Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan Update

Cumberland County, Illinois

Draft

Participants:

Cumberland County
Cumberland Community Unit School District #77
Greenup, Village of
Neoga, City of
Neoga Community Unit School District #3
Neoga Fire Protection District
Sigel Fire Protection District
Toledo, Village of
Toledo Fire Protection District

February 2023

The five year update of this Plan must be completed on or before (date).

CUMBERLAND COUNTY MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN

CUMBERLAND COUNTY, ILLINOIS

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

Researched and written for the Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee
by American Environmental Corporation

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 Cumberland County. Since 1974, Cumberland County has been included in six major federally-declared disasters. **Figure I-1** identifies each declaration including the year the disaster was declared and the type of natural hazard that triggered the declaration. The natural hazard(s) recognized as contributing to the declaration for Cumberland County is identified in bold.

Figure I-1
Major Federal Disaster Declarations: Cumberland County

Declaration #	Year	Natural Hazard(s) Covered by Declaration
438	1974	severe storms; **flooding**
1112	1996	severe storms; **flooding**
1416	2002	**severe storms; tornadoes; flooding**
1771	2008	**severe storms; flooding**
1960	2011	**severe winter storm; snowstorm**
4489	2020	**COVID-19 pandemic**

In the last 10 years alone (2012 – 2021), there have been 48 heavy rain events, 42 excessive heat events, 18 flash flood events, 16 extreme cold events, 14 thunderstorms with damaging winds, 12 riverine flood events, 11 severe winter storms, 5 severe storms with hail one inch in diameter or greater, 3 tornadoes, and 1 drought verified in the County.

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 and man-made hazards. This process helps the County and participating jurisdictions reduce their risk from these 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 an all hazards mitigation plan.

Why update an all hazards mitigation plan?

By updating and adopting an all 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 and activities 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?

An all hazards mitigation plan is aimed at identifying projects and activities that can be conducted prior to a natural or man-made disaster, unlike other emergency plans which provide direction on how to respond to a disaster after it occurs. This is the first time that Cumberland County has updated its hazard mitigation plan since the original plan was prepared in 2015. This update describes in detail the actions that can be taken to help reduce or eliminate damages caused by specific types of natural and man-made hazards.

1.1 PARTICIPATING JURISDICTIONS

Recognizing the benefits of having an all hazards mitigation plan, the Cumberland County Board authorized the update of the Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan (hereto referred to as the Plan). The County then invited all the local government entities within Cumberland County to participate. **Figure I-2** identifies the participating jurisdictions represented in the Plan update who sought Plan approval.

Figure I-2 **Participating Jurisdictions Represented in the Plan**	
❖ Cumberland CUSD #77	❖ Neoga Fire Protection District
❖ Greenup, Village of	❖ Toledo, Village of
❖ Neoga, City of	❖ Toledo Fire Protection District
❖ Neoga CUSD #3	❖ Sigel Fire Protection District

While a small portion of Casey extends into Cumberland County, a majority of the City is located in Clark County. As a result, the City chose to participate in the Clark County Hazard Mitigation Plan, which was updated in 2018. Therefore, Casey's risk and/or vulnerability is not discussed in this Plan.

While both Jewett and Montrose were invited and encouraged to participate in the Plan update, neither chose to engage in the process and therefore are not included as participating jurisdictions in the Plan update.

1.2 COUNTY PROFILE

Cumberland County is located in east-central Illinois and covers approximately 347 square miles. **Figure I-3** provides a location map of the County and the participating municipalities while **Figures I-4** identifies the boundaries of the census tracts located in the County. **Figures I-5, I-6** and **I-7** identify the boundaries of the Cumberland County townships, school districts, and fire protection districts.

The County is bounded to the north by Coles County, to the east by Clark County, to the south by Jasper and Effingham Counties, and to the west by Effingham and Shelby Counties. The Village of Toledo is the county seat. The topography is nearly level to gently sloping.

