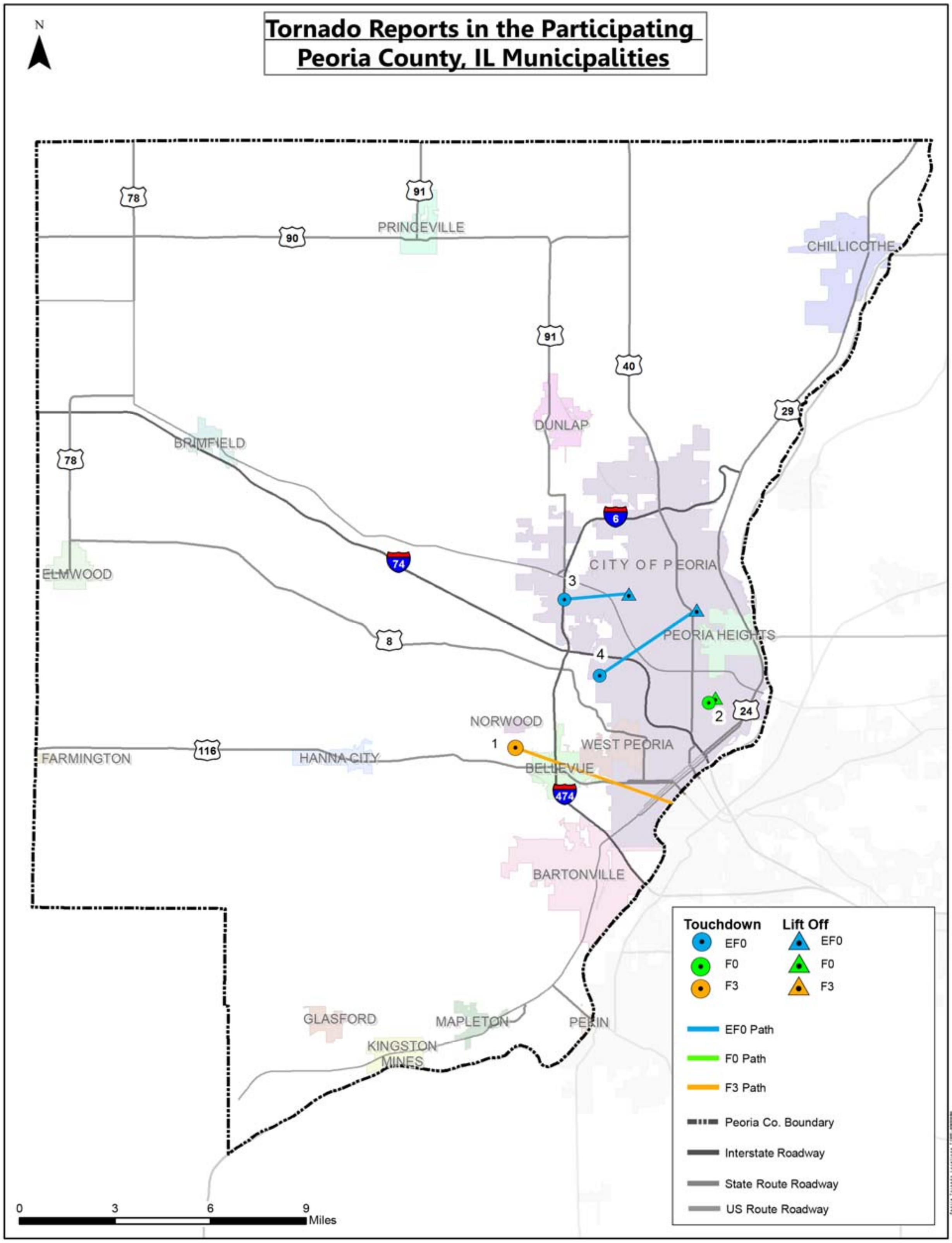
Figure 172, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in the participating Peoria County municipalities. NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center, the NWS Weather Forecast Office in Lincoln and news articles have documented four occurrences of tornadoes in the participating Peoria County municipalities between 1950 and 2017. In comparison, Peoria County as a whole has experienced 26 tornadoes between 1950 and 2017. According to the most recent Illinois Natural Hazard Mitigation Plan, there have been 2,199 tornadoes statewide between 1950 and 2012.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

Of the four reported occurrences there was: one – F3, one – F0, and two EF0s. Two of the four reported tornadoes (50%) occurred in June while all four of the events occurred during the p.m. hours. The tornadoes that have impacted participating Peoria County municipalities have varied from 0.1 miles to 5.2 miles in length and from 10 yards to 200 yards in width. **Figure 173** shows the pathway of each reported tornado by F/EF rating. The numbers by each tornado correspond with the tornado description in **Figure 172**.

The longest and widest tornado recorded in participating Peoria County municipalities occurred on September 14, 1965. This F3 tornado, measuring 5.7 miles in length and 200 yards in width, touched down in Peoria County just south of Norwood near the grade school and traveled southeast crossing the Illinois River into Tazewell County before lifting off in East Peoria. The tornado was on the ground in Peoria County for approximately 5.2 miles.

Figure 172
Tornado Touchdowns in Participating Peoria County Municipalities



What locations are affected by tornadoes?
Tornadoes have the potential to affect the entire County. Two of the five participating municipalities, Peoria and Peoria Heights, have had reported occurrences of tornadoes within their corporate limits. The *2013 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Peoria County's hazard rating for tornadoes as "high."

What is the probability of future tornadoes occurring?
Peoria
The City of Peoria has had four verified tornadoes touch down or pass through its municipal boundaries between 1950 and 2017. With four tornado events impacting the City over the past 68 years, the probability or likelihood that a tornado will touch down or pass through the City in any given year is approximately 6%.

Peoria Heights
Peoria Heights has had one verified occurrence of a tornado between 1950 and 2017. With one tornado event impacting the Village over the past 68 years, the probability or likelihood that a tornado will touch down or pass through the Village in any given year is approximately 1%.

Bartonville/Chillicothe/Hanna City
Bartonville, Chillicothe and Hanna City have not had a tornado touch down or pass through their municipal boundaries between 1950 and 2017. With no recorded events during the past 68 years, it makes it difficult to specifically establish the probability that a tornado will impact the municipalities in any given year; however, it is estimated to be low.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions and identifies the impacts on public health and property (if known).

Are the participating jurisdictions vulnerable to tornadoes?
Yes. All of the participating Peoria County municipalities are vulnerable to the dangers presented by tornadoes. Two of the five participating municipalities, Peoria and Peoria Heights, have had a tornado touch down or pass through their municipal boundaries. Since 2008, two tornadoes have been recorded in the participating municipalities.

What impacts resulted from the recorded tornadoes?
Data obtained from NOAA's Storm Events Database, NOAAs Storm Data Publications, NOAA's Storm Prediction Center and the NWS Weather Forecast Office in Lincoln indicates that between 1950 and 2017, three of the four tornadoes

Tornado Fast Facts – Impacts/Risk

Tornado Impacts
- Total Property Damage: ***$2,860,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***30***
- Fatalities: ***n/a***

Tornado Risk/Vulnerability to:
- Public Health & Safety: ***High***
- Buildings/Infrastructure/Critical Facilities: ***High***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

caused $2.86 million in property damages. Property damage information was either unavailable or none was recorded for the remaining reported occurrence.

NOAA's Storm Events Database documented 30 injuries as a result of one tornado event. Detailed information on the injuries sustained was not available for the event. In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

What is the level of risk/vulnerability to public health and safety from tornadoes?

In general, if a tornado were to touchdown or pass through any of the participating municipalities the risk to the public health and safety would be considered high. This is based on the fact that the participating jurisdictions have relatively dense and evenly distributed populations within their municipal boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

Are existing buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure and critical facilities located within the participating municipalities are vulnerable to damage from tornadoes. Buildings, infrastructure and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding and windows. In addition, mobile homes, homes on crawlspaces and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

In general, if a tornado were to touchdown or pass through any of the participating municipalities the risk to existing buildings, infrastructure and critical facilities would be considered high. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces generally do not exist. As a result, if a tornado were to touch down within any of the municipalities it will have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure and critical facilities vulnerable to tornadoes?

Yes and No. All of the participating municipalities have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes. However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a high rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. With only four tornadoes impacting just two of the five participating municipalities over the last 68 years, there is insufficient information available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures from tornadoes. However, since all existing structures within the participating municipalities are vulnerable to damage, it is highly likely that there will be future dollar losses if a tornado touches down or passes through any of the participating municipalities.

Participating Peoria County Municipalities Only

Figure 173 (Sheet 1 of 2) Tornado Events 1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
1	9/14/1965	2:40 p.m.	Norwood^ Bellevue^ Peoria	F3	5.2	200	30	0	$2,500,000	n/a	*Event Description Provided Below*

Touchdown/Liftoff – Two Counties

touched down in Peoria County just south of Norwood near the grade school and traveled southeast crossing the Illinois river into Tazewell County before lifting off in East Peoria – total length: 5.7 miles

3 individuals were hospitalized with others less seriously injured

Norwood/Bellevue area

- destroyed most of the Norwood Grade School
- ripped apart the hospital wing at Bel-Wood Nursing Home
- tore through isolated farmland

Peoria

- lifted a ventilator from the roof at Manuel High School and damaged the gym roof
- tore up the business/manufacturing district along SW Adams & SW Washington Streets including the Peoria Union Stock Yards, the Coca-Cola Bottling Co. plant and Hiram Walker & Sons Inc. whiskey distillery
- 3 homes sustained major damage
- numerous trees, utility lines and roofs were damaged

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
2	6/8/1974	5:15 p.m.	Peoria	F0	0.1	10	n/a	n/a	n/a	n/a	
3	6/5/2010	7:32 p.m.	Peoria	EF0	2.02	100	n/a	n/a	$100,000	n/a	- numerous trees were snapped - several homes experienced shingle damage
Subtotal:							**30**	**0**	**$2,600,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Peoria County.

^ Tornado touchdown verified in the vicinity of this location(s).

Participating Peoria County Municipalities Only

Figure 173
(Sheet 2 of 2)
Tornado Events
1950 – 2017

Map No.	Date(s)	Start Time	Location(s)	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Crop Damage	Description
4	3/15/2016	7:14 p.m.	Peoria Peoria Heights	EF0	3.68	200	n/a	n/a	$260,000	n/a	*Event Description Provided Below*
Peoria - damaged the roof, gutters, soffits and ceiling tiles of the St. Frances Wood Supportive Living Center near W. Richwoods Blvd. and N. Molleck Dr. - roofs and trees damaged near N. University St. and W. Christine Ave. - damaged the Farmer's Market at the Metro Centre shopping facility - damaged trees at Donovan Golf Course - City of Peoria Office of Emergency Management Coordinator indicated that one house/garage sustained substantial damage in addition to downed trees and minor damage to several homes							*Peoria Heights* - broke a pole, snapped a tree that fell on a garage and damaged shingle and siding on N. Wickwood and Prospect roads				
Subtotal:							**0**	**0**	**$260,000**	**$0**	
GRAMD TOTAL:							**30**	**0**	**2,860,000**	**$0**	

[1] The length provided is only for the portion(s) of the tornado that occurred in Peoria County.

^ Tornado touchdown verified in the vicinity of this location(s).

Sources: Chris Miller, Warning Coordination Meteorologist, National Weather Service, Weather Forecast Office Lincoln, Illinois.
NOAA, National Weather Service, Storm Prediction Center, Weather Coordination Meteorologist's Page, Severe Weather Database Files (1950-2017).
NOAA, National Weather Service, Weather Forecast Office Lincoln, Illinois, Tornado Climatology for Central and Southeast Illinois, Peoria County.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
Peoria Journal Star.
Tri-County MAC Member responses to the Natural Hazard Events Questionnaire.

During the process of collecting and verifying the tornado data used in this updated Plan, discrepancies were identified in the existing tornado information databases. Discussions were immediately conducted with Chris Miller, Warning Coordination Meteorologist with the NWS Weather Forecast Office in Lincoln to verify tornado coordinates so that these discrepancies could be corrected or clarified. Consequently, this NHMP has the most accurate information on tornadoes in the Tri-County area. If the reader compares the tornado information in this Plan with other databases, they may encounter the same discrepancies until these databases are formally corrected.

3.5 EXCESSIVE HEAT

HAZARD IDENTIFICATION

What is the definition of excessive heat?

Excessive heat is generally characterized by temperatures that hover 10 degrees or more above the average high temperature of a region for a prolonged period of time (several days to several weeks) and is often accompanied by high humidity. In comparison, a heat wave is generally defined as a period of abnormally and uncomfortably hot and unusually humid weather that typically lasts two or more days.

Excessive heat events are usually a result of both high temperatures and high relative humidity. (Relative humidity refers to the amount of moisture in the air.) The higher the relative humidity or the more moisture in the air, the less likely that evaporation will take place. This becomes significant when high relative humidity is coupled with soaring temperatures.

On hot days the human body relies on the evaporation of perspiration or sweat to cool and regulate the body's internal temperature. Sweating does nothing to cool the body unless the water is removed by evaporation. When the relative humidity is high, then the evaporation process is hindered, robbing the body of its ability to cool itself.

Excessive heat is one of the leading weather-related killers in the United States. On average, hundreds of fatalities and even more heat-related illnesses occur each year.

What is the Heat Index?

In an effort to raise the public's awareness of the hazards of excessive heat, the National Weather Service (NWS) devised the "Heat Index". The Heat Index, sometimes referred to as the "apparent temperature", is a measure of how hot it feels when relative humidity is added to the actual air temperature. **Figure 174** shows the Heat Index as it corresponds to various air temperatures and relative humidity.

As an example, if the air temperature is 96°F and the relative humidity is 65%, then the Heat Index would be 121°F. It should be noted that the Heat Index values were devised for shady, light wind conditions. Exposure to full sunshine can increase Heat Index values by up to 15°F. Also, strong winds, particularly with very hot, very dry air, can be extremely hazardous. When the Heat Index reaches 105°F or greater, there is an increased likelihood that continued exposure and/or physical activity will lead to individuals developing severe heat disorders.

What are heat disorders?

Heat disorders are a group of illnesses caused by prolonged exposure to hot temperatures and are characterized by the body's inability to shed excess heat. These disorders develop when the heat gain exceeds the level the body can remove or if the body cannot compensate for fluids and salt lost through perspiration. In either case the body loses its ability to regulate its internal

Figure 174
Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

Source: NOAA, National Weather Service.

temperature. All heat disorders share one common feature: the individual has been overexposed to heat, or over exercised for their age and physical condition on a hot day. The following describes the symptoms associated with the different heat disorders.

- **Sunburn.** Sunburn is characterized by redness and pain of skin exposed too long to the sun without proper protection. In severe cases it can cause swelling, blisters, fever and headaches. It can significantly retard the skin's ability to shed excess heat.
- **Heat Cramps.** Heat cramps are characterized by heavy sweating and painful spasms, usually in the muscles of the legs and possibly the abdomen. The loss of fluid through perspiration leaves the body dehydrated resulting in muscle cramps. This is usually the first sign that the body is experiencing trouble dealing with heat.
- **Heat Exhaustion.** Heat exhaustion is characterized by heavy sweating, weakness, nausea, exhaustion, dizziness and faintness. Breathing may become rapid and shallow and the pulse thready (weak). The skin may appear cool, moist and pale. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a mild form of shock. If not treated, the victim's condition will worsen.
- **Heat Stroke (Sunstroke).** Heat stroke is a life-threatening condition characterized by a high body temperature (106°F or higher). The skin appears to be dry and flushed with very little perspiration present. The individual may become mentally confused and aggressive. The pulse is rapid and strong. There is a possibility that the individual will faint or slip into unconsciousness. If the body is not cooled quickly, then brain damage and death may result.

Studies indicate that, all things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60. Elderly persons, small children, chronic invalids, those on certain medications and persons with weight or alcohol problems are particularly susceptible to heat reactions.

Figure 175 below indicates the heat index at which individuals, particularly those in higher risk groups, might experience heat-related disorders. Generally, when the heat index is expected to exceed 105°F, the NWS will initiate excessive heat alert procedures.

Figure 175
Relationship between Heat Index and Heat Disorders

Heat Index (°F)	Heat Disorders
80°F – 90°F	Fatigue is possible with prolonged exposure and/or physical activity
90°F – 105°F	Heat cramps, heat exhaustion and heat stroke possible with prolonged exposure and/or physical activity
105°F – 130°F	Heat cramps, heat exhaustion and heat stroke likely; heat stroke possible with prolonged exposure and/or physical activity
130°F or Higher	Heat stroke highly likely with continued exposure

Source: NOAA, Heat Wave: A Major Summer Killer.

What is an excessive heat alert?

An excessive heat alert is an advisory or warning issued by the NWS when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines the type of alert issued. There are four types of alerts that can be issued for an excessive heat event. The following provides a brief description of each type of alert based on the ***excessive heat advisory/warning criteria*** established by NWS Weather Forecast Office in Lincoln, Illinois. The Lincoln Office is responsible for issuing alerts for Peoria, Tazewell and Woodford Counties.

- **Outlook.** An excessive heat outlook is issued when the potential exists for an excessive heat event to develop over the next three (3) to seven (7) days.
- **Watch.** An excessive heat watch is issued when conditions are favorable for an excessive heat event to occur within the next 24 to 72 hours.
- **Advisory.** An excessive heat advisory is issued when the maximum heat index temperature is expected to be 100°F or higher for at least two (2) days and the night time air temperatures will not drop below 75°F.
- **Warning.** An excessive heat warning is issued when the maximum heat index temperature is expected to be 105°F or higher for at least two (2) days and the night time air temperatures will not drop below 75°F.

3.5.1 Tazewell County

Hazard Profile

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Extreme Heat Fast Facts – Occurrences

Number of Extreme Heat Events Reported (1997 – 2017): ***9***

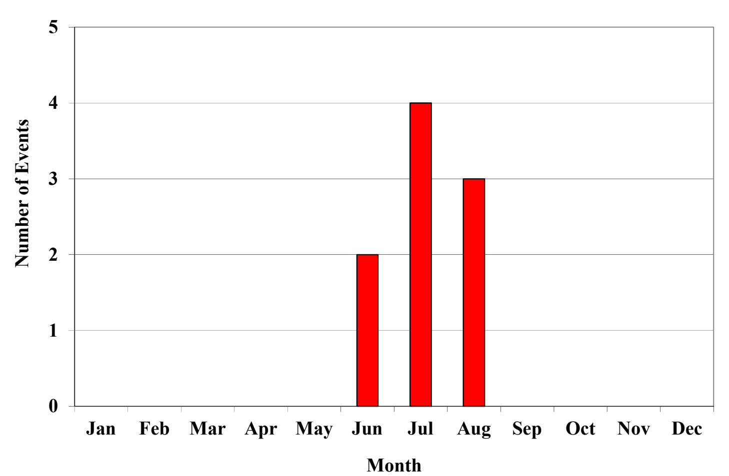
Most Likely Month for Extreme Heat Events to Occur: ***July***

Figure 176, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Tazewell County. NOAA's Storm Events Database has documented nine occurrences of excessive heat in Tazewell County between 1997 and 2017.

These represent the ***reported occurrences*** of excessive heat. The NWS acknowledges that excessive heat events are not well recorded. Only those events with impacts, such as injuries or fatalities, are reported. As a result, excessive heat events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Figure 177 charts the reported occurrences of excessive heat events by month. Of the nine events, four (44%) either began or took place in July making this the peak month for excessive heat events in Tazewell County. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Approximately 67% of all excessive heat events began during the a.m. hours.

Figure 177
Graph: Excessive Heat Events by Month
Tazewell County: 1997 – 2017



According to the Midwestern Regional Climate Center station information, temperature records either were not kept or are not available from any of the weather recording stations or networks in Tazewell County, with the exception of the COOP Observation Station east of South Pekin. Temperature data was recorded at this station from December, 2003 through July, 2005. During this period, the hottest temperature recorded at the South Pekin location was 102°F.

What locations are affected by excessive heat?

Excessive heat events affect the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Tazewell County's hazard rating for excessive heat as "elevated."

Do any of the participating municipalities have designated cooling centers?

Yes. Two of the five participating municipalities have designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events. **Figure 178a** identifies the location of each cooling center by jurisdiction. At this time Morton, Tremont and Washington do not have any cooling centers designated within their municipalities.

Figure 178a
Designated Cooling Centers by Participating Municipality – Tazewell County

Name/Address	Name/Address
East Peoria	*Pekin*
Festival of Lights Building, 2200 E. Washington St.	City Hall, 111 N. Capitol St.

In addition to those designated cooling centers identified by the participating municipalities, the Illinois Department of Human Services offices located in Pekin also serve as cooling centers.

What is the probability of future excessive heat events occurring?

Tazewell County has experienced nine verified occurrences of excessive heat between 1997 and 2017. With nine occurrences over the past 21 years, the probability or likelihood that Tazewell County may experience an excessive heat event in any given year is 43%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of Tazewell County, including the participating municipalities, is vulnerable to the dangers presented by excessive heat. Since 2008, Tazewell County has experienced three excessive heat events.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded and no injuries or fatalities were reported as a result of any of the excessive heat events.

In comparison, Illinois averages 74 deaths per year as a result of excessive heat. Excessive heat has triggered more deaths than any other natural hazard in Illinois. More deaths are attributed to excessive heat than the combined number of deaths attributed to floods, tornadoes, lightning and extreme cold.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Events

- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability to:

- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

While no recorded injuries or fatalities were reported as a result of excessive heat in Tazewell County, it does not mean that none occurred. It simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for both excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. In Tazewell County, excessive heat should not impact municipal water supplies since none obtain their water from surface water bodies.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in Tazewell County, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be low. This assessment is based on the absence of designated cooling centers in most of the participating municipalities tempered by the fact that Tazewell County does not have large urban areas where living conditions (such as older, poorly-ventilated high rise buildings and low-income neighborhoods) tend to contribute to heat-related injuries and fatalities.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be medium. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure 178b** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

Figure 178b
Sensitive Populations by Participating Jurisdiction: Tazewell County

Participating Jurisdiction	% of Population 70 year of age & Older	% of Population 5 years age & Younger	Total % of Sensitive Population
East Peoria	12.5%	5.9%	18.4%
Morton	14.0%	6.7%	20.7%
Pekin	11.9%	6.4%	18.3%
Tremont	12.0%	5.6%	17.6%
Washington	9.9%	7.9%	17.8%
Unincorp. Tazewell County	16.3%	10.4%	26.7%
Tazewell County	11.3%	6.4%	17.7%

Source: U. S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the County and the participating municipalities are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the County (including all of the municipalities).

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways within Tazewell County. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Tazewell County, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered low, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the County and participating municipalities are no more vulnerable to excessive heat events than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with excessive heat is the health and safety of those living in the County and municipalities, especially sensitive populations such as the elderly, infants, young children and those with medical conditions.

Tazewell County

Figure 176
(Sheet 1 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/26/1997 thru 7/27/1997	9:00 a.m.	100°F	n/a	115°F	SED	n/a	n/a	n/a	n/a	- numerous reports of heat-related injuries in most area hospitals - numerous reports of roads buckling
6/26/1998 thru 6/28/1998	3:00 a.m.	upper 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	- several heat-related illnesses were reported in area hospitals - several highways in the area had sections of roadway buckle
7/20/1999 thru 7/25/1999	10:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
7/28/1999 thru 7/30/1999	10:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
7/22/2005 thru 7/25/2005	12:00 p.m.	100°F	mid 70s	115°F	SED	n/a	n/a	n/a	n/a	
7/30/2006 thru 8/2/2006	11:00 a.m.	100°F	mid 70s	110°F	SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Tazewell County

Figure 176
(Sheet 2 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
8/11/2010 thru 8/13/2010	2:00 p.m.	90s	n/a	105°F	SED	n/a	n/a	n/a	n/a	
8/2/2011	11:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
6/29/2012 thru 7/7/2012	1:45 p.m.	105°F	70s	110°F	SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	
GRAND TOTAL:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

3.5.2 WOODFORD COUNTY

HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Figure 179, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Woodford County. NOAA's Storm Events Database has documented nine occurrences of excessive heat in Woodford County between 1997 and 2017.

Excessive Heat Fast Facts – Occurrences

Number of Excessive Heat Events Reported (1997 – 2017): ***9***

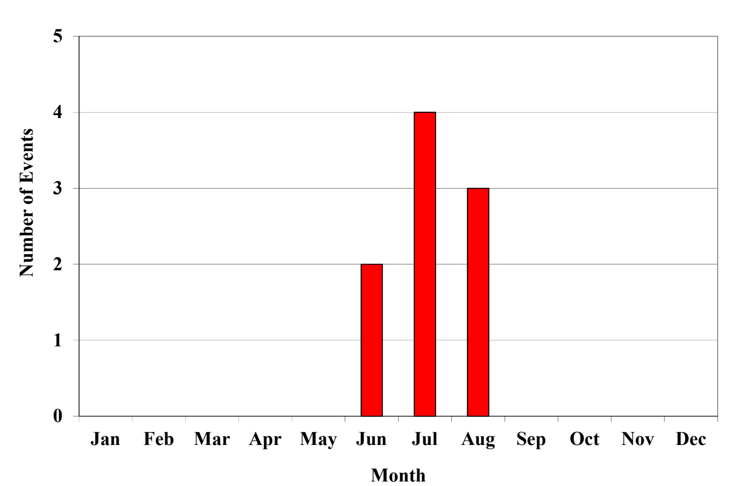
Hottest Temperature Recorded in the County: ***111°F (July 14 & 15, 1936 at Minonk)***

Most Likely Month for Excessive Heat Events to Occur: ***July***

These represent the ***reported occurrences*** of excessive heat. The NWS acknowledges that excessive heat events are not well recorded. Only those events with impacts, such as injuries or fatalities, are reported. As a result, excessive heat events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Figure 180 charts the reported occurrences of excessive heat events by month. Of the nine events, four (44%) either began or took place in July making this the peak month for excessive heat events in Woodford County. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Approximately 67% of all excessive heat events began during the a.m. hours.

Figure 180
Graph: Excessive Heat Events by Month
Woodford County: 1997 – 2017



According to the Midwestern Regional Climate Center, continuous temperature records for Woodford County have been kept from 1896 to present by the NWS COOP Observer Station at Minonk and from 1996 to present by the COOP Observer Station northwest of Congerville. Based on the available records, the hottest temperature recorded in Woodford County was 111°F at the Minonk COOP Station on July 14, 1936 and again on July 15, 1936. **Figure 181a** lists the hottest days recorded at the Minonk observation station.

Figure 181a
Hottest Days Recorded in Minonk

	Date	Temperature		Date	Temperature
1	07/14/1936	111°F	4	07/12/1936	110°F
2	07/15/1936	111°F	5	07/07/1936	108°F
3	07/11/1936	110°F	6	07/28/1916	107°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by excessive heat?

Excessive heat events affect the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Woodford County's hazard rating for excessive heat as "elevated."

Do any of the participating municipalities have designated cooling centers?

Yes. One of the three participating municipalities has designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events. Eureka designates centers as needed and indicated their locations vary due to event needs. There are no State of Illinois-designated cooling centers in Woodford County.

What is the probability of future excessive heat events occurring?

Woodford County has experienced nine verified occurrences of excessive heat between 1997 and 2017. With nine occurrences over the past 21 years, the probability or likelihood that Woodford County may experience an excessive heat event in any given year is 43%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of Woodford County, including the participating municipalities, is vulnerable to the dangers presented by excessive heat. Since 2008, Woodford County has experienced three excessive heat events.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded and no injuries or fatalities were reported as a result of any of the excessive heat events.

In comparison, Illinois averages 74 deaths per year as a result of excessive heat. Excessive heat has triggered more deaths than any other natural hazard in Illinois. More deaths are attributed to excessive heat than the combined number of deaths attributed to floods, tornadoes, lightning and extreme cold.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Events
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability to:
- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

While no recorded injuries or fatalities were reported as a result of excessive heat in Woodford County, it does not mean that none occurred. It simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for both excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. In Woodford County, excessive heat should not impact municipal water supplies since none obtain their water from surface water bodies.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in Woodford County, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be low. This assessment is based on the absence of designated cooling centers in the participating municipalities tempered by the fact that Woodford County does not have large urban areas where living conditions (such as older, poorly-ventilated high rise buildings and low-income neighborhoods) tend to contribute to heat-related injuries and fatalities.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be medium. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure 181b** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

Figure 181b **Sensitive Populations by Participating Jurisdiction: Woodford County**			
Participating Jurisdiction	**% of Population 70 year of age & Older**	**% of Population 5 years age & Younger**	**Total % of Sensitive Population**
Eureka	14.7%	7.2%	21.9%
Germantown Hills	3.9%	7.9%	11.8%
Roanoke	15.3%	6.3%	21.6%
Unincorp. Woodford County	10.3%	6.3%	16.6%
Woodford County	10.6%	6.5%	17.1%

Source: U. S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the County and the participating municipalities are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the County (including all of the municipalities).

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways within Woodford County. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Woodford County, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered low, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the County and participating municipalities are no more vulnerable to excessive heat events than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with excessive heat is the health and safety of those living in the County and municipalities, especially sensitive populations such as the elderly, infants, young children and those with medical conditions.

Woodford County

Figure 179 (Sheet 1 of 2) Excessive Heat Events 1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/26/1997 thru 7/27/1997	9:00 a.m.	100°F	69°F	115°F	COOP/ SED	n/a	n/a	n/a	n/a	- numerous reports of heat-related injuries in most area hospitals - numerous reports of roads buckling
6/26/1998 thru 6/28/1998	3:00 a.m.	96°F	67°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	- several heat-related illnesses were reported in area hospitals - several highways in the area had sections of roadway buckle
7/20/1999 thru 7/25/1999	10:00 a.m.	98°F	65°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/28/1999 thru 7/30/1999	10:00 a.m.	101°F	70°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/22/2005 thru 7/25/2005	12:00 p.m.	101°F	66°F	115°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/30/2006 thru 8/2/2006	11:00 a.m.	98°F	73°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Woodford County

Figure 179
(Sheet 2 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
8/11/2010 thru 8/13/2010	2:00 p.m.	94°F	69°F	105°F	COOP/ SED	n/a	n/a	n/a	n/a	
8/2/2011	11:00 a.m.	93°F	73°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
6/29/2012 thru 7/7/2012	1:45 p.m.	106°F	67°F	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	**$0**	
GRAND TOTAL:						**0**	**0**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

3.5.3 PEORIA COUNTY (INCLUDING THE PARTICIPATING MUNICIPALITIES)

HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Excessive Heat Fast Facts – Occurrences

Number of Excessive Heat Events Reported (1997 – 2017): ***9***

Hottest Temperature Recorded in the County: ***113°F (July 15, 1936 at the Peoria International Airport)***

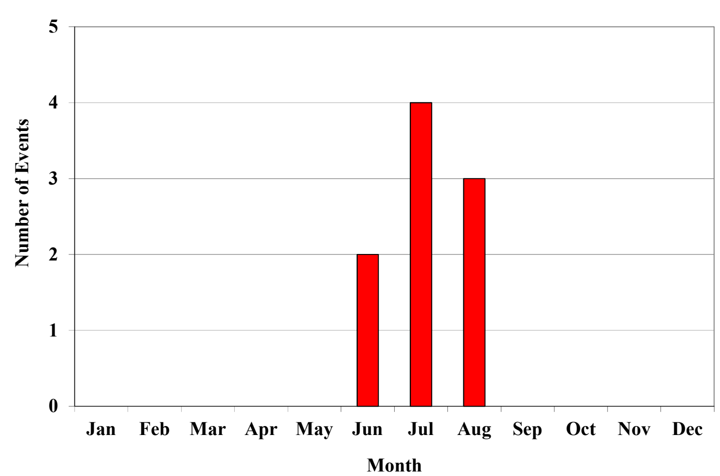
Most Likely Month for Excessive Heat Events to Occur: ***July***

Figure 182, located at the end of this subsection, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in the Peoria County, including the participating municipalities. NOAA's Storm Events Database has documented nine occurrences of excessive heat in Peoria County between 1997 and 2017.

These represent the ***reported occurrences*** of excessive heat. The NWS acknowledges that excessive heat events are not well recorded. Only those events with impacts, such as injuries or fatalities, are reported. As a result, excessive heat events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Figure 183 charts the reported occurrences of excessive heat events by month. Of the nine events, four (44%) either began or took place in July making this the peak month for excessive heat events in Peoria County. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Approximately 67% of all excessive heat events began during the a.m. hours.

Figure 183
Graph: Excessive Heat Events by Month Participating Peoria County Municipalities: 1997 – 2017



According to the Midwestern Regional Climate Center, continuous temperature records have been kept from 1914 to present by the NWS COOP Observer Station at the Peoria International Airport. Based on the available records, the hottest temperature recorded at the Airport was 113°F on July 15, 1936. **Figure 184a** lists the hottest days recorded at the Airport observation station.

Figure 184a
Hottest Days Recorded at the Peoria International Airport

	Date	Temperature			Date	Temperature
1	07/15/1936	113°F		4	07/11/1936	108°F
2	07/14/1936	110°F		5	07/12/1936	107°F
3	07/13/1936	109°F		6	07/27/1930	107°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by excessive heat?

Excessive heat events affect the entire County, including the participating municipalities. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Peoria County's hazard rating for excessive heat as "elevated."

Do any of the participating municipalities have designated cooling centers?

Yes. One of the five participating municipalities has designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events. The City of Peoria has designated the Police Station Lobby at 600 SW Adams Street as a designated cooling center along with fire stations at various locations as available. At this time Bartonville, Chillicothe, Hanna City and Peoria Heights do not have any cooling centers designated within their municipalities.

In addition to those designated cooling centers identified by the participating municipalities, the Illinois Department of Human Services office located in Peoria also serves as cooling center.

What is the probability of future excessive heat events occurring?

Peoria County (including the participating municipalities) has experienced nine verified occurrences of excessive heat between 1997 and 2017. With nine occurrences over the past 21 years, the probability or likelihood that Peoria County may experience an excessive heat event in any given year is 43%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of the participating municipalities are vulnerable to the dangers presented by excessive heat. Since 2008, Peoria County (including the participating jurisdictions) has experienced three excessive heat events.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded. NOAA's Storm Events Database did document two fatalities as a result of two excessive heat events in the participating municipalities. The following provides a brief description of each event.

- On June 27, 1998 a woman died at her home in Peoria as a result of heat-related causes.
- An individual died as a result of the intense heat on July 5, 2012 in Chillicothe.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Events
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities: ***2***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability to:
- Public Health & Safety – General Population: ***Low to Medium***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

In comparison, Illinois averages 74 deaths per year as a result of excessive heat. Excessive heat has triggered more deaths than any other natural hazard in Illinois. More deaths are attributed to excessive heat than the combined number of deaths attributed to floods, tornadoes, lightning and extreme cold.

While only two fatalities were reported as a result of excessive heat events in the participating municipalities, it does not mean that additional injuries and fatalities did not occurred. It simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for both excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. Excessive heat has the ability to potentially impact the drinking water supplies of Peoria, Bartonville and Hanna City which obtain a portion of their water from the Illinois River. This vulnerability to excessive heat is partially limited due to the surface water/groundwater combination supplied by Illinois American Water Company.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in participating municipalities, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be low to medium. This assessment is based on the absence of designated cooling centers in most of the participating municipalities, the previously reported fatalities and in the case of Peoria, the presence of low-income neighborhoods with poorly-ventilated buildings. These factors are partially offset by the general awareness of the dangers associated with excessive heat and the steps that should be taken to combat heat-related disorders.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be medium. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure 184b** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

Figure 184b
Sensitive Populations by Participating Jurisdiction: Participating Peoria County Municipalities

Participating Jurisdiction	% of Population 70 year of age & Older	% of Population 5 years age & Younger	Total % of Sensitive Population
Bartonville	12.0%	5.3%	17.3%
Chillicothe	12.3%	6.2%	18.5%
Hanna City	14.2%	5.6%	19.8%
Peoria	9.5%	7.5%	17.0%
Peoria Heights	10.5%	5.4%	15.9%

Source: U. S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the participating municipalities are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the municipalities.

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in participating municipalities, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered low, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the participating municipalities are no more vulnerable to excessive heat events than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with excessive heat is the health and safety of those living in the participating municipalities, especially sensitive populations such as the elderly, infants, young children and those with medical conditions.

Peoria County (including the Participating Municipalities)

Figure 182
(Sheet 1 of 2)
Excessive Heat Events
1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/26/1997 thru 7/27/1997	9:00 a.m.	100°F	n/a	115°F	SED	n/a	n/a	n/a	n/a	- numerous reports of heat-related injuries in most area hospitals - numerous reports of roads buckling
6/26/1998 thru 6/28/1998	3:00 a.m.	upper 90s	n/a	110°F	SED	n/a	1	n/a	n/a	- a woman died in her Peoria home on the 27th from heat-related causes - several heat-related illnesses were reported in area hospitals - several highways in the area had sections of roadway buckle
7/20/1999 thru 7/25/1999	10:00 a.m.	mid 90s	n/a	110°F	COOP/ SED	n/a	n/a	n/a	n/a	
7/28/1999 thru 7/30/1999	10:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
7/22/2005 thru 7/25/2005	12:00 p.m.	100°F	mid 70s	115°F	SED	n/a	n/a	n/a	n/a	
Subtotal:						**0**	**1**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

Peoria County (including the Participating Municipalities)

Figure 182 (Sheet 2 of 2) Excessive Heat Events 1997 – 2017

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
7/30/2006 thru 8/2/2006	11:00 a.m.	100°F	mid 70s	110°F	SED	n/a	n/a	n/a	n/a	
8/11/2010 thru 8/13/2010	2:00 p.m.	90s	n/a	105°F	SED	n/a	n/a	n/a	n/a	
8/2/2011	11:00 a.m.	mid 90s	n/a	110°F	SED	n/a	n/a	n/a	n/a	
6/29/2012 thru 7/7/2012	1:45 p.m.	105°F	70s	110°F	SED	n/a	1	n/a	n/a	an individual died as a result of the intense heat in Chillicothe on the 5th
Subtotal:						**0**	**1**	**$0**	**$0**	
GRAND TOTAL:						**0**	**2**	**$0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Source: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

Acronyms:

COOP NWS COOP Observation Station Records
SED NOAA's Storm Events Database

3.6 DROUGHTS

HAZARD IDENTIFICATION

What is the definition of a drought?

While difficult to define, the National Drought Mitigation Center (NDMC) considers "drought" in its most general sense to be a deficiency of precipitation over an extended period of time, usually a season or more, resulting in a water shortage for some activity, group or environmental sector.

Drought is a normal and recurrent feature of climate and can occur in all climate zones, though its characteristics and impacts vary significantly from one region to another. Unlike other natural hazards, drought does not have a clearly defined beginning or end. Droughts can be short, lasting just a few months, or they can persist for several years. There have been 25 drought events with losses exceeding $1 billion each (CPI-Adjusted) across the United States between 1980 and 2017. This is due in part to the sheer size of the areas affected.

What types of drought occur?

There are four main types of drought that occur: meteorological, agricultural, hydrological and socioeconomic. They are differentiated based on the use and need for water. The following provides a brief description of each type.

- **Meteorological Drought.** Meteorological drought is defined by the degree of dryness or rainfall deficit and the duration of the dry period. Due to climate differences, what might be considered a drought in one location of the country may not be in another location.
- **Agricultural Drought.** An agricultural drought refers to a period when rainfall deficits, soil moisture deficits, reduced ground water or reservoir levels needed for irrigation impact crop development and yields.
- **Hydrological Drought.** Hydrological drought refers to a period when precipitation deficits (including snowfall) impact surface (stream flow, reservoir and lake levels) and subsurface (aquifers) water supply levels.
- **Socioeconomic Drought.** Socioeconomic drought refers to a period when the demand for an economic good (fruit, vegetables, grains, etc.) exceeds the supply as a result of weather-related shortfall in the water supply.

How are droughts measured?

There are numerous quantitative measures (indicators and indices) that have been developed to measure drought. How these indicators and indices measure drought depends on the discipline affected (i.e., agriculture, hydrology, meteorology, etc.) and the region being considered. There is no single index or indicator that can account for and be applied to all types of drought.

Although none of the major indices are inherently superior to the rest, some are better suited than others for certain uses. The first comprehensive drought index developed in the United States was the Palmer Drought Severity Index (PDSI). The PDSI is calculated based on precipitation and temperature data, as well as the local Available Water Content of the soil. It is most effective measuring drought impacts on agriculture. For many years it was the only operational drought index and it is still very popular around the world.

The Standardized Precipitation Index (SPI), developed in 1993, uses precipitation records for any location to develop a probability of precipitation for any time scale in order to reflect the impact of drought on the availability of different water resources (groundwater, reservoir storage, streamflow, snowpack, etc.) In 2009 the World Meteorological Organization recommended SPI as the main meteorological drought index that countries should use to monitor and follow drought conditions.

The first operational 'composite' approach applied in the United States was the U.S. Drought Monitor (USDM). The USDM utilizes five key indicators, numerous supplementary indicators and local reports from expert observers around the country to produce a drought intensity rating that is ideal for monitoring droughts that have many impacts, especially on agriculture and water resources during all seasons over all climate types. NOAA's Storm Events Database records include USDM ratings and utilized them along with additional weather information to describe the severity of the drought conditions impacting affected counties. Therefore, this Plan will utilize USDM ratings to identify and describe previous drought events recorded within the County. The following provides a more detailed discussion of the USDM to aid the Plan's developers and the general public in understanding how droughts are identified and categorized.

U.S. Drought Monitor (USDM)

Established in 1999, the USDM is a relatively new index that combines quantitative measures with input from experts in the field. It is designed to provide the general public, media, government officials and others with an easily understandable "big picture" overview of drought conditions across the United States. It is unique in that it combines a variety of data-based drought indices and indicators with local expert input to create a single composite drought indicator, the results of which are illustrated via a weekly map that depicts drought conditions across the United States. The USDM is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture, and the National Oceanic and Atmospheric Administration.

Five drought intensity categories, D0 through D4, are utilized to identify areas of drought. **Figure 185** provides a brief description of each category. As mentioned previously, the drought intensity categories are based on five key indicators, numerous supplementary indicators and local observers. The five key indicators include: the Palmer Drought Severity Index, the Climate Prediction Center's Soil Moisture Model (percentiles), the United States Geological Survey Weekly Streamflow (percentiles), the Standardized Precipitation Index and the Objective Drought Indicator Blends (percentiles).

Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what a majority of the indictors show and on local observations. The authors also weight the indices according to how well they perform in various parts of the country and at different times of the year. It is the combination of the best available data, location observations and experts' best judgment that make the U.S. Drought Monitor more versatile than other drought indices.

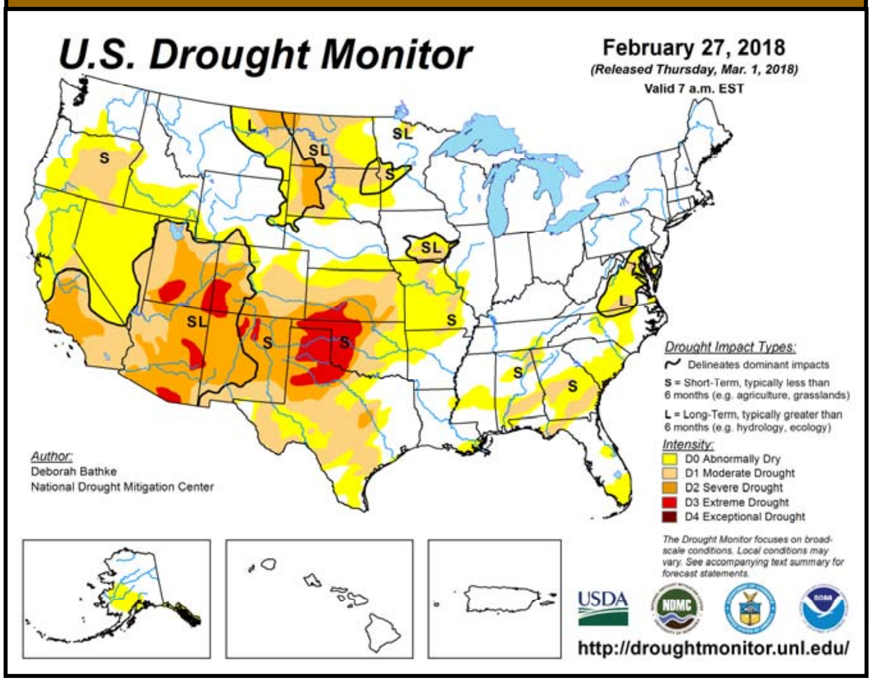
Figure 185
U.S. Drought Monitor – Drought Severity Classifications

Category	Possible Impacts
D0 (Abnormally Dry)	• Going into drought: - short-term dryness slowing planting, growth of crops or pastures. • Coming out of drought: - some lingering water deficits - pastures or crops not fully recovered
D1 (Moderate Drought)	• Some damage to crops, pastures • Streams, reservoirs, or wells low; some water shortages developing or imminent • Voluntary water-use restrictions requested
D2 (Severe Drought)	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3 (Extreme Drought)	• Major crop/pasture losses • Widespread water shortages or restrictions
D4 (Exceptional Drought)	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Source: U.S. Drought Monitor.

In addition to identifying and categorizing general areas of drought, the USDM also identifies whether a drought's impacts are short-term (typically less than 6 months – agriculture, grasslands) or long-term (typically more than 6 months – hydrology, ecology). **Figure 186** shows an example of the USDM weekly map. The USDM is designed to provide a consistent big-picture look at drought conditions in the United States. It is not designed to infer specifics about local conditions.