Figure I-3
Location Map

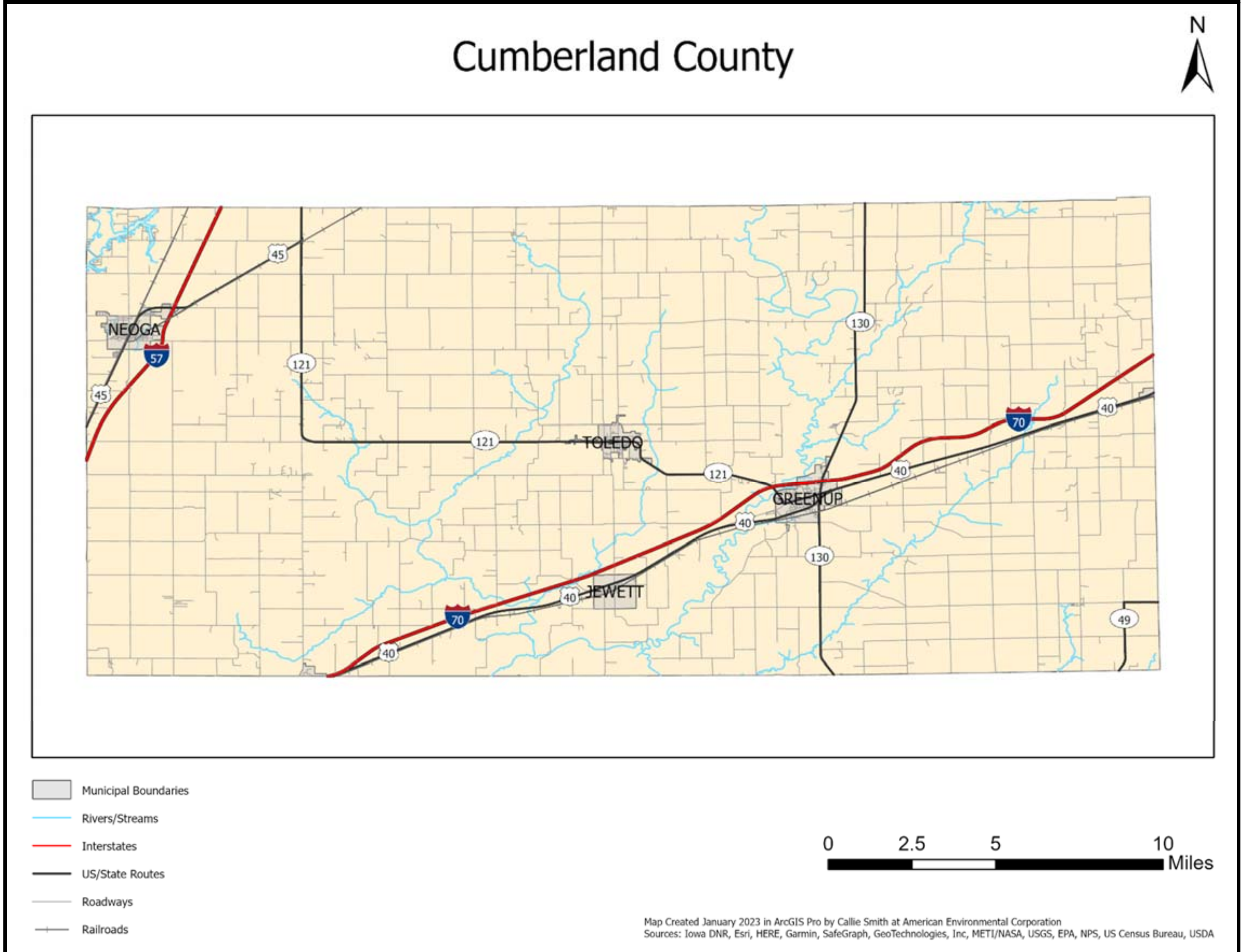


Figure I-4
Cumberland County 2010 Census Tract Map

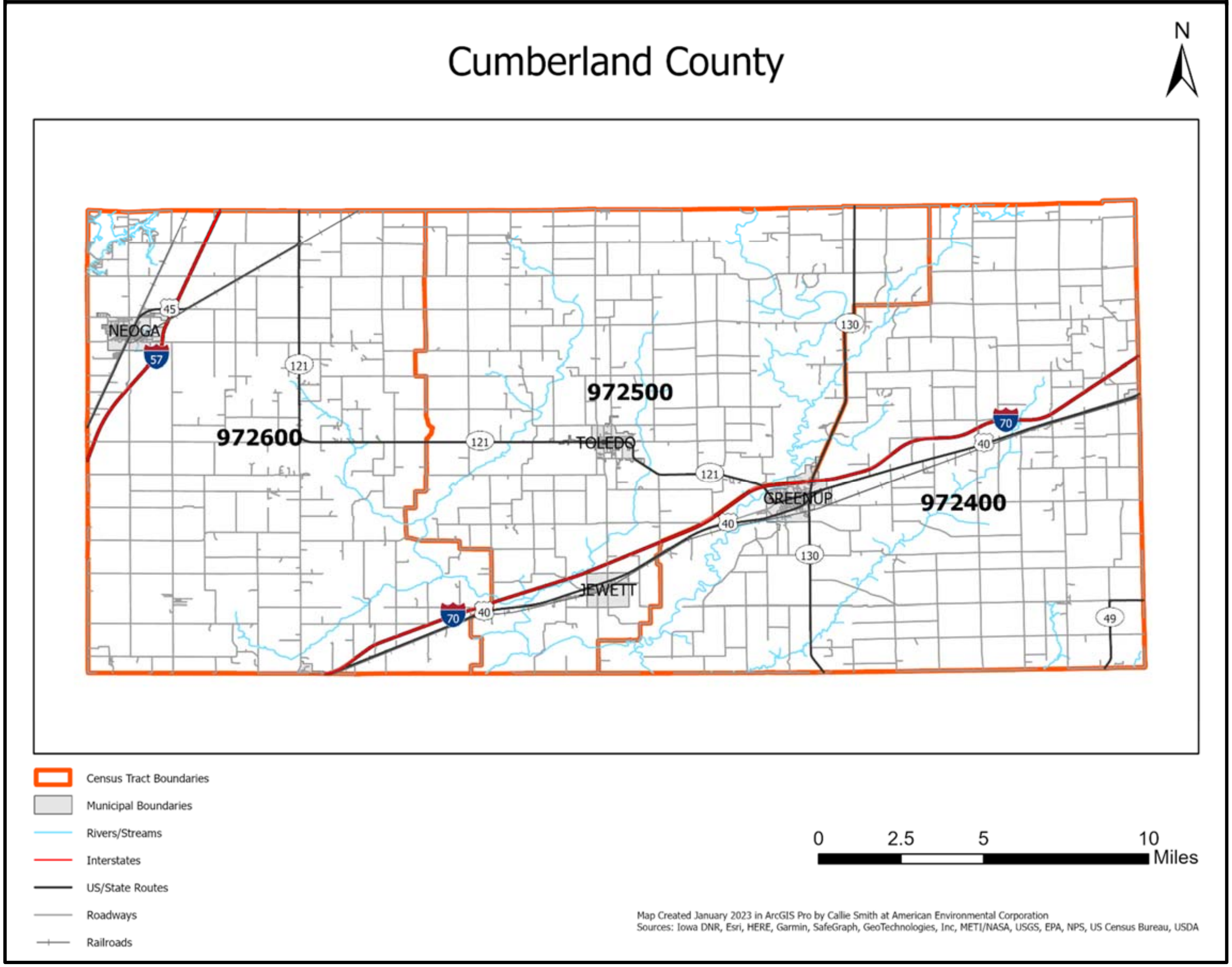


Figure I-5
Township Boundary Map

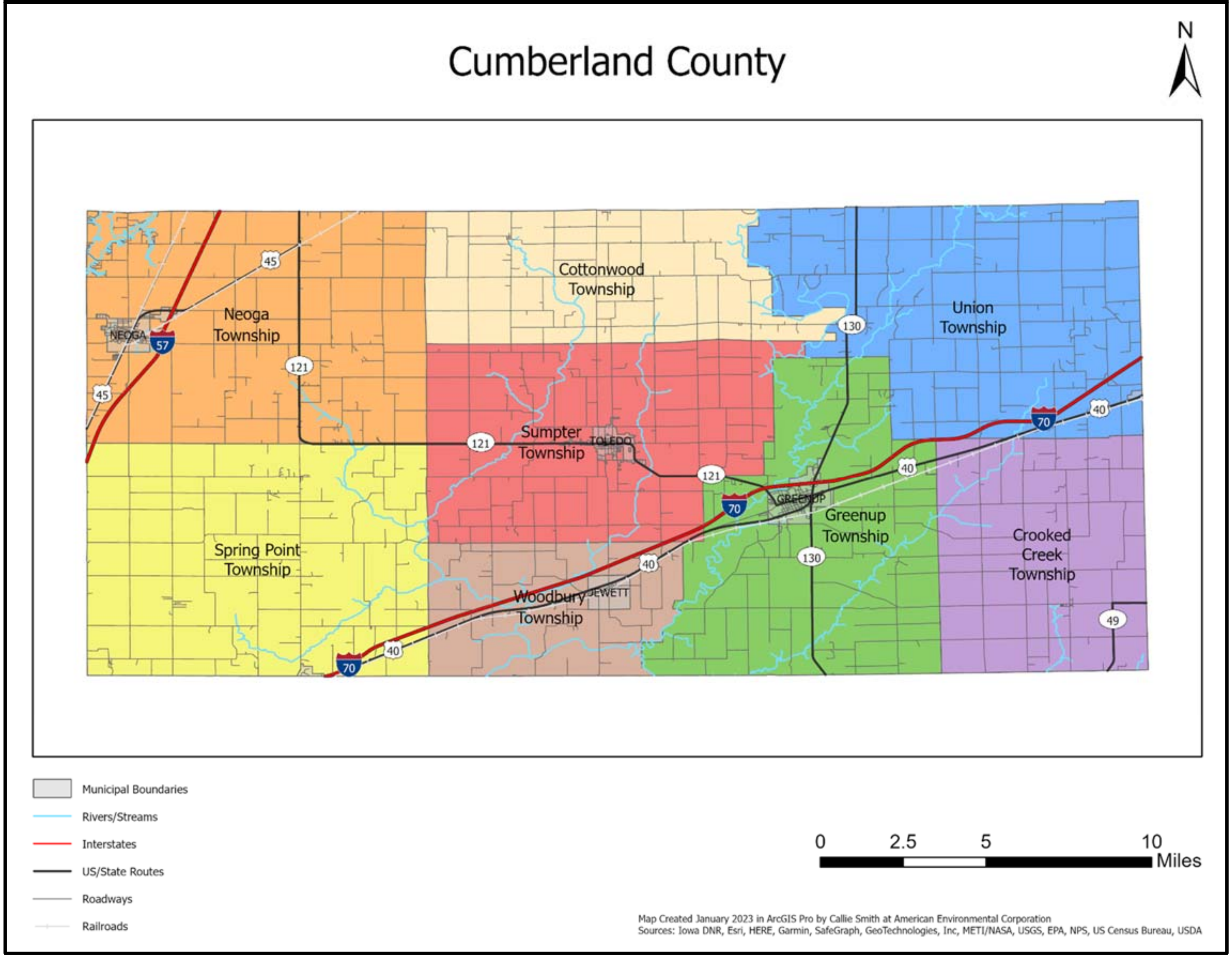


Figure I-6
School District Boundary Map

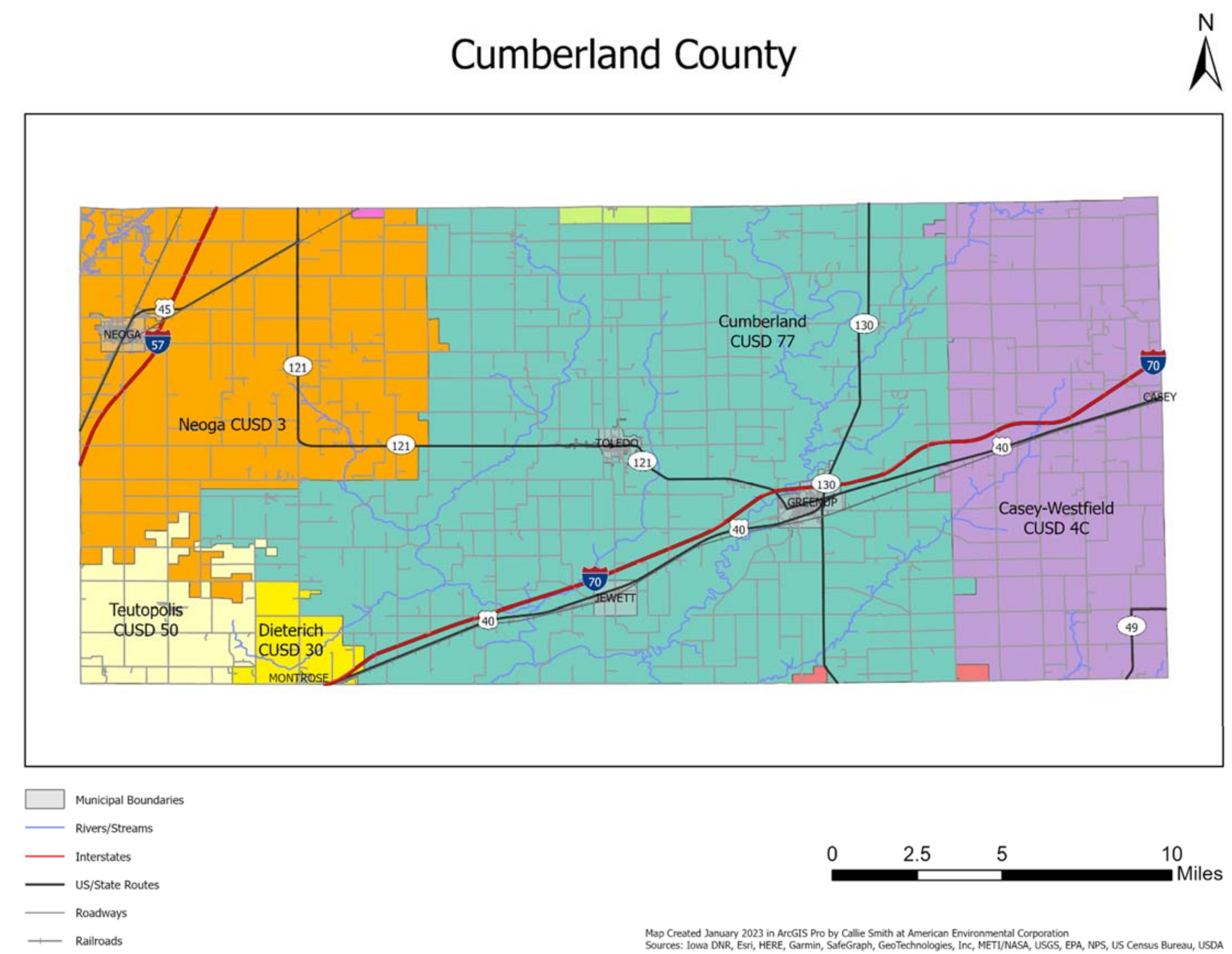
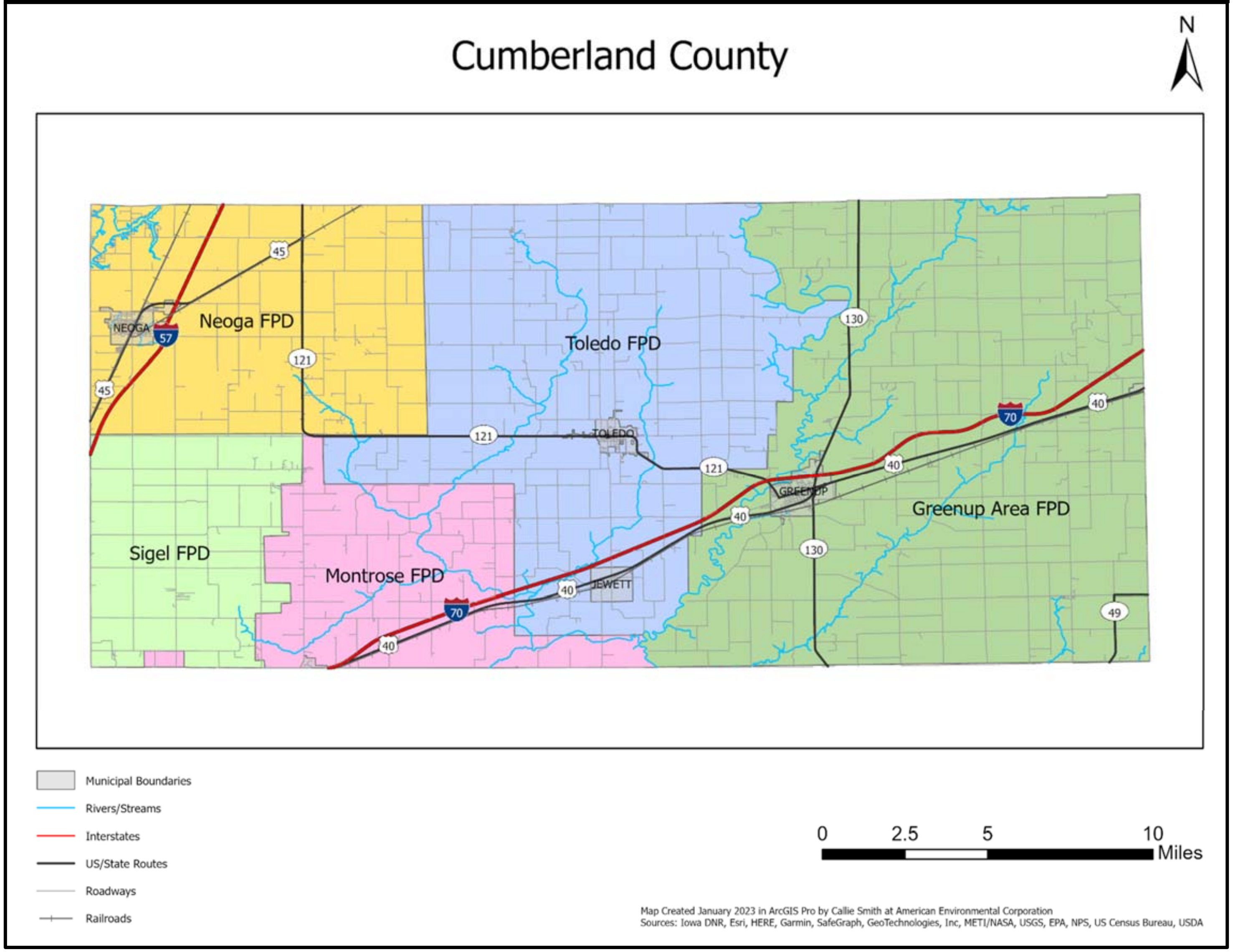


Figure I-7
Fire Protection District Boundary Map



The County is situated in the northern portion of the Till Plains Section of the Central Lowland Province of the Interior Plains. Soils are characterized by a series of end moraines and ground moraines. Most areas are well-drained for crops grown in this area. With the exception of the western edge, the Embarras River watershed encompasses almost the entire County. The remaining portion of the County along the western edge is drained by the Little Wabash watershed.

Agriculture is the main industry in Cumberland County. According to the 2017 Census of Agriculture, there were 724 farms in Cumberland County occupying approximately 77.6% (171,760 acres) of the total land area in the County. In comparison, there were 733 farms occupying 76.8% (170,149 acres) of the total land area in the County in 2012. The major crops include corn, soybeans, and winter wheat while the major livestock includes hogs and dairy cows. The County ranks 28th in the State for livestock cash receipts.

The largest employment sectors in Cumberland County are manufacturing and health care/social assistance followed by retail trade, educational services, and construction according to the Illinois Department of Commerce and Economic Opportunity. According to the Cumberland County Development Corporation, leading employers include Evapco, Inc., Neoga CUSD #3, Cumberland CUSD #77, First Neighbor Bank, and area nursing centers.

Figure I-8, located at the end of this section, 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 buildings associated with the main residence.) The assessed value of a residence in Cumberland County is approximately one-third of the market value.

Figure I-9, also located at the end of this section, provides additional demographic information by census tract along with the CDC/ATSDR Social Vulnerability Index (SVI) and overall level of vulnerability. The SVI is a database that uses U.S. Census Bureau American Community Survey data to rank census tracts and counties on 16 social factors within four themes: Socioeconomic Status, Household Characteristics, Racial & Ethnic Minority Status, and Housing Type & Transportation. The goal of the SVI is to help emergency response planners and public health officials identify, map, and plan support for communities that will most likely need support before, during, and after a public health emergency.