Figure 186
U. S. Drought Monitor



Map Courtesy of NDMC-UNL.

3.6.1 TAZEWELL COUNTY

HAZARD PROFILE

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

Drought Fast Facts – Occurrences

Number of Drought Events Reported (1983 – 2017): ***6***

According to NOAA's Storm Events Database, the Illinois State Water Survey, the Illinois Emergency Management Agency (IEMA) and the USDA there have been six drought events reported for Tazewell County between 1983 and 2017. The following provides a summary of these previous occurrences as well as the extent or severity of each event.

- In 1983, all 102 Illinois counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. USDA crop yield statistics indicates that soybean and corn yields were 18.2% to 38.4% lower than the previous year.
- In 1988, approximately half of all Illinois counties (including Tazewell County) were impacted by drought conditions, although none of the counties were proclaimed state disaster areas. Lower than normal precipitation levels were recorded between April and June and unusually dry weather conditions persisted throughout the summer months. Soybean and corn yields were 35.7% to 50.7% lower than the previous year, according to USDA crop yield statistics.
- In 2005, drought conditions impacted much of the State, including Tazewell County. A dry winter and spring developed into drought conditions by the beginning of June. On May 24, 2005 Tazewell County was designated as D1 – moderate drought and upgraded to D2 – severe drought on June 21, 2005. Two weeks later the County was classified as D3 – extreme drought. Drought conditions for the County were downgraded to D2 – severe drought on September 20, 2005. Severe to moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry April 18, 2006. All designations were removed on May 2, 2006.

  On July 27, 2005 the USDA designated 93 counties in Illinois, including Tazewell County, as primary natural disaster areas due to the damage and losses caused by drought. According to USDA crop yield statistics, corn yields were 24.1% lower than the previous year.
- In 2011, drought conditions impacted portions of the state. On August 9, 2011 the southern half of Tazewell County was designated as D1 – moderate drought and upgraded to D2 – severe drought on August 30, 2011. Drought conditions for the County were downgraded to D1 – moderate drought on September 27, 2011. All designations were removed on November 15, 2011.

  On November 2, 2011 the USDA designated 44 counties in Illinois as primary natural disaster areas due to losses caused by drought and excessive heat. While Tazewell

County was not one of the designated counties, it did qualify for natural disaster assistance because it was contiguous to the disaster area. USDA Crop yield statistics did not show any significant yield reductions for either corn or soybean from the previous year as a result of this event.

- In 2012, drought conditions impacted all of Illinois and most of the Midwest. On June 5, 2012 the southern half of Tazewell County was designated as D1 – moderate drought and the entire County was upgraded to D2 – severe drought on June 19, 2012 due to an abnormally warm and dry spring. Five weeks later on July 24, 2012 the County was classified as D3 – extreme drought due to the continued hot and dry conditions. Only 1.00 to 1.25 inches of rain fell across Tazewell County during the month making it the 9th driest July on record. As a result of the hot and dry conditions, a countywide burn ban was instituted. The flow along the Mackinaw River near Green Valley dropped into the 11th percentile and the flow along Fondulac Creek near East Peoria ties for the lowest on record.

  Extreme drought conditions continued through August before being downgraded to D2 – extreme drought on September 4, 2012 due to beneficial rainfall from the remnants of Hurricane Isaac. On October 30, 2012 the County was downgraded to D1 – moderate drought and again to D0 – abnormally dry on November 13, 2012. All designations were removed on February 5, 2013.

  Crop stress was extreme for corn and soybeans during this event. On August 1, 2012 the USDA designated 66 counties in Illinois, including Tazewell County, as primary natural disaster areas due to damage and losses caused by drought and excessive heat. According to USDA crop yield statistics, soybean and corn yields were 10.1% to 22.8% lower than the previous year.

- In 2013, a “flash drought” impacted central Illinois. While droughts typically develop slowly, a “flash drought” happens within weeks rather than months. Unusually dry conditions began in early August and extended into September resulting in rainfall deficits. On August 27, 2013 the western half of Tazewell County was designated as D1 – moderate drought with the entire County upgraded to D2 – severe drought on September 24, 2013. Despite near normal rainfall amounts in October, cumulative deficits remained unchanged. A majority of the County was downgraded to D1 – moderate drought on November 5, 2013. A week later a majority of the County was downgraded to D0 – abnormally dry. It wasn’t until April 8, 2014 that all drought designations were removed.

  Given the timing of this “flash drought”, no significant crop stress or reductions in yields were reported. USDA crop yield statistics for Tazewell County did not show any reductions from the previous year.

The Illinois State Water Survey records indicate that droughts also occurred in the region in 1931, 1934, 1936 and 1954; however, the extent to which Tazewell County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Tazewell County's hazard rating for drought as "Elevated."

What is the probability of future drought events occurring?

Tazewell County has experienced six droughts between 1983 and 2017. With six occurrences over 35 years, the probability or likelihood that the County may experience a drought in any given year is 17.1%. However, if earlier recorded droughts are factored in, then the probability that Tazewell County may experience a drought in any given year decreases to 12.5%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of Tazewell County is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provide protection for any area within the County. Since 2008, Tazewell County has experienced three droughts.

What impacts resulted from the recorded drought events?

Damage information was only available for one of the six drought events experienced between 1983 and 2017. According to NOAA's Storm Events Database, the 2012 drought caused an estimated $35.9 million in damages to the corn crop in Tazewell County. Damage information was either unavailable or none was recorded for the remaining five reported occurrences.

Of the six drought events, disaster relief payment information was only available for one of the events. In 1988, landowners and farmers in Illinois were paid in excess of $382 million in relief payments; however, a breakdown by county was unavailable.

Drought Fast Facts – Impacts/Risk

Drought Impacts
- ❖ Total Property Damage: ***n/a***
- ❖ Infrastructure/Critical Facilites Damage*: ***n/a***
- ❖ Total Crop Damage: ***$35.9 million (corn crop damage only – 2012 drought)***

Drought Risk/Vulnerability to:
- ❖ Public Health & Safety: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Low***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

No injuries or fatalities were reported as a result of any of the recorded drought events in Tazewell County.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

<u>*Crop Yield Reductions*</u>

Agriculture is an important industry in Tazewell County. Farmland accounts for 81.2% of all the land in the County. According to the 2012 Census of Agriculture, there were 942 farms in Tazewell County occupying 337,376 acres. Of the land in farms, approximately 90.1% or 304,039 acres is in crop production. Due to its sandy soils and a plentiful supply of water from the Mahomet Aquifer, the farms within the County have developed extensive irrigation systems to help them grow specialty crops such as pumpkins, which Tazewell County produces more of than any county in Illinois. As a result, approximately 12.6% or 38,492 acres of the land in crop production is irrigated. Compared to a majority of the State and even neighboring counties, this is a large number of irrigated acres.

According to the 2012 Census of Agriculture, crop sales accounted for $233.8 million in revenue while livestock sales accounted for $29.9 million. Tazewell County ranks 18th in Illinois for crop cash receipts and 34th for livestock cash receipts. A severe drought would have a great financial impact on the large agricultural community, particularly if it occurred during the growing season. Dry weather conditions, particularly when accompanied by excessive heat, can result in diminished crop yields and place stress on livestock.

A reduction in crop yields was seen as a result of the 1983, 1988, 2005 and 2012 droughts. **Figure 187** illustrates the reduction yields seen for corn and soybeans during the six recorded drought events.

Figure 187
Crop Yield Reductions Due to Drought – Tazewell County

Year	Corn		Soybeans	
	Yield (bushel)	% Reduction Previous Year	Yield (bushel)	% Reduction Previous Year
1982	138.0	--	44.0	--
1983	**85.0**	**38.4%**	**36.0**	**18.2%**
1984	118.0	--	36.5	--
1987	138.0	--	42.5	--
1988	**68.0**	**50.7%**	**27.0**	**35.7%**
1989	125.0	--	48.5	--
2004	187.0	--	54.0	--
2005	**142.0**	**24.1%**	**53.0**	**1.9%**
2006	176.0	--	54.0	--
2010	163.4	--	58.1	--
2011	172.7	--	57.3	1.4%
2012	**133.4**	**22.8%**	**51.5**	**10.1%**
2013	177.1	--	54.6	--
2014	224.4	--	61.0	--

Source: USDA, National Agricultural Statistics Service.

Records obtained from the USDA's National Agricultural Statistics Service show that the 1983 drought resulted in corn yield reductions of 38.4% and soybean yield reductions of 18.2% while the 1988 drought resulted in corn yield reductions of 50.7% and soybean yield reductions of

35.7%. In 2005, the drought caused a 24.1% reduction in corn yields and a 1.9% reduction in soybean yields while the 2012 drought led to corn yield reductions of 22.8% and soybean yield reductions of 10.1%.

Drinking Water Shortages
Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. In Tazewell County ***none of the participating municipalities rely on surface water sources*** for their drinking water supplies. According to the Illinois Environmental Protection Agency's Source Water Assessment Program, all of the participating municipalities obtain their water from deep sand and gravel aquifers, with the exception of several wells in Pekin and East Peoria. Six of East Peoria's eleven wells and three of Illinois American Water Company – Pekin District's eight wells are drilled into shallow unconfined aquifers. The use of deep wells helps lessen a municipality's vulnerability to drought.

While the participating jurisdictions are less vulnerable to drinking water shortages, a prolonged drought or a series of droughts in close succession do have the potential to impact water levels in aquifers used for individual drinking water wells in rural areas. This is because individual (private) water wells tend to be shallower than municipal (public) water wells.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the County, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is low.

Are existing buildings, infrastructure and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling. Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid infrastructure, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in the aquifer's water level can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought or a series of droughts occur. Effective mitigation measures include drilling additional, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is low, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the County are no more vulnerable to drought than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. Since a large portion of the County is involved in farming activities, it is likely that there will be future dollar losses to drought. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

3.6.2 Woodford County

Hazard Profile

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

According to NOAA's Storm Events Database, the Illinois State Water Survey, IEMA and the USDA there have been six drought events reported for Woodford County between 1983 and 2017. The following provides a summary of these previous occurrences as well as the extent or severity of each event.

<u>Drought Fast Facts – Occurrences</u>

Number of Drought Events Reported (1983 – 2017): ***6***

- In 1983, all 102 Illinois counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. USDA crop yield statistics indicates that soybean and corn yields were 10.3% to 39.4% lower than the previous year.

- In 1988, approximately half of all Illinois counties (including Woodford County) were impacted by drought conditions, although none of the counties were proclaimed state disaster areas. Lower than normal precipitation levels were recorded between April and June and unusually dry weather conditions persisted throughout the summer months. Soybean and corn yields were 44.9% to 58.9% lower than the previous year, according to USDA crop yield statistics.
- In 2005, drought conditions impacted much of the State, including Woodford County. A dry winter and spring developed into drought conditions by the beginning of June. On May 24, 2005 a majority of Woodford County was designated as D1 – moderate drought and the entire County was upgraded to D2 – severe drought on June 21, 2005. Two weeks later the County was classified as D3 – extreme drought. Drought conditions for the County were downgraded to D2 – severe drought on September 27, 2005. Severe to moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry April 18, 2006. All designations were removed on May 2, 2006.

  On July 27, 2005 the USDA designated 93 counties in Illinois, including Woodford County, as primary natural disaster areas due to the damage and losses caused by drought. According to USDA crop yield statistics, soybean and corn yields were 5.6% to 20.9% lower than the previous year.
- In 2011, drought conditions impacted portions of the state. On August 2, 2011 Woodford County was designated at D0 – abnormally dry. All designations were removed on October 4, 2011. On November 2, 2011 the USDA designated 44 counties in Illinois as primary natural disaster areas due to losses caused by drought and excessive heat. While Woodford County was not one of the designated counties, it did qualify for natural disaster assistance because it was contiguous to the disaster area. USDA Crop yield statistics did not show any significant yield reductions for either corn or soybean from the previous year as a result of this event.
- In 2012, drought conditions impacted all of Illinois and most of the Midwest. On June 12, 2012 Woodford County was designated as D1 – moderate drought and upgraded to D2 – severe drought on June 19, 2012 due to an abnormally warm and dry spring. Five weeks later on July 24, 2012 the County was classified as D3 – extreme drought due to the continued hot and dry conditions. On Average only 0.40 inches of rain fell across Woodford County during July which was among the top three driest Julys on record. In August the Mackinaw River at Congerville dropped to the 9th lowest on record.

  Extreme drought conditions continued through August before being downgraded to D2 – extreme drought / D1 – moderate drought on September 4, 2012 due to beneficial rainfall from the remnants of Hurricane Isaac. On October 30, 2012 the County was downgraded to D1 – moderate drought / D0 – abnormally dry and again to D0 – abnormally dry on November 13, 2012. All designations were removed on February 5, 2013.

  Crop stress was extreme for corn and soybeans during this event. On August 1, 2012 the USDA designated 66 counties in Illinois, including Woodford County, as primary natural disaster areas due to damage and losses caused by drought and excessive heat.

According to USDA crop yield statistics, soybean and corn yields were 23.1% to 45.0% lower than the previous year.

- In 2013, a "flash drought" impacted central Illinois. While droughts typically develop slowly, a "flash drought" happens within weeks rather than months. Unusually dry conditions began in early August and extended into September resulting in rainfall deficits. On September 3, 2013 Woodford County was designated as D1 – moderate drought and upgraded to D2 – severe drought on September 24, 2013. Despite near normal rainfall amounts in October, cumulative deficits remained unchanged. The County was downgraded to D1 – moderate drought on November 5, 2013 and again on November 12, 2013 to D0 – abnormally dry. Abnormally dry conditions lingered across the southern portion of the county through the winter. It wasn't until February 25, 2014 that all drought designations were removed.

  Given the timing of this "flash drought", no significant crop stress or reductions in yields were reported. USDA crop yield statistics for Woodford County did not show any reductions from the previous year.

The Illinois State Water Survey records indicate that droughts also occurred in the region in 1931, 1934, 1936 and 1954; however, the extent to which Woodford County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Woodford County's hazard rating for drought as "Elevated."

What is the probability of future drought events occurring?

Woodford County has experienced six droughts between 1983 and 2017. With six occurrences over 35 years, the probability or likelihood that the County may experience a drought in any given year is 17.1%. However, if earlier recorded droughts are factored in, then the probability that Woodford County may experience a drought in any given year decreases to 12.5%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of Woodford County is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provide protection for any area within the County. Since 2008, Woodford County has experienced three droughts.

What impacts resulted from the recorded drought events?

Damage information was only available for one of the six drought events experienced between 1983 and 2017. According to NOAA's Storm Events Database, the 2012 drought caused an estimated $29.2 million in damages to the corn crop in Woodford County. Damage information was either unavailable or none was recorded for the remaining five reported occurrences.

Of the six drought events, disaster relief payment information was only available for one of the events. In 1988, landowners and farmers in Illinois were paid in excess of $382 million in relief payments; however, a breakdown by county was unavailable.

Drought Fast Facts – Impacts/Risk

Drought Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilites Damage*: ***n/a***
- Total Crop Damage: ***$29.2 million (corn crop damage only – 2012 drought)***

Drought Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

No injuries or fatalities were reported as a result of any of the recorded drought events in Woodford County.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

Crop Yield Reductions

Agriculture is an important enterprise in Woodford County. Farmland accounts for 95.6% of all the land in the County. According to the 2012 Census of Agriculture, there were 958 farms in Woodford County occupying 322,983 acres. Of the land in farms, approximately 90.3% or 291,630 acres is in crop production. Less than 1% of the land in crop production is irrigated.

According to the 2012 Census of Agriculture, crop sales accounted for $188.8 million in revenue while livestock sales accounted for $51.8 million. Woodford County ranks 22nd in Illinois for crop cash receipts and 18th for livestock cash receipts. A severe drought would have a great financial impact on the large agricultural community, particularly if it occurred during the growing season. Dry weather conditions, particularly when accompanied by excessive heat, can result in diminished crop yields and place stress on livestock.

A reduction in crop yields was seen as a result of the 1983, 1988, 2005 and 2012 droughts. **Figure 188** illustrates the reduction yields seen for corn and soybeans during the four recorded drought events.

Records obtained from the USDA's National Agricultural Statistics Service show that the 1983 drought resulted in corn yield reductions of 39.4% and soybean yield reductions of 10.3% while the 1988 drought resulted in corn yield reductions of 58.9% and soybean yield reductions of 44.9%. In 2005, the drought caused a 20.9% reduction in corn yields and a 5.6% reduction in soybean yields while the 2012 drought led to corn yield reductions of 45.0% and soybean yield reductions of 23.1%.

Figure 188
Crop Yield Reductions Due to Drought – Woodford County

Year	Corn		Soybeans	
	Yield (bushel)	% Reduction Previous Year	Yield (bushel)	% Reduction Previous Year
1982	142.0	--	43.5	--
1983	**86.0**	**39.4%**	**39.0**	**10.3%**
1984	110.0	--	37.0	5.1%
1987	129.0	--	44.5	--
1988	**53.0**	**58.9%**	**24.5**	**44.9%**
1989	118.0	--	48.0	--
2004	182.0	--	54.0	--
2005	**144.0**	**20.9%**	**51.0**	**5.6%**
2006	177.0	--	55.0	--
2010	171.5	--	56.1	--
2011	186.5	--	60.5	--
2012	**102.5**	**45.0%**	**46.5**	**23.1%**
2013	192.3	--	56.9	--
2014	217.5	--	61.4	--

Source: USDA, National Agricultural Statistics Service.

<u>*Drinking Water Shortages*</u>
Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. In Woodford County ***none of the participating municipalities rely on surface water sources*** for their drinking water supplies. According to the Illinois Environmental Protection Agency's Source Water Assessment Program, all of the participating municipalities obtain their water from deep sand and gravel aquifers, with the exception of two of Roanoke's four wells. These two wells are drilled into shallow unconfined aquifers. The high recharge rate found in these unconfined aquifers and the presence of two deep wells have generally helped prevent water shortages during drought.

While the participating jurisdictions are less vulnerable to drinking water shortages, a prolonged drought or a series of droughts in close succession do have the potential to impact water levels in aquifers used for individual drinking water wells in rural areas. This is because individual (private) water wells tend to be shallower than municipal (public) water wells.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the County, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is low.

Are existing buildings, infrastructure and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling. Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid infrastructure, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in the aquifer's water level can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought or a series of droughts occur. Effective mitigation measures include drilling additional, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is low, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the County are no more vulnerable to drought than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. Since a large portion of the County is involved in farming activities, it is likely that there will be future dollar losses to drought. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

3.6.3 PEORIA COUNTY (INCLUDING THE PARTICIPATING MUNICIPALITIES)

HAZARD PROFILE

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

> **Drought Fast Facts – Occurrences**
>
> Number of Drought Events Reported (1983 – 2017): ***6***

According to NOAA's Storm Events Database, the Illinois State Water Survey, IEMA and the USDA there have been six drought events reported for Peoria County (including the participating municipalities) between 1983 and 2017. The following provides a summary of these previous occurrences as well as the extent or severity of each event.

- In 1983, all 102 Illinois counties were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. USDA crop yield statistics indicates that soybean and corn yields were 16.9% to 48.5% lower than the previous year.
- In 1988, approximately half of all Illinois counties (including Peoria County) were impacted by drought conditions, although none of the counties were proclaimed state disaster areas. Lower than normal precipitation levels were recorded between April and June and unusually dry weather conditions persisted throughout the summer months. Soybean and corn yields were 23.8% to 48.3% lower than the previous year, according to USDA crop yield statistics.
- In 2005, drought conditions impacted much of the State, including Peoria County. A dry winter and spring developed into drought conditions by the beginning of June. On June 7, 2005 Peoria County was designated as D1 – moderate drought and upgraded to D2 – severe drought on June 21, 2005. Two weeks later the County was classified as D3 – extreme drought. Drought conditions for most of the County were downgraded to D2 – severe drought on September 20, 2005. Severe to moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry April 18, 2006. All designations were removed on May 2, 2006.
- On July 27, 2005 the USDA designated 93 counties in Illinois, including Peoria County, as primary natural disaster areas due to the damage and losses caused by drought. According to USDA crop yield statistics, soybean and corn yields were 18.2% to 38.0% lower than the previous year.
- In 2011, drought conditions impacted portions of the state. On August 30, 2011 the southern half of Peoria County was designated at D1 – moderate drought. Drought conditions for the entire County were downgraded to D0 – abnormally dry on September 27, 2011. All designations were removed on November 15, 2011.

  On November 2, 2011 the USDA designated 44 counties in Illinois as primary natural disaster areas due to losses caused by drought and excessive heat. While Peoria County was not one of the designated counties, it did qualify for natural disaster assistance because it was contiguous to the disaster area. USDA Crop yield statistics did not show any significant yield reductions for either corn or soybean from the previous year as a result of this event.

- In 2012, drought conditions impacted all of Illinois and most of the Midwest. On June 12, 2012 the southern half of Peoria County was designated as D1 – moderate drought and the entire County was upgraded to D2 – severe drought on July 17, 2012 due to an abnormally warm and dry spring. Three weeks later on August 7, 2012 the County was classified as D3 – extreme drought due to the continued hot and dry conditions. Dredging was necessary on the Illinois River south of the Peoria Lock & Dam to keep the channel clear for barge traffic due to low river levels.

  Extreme drought conditions continued through August before being downgraded to D2 – extreme drought on September 4, 2012 due to beneficial rainfall from the remnants of Hurricane Isaac. On October 30, 2012 the County was downgraded to D1 – moderate drought. Moderate drought conditions continued through the fall and winter before being downgraded to D0 – abnormally dry on February 5, 2013. All designations were removed on March 12, 2013.

  Crop stress was extreme for corn and soybeans during this event. On August 1, 2012 the USDA designated 66 counties in Illinois, including Peoria County, as primary natural disaster areas due to damage and losses caused by drought and excessive heat. According to USDA crop yield statistics, corn and soybean yields were 4.1% to 6.7% lower than the previous year.

- In 2013, a "flash drought" impacted central Illinois. While droughts typically develop slowly, a "flash drought" happens within weeks rather than months. Unusually dry conditions began in early August and extended into September resulting in rainfall deficits. On August 27, 2013 Peoria County was designated as D1 – moderate drought and upgraded to D2 – severe drought on September 24, 2013. Despite near normal rainfall amounts in October, cumulative deficits remained unchanged. The County was downgraded to D1 – moderate drought on November 5, 2013. A week later a majority of the County has all designations removed. Abnormally dry conditions persisted along the western and southern edges through the winter. It wasn't until February 25, 2014 that all drought designations were removed.

  Given the timing of this "flash drought", no significant crop stress or reductions in yields were reported. USDA crop yield statistics for Peoria County did show a 5.7% reduction in soybean yields from the previous year.

The Illinois State Water Survey records indicate that droughts also occurred in the region in 1931, 1934, 1936 and 1954; however, the extent to which Peoria County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County, including the participating municipalities. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Peoria County's hazard rating for drought as "Elevated."

What is the probability of future drought events occurring?

Peoria County (including the participating municipalities) has experienced six droughts between 1983 and 2017. With six occurrences over 35 years, the probability or likelihood that the County may experience a drought in any given year is 17.1%. However, if earlier recorded droughts are factored in, then the probability that Peoria County may experience a drought in any given year decreases to 12.5%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of the participating municipalities are vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provide protection for any area within the County. Since 2008, Peoria County (including the participating municipalities) has experienced three droughts.

What impacts resulted from the recorded drought events?

Damage information was either unavailable or none was recorded for any of the six drought events experienced between 1983 and 2017 within the participating municipalities.

No injuries or fatalities were reported as a result of any of the recorded drought events in the participating Peoria County municipalities.

Drought Fast Facts – Impacts/Risk

Drought Impacts
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilites Damage*: ***n/a***

Drought Risk/Vulnerability to:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. According to the Illinois Environmental Protection Agency's Source Water Assessment Program, ***three of the participating municipalities rely, in part, on surface water sources*** for their drinking water supplies. Bartonville, Hanna City and Peoria all purchase drinking water from the Illinois American Water Company (IAWC). IAWC draws water from the Illinois River through one surface water intake and utilizes 14 shallow sand and gravel located in three separate well fields to supply drinking water to its customers. Approximately 60 percent of the water is groundwater and 40 percent is surface water.

While these participants receive a portion of their drinking water from a surface water source, their vulnerability to drought is partially limited due to the surface water/groundwater combination. However, they are still more vulnerable than communities that rely solely on deep wells to shortages as a result of a prolonged drought or a series of droughts in close succession. The remaining two participating municipalities, Chillicothe and Peoria Heights, obtain their water from relatively shallow sand and gravel aquifers.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the municipalities, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is low.

Are existing buildings, infrastructure and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in the participating municipalities are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling. Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid infrastructure, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in the aquifer's water level can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought or a series of droughts occur. Effective mitigation measures include drilling additional, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is low, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the participating municipalities are no more vulnerable to drought than the existing building, infrastructure and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

3.7 LANDSLIDES

HAZARD IDENTIFICATION

What is the definition of a slope?

A slope generally refers to any natural or artificial incline of the earth's surface.

What is the definition of a landslide?

A landslide or slope failure is the mass downward and outward movement of slope-forming materials such as rock, soil, artificial fill, organic matter, debris or a combination of these that occurs under the force of gravity. Depending on the type of landslide, it can move rapidly damaging roads and homes or develop slowly causing gradual damage that may occur over months and even years.

How are landslides classified?

Landslides are classified by: 1) the type of slope movement and 2) the slope material involved and include rock falls, rock slides, debris flows, mudflows, debris avalanches, earth flows and debris slides.

<u>*Slope Movement*</u>

Slope movements include falls, topples, slides, spreads and flows. The following provides a brief description of each.

- ***Falls*** occur when masses of rock or other material become detached from steep slopes or cliffs and descend by free-falling, bouncing or rolling.
- ***Topples*** consist of forward rotation of rocks or other material about a pivot point on a slope. Toppling can be driven by gravity or by fluids (water or ice) in cracks.
- ***Slides*** involve the downslope movement of rock or other material along one or more distinct zones of weakness that separate the slide material from more stable underlying material. The two major types of slides are rotational and transitional.
- ***Spreads*** usually occur on very gentle slopes or essentially flat terrain where a stronger upper layer of rock or soil moves above an underlying softer, weaker layer. In some cases, the stronger upper layer will subside into the weaker underlying layer. The failure is caused by liquefaction and usually triggered by rapid ground motion, such as that experienced during an earthquake.
- ***Flows*** are distinguished from slides by high water content and have a velocity resembles that of a viscous liquid. There are five basic categories of flows: debris flow, debris avalanche, earthflow, mudflow and creep.

A combination of two or more of the main types of slope movement is referred to as a "complex movement."

Slope Material
The slope material in a landslide is either rock, soil or both. Soil is further classified as "debris" if it is composed of predominantly course fragments or "earth" if it is composed of sand-sized or finer particles.

What causes a landslide?

Landslides can have multiple causes, both natural and man-made. In terms of natural factors, topography, geology and precipitation play an important role in the formation of landslides. Frequently landslides occur when soil is saturated from heavy rain or snowmelt. Landslides can also be initiated in slopes already on the verge of movement by changes in water levels, stream erosion, bedrock fracturing, freeze-thaw cycles, tree root growth, changes in ground water, earthquakes and volcanic activity.

Man-made factors that can contribute to landslides include mining operations, excavation of a slope or its toe for building purposes, loading of a slope or its crest related to construction activities, deforestation, artificial vibrations, irrigation and water leakage from utilities. Individuals seeking unique views of rivers, valleys and lakes can also contribute to landslides by building on land that might have been better left to agriculture, open-space or other uses than for dwellings. The construction of homes on slopes that overwhelm the underlying support material have resulted in landslides. This activity is also referred to as overloading the top of the slope. This type of problem involving residential construction has occurred in Lake County along Lake Michigan and in LaSalle County along the Illinois River.

Where do landslides occur?

Landslides typically start on steep hillsides (slopes) and are primarily associated with mountainous regions, although they can also occur in areas of generally low relief. In low-relief areas, landslides occur in cut-and-fill area associated with roadways and building excavations, along river bluffs, and at quarries and open-pit mines.

Landslides occur in all 50 states, including Illinois. In Illinois, landslides primarily occur in areas adjacent to major rivers and lakes where there are bluffs, hills and valleys. Areas most vulnerable to landslides include the upper Mississippi River, the lower Mississippi River, the middle portion of the Illinois River (roughly covering the area from LaSalle County to Mason County), and the bluff areas along Lake Michigan.

3.7.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of steep slope areas (slopes 25% and steeper), identifies past occurrences of landslides, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any steep slope areas located in the County?

Yes. According to the *Ravine Overlay District Ordinance Report Summary* prepared by the Tri-County Regional Planning Commission in 2005, there are steep slope areas (slopes of 25% or greater) located in Tazewell County. These areas are primarily associated with the Illinois and Mackinaw Rivers and their tributaries. **Figure 189** illustrates the location of these steep slope areas.

When have landslides occurred previously? What is the extent of these previous landslides?

Landslide Fast Facts – Occurrences

Number of Landslide Events Reported: ***4***

Probability of Future Landslide Events: ***Low to Medium***

No comprehensive, publicly-accessible database detailing landslide occurrences currently exists in Illinois. A review of the Illinois State Geologic Survey's 1985 *Landslide Inventory of Illinois*, local newspaper articles and discussions with MAC members documented four landslide events in Tazewell County between 1995 and 2017. All of the events occurred during the spring. The following provides a brief description of each event.

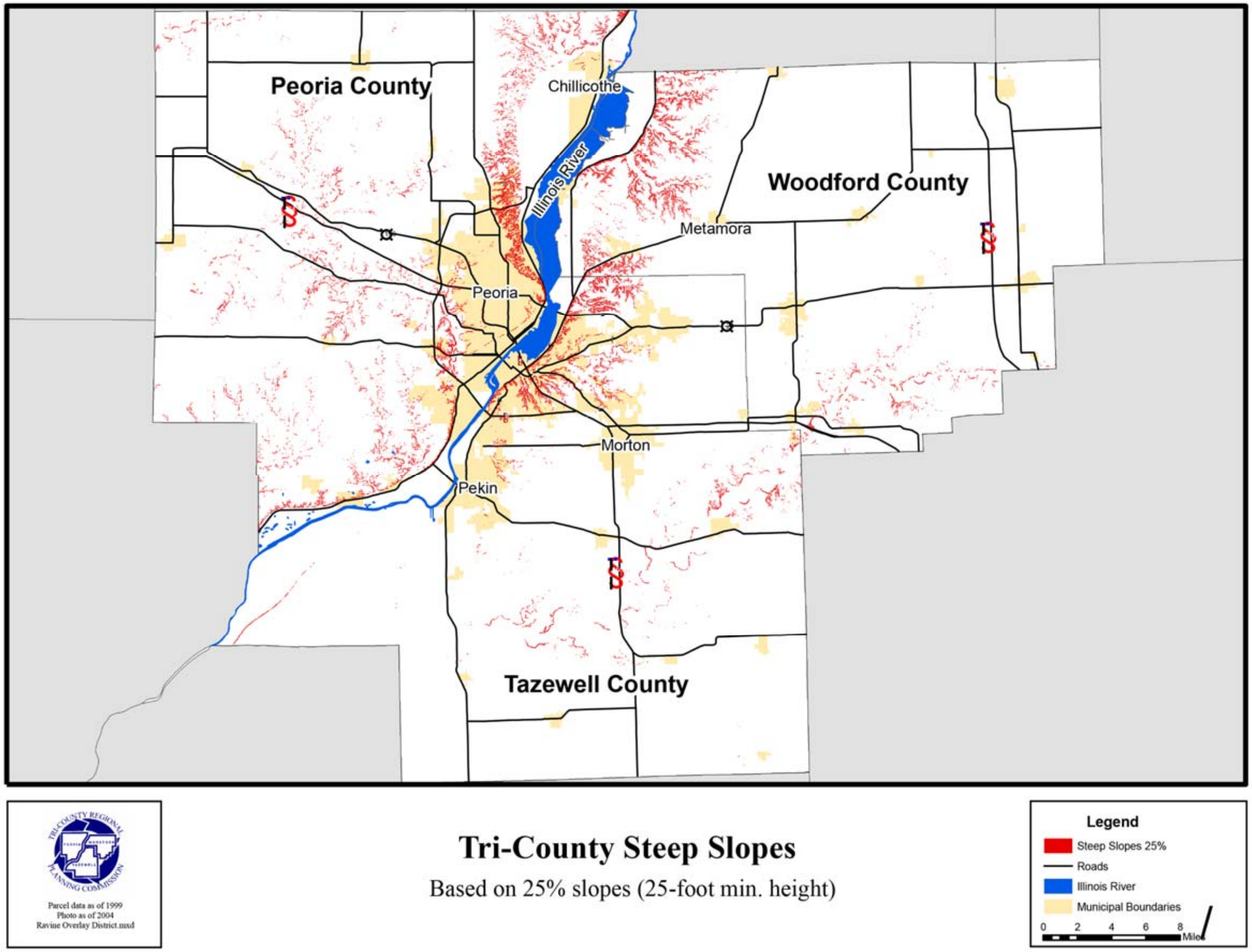
- On May 11, 1995 a mudslide crashed into The Meadows apartment complex in East Peoria. The complex is located at the foot of a steep cliff that was topped by a construction site. Residents reported hearing a loud boom about 5:30 a.m. and waking to find their apartments torn apart. Three apartments were heavily damaged with one engulfed in mud. The mudslide also cut the power and gas lines to the building.
- On April 18, 2013 a landslide caused by heavy rain resulted in the immediate evacuation of four houses in the Pinecrest Hills subdivision of East Peoria. An additional three houses were later evacuated and all of the houses were deemed too dangerous to be inhabited. The backyards of some of the houses slid to the bottom of a steep ravine behind the properties, leaving the structures teetering on the edge of a steep and potentially compromised hillside. The houses were demolished in 2017 and the area graded and fenced.

  During the same heavy rain event a mudslide was reported along the western bluffs of the Illinois River in East Peoria, damaging a gas station and covering US Route 150 with several inches of mud.
- Sometime during the spring of 2018, a landslide occurred in an inaccessible ravine in East Peoria damaging a sewer trunk line and causing a sewage leak. The damage was not discovered until mid-summer.

What locations are affected by landslides?

The topography and geologic materials within the State greatly limit the locations where landslides can occur. In Tazewell County, the bluffs of the Illinois River floodplain located along the western edge of the County from Pekin northward to the Tazewell/Woodford County line and areas surrounding the Mackinaw River floodplain in the central and eastern parts of the County are the most likely locations affected by landslides.

Figure 189
Steep Slopes in the Tri-County Area



What is the probability of future landslide events occurring?

Tazewell County has experienced four verified landslides between 1995 and 2017. With four occurrences over the past 23 years, the probability or likelihood that Tazewell County may experience a landslide event in any given year is 17%. There are almost certainly gaps in the landslide data that distort this probability. It is likely given the topography of the area that additional landslides have occurred in areas that are either inaccessible or have had little impact. As a result, it is estimated that the probability of future landslide events occurring is ***low to medium***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from landslides.

Are the participating jurisdictions vulnerable to landslides?

Yes. Portions of East Peoria, Morton, Pekin, Washington and unincorporated Tazewell County are vulnerable to the dangers presented by landslides. None of the rest of the participating municipalities are considered vulnerable.

What impacts resulted from the recorded landslide events?

Damage information was only available for one of the four events experienced between 1995 and 2017. According to the East Peoria Director of Public Works, the repairs to the sewer truck line damaged in the 2018 landslide cost an estimated $14,422. Damage information was either unavailable or for the remaining three events.

While damage information was unavailable for the 2013 landslide events, news articles reported that the seven houses demolished as a result of the landslide in the Pinecrest Hills subdivision ranged in value from $160,000 to $212,000.

Newspaper articles documented one fatality as a result of the 1995 mudslide. A 34-year old woman was buried under four feet of mud and debris in her apartment. No other injuries or fatalities were reported.

Landslides Fast Facts – Impacts/Risk

Landslides Events

- Total Property Damage: ***$14,422***
- Infrastructure/Critical Facilities Damage*: ***$14,422***
- Fatalities: ***1***
- Injuries: ***n/a***

Landslide Risk/Vulnerability to:

- Public Health & Safety – Steep Slope Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low to Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

In comparison, the United States averages an estimated $3.5 billion in property damage losses and between 25 and 50 fatalities annually due to landslides according to the United States Geological Survey.

What other impacts can result from landslides?

Landslides have the potential to impact not only human life and public safety but they also have the potential to damage or destroy buildings and infrastructure. Depending on the type of landslide, there may be little if any warning an event is about to occur. Individuals caught in a landslide, especially motorists, face potential injury or loss of life.

Property owners seeking views of valleys, rivers and lakes have built in vulnerable locations and experienced damage as the slope they built on slumps, impacting their foundation and potentially carrying away their home. Buildings downslope from a landslide face the threat of structural damage, if not complete destruction. In addition to structural damage, a landslide can also cause serious damage to a building's content.

Infrastructure is also vulnerable to landslides. Electrical, water, gas and sewer lines can be weakened or broken during an event resulting in disruptions to vital services. A major concern associated with landslides is damage sustained to transportation systems, both highway and rail. At the very least, landslides can disrupt the flow of traffic, resulting in delays and adverse travel until the material is removed. These disruptions have the potential to impact emergency services (ambulance, fire and police) along with school bus routes and business traffic. Road and rail beds can be weakened or completely undermined by landslides which can lead to the indefinite closure of those facilities while repairs are made.

In addition to impacting the human environment, landslides can affect the natural environment. The material carried along by landslides can fill drainage ditches, streams and creeks causing drainage and flooding problems. The force of a landslide can cave in stream banks, uproot trees and shrubs and negatively impact wildlife.

What is the level of vulnerability to public health and safety from landslides?

For Tazewell County the risk or vulnerability posed by landslides to public health and safety is considered to be low to medium for steep slope areas as described previously and low for all other areas of the County. This assessment is based on the fact that most landslides that occur in Illinois are not life-threatening nor are they considered to be severe in comparison to landslides that occur in other parts of the country. In addition, the number of injuries and fatalities recorded is low.

Are existing buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. Buildings, infrastructure and critical facilities located within steep slope areas are vulnerable to landslides. Currently, only East Peoria has a steep slope ordinance in place that will likely lessen the vulnerability of those buildings and critical facilities built since it was enacted in 2006. None of the other participating jurisdictions have specific regulations for building practices within steep slope areas. This means existing buildings in steep slope areas may be more vulnerable to landslides.

In addition to impacting structures, landslides primarily damage roads, bridges and utilities. Roadways, culverts and bridges can be damaged by landslides and even destroyed if the landslide occurs directly next of them. Water, sewer, gas, power and communication lines, both above and below ground, are also vulnerable to landslides. Depending on the location of the landslide, water, sewer, gas and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the extent of the development and infrastructure in the vicinity of the steep slopes, soil stability and weather conditions. When these factors are taken into consideration, the overall risk posed by landslides to vulnerability to buildings, infrastructure and critical facilities in Tazewell County is considered to be low to medium for steep slope areas and low for all other areas in the County.

Are future buildings, infrastructure and critical facilities vulnerable to landslides?

Yes and No. While East Peoria has a steep slope ordinance in place that will likely less the vulnerability of new buildings and critical facilities to damage from landslides, the County and the other three municipalities vulnerable to landslides do not. As a result, any future buildings and critical facilities built on steep slope areas in these jurisdictions are vulnerable to landslides.

Infrastructure such as roadway and communication, power and sewer lines built in steep slope areas will continue to be vulnerable as long as specific building regulations are not enacted. Future buildings, infrastructure and critical facilities in these areas will face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from landslides?

Unlike other hazards, there are no standard loss estimation models or methodologies for landslides. Given the lack of recorded events and unpredictability of landslides, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures. However, those housing units near steep slope areas have the potential to experience future dollar losses from landslides.

3.7.2 WOODFORD COUNTY

HAZARD PROFILE

The following details the location of steep slope areas (slopes 25% and steeper), identifies past occurrences of landslides, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any steep slope areas located in the County?

Yes. According to the *Ravine Overlay District Ordinance Report Summary* prepared by the Tri-County Regional Planning Commission in 2005, there are steep slope areas (slopes of 25% or greater) located in Woodford County. These areas are primarily associated with the Illinois and Mackinaw Rivers and their tributaries. **Figure 189** illustrates the location of these steep slope areas.

When have landslides occurred previously? What is the extent of these previous landslides?

No comprehensive, publicly-accessible database detailing landslide occurrences currently exists in Illinois. A review of the Illinois State Geologic Survey's (ISGS's) 1985 *Landslide Inventory of Illinois*, local newspaper articles and discussions with MAC members documented one landslide event in Woodford County. A natural earth slump occurred north of Congerville prior to 1985. Information on the date this event occurred was unavailable.

Landslide Fast Facts – Occurrences

Number of Landslide Events Reported: ***1***

Probability of Future Landslide Events: ***Low***

What locations are affected by landslides?

The topography and geologic materials within the State greatly limit the locations where landslides can occur. In Woodford County, the bluffs of the Illinois River floodplain located along the western edge of the County from the Woodford/Tazewell County line to the Woodford/Marshall County line and areas surrounding the Mackinaw River floodplain in the southern part of the County are the most likely locations affected by landslides.

What is the probability of future landslide events occurring?

Given the limited amount of data available, it is difficult to specifically establish the probability of a future landslide. However, if factors such as the extent of the development and infrastructure in the vicinity of steep slope areas, soil stability and weather events are taken into consideration, then the probability is estimated to be ***Low***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from landslides.

Are the participating jurisdictions vulnerable to landslides?

Yes. Portions of unincorporated Woodford County are vulnerable to the dangers presented by landslides. None of the participating municipalities are considered vulnerable.

What impacts resulted from the recorded landslide events?

Damage information was either unavailable or none was recorded for the single recorded event. No injuries or fatalities were reported as a result this event either.

In comparison, the United States averages an estimated $3.5 billion in property damage losses and between 25 and 50 fatalities annually due to landslides according to the United States Geological Survey.

Landslides Fast Facts – Impacts/Risk

Landslides Events
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Landslide Risk/Vulnerability to:
- Public Health & Safety – Steep Slope Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low to Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from landslides?

Landslides have the potential to impact not only human life and public safety but they also have the potential to damage or destroy buildings and infrastructure. Depending on the type of landslide, there may be little if any warning an event is about to occur. Individuals caught in a landslide, especially motorists, face potential injury or loss of life.

Property owners seeking views of valleys, rivers and lakes have built in vulnerable locations and experienced damage as the slope they built on slumps, impacting their foundation and potentially carrying away their home. Buildings downslope from a landslide face the threat of structural damage, if not complete destruction. In addition to structural damage, a landslide can also cause serious damage to a building's content.

Infrastructure is also vulnerable to landslides. Electrical, water, gas and sewer lines can be weakened or broken during an event resulting in disruptions to vital services. A major concern associated with landslides is damage sustained to transportation systems, both highway and rail. At the very least, landslides can disrupt the flow of traffic, resulting in delays and adverse travel until the material is removed. These disruptions have the potential to impact emergency services (ambulance, fire and police) along with school bus routes and business traffic. Road and rail beds can be weakened or completely undermined by landslides which can lead to the indefinite closure of those facilities while repairs are made.

In addition to impacting the human environment, landslides can affect the natural environment. The material carried along by landslides can fill drainage ditches, streams and creeks causing drainage and flooding problems. The force of a landslide can cave in stream banks, uproot trees and shrubs and negatively impact wildlife.

What is the level of vulnerability to public health and safety from landslides?

For Woodford County the risk or vulnerability posed by landslides to public health and safety is considered to be low to medium for steep slope areas as described previously and low for all other areas of the County. This assessment is based on the fact that most landslides that occur in Illinois are not life-threatening nor are they considered to be severe in comparison to landslides that occur in other parts of the country. In addition, the number of injuries and fatalities recorded is low.

Are existing buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. Buildings, infrastructure and critical facilities located within steep slope areas are vulnerable to landslides. Currently, there are no specific regulations for building practices within steep slope areas in Woodford County. This means existing buildings as well as buildings in steep slope areas may be more vulnerable to landslides.

In addition to impacting structures, landslides primarily damage roads, bridges and utilities. Roadways, culverts and bridges can be damaged by landslides and even destroyed if the landslide occurs directly next of them. Water, sewer, gas, power and communication lines, both above and below ground, are also vulnerable to landslides. Depending on the location of the landslide, water, sewer, gas and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the extent of the development and infrastructure in the vicinity of the steep slopes, soil stability and weather conditions. When these factors are taken into consideration, the overall risk posed by landslides to vulnerability to buildings, infrastructure and critical facilities in Woodford County is considered to be low to medium for steep slope areas and low for all other areas in the County.

Are future buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. None of the participating jurisdictions have steep slope ordinances in place that will likely less the vulnerability of new buildings and critical facilities to damage from landslides. Any future buildings and critical facilities built within steep slope areas will have the same vulnerability to landslides as those of existing buildings and critical facilities described previously. Infrastructure such as roadway and communication, power and sewer lines built in steep slope areas will also continue to be vulnerable as long as specific building regulations are not enacted.

What are the potential dollar losses to vulnerable structures from landslides?

Unlike other hazards, there are no standard loss estimation models or methodologies for landslides. Given the lack of recorded events and unpredictability of landslides, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures. However, those housing units near steep slope areas have the potential to experience future dollar losses from landslides.