The rankings generated by the SVI describe a county's or census tract's relative vulnerability among all other U.S. counties and census tracts. Rankings are based on percentiles ranging from 0 to 1, with higher values indicating greater vulnerability. Each ranking is assigned to one of four levels of vulnerability: Low (0 – 0.2499), Low to Medium (0.2500 – 0.4999), Medium to High (0.5000 – 0.7499), and High (0.7500 – 1). The SVI currently uses 2010 census tract information. In 2010, there were three census tracts in Cumberland County. Of the three census tracts in Cumberland County, one has a "Low" overall SVI ranking, one has a Low to Medium overall SVI ranking, and one has a "Medium to High" overall SVI ranking while the County as a whole has a "Low" overall SVI.

Figures I-10 and **I-11** provide basic demographic information about the size and populations served by the participating school districts and fire protection districts.

Figure I-10 Demographic Data by Participating School District				
Participating District	**Number of Schools in District**	**Estimated Population Served**	**Area Served (Sq. Miles) (2010)**	**Communities / Unincorp. Areas Served in Cumberland County**
Cumberland CUSD #77	3	5,500	347	Bradbury, Greenup, Janesville, Jewett, Liberty Hill, Toledo, Walla Walla, Woodbury,
Neoga CUSD #3	2	2,700	135	Neal, Neoga

Source: Capability Assessment Worksheets – School Districts.

Figure I-11 Demographic Data by Participating Fire Protection Districts				
Participating District	**Number of Fire Stations**	**Estimated Population Served**	**Area Served (Sq. Miles) (2010)**	**Communities / Unincorp. Areas Served in Cumberland County**
Neoga Fire Protection District	1	6,000	85	Neal, Neoga, Trowbridge
Toledo Fire Protection District	1	10,000	119	Bradbury, Janesville, Jewett, Johnstown, Toledo
Sigel Fire Protection District	1	2,500	72	Lillyville, Sigel

Source: Capability Assessment Worksheets – Fire Protection Districts.

1.3 LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Cumberland County is almost entirely rural with a population that has seen a decrease between 1900 and 2010 from 16,124 to 11,048. Between 2010 and 2020 the population decreased by 2.4% from 11,048 to 10,787. During that same time period, all of the participating municipalities experienced population decreases with the exception of Greenup, which increased slightly.

Land use in Cumberland County is primarily agricultural. As discussed in the previous section, approximately 77.6% of the land within the County is used for farming practices. Agriculture is and will continue to be a major industry within the County and a mainstay of the County's economy.