3.7.3 PARTICIPATING PEORIA COUNTY MUNICIPALITIES

HAZARD PROFILE

The following details the location of steep slope areas (slopes 25% and steeper), identifies past occurrences of landslides, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any steep slope areas located in the County?

Yes. According to the *Ravine Overlay District Ordinance Report Summary* prepared by the Tri-County Regional Planning Commission in 2005, there are steep slope areas (slopes of 25% or greater) located in the participating Peoria County municipalities. These areas are primarily associated with the Illinois River and its tributaries. **Figure 189** illustrates the location of these steep slope areas.

When have landslides occurred previously? What is the extent of these previous landslides?

No comprehensive, publicly-accessible database detailing landslide occurrences currently exists in Illinois. A review of the Illinois State Geologic Survey's (ISGS's) 1985 *Landslide Inventory of Illinois*, local newspaper articles, the 2010 Plan and discussions with MAC members documented six landslide events in the participating Peoria County. The following provides a brief description of each event by municipality.

> **Landslide Fast Facts – Occurrences**
>
> Number of Landslide Events Reported: ***6***
>
> Probability of Future Landslide Events: ***Low to Medium***

<u>*Peoria*</u>

- According to the ISGS ISGS's 1985 *Landslide Inventory of Illinois*, there have been two landslide events in the City. A natural earth slump occurred at the north end of the City while a man-induced rock fall occurred at the southwest end. Information on the date these events occurred was unavailable.
- On April 29, 2017 a heavy rain event caused a mudslide on Illinois Route 29 north of the McCluggage Bridge in Peoria. The mudslide closed the roadway for approximately one mile.

<u>*Peoria Heights*</u>

In 1982 a landslide occurred in Hillside Park across from 4433 Grandview Drive in Peoria Heights according to the Peoria Park District. Information on the specific date this event occurred was unavailable.

<u>*Bartonville*</u>

According to the ISGS ISGS's 1985 *Landslide Inventory of Illinois*, there have been two landslide events in the Village. A man-induced rock slump and an unclassified man-induced landslide occurred along US Route 24. Information on when these events occurred was unavailable.

What locations are affected by landslides?

The topography and geologic materials within the State greatly limit the locations where landslides can occur. In the participating Peoria County municipalities, the bluffs of the Illinois River floodplain located along the eastern edge of the County are the most likely locations affected by landslides.

What is the probability of future landslide events occurring?

Given the limited amount of data available, it is difficult to specifically establish the probability of a future landslide. However, if factors such as the extent of the development and infrastructure in the vicinity of steep slope areas, soil stability and weather events are taken into consideration, then the probability is estimated to be ***low to medium***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from landslides.

Are the participating jurisdictions vulnerable to landslides?

Yes. Portions of Bartonville, Chillicothe, Peoria and Peoria Heights are vulnerable to the dangers presented by landslides. None of the rest of the participating municipalities are considered vulnerable.

What impacts resulted from the recorded landslide events?

Damage information was either unavailable or none was recorded for any of the six events. No injuries or fatalities were reported as a result of any of the events either.

In comparison, the United States averages an estimated $3.5 billion in property damage losses and between 25 and 50 fatalities annually due to landslides according to the United States Geological Survey.

Landslides Fast Facts – Impacts/Risk

Landslides Events
- Total Property Damage: ***n/a***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Landslide Risk/Vulnerability to:
- Public Health & Safety – Steep Slope Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low to Medium***

* Infrastructure/Critical Facilities Damage totals are included in the Total Property Damage amounts.

What other impacts can result from landslides?

Landslides have the potential to impact not only human life and public safety but they also have the potential to damage or destroy buildings and infrastructure. Depending on the type of landslide, there may be little if any warning an event is about to occur. Individuals caught in a landslide, especially motorists, face potential injury or loss of life.

Property owners seeking views of valleys, rivers and lakes have built in vulnerable locations and experienced damage as the slope they built on slumps, impacting their foundation and potentially carrying away their home. Buildings downslope from a landslide face the threat of structural damage, if not complete destruction. In addition to structural damage, a landslide can also cause serious damage to a building's content.

Infrastructure is also vulnerable to landslides. Electrical, water, gas and sewer lines can be weakened or broken during an event resulting in disruptions to vital services. A major concern associated with landslides is damage sustained to transportation systems, both highway and rail. At the very least, landslides can disrupt the flow of traffic, resulting in delays and adverse travel until the material is removed. These disruptions have the potential to impact emergency services (ambulance, fire and police) along with school bus routes and business traffic. Road and rail beds can be weakened or completely undermined by landslides which can lead to the indefinite closure of those facilities while repairs are made.

In addition to impacting the human environment, landslides can affect the natural environment. The material carried along by landslides can fill drainage ditches, streams and creeks causing drainage and flooding problems. The force of a landslide can cave in stream banks, uproot trees and shrubs and negatively impact wildlife.

What is the level of vulnerability to public health and safety from landslides?

For the participating Peoria County municipalities, the risk or vulnerability posed by landslides to public health and safety is considered to be low to medium for steep slope areas as described previously and low for all other areas. This assessment is based on the fact that most landslides that occur in Illinois are not life-threatening nor are they considered to be severe in comparison to landslides that occur in other parts of the country. In addition, the number of injuries and fatalities recorded is low.

Are existing buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. Buildings, infrastructure and critical facilities located within steep slope areas are vulnerable to landslides. Currently, there are no specific regulations for building practices within steep slope areas in the participating municipalities. This means existing buildings as well as buildings in steep slope areas may be more vulnerable to landslides.

In addition to impacting structures, landslides primarily damage roads, bridges and utilities. Roadways, culverts and bridges can be damaged by landslides and even destroyed if the landslide occurs directly next of them. Water, sewer, gas, power and communication lines, both above and below ground, are also vulnerable to landslides. Depending on the location of the landslide, water, sewer, gas and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the extent of the development and infrastructure in the vicinity of the steep slopes, soil stability and weather conditions. When these factors are taken into consideration, the overall risk posed by landslides to vulnerability to buildings, infrastructure and critical facilities in the participating municipalities is considered to be low to medium for steep slope areas and low for all other areas.

Are future buildings, infrastructure and critical facilities vulnerable to landslides?

Yes. None of the participating municipalities have steep slope ordinances in place that will likely less the vulnerability of new buildings and critical facilities to damage from landslides. Any future buildings and critical facilities built within steep slope areas will have the same vulnerability to landslides as those of existing buildings and critical facilities described previously. Infrastructure such as roadway and communication, power and sewer lines built in steep slope areas will also continue to be vulnerable as long as specific building regulations are not enacted.

What are the potential dollar losses to vulnerable structures from landslides?

Unlike other hazards, there are no standard loss estimation models or methodologies for landslides. Given the lack of recorded events and unpredictability of landslides, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures. However, those housing units near steep slope areas have the potential to experience future dollar losses from landslides.

3.8 EARTHQUAKES

HAZARD IDENTIFICATION

What is the definition of an earthquake?

An earthquake is a sudden shaking of the ground caused when rocks forming the earth's crust slip or move past each other along a fault (a fracture in the rocks). Most earthquakes occur along the boundaries of the earth's tectonic plates. These slow-moving plates are being pulled and dragged in different directions, sliding over, under and past each other. Occasionally, as the plates move past each other, their jagged edges will catch or stick causing a gradual buildup of pressure (energy).

Eventually, the force exerted by the moving plates overcomes the resistance at the edges and the plates snap into a new position. This abrupt shift releases the pent-up energy, producing vibrations or seismic waves that travel outward from the earthquake's point of origin. The location below the earth's surface where the earthquake starts is known as the hypocenter or focus. The point on the earth's surface directly above the focus is the epicenter.

The destruction caused by an earthquake may range from light to catastrophic depending on a number of factors including the magnitude of the earthquake, the distance from the epicenter, the local geologic conditions as well as construction standards and time of day (i.e., rush hour). Earthquake damage may include power outages, general property damage, road and bridge failure, collapsed buildings and utility damage (ruptured gas lines, broken water mains, etc.).

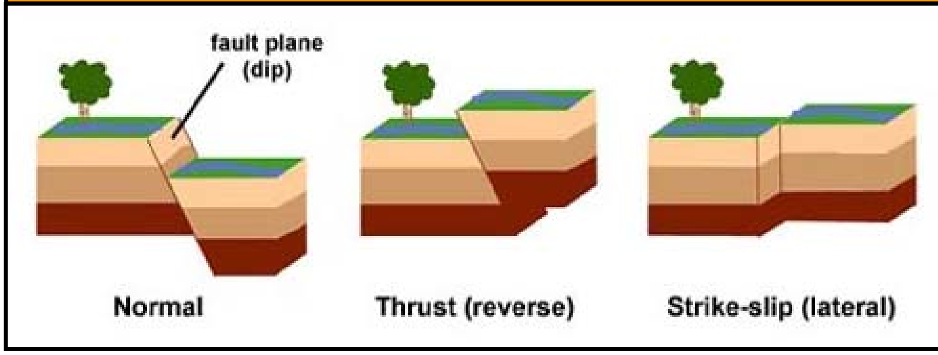
Most of the damage done by an earthquake is caused by its secondary or indirect effects. These secondary effects result from the seismic waves released by the earthquake and include ground shaking, surface faulting, liquefaction, landslides and, in rare cases, tsunamis.

According to the U.S. Geological Survey, more than 143 million Americans in the contiguous United States are exposed to potentially damaging ground shaking from earthquakes. Over 44 million of those Americans, located in 18 states, are exposed to very strong ground shaking from earthquakes. Illinois ranks 10th in terms of the number of individuals exposed to very strong ground shaking. The Federal Emergency Management Agency's HAZUS analysis indicates that the annualized earthquake losses to the national building stock is $6.1 billion per year. A majority of the average annual loss is concentrated in California ($3.7 million). The central United States (including Illinois) ranks third in annualized earthquake losses at $480 billion, behind the Pacific Northwest (Washington and Oregon) with annualized earthquake losses at $710 billion.

What is a fault?

A fault is a fracture or zone of fractures in the earth's crust between two blocks of rock. They may range in length from a few millimeters to thousands of kilometers. Many faults form along tectonic plate boundaries. Faults are classified based on the angle of the fault with respect to the surface (known as the dip) and the direction of slip or movement along the fault. There are three main groups of faults: normal, thrust (reverse) and strike-slip (lateral). **Figure 190** provides an illustration of each type of fault.

Figure 190
Fault Illustration



Source: U. S. Geological Survey.

Normal faults occur in response to pulling or tension along the two blocks of rock causing the overlying block to move down the dip of the fault plane. Most of the faults in Illinois are normal faults. Thrust or reverse faults occur in response to squeezing or compression of the two blocks of rock causing the overlying block to move up the dip of the fault plane. Strike-slip or lateral faults can occur in response to either pulling/tension or squeezing/compression causing the blocks to move horizontally past each other.

Geologists have found that earthquakes tend to recur along faults, which reflect zones of weakness in the earth's crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

What are tectonic plates?

Tectonic plates are large, irregularly-shaped, relatively rigid sections of the earth's crust that float on the top, fluid layer of the earth's mantle. There are about a dozen tectonic plates that make up the surface of the planet. These plates are approximately 50 to 60 miles thick and the largest are millions of square miles in size.

How are earthquakes measured?

The severity of an earthquake is measured in terms of its magnitude and intensity. A brief description of both terms and the scales used to measure each are provided below.

<u>*Magnitude*</u>

Magnitude refers to the amount of seismic energy released at the hypocenter of an earthquake. The magnitude of an earthquake is determined from measurements of ground vibrations recorded by seismographs. As a result, magnitude is represented as a single, instrumentally determined value. A loose network of seismographs has been installed all over the world to help record and verify earthquake events.

There are several scales that measure the magnitude of an earthquake. The most well-known is the Richter Scale. This logarithmic scale provides a numeric representation of the magnitude of an earthquake through the use of whole numbers and decimal fractions. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in ground vibrations measured. In addition, each whole number increase corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number. It is important to note that the Richter Scale is used only to determine the magnitude of an earthquake, it does not assess the damage that results.

Once an earthquake's magnitude has been confirmed, it can be classified. **Figure 191** categorizes earthquakes by class based on their magnitude (i.e., Richter Scale value). Any earthquake with a magnitude less than 3.0 on the Richter Scale is classified as a micro earthquake while any earthquake with a magnitude of 8.0 or greater on the Richter Scale is considered a "great" earthquake. Earthquakes with a magnitude of 2.0 or less are not commonly felt by individuals. The largest earthquake to occur in the United States since 1900 took place off the coast of Alaska in Prince William Sound on March 28, 1964 and registered a 9.2 on the Richter Scale.

Figure 191
Earthquake Magnitude Classes

Class	Magnitude (Richter Scale)
micro	smaller than 3.0
minor	3.0 – 3.9
light	4.0 – 4.9
moderate	5.0 – 5.9
strong	6.0 – 6.9
major	7.0 – 7.9
great	8.0 or larger

Source: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis

Intensity

Intensity refers to the effect an earthquake has on a particular location. The intensity of an earthquake is determined from observations made of the damage inflicted on individuals, structures and the environment. As a result, intensity does not have a mathematical basis; instead it is an arbitrary ranking of observed effects. In addition, intensity generally diminishes with distance. There may be multiple intensity recordings for a region depending on a location's distance from the epicenter.

Although numerous intensity scales have been developed over the years, the one currently used in the United States is the Modified Mercalli Intensity Scale. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (i.e., felt only by a few people at rest, felt quite noticeably by persons indoors, etc.)

The higher numbers of the scale are based on observed structural damage (i.e., broken windows, general damage to foundations etc.). Structural engineers usually contribute information when assigning intensity values of VIII or greater. **Figure 192** provides a description of the damages associated with each level of intensity as well as comparing Richter Scales values to Modified Mercalli Intensity Scale values.

Generally, the Modified Mercalli Intensity value assigned to a specific site after an earthquake is a more meaningful measure of severity to the general public than magnitude because intensity refers to the effects actually experienced at that location.

Figure 192
Comparison of Richter Scale and Modified Mercalli Intensity Scale

Richter Scale	Modified Mercalli Scale	Observations
1.0 – 1.9	I	Felt by very few people; barely noticeable. No damage.
2.0 – 2.9	II	Felt by a few people, especially on the upper floors of buildings. No damage.
3.0 – 3.9	III	Noticeable indoors, especially on the upper floors of buildings, but may not be recognized as an earthquake. Standing cars may rock slightly; vibrations similar to the passing of a truck. No damage.
4.0	IV	Felt by many indoors and a few outdoors. Dishes, windows, and doors disturbed. Standing cars rocked noticeably. No damage.
4.1 – 4.9	V	Felt by nearly everyone. Small, unstable objects displaced or upset; some dishes and glassware broken. Negligible damage.
5.0 – 5.9	VI	Felt by everyone. Difficult to stand. Some heavy furniture moved. Weak plaster may fall and some masonry, such as chimneys, may be slightly damaged. Slight damage.
6.0	VII	Slight to moderate damage to well-built ordinary structures. Considerable damage to poorly-built structures. Some chimneys may break. Some walls may fall.
6.1 – 6.9	VIII	Considerable damage to ordinary buildings. Severe damage to poorly built buildings. Some walls collapse. Chimneys, monuments, factory stacks, columns fall.
7.0	IX	Severe structural damage in substantial buildings, with partial collapses. Buildings shifted off foundations. Ground cracks noticeable.
7.1 – 7.9	X	Most masonry and frame structures and their foundations destroyed. Some well-built wooden structures destroyed. Train tracks bent. Ground badly cracked. Landslides.
8.0	XI	Few, if any structures remain standing. Bridges destroyed. Wide cracks in ground. Train tracks bent greatly. Wholesale destruction.
> 8.0	XII	Total damage. Lines of sight and level are distorted. Waves seen on the ground. Objects thrown up into the air.

Sources: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis.
U.S. Geological Survey.

When and where do earthquakes occur?

Earthquakes can strike any location at any time. However, history has shown that most earthquakes occur in the same general areas year after year, principally in three large zones around the globe. The world's greatest earthquake belt, the circum-Pacific seismic belt (nicknamed the "Ring of Fire"), is found along the rim of the Pacific Ocean, where about 81 percent of the world's largest earthquakes occur.

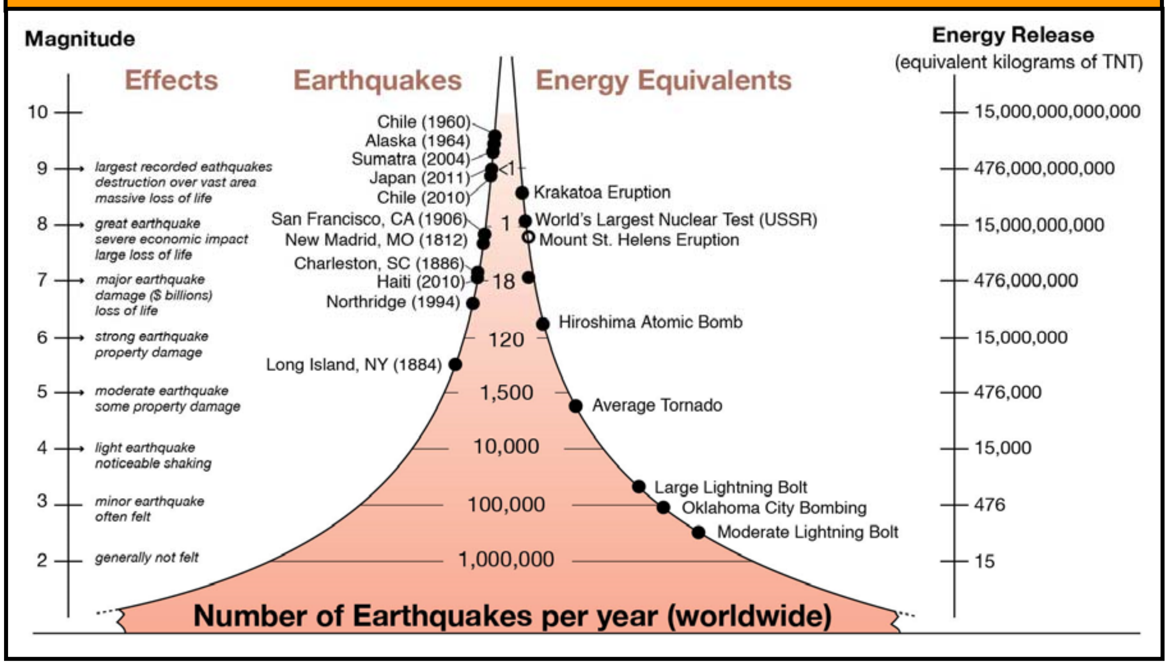
The second prominent belt is the Alpide, which extends from Java to Sumatra and through the Himalayan Mountains, the Mediterranean Sea and out into the Atlantic Ocean. It accounts for about 17 percent of the world's largest earthquakes, including those in Iran, Turkey and Pakistan. The third belt follows the submerged mid-Atlantic Ridge, the longest mountain range in the world, nearly splitting the entire Atlantic Ocean north to south.

While most earthquakes occur along plate boundaries some are known to occur within the interior of a plate. (As the plates continue to move and plate boundaries change over time, weakened boundary regions become part of the interiors of the plates.) Earthquakes can occur along zones of weakness within a plate in response to stresses that originate at the edges of the plate or from deep within the earth's crust. The New Madrid earthquakes of 1811 and 1812 occurred within the North American plate.

How often do earthquakes occur?

Earthquakes occur every day. Magnitude 2 and smaller earthquakes occur several hundred times a day worldwide. These earthquakes are known as micro earthquakes and are generally not felt by humans. Major earthquakes, greater than magnitude 7, generally occur at least once a month. **Figure 193** illustrates the approximate number of earthquakes that occur worldwide per year based on magnitude. This figure also identifies manmade and natural events that release approximately the same amount of energy for comparison.

Figure 193
Approximate Number of Earthquakes Recorded Annually



Source: Incorporated Research Institutions for Seismology, Education and Outreach Series, "How Often Do Earthquakes Occur?"

3.8.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of known fault zones and geologic structures, identifies past occurrences, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

No. There are no known faults or geologic structures located in Tazewell County. However, there is one known geological structure in the immediate region, the La Salle Anticlinorium. The La Salle Anticlinorium is composed of a group or zone of closely related anticlines, domes, monoclines and synclines, several of which are individually named. In 2004 an earthquake was recorded along one of the Anticlinorium's monoclines in LaSalle County. **Figure 194** illustrates the location of this geologic structure.

Figure 194
Geological Structures in Central Illinois

Source: Illinois State Geological Survey.

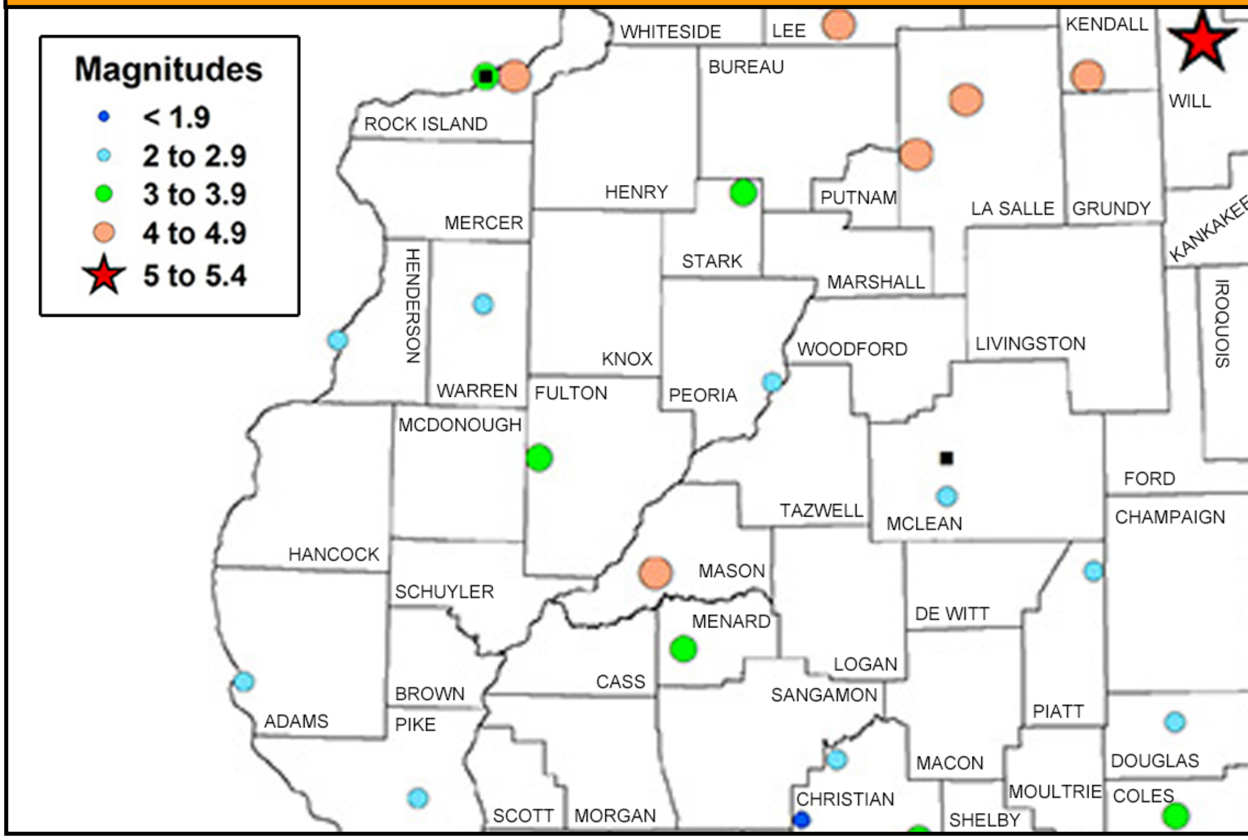
When have earthquakes occurred previously? What is the extent of these previous quakes?

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2015): ***0***
Fault Zones Located within the County: ***None***
Earthquakes Originating in nearby Counties (1795-2015): ***5***
Fault Zones Located in Nearby Counties: ***None***

According to the Illinois State Geological Survey (ISGS) *Earthquakes of Illinois: 1795 – 2015* map, no earthquakes have originated in Tazewell County during the last 200 years. While no earthquakes have originated in the County, residents have felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description, by region, of these events. **Figure 195** illustrates the epicenters of nearby earthquakes.

Figure 195
Earthquakes Originating in Tazewell County



Source: Illinois State Geological Survey.

Central Illinois

Five earthquakes have originated in nearby Fulton, Mason, Peoria and McLean Counties. The following provides a brief description of each. Damage information was unavailable for either event.

- An estimated magnitude 3.7 earthquake originated in Fulton County just west of Marietta on March 13, 1956.

- On July 19, 1909 an earthquake with an estimated magnitude of 4.5 originated in Mason County approximately three miles north-northeast of Kilbourne.
- An earthquake originated in downtown Peoria in Peoria County on June 29, 1937 and was originally estimated as a magnitude 3.0; however, ISGS re-evaluated this event and determined that it was between a 2.0 and 2.9 magnitude earthquake.
- An estimated magnitude 3.4 earthquake originated approximately four miles south of Bloomington in unincorporated McLean County on December 27, 1885
- On February 4, 1883 an earthquake of undetermined magnitude originated at Normal in McLean County.

Southeastern Illinois

Tazewell County residents also felt ground shaking caused by several earthquakes that have originated in southeastern Illinois. The following provides a brief description of a few of the larger events that have occurred.

- On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada.
- A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.
- The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the United States east of the Rockies.

Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes?

Earthquake events can affect the entire County. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Tazewell County's proximity to geologic structures and fault zones, both large and small, makes the entire area likely to be affected by an earthquake if these faults become seismically active. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Tazewell County's hazard rating for earthquakes as "guarded."

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of Tazewell County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

This vulnerability, found throughout most of Illinois and all of Tazewell County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Tazewell County would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability to:

- Public Health & Safety: Light/Moderate Quake – ***Low***
- Public Health & Safety: Major/Great Quake Wabash Valley seismic zone – ***Low/Medium***
- Public Health & Safety: Major/Great Quake New Madrid seismic zone – ***Medium***
- Buildings/Infrastructure/Critical Facilities: Light/ Moderate Quake – ***Low***
- Buildings/Infrastructure/Critical Facilities: Major/ Great Quake – ***Medium***

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Tazewell County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating municipalities to develop largely without regard to earthquake safety.

What impacts resulted from the recorded earthquake events?

While Tazewell County residents felt the earthquakes that occurred in 2008, 1987 and 1968, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Tazewell County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health and public safety. **Figure 196** details the potential impacts that may be experienced by the County should a magnitude 6.0 or greater earthquake occur in the region.

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Tazewell County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the geologic structures in the immediate region, the risk or vulnerability to public health and safety is considered low. This risk is elevated from low to low/medium for a major earthquake originating along the Wabash Valley seismic zone. Finally, if a major or great earthquake similar to those experienced in 1811 and 1812 were to occur along the New Madrid seismic zone, then the risk or vulnerability to public health and safety is elevated again to medium.

Figure 196
Potential Earthquake Impacts – Tazewell County

Direct	Indirect
Buildings • Temporary displacement of businesses, households, schools and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on Interstates, US and State Routes (especially if the quake originates along the New Madrid fault) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the County which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the New Madrid Fault) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

Are existing buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are vulnerable to damage from earthquakes. However, given the County’s size (just over 135,000 individuals), it’s population density, the fact that there are not many buildings higher than two stories (with the exception of grain elevators and several multi-story buildings in Pekin and East Peoria) and earthquakes larger than magnitude 5.0 are not expected in this region, the damage is anticipated to be slight with only superficial structure damage such as broken windows and cracks in weak plaster and masonry.

While unlikely, if a strong earthquake were to occur in the region then unreinforced masonry buildings would be most at risk because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy form an earthquake while wood buildings with proper foundation ties have rarely collapsed in earthquakes. In this scenario building damage in Tazewell County could range from moderate to considerable in well-built structures to severe in poorly -built structures.

A listing of the unreinforced masonry buildings that serve as critical infrastructure within the participating jurisdictions is not currently available. As a result, a data deficiency exists in terms of comprehensively identifying the risk by jurisdiction to infrastructure and critical facilities to a strong earthquake.

An earthquake also has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the County, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities from a light to moderate earthquake is likely to be low, while the risk from a major or great earthquake is likely to be medium.

Are future buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in Tazewell County and the participating municipalities are vulnerable to damage from earthquakes. While the County and all of the participating municipalities have building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes felt in Tazewell County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. In addition, there is insufficient data available to make useful predictions regarding potential earthquake damages through the use of computer modeling.

Given Tazewell County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

3.8.2 Woodford County

Hazard Profile

The following details the location of known fault zones and geologic structures, identifies past occurrences of earthquakes, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

No. There are no known faults or geologic structures located in Woodford County. However, there is one known geological structure in the immediate region, the La Salle Anticlinorium. The La Salle Anticlinorium is composed of a group or zone of closely related anticlines, domes, monoclines and synclines, several of which are individually named. In 2004 an earthquake was recorded along one of the Anticlinorium's monoclines in LaSalle County. **Figure 197** illustrates the location of this geologic structure.

When have earthquakes occurred previously? What is the extent of these previous quakes?

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2015): ***0***

Fault Zones Located within the County: ***None***

Earthquakes Originating in nearby Counties (1795-2015): ***5***

Fault Zones Located in Nearby Counties: ***None***

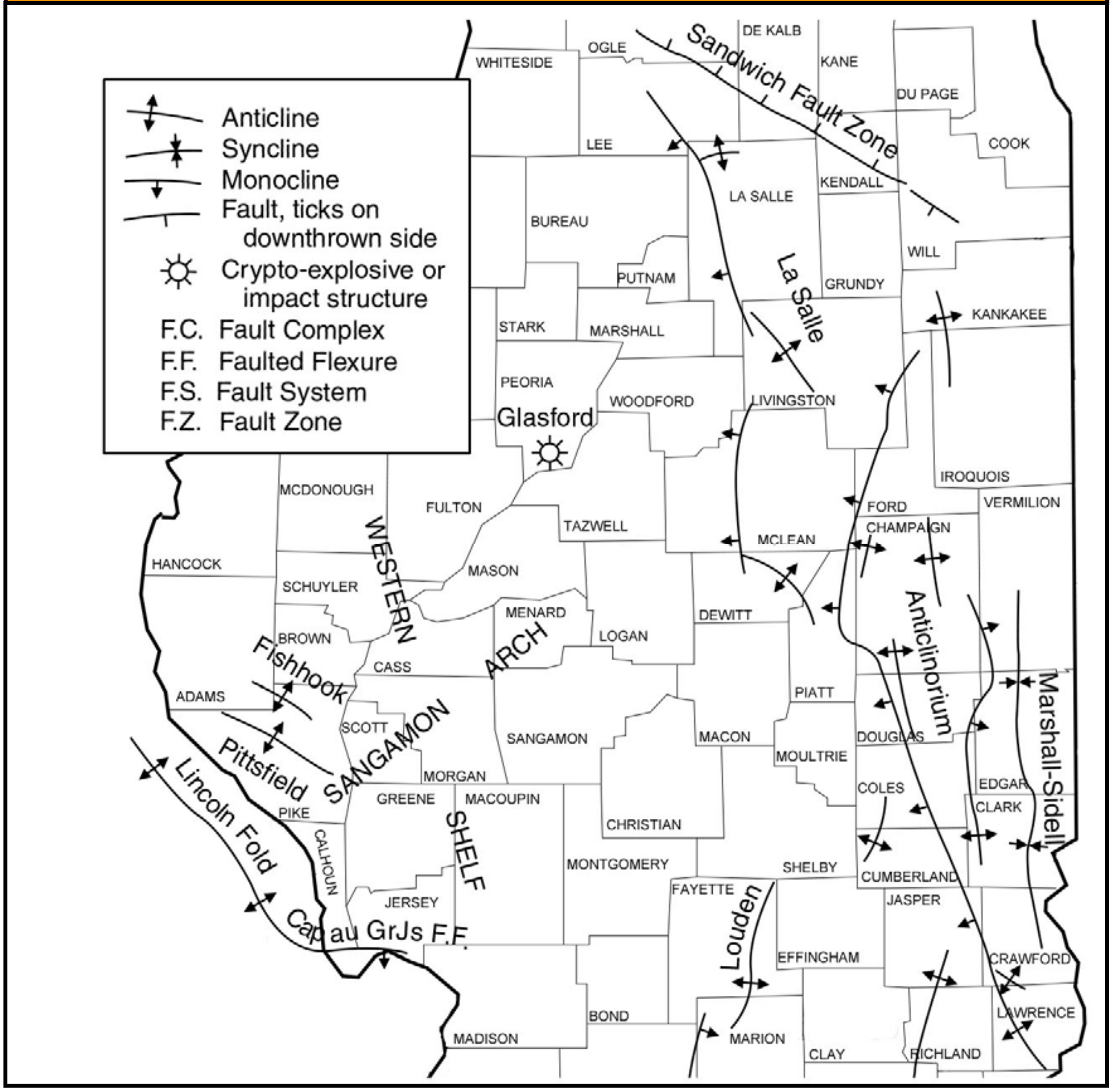
According to the Illinois State Geological Survey (ISGS) *Earthquakes of Illinois: 1795 – 2015* map, no earthquakes have originated in Woodford County during the last 200 years. While no earthquakes have originated in the County, residents have felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description, by region, of these events. **Figure 198** illustrates the epicenters of nearby earthquakes.

Central Illinois

Five earthquakes have originated in nearby LaSalle, Peoria and McLean Counties. The following provides a brief description of each. Damage information was either unavailable or none was reported for any of the events.

- On June 28, 2004 a magnitude 4.2 earthquake originated approximately eight miles northwest of Ottawa in LaSalle County. Ground shaking was felt across six states. There were no reports of significant damage.
- An earthquake originated in downtown Peoria in Peoria County on June 29, 1937 and was originally estimated as a magnitude 3.0; however, ISGS re-evaluated this event and determined that it was between a 2.0 and 2.9 magnitude earthquake.
- An estimated magnitude 3.4 earthquake originated approximately four miles south of Bloomington in unincorporated McLean County on December 27, 1885
- On February 4, 1883 an earthquake of undetermined magnitude originated at Normal in McLean County.
- An estimated magnitude 4.6 earthquake originated approximately two miles west of Oglesby in LaSalle County on May 27, 1881.

Figure 197
Geological Structures in Central Illinois



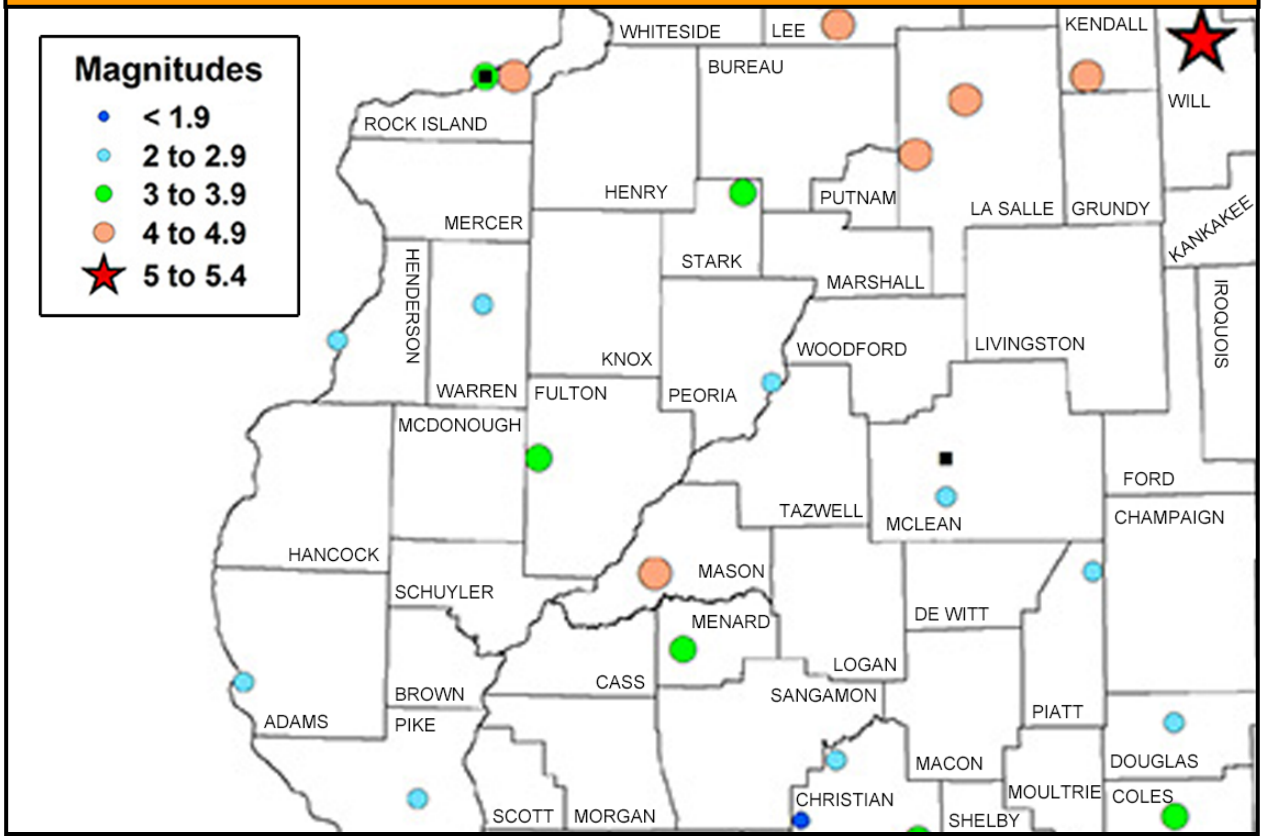
Source: Illinois State Geological Survey.

Southeastern Illinois

Woodford County residents also felt ground shaking caused by several earthquakes that have originated in southeastern Illinois. The following provides a brief description of a few of the larger events that have occurred.

- On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada.

Figure 198
Earthquakes Originating in Woodford County



Source: Illinois State Geological Survey.

- ❖ A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.

- ❖ The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the United States east of the Rockies. Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes?

Earthquake events can affect the entire County. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Woodford County's proximity to geologic structures and fault zones, both large and small, makes the entire area likely to be affected by an earthquake if these faults become seismically active. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Woodford County's hazard rating for earthquakes as "guarded."

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of Woodford County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

This vulnerability, found throughout most of Illinois and all of Woodford County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Woodford County would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Woodford County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating municipalities to develop largely without regard to earthquake safety.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability to:

- ❖ Public Health & Safety: Light/Moderate Quake – ***Low***
- ❖ Public Health & Safety: Major/Great Quake Wabash Valley seismic zone – ***Low/Medium***
- ❖ Public Health & Safety: Major/Great Quake New Madrid seismic zone – ***Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: Light/ Moderate Quake – ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities: Major/ Great Quake – j ***Medium***

What impacts resulted from the recorded earthquake events?

While Woodford County residents felt the earthquakes that occurred in 2008, 2004, 1987 and 1968, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Woodford County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health and public safety. **Figure 199** details the potential impacts that may be experienced by the County should a magnitude 6.0 or greater earthquake occur in the region.

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Woodford County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the geologic structures in the immediate region, the risk or vulnerability to public health and safety is considered low. This risk is elevated from low to low/medium for a major earthquake originating along the Wabash Valley seismic zone. Finally, if a major or great earthquake similar to those experienced in 1811 and 1812 were to occur along the New Madrid seismic zone, then the risk or vulnerability to public health and safety is elevated again to medium.

Figure 199
Potential Earthquake Impacts – Woodford County

Direct	Indirect
Buildings • Temporary displacement of businesses, households, schools and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on Interstate, US and State Routes (especially if the quake originates along the New Madrid fault) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the County which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the New Madrid Fault) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

Are existing buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are vulnerable to damage from earthquakes. However, given the County's size (just over 38,000 individuals), it's population density, the fact that there are very few buildings higher than two stories (with the exception of grain elevators and several three to four story buildings in Eureka) and earthquakes larger than magnitude 5.0 are not expected in this regions, the damage is anticipated to be slight with only superficial structure damage such as broken windows and cracks in weak plaster and masonry.

While unlikely, if a strong earthquake were to occur in the region then the unreinforced masonry buildings would be most at risk because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy from an earthquake while wood buildings with proper foundation ties have rarely collapsed in earthquakes. In this scenario buildings damage in Woodford County could range from moderate to considerable in well-built structures to severe in poorly-built structures.

A listing of the unreinforced masonry buildings that serve as critical infrastructure within the participating jurisdictions is not currently available. As a result, a data deficiency exists in terms of comprehensively identifying the risk by jurisdiction to infrastructure and critical facilities to a strong earthquake.

An earthquake has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the County, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities from a light to moderate earthquake is likely to be low, while the risk from a major or great earthquake is likely to be medium.

Are future buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in Woodford County and the participating municipalities are vulnerable to damage from earthquakes. While two of the participating municipalities have building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes felt in Woodford County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. In addition, there is insufficient data available to make useful predictions regarding potential earthquake damages through the use of computer modeling.

Given Woodford County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

3.8.3 PEORIA COUNTY (INCLUDING THE PARTICIPATING MUNICIPALITIES)

HAZARD PROFILE

The following details the location of known fault zones and geologic structures, identifies past occurrences of earthquakes, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

No. There are no known faults or geologic structures located in Peoria County. The ISGS acknowledges the presence of the Glasford Structure within the County but considers this formation a probable meteorite impact feature and not a geologic structure with the potential to cause an earthquake. There is one known geological structure in the immediate region, the La Salle Anticlinorium. The La Salle Anticlinorium is composed of a group or zone of closely related anticlines, domes, monoclines and synclines, several of which are individually named. In 2004 an earthquake was recorded along one of the Anticlinorium's monoclines in LaSalle County. **Figure 200** illustrates the location of this geologic structure.

When have earthquakes occurred previously? What is the extent of these previous quakes?

According to the Illinois State Geological Survey (ISGS) *Earthquakes of Illinois: 1795 – 2015* map, one earthquake has originated in participating Peoria County municipalities during the last 200 years. **Figure 201** illustrates the epicenter of this earthquake. On June 29, 1937 an earthquake originated in downtown Peoria and was originally estimated as a magnitude 3.0; however, ISGS re-evaluated this event and determined that it was between a 2.0 and 2.9 magnitude earthquake. Damage information was unavailable for this event.

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2015): ***1***

Fault Zones Located within the County: ***None***

Earthquakes Originating in nearby Counties (1795-2015): ***3***

Fault Zones Located in Nearby Counties: ***None***

Peoria County residents, including those in the participating municipalities, have also felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description by region, of these events.

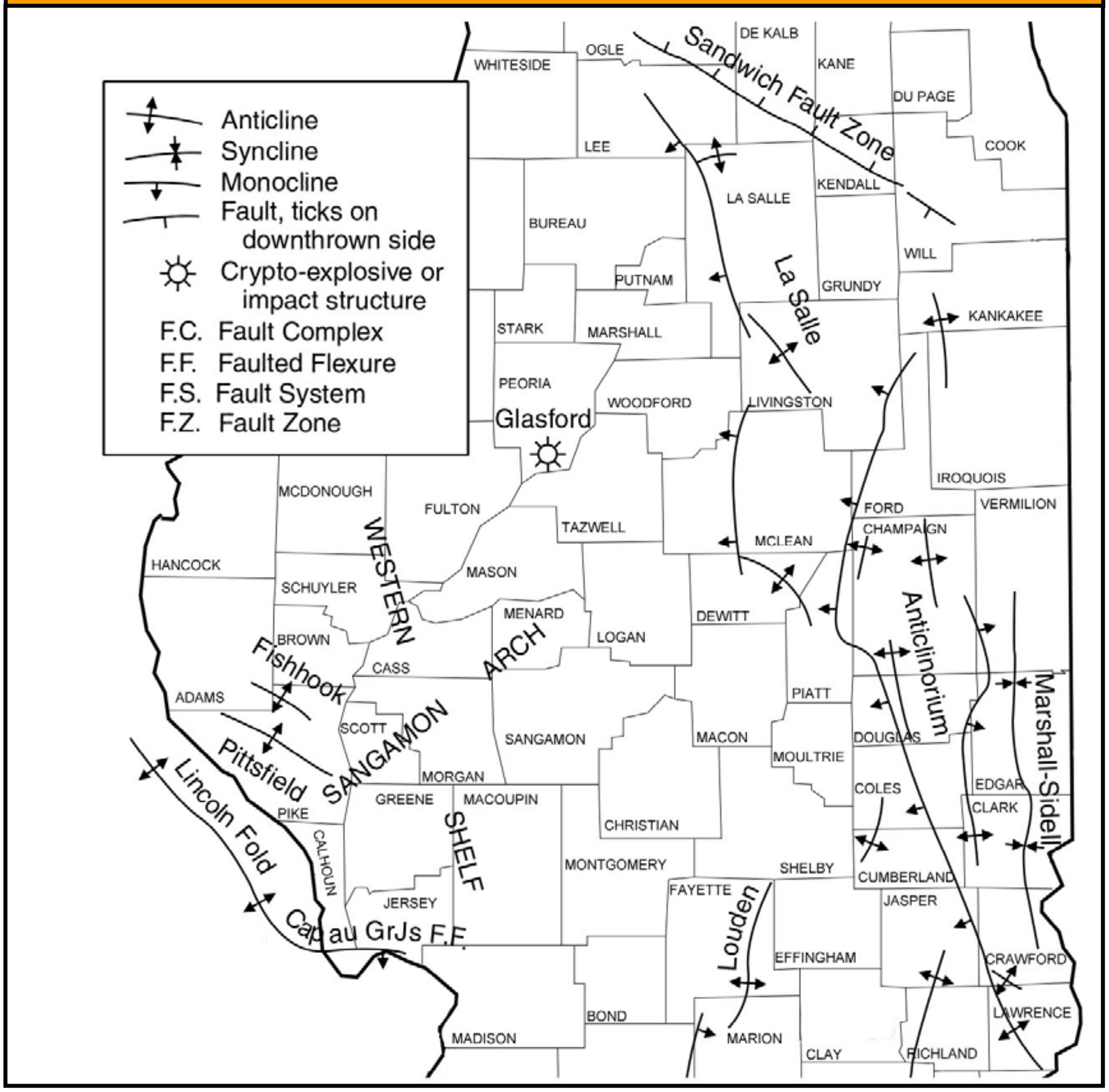
Central Illinois

Two earthquakes have originated in nearby Fulton and Stark Counties. The following provides a brief description of each. Damage information was unavailable for either event.

- An estimated magnitude 3.7 earthquake originated in Fulton County just west of Marietta on March 13, 1956.
- On March 1, 1942 an earthquake originated in Stark County approximately 2 ½ miles northwest of Bradford and was originally estimated as a magnitude 4.0; however, ISGS

re-evaluated this event and determined that it was between a 3.0 and 3.9 magnitude earthquake.

Figure 200
Geological Structures in Central Illinois



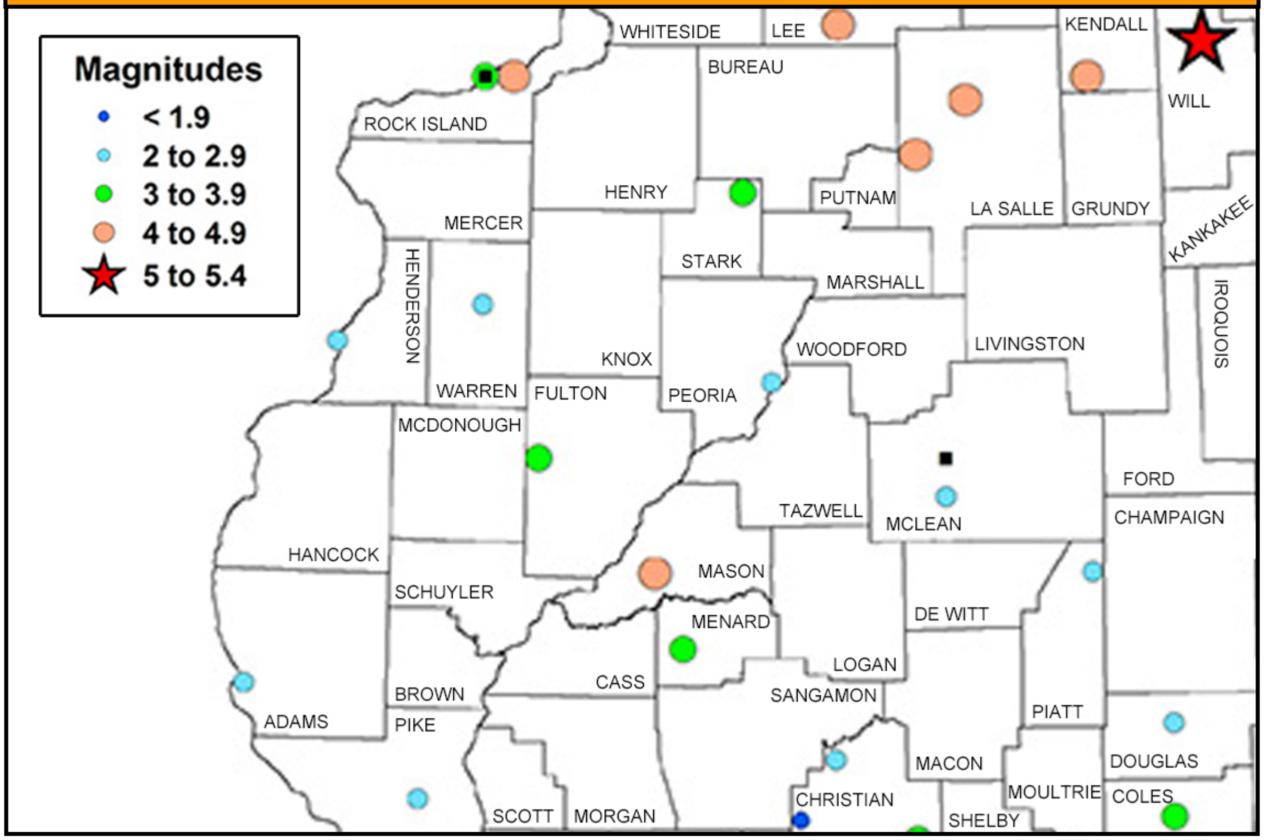
Source: Illinois State Geological Survey.

Southeastern Illinois

Peoria County residents also felt ground shaking caused by several earthquakes that have originated in southeastern Illinois.

❖ On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central United States and southern Ontario, Canada.

Figure 201
Earthquakes Originating in Peoria County



Source: Illinois State Geological Survey.

- ❖ A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.

- ❖ The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the United States east of the Rockies. Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes?

Earthquake events can affect the entire County, including the participating municipalities. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties Peoria County's proximity to geologic structures and fault zones, both large and small, makes the entire area, including the participating municipalities, likely to be affected by an earthquake if these faults become seismically active. The *2013 Illinois Natural Hazard Mitigation Plan* classifies Peoria County's hazard rating for earthquakes as "guarded."

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of participating Peoria County municipalities are vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

This vulnerability, found throughout most of Illinois and all of Peoria County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

> **Earthquake Fast Facts – Risk**
>
> Earthquake Risk/Vulnerability to:
> - Public Health & Safety: Light/Moderate Quake – ***Low***
> - Public Health & Safety: Major/Great Quake Wabash Valley seismic zone – ***Low/Medium***
> - Public Health & Safety: Major/Great Quake New Madrid seismic zone – ***Medium***
> - Buildings/Infrastructure/Critical Facilities: Light/ Moderate Quake – ***Low***
> - Buildings/Infrastructure/Critical Facilities: Major/ Great Quake – j ***Medium***

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Peoria County (including the participating municipalities) would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Peoria County is not vulnerable to damaging earthquakes. This perception has allowed the participating municipalities to develop largely without regard to earthquake safety.

What impacts resulted from the recorded earthquake events?

While Peoria County residents felt the earthquakes that occurred in 2008, 2004, 1987 and 1968, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Peoria County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health and public safety. **Figure 202** details the potential impacts that may be experienced by the participating municipalities should a magnitude 6.0 or greater earthquake occur in the region.

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Peoria County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the geologic structures in the immediate region, the risk or vulnerability to public health and safety is considered low. This risk is elevated from low to low/medium for a major earthquake originating along the Wabash Valley seismic zone. Finally, if a major or great earthquake similar to those experienced in 1811 and 1812 were to occur along the New Madrid seismic zone, then the risk or vulnerability to public health and safety is elevated again to medium.

Figure 202
Potential Earthquake Impacts – Peoria County (including the Participating Municipalities)

Direct	Indirect
Buildings • Temporary displacement of businesses, households, schools and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on Interstates, US and State Routes (especially if the quake originates along the New Madrid fault) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the participating municipalities which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the New Madrid Fault) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

Are existing buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in the participating municipalities are vulnerable to damage form earthquakes. However, given that there are no faults or geologic structures in the immediate vicinity; the fact that there are very few multi-story buildings (with the exception of downtown Peoria and the medical district); and earthquakes larger than magnitude 5.0 are not expected in the region; the damage is anticipated to be slight with only superficial structural damage such as broken windows and cracks in weak plaster and masonry.

While unlikely, if a strong earthquake were to occur in the region then unreinforced masonry buildings would be most at risk because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy form an earthquake while wood buildings with proper foundation ties rarely collapsed in earthquakes. In this scenario building damage in the participating municipalities could range from moderate to considerable in well-built structures to severe in poorly-built structures.

A listing of the unreinforced masonry buildings that serve as critical infrastructure within the participating jurisdictions is not currently available. As a result, a data deficiency exists in terms of comprehensively identifying the risk by jurisdiction in infrastructure and critical facilities to a strong earthquake.

An earthquake has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the municipalities, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities from a light to moderate earthquake is likely to be low, while the risk from a major or great earthquake is likely to be medium.

Are future buildings, infrastructure and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in the participating municipalities are vulnerable to damage from earthquakes. While all of the participating municipalities have building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes felt in the participating Peoria County municipalities, there is no way to accurately estimate future potential dollar losses to vulnerable structures. In addition, there is insufficient data available to make useful predictions regarding potential earthquake damages through the use of computer modeling.

Given Peoria County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating municipalities were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

3.9 MINE SUBSIDENCE

HAZARD IDENTIFICATION

What is a mine?

A mine is a pit or excavation made in the earth for the purpose of extracting minerals or ore. Mines were developed in Illinois to extract coal, clay, shale, limestone, dolomite, silica sand, tripoli, peat, ganister, lead, zinc and fluorite.

What is mining?

Mining is the process of extracting minerals or ore from a mine. There are two common mining methods: surface mining and sub-surface (underground) mining. This section focuses on underground mining practices since surface mining was not conducted in Tazewell County, Woodford County or any of the participating Peoria County municipalities.

Mining has long figured prominently into Illinois' history. According to the Illinois State Geological Survey (ISGS), Illinois has the third largest recoverable reserves of coal in the country, behind only Montana and Wyoming. Coal deposits can be found under 86 of the 102 counties in Illinois and underground mining operations have been conducted in at least 72 counties. **Figure 203** shows the extent of coal deposits (Pennsylvanian rocks) present in Illinois and the mined-out areas from surface and underground coal mining. In 2015, Illinois ranked fourth in the United States in coal production according to the National Mining Association.

The first commercial coal mine in Illinois is thought have started in Jackson County about 1810. Since that time, there have been more than 3,800 underground coal mines and 363 underground metal and industrial mineral mines operated in Illinois. Almost all of these mines have been abandoned over the years. According to ISGS, there were 12 active underground coal mines in Illinois in 2015. The United States Geological Survey identified 10 active metal and industrial mineral underground mines in Illinois.

What methods are used in underground mining?

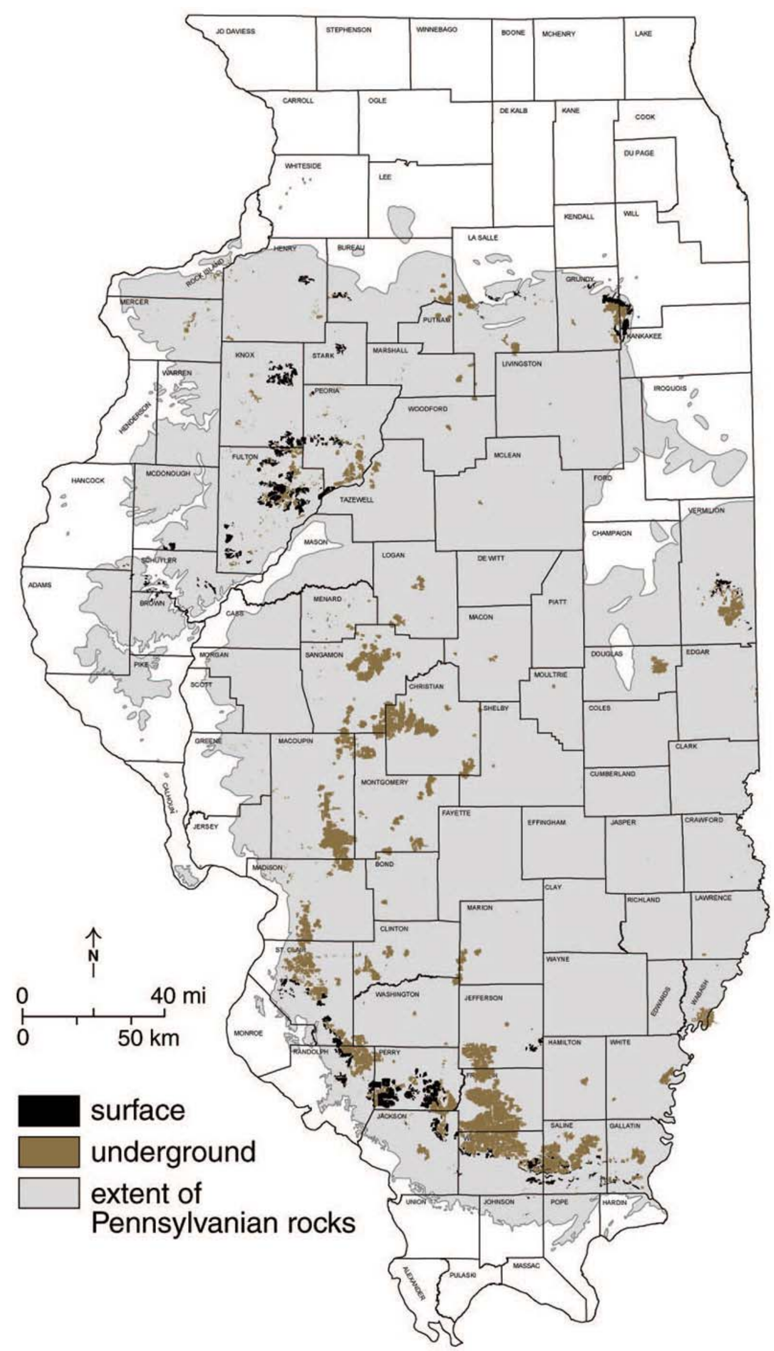
Much of Illinois coal lies too deep for surface mining and requires extraction using underground mining methods. There are three main methods of underground mining that have been used in Illinois over the years: room-and-pillar, high-extraction retreat and longwall. The following provides a brief description of each.

Room-and-Pillar

In the room-and-pillar system, the areas where coal is removed are referred to as "rooms" and the blocks of coal left in place to support the mine's roof and surface are referred to as "pillars". A "panel" refers to a group of rooms isolated from other room groups by surrounding pillars and generally accessed from only one entryway. The room-and-pillar method that was generally used before the early 1900s was characterized by rooms that varied considerably in length, width and sometimes direction, forming irregular mining patterns.

Modern room-and-pillar mines have a regular configuration of production areas (panels) and entryways, and the rooms and entries range from 18 to 24 feet, which is considerably narrower than in older mines. Generally modern room-and-pillar mining methods recover less than 50% to 60% of the coal in a panel. Most underground mines in Illinois have used a type of room-and-pillar pattern.

Figure 203
Coal Mine Deposits & Mined Areas in Illinois



Source: Illinois Department of Natural Resources & Illinois State Geological Survey.

High-Extraction Retreat

High-extraction retreat mining operations first develop a room-and-pillar production area (panel). The miners then systematically begin taking additional coal from the pillars that are left behind. The secondary extraction occurs in a retreating fashion, working from the outer edges of the panel to the main entries. Most of the coal pillars which support the roof are removed shortly after a few rows of rooms and pillars have been formed, leaving only small pillars.

The size and number of pillars left to maintain worker safety varies depending on underground geologic conditions. Roof collapses are controlled by the use of temporary roof supports and planned subsidence of the surface is initiated immediately. Since planned subsidence is part of this operation, this method requires the legal rights to the ground surface. High-extraction retreat methods recover up to 80% to 90% of the coal in a panel. No Illinois mines currently use high-extraction retreat mining, but from the 1940s to 2002, this method was used in the State.

Longwall

Modern longwall mining methods remove coal along a straight working face within defined panels (in this case a solid block of coal), up to 1 to 2 miles long and about 1,000 feet wide. Room-and-pillar methods must be used in conjunction with longwall mining. Like high-extraction retreat, longwall mining begins at the outer edges and works toward the main entries. This fully-mechanized method uses a rotating cutting drum or shearer that works back and forth across the coal face. The coal falls onto a conveyer below the cutting machine and is transported out of the mine.

All of this is performed under a canopy of steel supports that sustains the weight of the roof along the mining surface. As the coal is mined the steel supports advance. The mine roof immediately collapses behind the moving supports, causing 4 to 6 feet of maximum settling of the ground surface over the panel. Since planned subsidence is part of this operation, this method requires the legal rights to the ground surface. Longwall mining methods recover 100% of the coal in a panel.

What is mine subsidence?

Mine subsidence is the sinking or shifting of the ground surface resulting from the collapse of an underground mine. Subsidence is possible in any area where minerals or ore have been undermined. Most of the mine subsidence in Illinois is related to coal mining, which represents the largest volume extracted and area undermined of any solid commodity in the State.

Mine subsidence can be planned, as with modern high-extraction retreat and longwall mining techniques, or it can occur as the result of age and instability. For many years, underground mining was not tightly regulated and not much thought was given to the long-term stability of the mines since most of the land over the mine was sparsely populated. Once mining operations were complete, the mine was abandoned. As cities and towns grew up around the mines, many urban and residential areas were built over or near undermined areas.

ISGS estimates that approximately 333,000 housing units are located in close proximity to underground mines and may potentially be exposed to mine subsidence while approximately 201,000 acres of urban and developed land overlie or are immediately adjacent to underground mines. Most experts agree that room-and-pillar mines will eventually experience some degree of subsidence, but currently there is no way to know when or exactly where it will occur.

What types of mine subsidence can occur in Illinois?

In Illinois mine subsidence typically takes one of two forms: pit subsidence or sag (trough) subsidence. The following provides a brief description of each.

Pit Subsidence

Pit subsidence generally occurs when the roof of a shallow mine (less than 100 feet deep) collapses and forms a bell-shaped hole at the ground's surface, 6 to 8 feet deep and 2 to 40 feet across. **Figure 204** provides an illustration of pit subsidence. This type of subsidence forms very quickly causing sudden and swift ground movement. While the probability of a structure being damaged by pit subsidence is generally low since most pits are relatively small, structural damage can occur if pit subsidence develops under the corner of a building, the support posts of a foundation or another critical spot.

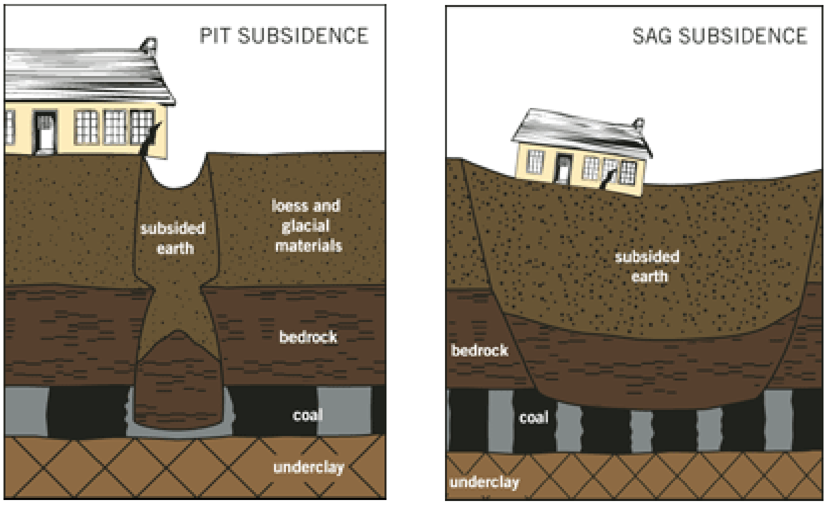
Sag (Trough) Subsidence

Sag or trough subsidence generally forms a gentle depression in the ground's surface that can spread over an entire mine panel and affect several acres of land. A major sag can develop suddenly within a few hours or days, or gradually over years. This type of subsidence may originate over places in the mine where pillars have disintegrated and collapsed or where pillars are being pushed into the relatively soft underclay that forms the floor of most mines. **Figure 204** illustrates sag subsidence. This is the most common type of mine subsidence and can develop over mines of any depth. Given the relatively large area covered by sag subsidence, buildings, roads, driveways, sidewalks, sewer and water pipes and other utilities may experience damage.

What is the Illinois Mine Subsidence Insurance Fund?

Prior to 1979, traditional property owner's insurance did not cover mine subsidence nor was mine subsidence coverage available for purchase in Illinois. Since many mining companies in Illinois ceased operations long before mine subsidence occurred and insurance did not cover such damage, property owner who experienced subsidence damage had no recourse. Several high-profile incidents in the Metro East St. Louis area ultimately led to the passage of the Mine Subsidence Insurance Act in 1979. The Statute required insurers to make mine subsidence insurance available to Illinois homeowners and established the Illinois Mine Subsidence Insurance Fund (IMSIF). Later amendments to the Act gave the Fund the authority, with approval from the Director of Insurance, to set the maximum limits for mine subsidence coverage.

Figure 204
Types of Mine Subsidence



Source: Illinois Mine Subsidence Insurance Fund.

The IMSIF is a taxable enterprise created by Statute to operate as a private solution to a public problem. The purpose of the Fund is to assure financial resources are available to owners of property damaged by mine subsidence. The Fund fills a gap in the insurance market for the benefit of Illinois property owners at risk of experiencing mine subsidence damage.

All insurance companies authorized to write basic property insurance in Illinois are required to enter into a Reinsurance Agreement with the Fund and offer mine subsidence insurance coverage. Mine subsidence insurance covers damage caused by underground mining of any solid mineral resource. In the 34 counties where underground mining has been most prevalent, the Statute requires mine subsidence coverage be automatically included in both residential and commercial property policies. Coverage may be rejected in writing by the insured. **Figure 205** identifies the 34 counties where mine subsidence insurance is automatically included in property insurance policies.

In addition to providing reinsurance to insurers, the Fund also is responsible for conducting geotechnical investigations to determine if mine subsidence caused the damage, establishing rates and rating schedules, providing underwriting guidance to insurers, supporting and sponsoring mine subsidence related research and initiatives consistent with the public interest and educating the public about mine subsidence issues.

Figure 205
Counties Required to include Mine Subsidence Coverage in Property Insurance

Source: Illinois Mine Subsidence Insurance Fund.

3.9.1 Tazewell County

Hazard Profile

The following details the location of underground mines, identifies past occurrences of mine subsidence, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any underground mines located in the County?

Yes. According to the Illinois State Geological Survey's Directory of Coal Mines for Tazewell County, there are 27 documented underground mines located in the County. A copy of the

Directory is included in **Appendix L**. **Figure 206** illustrates the locations of these mines. To view detailed maps of the studied quadrangles, see **Appendix L**.

When has mine subsidence occurred previously? What is the extent of these previous occurrences?

No comprehensive, publicly-accessible database detailing mine subsidence occurrences currently exists in Illinois. A review of local records and discussions with MAC members did not identify any known recorded mine subsidence events in Tazewell County.

Mine Subsidence Fast Facts – Occurrences

Number of Underground Mines Located within the County: ***27***

Number of Mine Subsidence Events Reported ***None***

Probability of Future Mine Subsidence Events: ***High***

According to the *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency, there were 16 confirmed mine subsidence claims submitted to the Illinois Mine Subsidence Insurance Fund for Tazewell County between 1999 and 2012. However, no information was available regarding mine subsidence events associated with these claims.

What locations are affected by mine subsidence?

According to the Illinois State Geological Survey's (ISGS) *Proximity of Underground Mines to Urban and Developed Lands in Illinois* study published in 2009, there are:

- ❖ Approximately 4,601 acres (1.1% of the land area) and 4,281 housing units (8.1% of the total housing units) in Tazewell County are located in Zone 1, land over or adjacent to mapped mines.
- ❖ An additional 3,687 acres (0.9% of the land area) and 3,258 housing units (6.2% of the total housing units) in the County are located in Zone 2, land surrounding Zone 1 that could be affected if the mine boundaries are inaccurate or uncertain.

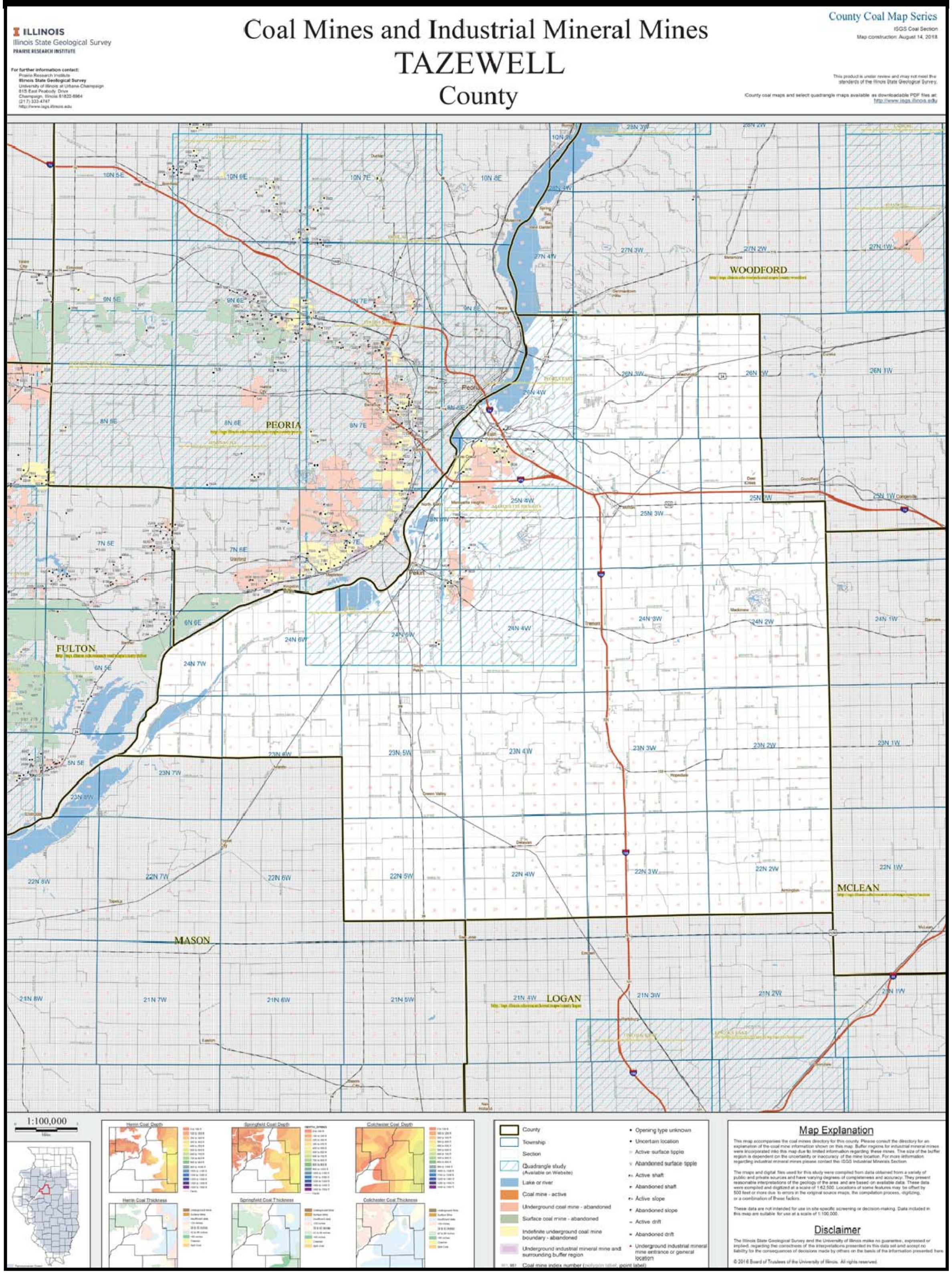
Figure 207 identifies the location of the Zone 1 and 2 areas in Tazewell County. Based on this mapping, mine subsidence has the potential to impact parts of unincorporated Tazewell County as well as Creve Coeur, East Peoria, Marquette Heights and Pekin, some of the more densely populated communities in the County.

What is the probability of future mine subsidence events occurring?

There are many variables that must be considered when calculating the probability of future mine subsidence events including whether subsidence has occurred previously in an area, the size, depth and age of the mine, the magnitude or extent of the failure as well as soil and weather conditions. Given the unpredictability of mine subsidence events, the variables involved and the lack of data available for Tazewell County, it is difficult to specifically establish the probability of future mine subsidence events without extensive research.

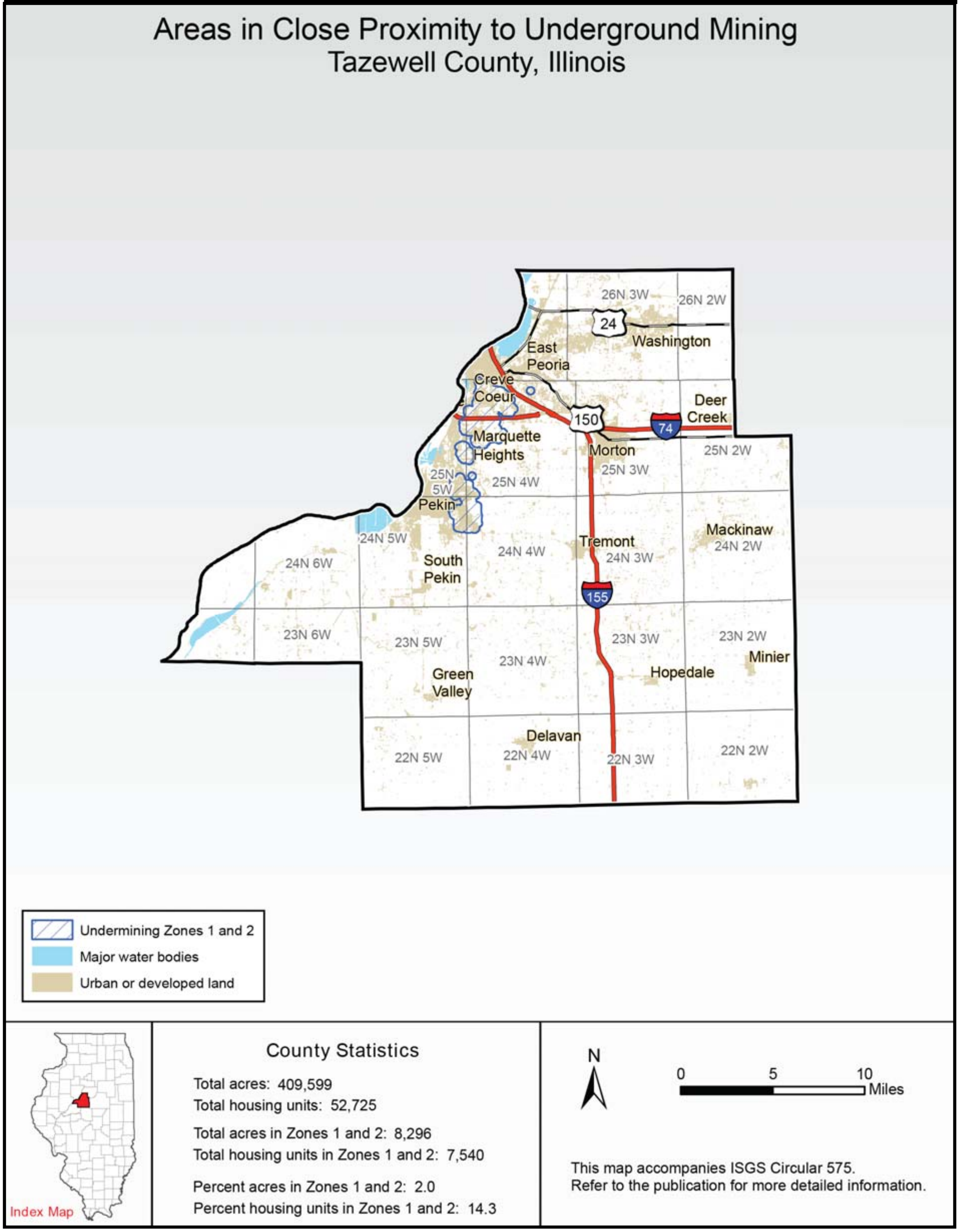
However, given the mining methods used, the age and location of the mines and the number of housing units located over or adjacent to undermined areas in the County, the probability that Tazewell County will experience future mine subsidence events is estimated to be ***high***.

Figure 206
Underground Mines Located in Tazewell County



Source: Illinois State Geological Survey

Figure 207
Areas Potentially Impacted by Mine Subsidence in Tazewell County



Source: Illinois State Geological Survey

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from mine subsidence.

Are the participating jurisdictions vulnerable to mine subsidence?

Yes. East Peoria and Pekin as well as parts of unincorporated Tazewell County are vulnerable to mine subsidence. According to ISGS, approximately 4,609 acres (1.1% of the land area) of Tazewell County are over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 3,687 acres (0.9% of the land area) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. These areas are all located along the western edge of the County near the Illinois River. None of the other participating municipalities or the remainder of the County are considered vulnerable.

Mine Subsidence Fast Facts – Risk

Mine Subsidence Risk/Vulnerability to:
- ❖ Public Health & Safety – Zones 1 & 2: ***Low***
- ❖ Public Health & Safety – Areas Outside Zones 1 & 2: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities – Zones 1 & 2: ***Medium***
- ❖ Buildings/Infrastructure/Critical Facilities – Areas Outside Zones 1 & 2: ***Low***

What impacts resulted from the recorded mine subsidence events?

While 16 confirmed mine subsidence claims were submitted to the Illinois Mine Subsidence Insurance Fund for Tazewell County between 1999 and 2012, no information was available regarding the mine subsidence events that led to the claims. Since there is no available information on any *recorded* mine subsidence events in Tazewell County, there are no recorded impacts to report.

What other impacts can result from mine subsidence events?

The initial damage to a property from mine subsidence may appear suddenly, or occur gradually over many years. Damage to structures can include:

- ❖ cracked, broken or damaged foundations
- ❖ cracks in the basement walls, ceilings, garage floors, driveways, sidewalks or roadways
- ❖ doors and windows stick, jam or break
- ❖ unlevel or tilted walls or floors
- ❖ doors swing open or closed
- ❖ chimney, porch or steps separate from the rest of the structure
- ❖ water, sewer or gas lines may rupture in extreme cases

A structure need not lie directly over a mine to be affected by mine subsidence. It is extremely difficult to accurately gauge how far a property must be from a mine to ensure that it will be unaffected by mine subsidence. Each subsidence is unique and influenced by multiple factors.

What is the level of vulnerability to public health and safety from mine subsidence?

In terms of the risk or vulnerability to public health and safety from a mine subsidence event, there are several factors that must be taken into consideration including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When all of the factors are taken into consideration, the overall risk to public health and safety posed by a mine subsidence event in Tazewell County is considered to be low for both Zones 1 and 2 and all other portions of the County.

Are existing buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. According to ISGS, approximately 4,281 housing units (8.1% of the total housing units in the County) are located over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 3,258 housing units (6.2% of the total housing units) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain.

According to an analysis conducted for the original Plan developed in 2004, there are ten critical facilities located in or near undermined areas in the County, six schools/educational facilities and four communication transmitters. **Figure 208** identifies the potentially-impacted critical facilities. Given that mining operations have not expanded in the Tri-County area since the original Plan was developed, this analysis is still considered to be accurate.

Figure 208
Critical Facilities Located in or near Undermined Areas – Tazewell County

Critical Facility Name	Critical Facility Type	Location
Parkview Jr. High School	School	Creve Coeur
WHOI TV Channel 19	Communications	Creve Coeur
WCBU FM 89.9	Communications	East Peoria
WTVP TV Channel 47	Communications	East Peoria
WIRL AM 1290	Communications	Marquette Heights
Broadmoor Jr. High School	School	Pekin
Pekin High School	School	Pekin
Sunset Hills Elementary School	School	Pekin
Willow Elementary School	School	Pekin
Schramm Educational Center	School	Pekin

In addition to impacting structures, mine subsidence can damage roads, bridges and utilities. Roadways, culverts and bridges can be weakened by mine subsidence and even destroyed if the subsidence occurs directly underneath of them. Water, sewer, power and communication lines, both above and below ground, are also vulnerable to mine subsidence. Depending on the location of the subsidence, water, sewer and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When these factors are taken into consideration, the overall risk posed by mine subsidence to vulnerability to buildings, infrastructure and critical facilities in Tazewell County is considered to be medium for Zone 1 and low for Zone 2 and all other portions of the County.

Are future buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Any future buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from mine subsidence?

Unlike other hazards, there are no standard loss estimation models or methodologies for mine subsidence. Given the lack of recorded events and unpredictability of mine subsidence, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from mine subsidence. However, those housing units that reside in Zones 1 have the potential to experience future dollar losses from mine subsidence.

3.9.2 WOODFORD COUNTY

HAZARD PROFILE

The following details the location of underground mines, identifies past occurrences of mine subsidence, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any underground mines located in the County?

Yes. According to the Illinois State Geological Survey's Directory of Coal Mines for Woodford County, there are only four documented underground mines located in the County. A copy of the Directory is included in **Appendix L**. **Figure 209** illustrates the locations of these mines. To view detailed maps of the studied quadrangles, see **Appendix L**.

Mine Subsidence Fast Facts – Occurrences

Number of Underground Mines Located within the County: ***4***

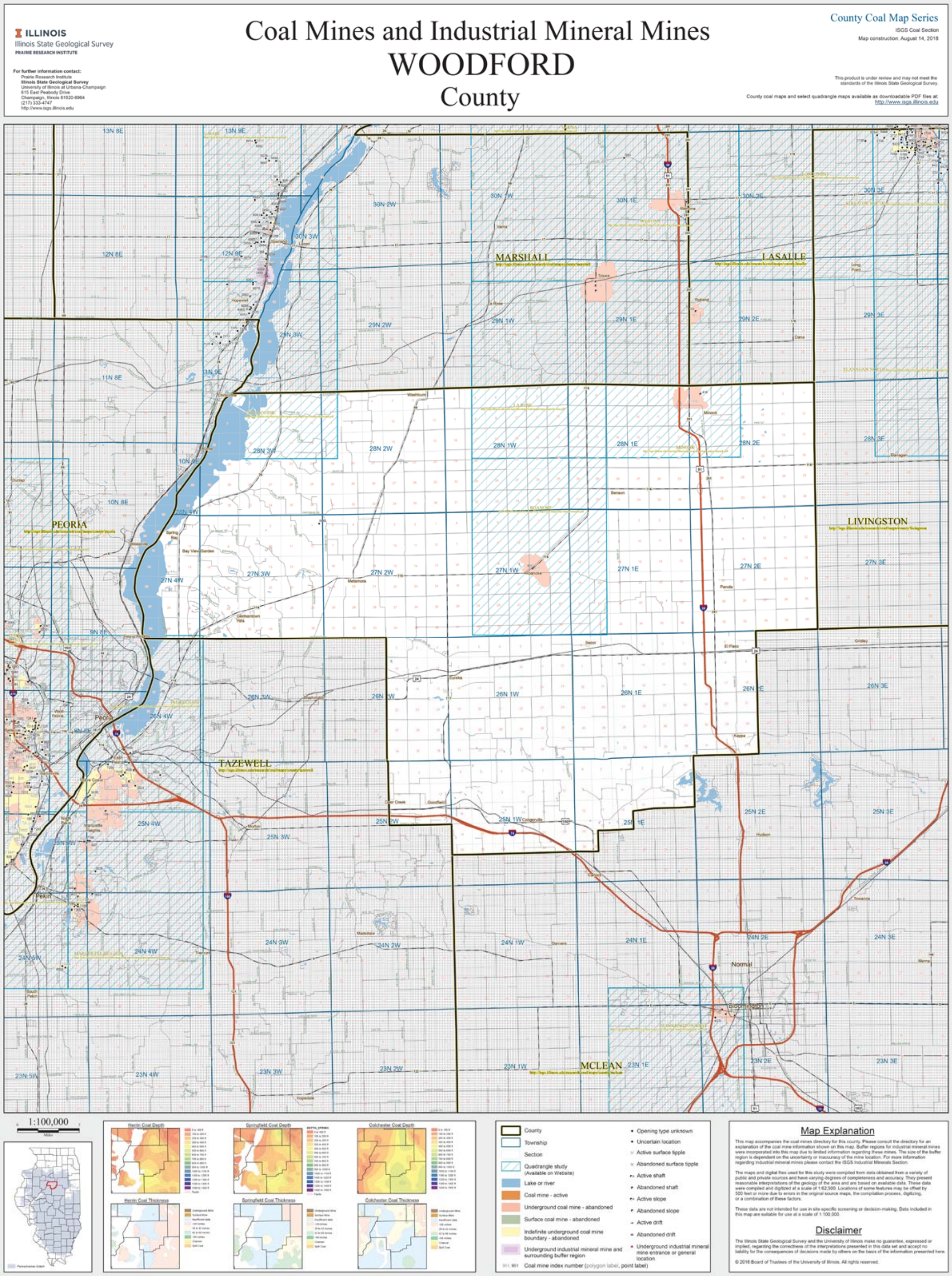
Number of Mine Subsidence Events Reported ***None***

Probability of Future Mine Subsidence Events: ***Low***

When has mine subsidence occurred previously? What is the extent of these previous occurrences?

No comprehensive, publicly-accessible database detailing mine subsidence occurrences currently exists in Illinois. A review of local records and discussions with MAC members and did not identify any known recorded mine subsidence events in Woodford County. According to the *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency, there were no mine subsidence claims submitted to the Illinois Mine Subsidence Insurance Fund for Woodford County between 1999 and 2012.

Figure 209
Underground Mines Located in Woodford County



Source: Illinois State Geological Survey

What locations are affected by mine subsidence?

According to the Illinois State Geological Survey's (ISGS) *Proximity of Underground Mines to Urban and Developed Lands in Illinois* study published in 2009, there are:

- ❖ Approximately 2,255 acres (0.7% of the land area) and 618 housing units (4.6% of the total housing units) in Tazewell County are located in Zone 1, land over or adjacent to mapped mines.
- ❖ An additional 1,395 acres (0.4% of the land area) and 288 housing units (2.2% of the total housing units) in the County are located in Zone 2, land surrounding Zone 1 that could be affected if the mine boundaries are inaccurate or uncertain.

Figure 210 identifies the location of the Zone 1 and 2 areas in Woodford County. Based on this mapping, mine subsidence has the potential to impact parts of unincorporated Woodford County as well as Minonk and Roanoke.

What is the probability of future mine subsidence events occurring?

There are many variables that must be considered when calculating the probability of future mine subsidence events including whether subsidence has occurred previously in an area, the size, depth and age of the mine, the magnitude or extent of the failure as well as soil and weather conditions. Given the unpredictability of mine subsidence events, the variables involved and the lack of data available for Woodford County, it is difficult to specifically establish the probability of future mine subsidence events without extensive research.

However, given the number, size and mining methods used, the probability that Woodford County will experience future mine subsidence events is estimated to be ***low***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from mine subsidence.

Are the participating jurisdictions vulnerable to mine subsidence?

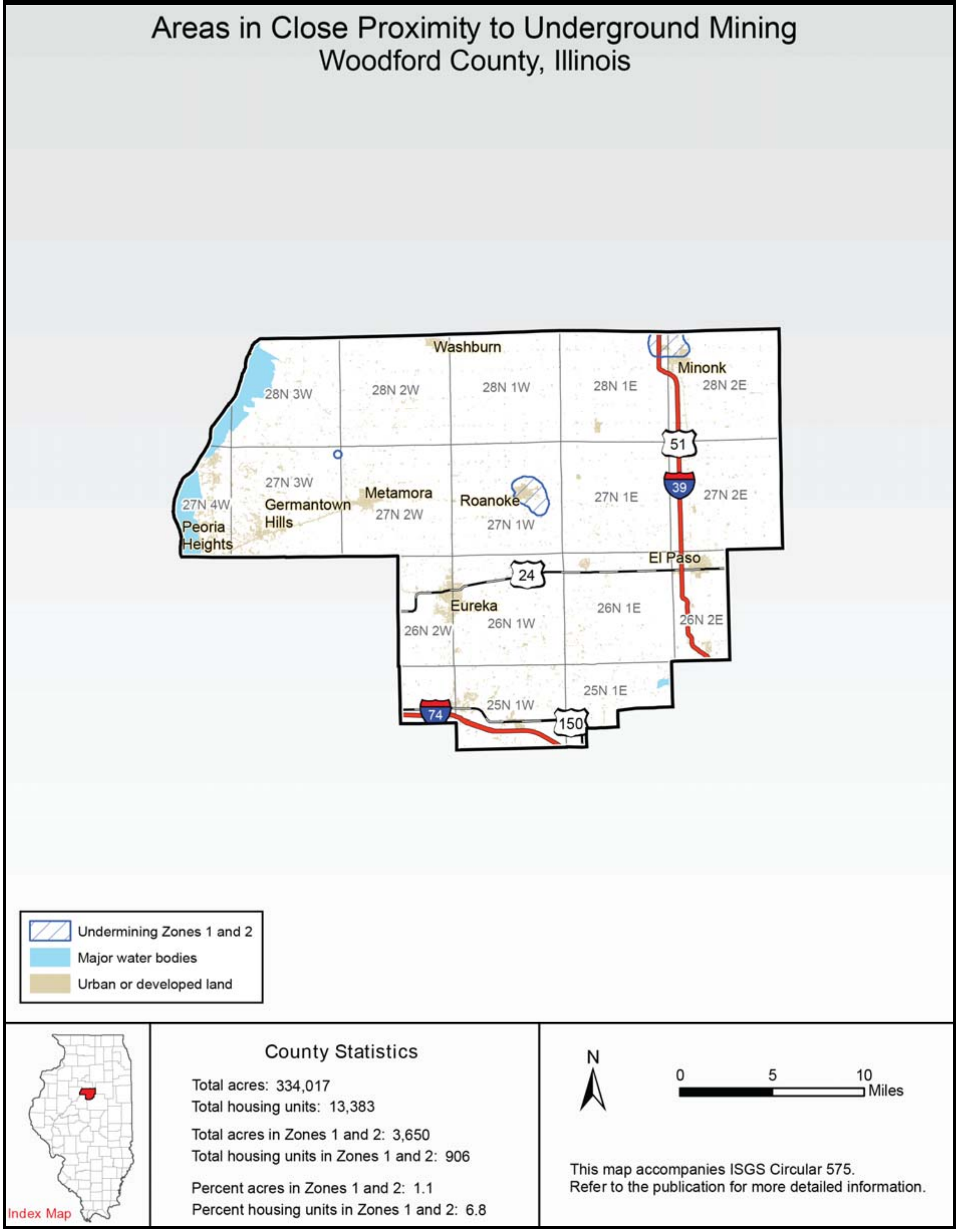
Yes. Roanoke and parts of unincorporated Woodford County are vulnerable to mine subsidence. According to ISGS, approximately 2,255 acres (0.7% of the land area) of Woodford County are over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 1,395 acres (0.4% of the land area) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. These areas are primarily located in and around Roanoke and Minonk. None of the other participating municipalities or the remainder of the County are considered vulnerable.