According to the Cumberland County Development Corporation, there have been no substantial changes in development within the County or any of the participating jurisdictions that have impacted their overall vulnerability since the original Plan was approved. In 2017, a 14-acre Love's Travel Stop opened on the southeast side of the junction of Interstate-70 and Illinois Route 130 in Greenup. The Greenup Village Clerk, Jill Kimble, confirmed no other substantial changes in development have occurred in or near that community.

In terms of development and economic initiatives within the County and the participating jurisdictions, discussions are underway concerning the development of rural wind farms and solar energy development; however, there is considerable opposition to this initiative. As a result, it is unclear whether such development will be part of the future landscape of Cumberland County. On the east side of Toledo, a multi-field, outdoor sports complex is in the planning stages.

There are no other large-scale economic development 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 commercial or industrial developments are expected within the next five years.

Figure I-8 **2016-2020 Demographic Data by Participating Jurisdiction**																	
Participating Jurisdiction	**Population**	**Projected Population (2030)**	**Total Area (Sq. Miles) (2020)**	**Number of Housing Units**	**Percent Race**								**Income**			**Total Assessed Value of Housing Units (2020)**
					White (alone)	Black or African American (alone)	Asian (alone)	Hispanic or Latino (of any race)	American Indian & Alaska Native (alone)	Native Hawaiian & Other Pacific Islander (alone)	Some other Race (alone)	Two or more Races	% of People whose Income is below the Poverty Line	Per Capita Income	Economically Disadvantaged Rural Community*	
Cumberland County (Total)	10,787	10,165	346.024	4,879	96.8%	0.1%	0.2%	1.0%	0.1%	0.0%	0.7%	2.2%	11.4%	$29,426	---	$84,120,946
Cumberland County (Unincorp.)	6,010	5,663	340.935	2,768	96.5%	0.0%	0.2%	1.3%	0.1%	0.0%	1.2%	2.0%	9.8%	---	---	$52,836,307
Greenup	1,754	1,653	1.747	819	98.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.4%	0.7%	14.8%	$22,561	Yes	$10,160,912
Neoga	1,579	1,488	1.429	639	98.7%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%	1.3%	12.1%	$23,353	Yes	$11,657,342
Toledo	1,163	1,096	0.908	542	93.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	13.2%	$24,696	Yes	$8,498,552
Illinois	12,770,631	12,790,000	55,513.18	5,373,385	61.3%	14.0%	5.4%	17.1%	0.1%	0.02%	0.2%	1.9%	14.2%	$37,306	---	---
US	329,569,308	---	3,533,038	138,432,751	69.8%	12.5%	5.6%	18.0%	0.8%	0.2%	5.1%	5.1%	12.8%	$35,384	---	---

* For the purposes of FEMA's Hazard Mitigation Assistance grant programs administered by the Illinois Emergency Management Agency, an Economically Disadvantaged Rural Community is defined in Illinois as a community of 3,000 or fewer individuals whose residents have an average per capita annual income not exceeding 80 percent of the US per capita income based on best available data.

Sources: Cumberland County Clerk.
Illinois Department Public Health, Population Projections – Illinois, Chicago and Illinois Counties by Age and Sex: July 1, 2015 to July 1, 2030 (2019 Edition).
U. S. Census Bureau, American Community Survey, 5-Year Data Profile.

Figure I-9
2016-2020 Demographic Data by Census Tract

Census Tract	Incorporated Municipalities Located in Census Tract	Population (2016-2020)	Total Area (Sq. Miles) (2010)	Number of Housing Units (2016-2020)	Percent Race								Income	Social Vulnerability Index	
					White (alone)	Black or African American (alone)	Asian (alone)	Hispanic or Latino (of any race)	American Indian & Alaska Native (alone)	Native Hawaiian & Other Pacific Islander (alone)	Some other Race (alone)	Two or more Races	% of People whose Income is below the Poverty Line	Overall SVI Ranking	Level of Vulnerability
972400	Greenup	3,035	117.132	1,498	98.5%	0.3%	0.6%	0.0%	0.0%	0.0%	0.2%	0.4%	13.1%	0.3867	Low-Medium
972500	Jewett, Toledo	3,276	114.035	1,466	94.7%	0.1%	0.0%	2.4%	0.0%	0.0%	2.2%	3.0%	13.0%	0.5114	Medium-High
972600	Neoga	4,476	115.837	1,915	97.2%	0.0%	0.0%	0.5%	0.1%	0.0%	0.0%	2.7%	8.9%	0.1797	Low
Cumberland County	---	10,787	347.004	4,879	96.8%	0.1%	0.2%	1.0%	0.06%	0.0%	0.7%	2.2%	11.4%	0.0175	Low

Sources: CDC/ATSDR Social Vulnerability Index.
U.S. Census Bureau, American Community Survey, 5-Year Data Profile.

2.0 PLANNING PROCESS

The Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan (the Plan) was updated through the Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee (Planning Committee). The Plan was prepared to comply with the Disaster Mitigation Act of 2000 and incorporates the nine recommended tasks for developing or updating a local hazard mitigation plan as outlined in Federal Emergency Management Agency's (FEMA) Local Mitigation Planning Handbook. **Figure PP-1** provides a brief description of the process utilized to prepare this Plan.

Figure PP-1
Description of Planning Process

Tasks	Description
Task One: Organize the Committee	The Planning Committee was formed with broad representation and specific expertise to assist the County 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 & Vulnerability Analyses	The Consultant identified and profiled the natural and man-made hazards that have impacted the County and conducted vulnerability analyses 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 Planning Committee in updating the goals and objectives for the Plan.
Task Six: Mitigation Strategy & Activities	The participating jurisdictions were asked to identify mitigation actions that had been started and/or completed since the original 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 draft Plan update summarized the results of Tasks One through Six. In addition, it described the responsibilities to monitor, evaluate and update the Plan. The draft Plan update 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 draft Plan update and submitted to the Illinois Emergency Management Agency (IEMA) and FEMA for review and approval.
Task Eight: Finalize Plan & Adoption	Comments received from IEMA and FEMA were incorporated into the final Plan update. The final Plan update was then submitted to the County and participating jurisdictions 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 Joseph Vogt, the Cumberland County Emergency Management Agency (EMA) Coordinator. American Environmental Corp. (AEC) an environmental consulting firm, with experience in hazard mitigation, risk assessment and public involvement, was employed to guide the County and participating jurisdictions through the planning process.

Participation in the planning process, especially by the County and local government representatives, was crucial to the development of the Plan update. 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 Plan update. All of the participating jurisdictions met the participation requirements.

- Attend at least one Planning Committee meeting.
- Complete a capability assessment identifying existing capabilities and resources (i.e., plans, policies, ordinances studies, reports, maps, etc.) available to accomplish hazard mitigation.
- Identify/submit a list of critical infrastructure and facilities.
- Review the risk assessment and provide additional information on events and damages when available.
- Participate in the update of the mitigation goals and project prioritization methodology.
- Provide information on any mitigation actions started and/or completed since the adoption of the original Plan.
- Identify and submit a list of new mitigation actions.
- Review and comment on the draft Plan update.
- Formally adopt the Plan update.
- Where applicable, incorporate the Plan update into existing planning efforts.
- Participate in the Plan update maintenance.

2.1 PLANNING COMMITTEE

As previously mentioned, at the start of the planning process, the Cumberland County Multi-Jurisdictional All Mitigation Planning Committee was formed to update the hazard mitigation plan. The Planning Committee included representatives from each participating jurisdiction, as well as education, emergency services and healthcare.

Figure PP-2 details the entities represented on the Planning Committee and the individuals who attended on their behalf. The Planning Committee was chaired by the Cumberland County EMA.

Additional technical expertise was provided by the staff at the Illinois Emergency Management Agency and the Illinois Department of Natural Resources Office of Water Resources.

Mission Statement

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

"The mission of the Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee is to develop a mitigation plan that:

1) documents the risks associated with the natural and man-made hazards that impact the County and

2) identifies projects and activities that mitigate the risk to structures, facilities, and systems that provide support to the County, its residents, and economy as well as community lifelines that enable the continuous operation of critical government and business functions."

Figure PP-2
Cumberland County Planning Committee Member Attendance Record

Representing	Name	Title	12/7/2021	3/8/2022	7/12/2022	10/18/2022	2/14/2023
American Environmental Corporation	Bostwick-Campbell, Andrea	EMS Manager	X	X	X	X	
American Environmental Corporation	Runkle, Ken	Risk Assessor		X	X	X	
American Red Cross	Beaver, Jamie	Disaster Program Manager		X			
Cumberland County - Clerk's Office	Howard, Bev	County Clerk	X	X	X	X	
Cumberland County - EMA	Vogt, Joseph	Coordinator	X	X	X	X	
Cumberland County - Health Department	Bishop, Juli	Director of Environmental Health			X		
Cumberland County - Health Department	Drotor, Sheri	Administrator	X	X		X	
Cumberland County - Highway Department	Bland, Ben	County Engineer	X				
Cumberland County - Highway Department	Murray, Richard	County Engineer			X	X	
Cumberland County - Treasurer	Maynard, Jenny	Chief Deputy		X		X	
Cumberland CUSD #77	Hensley, George	Maintenance Director	X				
Cumberland CUSD #77	Tarr, Larry	Maintenance		X	X		
Greenup Fire Protection District	Wright, Tony	Assistant Fire Chief	X	X			
Greenup, Village of	Ryder, Michael	Superintendent of Utilities	X				
Neoga CUSD #3	Fritcher, Bill	Superintendent	X	X			
Neoga CUSD #3	Haarman, Kevin	Principal		X			
Neoga Fire Protection District	Albin, Bill	Fire Chief	X	X			
Neoga Fire Protection District	Willenborg, Clint	Fire Chief			X		
Neoga, City of	Evans, Brenda	City Administrator			X		
Neoga, City of	Schabbing, Andy	Police Chief			X		
Sigel Fire Protection District	Vogt, Joseph	Assistant Fire Chief	X	X	X	X	
Toledo Area Ambulance	Lewis, Robert	Coordinator			X		
Toledo Area Ambulance	Martin, Mikela	Coordinator	X				
Toledo Fire Protection District	Layton, Chuck	Fire Chief		X	X		
Toledo Fire Protection District	Pruemer, Chuck	Fire Captain	X	X			
Toledo, Village of	Layton, Chuck	Superintendent		X	X		

Planning Committee Meetings

The Planning Committee met five times between December 2021 and February 2023. **Figure PP-2** 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.