Mine Subsidence Fast Facts – Risk

Mine Subsidence Risk/Vulnerability to:

- ❖ Public Health & Safety – Zones 1 & 2: ***Low***
- ❖ Public Health & Safety – Areas Outside Zones 1 & 2: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities – Zones 1 & 2: ***Medium to Low***
- ❖ Buildings/Infrastructure/Critical Facilities – Areas Outside Zones 1 & 2: ***Low***

Figure 210
Areas Potentially Impacted by Mine Subsidence in Woodford County



Source: Illinois State Geological Survey

What impacts resulted from the recorded mine subsidence events?

Since there have been no *recorded* mine subsidence events in Woodford County, there are no recorded impacts to report.

What other impacts can result from mine subsidence events?

The initial damage to a property from mine subsidence may appear suddenly, or occur gradually over many years. Damage to structures can include:

- ❖ cracked, broken or damaged foundations
- ❖ cracks in the basement walls, ceilings, garage floors, driveways, sidewalks or roadways
- ❖ doors and windows stick, jam or break
- ❖ unlevel or tilted walls or floors
- ❖ doors swing open or closed
- ❖ chimney, porch or steps separate from the rest of the structure
- ❖ water, sewer or gas lines may rupture in extreme cases

A structure need not lie directly over a mine to be affected by mine subsidence. It is extremely difficult to accurately gauge how far a property must be from a mine to ensure that it will be unaffected by mine subsidence. Each subsidence is unique and influenced by multiple factors.

What is the level of vulnerability to public health and safety from mine subsidence?

In terms of the risk or vulnerability to public health and safety from a mine subsidence event, there are several factors that must be taken into consideration including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When all of the factors are taken into consideration, the overall risk to public health and safety posed by a mine subsidence event in Woodford County is considered to be low for both Zones 1 and 2 and all other portions of the County.

Are existing buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. According to ISGS, approximately 618 housing units (4.6% of the total housing units in the County) are located over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 288 housing units (0.4% of the total housing units) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain.

According to an analysis conducted for the original Plan developed in 2004, there are four critical facilities located in or near undermined areas in the County, two educational facilities and two emergency service providers. **Figure 211** identifies the potentially-impacted critical facilities. Given that mining operations have not expanded in the Tri-County area since the original Plan was developed, this analysis is still considered to be accurate.

In addition to impacting structures, mine subsidence can damage roads, bridges and utilities. Roadways, culverts and bridges can be weakened by mine subsidence and even destroyed if the subsidence occurs directly underneath of them. Water, sewer, power and communication lines, both above and below ground, are also vulnerable to mine subsidence. Depending on the location of the subsidence, water, sewer and power lines can experience ruptures causing major disruptions to vital services.

Figure 211
Critical Facilities Located in or near Undermined Areas – Woodford County

Critical Facility Name	Critical Facility Type	Location
Roanoke-Benson CUSD #60	School	Roanoke
Roanoke Fire Department	Emergency Services	Roanoke
Roanoke Police Department	Emergency Services	Roanoke
Sowers Elementary School	School	Roanoke

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When these factors are taken into consideration, the overall risk posed by mine subsidence to vulnerability to buildings, infrastructure and critical facilities in Woodford County is considered to be medium to low for Zone 1 and low for Zone 2 and all other portions of the County.

Are future buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Any future buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from mine subsidence?

Unlike other hazards, there are no standard loss estimation models or methodologies for mine subsidence. Given the lack of recorded events and unpredictability of mine subsidence, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from mine subsidence. However, those housing units that reside in Zones 1 have the potential to experience future dollar losses from mine subsidence.

3.9.3 PARTICIPATING PEORIA COUNTY MUNICIPALITIES

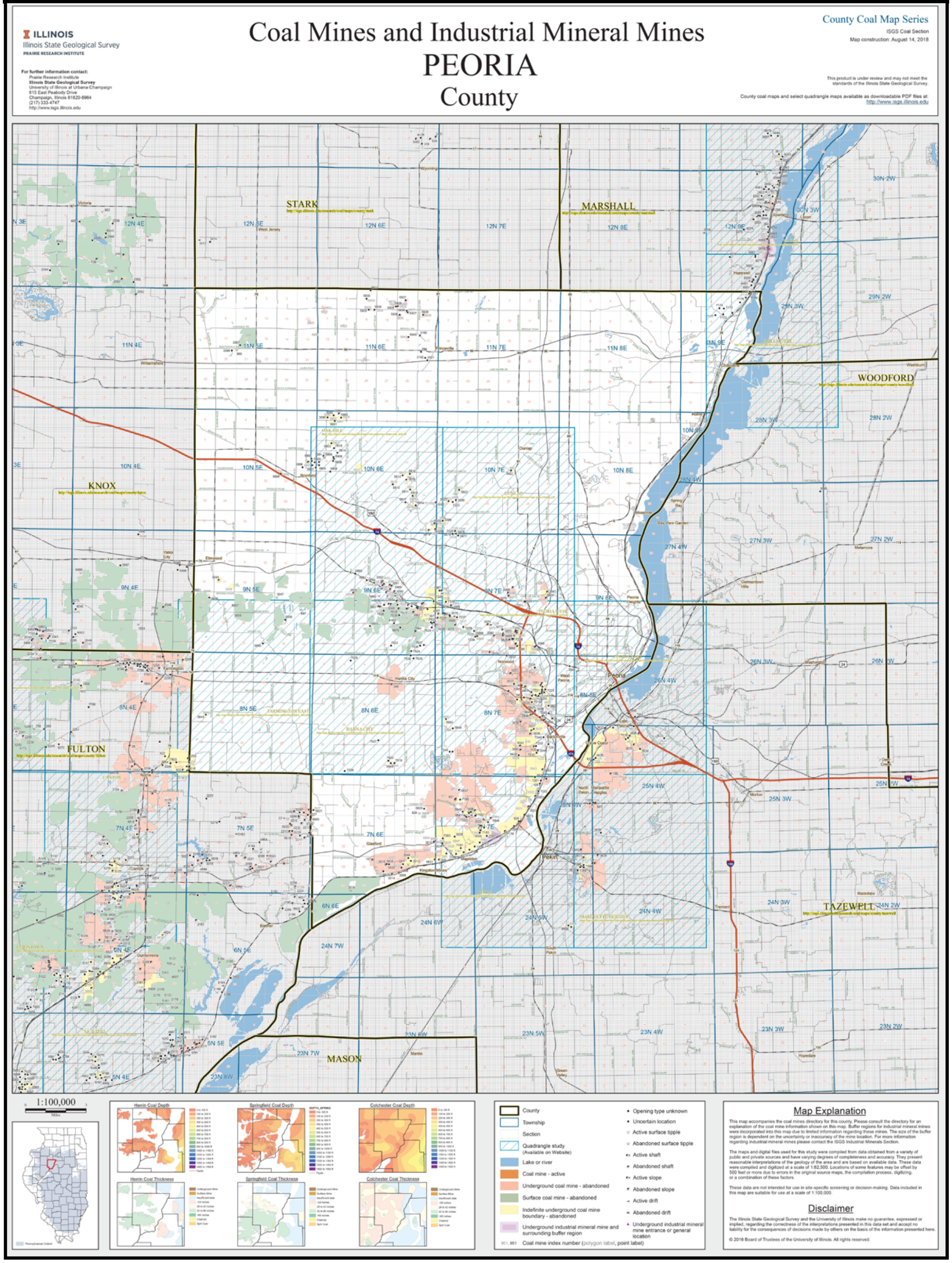
HAZARD PROFILE

The following details the location of underground mines, identifies past occurrences of mine subsidence, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any underground mines located in the participating Peoria County municipalities?

Yes. According to the Illinois State Geological Survey's Directory of Coal Mines for Peoria County, there are 25 documented underground mines located in the participating municipalities. A copy of the Directory is included in **Appendix L**. **Figure 112** illustrates the locations of these mines. To view detailed maps of the studied quadrangles, see **Appendix L**.

Figure 112
Underground Mines Located in Peoria County



Source: Illinois State Geological Survey

Of the 25 documented underground mines, 19 are located in Bartonville, five are located in Peoria and one is located in Hanna City. Neither Chillicothe nor Peoria Heights have underground mines located in or near their municipal limits

When has mine subsidence occurred previously? What is the extent of these previous occurrences?

No comprehensive, publicly-accessible database detailing mine subsidence occurrences currently exists in Illinois. A review of local records and discussions with MAC members did not identify any known recorded mine subsidence events in the participating Peoria County municipalities.

According to the *2013 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency, there was one confirmed mine subsidence claim submitted to the Illinois Mine Subsidence Insurance Fund for all of Peoria County between 1999 and 2012. However, no information was available regarding the mine subsidence event associated with this claim.

Mine Subsidence Fast Facts – Occurrences

Number of Underground Mines Located within the Participating Municipalities: ***25***

Number of Mine Subsidence Events Reported ***None***

Probability of Future Mine Subsidence Events: Bartonville & Hanna City – ***Medium to High***

Probability of Future Mine Subsidence Events: Peoria - ***Low***

What locations are affected by mine subsidence?

According to the Illinois State Geological Survey's (ISGS) *Proximity of Underground Mines to Urban and Developed Lands in Illinois* study published in 2009, there are:

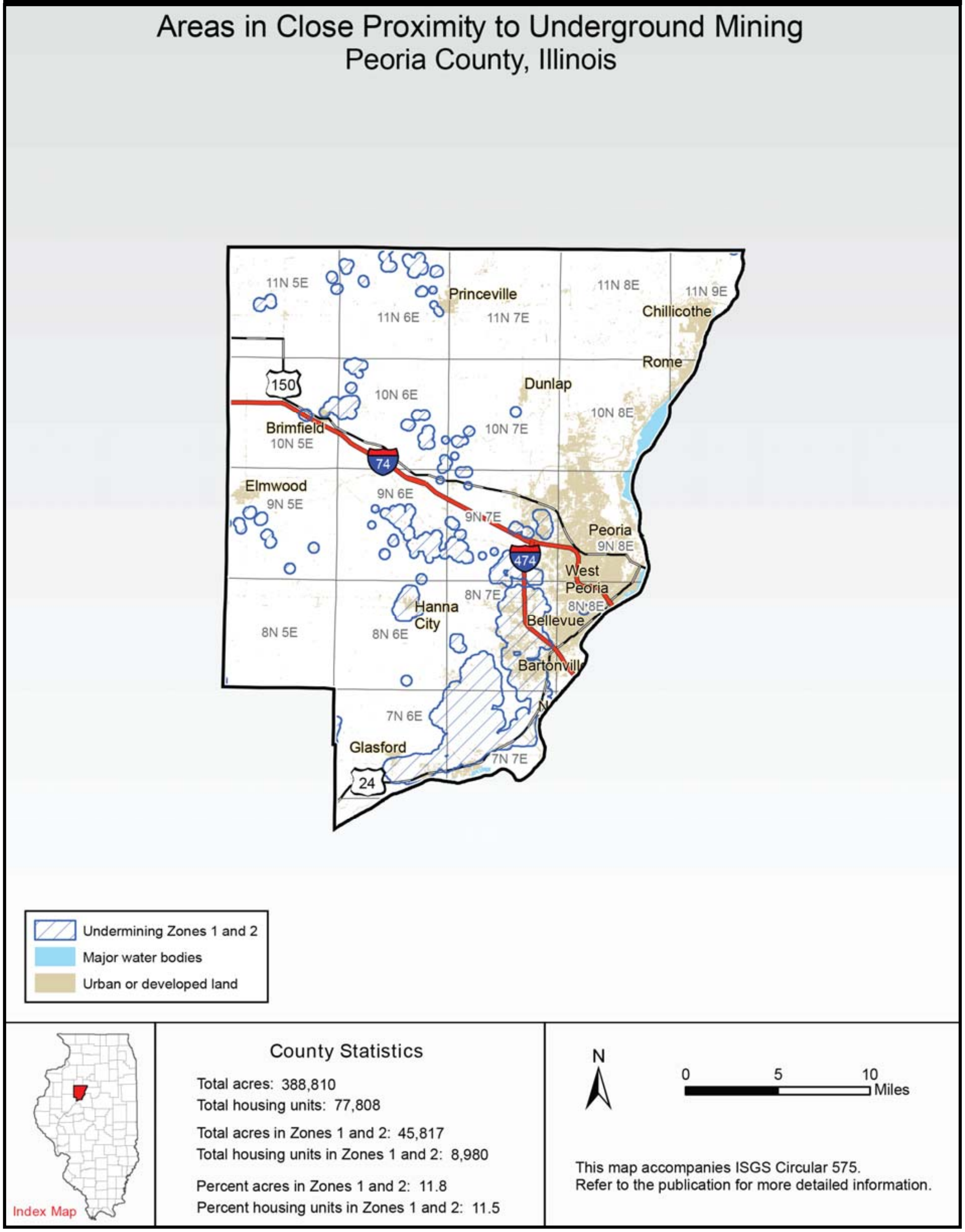
- ❖ Approximately 21,292 acres (5.5% of the land area) and 5,213 housing units (6.7% of the total housing units) in Peoria County are located in Zone 1, land over or adjacent to mapped mines. A detailed breakdown by municipality was not available.
- ❖ An additional 24,526 acres (6.3% of the land area) and 3,768 housing units (4.8% of the total housing units) in the County are located in Zone 2, land surrounding Zone 1 that could be affected if the mine boundaries are inaccurate or uncertain. Again, a detailed breakdown by municipality was not available.

Figure 213 identifies the location of the Zone 1 and 2 areas in Peoria County. Based on this mapping, mine subsidence has the potential to impact Bartonville, Hanna City and Peoria.

What is the probability of future mine subsidence events occurring?

There are many variables that must be considered when calculating the probability of future mine subsidence events including whether subsidence has occurred previously in an area, the size, depth and age of the mine, the magnitude or extent of the failure as well as soil and weather conditions. Given the unpredictability of mine subsidence events, the variables involved and the lack of data available for the participating Peoria County municipalities, it is difficult to specifically establish the probability of future mine subsidence events without extensive research.

Figure 213
Areas Potentially Impacted by Mine Subsidence in Peoria County



Source: Illinois State Geological Survey

However, given the mining methods used, the age, size and location of the mines in the Bartonville and Hanna City, the probability that either will experience future mine subsidence events is estimated to be ***medium to high***. Based on the number, size and locations of the mines in the City of Peoria, the probability that the City will experience future mine subsidence events is estimated to be ***low***.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from mine subsidence.

Are the participating jurisdictions vulnerable to mine subsidence?

Yes. Bartonville, Hanna City and the City of Peoria are vulnerable to mine subsidence. According to ISGS, approximately 21,292 acres (5.5% of the land area) of Peoria County are over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 24,526 acres (4.8% of the land area) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. A breakdown by municipality as not available. None of the other participating municipalities are considered vulnerable.

Mine Subsidence Fast Facts – Risk

Mine Subsidence Risk/Vulnerability to:
- Public Health & Safety – Zones 1 & 2: ***Low***
- Public Health & Safety – Areas Outside Zones 1 & 2: ***Low***
- Buildings/Infrastructure/Critical Facilities – Zones 1 & 2: ***Medium***
- Buildings/Infrastructure/Critical Facilities – Areas Outside Zones 1 & 2: ***Low***

What impacts resulted from the recorded mine subsidence events?

While one confirmed mine subsidence claim was submitted to the Illinois Mine Subsidence Insurance Fund for Peoria County between 1999 and 2012, no information was available regarding the mine subsidence event that led to the claim. Since there is no available information on any *recorded* mine subsidence events in Peoria County (including the participating municipalities), there are no recorded impacts to report.

What other impacts can result from mine subsidence events?

The initial damage to a property from mine subsidence may appear suddenly, or occur gradually over many years. Damage to structures can include:

- cracked, broken or damaged foundations
- cracks in the basement walls, ceilings, garage floors, driveways, sidewalks or roadways
- doors and windows stick, jam or break
- unlevel or tilted walls or floors
- doors swing open or closed
- chimney, porch or steps separate from the rest of the structure
- water, sewer or gas lines may rupture in extreme cases

A structure need not lie directly over a mine to be affected by mine subsidence. It is extremely difficult to accurately gauge how far a property must be from a mine to ensure that it will be unaffected by mine subsidence. Each subsidence is unique and influenced by multiple factors.

What is the level of vulnerability to public health and safety from mine subsidence?

In terms of the risk or vulnerability to public health and safety from a mine subsidence event, there are several factors that must be taken into consideration including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When all of the factors are taken into consideration, the overall risk to public health and safety posed by a mine subsidence event in participating Peoria County municipalities is considered to be low for both Zones 1 and 2.

Are existing buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. According to ISGS, approximately 5,213 housing units (6.7% of the total housing units in the County) are located over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 3,768 housing units (4.8% of the total housing units) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. A breakdown by municipality as not available.

According to an analysis conducted for the original Plan developed in 2004, there are three critical facilities, all schools, located in or near undermined areas in the participating municipalities. **Figure 214** identifies the potentially-impacted critical facilities. Given that mining operations have not expanded in the Tri-County area since the original Plan was developed, this analysis is still considered to be accurate.

Figure 214
Critical Facilities Located in or near Undermined Areas –
Participating Peoria County Municipalities

Critical Facility Name	Critical Facility Type	Location
Bartonville Elementary School	School	Bartonville
Limestone Community High School	School	Bartonville
Oak Grove School	School	Bartonville

In addition to impacting structures, mine subsidence can damage roads, bridges and utilities. Roadways, culverts and bridges can be weakened by mine subsidence and even destroyed if the subsidence occurs directly underneath of them. Water, sewer, power and communication lines, both above and below ground, are also vulnerable to mine subsidence. Depending on the location of the subsidence, water, sewer and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the age, size and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When these factors are taken into consideration, the overall risk posed by mine subsidence to vulnerability to buildings, infrastructure and critical facilities in participating Peoria County municipalities is considered to be medium for Zone 1 and low for Zone 2 and all other areas.

Are future buildings, infrastructure and critical facilities vulnerable to mine subsidence?

Yes. Any future buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from mine subsidence?

Unlike other hazards, there are no standard loss estimation models or methodologies for mine subsidence. Given the lack of recorded events and unpredictability of mine subsidence, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from mine subsidence. However, those housing units that reside in Zones 1 have the potential to experience future dollar losses from mine subsidence.

3.10 DAMS

HAZARD IDENTIFICATION

What is the definition of a dam?

A dam is an artificial barrier constructed across a stream channel or a man-made basin for the purpose of storing, controlling or diverting water. Dams typically are constructed of earth, rock, concrete or mine tailings. The area directly behind the dam where water is impounded or stored is referred to as a reservoir.

According to the U.S. Army Corps of Engineers' National Inventory of Dams (NID), there are approximately 90,580 dams in the United States and Puerto Rico, with 1,607 dams located in Illinois. (The NID is maintained by the U.S. Army Corps of Engineers and is updated approximately every two years.) Of the 1,607 dams in Illinois, approximately 92% are constructed of earth.

What is the definition of a dam failure?

A dam failure is the partial or total collapse, breach or other failure of a dam that causes flooding downstream. In the event of a dam failure, the people, property and infrastructure downstream could be subject to devastating damages. The potential severity of a full or partial dam failure is influenced by two factors:

- the capacity of the reservoir and
- the density, type and value of development/infrastructure located downstream.

There are two categories of dam failures, "flood" or "rainy day" failures and "sunny day" failures. A "flood" or "rainy day" failure usually results when excess precipitation and runoff cause overtopping or a buildup of pressure behind a dam which leads to a breach. Even normal storm events can lead to "flood" failures if debris plugs the water outlets. Given the conditions that lead to a "flood" failure (i.e., rainfall over a period of hours or days), there is usually a sufficient amount of time to warn and evacuate residents downstream.

Unlike a "flood" failure, there is generally no warning associated with a "sunny day" failure. A "sunny day" failure is usually the result of improper or poor dam maintenance, internal erosion, vandalism or an earthquake. This unexpected failure can be catastrophic because it may not allow enough time to warn and evacuate residents downstream.

No one knows precisely how many dam failures have occurred in the United States; however, it's estimated that hundreds have taken place over the last century. Some of the worst failures have caused catastrophic property and environmental damage and have taken hundreds of lives. The worst dam failure in the last 50 years occurred on February 26, 1972 in Buffalo Creek, West Virginia. A tailings dam owned by the Buffalo Mining Company failed, taking 125 lives, injuring 1,000 individuals, destroying 507 homes and causing property damage in excess of $50 million (approximately $298.6 million in 2017 based on the Bureau of Labor Statistics Consumer Price Index Inflation Calculator.)

Dam failures have been documented in every state, including Illinois. According to the Dam Incident Database compiled by the National Performance of Dams Program, there have been 10 reported dam failures with uncontrolled releases of the reservoir in Illinois since 1950.

What causes a dam failure?

Dam failures can result from one or more of the following:

- ***prolonged periods of rainfall and flooding*** (the cause of most failures);
- ***inadequate spillway capacity*** resulting in excess flow overtopping the dam;
- ***internal erosion*** caused by embankment or foundation leakage;
- ***improper maintenance*** (including failure to remove trees, repair internal seepage problems, maintain gates, valves and other operational components, etc.);
- ***improper design*** (including use of improper construction materials and practices);
- ***negligent operation*** (including failure to remove or open gates or valves during high flow periods);
- ***failure of an upstream dam on the same waterway***;
- ***landslides into reservoirs*** which cause surges that result in overtopping of the dam;
- ***high winds*** which can cause significant wave action and result in substantial erosion; and
- ***earthquakes*** which can cause longitudinal cracks at the tops of embankments that can weaken entire structures.

How are dams classified?

The U.S. Army Corps of Engineers assigns each dam listed on the National Inventory of Dams a hazard potential classification rating per the "Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams." The classification system is based on the potential for loss of life and damage to property in the event of a dam failure. There are three classifications: High, Significant and Low. **Figure 215** provides a brief description of each hazard potential classification. It is important to note that the hazard potential classification assigned is not an indicator of the adequacy of the dam or its physical integrity and in no way reflects the current condition of the dam.

Figure 215
Dam Hazard Classification System

Hazard Potential Classification	Description
High	Those dams where failure or mis-operation result in probable loss of human life, regardless of the magnitude of other losses. The probable loss of human life is defined to signify one or more lives lost.
Significant	Those dams where failure or mis-operation result in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas but could be located in areas with population and significant infrastructure.
Low	Those dams where failure or mis-operation results in no probable loss of human life and low economic and/or or environmental losses. Losses are principally limited to the dam owner's property.

Sources: Federal Emergency Management Agency
U.S. Army Corps of Engineers

3.10.1 TAZEWELL COUNTY

HAZARD PROFILE

The following details the location of classified dams, identifies past occurrences of dam failures, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any classified dams owned by any of the participating jurisdictions?

Yes. There is one publicly-owned classified dam within the County owned by the City of Washington. The School Street Detention Basin Dam, an earthen dam located on a tributary of Farm Creek, was completed in 1996. It has a hazard classification of "Significant" and its purpose is flood control.

Dam Failure Fast Facts – Occurrences

Number of Classified Dams Located in the County: ***40***

Number of Classified Dams owned by Participating Jurisdictions: ***1***

Number of Dam Failures Reported: ***None***

Probability of Future Dam Failure Events: ***Low***

Are there any other publicly-owned classified dams within the County?

Yes. There are three other publicly-owned classified dam within the County, all owned by the U.S. Army Corps of Engineers.

Figure 216 provides detailed information on each of the four publicly-owned classified dams located in Tazewell County.

Are there any privately-owned classified dams within the County?

Yes. There are 36 privately-owned classified dams within Tazewell County. Twelve of the dams have a hazard classification of "High" or "Significant". Of the remaining 24 privately-owned classified dams, 22 have a hazard classification of "Low" and the remaining two are classified as "Unknown".

Of the 36 privately-owned classified dams in Tazewell County:

- 15 are owned by individuals;
- 8 are owned by homeowner/lake associations;
- 5 are owned by sportsmen clubs;
- 3 are owned by golf clubs;
- 2 are owned by businesses;
- 1 is owned by power plant; and
- 2 do not identify an owner.

Figure 217 provides detailed information on each of the twelve privately-owned classified dams with a hazard classification of "High" or "Significant" located in Tazewell County.

When have dam failures occurred previously? What is the extent of these previous dam failures?

According to the data from Stanford University's National Performance of Dams Incident Database and discussions with MAC members, there are no known recorded dam failures in Tazewell County.

Figure 216
Publicly-Owned Classified Dams Located in Tazewell County

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Farmdale	High	Farm Creek	USACE	Gravity Earth	Flood Control	1951	90 ft.	1,275 ft.	15,500 ac.-ft.	n/a	26 sq. mi.	Yes
Fondulac	High	Fondulac Creek	USACE	Gravity Earth	Flood Control	1949	74 ft.	1,000 ft.	18,100 ac.-ft.	n/a	5 sq. mi.	Yes
Peoria Lock & Dam	Significant	Illinois River	USACE	Concrete	Navigation	1939	23 ft.	536 ft.	225,000 ac.-ft.	n/a	14,544 sq. mi.	Yes
School Street Detention Basin Dam	Significant	Tributary Farm Creek	Washington	Earth	Flood Control	1996	12 ft.	330 ft.	8.0 ac.-ft.	n/a	0.06 sq. m.	Yes

Sources: Stanford University, National Performance of Dams Program, NPDP Dams Database.
U.S. Army Corps of Engineers, National Inventory of Dams Interactive Report.

Figure 217
Select Privately-Owned Classified Dams Located in Tazewell County
(Sheet 1 of 2)

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Sunset Hills Lake 1 Dam	High	Tributary Lost Creek	Golf Club Properties Inc.	Earth	Irrigation, Recreation	1964	42 ft.	420 ft.	106 ac.-ft.	4 ac.	0.1 sq. mi	Yes
Sunset Hills Lake 2 Dam	High	Tributary Lick Creek	n/a	Earth	Other, Water Supply	1964	35 ft.	565 ft.	266 ac.-ft.	17 ac.	0.7 sq. mi.	No
Bessler Lake Dam	Significant	Tributary Lick Creek	Individual	Earth	Recreation	1965	29 ft.	180 ft.	44 ac.-ft.	n/a	n/a	No
Birkey Lake Dam	Significant	Tributary Lick Creek	Individual	Earth	Recreation	1978	28 ft.	540 ft.	105 ac.-ft.	n/a	n/a	No

Figure 217
Select Privately-Owned Classified Dams Located in Tazewell County
(Sheet 2 of 2)

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Grand Oaks Lake Dam	Significant	Tributary Lick Creek	Northern Oaks Estates Homeowner Assoc.	Earth	Recreation	1978	22 ft.	285 ft.	52 ac.-ft.	5 ac.	0.5 sq. mi.	Yes
Heritage Lake Dam	Significant	Tributary Mackinaw River	Heritage Lake Assoc. Inc.	Earth	Recreation	1968	56 ft.	590 ft.	2425 ac.-ft.	78 ac.	1.9 sq. mi.	Yes
Pine Lakes Country Club North Pond Dam	Significant	Tributary Farm Creek	Pine Lakes Country Club	Earth	Other	1959	42 ft	270 ft.	66 ac.-ft.	n/a	n/a	No
Pine Lakes Country Club South Pond Dam	Significant	Tributary Farm Creek	Pine Lakes Country Club	Earth	Other	1958	27 ft.	255 ft.	41 ac.-ft.	n/a	n/a	No
Powerton Cooling Lake Dam	Significant	Illinois River	Midwest Generation	Earth	Other	1970	26 ft.	31,200 ft.	25,630 ac.-ft.	1440 ac.	2.3 sq. mi.	Yes
Sutton Pond Dam	Significant	Tributary Mackinaw River	Individual	Earth	Recreation	1965	27 ft.	226 ft.	104 ac.-ft.	6 ac.	0.5 sq. mi.	No
Vendo Grande Lake Dam	Significant	Tributary Mackinaw River	Vendo Lake Homeowners Assoc.	Earth	Recreation	1975	44 ft.	415 ft.	1178 ac.-ft.	n/a	n/a	No
Vendo Pequeno Lake Dam	Significant	Tributary Mackinaw River	Vendo Lake Homeowners Assoc	Earth	Recreation	1975	44 ft.	252 ft.	128 ac.-ft.	n/a	n/a	No

Sources: Stanford University, National Performance of Dams Program, NPDP Dams Database.
U.S. Army Corps of Engineers, National Inventory of Dams Interactive Report.

According to the National Inventory of Dams (NID), Emergency Action Plans (EAPs) defining the extent or magnitude of potential dam failures (water depth, speed of onset and warning times) were not developed or were not required to be developed for eight of the sixteen dams. The EAPs for the remaining eight dams were not made available to the Tazewell County Emergency Management Agency. As a result, a data deficiency exists in terms of defining the extent or magnitude of future potential dam failures.

What locations are affected by dam failure?

Figure 218 shows the locations of ***select classified dams*** in Tazewell County. Dam failures have the potential to impact the following municipalities/unincorporated areas:

- East Peoria;
- extreme northern boundary of Morton at Wastewater Treatment Plant #3;
- Rolling Meadows subdivision in Washington;
- Sunset Hills subdivision in Pekin;
- Towne Oaks community west of Groveland;
- Northern Oaks Estate community west of Groveland;
- undeveloped land north-northwest of Pine Lakes Country Club south of Washington;
- agricultural land east of Pekin Country Club (east of Veterans Drive and north of Broadway Street);
- agricultural and undeveloped land south and west of Powerton Generating Station near Pekin;
- agricultural and undeveloped land north and west of Mackinaw;
- undeveloped land just west of Lake Windermere community (along East Lake Windermere Road); and
- agricultural and undeveloped land north of Venado Lake community approximately 3 ½ miles north-northeast of Delavan.

What is the probability of future dam failure events occurring?

Since none of the other dams have experienced a dam failure, it is difficult to specifically establish the probability of a future failure; however, given the capacities of their reservoirs and the scope and type of development and infrastructure located downstream, the probability is also estimates to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

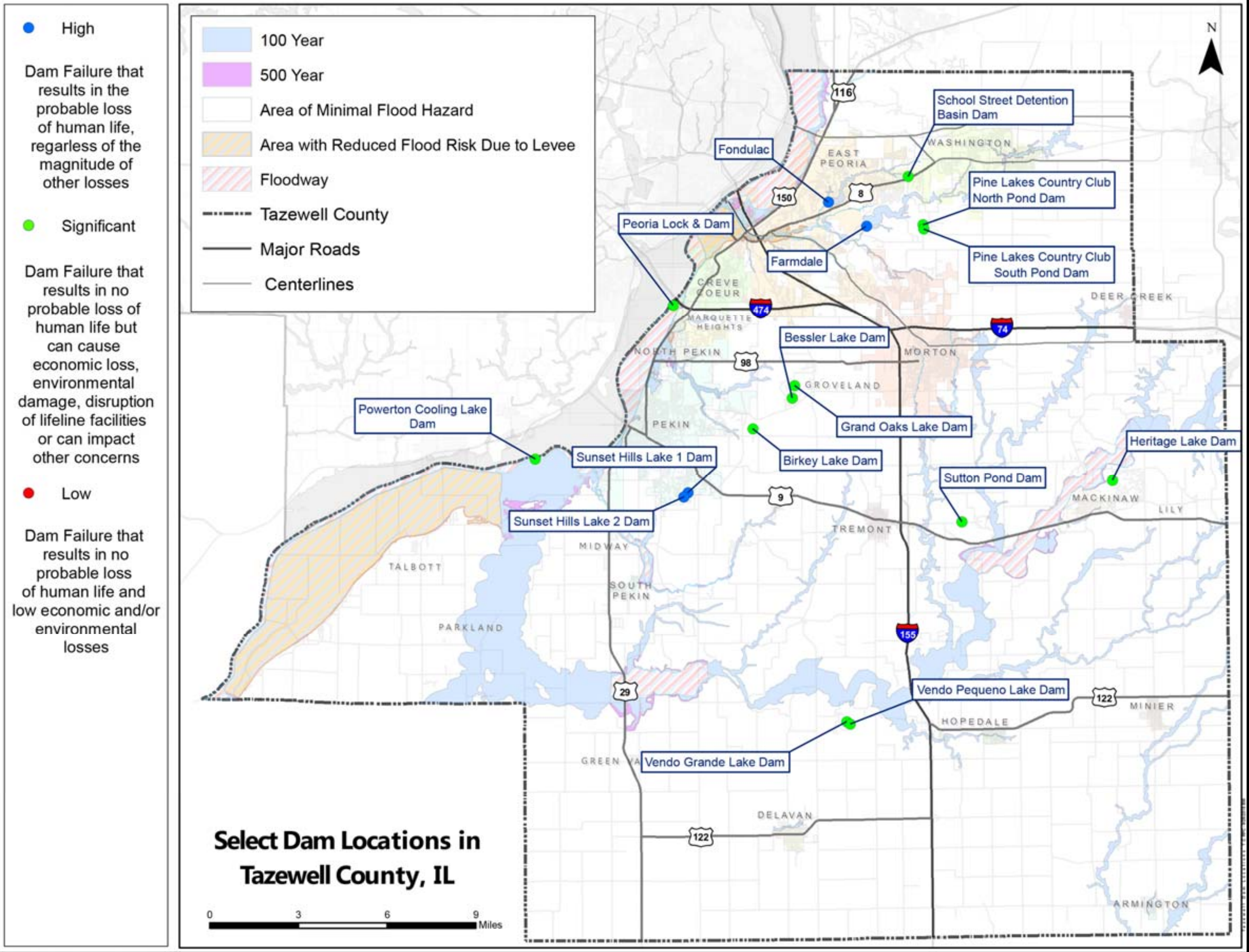
HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from dam failures.

Are the participating jurisdictions vulnerable to dam failures?

Yes. East Peoria, Pekin, Washington, Morton and unincorporated areas of Tazewell County are vulnerable to the dangers presented by dam failures. None of the rest of the participating municipalities are considered vulnerable.

Figure 218a
Location of Select Classified Dams in Tazewell County



What impacts resulted from the recorded dam failures?
Since there have been no *recorded* dam failures in Tazewell County, there are no recorded impacts to report.

What other impacts can result from dam failures?

The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding or roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

Dam Failure Fast Facts – Risk

Dam Failure Risk/Vulnerability to:
- Public Health & Safety: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Public Health & Safety: "Low" Hazard Classification & "Unknown" Dams – ***Low***
- Buildings/Infrastructure/Critical Facilities: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Buildings/Infrastructure/Critical Facilities: "Low" Hazard Classification & "Unknown" Dams – ***Low***

In addition to concerns about injuries and fatalities, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding from dam failures can also cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure may also carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

What is the level of vulnerability to public health and safety from dam failures?
In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed by a dam failure in Tazewell County is considered to be low for the "Low" hazard classification and "Unknown" dams and medium for the "High" and "Significant" hazard classification dams.

Are existing buildings, infrastructure and critical facilities vulnerable to dam failures?

As discussed previously, Emergency Action Plans (EAPs) detailing the existing buildings, infrastructure and critical facilities vulnerable to dam failures were not developed or were not required to be developed for eight of the sixteen dams. The EAPs for the remaining eight dams were not made available to the Tazewell County Emergency Management Agency. As a result, a data deficiency exists in terms of comprehensively identifying existing buildings, infrastructure and critical facilities vulnerable to dam failures. While EAPs were not available for the Farmdale and Fondulac Dams, the US Army Corps of Engineers did provide Dam Failure Inundation Maps (DFIMs) and preliminary estimates on the number of structures (residential and commercial) that have the potential to be impacted based on modeling.

While detailed information was not available for a majority of the dams, a visual inspection of the areas surrounding the classified dams indicates that there are buildings, infrastructure and critical facilities that are vulnerable to dam failures. **Figure 218b** provides a ***rough estimate*** of the buildings, infrastructure and critical facilities by dam vulnerable to a dam failure.

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural damage may result. Because none of the reservoirs within the County are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk posed by a dam failure in Tazewell County is considered to be low for the “Low” hazard classification and “Unknown” dams and medium for the “High” and “Significant” hazard classification dams.

Are future buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. Any future buildings, infrastructure and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from dam failures?

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in Tazewell County, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from dam failures.

Figure 218b Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in Tazewell County (Sheet 1 of 3)					
Dam Name	**Location**	**Number of Vulnerable Buildings/Infrastructure**			
		Residential	**Commercial**	**Infrastructure**	**Critical Facilities**
Publicly-Owned Classified Dams					
Farmdale	East Peoria	1,074*		- Toledo, Peoria, Western Railway - Tazewell & Peoria Railroad - Interstate 74 - US Route 24/Main St. - US Route 150/Meadow Ave. - Illinois Route 116 - Illinois Route 29 - Illinois Route 8/Washington St. - Farmdale Rd. - Camp St. - Tractor Rd. - Veterans Dr. - Bloomington Rd. - Camp Rd. - various residential streets	- Central Junior High School - East Peoria Community High School - East Peoria City Hall - James L. Ranney Public Safety Building (Police & Fire Central House) - East Peoria Fire Station 3 - East Peoria City Hall - Morton's Wastewater Treatment Plant #3 - East Peoria drinking water wells #8 & Catherine - Two power generation substations
Fondulac	East Peoria	1,113*		- Toledo, Peoria, Western Railway - Tazewell & Peoria Railroad - Interstate 74 - US Route 150/Meadow Ave. - Illinois Route 8/Washington St. - Veterans Dr. - Camp Rd. - various residential streets	- Central Junior High School - East Peoria Community High School - East Peoria Fire Station 3 - Oakwood Drinking Water Treatment Plant - East Peoria drinking water wells #8 & Catherine - One power generation substation

* Residential/commercial counts provided by the US Army Corps of Engineers and represent the worst case scenario (i.e., Maximum High Pool). The counts provided were describe as residential structures with commercial and industrial intermixed. A breakdown by structure type is not available.

Figure 218b
Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in Tazewell County
(Sheet 2 of 3)

Dam Name	Location	Number of Vulnerable Buildings/Infrastructure			
		Residential	Commercial	Infrastructure	Critical Facilities
Publicly-Owned Classified Dams Continued…					
Peoria Lock & Dam	Creve Coeur	---	---	---	---
School Street Detention Basin Dam	Washington	1	---	- School Street	- Faith Lutheran Church
High & Significant Hazard Class Privately-Owned Classified Dams					
Sunset Hills Lake 1 Dam	Sunset Hills Subdivision (Pekin)	1-3	---	- Highwood Ave - North Lake Dr.	---
Sunset Hills Lake 2 Dam	Sunset Hills Subdivision (Pekin)	8-10	1	- Highwood Ave - Sierra Dr.	---
Bessler Lake Dam	Towne Oaks (Unincorp. Tazewell County)	---	---	- Bessler Lake Dr.	---
Birkey Lake Dam	0.5 miles west of Pekin Country Club (Unincorp. Tazewell County)	---	---	- Veterans Dr.	---
Grand Oaks Lake Dam	Groveland (Unincorp. Tazewell County)	1-3	---	- Locust Grove Rd.	---
Heritage Lake Dam	Mackinaw	2-6	1	- Heritage Dr. - Hild Rd. - Dee Mac Rd. - W. Fast Ave - N. Hoffman Ave.	---
Pine Lakes Country Club North Pond Dam	Pine Lakes Country Club (Unincorp. Tazewell County)	---	1	---	---
Pine Lakes Country Club South Pond Dam	Pine Lakes Country Club (Unincorp. Tazewell County)	---	1	---	---

Figure 218b Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in Tazewell County (Sheet 3 of 3)					
Dam Name	**Location**	**Number of Vulnerable Buildings/Infrastructure**			
		Residential	**Commercial**	**Infrastructure**	**Critical Facilities**
High & Significant Hazard Class Privately-Owned Classified Dams Continued…					
Powerton Cooling Lake Dam	Powerton Generating Station (Unincorp. Tazewell County)	4-5	3-4	- Manito Rd. - Wagonseller Rd. - Excel Way - Schumm Rd.	- NRG Powerton Generating Station
Sutton Pond Dam	0.5 mile west of Lake Windermere community (Unincorp. Tazewell County)	1-3	---	- E Lake Windemere Rd.	---
Vendo Grande Lake Dam	Venado Lake community (Unincorp. Tazewell County)	3-4	---	- Granada Dr. - Tullamore Rd.	---
Vendo Pequeno Lake Dam	Venado Lake community (Unincorp. Tazewell County)	2-3	---	- Granada Dr.	---

3.10.2 Woodford County

Hazard Profile

The following details the location of classified dams, identifies past occurrences of dam failures, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any classified dams owned by any of the participating jurisdictions?

Yes. There is one publicly-owned classified dam within the County owned by the City of Eureka. The Eureka Lake Dam, an earthen dam located on a tributary of Walnut Creek, was completed in 1942. It has a hazard classification of "Significant" and its purpose is as a water supply.

Dam Failure Fast Facts – Occurrences

Number of Classified Dams Located in the County: ***10***

Number of Classified Dams owned by Participating Jurisdictions: ***1***

Number of Dam Failures Reported: ***None***

Probability of Future Dam Failure Events: ***Low***

Are there any other publicly-owned classified dams within the County?

Yes. There is one other publicly-owned classified dam within the County owned by the City of Bloomington. (While Bloomington is located in McLean County, it owns property in Woodford County.) The Evergreen Lake Dam, an earthen dam located on Six Mile Creek, was completed in 1971. It has a hazard classification of "High" and its purpose is recreation and as a water supply.

Are there any privately-owned classified dams within the County?

Yes. There are eight privately-owned classified dams within Woodford County. Seven of the eight privately-owned classified dams have a hazard classification of "Low" and the remaining dam is classified as "Unknown".

Of these eight privately-owned classified dams:

- one is owned by an individual;
- four are owned by associations/leagues;
- one is owned by a business; and
- two do not identify an owner.

When have dam failures occurred previously? What is the extent of these previous dam failures?

According to the data from Stanford University's National Performance of Dams Incident Database and discussions with MAC members, there are no known recorded dam failures in Woodford County.

What locations are affected by dam failure?

Dam failures have the potential to impact Eureka, Germantown Hills and unincorporated areas of Woodford County. **Figure 219** shows the locations of ***select classified dams*** in Woodford County.

What is the probability of future dam failure events occurring?

Since none of the other dams have experienced a dam failure, it is difficult to specifically establish the probability of a future failure; however, given the capacities of their reservoirs and the scope and type of development and infrastructure located downstream, the probability is also estimates to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from dam failures.

Are the participating jurisdictions vulnerable to dam failures?

Yes. Eureka, Germantown Hills and unincorporated areas of Woodford County are vulnerable to the dangers presented by dam failures. None of the rest of the participating municipalities are considered vulnerable.

What impacts resulted from the recorded dam failures?

Since there have been no *recorded* dam failures in Woodford County, there are no recorded impacts to report.

What other impacts can result from dam failures?

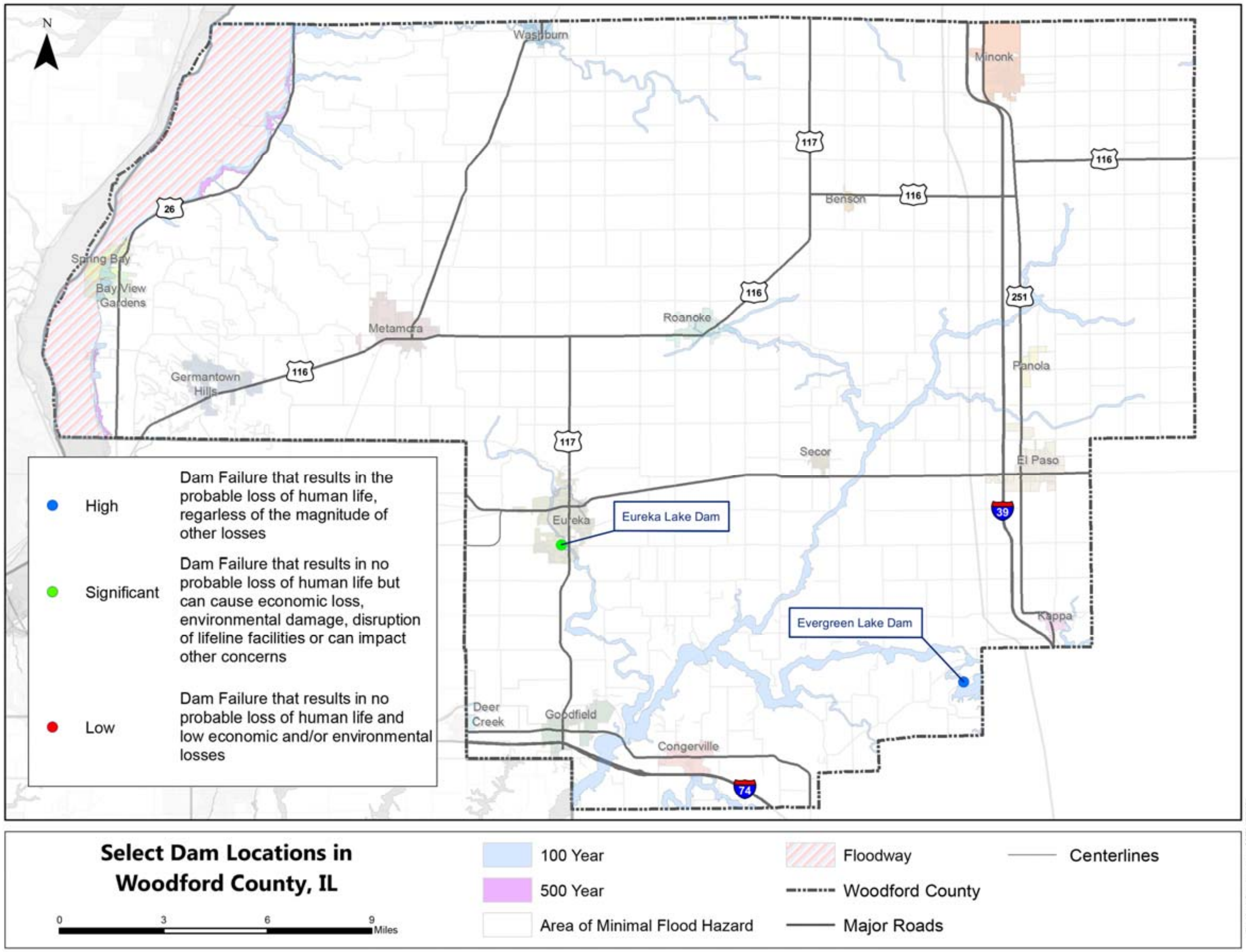
The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding or roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

Dam Failure Fast Facts – Risk

Dam Failure Risk/Vulnerability to:

- Public Health & Safety: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Public Health & Safety: "Low" Hazard Classification & "Unknown" Dams – ***Low***
- Buildings/Infrastructure/Critical Facilities: "High" & "Significant" Hazard Classification Dams – ***Medium***
- Buildings/Infrastructure/Critical Facilities: "Low" Hazard Classification & "Unknown" Dams – ***Low***

Figure 219
Location of Select Classified Dams in Woodford County



In addition to concerns about injuries and fatalities, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding from dam failures can also cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure may also carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

What is the level of vulnerability to public health and safety from dam failures?

In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed by a dam failure in Woodford County is considered to be low for the "Low" hazard classification and "Unknown" dams and medium for the "High" and "Significant" hazard classification dams.

Are existing buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. While an Emergency Action Plan and inundation mapping was only available for the Evergreen Lake Dam, a visual inspection of the area surrounding the remaining nine classified dams indicates there are buildings and infrastructure that are vulnerable to dam failures.

The Tri-County Regional Planning Commission prepared inundation mapping based the Emergency Action Plan for Evergreen Lake Dam. This mapping identifies the number of residential structures, outbuildings and roadways that would be impacted by a dam failure based on two separate scenarios: the probable maximum flood (PMF) and sunny day. The PMF is a rainy-day failure scenario that refers to the flood magnitude that may be expected from the worst combination of meteorological and hydrologic conditions for a watershed. A sunny day failure, as discussed previously, results from a structural breach at a time when the reservoir is near normal pool level with less water entering the reservoir and therefore a smaller amount of water is being released at a lesser velocity than would occur during a PMF. **Figure 220** illustrates the area potentially affected by scenario while **Figure 221** provides a breakdown of the buildings and infrastructure vulnerable to a dam failure based on each scenario.

Figure 220
Evergreen Lake Dam Failure Inundation Map – Woodford County

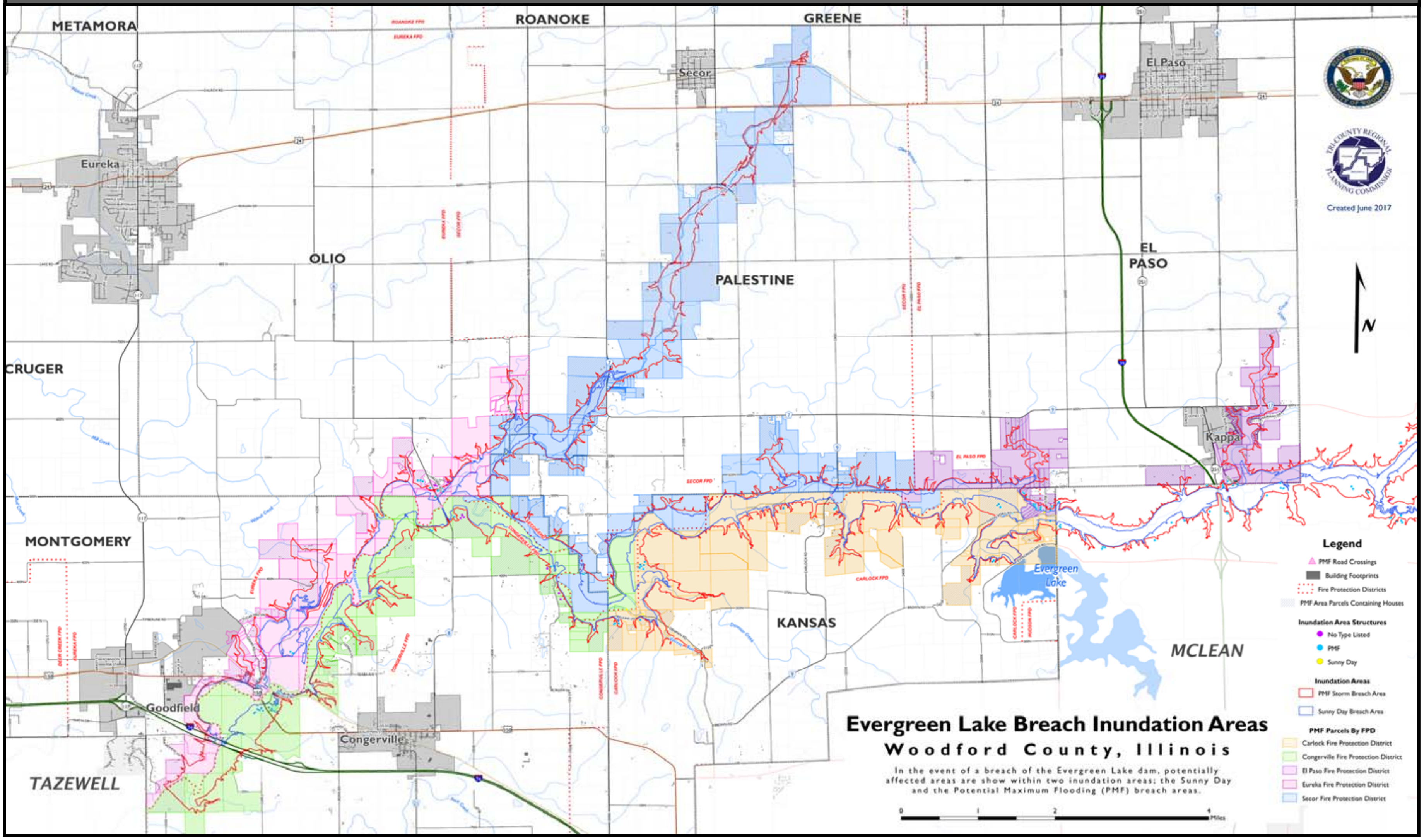


Figure 221 Evergreen Lake Dam – Buildings and Infrastructure Vulnerable to a Dam Failure in Woodford County				
Scenario	**Number of Impacted Buildings/Infrastructure**			**Residential Structures within 100 feet**
	Residential	**Garages/ Outbuildings**	**Highways/ Roadways**	
Probable Maximum Flood (PMF)	49	103	8	57
Sunny Day	2	3	0	0

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural damage may result. Because none of the reservoirs within the County are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. According to the inundation mapping for the Evergreen Lake Dam, ***eight roadways, including Interstate 74 and US Route 150, would be overtopped by the PMF***.

Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk posed by a dam failure in Woodford County is considered to be low for the "Low" hazard classification and "Unknown" dams and medium for the "High" and "Significant" hazard classification dams.

Are future buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. Any future buildings, infrastructure and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from dam failures?

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in Woodford County, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from dam failures.

3.10.3 Participating Peoria County Municipalities

Hazard Profile

The following details the location of classified dams, identifies past occurrences of dam failures, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any classified dams owned by any of the participating jurisdictions?

Yes. There are two publicly-owned classified dam within the participating Peoria County municipalities, both owned or co-owned by the City of Peoria.

Are there any other publicly-owned classified dams within the participating Peoria County municipalities?

Yes. There are two other publicly-owned classified dams within the participating Peoria County municipalities, both are owned or co-owned by the Peoria Park District.

Figure 222 provides detailed information on each of the four publicly-owned classified dams located in in the participating Peoria County municipalities.

Are there any privately-owned classified dams within the participating Peoria County municipalities?

Yes. There are four privately-owned classified dams within the participating Peoria County municipalities. Two of the dams have a hazard classification of "High" or "Significant" and are located in Peoria. Both of the remaining privately-owned classified dams have a hazard classification of "Low" with one located in Peoria and the other located in Hanna City.

Dam Failure Fast Facts – Occurrences

Number of Classified Dams Located in the Participating Municipalities: ***8***

Number of Dam Failures Reported: ***None***

Probability of Future Dam Failure Events: ***Low***

Figure 223 provides detailed information on the privately-owned classified dams with a hazard classification of "High" or "Significant" located in the participating Peoria County municipalities.

When have dam failures occurred previously? What is the extent of these previous dam failures?

According to the data from Stanford University's National Performance of Dams Incident Database and discussions with MAC members, there are no known recorded dam failures in the participating Peoria County municipalities.

According to the National Inventory of Dams (NID), Emergency Action Plans (EAPs) defining the extent or magnitude of potential dam failures (water depth, speed of onset and warning times) were not developed or were not required to be developed for five of the six dams. The EAP for Franciscan Prairie Point Dam was not made available to the City of Peoria's Emergency Management Coordinator As a result, a data deficiency exists in terms of defining the extent or magnitude of future potential dam failures.

Figure 222 Publicly-Owned Classified Dams Located in the Participating Peoria County Municipalities												
Dam Name	**Hazard Classification**	**Associated Waterway**	**Owner**	**Type**	**Primary Purpose**	**Completion Year**	**Height (feet)**	**Length (feet)**	**Storage (acre-feet)**	**Impoundment Surface Area (acres)**	**Drainage Area (square miles)**	**Emergency Action Plan**
Charter Oak North Lake Dam	Low	Tributary Kickapoo Creek	Peoria Park District	Earth	Recreation	1978	39 ft.	440 ft.	208 ac.-ft.	7 ac.	0.6 sq. mi.	No
Charter Oak South Lake Dam	Significant	Tributary Kickapoo Creek	Peoria Park District	Earth	Recreation	1970	33 ft.	303 ft.	43 ac.-ft.	n/a	n/a	No
Huntington Pointe Dam	Low	Tributary Kickapoo Creek	City of Peoria	Earth	Recreation	1993	34 ft.	250 ft.	16 ac.-ft.	3 ac.	0.2 sq. mi	No
Peoria City-County Landfill 2 Dam	Low	Tributary Warsaw Run	City of Peoria/ Peoria County	Earth	Other	n/a	22 ft.	n/a	51 ac.-ft.	11 ac.	n/a	No

Figure 223 Select Privately-Owned Classified Dams Located in the Participating Peoria County Municipalities												
Dam Name	**Hazard Classification**	**Associated Waterway**	**Owner**	**Type**	**Primary Purpose**	**Completion Year**	**Height (feet)**	**Length (feet)**	**Storage (acre-feet)**	**Impoundment Surface Area (acres)**	**Drainage Area (square miles)**	**Emergency Action Plan**
Franciscan Prairie Pointe Dam	High	Fargo Run	OSF - Health Care System	Earth	Flood Control Other	n/a	10.7 ft.	340 ft.	166 ac.-ft.	13.2 ac.	1.91 sq. mi.	Yes
Lake Lynnhurst Dam	High	Tributary Kickapoo Creek	Lake Lynnhurst Owners Association	Earth	Recreation	1940	44 ft.	530 ft.	159 ac.-ft.	7 ac.	0.2 sq. mi.	No

What locations are affected by dam failure?

Figure 224 shows the locations of ***select classified dams*** in the participating Peoria County municipalities. Dam failures have the potential to impact the following municipalities:

- ❖ undeveloped area east and south of Huntington Point subdivision in Peoria;
- ❖ Charter Oak subdivision in Peoria;
- ❖ undeveloped area west of Franciscan Prairie Pointe in Peoria;
- ❖ Lynnhurst subdivision in Peoria; and
- ❖ Peoria City/County Landfill # 3 approximately 3 miles west-southwest of Edwards.

What is the probability of future dam failure events occurring?

Since none of the other dams have experienced a dam failure, it is difficult to specifically establish the probability of a future failure; however, given the capacities of their reservoirs and the scope and type of development and infrastructure located downstream, the probability is also estimates to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from dam failures.

Are the participating jurisdictions vulnerable to dam failures?

Yes. Peoria and Hanna City are vulnerable to the dangers presented by dam failures. None of the rest of the participating Peoria County municipalities are considered vulnerable.

What impacts resulted from the recorded dam failures?

Since there have been no *recorded* dam failures in participating Peoria County municipalities, there are no recorded impacts to report.

What other impacts can result from dam failures?

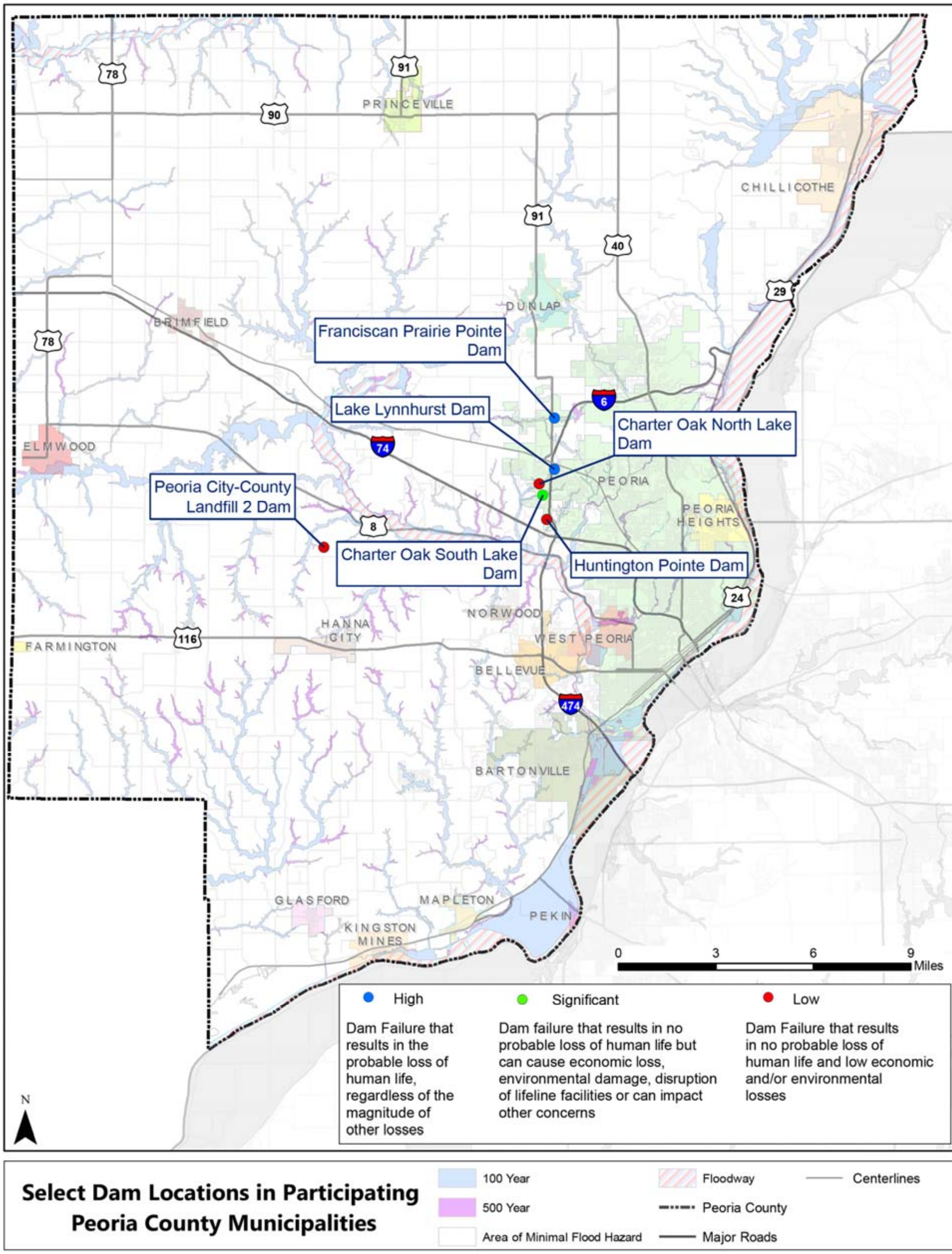
Dam Failure Fast Facts – Risk

Dam Failure Risk/Vulnerability to:

- ❖ Public Health & Safety: "High" & "Significant" Hazard Classification Dams – ***Medium***
- ❖ Public Health & Safety: "Low" Hazard Classification Dams – ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities: "High" & "Significant" Hazard Classification Dams – ***Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: "Low" Hazard Classification Dams – ***Low***

The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding or roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

Figure 224
Location of Select Classified Dams in Participating Peoria County Municipalities



In addition to concerns about injuries and fatalities, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding from dam failures can also cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure may also carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

What is the level of vulnerability to public health and safety from dam failures?

In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed by a dam failure is considered to be low for the "Low" hazard classification dams and medium for the "High" and "Significant" hazard classification dams located in the participating Peoria County municipalities.

Are existing buildings, infrastructure and critical facilities vulnerable to dam failures?

According to the National Inventory of Dams (NID), Emergency Action Plans (EAPs) defining the extent or magnitude of potential dam failures (water depth, speed of onset and warning times) were not developed or were not required to be developed for five of the six dams. The EAP for Franciscan Prairie Point Dam was not made available to the City of Peoria's Emergency Management Coordinator As a result, a data deficiency exists in terms of defining the extent or magnitude of future potential dam failures.

As discussed previously, Emergency Action Plans (EAPs) detailing the existing buildings, infrastructure and critical facilities vulnerable to dam failures were not developed or were not required to be developed for five of the six dams. The EAP for Franciscan Prairie Point Dam was not made available to the City of Peoria's Emergency Management Coordinator As a result, a data deficiency exists in terms of comprehensively identifying existing buildings, infrastructure and critical facilities vulnerable to dam failures.

While detailed information was not available for a majority of the dams, a visual inspection of the areas surrounding the classified dams indicates that there are buildings, infrastructure and critical facilities that are vulnerable to dam failures. **Figure 225** provides a ***rough estimate*** of the buildings, infrastructure and critical facilities by dam vulnerable to a dam failure.

Figure 225
Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure in the Participating Peoria County Municipalities

Dam Name	Location	Number of Vulnerable Buildings/Infrastructure			
		Residential	Commercial	Infrastructure	Critical Facilities
Huntington Pointe Dam	Huntington Pointe Subdivision (Peoria)	---	---	- North Rothmere Dr.	---
Peoria City-County Landfill 2 Dam	3 miles west-southwest of Edwards (Unincorp. Peoria County)	1-3	---	- West Cottonwood Rd.	---
Charter Oak South Lake Dam	Charter Oak Subdivision (Peoria)	1-2 apartment complexes	---	- Orange Prairie Rd. - Haymeadow Pl.	---
Charter Oak North Lake Dam	Charter Oak Subdivision (Peoria)	---	---	- Orange Prairie Rd. - Ancient Oak Dr.	---
Franciscan Prairie Pointe Dam	Franciscan Prairie Pointe (Peoria)	---	---	- Illinois Route 91	---
Lake Lynnhurst Dam	Lynnhurst Subdivision (Peoria)	---	---	- Illinois Route 6 - Charter Oak Park	---

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural damage may result. Because none of the reservoirs within the participating municipalities are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk posed by a dam failure in the participating Peoria County municipalities is considered to be low for the “Low” hazard classification dams and medium for the “High” and “Significant” hazard classification dams.

Are future buildings, infrastructure and critical facilities vulnerable to dam failures?

Yes. Any future buildings, infrastructure and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from dam failures?

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in participating Peoria County municipalities, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from dam failures.

3.11 LEVEES

HAZARD IDENTIFICATION

What is the definition of a levee?

The U.S. Army Corps of Engineers (USACE or the Corps) defines a "levee" as an earthen embankment, floodwall or structure along a water course whose purpose is flood risk reduction or water conveyance while the National Flood Insurance Program defines a "levee" as a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding. Levees are typically not designed to hold back water for extended periods of time, rather they are meant to provide temporary flood protection from seasonal high water, precipitation and other weather events. While levees reduce the risk from a flooding event, they do not eliminate it. There is always the chance a flood will exceed the capacity of a levee, no matter how well it is built.

In Illinois, the Mississippi and Illinois River valleys were largely transformed from permanent, seasonal wetlands to highly productive agricultural lands by the construction of levees and the organization of drainage districts between 1879 and 1916.

What is the definition of a levee breach?

A levee breach is a rupture, break or gap in a levee which causes previously contained water to flood the land behind the levee. If the levee breach is identified as a "failure breach" then the cause of the breach is known and occurred without overtopping. In order for a breach to be termed a failure breach, an investigation is usually required to determine the cause.

What is the definition of overtopping?

Overtopping occurs when the water levels contained by the levee exceed the levee's crest elevation and flood the land behind the levee. The flooding occurs from overflow/overwash (waves) and other sources. In most cases overtopping may damage the levee but not compromise it. If the levee is compromised because of overtopping then it is identified as an "overtopping breach."

What causes a levee breach?

Levee breaches can result from one or more of the following:

- ***erosion of the crown and land-side face of the levee*** caused by overtopping (the higher the velocity of flow over the levee, the more quickly that erosion will occur and cause a failure of the levee);
- ***sand boils and piping*** resulting from the relatively fast passage of flood waters through permeable materials under the base of the levee to the land behind the levee (depending on the amount of sand and soil transported by the waters from the base to the surface, the levee may settle unevenly, crack or even completely fail);
- ***seepage and saturation*** (prolonged exposure to water will cause levee materials to become saturated, leading to seepage and sloughing of the soil on land-side face of the levee and resulting in the loss of slope stability and ultimately failure of the levee);

- ***erosion of the river-side slope of the levee*** as a result of wave action caused by wind and/or commercial or recreational vessels over a long period of time (most Illinois levees are constructed of sand and alluvial materials, both of which are among the easiest materials to erode);
- ***structural failures*** at gates, walls or closure structures;
- ***improper maintenance*** (including failure to maintain gates, walls or closure structures; remove trees; fill in holes created by burrowing animals, etc.); and
- ***earthquakes*** which can cause loss of soil strength and destabilize the levee and foundation materials.

Who is responsible for regulating levees?

This is no single agency with responsibility for levee oversight nationwide. The USACE has specific and limited authorities for approximately 2,000 levees across the country, totaling 14,000 miles. While the Corps serves as one of the nation's largest infrastructure stewards, the misperception exists that the USACE has universal responsibility for the nation's levees. There are three different classifications of levees:

- ***Federally Authorized Levees***. A levee typically designed and built by the Corps in cooperation with a local sponsor, then turned over to the local sponsor (i.e. drainage district) to operate, maintain, repair and replace the levee.
- ***Non-Federally Authorized Levees***. A levee designed and built by a non-federal agency, which is responsible for the operation, maintenance, repair and replacement of the levee.
- ***Private or Corporate-Owned Levees***. A levee designed and built by a private citizen, company or other public entity, which is responsible for the operation, maintenance, repair and replacement of the levee. The Corps has no responsibility for this type of levee.

3.11.1 Tazewell County

Hazard Profile

The following details the location of levees of significance (those levees protecting a sizable amount of land, considerable number of structures and/or individuals); identifies past occurrences of levee failures associated with the levees of significance studied; details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences of levee failures.

Are there any levees of significance located in Tazewell County?

Yes. According to the USACE National Levee Database there are three levee systems of significance located in Tazewell County. **Figure 226** provides information on each levee system while **Figures 227, 228** and **229** illustrates their location and area protected.

Levee Breach Fast Facts – Occurrences

Number of Levee Systems of Significance Located in the County: ***3***

Number of Levee Breaches Reported: ***None***

Probability of Future Levee Breach Events: ***Low***

Figure 226
Levee Systems of Significance in Tazewell County

Levee System Name	Levee Category	Year Constructed	# of Levee Segments	Length of Levee (Miles)	Land Protected (Acres)	Inspection Rating	Year Inspected	PL 84-99 Status
East Peoria Drainage & Levee District (D&LD) and East Peoria Sanitary District (EPSD) LDB Farm Creek / Cole Creek	Federally Authorized	1945	3	3.83	980	Minimally Acceptable	2017	Inactive
East Peoria Sanitary District (EPSD) RDB Farm Creek & Diversion Channel	Federally Authorized	1954	2	2.86	500	Unacceptable	2016	Inactive
Spring Lake Drainage & Levee District (D&LD)	Federally Authorized	1940	1	16.02	13,500	Minimally Acceptable	2017	Active

Source: US Army Corps of Engineers, National Levee Database.

When have levee breaches occurred previously? What is the extent of these previous levee breaches?

There have been *no recorded* levee breaches along any of the levees of significance studied in Tazewell County.

What locations are affected by levee breaches?

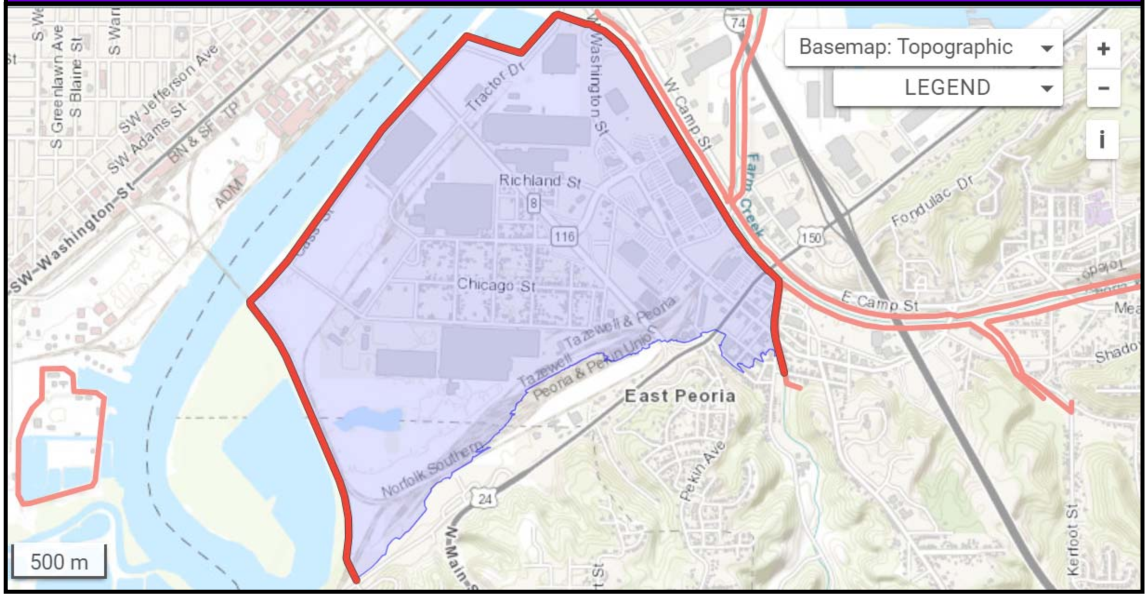
Levee breaches along the studied levees of significance have the potential to affect portions of East Peoria and unincorporated areas of Tazewell County.

What is the probability of future levee breach events occurring?

There are several factors that must be considered when calculating the probability of future levee breaches including whether a breach has occurred previously, the age and current conditions of the levee, whether proper maintenance is ongoing and the magnitude of the event. Since none of the levees of significance studied in Tazewell County have experienced a breach it is difficult to specifically establish the probability of future levee breaches associated with these levees; however, it is estimated to be relatively ***low***.

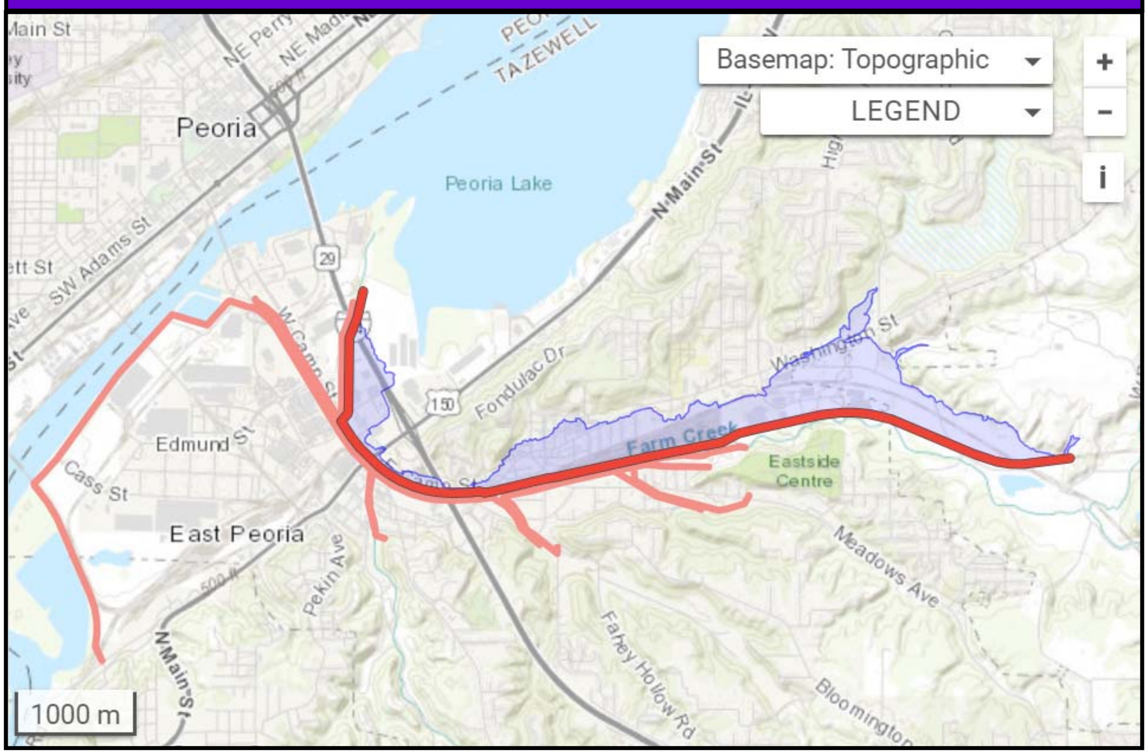
According to the USACE National Levee Database, the East Peoria Drainage & Levee District (D&LD) and East Peoria Sanitary District (EPSD) LDB Farm Creek / Cole Creek system and the Spring Lake D&LD have Levee Safety Action Classifications of "Low." The USACE's Levee Safety Senior Oversight Group considers the risk associated with overtopping of the East Peoria D&LD to be low due to the moderate likelihood of overtopping with low associated consequences. The EPSD RDB Farm Creek & Diversion Channel system has not been screened for a Levee Safety Action Classification.

Figure 227
East Peoria Drainage & Levee District & East Peoria Sanitary District: LDB Farm Creek / Cole Creek Levee System



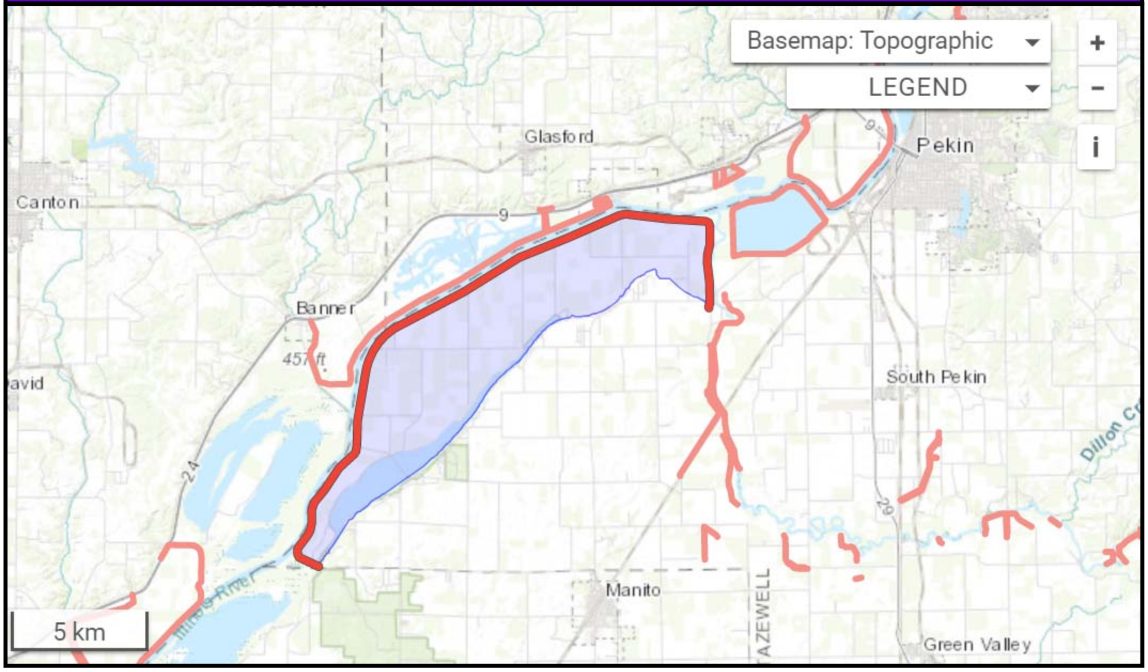
Source: US Army Corps of Engineers, National Levee Database.

Figure 228
East Peoria Sanitary District RDB Farm Creek & Diversion Channel Levee System



Source: US Army Corps of Engineers, National Levee Database.

Figure 229
Spring Lake Drainage & Levee District



Source: US Army Corps of Engineers, National Levee Database.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions associated with the levees of significance studied, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from levee failures.

Are the participating jurisdictions vulnerable to levee breaches?

Yes. Portions of East Peoria and unincorporated Tazewell County are vulnerable to the dangers presented by levee breaches associated with the studied levees. None of the rest of the County or participating municipalities are considered vulnerable.

What impacts resulted from the recorded levee breaches?

Since there have been no *recorded* levee breaches associated with the levees of significances studied in Tazewell County, there are no recorded impacts to report.

Levee Failure Fast Facts – Risk

Levee Breach Risk/Vulnerability to:

- Public Health & Safety: East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system – ***Low to Medium***
- Public Health & Safety: EPSD RDB Farm Creek & Diversion Channel levee system – ***Low to Medium***
- Public Health & Safety: Spring Lake D&LD – ***Low***
- Buildings/Infrastructure/Critical Facilities: East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system – ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: EPSD RDB Farm Creek & Diversion Channel levee system – ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: Spring Lake D&LD – ***Low***

What other impacts can result from levee breaches?

Aside from causing damage to buildings, infrastructure and critical facilities, floodwaters released due to a levee breach also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew which can pose a health hazard, especially for small children, the elderly and those with specific allergies. Flooding also has the potential to contaminate drinking water sources used for both human and livestock consumption.

Flooding resulting from a levee breach can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during an event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

What is the level of vulnerability to public health and safety from levee breaches?

In terms of the risk or vulnerability to public health and safety from a levee breach associated with the studied levees, there are several factors that must be taken into consideration including the magnitude or severity of the precipitating event (whether an earthquake or flooding); the extent and type of development and infrastructure protected by the levee; the amount of time available to enact emergency measures such as evacuations; and USACE's Levee Safety Action Classification assessment. The following provides an evaluation of the risk to public health and safety by participating jurisdiction.

Unincorporated Tazewell County

According to the USACE's National Levee Database, there are only 271 people at risk in the Spring Lake D&LD levee system, the only levee of significance located in unincorporated Tazewell County. Given the amount of area protected (13,500 acres), there are relatively few individuals that have the potential to be impacted in the event of a levee breach. This fact, along with USACE's Levee Safety Action Classification assessment indicates the level of risk or vulnerability posed by a levee breach to public health and safety is low for the Spring Lake D&LD.

East Peoria

According to the USACE's National Levee Database, there are 4,205 people at risk in the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system and 1,860 people at risk in the EPSD RDB Farm Creek & Diversion Channel levee system, the only two levees of significance located within the City. The number of individuals potentially impacted was considered along with the USACE's Levee Safety Action Classification assessment in assessing the level or risk or vulnerability posed by a levee breach to public health and safety for both these levees.

In terms of the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system, the risk or vulnerability to public health and safety is considered to be low to medium. This is due in part to the USACE's Levee Safety Action Classification assessment and the number of potentially-impacted individuals. The USACE's Levee Safety Senior Oversight Group acknowledged that the large number of evacuees using the limited egress routes causes concern and there are a large number of transient shoppers from outside the leveed area that create a challenge to implement an evacuation plan.

In terms of the EPSD RDB Farm Creek & Diversion Channel levee system, the risk or vulnerability to public health and safety is also considered to be low to medium, in part due to the number of potentially-impacted individuals and the fact that the USACE has not assigned a Levee Safety Action Classification to this system.

Are existing buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Buildings, infrastructure and critical facilities located within the leveed area associated with the studied levees are vulnerable to levee breaches. **Figure 230** identifies the number of existing structures vulnerable to a levee breach by system, the estimated property value of the vulnerable structures and the participating jurisdiction the structures are located within. These counts were acquired from the USACE's National Levee Database.

Figure 230
Number of Existing Structures Vulnerable to a Levee Breach – Tazewell County

Levee System Name	Number of Vulnerable Structures	Estimated Property Value of Vulnerable Structures	Structure Location
East Peoria Drainage & Levee District (D&LD) and East Peoria Sanitary District (EPSD) LDB Farm Creek / Cole Creek	422	$323 million	East Peoria
East Peoria Sanitary District (EPSD) RDB Farm Creek & Diversion Channel	267	$217 million	East Peoria
Spring Lake Drainage & Levee District (D&LD)	178	$42.5 million	Unincorporated Tazewell County

Source: US Army Corps of Engineers, National Levee Database.

Depending on the magnitude of the breach, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural and content damage may result. In addition to impacting structures, a levee breach can damage roads and utilities. Roadways, culverts and bridges can be weakened by levee breach floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to levee breach flooding. Depending on their location and the velocity of the water as it escapes the levee, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

Aside from key roads and power and communication lines, East Peoria has specific infrastructure/critical facilities that are vulnerable to the impacts of a levee breach from the studied levees. The following provides a description of each.

- City Hall, Central House fire station, the police department and wastewater treatment plant #1 are protected by the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system.
- The East Peoria Community High School is protected by EPSD RDB Farm Creek & Diversion Channel levee system.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the magnitude or severity of the precipitating event (whether an earthquake, general flood or flash flood), the extent and type of development and infrastructure protected by the levee, the amount of time available to implement emergency measures such as sandbagging and the USACE's Levee Safety Action Classification assessment. The following provides an evaluation of the risk to buildings, infrastructure and critical facilities by participating jurisdiction.

Unincorporated Tazewell County
Based on the number and type of structures at risk and the Levee Safety Action Classification assigned by USACE, the risk to existing buildings, infrastructure and critical facilities from a levee breach is considered to be low for the Spring Lake D&LD.

East Peoria
In terms of the East Peoria D&LD and EPSD LDB Farm Creek / Cole Creek levee system, the risk or vulnerability to existing buildings, infrastructure and critical facilities is considered to be low to medium. This is due in part to the USACE's Levee Safety Action Classification assessment tempered by the number and type of at-risk structures. According to the USACE Risk Characterization Summary, the East Peoria D&LD was improved in 2009 and has been loaded up to 31% of the levee height with no performance issues. The Illinois River is slow rising and the D&LD closely monitors flood stages providing time for notifications and evacuation. The USACE's Levee Safety Senior Oversight Group did indicate in their assessment that there is some uncertainty about potential seepage under larger loadings related to animal burrows, the levee foundation that includes pervious fill materials along Wesley Slough, and long loading duration; however, a seepage analysis was completed as part of the 1996 Detailed Project Report and seepage beams were added where the minimum factor of safety was not present.

In terms of the EPSD RDB Farm Creek & Diversion Channel levee system, the risk to existing buildings, infrastructure and critical facilities is also considered to be low to medium, in part due to the number and type of at-risk structures and the fact that the USACE has not completed its risk characterization of this levee system.

Are future buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Any future buildings, infrastructure and critical facilities located within the studied levee systems are vulnerable to damage from a levee breach. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from levee breaches?

Unlike other hazards, there are no standard loss estimation models or methodologies for levee breaches. Given that there have been no recorded levee breaches associated with any of the levees of significance studied in Tazewell County, sufficient information is not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures from a levee breach.

3.11.2 Woodford County

Hazard Profile

According to the USACE National Levee Database there are only three small, privately-owned levees located within Woodford County. None of the levees protect a sizeable amount of land or a considerable number of structures or individuals.

Due to the limited impacts on the population, land use and infrastructure, levees are not analyzed in detail for Woodford County as part of this Plan update.

3.11.3 Participating Peoria County Municipalities

Hazard Profile

The following details the location of levees of significance (those levees protecting a sizable amount of land, considerable number of structures and/or individuals); identifies past occurrences of levee failures associated with the levees of significance studied; details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences of levee failures.

Are there any levees of significance located in participating Peoria County municipalities?

Yes. According to the USACE National Levee Database there are two levee systems of significance located in the City of Peoria. **Figure 231** provides information on each levee system while **Figures 232** and **233** illustrates their location and area protected. No other levees of significance are located in the remaining participating Peoria County municipalities

Levee Breach Fast Facts – Occurrences

Number of Levee Systems of Significance Located in the Participating Municipalities: ***2***

Number of Levee Breaches Reported: ***None***

Probability of Future Levee Breach Events: ***Low***

When have levee breaches occurred previously? What is the extent of these previous levee breaches?

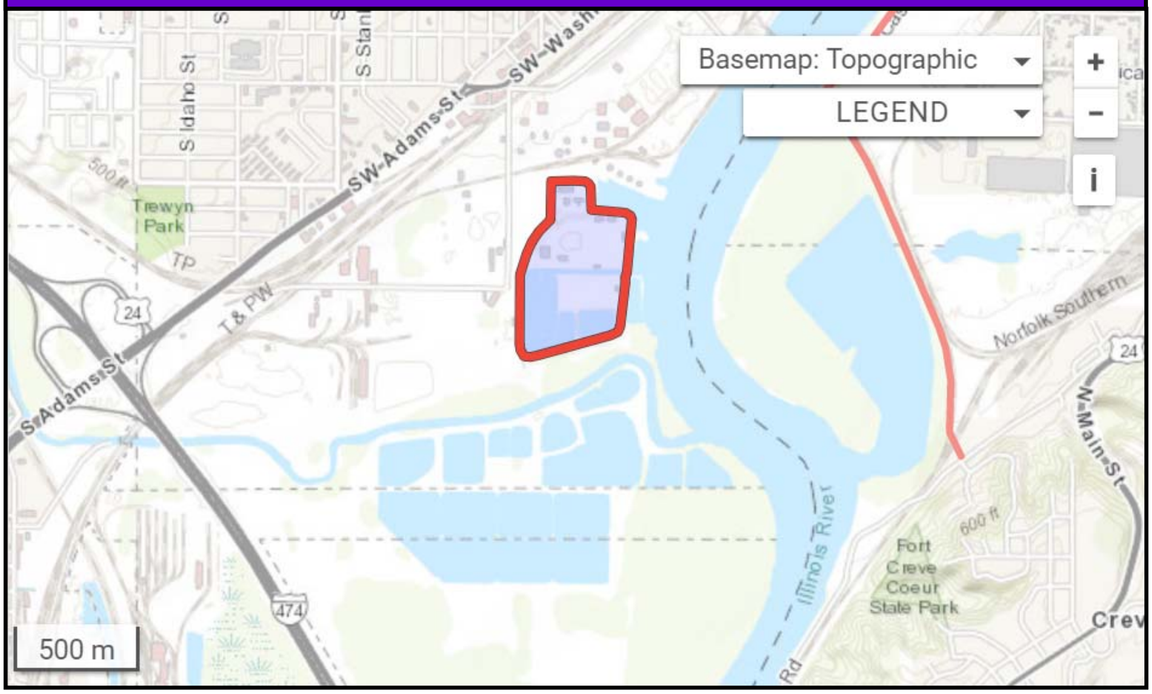
There have been *no recorded* levee breaches associated with the levees of significance studied in the City of Peoria.