<u>First Planning Committee Meeting – December 7, 2021</u>

The purpose of this meeting was to explain the planning process to the Planning Committee members and give them a brief overview of the planning process including what mitigation is, what a hazards mitigation plan is and why the Plan needs to be updated. A discussion regarding the hazards to be included in the Plan update was conducted.

Information needed from each participant was discussed and representatives for the County and the participating jurisdictions were asked to complete the forms entitled "Capability Assessment Worksheet," "Critical Facilities & Infrastructure," "Identification of Severe Weather Shelters" and "Drinking Water Supply Worksheet" and return them at the next meeting.

Committee members were then asked to identify any recent or historic natural or man-made hazard events that have impacted the County and participants. A "Hazard Events Questionnaire" was distributed during the meeting to solicit information on hazard events. Community participation was also discussed. The County and participating jurisdictions were asked to make information available on the planning process at their offices and in the communities. A "Citizen Questionnaire," was also distributed electronically to Committee Members prior to the meeting for distribution to their constituents to gauge the public's perception about the hazards that impact the County. Finally, drafts of a mission statement and updated mitigation goals were presented for review.

Second Planning Committee Meeting – March 8, 2022

At the second Planning Committee meeting portions of the updated natural and man-made hazard risk assessment section were presented for review. Following the review of the risk assessment, the Planning Committee members participated in an exercise to calculate the Risk Priority Index (RPI) for the County and participating jurisdictions. The RPI can assist participants in determining which hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities. The Planning Committee then reviewed and discussed the draft mission statement and updated mitigation goals and finalized both with no changes.

Next, mitigation actions were defined, and examples were discussed. Committee members were asked to identify any mitigation projects and activities their jurisdictions had started and/or completed since the original Plan was completed in 2015. Ideas for new potential mitigation projects and activities were presented. Representatives for the County and the participating jurisdictions were asked to complete the forms entitled "Existing Mitigation Project/Activity Status" and "New Hazard Mitigation Projects" and return them at the next meeting.

Third Planning Committee Meeting – July 12, 2022

The purpose of the third Planning Committee meeting was to discuss the vulnerability analysis for select natural hazards and the preliminary results of the RPI exercise. The Planning Committee members then discussed vulnerable community assets and completed the form entitled "Critical Facilities Vulnerability Survey" which will be used in the vulnerability analyses.

The concept of community lifelines was also discussed. Community lifelines enable the continuous operation of critical government and business functions essential to human health and safety or economic security. While the concept was developed to support emergency response and planning, FEMA has begun applying it to all phases of emergency management, including mitigation. Community lifelines will be included in most project descriptions to create a clear connection to the concept.

Next, an explanation of what a mitigation action prioritization methodology is and how it fits into the Mitigation Strategy was provided. The Planning Committee reviewed the updated mitigation project prioritization methodology and approved it with no changes. Finally, a discussion on how the mitigation projects and activities identified by the participating jurisdictions will be presented in the Plan update was provided. Participants were encouraged to provide their mitigation project lists prior to the 4^{th} meeting when draft lists will be distributed for review.

Fourth Planning Committee Meeting – October 18, 2022

At the fourth Planning Committee meeting, Committee members 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 outlining the mitigation strategy, plan maintenance and adoption were also reviewed.

The public forum and adoption process were then discussed, and a date for the public forum was set. Finally, the plan maintenance and update requirements were discussed. The Plan update will be monitored and evaluated on an annual basis by a Plan Maintenance Subcommittee which will be made up of the participating jurisdictions and key members of the Planning Committee. The Plan must be reviewed, revised, and resubmitted to IEMA and FEMA at least once every five years.

Fifth Planning Committee Meeting – February 14, 2023

At this Planning Committee meeting the public was provided an opportunity to ask questions and provide comments on the draft Plan update.

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 Plan update's development; and
- cultivate ownership of the Plan update, 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 Plan update. 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 gather facts and gauge public perceptions about natural hazards that affect Cumberland County. The questionnaire was distributed electronically to the Planning Committee members who were encouraged to make it available to their residents. A copy of the questionnaire and social media posts related to the questionnaire are contained in **Appendix C**.

A total of 82 questionnaires were completed and returned to the Planning Committee. Questionnaires were completed by residents in each participating jurisdiction. These responses provide useful information to decision makers as they determine how best to disseminate information on natural hazards and safeguard the public. Additionally, these responses identify the types of projects and activities the public is most likely to support. The following provides a summary of the results.

- Respondents felt that severe summer storms were the most frequently encountered natural hazard in Cumberland County followed by severe winter storms. However, compiled weather records indicate that excessive heat events, in fact, occur more frequently than severe winter storms.
- The most effective means of communication identified by respondents to disseminate information about natural hazards were social media and the Internet, followed by the mailings, radio and television. Schools, newspapers, and fact sheet/brochures disseminated via fire departments/law enforcement also received support among respondents.
- In terms of the most needed mitigation projects and activities, the following categories received the strongest support:
  - maintain power during storms by burying power lines, trimming trees and/or purchasing backup generators (74%);
  - maintain roadway passages during snowstorms and heavy rains (68%);
  - flood or drainage protection (59%); and
  - install/maintain sirens and other alert systems (57%).

FAQ Fact Sheet
A "Frequently Asked Questions" fact sheet was disseminated to help explain what an all hazards mitigation plan is and briefly described the planning process. The fact sheet was made available at the participating jurisdictions. A copy of the fact sheet is contained in **Appendix D**.

News Releases
News releases were prepared and submitted to the Toledo Democrat and posted to the Cumberland County EMA's Facebook page prior to each Planning Committee meeting. The releases announced the purpose of the meetings and how the public could become involved in the Plan update's development. Copies of the news releases and Facebook posts can be found in **Appendix E**.

Planning Committee Meetings
All of the meetings conducted by the Planning Committee 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 Planning Committee.

Public Forum
The final meeting of the Planning Committee, held on February 14, 2023 was conducted as an open-house public forum. The open-house format was chosen for this forum instead of a hearing

to provide greater flexibility 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.

In conjunction the public forum, the draft Plan update was made available for review and comment on the Cumberland County website. A two-page handout summarizing the planning process and a link to a comment survey that could be used to provide feedback on the draft Plan update were also posted on the website.

At the forum, residents could review a draft of the Plan update; meet with representatives from the County, the participating jurisdictions, and the Consultant; ask any questions; and provide comments on the draft Plan update. 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 Plan update. **Appendices F** and **G** contain copies of these materials.

Public Comment Period

After the public forum, the draft Plan update was made available for public review and comment through February 28, 2023 at the Cumberland County Clerk's Office and on the County's website. A two-page handout summarizing the planning process and a link to a comment survey that could be used to provide feedback on the draft Plan update were also posted on the website. **Appendix G** contains a copy of the online comment survey. Residents were encouraged to submit their comments electronically, by mail or through representatives of the Planning Committee.

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 County. This information included details about lightning strikes, severe winter storms, and flooding not available from state and federal databases.
- Obtained critical facilities damage information. Data collection surveys soliciting information about critical facilities damaged by natural hazards were used to supplement information obtained from government databases. This information was vital to the preparation of the vulnerability analysis.
- Increased awareness of the impacts associated with natural hazard events within the County. Understanding how mitigation actions can reduce risk to life and property helped generate **over 25 new mitigation projects and activities** at the local level that had not been previously identified in any other planning process.

2.3 PARTICIPATION OPPORTUNITIES FOR INTERESTED PARTIES

Businesses, schools, not-for-profit organizations, neighboring counties, and other interested parties were provided multiple opportunities to participate in the planning process. Wide-reaching applications were combined with direct, person-to-person contacts to identify anyone who might have an interest or possess information which could be helpful in updating the Plan.

Education
Representatives from Cumberland Community Unit School District (CUSD) #77 and Neoga CUS #3 served on the Planning Committee and provided input into the planning process. Both Districts chose to be included as participating jurisdiction in the Plan update.

Healthcare
Input was sought from the healthcare community. Representatives from Cumberland County Health Department and the Toledo Ambulance Service attended the Planning Committee meetings, provided input into the planning process. In September 2022 the Toledo Ambulance Service was taken out of service due to a lack of staff.