Figure 231
Levee Systems of Significance in the City of Peoria

Levee System Name	Levee Category	Year Constructed	# of Levee Segments	Length of Levee (Miles)	Land Protected (Acres)	Inspection Rating	Year Inspected	PL 84-99 Status
Greater Peoria Sanitary District (GPSD)	Private / Corporate-Owned	n/a	1	1.25	57	Minimally Acceptable	2017	Active
Komatsu Levee	Private / Corporate-Owned	n/a	1	0.82	n/a	n/a	n/a	n/a

Source: US Army Corps of Engineers, National Levee Database.

Figure 232
Greater Peoria Sanitary District Levee System



Source: US Army Corps of Engineers, National Levee Database.

What locations are affected by levee breaches?

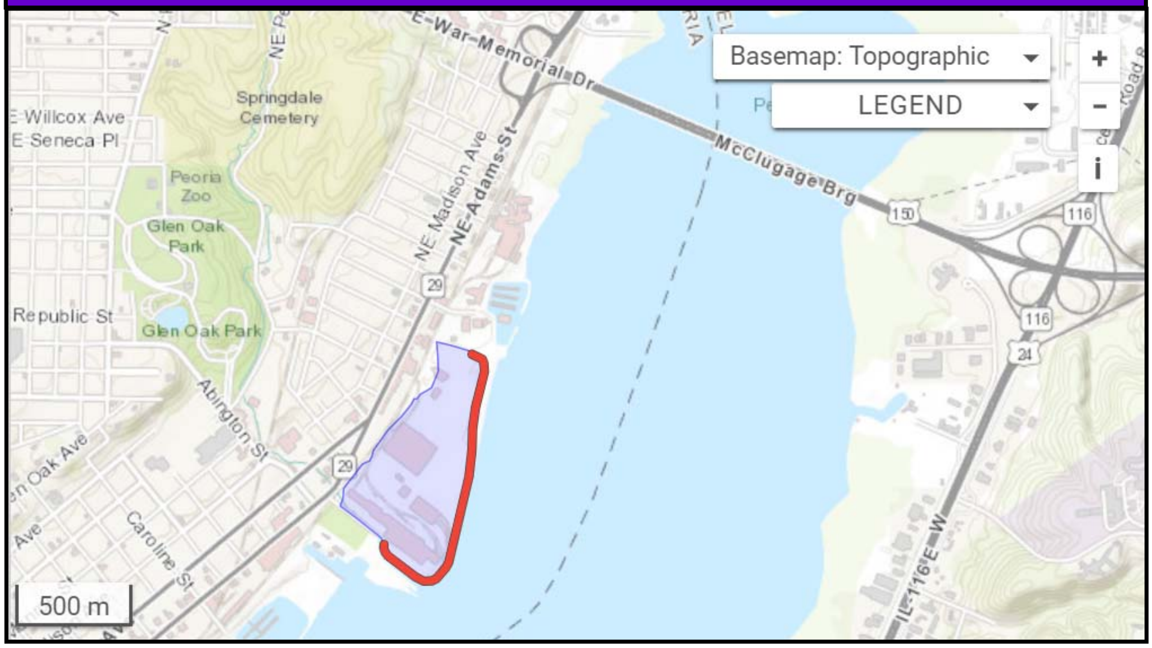
Levee breaches along the levees of significance studied have the potential to only affect portions of Peoria along the Illinois River.

What is the probability of future levee breach events occurring?

There are several factors that must be considered when calculating the probability of future levee breaches including whether a breach has occurred previously, the age and current conditions of the levee, whether proper maintenance is ongoing and the magnitude of the event. Since none of the levees of significance studied in City of Peoria have experienced a breach it is difficult to specifically establish the probability of future levee breaches associated with these levees; however, it is estimated to be relatively ***low***.

According to the USACE National Levee Database, the Greater Peoria Sanitary District (GPSD) has a Levee Safety Action Classification of low. The Komatsu Levee system has not been screened for a Levee Safety Action Classification.

Figure 233
Komatsu Levee System



Source: US Army Corps of Engineers, National Levee Database.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions associated with the levees of significance studied, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from levee failures.

Are the participating jurisdictions vulnerable to levee breaches?

Yes. Portions of Peoria are vulnerable to the dangers presented by levee breaches associated with the studied levees. None of the rest of the participating Peoria County municipalities are considered vulnerable.

Levee Failure Fast Facts – Risk

Levee Breach Risk/Vulnerability to:

- ❖ Public Health & Safety: GPSD levee system – ***Low***
- ❖ Public Health & Safety: Komatsu Levee system – ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities: GPSD levee system – ***Low to Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: Komatsu Levee system – ***Low to Medium***

What impacts resulted from the recorded levee breaches?

Since there have been no *recorded* levee breaches associated with the levees of significances studied in participating Peoria County municipalities, there are no recorded impacts to report.

What other impacts can result from levee breaches?

Aside from causing damage to buildings, infrastructure and critical facilities, floodwaters released due to a levee breach also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew which can pose a health hazard, especially for small children, the elderly and those with specific allergies. Flooding also has the potential to contaminate drinking water sources used for both human and livestock consumption.

Flooding resulting from a levee breach can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during an event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

What is the level of vulnerability to public health and safety from levee breaches?

In terms of the risk or vulnerability to public health and safety from a levee breach associated with the studied levees, there are several factors that must be taken into consideration including the magnitude or severity of the precipitating event (whether an earthquake or flooding); the extent and type of development and infrastructure protected by the levee; the amount of time available to enact emergency measures such as evacuations; and USACE's Levee Safety Action Classification assessment.

According to the USACE's National Levee Database, there are 70 people at risk in the Greater Peoria Sanitary District (GPSD) levee system and 38 people at risk in the Komatsu Levee system. The number of individuals potentially impacted was considered along with the USACE's Levee Safety Action Classification assessment in assessing the level of risk or vulnerability posed by a levee breach to public health and safety for both levees.

In terms of the GPSD levee system, the risk or vulnerability to public health and safety is considered to be low. This is due in part to the USACE's Levee Safety Action Classification assessment and the number of potentially-impacted individuals. The USACE's Levee Safety Senior Oversight Group in their Risk Characterization Summary indicated that given the flat leveed area and low workforce numbers, the workers would likely be able to evacuate before inundation depths would impede travel. The population at risk within the area is small with multiple egress routes a short distance away.

In terms of the Komatsu Levee system, the risk or vulnerability to public health and safety is also considered to be low, in part due to the low number of potentially-impacted individuals and the numerous egress routes. At the time this Plan was updated, the USACE had not assigned a Levee Safety Action Classification nor conducted any risk characterization of this system.

Are existing buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Buildings, infrastructure and critical facilities located within the leveed areas are vulnerable to levee breaches. **Figure 234** identifies the number of existing structures vulnerable to a levee breach by system, the estimated property value of the vulnerable structures and the participating jurisdiction the structures are located within. These counts were acquired from the USACE's National Levee Database.

Figure 234
Number of Existing Structures Vulnerable to a Levee Breach – City of Peoria

Levee System Name	Number of Vulnerable Structures	Estimated Property Value of Vulnerable Structures	Structure Location
Greater Peoria Sanitary District (GPSD)	10	$120 million	Peoria
Komatsu Levee	2	$3.02 million	Peoria

Source: US Army Corps of Engineers, National Levee Database.

Depending on the magnitude of the breach, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural and content damage may result. In addition to impacting structures, a levee breach can damage roads and utilities. Roadways and culverts can be weakened by levee breach floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to levee breach flooding. Depending on their location and the velocity of the water as it escapes the levee, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

Aside from key roads and power and communication lines, Peoria has specific infrastructure/critical facilities that are vulnerable to the impacts of a levee breach from the studied levees. The following provides a description of each.

- The Greater Peoria Sanitary District's wastewater treatment facility is protected by the Greater Peoria Sanitary District levee system. This facility provides sanitary sewer service to 50,000 customers.
- Komatsu America Corp.'s Mining Division headquarters and manufacturing facility are protected by the Komatsu Levee system. This facility is the "mother plant" for the manufacturing of electric-drive off-road dump trucks (up to 400-ton payload) used in mining applications around the world.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the magnitude or severity of the precipitating event (whether an earthquake, general flood or flash flood), the extent and type of development and infrastructure protected by the levee, the amount of time available to implement emergency measures such as sandbagging and the USACE's Levee Safety Action Classification assessment.

In terms of the Greater Peoria Sanitary District levee system, the risk or vulnerability to existing buildings, infrastructure and critical facilities is considered to be low to medium. This is due in part to the USACE's Levee Safety Action Classification assessment tempered by the type of critical facility at risk. According to the USACE Risk Characterization Summary, the levee system has experienced multiple significant loading events, with a history of good performance during the flood of record (60% loading). There is uncertainty in performance related to embankment seepage due to a portion of the levee embankment material consisting of landfill material (bricks, rocks, glass, and poor material quality); however, the remaining sections of the embankment and foundation consist of impervious material that is well compacted.

In terms of the Komatsu Levee system, the risk existing buildings, infrastructure and critical facilities is also considered to be low to medium, in part due to the type of at-risk structures and the fact that the USACE has not completed its risk characterization of this levee system.

Are future buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Any future buildings, infrastructure and critical facilities located within the studied levee systems are vulnerable to damage from a levee breach. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from levee breaches?

Unlike other hazards, there are no standard loss estimation models or methodologies for levee breaches. Given that there have been no recorded levee breaches associated with any of the levees of significance studied in participating Peoria County municipalities, sufficient information is not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures from a levee breach.

4.0 MITIGATION STRATEGY

4.0 MITIGATION STRATEGY

The mitigation strategy identifies how participating jurisdictions are going to reduce or eliminate the potential loss of life and property damage that results from the natural hazards identified in the Risk Assessment section of this Plan. The strategy includes:

- Reviewing and updating the mitigation goals. Mitigation goals describe the objective(s) or desired outcome(s) that the participants would like to accomplish in term of hazard and loss prevention. These goals are intended to reduce or eliminate long-term vulnerabilities to natural hazards.
- Evaluating the status of the existing mitigation actions and identifying a comprehensive range of jurisdiction-specific mitigation actions including those related to continued compliance with the National Flood Insurance Program (NFIP). Mitigation actions are projects, plans, activities or programs that achieve at least one of the mitigation goals identified.
- Analyzing the existing and new mitigation actions identified for each jurisdiction. This analysis ensures each action will reduce or eliminate future losses associated with the hazards identified in the Risk Assessment section.
- Reviewing and updating the mitigation actions prioritization methodology. The prioritization methodology outlines the approach used to prioritize the implementation of each identified mitigation action.
- Identifying the entity(s) responsible for implementing and administering. For each mitigation action, the entity(s) responsible for implementing and administering that action is identified as well as the timeframes for completing the actions and potential funding sources.
- Conducting a preliminary cost/benefit analysis of each mitigation action. The qualitative cost/benefit analysis provides participants a general idea which actions are likely to provide the greatest benefit based on the financial cost and staffing efforts needed.

As part of the Plan update, the mitigation strategy was reviewed and revised. A detailed discussion of each aspect of the mitigation strategy and any updates that were made is provided below.

4.1 MITIGATION GOALS REVIEW

As part of the Plan update process, the mitigation goals identified in the 2010 Plan Update were reviewed and re-evaluated. The Mitigation Action Committee (MAC) decided to replace the overarching goal, the four updated mitigation goals and the extensive list of objectives and implementation strategies outlined in the 2010 Plan Update in order to simplify the mitigation strategy, streamline the implementation process and address a more comprehensive range of mitigation activities and projects. The core values of the mitigation goals identified in 2010 Plan Update were used to develop a set of eight broadly-defined mitigation goals.

The new updated list of mitigation goals was distributed to the MAC members at the first meeting on October 25, 2017. Members were asked to review the updated list before the second meeting and consider whether any changes needed to be made or if additional goals should be included. At the MAC's meeting on March 14, 2018 the group discussed the updated list of goals and approved them with no changes or additions. **Figure 235** lists the approved mitigation goals.

Figure 235
Mitigation Goals

Goal 1	Educate people about the natural hazards they face and the ways they can protect themselves, their homes, and their businesses from those hazards.
Goal 2	Protect the crops and lives, health, and safety of the people and animals in the County from the dangers of natural hazards.
Goal 3	Protect existing infrastructure and design new infrastructure (roads, bridges, utilities, water supplies, sanitary sewer systems, etc.) to be resilient to the impacts of natural hazards.
Goal 4	Incorporate natural hazard mitigation into community plans, regulations and activities.
Goal 5	Place a priority on protecting public services, including critical facilities, utilities, roads and schools.
Goal 6	Preserve and protect the rivers and floodplains in our County.
Goal 7	Ensure that new developments do not create new exposures to damage from natural hazards.
Goal 8	Protect historic, cultural, and natural resources from the effects of natural hazards.

4.2 EXISTING MITIGATION ACTIONS REVIEW

The Plan update process included a review and evaluation of the ***existing hazard mitigation actions*** listed in the 2010 Plan Update. A copy of these actions are included in **Appendix M**. A review of the existing hazard mitigation actions revealed the following shortcomings:

- Actions were not jurisdiction-specific. Many of the actions were applied to every participant no matter their level of interest, ability to implement or relevance to their jurisdiction.
- Actions did not identify specific entities responsible for implementation. In many cases the responsibility for implementing an action was assigned to a generic agency such as "local government". This created a situation in which the participating jurisdictions did not have a clear understanding of which department within their own jurisdiction was tasked with implementing the action and therefore felt no sense of responsibility or ownership of the action.
- Actions were applied to non-participating entities. A few of the actions covered entities (such as local school districts) that did not participate in the development of the 2010 Plan Update, and therefore should not have been assigned responsibility for implementation of mitigation actions.
- Actions were assigned to non-governmental entities. Several of the actions were specifically assigned to the Mitigation Advisory Committee (MAC), which does not have the legal authority to implement actions within any of the participating jurisdictions. In addition, there is no indication that the MAC met on a regular basis to work towards implementing any of their assigned actions. Aside from updating the Plan, the Tri-

County Regional Planning Commission reported that to their knowledge no progress had been made on any of the MAC-assigned actions.

As a result of these findings, the MAC decided to eliminate any action that was: a) vague or too general/broad in scope and b) not assigned to a participating jurisdiction. In addition, those actions listed for wildfires were also eliminated as the MAC concluded that it was a minimal risk and chose not to include it in the Plan update. As a result, mitigation actions 4, 5, 8, 11, 14, 15 and 16 were removed.

The MAC then agreed to create individual, jurisdiction-specific mitigation action lists for each participating jurisdiction. The remaining mitigation actions included in the 2010 Plan Update were evaluated, assigned to the appropriate participating jurisdiction(s) and presented to the MAC members for their review and evaluation at the second meeting held on March 14, 2018. Each of the participating jurisdictions were asked to identify those actions that were either in progress or that had been completed since the 2010 Plan Update was adopted. They were also given the opportunity to eliminate any action on their specific list that they did not deem viable and/or practical for implementation by their jurisdiction.

Figure 236 through **245** located at the end of this section, summarize the results of this evaluation by participating jurisdiction. Each action listed includes a reference number to the 2010 Plan Update mitigation action list located in **Appendix M**. The following exceptions should be noted:

- Bartonville, Hanna City, Morton, Tremont, Eureka and Germantown Hills did not participate in the development of either the original Plan or the 2010 Plan Update and therefore are not included in the summary.
- While Peoria County participated in the 2010 Plan Update, it chose not to participate in this update process and therefore is not included in the summary. The County chose to prepare its own hazard mitigation plan for the unincorporated areas of the County in 2017.

While not specifically listed in the 2010 Plan Update, Washington has completed several additional mitigation-related projects and activities. The following identifies the action, the year it was completed and provides a brief description of the action.

Activity/Project Description	Completed	Summary of Activity/Project
1. Emergency backup generator installed at the Rolling Meadows lift station to provide uninterrupted power and maintain operations.	2017	125kW backup generator was added at this critical lift station serving a population of 1,500.
2. Emergency backup generator installed at Water Treatment Plant #1 to provide uninterrupted power and maintain operations.	2016	500kW backup generator was added at this water plant serving a population of 13,500.

Activity/Project Description	Completed	Summary of Activity/Project
3. Emergency backup generator installed at City Hall to provide uninterrupted power and maintain operations.	2016	50kW backup generator was added at City Hall to help insure continuation of services during hazard events.
4. Drainage enhancements undertaken at Diebel detention basin.	2017	Drainage upgrades were performed within the regional detention basin protecting portions of the City's east end.
5. East side Letter of Map Revision (LOMR) submitted for North Main Street to Diebel Road	2017	LOMR reduced the overall 100-year floodplain delineation for many properties along and near Farm Creek. Established modern base flood elevation data replacing data that was 30 years old.

4.3 NEW MITIGATION ACTIONS IDENTIFICATION

Given the shortcomings of the existing mitigation actions, it was essential that a comprehensive range of ***new, jurisdiction-specific mitigation actions*** be identified for each participating jurisdiction as part of the Plan update process. Instead of focusing on all-inclusive actions covering multiple jurisdictions, participants were asked to identify mitigation actions that met the specific needs and risks identified for their jurisdiction.

Representatives of the following jurisdictions were also asked to identify mitigation actions that would ensure their continued compliance with the National Flood Insurance Program.

- Bartonville
- Chillicothe
- East Peoria
- Eureka
- Morton
- Pekin
- Peoria
- Peoria Heights
- Roanoke
- Tazewell County
- Tremont
- Washington
- Woodford County

The compiled lists of new mitigation actions were reviewed to assure the appropriateness and suitability of each action. Those actions that were not deemed appropriate and/or suitable were either reworded or eliminated.

4.4 MITIGATION ACTIONS ANALYSIS

Next, the existing and new mitigation actions were then assigned to one of six broad mitigation activity categories which allowed Committee members to compare and consolidate similar actions. Projects and activities of similar scope were reworded and/or combined to eliminate repetition. **Figure 246** identifies each mitigation activity category and provides a brief description.

Each mitigation action was then analyzed to determine:

- the hazard or hazards being mitigated;

- the degree to which the impacts associated with a particular hazard(s) would be mitigated (i.e., reduced or eliminated);
- the general size of the population affected (i.e., small, medium or large);
- the goal or goals fulfilled;
- whether the action would reduce the effects on new or existing buildings and infrastructure; and
- whether the action would ensure continued compliance with the National Flood Insurance Program.

Figure 246
Types of Mitigation Activities

Category	Description
Regulatory Activities (RA)	Regulatory activities are designed to reduce a jurisdiction's vulnerability to specific hazard events. These activities are especially effective in hazard prone areas where development has yet to occur. Examples include: planning and zoning, floodplain regulations and local ordinances (i.e., building codes, etc.).
Structural Projects (SP)	Structural projects lessen the impact that a hazard has on a particular structure through design and engineering. Examples include: storm sewers, road and bridge projects, storm/tornado shelters, flood walls and seismic retrofits.
Public Information & Awareness (PI)	Public information and awareness activities are used to educate individuals about the potential hazards that affect their community and the mitigation strategies that they can take part in to protect themselves and their property. Examples include: outreach programs, school programs, brochures and handout materials, evacuation planning and drills, volunteer activities (i.e., culvert cleanout days, initiatives to check on the elderly/disabled during hazard events, etc.).
Studies (S)	Studies are used to identify activities that can be undertaken to reduce the impacts associated with certain hazards. Examples include: hydraulic and drainage studies.
Miscellaneous Projects (MP)	Miscellaneous projects is a catchall for those activities or projects that help to reduce or lessen the impact that a hazard may have on a critical facility or community service. Examples include: snow fences, generators, warning sirens, etc.
Property Protection (PP)	Property protection activities are designed to retrofit existing structures to withstand natural hazards or to remove structures from hazard prone areas. In Illinois, this category of activities primarily pertains to flood protection. Examples include: acquisition, relocation, elevation, insurance (i.e., flood, homeowners, etc.) and retrofitting (i.e., impact resistant windows, etc.).

4.5 MITIGATION ACTIONS PRIORITIZATION METHODOLOGY REVIEW

The methodology developed to prioritize mitigation actions in the 2010 Plan Update was reviewed by the MAC as part of this Plan update process. The prioritization methodology was based on the STAPLE+E planning factors (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) and applied a rating of high, moderate or low to each mitigation action. Taking into account the number and types of factors assessed and the complexity associated with the STAPLE+E analysis, the MAC decided to replace the prioritization methodology with one focused on just two key factors: 1) the frequency of the hazard and 2) the degree of mitigation attained. This updated prioritization methodology was presented to the MAC members at the third meeting held on June 20, 2018. The group reviewed and discussed the updated methodology and chose to approve it with no changes.

Figure 247 identifies and describes the four-tiered prioritization methodology adopted by the Committee. The methodology developed provides a means of objectively determining which actions have a greater likelihood of eliminating or reducing the long-term vulnerabilities associated with the most frequently-occurring natural hazards.

While prioritizing the actions is useful and provides participants with additional information, it is important to keep in mind that implementing any the mitigation actions is desirable regardless of which prioritization category an action falls under.

Figure 247
Mitigation Action Prioritization Methodology

		Hazard	
		Most Significant Hazard **(M)** (i.e., severe storms, severe winter storms, floods, tornadoes)	Less Significant Hazard **(L)** (i.e., excessive heat, drought, landslides, earthquakes, dam failures, levee failures)
Mitigation Action	Mitigation Action with the Potential to Virtually Eliminate or Significantly Reduce Impacts **(H)**	**HM** mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from the most significant hazards	**HL** mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from less significant hazards
Mitigation Action	Mitigation Action with the Potential to Reduce Impacts **(L)**	**LM** mitigation action has the potential to reduce damages, fatalities and/or injuries from the most significant hazards	**LL** mitigation action has the potential to reduce damages, fatalities and/or injuries from less significant hazards

4.6 Mitigation Actions Implementation, Administration & Cost/Benefit Analysis

Finally, each participating jurisdiction was asked to identify how the mitigation actions will be implemented and administered. This included:

- ❖ Identifying the party or parties responsible for oversight and administration.
- ❖ Determining what funding source(s) are available or will be pursued.
- ❖ Describing the time frame for completion.
- ❖ Conducting a preliminary cost/benefit analysis.

Oversight & Administration

It is important to keep in mind that some of the participating municipalities have limited capabilities related to organization and staffing for oversight and administration of the identified mitigation actions. Four of the thirteen participating municipalities are small in size, with populations of less than 3,500 individuals while an additional four participating municipalities have populations of less than 6,500 individuals. In most cases these municipalities have minimal staff. Their organizational structure is such that most have very few offices and/or departments, generally limited to public works and water/sewer. Those in charge of the offices/departments often lack the technical expertise needed in many cases to individually oversee and administer the identified mitigation actions. As a result, many of the smaller municipalities identified the village board/city council as the entity responsible for oversight and administration simply because it is the only practical option given their organizational constraints.

Funding Sources

While the Tri-County Regional Planning Commission has the ability to provide grant writing services to the participating counties and municipalities, many of the participating jurisdictions do not have city/county administrators with grant writing capabilities. Given the specific nature of the identified mitigation actions, assistance was needed in identifying possible funding sources. The consultant provided written information to the participants about FEMA and non-FEMA funding opportunities that have been used previously to finance mitigation actions. In addition, funding information was discussed with participants during planning committee meetings and in one-on-one contacts so that an appropriate funding source could be identified for each mitigation action.

A handout was prepared and distributed that provided specific information on the non-FEMA grant sources available including the grant name, the government agency responsible for administering the grant, grant ceiling, contact person and application period among other key points. Specific grants from the following agencies were identified: United State Department of Agricultural – Rural Development (USDA – RD), Illinois Department of Agriculture (IDOA), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR) and Illinois Department of Transportation (IDOT).

The funding source identified for each action is the most likely source to be pursued. However if grant funding is unavailable through the most likely or other suggested sources, then implementation of medium and large-scale projects and activities is unlikely due to the budgetary constraints experienced by most, if not all, of the participants due to their size, projected population growth and limited revenue streams. It is important to remember that the population for unincorporated Woodford County is approximately 15,000 individuals while the population for unincorporated Tazewell County is just over 25,700 individuals. eight of the thirteen participating municipalities have populations of less than 6,500 individuals. Most of the jurisdictions work hard to maintain and provide the most critical of services to their residents. Additional funding is necessary if implementation is to be achieved.

Time Frame for Completion

The time frame for completion identified for each action is the timespan in which participants would like to see the action successfully completed. In many cases, however, the time frame identified is dependent on obtaining the necessary funding. As a result, a time range has been identified for many of the mitigation actions to allow for unpredictability in securing funds.

Cost/Benefit Analysis

A preliminary qualitative cost/benefit analysis was conducted on each mitigation action. The costs and benefits were analyzed in terms of the general overall cost to complete an action as well as the action's likelihood of permanently eliminating or reducing the risk associated with a specific hazard. The general descriptors of high, medium and low were used. These terms are not meant to translate into a specific dollar amount, but rather to provide a relative comparison between the actions identified by each jurisdiction.

This analysis is only meant to give the participants a starting point to compare which actions are likely to provide the greatest benefit based on the financial cost and staffing effort needed. It was repeatedly communicated to the Planning Committee members that when a grant application is submitted to IEMA/FEMA for a specific action, a detailed cost/benefit analysis will be required to receive funding.

4.7 MITIGATION STRATEGY RESULTS

Figures 248 through **263** located at the end of this section, summarize the results of the mitigation strategy. The mitigation actions are arranged alphabetically by County by participating jurisdiction and include both existing and new actions.

Figure 236 **Tri-County Regional Planning Commission (MAC) – Status of Existing Mitigation Actions**					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Target FEMA's Repetitive Loss Properties for potential mitigation projects. (Action Number 1)	✓				
Obtain official recognition of the Mitigation Advisory Committee by the Tri-County communities in order to help institutionalize and develop an ongoing mitigation program. (Action Number 4)	✓				
Universal Siren Protocol for Tri- County Area: Coordinate among all agencies to ensure rapid and comprehensive dissemination of necessary information and of response operations. (Action Number 5)	✓				
Update the 2010 Tri-County Regional Planning Commission Natural Hazards Mitigation Plan. (Action Number 8)		✓			
Partner with Parent Teacher Associations and local schools to develop an annual children's and teacher's educational program which focuses on teaching children and adults about hazard seasons, effects, and mitigation opportunities. (Action Number 11)	✓				
Contact NRCS regarding opportunities for technical assistance and financial assistance for drought preparedness and response. (Action Number 14)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

In terms of changes associated with mitigation actions in progress or completed, Tri-County has one administrative activity in progress and it is not expected to substantially change the vulnerability of hazard prone areas within the region.

Tazewell County

Figure 137
Sheet (1 of 2)
Tazewell County – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties for potential mitigation projects. (Action Number 1)		✓			
Distribute NOAA weather radios to residents that are most vulnerable to wind events. Determine which facilities currently have radios and feasibility of hard-wiring. Further investigate StormReady programs. (Action Number 2)		✓		2017	Tazewell County has distributed weather radios and continue to do so as they become available. Tazewell County was designated a StormReady County by NWS in 2017.
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)		✓			
Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters. This includes determining safety of current shelters, long and short-term shelter needs and retro-fitting existing facilities. (Action Number 6)		✓			Working with American Red Cross and Salvation Army to designate locations.
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓		2017	Adopted updated floodplain ordinance in 2017.

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Tazewell County has several projects and administrative activities completed or in progress that have the potential to decrease the vulnerability of hazard prone areas, especially for flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of these projects.

Tazewell County

Figure 137
Sheet (2 of 2)
Tazewell County – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Contact NRCS regarding opportunities for technical assistance and financial assistance for drought preparedness and response. (Action Number 14)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			Community Development and EMA working with Tri-County Regional Planning Commission's GIS Department on this project
Utilize the news media and schools for public information promulgation about seismic risks. (Action Number 18)		✓			Participate in "Shake Out" each year and distribute information to Tazewell County superintendent

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Tazewell County has several projects and administrative activities completed or in progress that have the potential to decrease the vulnerability of hazard prone areas, especially for flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of these projects.

Tazewell County

Figure 238
(Sheet 1 of 2)
East Peoria – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and Label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)	✓				
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)			✓	2017	Adopted updated floodplain ordinance in 2017.

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

Between 2012 and 2017 sixteen commercial development projects, seven of them multi-tenant, the East Peoria City Hall and the East Peoria Library/Civic Plaza were constructed in the Levee District of East Peoria. These structures are protected from the 1% annual chance flood (100-year flood) by a provisionally-accredited levee. While the levee reduces the risk of flooding, it cannot eliminate all flood risk. The USACE's Levee Safety Senior Oversight Group considers the risk associated with this levee to be low. These changes in development have the potential to increase the City's vulnerability to flooding along the riverfront if a flood overtops or breaches the levee allowing floodwaters to inundate the protected areas behind. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, East Peoria has one administrative activity completed and this action has the potential to decrease the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 238 (Sheet 2 of 2) East Peoria – Status of Existing Mitigation Actions					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

Between 2012 and 2017 sixteen commercial development projects, seven of them multi-tenant, the East Peoria City Hall and the East Peoria Library/Civic Plaza were constructed in the Levee District of East Peoria. These structures are protected from the 1% annual chance flood (100-year flood) by a provisionally-accredited levee. While the levee reduces the risk of flooding, it cannot eliminate all flood risk. The USACE's Levee Safety Senior Oversight Group considers the risk associated with this levee to be low. These changes in development have the potential to increase the City's vulnerability to flooding along the riverfront if a flood overtops or breaches the levee allowing floodwaters to inundate the protected areas behind. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, East Peoria has one administrative activity completed and this action has the potential to decrease the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 239
(Sheet 1 of 2)
Pekin – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)			✓	2018	Received online access to all the hydrants owned by Illinois American Water Company within the corporate boundaries of the City.
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓			
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Pekin has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 239
(Sheet 2 of 2)
Pekin – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Pekin has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 240
(Sheet 1 of 2)
Washington – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)			✓	2016	Floodplain ordinance was amended to comply with changes to the model ordinance
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Washington has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Tazewell County

Figure 240
(Sheet 2 of 2)
Washington – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			While this is largely in place, mapping needs to be continually updated to reflect new development and enhancements to our infrastructure network.

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Washington has one project and three administrative activities in progress or completed and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Woodford County

Figure 241
Sheet (1 of 2)
Woodford County – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties for potential mitigation projects. (Action Number 1)			✓	2016	Twelve repetitive loss properties were purchased and the homes removed. Deed restrictions prevent sail or building
Distribute NOAA weather radios to residents that are most vulnerable to wind events. Determine which facilities currently have radios and feasibility of hard-wiring. Further investigate StormReady programs. (Action Number 2)			✓	2015	Woodford County EMA distributed NOAA weather radios to the schools and nursing homes throughout the County who needed them. Woodford County EMA became a Storm Ready County in 2015.
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters. This includes determining safety of current shelters, long and short-term shelter needs and retro-fitting existing facilities. (Action Number 6)		✓			Woodford County has been working with the Red Cross, churches and community buildings to designate them as warming and emergency shelters.
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Woodford County has decreased the vulnerability of the hazard prone areas along floodways in the County by completing buyouts of 12 homes between 2013 and 2015. The County has several other projects and activities in progress or completed and these activities will not significantly change the vulnerability of hazard prone areas within the County.

Woodford County

Figure 241 Sheet (2 of 2) Woodford County – Status of Existing Mitigation Actions					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Contact NRCS regarding opportunities for technical assistance and financial assistance for drought preparedness and response. (Action Number 14)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			Woodford County is currently working with the Tri-County Regional Planning Commission on mapping hazardous facilities in the County.
Utilize the news media and schools for public information promulgation about seismic risks. (Action Number 18)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the last Plan update was approved.

In terms of changes associated with mitigation actions in progress or completed, Woodford County has decreased the vulnerability of the hazard prone areas along floodways in the County by completing buyouts of 12 homes between 2013 and 2015. The County has several other projects and activities in progress or completed and these activities will not significantly change the vulnerability of hazard prone areas within the County.

Woodford County

Figure 242
(Sheet 1 of 2)
Roanoke – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)		✓			
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)		✓			
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)	✓				
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)			✓	2016	Adopted updated floodplain ordinance in July, 2016.
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Roanoke has one project and two administrative activities in progress or completed that have the potential to decrease the vulnerability of hazard prone areas within the Village.

Woodford County

Figure 242
(Sheet 2 of 2)
Roanoke – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Roanoke has one project and two administrative activities in progress or completed that have the potential to decrease the vulnerability of hazard prone areas within the Village.

Peoria County (Participating Municipalities Only)

Figure 243 (Sheet 1 of 2) Chillicothe – Status of Existing Mitigation Actions					
Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)		✓			
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)		✓			
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)		✓			
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Chillicothe has several projects and activities that have potential to decrease the vulnerability of the hazard prone areas within the City. It's still too early to tell the degree of reduction that will be experienced from the implementation of these actions.

Peoria County (Participating Municipalities Only)

Figure 243
(Sheet 2 of 2)
Chillicothe – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)		✓			
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Chillicothe has several projects and activities that have potential to decrease the vulnerability of the hazard prone areas within the City. It's still too early to tell the degree of reduction that will be experienced from the implementation of these actions.

Peoria County (Participating Municipalities Only)

Figure 244
(Sheet 1 of 2)
Peoria – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Distribute NOAA weather radios to residents that are most vulnerable to wind events. Determine which facilities currently have radios and feasibility of hard-wiring. Further investigate StormReady programs. (Action Number 2)		✓			
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)		✓			
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

The Riverfront Village Platform and parking deck, which housed three restaurants and 200 parking spaces and was located in the floodplain of the Illinois River, were demolished in 2017 and replaced with green space. This change in development decreased the City's vulnerability to flooding along the riverfront. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria has several activities in progress and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Peoria County (Participating Municipalities Only)

Figure 244
(Sheet 2 of 2)
Peoria – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

The Riverfront Village Platform and parking deck, which housed three restaurants and 200 parking spaces and was located in the floodplain of the Illinois River, were demolished in 2017 and replaced with green space. This change in development decreased the City's vulnerability to flooding along the riverfront. No other substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the last Plan update was completed.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria has several activities in progress and these actions will not significantly change the vulnerability of hazard prone areas within the City.

Peoria County (Participating Municipalities Only)

Figure 245
(Sheet 1 of 2)
Peoria Heights – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Target FEMA's Repetitive Loss Properties throughout the Tri- County area for potential mitigation projects. (Action Number 1)	✓				
Target FEMA's Repetitive Loss Properties for educational outreach and mitigation activities. (Action Number 3)	✓				
Develop educational materials, both web-based and in paper form, that can be used to inform the Tri-County citizenry about the benefits of the National Flood Insurance Program and how it is administered locally. (Action Number 7)	✓				
Locate and label all public hydrants in the Tri-County area to assist in street identification in the event of widespread destruction. (Action Number 9)	✓				
Revise the Tri-County communities' floodplain ordinances that are outdated, continued compliance with NFIP, evaluate feasibility of joining CRS and/or increasing rating score. (Action Number 10)	✓				
Develop "hazard information centers" on the Tri-County communities' websites and in public libraries where individuals can find hazard and mitigation information. (Action Number 12)	✓				

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria Heights has one activity in progress and that activity will not significantly change the vulnerability of hazard prone areas within the Village.

Peoria County (Participating Municipalities Only)

Figure 245
(Sheet 2 of 2)
Peoria Heights – Status of Existing Mitigation Actions

Activity/Project Description	Status: No Progress (✓)	Status: In Progress (✓)	Status: Completed (✓)	Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
Evaluate critical facilities and shelters to determine their resistance to all hazards. Examine and make recommendations as to ways in which the facilities can be strengthened or hardened. (Action Number 13)	✓				
Pursue the utilization of emergency management mitigation measures to address hazards in the Tri-County area, including hazard mapping (GIS); critical facility and infrastructure mapping (GIS) and hardening. (Action Number 17)		✓			

(Action Number "No.") refers to the 2010 Plan Update mitigation action by number detailed in Appendix M.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the last Plan update was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Peoria Heights has one activity in progress and that activity will not significantly change the vulnerability of hazard prone areas within the Village.

Figure 248
(Sheet 1 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Identify areas where erosion is or will occur (such as steep slopes & stream banks) and incorporate/construct erosion-focused best management practices (BMPs) where possible.	F, L, SS, SWS	MP	Reduces	Small	2, 3, 4, 5, 6	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/Medium	New
LM	Identify areas where flooding is or will occur (such as non-permeable surfaces) and incorporate/construct stormwater management-focused best management practices (BMPs) where possible.	F, SS, SWS	MP	Reduces	Small	2, 3, 4, 5, 6	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Medium/Medium	New
LM	Educate Tri-County area residents about the benefits of stormwater management practices in their communities and on their personal property.	F, SS	PI	Reduces	Medium	1, 2	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/Medium	New
LM	Conduct a drainage/hydraulic study to identify the cause(s) and determine the appropriate remedy(s) to alleviate recurring drainage problems within the region.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Planning Commission	2 - 4 years	IDOT Local Roads	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 2 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Select, design and construct the appropriate remedy(s) to alleviate recurring drainage problems within the region.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	3 - 5 years	IDOT Local Roads	High/High	New
HM	Reshape/regrade select high impact drainage areas in the region to increase carrying capacity and alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	2 - 5 years	Planning Commission/ Municipalities & Counties	Medium/High	New
HM	Remove debris, vegetative overgrowth and/or brush from streams and creeks within the region to maintain/increase carrying capacity, better manage stormwater runoff and reduce/prevent drainage/flooding problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/High	New
HM	Remove debris, sediment and obstructions from ditches, culverts and bridges and implement best management practices (BMPs) to maximize carrying capacity, better manage stormwater runoff and reduce/prevent drainage/flooding problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Municipalities & Counties	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 3 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Construct upstream detention basins, channelize/reshape tributaries and extend storm sewer lines to better manage stormwater runoff, increase carrying capacity and alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Planning Commission	3 - 5 years	FEMA Flood Mitigation Assistance	High/High	New
LM	Educate landowners on the importance of implementing stormwater management-related best management practices (BMPs) to reduce nutrient loss and topsoil from agricultural fields and urbanized areas.	F, SS	PI	Reduces	Medium	1, 2, 6	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Counties	Low/Medium	New
LM	Conduct watershed studies to identify potential flood mitigation activities and determine best management practices (BMPs).	F, SS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Planning Commission	1 - 5 years	IEPA Section 319(h)	Low/Medium	New
LL	Conduct a study to identify, evaluate and/or implement potential measures to reduce the impacts of drought on the region's water supply.	DR	S	Reduces	Large	2, 3, 5	Yes	Yes	Planning Commission	2 - 4 years	Planning Commission	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

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LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 4 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.	F	PP	Reduces	Small	2, 6	n/a	Yes	Planning Commission	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Obtain official recognition of the Mitigation Advisory Committee by the Tri-County communities in order to institutionalize and develop an ongoing mitigation program.	DF, DR, EH, EQ, F, L, MS, SS, SWS, T	MP	Reduces	Large	2, 4	Yes	Yes	Planning Commission	1 - 2 years	Planning Commission	Low/Medium	Existing (2010)
LM	*Universal siren protocol for Tri-County area*: Coordinate among all agencies to ensure rapid and comprehensive dissemination of necessary information and of response operations.	SS, T	MP	Reduces	Large	2, 3, 4, 5	Yes	Yes	Planning Commission	2 - 4 years	Planning Commission	Low/High	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Figure 248
(Sheet 5 of 5)
Tri-County Regional Planning Commission Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LL	Contact NRCS regarding opportunities for technical and financial assistance for drought preparedness and response.	DR	MP	Reduces	Medium	2, 3, 5	n/a	Yes	Planning Commission	3 - 5 years	Planning Commission	Low/Medium	Existing (2010)
LM	Partner with Parent Teacher Associations and local schools to develop an annual children's and teacher's educational program which focuses on teaching children and adults about hazard seasons, effects, and mitigation opportunities.	EH, EQ, F, L, MS, SS, SWS, T	PI	Reduces	Medium	1, 2	Yes	Yes	Planning Commission	1 - 5 years	Planning Commission/ Local Schools	Low/High	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to budgetary constraints. Additional funding is necessary if implementation is to be achieved within the time frames specified. In addition, the implementation of some projects requires the participation of municipal and county governments. If these entities are either unable or unwilling to participate then implementation is unlikely.

Acronyms

Priority

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LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 249
(Sheet 1 of 4)
Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Community Development													
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Community Development Department/ County Board	1 - 5 years	County	Low/High	New
LM	Continue to make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Community Development Department	1 year	County	Low/High	New
LM	Continue to make county officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Community Development Department	1 - 5 years	County	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Community Development Department	1 - 3 years	County	Low/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
- HL Mitigation action with the potential to reduce impacts from the most significant hazards
- LM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
- LL Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Tazewell County

Figure 249 (Sheet 2 of 4) Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Community Development Continued…													
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Community Development Department	1 - 3 years	County	Low/Medium	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Community Development Department	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Community Development Department	1 - 5 years	County	Low/Medium	Existing (2010)
LM	Develop "hazard information centers" on the County's website and in public libraries where individuals can find information about the risks to life and property associated with natural hazards and the proactive actions that they can take to reduce or eliminate their risk.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Community Development Department	1 - 5 years	County	Low/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 249
(Sheet 3 of 4)
Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Emergency Management Agency													
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilitates within the County and participating jurisdictions.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Emergency Management Agency	3 - 5 years	County	Low/Low	New
LL	Partner with classified dams owners to develop Emergency Action Plans (EAPs) that identify the extent (water depth, speed of onset, warning times, etc.) and location (inundation areas) of potential dam failures to address data deficiencies.	DF	S	Reduces	Small	2, 3, 5	Yes	Yes	Emergency Management Agency	5 years	County/ Classified Dam Owners	Low/Medium	New
HM	Purchase and distribute NOAA weather radios to vulnerable County residents.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2	n/a	n/a	Emergency Management Agency	1 - 5 years	County	Low/High	Existing (2010)
HM	Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	Emergency Management Agency	1 - 3 years	County	Low/High	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 249 (Sheet 4 of 4) Tazewell County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Emergency Management Agency Continued…													
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Emergency Management Agency	2 - 4 years	County	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Emergency Management Agency	3 - 5 years	County	Low/Medium	Existing (2010)
LL	Disseminate information on the risks associated with earthquakes.	EQ	PI	Reduces	Large	1, 2	Yes	Yes	Emergency Management Agency	1 - 5 years	County	Low/Low	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to budgetary constraints experienced by a largely rural county. The County works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 250
(Sheet 1 of 4)
East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Develop a sewer truck line inspection plan/program to monitor lines located in remote ravines for potential impacts caused by natural hazard events.	EQ, F, L, SS, SWS, T	S	Reduces	Medium	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1-2 years	City	Low/High	New
HM	Setup a ravine stormwater monitoring program to gather data and identify events that have the potential to impact City infrastructure (i.e., sewer lines, roadways, etc.)	SS	MP	Reduces	Medium	2, 3, 5	Yes	Yes	Street Department of Public Works	1-2 years	City	Low/High	New
HM	Strengthen the utilization of the City's CodeRED notification system to inform potentially impacted areas of natural hazard events.	DF, EH, EQ, F, SS, SWS, t	MP	Reduces	Large	2	n/a	n/a	Fire Department/ Public Works	1-2 years	City	Low/High	New
LM	Update existing digital data sets of City utilities (including sewer, water and storm sewer distribution lines) and geo-locate critical infrastructure for use with GIS mapping applications.	DF, EQ, F, L, SS, SWS, T	MP	Reduces	Large	2, 3, 5	Yes	Yes	GIS Department	1-2 years	City	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 23,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 250
(Sheet 2 of 4)
East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Develop a sanitary sewer system master plan with the goal of decreasing storm water infiltration and excess flow within the system. The plan should efficiently track system maintenance and identify areas where infiltration of storm water has the potential to occur.	F, SS, SWS	S	Reduces	Large	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1 - 2 years	City	Low/Medium	New
LM	Conduct sanitary sewer line reconnaissance study to identify locations where storm water infiltrates the system.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1 - 5 years	City	Medium/Medium	New
HM	Repair/reline sanitary sewer line sections to reduce stormwater infiltration and prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Yes	Yes	Wastewater/ Sewer Department of Public Works	1 - 5 years	City	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 23,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 250
(Sheet 3 of 4)
East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Improve coordination between Public Works, Police and Fire in an effort to implement hazard mitigation projects activities aimed at reducing or eliminating the risk associated with natural hazard events.	DF, DR, EH, EQ, F, L, SS, SWS, T	PI	Reduces	Large	2, 3, 5	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council City Clerk	1 year	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 23,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 250
(Sheet 4 of 4)
East Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	1 - 4 years	City	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Department of Public Works	3 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	GIS Department	2 - 4 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 23,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 1 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Prairie Creek Channel, Floodplain & Tailwaters Improvements:* Make improvements to the 3.1-mile unimproved reach of Prairie Creek located between Queenwood Rd. and Allentown Rd. which serves as a discharge for a large portion of the developed watershed within the Village. The improvements will help maintain the creek's current flood control function for the upstream watershed and correct damages occurring within the downstream watershed. Improvements likely include but are not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	5 years	FEMA Flood Mitigation Assistance	High/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 2 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Prairie Creek Headwaters Improvements:* Make improvements to the Village's Detroit Parkway Detention Basin at the headwaters of Prairie Creek to help protect both upstream and downstream properties within the watershed from flooding problems. Improvements/expansion of this existing regional detention basin likely includes but is not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	FEMA Flood Mitigation Assistance/ Pre-Disaster Mitigation	High/High	New

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† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 3 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	*Bull Run Creek & Tributaries Detention Basin:* Develop a regional detention basin(s) and other related conveyance improvements upstream and alongside Bull Run Creek and its tributaries to relieve hydraulic congestion and reduce flood stages within the Creek, its tributaries and the watershed. Improvements likely include but are not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	FEMA Pre-Disaster Mitigation	Medium/High	New

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Acronyms

Priority

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LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 4 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Deer Creek Channel & Floodplain Improvements:* Make improvements to the 2.5-mile unimproved reach of Deer Creek located between I-74 and Queenwood Rd. which serves as a discharge for a portion of the eastern developed watershed within the Village. The improvements will help maintain the creek's current flood control function for the upstream watershed and correct damages occurring within the downstream watershed. Improvements likely include but are not limited to land acquisition, hydrologic & hydraulic study, engineering & plan development and construction.*	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	FEMA Pre-Disaster Mitigation	High/High	New

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† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 5 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Bull Run Creek Floodplain Mitigation Projects:* Elevate flood-prone residential structures located in the SFHA along/adjacent to Bull Run Creek and its tributary confluence at N. Ohio Ave. and Ohio Ct. and/or acquire the properties and remove any existing structures to alleviate flooding problems and mitigate the flood risk.*	F, SS	PP	Eliminates	Small	2, 6	n/a	Yes	Village Board / Department of Public Works	2-5 years	FEMA Flood Mitigation Assistance	Medium/High	New
LM	Conduct a drainage/hydraulic study to identify the cause(s) and determine the appropriate remedy(s) to address the failing drainage system associated with the at-grade crossing of N. Main St. and the Norfolk Southern Railroad on the northeast side of the Village. Coordinate study with the railroad.	F, SS	S	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	Norfolk Southern/ IDOT Local Roads	Low/Medium	New

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Acronyms

Priority

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
- HL Mitigation action with the potential to reduce impacts from the most significant hazards
- LM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
- LL Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Tazewell County

Figure 251
(Sheet 6 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	Select, design and construct the appropriate improvement(s)/remedy(s) to alleviate drainage problems and better manage stormwater associated with the at-grade crossing of N. Main St. and the Norfolk Southern Railroad on the northeast side of the Village. Coordinate the implementation of the appropriate remedy(s) with the railroad.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2-5 years	Norfolk Southern/ IDOT Local Roads	Medium/Medium	New
HM	Bury power lines along N. Morton Ave. to Lettie Brown Elementary School & subdivisions north of Lakeview Dr. to limit service disruptions and road blockages by downed lines during natural hazard events. This area is heavily wooded and can only be accessed by N. Morton Ave.	SS, SWS, T	MP	Eliminates	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2 - 5 years	FEMA Pre-Disaster Mitigation	Medium/High	New

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 7 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Trim trees and remove dead material to minimize utility service disruptions and road blockages along N. Morton Ave. to Lettie Brown Elementary School & subdivisions north of Lakeview Dr.	SS, SWS, T	MP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2 - 5 years	Village	Low/High	New
HM	Collaborate with developers on any future development east of Hyde Park Dr. (located off of N. Morton Ave.) to ensure proper layout and construction of a roadway that provides secondary access to Lettie Brown Elementary School and subdivisions to the west.	F, SS, SWS, T	SP	Eliminates	Small	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	2 -5 years	Village	High/High	New
LM	Conduct sewer line reconnaissance study to identify locations where storm water infiltrates the lines to improve the capacity, function and reliability of the Village's wastewater treatment plants.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	Village Board / Department of Public Works	5 years	Village	Medium/High	New

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Hazard(s) to be Mitigated:

- DF Dam Failure
- DR Drought
- EH Excessive Heat
- EQ Earthquake
- F Flood
- L Landslide
- MS Mine Subsidence
- SS Severe Storms (Thunderstorms, Hail, Lightning)
- SWS Severe Winter Storms & Excessive Cold
- T Tornado

Type of Mitigation Activity:

- RA Regulatory Activities
- SP Structural Projects
- PI Public Involvement
- S Studies
- MP Miscellaneous Projects
- PP Property Protection

Tazewell County

Figure 251
(Sheet 8 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Repair/reline sewer line sections to reduce stormwater infiltration, improve the capacity, function and reliability of the Village's wastewater treatment plants and prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Ye	Yes	Village Board / Department of Public Works	5 years	Village	Medium/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board Village Clerk	1 - 3 years	Village	Low/High	New

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 251
(Sheet 9 of 9)
Morton Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	3 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 152
(Sheet 1 of 3)
Pekin Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Conduct a drainage/hydraulic study to determine the appropriate remedy(s) to alleviate recurring Illinois River flooding along Front Street and better protect the wastewater treatment facility which is located in the base floodplain of the Illinois River.	F, SS, SWS	S	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council City Engineer	5 years	FEMA Flood Mitigation Assistance	Medium/Medium	New
HM	Select, design and construct the appropriate remedy(s) to alleviate Illinois River flooding along Front Street and better protect the wastewater treatment facility which is located in the base floodplain of the Illinois River.	F, SS, SWS	SP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council City Engineer	5 years	FEMA Flood Mitigation Assistance	High/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 34,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 152
(Sheet 2 of 3)
Pekin Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council City Clerk	1 - 2 years	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	2 - 4 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	3 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 34,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake		
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 152
(Sheet 3 of 3)
Pekin Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council Public Works Department	5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 34,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 153
(Sheet 1 of 2)
Tremont Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	Purchase and install a new electronic warning siren system with public address capabilities within the Village to replace the two outdated sirens currently in use.	SS, T	MP	Reduces	Large	2	n/a	n/a	President/ Village Board	3 - 5 years	City/ IDOA	Medium/High	New
HM	Purchase and install automatic emergency backup generators at drinking water well sites to provide uninterrupted power and maintain operations during a power outage.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Large	2, 3, 5	Yes	Yes	President/ Village Board	2 - 5 years	City/ DCEO	Medium/High	New
HM	Purchase and install an automatic emergency backup generator at Locust Street lift station to provide uninterrupted power and maintain operations during a power outage.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	Yes	Yes	President/ Village Board	2 - 5 years	City/ DCEO	Medium/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 153
(Sheet 2 of 2)
Tremont Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President Village Board/ Village Clerk	1 - 3 years	Village	Low/High	New
LM	Make village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	3 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 16,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 1 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	*Washington Estates Flood Mitigation Project*: Construct upstream detention basin, channelize/reshape Tributary No. 2 and extend storm sewer to the Washington Estates Subdivision to better manage stormwater runoff, increase carrying capacity and alleviate drainage/flooding problems.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Mayor City Council/ Public Works Director	5 years	FEMA Pre-Disaster Mitigation	High/Medium	New
LM	*School Street Detention Basin Dam Reconfiguration Project:* Conduct a study to determine the potential impacts reconfiguring the School Street Detention Basin Dam would have on flood protection to downstream residents.	DF, F, SS	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor City Council/ Public Works Director	5 years	City	Low/Medium	New
HM	*Rolling Meadows Stormwater Mitigation Project:* Replace/upsize culverts in the Rolling Meadows Subdivision to maintain/increase carrying capacity and reduce/prevent drainage/flooding problems.	F, SS	SP	Reduces	Small	2, 3, 5	n/a	Yes	Mayor City Council/ Public Works Director	5 years	IDOT Local Roads	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 2 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	*Water Treatment Plant #1 Flood Protection Project:* Select, design and construct the appropriate remedy(s) outlined in the Water Treatment No. 1 Flood Protection Investigation Planning Report (Sept. 2018) to reduce the likelihood of a flood event impacting Water Treatment Plant No. 1. Currently the treatment plant is located in the base/500-year floodplain of Farm Creek.	F, SS	SP	Reduces	Medium	2, 3, 5	n/a	Yes	Mayor/ City Council Public Works Director	2 years	FEMA Flood Mitigation Assistance	Medium/High	New
LM	*East Side Regional Drainage Flood Mitigation Project:* Conduct a drainage/hydraulic study to determine the appropriate remedy(s) to address potential flood problems associated with Farm Creek at the east end of the City.	F, SS	S	Reduces	Small	2, 3, 5	Yes	Yes	Mayor/ City Council Public Works Director	5 years	FEMA Flood Mitigation Assistance	Low/Medium	New
LM	Submit Letters of Map Revisions (LOM-R) when needed for areas within the City.	F	MP	Reduces	Small	4, 6	Yes	Yes	Mayor/ City Council Public Works Director	1 - 5 years	City	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 3 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	*Farm Creek Railroad Structures Project:* Select and implement the appropriate remedy(s) (i.e., stream modifications, set-aside/compensatory storage, acquisitions, etc.) to alleviate flooding problems associated with the two TP&W Railroad bridges and old railroad bridge/park district bike trail over Farm Creek.	F, SS	SP	Reduces	Small	2, 3, 5, 6	n/a	Yes	Mayor City Council/ Public Works Director	5 years	FEMA Flood Mitigation Assitance	High/High	New
LM	Designate Five Points as a warming center for city residents.	SWS	MP	Reduces	Small	2	n/a	n/a	Mayor City Council/ Five Points Washington	1 - 3 years	City	Low/High	New
HM	Purchase and install an automatic emergency backup generator at Five Points Washington (a designated warming center) to provide uninterrupted during power outages.	SWS	MP	Eliminates	Small	2	n/a	Yes	Mayor City Council/ Five Points Washington	3 - 5 years	City/ Five Points Washington	Medium/High	New

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Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 4 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Identify strategic locations within the City to site community safe rooms (tornado shelters) and determine whether existing public buildings can be retrofitted to include community safe rooms or if standalone structures need to be erected.	SS, T	S	Reduces	Medium	2	Yes	Yes	Mayor City Council/ Public Works Director	5 years	City	Low/Medium	New
HM	Retrofit an existing public building and/or construct a new standalone structure to serve as a community safe room (tornado shelter) for City residents.	SS, T	SP	Reduces	Small	2	Yes	Yes	Mayor/ City Council	1 - 5 years	FEMA Pre-Disaster Mitigation	Medium/High	New
HM	Clear wooded ravine easements to help access and maintain sanitary sewer and manholes. The City owns and maintains approximately 80 miles of sanitary sewer and has approximately 18,700 linear feet of wooded ravine easements.	EQ, F, L, SS, SWS, T	MP	Reduces	Medium	2, 3, 5	Yes	Yes	Public Works Director	1 - 5 years	City	Medium/Medium	New

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Acronyms

Priority

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HL	Mitigation action with the potential to reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 5 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	Provide crossing protection (i.e., riprap, caging, etc.) for sanitary sewer line stream crossings. There are 70 sanitary sewer stream crossings within the City's system that would benefit from protection.	F, SS, SWS	SP	Reduces	Small	2, 3, 5, 6	Yes	Yes	Public Works Director	1 - 5 years	City	Medium/High	New
HM	Reconfigure 4 aerial sanitary sewer line stream crossings to meet guidelines for storm conveyance.	F, SS, SWS	SP	Reduces	Small	2, 3 5, 6	Yes	Yes	Public Works Director	5 years	City	Medium/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor City Council/ City Clerk	1 - 2 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

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Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 6 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor City Council/ Public Works Director	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Tazewell County

Figure 254
(Sheet 7 of 7)
Washington Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Public Works Director	2 - 5 years	City	Low/Medium	Existing 2010)
LM	Develop "hazard information centers" in public libraries and on the City's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Public Works Director	2 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor City Council/ Public Works Director	2 - 4 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 15,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 1 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
County Board													
LM	Improve coordination between the County, townships, cities and villages in an effort to help implement hazard mitigation projects and cleanup activities aimed at reducing or eliminating the risk associated with natural hazard events.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	2, 3, 5	Yes	Yes	Emergency Management Agency	1 - 5 years	County	Low/High	New
HM	Purchase and install an automatic emergency backup generator at the County Courthouse to provide uninterrupted power to the Emergency Operations Center/Joint Information Center (County Board Room) and maintain operations during a power outage.	DF, EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	n/a	Yes	Emergency Management Agency	5 years	County/ DCEO	Medium/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 38,700 individuals) and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

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EH	Excessive Heat		
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F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 2 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Building/Zoning													
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Building/Zoning Department/ County Board	1 - 5 years	County	Low/High	New
LM	Continue to make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Building/Zoning Department	1 year	County	Low/High	New
LM	Continue to make county officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Building/Zoning Department	1 - 5 years	County	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Building/Zoning Department	1 - 3 years	County	Low/High	Existing (2010)

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† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 38,700 individuals) and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 3 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Building/Zoning Continued…													
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Building/Zoning Department	1 - 5 years	County	Low/Medium	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Building/Zoning Department	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Building/Zoning Department	1 - 5 years	County	Low/Medium	Existing (2010)
Emergency Management Agency													
HM	Purchase portable, trailer-mounted LED emergency message boards to alert the public of hazardous conditions associated with natural hazard events.	DF, EH, DQ, F, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	Emergency Management Agency	2 - 4 years	County	Low/Medium	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 38,700 individuals) and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
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F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 4 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Emergency Management Agency Continued…													
HM	Purchase and install storm warning sirens in unincorporated communities and subdivisions within the County that do not have coverage.	SS, T	MP	Reduces	Small	2	n/a	n/a	Emergency Management Agency	3 - 5 years	County/ DCEO	Medium/High	New
HM	Purchase a new siren encoder (siren control unit) that can be utilized as a backup to activate sirens in all the communities in the County.	SS, T	MP	Reduces	Large	2	n/a	n/a	Emergency Management Agency	1 year	County	Low/High	New
HL	Develop an early warning notification system to alert residents along the Mackinaw River in the event of a dam failure at Lake Evergreen Dam.	DF	PI	Reduces	Small	2	n/a	n/a	Emergency Management Agency	1 year	County	Medium/Medium	New
LL	Partner with classified dam owners to develop Emergency Action Plans (EAPs) that identify the extent (water depths, speed of onset, warning times, etc.) and location (inundation areas) of potential dam failures to address data deficiencies.	DF	S	Reduces	Small	2, 3, 5	Yes	Yes	Emergency Management Agency	5 years	County/ Classified Dam Owners	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (just over 38,700 individuals) and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake		
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 5 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Emergency Management Agency Continued…													
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the County and participating jurisdictions.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Emergency Management Agency	3-5 years	County	Low/Low	New
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Emergency Management Agency	3 - 5 years	County	Low/Medium	Existing (2010)
HM	Purchase and distribute NOAA weather radios to schools, churches and other gathering places.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2	n/a	n/a	Emergency Management Agency	1 - 5 years	County	Low/High	Existing (2010)
HM	Examine the feasibility of designating schools and other public buildings as heating centers and emergency shelters.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	Emergency Management Agency	1 - 2 years	County	Low/High	Existing (2010)

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Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 255
(Sheet 6 of 6)
Woodford County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
Emergency Management Agency Continued…													
LM	Develop and implement a community outreach program that informs residents of the risks to life and property associated with natural hazards and the proactive actions that they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, T	PI	Reduces	Large	1, 2	Yes	Yes	Emergency Management Agency	2 - 5 years	County	Low/High	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Emergency Management	3 - 5 years	County	Low/Medium	Existing (2010)

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Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256
(Sheet 1 of 4)
Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install sewer valves at wastewater treatment plant to isolate system operations and protect plant functions during heavy rain events.	F, SS	SP	Reduces	Large	2, 3, 5	n/a	Yes	City Council / Enterprise Committee / WWTP	1 year	City	Low/High	New
LM	Obtain approval from Illinois Department of Natural Resources to construct flood wall/berm around the wastewater treatment plant.	F, SS	MP	Reduces	Large	2, 3, 5	n/a	Yes	City Council / Enterprise Committee / WWTP	2-3 years	City	Low/High	New
HM	Construct flood wall/berm around the wastewater treatment plant to address recurring flood problems associated with Walnut Creek.	F, SS	SP	Reduces	Large	2, 3, 5	n/a	Yes	City Council / Enterprise Committee / Wastewater Treatment Plant	2-3 years	FEMA Flood Mitigation Assistance	Medium/High	New
HM	Incorporate a community safe room (tornado shelter) into the design and construction of a new combined city services building for use by city employees and area residents.	SS, T	SP	Reduces	Small	2	Yes	n/a	City Council / Public Safety and Administration Committee	2 years	FEMA Pre-Disaster Mitigation	Medium/High	New

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Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256
(Sheet 2 of 4)
Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Install/upsize new water mains and fire hydrants at various locations within the City to ensure a constant supply of water for residents and aid in fire suppression during natural hazard events.	DR, EH, EQ, F, SS, SWS, T	SP	Reduces	Large	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	1 - 5 years	City	High/Medium	New
HM	Repair/reline sewer line sections to reduce stormwater infiltration and prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Ye	Yes	City Council / Enterprise Committee	1 - 5 years	City	Medium/High	New
LM	Continue construction of water main loops to provide redundancy in the system, minimize service disruptions as a result of pipe or water main breaks and aid in fire suppression in the event of a natural hazard.	EQ, F, SS, SWS, T	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	1 - 5 years	City	Medium/Medium	New
HM	Upgrade/upsize storm sewer system in areas prone to flooding to increase capacity and better manage runoff.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	3 - 5 years	City	Medium/High	New

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Priority

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DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
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F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256 (Sheet 3 of 4) Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Upgrade/upsize stormwater drainage system (ditches, culverts, etc.) in areas prone to flooding to better manage runoff and alleviate flooding concerns.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	City Council / Enterprise Committee	1 - 5 years	City/ IDOT Local Roads	Medium/High	New
LM	Collaborate with the County's Emergency Management Agency to develop a more robust Emergency Services Department within the City.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	Yes	Yes	Mayor/ City Council	2 - 4 years	City	Low/High	New
HM	Purchase portable trash pump, 8" or larger, to remove excess water from critical facilities/infrastructure during heavy rain/flood events.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	City Council / Public Works	3 years	City	Low/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

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Acronyms

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LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 256
(Sheet 4 of 4)
Eureka Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	City Clerk/ Mayor/ City Council	1 - 2 years	City	Low/High	New
LM	Make village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 5,300 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257
(Sheet 1 of 4)
Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Retrofit an existing public building and/or construct a new structure to serve as a community safe room (tornado shelter) equipped with emergency backup generator and HVAC units that can also be used as an emergency shelter and heating/cooling center for Village residents.	EH, EQ, F, SS, SWS, T	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	High/High	New
HM	Retrofit the Village Hall, Maintenance Building/Shop and Wastewater Treatment Plant to high wind standards (including but not limited to installation of a roof anchoring system) to protect the buildings from high wind damage.	SS, T	SP	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	Medium/Medium	New
HM	Install shatter-proof glass at the Village Hall and Wastewater Treatment Plant to make the buildings resistant natural hazard events.	EQ, SS, T	SP	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
HL	Mitigation action with the potential to reduce impacts from the most significant hazards
LM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less significant hazards
LL	Mitigation action with the potential to reduce impacts from the less significant hazards

Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257
(Sheet 2 of 4)
Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	Repair/reline sewer line sections where storm water infiltration is occurring to prevent sewage backups in the Whispering Oaks subdivision.	F, SS, SWS	SP	Eliminates	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City	Medium/High	New
HM	Purchase a portable emergency backup generator for use at lift stations to maintain operations during power outages.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ DCEO	Low/High	New
HM	Purchase and install emergency backup generators with automatic transfer switches at Coventry Farms1 and Deer Ridge onsite lift stations to provide uninterrupted power and maintain operations during power outages.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ DCEO	Medium/High	New
HM	Purchase and install a new emergency backup generator at Wastewater Treatment Plant 1 to provide uninterrupted power and maintain operations during power outages.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ DCEO	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257 (Sheet 3 of 4) Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Inventory, scan and store off site (cloud-based storage) vital village records (including sewer & water records) to protect and maintain service in the event a natural hazard event impacts Village Hall.	EQ, F, SS, SWS, T	MP	Eliminates	Large	5, 8	n/a	n/a	President/ Village Board/ Village Administrator	5 years	City	Medium/High	New
HM	Purchase and install an automatic emergency backup generator at Village Hall to provide uninterrupted power and maintain operations during a power outage.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	n/a	Yes	President/ Village Board/ Public Works Department	3 years	City/ DCEO	Medium/High	New
LM	Conduct a drainage/hydraulic study to identify the cause(s) and determine the appropriate remedy(s) to alleviate recurring drainage/flooding problems within the City.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	Medium/Medium	New
HM	Select, design and construct the appropriate remedy(s) to alleviate recurring drainage/flooding problems within the City.	F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	High/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 257
(Sheet 4 of 4)
Germantown Hills Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Install curb and gutter at various locations within the Village to help direct the flow of stormwater runoff to drainage structures in an effort to alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	Medium/Medium	New
HM	Reshape and regrade select high impact drainage ditches to increase carrying capacity and alleviate drainage/flooding problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	5 years	City/ IDOT Local Roads	Medium/Medium	New
HM	Remove debris, vegetative overgrowth, brush from streams and creeks within the City to maintain/increase carrying capacity, better manage stormwater runoff and reduce/prevent drainage problems.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	1 - 5 years	Village	Low/High	New
HM	Clean debris/obstructions out of culverts to maximize carrying capacity and reduce/prevent drainage problems.	F, SS, SWS	MP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Public Works Department	1 - 5 years	Village	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 3,500 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 1 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Obtain elevation certificates for all municipal buildings located in the floodplain.*	F	S	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board	1 year	Village	Low/High	New
HM	Design and construct a community safe room (tornado shelter) that is equipped with an emergency backup generator and HVAC units as part of new a community center. The community safe room can be used as warming/cooling center and emergency shelter for village residents.	EH, EQ, F, SS, SWS, T	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	High/High	New
HM	Retrofit an existing public building and/or construct a new standalone structure to serve as a community safe room (tornado shelter) for City residents.	SS, T	SP	Reduces	Small	2	Yes	Yes	President/ Village Board	5 years	FEMA Pre-Disaster Mitigation	High/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 2,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 2 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Relocate Village Hall and Public Works out of the West Branch Panther Creek base floodplain to provide continuity/continuation of services during flood events.*	F, SS, SWS	PP	Eliminates	Small	2, 3, 5	Yes	n/a	President/ Village Board	5 years	FEMA Flood Mitigation Assistance	High/High	New
HM	Remove debris, vegetative overgrowth, and brush from streams and creeks within the Village to maintain/increase carrying capacity, better manage stormwater runoff and reduce the risk of flooding.	F, SS, SWS	MP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Department of Public Works	1 - 5 years	Village	Low/High	New
LM	Inventory, scan and store off site vital village records to protect and maintain service in the event a natural hazard event impacts Village Hall.	EQ, F, SS, SWS, T	MP	Eliminates	Large	5, 8	n/a	n/a	President/ Village Board/ Village Clerk	2 years	Village	Medium/High	New
HM	Acquire flood-prone properties and removed existing structures.*	F, SS, SWS	PP	Eliminates	Small	2, 6	n/a	Yes	President/ Village Board	3 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	New

* Mitigation action to ensure continued compliance with NFIP.

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Acronyms

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DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 3 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board/ Village Clerk	1 - 2 years	Village	Low/High	New
LM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Participate in the National Flood Insurance Program's voluntary Community Rating System to lower flood insurance rates for residents.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	1 year	Village	Low/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 2,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 4 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	President/ Village Board	1 - 5 years	Village	Low/Medium	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	President/ Village Board	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/Medium	Existing (2010)
LM	Locate and label all public hydrants in the Village to assist in street identification in the event of widespread natural hazard damage.	EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	President/ Village Board/ Department of Public Works	1 - 5 years	Village	Low/Medium	Existing 2010)

* Mitigation action to ensure continued compliance with NFIP.

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Woodford County

Figure 258
(Sheet 5 of 5)
Roanoke Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Develop "hazard information centers" at the public library and on the Village's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	President/ Village Board	2 - 3 years	Village	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	President/ Village Board/ Department of Public Works	5 years	Village	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Department of Public Works	3 - 5 years	Village	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

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Acronyms

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 259
(Sheet 1 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HL	Remove existing residential and commercial structures from subsidence hazard areas.	MS	PP	Eliminates	Small	2	n/a	Yes	President/ Village Board	1 year	Village/ FEMA Pre-Disaster Mitigation	Medium/High	New
LM	Develop and implement winter weather risk awareness activating that educates residents about severe winter storms and extreme cold and the actions they can take to protect themselves.	SWS	PI	Reduces	Large	1, 2	Yes	Yes	President/ Village Board	1 year	Village	Low/High	New
LM	Identify access and function needs residents and coordinate with local organizations to provide: 1) educational materials on emergency preparedness and the actions that can be taken to reduce or eliminate the risks to life and property associated with natural hazard events and 2) assistance/supportive services during and after natural hazard events.	EH, EQ, F, L, MS, SS, SWS, T	PI	Reduces	Small	1, 2	Yes	Yes	President/ Village Board	1 year	Village	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,400 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 259
(Sheet 2 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LL	Develop and implement a community outreach program that educates residents about mine subsidence and the actions residents can take to protect themselves and their property.	MS	PI	Reduces	Medium	1, 2	Yes	Yes	President/ Village Board	2 years	Village	Low/Medium	New
LM	Conduct a drainage/hydraulic study to determine the number of pump stations and associated piping/containment needed to alleviate recurring Kickapoo Creek flooding impacting homes and businesses along Illinois Route 24.	F, SS, SWS	S	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Department of Public Works	1 year	Village/ FEMA Flood Mitigation Assistance/ IDOT Local Roads	Medium/Medium	New
HM	Install pump stations with automatic emergency backup generators at selected locations to alleviate recurring Kickapoo Creek flooding impacting homes and businesses along Illinois Route 24.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	President/ Village Board/ Department of Public Works	2 years	Village/ FEMA Flood Mitigation Assistance/ IDOT/ Local Roads	High/High	New

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DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
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F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 259
(Sheet 3 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
HM	Purchase portable, trailer-mounted changeable emergency message boards to alert the public of hazardous conditions, detours, evacuations, etc. associated with natural hazard events.	EH, EQ, F, L, MS, SS, SWS, T	MP	Reduces	Medium	2	n/a	n/a	President/ Village Board/ Emergency Services Disaster Agency	1 year	Village	Low/Medium	New
LM	Designate warming/cooling centers within the Village for use by residents and secure hosting agreements with each location.	EH, SWS	MP	Reduces	Small	2	n/a	n/a	President/ Village Board/ Emergency Services Disaster Agency	1 year	Village	Low/High	New
HM	Bury utility lines to critical facilities to limit service disruptions during natural hazard events.	SS, SWS, T	MP	Eliminates	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Emergency Services Disaster Agency	1 year	Village/ FEMA Pre-Disaster Mitigation	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,400 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
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Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 259
(Sheet 4 of 4)
Bartonville Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/Medium	New
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board/ Village Clerk	1 - 5 years	Village	Low/Medium	New
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	President/ Village Board	1 - 5 years	Village	Low/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	President/ Village Board	1 -2 years	Village	Low/High	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the Village.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	President/ Village Board/ Department of Public Works	3 - 5 years	Village	Low/Low	New

* Mitigation action to ensure continued compliance with NFIP.

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DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 260
(Sheet 1 of 3)
Chillicothe Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 2 years	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the City.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Mayor/ City Council/ Department of Public Works	3 - 5 years	Village	Low/Low	New
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council/ City Clerk	1 - 5 years	City	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City's size (just over 6,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 260
(Sheet 2 of 3)
Chillicothe Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing 2010)

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L	Landslide	T	Tornado

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SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 260
(Sheet 3 of 3)
Chillicothe Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Develop “hazard information centers” in public libraries and on the City’s website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Mayor/ City Council	1 - 3 years	City	Low/High	Existing (2010)
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council	3 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the City’s size (just over 6,000 individuals) and budgetary constraints. The City works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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EH	Excessive Heat		
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Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 261
(Sheet 1 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Construct a new water tower to increase the amount of water available in reserve, improve resiliency to drought and to aid in fire suppression as necessary during natural hazard events.	DR, EQ, F, SS, SWS, T	SP	Reduces	Large	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	5 years	Village	High/High	New
LM	Purchase a stand-alone server with software to back up the Village's computer files.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Large	3, 5, 8	n/a	n/a	President/ Village Board/ Village Clerk	2 years	Village	Low/Medium	New
HM	Design and construct a community safe room (tornado shelter) equipped with emergency backup generator and HVAC units that can also serve as an emergency shelter/warming and cooling center for Village residents.	EH, F, SS, SWS, T	SP	Reduces	Large	2	Yes	n/a	President/ Village Board	4 years	FEMA Pre-Disaster Mitigation	High/High	New
LM	Identify residents with access and functional needs and create a volunteer network to assist these residents during a natural hazard event.	DF, EH, EQ, F, SS, SWS, T	PI	Reduces	Small	1, 2	n/a	n/a	President/ Village Board	1 year	Village	Low/High	New

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L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 261
(Sheet 2 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Install curb and gutter at various locations within the Village to help direct the flow of stormwater runoff to drainage structures in an effort to alleviate drainage/flooding problems.	F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Streets Department	3 years	Village/ IDOT Local Roads	Medium/Medium	New
LM	Conduct a sewer line reconnaissance study to identify locations where storm water infiltrates the lines.	F, SS, SWS	S	Reduces	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	3 years	Village	Medium/High	New
HM	Repair/reline sewer line sections where storm water infiltration is occurring to prevent sewage backups.	F, SS, SWS	SP	Eliminates	Medium	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	5 years	Village	High/High	New
LM	Improve coordination between the village, township and County in an effort to help implement hazard mitigation projects and cleanup activities aimed at reducing or eliminating the risk associated with natural hazard events.	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	1 year	Village	Low/High	New

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SP	Structural Projects	MP	Miscellaneous Projects
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Peoria County (Participating Municipalities Only)

Figure 261
(Sheet 3 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Install/upsize new water mains and fire hydrants at various locations within the Village to ensure a constant supply of water for residents and aid in fire suppression during natural hazard events.	DR, EH, EQ, F, SS, SWS, T	SP	Reduces	Large	2, 3, 5	Yes	Yes	President/ Village Board/ Water & Sewer Department	5 years	Village	High/Medium	New
HM	Purchase and install sewer valves at wastewater treatment plant to isolate system operations and protect plant functions during heavy rain events.	F, SS	SP	Reduces	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Water & Sewer Department	3 years	Village	Low/High	New
LM	Locate and label all public hydrants in the Village to assist in street identification in the event of widespread natural hazard damage.	EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	President/ Village Board/ Department of Public Works	5 years	Village	Low/Medium	New

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SP	Structural Projects	MP	Miscellaneous Projects
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Peoria County (Participating Municipalities Only)

Figure 261
(Sheet 4 of 4)
Hanna City Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	President/ Village Board/ Department of Public Works	2 years	Village	Low/Medium	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the Village.	EQ	S	Reduces	Small	2 , 3 5, 7	n/a	Yes	President/ Village Board/ Department of Public Works	3 - 5 years	Village	Low/Low	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 1,200 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 262 (Sheet 1 of 4) Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install automatic emergency backup generators at all Fire Stations not currently equipped with one to provide uninterrupted power and maintain operations and communication capabilities during a power outage. All fire stations in the City serve as warming/cooling centers for city residents.	EH, EQ, F, SS, SWS, T	MP	Eliminates	Medium	2, 3, 5	n/a	Yes	Fire Department	5 years	Village/ DCEO	Medium/High	New
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 year	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 262
(Sheet 2 of 4)
Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the City.	EQ	S	Reduces	Small	2, 3, 5, 7	n/a	Yes	Mayor/ City Council/ Department of Public Works	3-5 years	City	Low/Low	New
LL	Partner with classified dams owners to develop Emergency Action Plans (EAPs) that identify the extent (water depth, speed of onset, warning times, etc.) and location (inundation areas) of potential dam failures to address data deficiencies.	DF	S	Reduces	Small	2, 3, 5	Yes	Yes	Mayor/ City Council	5 years	City/ Classified Dam Owners	Low/Medium	New
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council/ City Clerk	1 - 5 years	City	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
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PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 262
(Sheet 3 of 4)
Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	Existing (2010)
HM	Purchase and distribute NOAA weather radios to vulnerable residents.	DF, EH, EQ, F, SS, SWS, T	MP	Reduces	Large	2	n/a	n/a	Fire Department	1 - 5 years	City	Low/High	Existing (2010)
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing 2010)
LM	Develop "hazard information centers" in public libraries and on the City's website to inform residents of the risks to life and property associated with natural hazards and the proactive actions they can take to reduce or eliminate their risk	DF, DR, EH, EQ, F, SS, SWS, T	PI	Reduces	Large	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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EH	Excessive Heat		
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F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 262
(Sheet 4 of 4)
Peoria Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council	2 - 4 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of large-scale activities/projects is unlikely due to the City's size (approx. 115,000 individuals), and budgetary constraints. The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat		
EQ	Earthquake	SWS	Severe Winter Storms & Excessive Cold
F	Flood		
L	Landslide	T	Tornado

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 263
(Sheet 1 of 3)
Peoria Heights Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 2 years	City	Low/High	New
LM	Make city officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/High	New
LL	Identify unreinforced masonry buildings that serve as critical infrastructure/facilities within the City.	EQ	S	Reduces	Small	2, 3 5, 7	n/a	Yes	Mayor/ City Council/ Department of Public Works	3 - 5 years	City	Low/Low	New
LM	Review and present for adoption the updated Flood Insurance Rate Maps when they become available.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Present for adoption an updated floodplain ordinance.*	F	RA	Reduces	Small	1, 2, 6, 7	Yes	Yes	Mayor/ City Council City Clerk	1 - 5 years	City	Low/Medium	Existing (2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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DF	Dam Failure	MS	Mine Subsidence
DR	Drought	SS	Severe Storms (Thunderstorms, Hail, Lightning)
EH	Excessive Heat	SWS	Severe Winter Storms & Excessive Cold
EQ	Earthquake	T	Tornado
F	Flood		
L	Landslide		

Type of Mitigation Activity:

RA	Regulatory Activities	S	Studies
SP	Structural Projects	MP	Miscellaneous Projects
PI	Public Involvement	PP	Property Protection

Peoria County (Participating Municipalities Only)

Figure 263
(Sheet 2 of 3)
Peoria Heights Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
LM	Evaluate the feasibility of participating in the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Small	1, 2, 3, 4, 5, 6, 7	Yes	Yes	Mayor/ City Council	3 - 5 years	City	Low/High	Existing (2010)
HM	Target FEMA's Repetitive Loss Properties for potential mitigation projects.*	F	PP	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	FEMA Flood Mitigation Assistance	Medium/High	Existing (2010)
LM	Target FEMA's Repetitive Loss Properties for educational outreach.*	F	PI	Reduces	Small	2, 6	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Develop educational materials that can be used to inform residents about the benefits of the National Flood Insurance Program and how it is administered locally.*	F	PI	Reduces	Small	1, 2	Yes	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Locate and label all public hydrants in the City to assist in street identification in the event of widespread natural hazard damage.	DF, EQ, F, SS, T	MP	Reduces	Large	2, 4	n/a	n/a	Mayor/ City Council/ Department of Public Works	1 - 5 years	City	Low/Medium	Existing 2010)

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Peoria County (Participating Municipalities Only)

Figure 263
(Sheet 3 of 3)
Peoria Heights Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
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LM	Evaluate critical facilities and shelters to determine their resistance to natural hazards and recommend ways to strengthen or harden these facilities.	DF, EH, EQ, F, SS, SWS, T	S	Reduces	Small	2, 3, 5	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)
LM	Establish digital coordinates for all critical facilities/infrastructure for use in GIS mapping applications. This information can be used to determine which critical facilities/infrastructure have the potential to be threatened by natural hazard events.	DF, EQ, F, SS, SWS, T	MP	Reduces	Large	2, 3, 5	n/a	Yes	Mayor/ City Council	1 - 5 years	City	Low/Medium	Existing (2010)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the Village's size (just over 6,000 individuals) and budgetary constraints. The Village works diligently to provide critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Type of Mitigation Activity:

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5.0 PLAN MAINTENANCE

5.0 PLAN MAINTENANCE

This section focuses on the Federal Emergency Management Agency (FEMA) requirements for maintaining and updating the Plan once it has been approved by FEMA and adopted by the participating jurisdictions. These requirements include:

- establishing the method and schedule for monitoring, evaluating and updating the Plan;
- describing how the mitigation strategy will be incorporated into existing planning processes; and
- detailing how continued public input will be obtained.

These requirements ensure that the Plan remains an effective and relevant document. Provided below is detailed discussion of each requirement.

5.1 MONITORING, EVALUATING & UPDATING THE PLAN

Outlined below is a method and schedule for monitoring, evaluating and updating the Plan. This method allows the participating jurisdictions to review and adjust the planning process as needed, make necessary changes and updates to the Plan and track the implementation and results of the mitigation actions that have been undertaken.

5.1.1 MONITORING AND EVALUATING THE PLAN

The updated Plan will be monitored and evaluated by a subcommittee of the Mitigation Advisory Committee (MAC) on an annual basis. The MAC subcommittee will be composed of key members from the MAC, including representatives from all of the participating jurisdictions. The subcommittee will be chaired by the Tri-County Regional Planning Commission (TCRPC). All meetings held by the subcommittee will be open to the public. The information gathered at each subcommittee meeting will be documented and provided to all participating jurisdictions for their review and use in the Plan update.

The TCRPC will be responsible for monitoring the status of the mitigation actions identified in the updated Plan and providing the Illinois Emergency Management Agency (IEMA) with an annual progress report. It will be the responsibility of each participating jurisdiction to provide a progress report on the status of their mitigation actions at each subcommittee meeting.

Monitoring & Evaluating

- A MAC subcommittee will be formed to monitor and evaluate the updated Plan.
- The updated Plan will be monitored and evaluated on an ***annual basis***.
- Each participating jurisdiction will be responsible for providing an annual progress report on the status of their mitigation actions.
- New mitigation actions can be added by participating jurisdictions during the annual evaluation.

The MAC subcommittee will also evaluate the updated Plan on an annual basis to determine the effectiveness of the planning process and the implemented mitigation actions. In addition, the subcommittee will decide whether any changes need to be made. As part of the evaluation of the planning process, the subcommittee will review the goals to determine whether they are still relevant or if new goals need to be added; assess whether other natural hazards need to be addressed or included in the updated Plan and review any new hazard data that may affect the Risk Assessment portion of the updated Plan.

The subcommittee will also evaluate whether other county or municipal departments should be invited to participate.

In terms of evaluating the effectiveness of the mitigation actions that have been implemented, the subcommittee will assess whether a project is on time, in line with the budget and moving ahead as planned; whether the project achieved the goals outlined and had the intended result; and whether losses were avoided as a result of the project. In addition, each of the participating jurisdictions will be given an opportunity to add new mitigation actions to the updated Plan and modify or withdraw mitigation actions already identified. In some cases, a project may need to be removed from the list of mitigation actions because of unforeseen problems with implementation.

5.1.2 Updating the Plan

The Plan must be updated within five years of the date the first participating jurisdiction adopts the updated Plan. (This date can be found in Section 7, Plan Adoption.) This ensures that all the participating jurisdictions will remain eligible to receive federal grant money to implement those mitigation actions identified in this Plan.

The Plan update will incorporate all of the information gathered and changes proposed at the previous annual monitoring and evaluation meetings. In addition, any government entity that did not take part in the previous planning process that now wishes to participate may do so. It will be the responsibility of these entities to provide all of the information needed to be integrated into the updated Plan.

Updating

- The Plan ***must be updated within 5 years*** of the date ***the first participating jurisdiction adopts*** the updated Plan.
- Any government entities that did not take part in the previous planning process but who now wish to participate may do so.
- Once the updated Plan has received FEMA/IEMA approval, ***each participating jurisdiction must re-adopt the Plan*** to remain eligible to receive federal grant money.

A public forum will be held to present the updated Plan to the public for review and comment. The comments received at the public forum will be reviewed and incorporated into the updated Plan. The updated Plan will then be submitted to IEMA and FEMA for review and approval. ***Once the updated Plan has received state and federal approval, FEMA requires that each of the participating jurisdictions re-adopt the Plan to remain eligible to receive federal grant money to implement the identified mitigation actions.***

5.2 Incorporating the Mitigation Strategy into Existing Planning Mechanisms

As part of the planning process, the MAC identified current plans, policies/ordinances and maps that supplement or help support mitigation planning efforts. **Figure 11** identifies the existing planning mechanism available by county by jurisdiction. It will be the responsibility of each participating jurisdiction to incorporate, where applicable, the mitigation strategy and other information contained in the updated Plan into the planning mechanisms identified for their jurisdiction.

Adoption of this updated Plan will trigger each participating jurisdiction to review and, where appropriate, integrate the Plan into other available planning mechanisms. The MAC's annual review will help maintain awareness of the Plan among the participating jurisdictions and encourage them to actively integrate it into their day-to-day operations and planning mechanisms. Any time a mitigation action is slated for implementation by a participating jurisdiction, it will be integrated into their capital improvement plan/budget.

Given that the TCRPC often assists and supports the participating jurisdictions in their planning efforts, they will also play a role in assuring the information presented in this Plan update is utilized and expanded on, when appropriate, in existing planning mechanisms. This can be achieved through discussions at regularly scheduled meeting with participating jurisdictions and when existing plans and programs are reviewed and updated.

5.3 CONTINUED PUBLIC INVOLVEMENT

The participating jurisdictions understand the importance of continued public involvement and will seek public input on the updated Plan throughout the plan maintenance process. A copy of the approved Plan Update will be maintained and available for review at the TCRPC's Office. Individuals will be encouraged to provide feedback and submit comments for the next Plan Update to the TCRPC.

The comments received will be compiled and presented at the annual MAC subcommittee meetings where members will consider them for incorporation into the updated Plan. All meetings held by the MAC subcommittee will be noticed and open to the public. A separate public forum will be held prior to the next Plan Update submittal to provide the public an opportunity to comment on the proposed revisions to the updated Plan.

6.0 PLAN ADOPTION

6.0 PLAN ADOPTION

The final step in the planning process is the adoption of the approved updated Plan by each participating jurisdiction. Each jurisdiction must formally re-adopt the Plan to remain eligible for federal grant money to implement mitigation actions identified in this Plan.

6.1 PLAN ADOPTION PROCESS

Before the updated Plan can be adopted by the participating jurisdictions, it must be made available for public review and comment through a public forum and comment period. Any comments received are incorporated into the updated Plan and the Plan is then submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for their review and approval.

Once IEMA and FEMA have reviewed and approved the updated Plan, it will be presented to the participating jurisdictions for adoption. ***Each participating jurisdiction must formally adopt*** the Plan to remain or become eligible to receive federal grant money to implement the mitigation actions identified in this Plan. If any of the jurisdictions choose not to adopt the updated Plan, their choice will not affect the eligibility of those that do adopt the updated Plan.

Figure 264 identifies the participating jurisdictions and the date each formally adopted the updated Plan. Signed copies of the adoption resolutions are located in **Appendix N**. FEMA signed the final approval letter on October 23, 2019 which began the five-year approval period and set the an expiration date of October 23, 2024 for the Plan.

Figure 264
Plan Adoption Dates

Participating Jurisdiction	Plan Adoption Date
Tri-County Regional Planning Commission	02/27/2020
Tazewell County	10/30/2019
East Peoria, City of	11/19/2019
Morton, Village of	11/04/2019
Pekin, City of	11/12/2019
Tremont, Village of	11/04/2019
Washington, City of	11/04/2019
Woodford County	10/15/2019
Eureka, City of	10/21/2019
Germantown Hills, Village of	10/17/2019
Roanoke, Village of	11/04/2019
Peoria County – Participating Municipalities Only	
Bartonville, Village of	10/28/2019
Chillicothe, City of	11/11/2019
Hanna City, Village of	11/05/2019
Peoria, City of	11/12/2019
Peoria Heights, Village of	12/17/2019

7.0 REFERENCES

7.0 REFERENCES

Provided below is a listing, by section, of the resources utilized to create this document.

1.0 INTRODUCTION

1. Federal Emergency Management Agency. Data Visualization: Disaster Declarations for States and Counties. Database. 20 December 2018 <http://www.fema.gov/data-visualization-disaster-declarations-states-and-counties>.
2. Federal Emergency Management Agency. Disaster Declarations. Database. 20 December 2018 <http://www.fema.gov/disasters>.
3. Federal Emergency Management Agency. Getting Started: Building Support for Mitigation Planning. FEMA 386-1. September 2002. 15 November 2017 <http://www.illinois.gov/iema/Mitigation/Documents/Plan_FEMA_HTG1.pdf>.
4. Illinois Emergency Management Agency. 2013 Illinois Natural Hazard Mitigation Plan. October 2013. 7 May 2015 <http://www.illinois.gov/iema/Mitigation/Documents/Plan_IllMitigationPlan.pdf>.

1.1 PARTICIPATING JURISDICTIONS

1. Illinois Department of Commerce and Economic Opportunity. Census 2010 Data. 15 November 2017 <https://www2.illinois.gov/sites/census/Pages/Census2010Data.aspx>.
2. Illinois Department of Public Health. IDPH Population Projections for Illinois Counties 2010 to 2025. 15 November 2017 <https://data.illinois.gov/dataset/438idph_population_projections_for_illinois_counties_2010_to_2025>.
3. United States Census Bureau. 2010 Census U.S. Gazetteer Files. 25 February 2014 <http://www.census.gov/geo/www/gazetteer/gazetteer2010.html>.
4. United States Census Bureau. American FactFinder. 26 March 2018 <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.
5. United States Census Bureau. 1990 Census. Illinois: Population of Counties by Decennial Census: 1900 to 1990. 1995. 15 November 2017 <http://www.census.gov/population/www/censusdata/cencounts/files/il190090.txt>.

1.1.1 TAZEWELL COUNTY

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