Not-for-Profit & Other Organizations
The American Red Cross, fire protection districts, and townships in Cumberland County were contacted and invited to participate in the Plan update. Representatives from the American Red Cross, Greenup Area Fire Protection District (FPD), Neoga FPD, Sigel FPD, and Toledo FPD served on the Planning Committee and provided input into the planning process. The Neoga FPD, Sigel FPD, and Toledo FPD and chose to be included as participating jurisdictions in the Plan update.

Neighboring Counties
A memo was sent to EMA/ESDA coordinators in the neighboring counties inviting them to participate in the mitigation planning process. The counties contacted included Clark, Coles, Effingham, Jasper, and Shelby. **Appendix H** contains a copy of the invitation memo.

2.4 IDENTIFICATION OF EXISTING CAPABILITIES

Each participating jurisdiction has a unique set of capabilities and resources available to accomplish hazard mitigation and reduce long-term vulnerabilities to hazard events. In order to identify these existing capabilities and resources, a Capability Assessment was conducted. The Capability Assessment helps determine the ability of the participating jurisdictions to implement the Mitigation Strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, program, or projects. It is important to try and establish which goals and actions are feasible based on an understanding of the organizational capacity of those entities tasked with their implementation. This assessment is designed to provide a general overview of the key capabilities in place for each participating jurisdiction along with their potential effect of loss reduction.

In order to catalog the existing capabilities of each participant, Capability Assessment Worksheets were distributed to each of the participating jurisdictions at the first Planning Committee meeting on December 7, 2021. The worksheets requested information on four primary types of capabilities: planning and regulatory; administrative and technical; financial; and education and outreach. The following provides a brief description of each capability type.

Planning & Regulatory Capabilities: Planning and regulatory capabilities are based on the implementation of existing plans, policies, codes, ordinances, resolutions, local laws, and programs that prevent or reduce the impacts of hazards and guide and manage growth and development.

Administrative & Technical Capabilities: Administrative and technical capabilities are based on the available staff and personnel resources as well as their related skills and tools that can be used to develop and implement mitigation actions, policies, and programs.

Financial Capabilities: Financial capabilities include those resources a jurisdiction has access to or is eligible to use to implement mitigation actions, polices, and programs.

Education & Outreach Capabilities: Education and outreach capabilities include programs and methods already in place that could be used to support implementation of mitigation actions and communicate hazard-related information.

Figures PP-3 through **PP-10** summarize the results of the Capability Assessment by participating jurisdiction type (i.e., county/municipalities, schools, fire protection districts, townships, healthcare facilities, etc.) A capability level of “Limited”, “Moderate” or “High” was assigned by capability type to each participating jurisdiction based on the number of available capabilities and resources as well as the jurisdiction’s size/area served. **Figure PP-11** summarizes the individual capability levels by capability type and provides an overall capability ranking for each participant.

This assessment provides a consolidated inventory of existing plans, ordinances, programs, and resources in place. Whenever applicable, these existing capabilities were reviewed and incorporated into the Plan.

Highlights from the Capability Assessment include:

- Only the County and Neoga have comprehensive/master plans in place.
- Only Neoga has building codes and a zoning ordinance in place.
- Only the County has a continuity of operations plan in place.

Neoga, Neoga FPD, Sigel FPD, and Toledo FPD are fortunate to have the resources and abilities to potentially expand on and improve the existing policies and programs identified. The County and a majority of the participating municipalities have limited resources and abilities to expand on and improve the existing policies and programs identified. The lack of legal authority and policies/programs currently in place, especially with regards to building codes and zoning ordinances, hamper these participants’ abilities to expand and strengthen existing policies and programs.

This is due to a general resistance from many residents towards these types of regulations, which has resulted in an unwillingness by local officials to implement such policies. Their fiscal and staffing situations are also extremely limited, bordering on inadequate in most cases. These local government officials are part-time and lack the technical expertise and funds to expand or implement new programs and policies.

Overcoming these limitations will require time and a range of actions including, but not limited to improved general awareness of natural hazards and the potential benefits that may come from the development of new standards in terms of hazard loss prevention and the identification of resources available to expand and improve existing policies and programs should the opportunity arise.

Figure PP-3
County / Municipalities – Planning & Regulatory Capabilities

Capability Type	Cumberland County	Greenup	Neoga	Toledo
Plans, Policies, Codes & Ordinances				
Comprehensive/Master Land Use Plan	X		X	
Continuity of Operations Plan	X			
Stormwater Management Plan				
Transportation Plan				
Economic Development Plan				
Emergency Operations Plan	X		X	X
Disaster Recovery Plan	X		X	
Threat & Hazard Identification Risk Assessment (THIRA) - County Only	X			
Infrastructure Maps		X	X	
Building Codes			X	
Floodplain Ordinance	X	X	X	
Stormwater Ordinance			X	
Zoning Ordinance			X	
Subdivision Ordinance		X	X	X
Historic Preservation Ordinance				
Private Sewage Disposal System Ordinance - County Only				
Manufactured/Mobile Home Tie Down Ordinance		X		
National Incident Management System (NIMS) Adoption	X	X	X	
National Flood Insurance Program (NFIP) Participation	X	X	X	
Community Rating System (CRS) Participation				
Level of Capability	**M**	**L**	**M**	**L**

An "X" indicates that the item is currently in place and being implemented.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-4
County / Municipalities – Administrative & Technical

Capability Type	**County/Municipality**			
	Cumberland County	Greenup	Neoga	Toledo
Adminstrative & Technical				
Zoning Board			X	
Public Utility Board				
Planning Commission				
Mutual Aid Agreements	X	X	X	X
Administrator/Manager	X		X	
Building Inspector/Officer			X	
Community/Economic Development Planner				
Emergency Manager	X		X	
Engineer/Construction Project Manager	X		X	X
GIS Coordinator				
Grant Administrator/Writer			X	
Fire Chief - Municipalities Only				
Floodplain Administrator			X	
Police Chief - Municipalities Only		X	X	X
Public Works/Streets Director - Municipalities Only		X	X	X
Water Superintendent - Municipalities Only		X	X	X
Zoning Officer/Administrator				
Solid Waste Director - County Only				
Level of Capability	**L**	**L**	**M**	**L**

An "X" indicates the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-5
County / Municipalities – Financial / Education & Outreach Capabilities

Capability Type	County/Municipality			
	Cumberland County	Greenup	Neoga	Toledo
Financial				
Roadway/Bridge Improvement Plan - County Only	X			
Capital Improvements Program			X	
Tax Levies for Special Purposes	X	X	X	
Motor Fuel Tax	X	X	X	X
General Obligation Bonds and/or Special Tax Bonds	X	X		
Utility Fees (Stormwater, Sewer, Water, Gas or Electric Service)		X	X	
Impact Fees - New Development				
Federal Funding Programs (Non-FEMA)	X	X	X	X
Level of Capability	**M**	**M**	**M**	**L**
Education & Outreach				
StormReady Certification				
Natural Disaster/Safety-Related School Programs	X			
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	X			
Seasonal Outreach	X			
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)				
Public-Private Partnership Initiatives Addressing Disaster-Related Issues	X			
Level of Capability	**M**	**L**	**L**	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-6
Schools – Planning & Regulatory /
Administrative & Technical Capabilities

Capability Type	**School District**	
	Cumberland CUSD #77	Neoga CUSD #3
Plans & Policies		
Comprehensive/Master Facilities Plan		
Continuity of Operations Plan		
Strategic Plan		
Emergency/Crisis Response Plan		X
National Incident Management System (NIMS) Adoption		
Level of Capability	**L**	**L**

Adminstrative & Technical		
Board of Education	X	X
Mutual Aid Agreements		X
Superintendent / President	X	X
Principal(s)	X	X
Chief Financial Officer/Finance Director	X	X
Food Services Supervisor	X	X
Grant Writer		
Health Care Supervisor	X	X
IT Director/Specialist	X	X
Maintenance Manager	X	X
Communications Director		
Operations Manager		
Safety & Security Director		
Transportation Director	X	X
Level of Capability	**M**	**M**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-7
Schools – Financial / Education & Outreach Capabilities

Capability Type	School District	
	Cumberland CUSD #77	Neoga CUSD #3
Financial		
Capital Improvements Program		
Tax Levies for Special Purposes	X	X
General Obligation Bonds and/or Special Tax Bonds	X	
Federal Funding Programs (Non-FEMA)	X	X
Level of Capability	**M**	**M**

Education & Outreach		
StormReady Certification		
Natural Disaster/Safety-Related School Programs		
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)		X
Seasonal Outreach		
Public-Private Partnership Initiatives Addressing Disaster-Related Issues		
Level of Capability	**L**	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-8
Fire Protection Districts – Planning & Regulatory Capabilities

Capability Type	Fire Protection District		
	Neoga FPD	Sigel FPD	Toledo FPD
Plans, Policies, Codes, Ordinances, Resolutions, & Technical Documents			
Standard Operating Procedures/Guidelines for Structural Fire Fighting (NFPA 1700)	X		X
Standard Operating Procedures for Operations at Technical Search & Rescue Incidents (NFPA 1670)			X
Pre-Incident Planning (NFPA 1620)		X	X
Fire Prevention Codes	X		
Burn Ordinance			
National Incident Management System (NIMS) Adoption	X	X	X
Incident Command System (ICS) Adoption	X	X	X
Building Inspections			
Tier II Reports		X	X
County Emergency Operations Plan	X	X	X
Safety Data Sheets	X	X	X
Pipeline Maps	X	X	X
Hazardous Materials Facilities Maps	X	X	X
Water Supply Systems Maps	X	X	X
Impassable Roads & Bridges Maps	X	X	
Evacuation Zones Maps			X
Community & Special Residential Areas Maps (i.e., manufactured home parks, subdivisions, recreational communities)	X		X
Level of Capability	**M**	**M**	**H**

An "X" indicates that the item is currently in place and being implemented.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-9
Fire Protection Districts –
Administrative & Technical Capabilities

Capability Type	**Fire Protection District**		
	Neoga FPD	Sigel FPD	Toledo FPD
Adminstrative & Technical			
Board of Trustees	X	X	X
Board of Fire Commissioners			X
Mutual Aid Box Alarm System (MABAS)	X	X	X
Mutual Aid Agreements	X	X	X
Hazardous Materials Response Team			
Water Rescue/Dive Team			
Technical Rescue Team			
Fire Chief	X	X	X
Deputy Fire Chief			X
Administrative Assistant			
Financial/Business Manager			
Inspector			
Public Education Director/Officer	X		X
Telecom Director			X
Training Coordinator	X	X	X
Level of Capability	**M**	**L**	**M**

An "X" indicates the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-10
Fire Protection Districts –
Financial / Education & Outreach Capabilities

Capability Type	**Fire Protection District**		
	Neoga FPD	Sigel FPD	Toledo FPD
Financial			
Capital Improvements Program	X		X
Tax Levies for Special Purposes	X	X	X
General Obligation Bonds and/or Special Tax Bonds	X	X	X
Federal Funding Programs (Non-FEMA)	X	X	X
Level of Capability	**H**	**M**	**H**
Education & Outreach			
Natural Disaster/Safety-Related School Programs	X	X	X
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness,	X	X	X
Seasonal Outreach	X	X	X
Public-Private Partnership Initiatives Addressing Disaster-Related Issues		X	X
Level of Capability	**M**	**H**	**H**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-11
Capability Rankings by Participating Jurisdiction

Capability Type	County/Municipality				Schools District		Fire Protection Districts		
	Cumberland County	Greenup	Neoga	Toledo	Cumberland CUSD #77	Neoga CUSD #3	Neoga FPD	Sigel FPD	Toledo FPD
Planning & Regulatory	M	L	M	L	L	L	M	M	H
Administrative & Technical	L	L	M	L	M	M	M	L	M
Financial	M	M	M	L	M	M	H	M	H
Education & Outreach	M	L	L	L	L	L	M	H	H
Overall Capability	**L/M**	**L**	**M**	**L**	**L/M**	**L/M**	**M/H**	**M/H**	**M/H**

Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

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 and man-made hazards. This section summarizes the results of the risk assessment conducted on the natural and man-made hazards in Cumberland County. The information contained in this section was gathered by evaluating local, state, and federal records from the last 20 to 70 years.

This risk assessment identifies the natural and man-made hazards deemed most important to the Planning Committee and includes a profile of each hazard that identifies past occurrences, the severity or extent of the events, and the likelihood of future occurrences. It also provides a vulnerability analysis that 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.

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 County. Each natural hazard section contains three subsections: hazard identification, hazard profile, and hazard vulnerability.

Hazard Selection
One of the responsibilities of the Planning Committee was to review the natural and man-made hazards detailed in the original Plan and decide if additional hazards should be included in the Plan update. Over the course of the first two meetings, the Planning Committee members discussed their experiences with natural and man-made hazard events and reviewed information on various hazards. After discussing the information provided, the Planning Committee chose not to add any additional natural hazards (i.e., landslides, etc.) to this Plan update.

The following identifies the hazards included in the Plan update:

- severe storms (thunderstorms, hail, lighting & heavy rain)
- excessive heat
- severe winter storms (snow & ice)
- floods
- extreme cold
- tornadoes
- drought
- earthquakes
- man-made hazards including:
  - hazardous substances (generation, transportation & storage/handling)
  - waste disposal
  - hazardous materials incidents
  - waste remediation
  - terrorism

The Planning Committee chose not to include the following hazards in the Plan: landslides, land/mine subsidence, wildfires, levee failures, and dam failures. A review of the USGS Landslide Inventory did not identify any landslide events within the County and only two man-induced events were identified in the Illinois State Geological Survey's (ISGS) Landslide Inventory of Illinois from the 1930s and 1950s. Discussions with the Planning Committee did not reveal any recent occurrences of landslides.

In Illinois land subsidence general occurs in areas where mining has been conducted. According to ISGS's ILMINES mapper, there are only two small underground mines located south of Neoga in unincorporated Cumberland County. Karst refers to landforms underlain by limestone that has been dissolved, producing characteristic landscapes such as sinkholes. Mapping prepared by the ISGS shows no karst geologic characteristics present in Cumberland County.

It was decided for the Plan update that wildfires would not be included due to their limited impact on the people and infrastructure within the County. Historical data indicates that wildfires have been virtually non-existent in the area. According to the U.S. Army Corps of Engineers' National Levee Database there are no levees located within the County.

A review of the U.S. Army Corps of Engineers' National Inventory of Dams identified four classified dams located in Cumberland County. Of those four dams, one has a hazard potential classification of "High", one has a hazard potential classification of "Significant" and the two remaining dams have a hazard potential classification of "Low". Based on information available from the National Inventory of Dams and a visual inspection, these dams do not have reservoirs with immense storage capacities and are not located in densely populated areas. According to the Stanford University's National Performance of Dams Incident Database, there are no known recorded dam failures associated with these dams and discussions with the Cumberland County EMA Coordinator did not identify any major concerns.

While the Diepholz Pond Dam has a hazard potential classification of "High" according to the National Inventory of Dams, the entire pond covers approximately 2.5 acres, has a dam height of 20 feet, and a maximum storage capacity of 65 acre-feet, which makes it a "Small" size classification dam. Based on the topographic relief of the area, water from a dam failure at Diepholz Pond Dam will likely flow west-southwest along an unnamed tributary of the Embarras River, staying south of the CSX railroad tracks, and potentially impacting two to three residential structures. Given that most of the properties downstream of the dam have been built up and the area around the tributary is primarily agricultural land where the water could spread out quickly, the impacts from a potential dam failure are considered to be limited and not likely to cause any loss of life. If the appropriate studies were conducted to determine the accurate hazard potential classification of this dam, it would not likely have a "High" classification.

Based on the information provided, the Committee did not consider these hazards warranted inclusion in the Plan update.

Risk Priority Index

After reviewing the preliminary results of the risk assessment at the second meeting, Planning Committee members and the participating jurisdictions were asked to complete a Risk Priority

Index (RPI) exercise for the hazards that have the potential to impact the County and participating jurisdictions. The RPI provides quantitative guidance for ranking the hazards and offers participants with another tool to determine which hazards present the highest risk and therefore which ones to focus on when formulating mitigation actions.

Each hazard was scored on three categories: 1) frequency, 2) impacts on life and health, and 3) impacts on property and infrastructure. A scoring system was developed that assigned specific factors to values of High, Moderate, or Low for each category. For those hazards that were not applicable to a particular jurisdiction, a value of "NA" was assigned to each category. The assigned values were then given a point ranking of 3 (High), 2 (Moderate), or 1 (Low). The higher the point value, the greater the risk associated with that hazard. **Figure R-1**, located at the end of this section, identifies the factors and values/point values associated with each category. Participants were asked to score the selected hazards based on the perspective of the entity they represented on the Planning Committee.

The Consultant took the point values assigned to each category and averaged the remaining results and came up with an overall value for each category. The values for each category were then added together to calculate an RPI score for each hazard. A ranking was then assigned to each hazard based on the RPI score. **Figure R-2**, located at the end of this section, provides the hazard rankings for the participating jurisdictions.

Figure R-3 provides a side-by-side comparison of how the hazards ranked between the RPI exercise conducted for the original Plan in 2014 and the exercise conducted for the Plan update for each of the original participants. RPIs were not generated in 2014 for any of the fire protection districts. The top hazard for the County in 2014 was tornadoes, followed by thunderstorms with damaging winds, hail, and lightning. In 2022, the top hazards were tornadoes, thunderstorms with damaging winds, and transportation hazmat incidents.

FEMA's National Risk Index

The National Risk Index (NRI) is an online mapping and data-based interface that helps illustrate a community's risk to 18 identified natural hazards. The natural hazards identified by the NRI and included in this Plan are: cold wave, drought, earthquake, hail, heat wave, ice storm, lightning, riverine flooding, strong wind, tornado, and winter weather. The NRI leverages available source data for natural hazard and community risk facts, such as social vulnerability and community resilience, to develop a baseline relative risk measurement for each county and census tract in the U.S. The goal is to help individuals better understand the natural hazard risk of their communities.

In the NRI, risk is defined as the potential for negative impacts as a result of a natural hazard. The risk equation behind the NRI includes three components: a natural hazards component (expected annual loss), a consequence enhancing component (social vulnerability), and a consequence reduction component (community resilience). Social vulnerability represents the susceptibility of social groups to the adverse impacts of natural hazards. Community resilience represents the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

The scores and ratings generated by the NRI describe a county's or census tract's relative position among all other U.S. counties and census tracts for a given component. Scores can range from 0 (the lowest possible value) to 100 (the highest possible value). For every score there is assigned one of five qualitative ratings: "Very Low", "Relatively Low", "Relatively Moderate", "Relatively High", and "Very High." Because all ratings are relative, there are no specific numeric values that determine the rating.

In order to provide the participating jurisdictions and public with additional information on the natural hazards included in the Plan, **Figure R-4** located at the end of this section, presents the overall NRI scores and ratings for each census tract as well as for the County and State as a whole. The NRI currently uses 2010 census tract information. In 2010, there were three census tracts in Cumberland County. All of the census tracts have a Risk Index rating of "Relatively Moderate". Two census tracts have a Social Vulnerability rating of "Relatively Moderate", while one census tract has a rating of "Relatively Low".

Figure R-5, located at the end of this section, provides the NRI scores and ratings by hazard type for each census tract as well as the County. Hazard ratings of "Relatively High" and "Very High" are highlighted in yellow by census tract. The hazards with the highest relative rating include severe storms, severe winter storms, and excessive heat.

Critical Facilities & Infrastructure

Critical facilities and infrastructure are structures, institutions, and systems that are critical for life safety and economic viability and necessary for a community's response to and recovery from emergencies. The loss of function of any of these assets can intensify the severity of the impacts and speed of recovery associated a hazard event. Critical facilities and infrastructure may include, but are not limited to, the following:

- **Essential Facilities**: Facilities essential to the health and welfare of the whole population including hospitals and other medical facilities, police and fire stations, emergency operations centers, evacuation shelters, and schools.
- **Government Facilities**: Facilities associated with the continued operations of government services such as courthouses, city/village halls, township buildings, and highway/maintenance centers.
- **Infrastructure Systems**: Infrastructure associated with drinking water, wastewater, transportation (roads, railways, waterways), communication systems, electric power, natural gas and oil.
- **Housing Facilities**: Facilities that serve populations that have access and function needs such as nursing homes, skilled and memory care facilities, residential group homes, and day care centers.
- **High Potential Loss Facilities**: Facilities that would have an impact or high loss associated with them if their functionality is compromised such as nuclear power plants, dams, levees, military installations and facilities housing industrial or hazardous materials.
- **Gathering Places**: Facilities such as parks, libraries, community centers, and churches.

As part of the planning process each participating jurisdiction completed a questionnaire identifying the critical facilities and infrastructure located within their jurisdiction, both publicly and privately-owned. **Figure R-6**, located at the end of this section, identifies the number of critical facilities and infrastructure located in each participating jurisdiction for select categories. Identifying these assets makes local leaders more aware of the critical facilities and infrastructure located within their jurisdictions and helps them make informed choices on how to better protect these key resources.

While considered a “local government entity” for planning purposes, Cumberland County Community Unit School District (CUSD) #77, Neoga CUSD #3, Neoga Fire Protection District (FPD), Toledo FPD, and Sigel FPD do not have an extensive inventory of assets to consider when conducting the risk assessment.

Since the assets for these local government entities, with the exception of Sigel FPD, are located within a participating municipality and are a subset of these municipalities’ critical facilities, their risk is considered to be the same or similar to the risk experienced by the municipalities for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.). For those hazards where the risk to the CUSD, FPDs and medical center varies from the risk facing the municipalities, a separate narrative assessment will be provided under the appropriate hazard’s vulnerability subsection.

While the Sigel FPD covers a portion of Cumberland County, its critical facilities are located in the Village of Sigel in Shelby County. Sigel’s risk is considered to be the same or similar to the risk experienced by the participating municipalities and the County for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.) For those hazards where the risk to FPD critical facilities varies from the risk facing the planning area (i.e., the County), a separate narrative assessment will be provided under the appropriate hazard’s vulnerability subsection. For a detailed analysis of Sigel’s risk, see the 2017 Shelby County Multi-Hazard Mitigation Plan.

Critical Facilities Vulnerability Survey

The participating jurisdictions were also asked to complete a Critical Facilities Vulnerability Survey at the third meeting to assist in the preparation of an overall summary of each jurisdiction’s vulnerability to the studied hazards. The Survey asked participants to describe their jurisdiction’s greatest vulnerability. This information is summarized under the appropriate hazard’s vulnerability subsection.

Figure R-1
Risk Priority Index Scoring System

Category	Factors	Value	Point Value
Hazard Frequency	An event is likely to occur in the next 1 to 3 years.	High	3
	An event is possible in the next 3 to 10 years.	Moderate	2
	An event is unlikely to occur within the next 10 years.	Low	1
Impacts on Life & Health	While fatalities are unlikely, injuries, some requiring hospitalization, may occur during the event.	High	3
	Minor injuries not requiring hospitalization may occur during the event.	Moderate	2
	Injuries or fatalities are unlikely to occur during the event.	Low	1
Impacts on Property & Infrastructure	- Substantial property damage is likely to occur including damage to infrastructure and critical facilities. AND/OR - Loss of access/operations at infrastructure and critical facilities (i.e., road & school closures, loss of power to drinking water/wastewater treatment facilities, municipal buildings, etc.) is anticipated for a period of time (i.e., a day or more).	High	3
	- Some minor property damage is anticipated (i.e., shingles & siding torn off homes, windows broken, etc.) but no significant damage to infrastructure or critical facilities is anticipated. AND/OR - Loss of access/operations to infrastructure and critical facilities is anticipated but only for a short period of time (i.e., up to a couple hours).	Moderate	2
	- Property damage is likely to be negligible and no loss of access/operations is anticipated at any infrastructure/critical facilities during the event.	Low	1

Figure R-2
Risk Priority Index Hazard Ranking by Participating Jurisdiction

Hazard	Hazard Ranking by Participating Jurisdiction								
	Cumberland County	Greenup	Neoga	Toledo	Cumberland CUSD #77	Neoga CUSD #3	Neoga FPD	Sigel FPD	Toledo FPD
Drought	9/10	3/4/5/6/7	13/14	4/5/6/7/8/9	5/6/7/8	6/7/8/9	6/7/8/9/10	13/14	4/5/6/7/8/9/10
Earthquakes	11/12	11/12/13	**1/2**	12/13/14	9/10/11/12	13	14	5/6/7	13/14
Excessive Heat	9/10	11/12/13	13/14	4/5/6/7/8/9	13	4/5	11/12	8/9/10/11	4/5/6/7/8/9/10
Extreme Cold	6/7	11/12/13	10/11/12	4/5/6/7/8/9	5/6/7/8	10/11	11/12	5/6/7	**1/2/3**
Floods	6/7	3/4/5/6/7	10/11/12	4/5/6/7/8/9	**1/2**	6/7/8/9	6/7/8/9/10	13/14	4/5/6/7/8/9/10
Hail	8	**1/2**	5/6/7/8/9	4/5/6/7/8/9	5/6/7/8	6/7/8/9	6/7/8/9/10	8/9/10/11	4/5/6/7/8/9/10
HazMat Incidents: Transportation	**1/2/3**	3/4/5/6/7	3	10/11	9/10/11/12	6/7/8/9	**1/2**	**1/2/3**	**1/2/3**
HazMat Incidents: Fixed Facility	13	8/9	**1/2**	12/13/14	9/10/11/12	12	6/7/8/9/10	**1/2/3**	11/12
Heavy Rain	4/5	3/4/5/6/7	5/6/7/8/9	10/11	3/4	4/5	6/7/8/9/10	12	4/5/6/7/8/9/10
Lightning	11/12	**1/2**	5/6/7/8/9	2/3	9/10/11/12	10/11	4/5	8/9/10/11	11/12
Terrorism	14	14	10/11/12	12/13/14	14	14	13	**1/2/3**	13/14
Thunderstorms w/ Damaging Winds	**1/2/3**	8/9	5/6/7/8/9	**1**	5/6/7/8	2/3	4/5	5/6/7	4/5/6/7/8/9/10
Tornadoes	**1/2/3**	10	4	2/3	**1/2**	2/3	3	4	4/5/6/7/8/9/10
Winter Storms	4/5	3/4/5/6/7	5/6/7/8/9	4/5/6/7/8/9	3/4	**1**	**1/2**	8/9/10/11	**1/2/3**

Figure R-3
Comparison of 2014 & 2022 Risk Priority Index Hazard Rankings by Participating Jurisdiction

Hazard	Hazard Ranking by Participating Jurisdiction											
	Cumberland County		Greenup		Neoga		Toledo		Cumberland CUSD #77		Neoga CUSD #3	
	2014	2022	2014	2022	2014	2022	2014	2022	2014	2022	2014	2022
Drought	5	9/10	5	3/4/5/6/7	4	13/14	6	4/5/6/7/8/9	5	5/6/7/8	5	6/7/8/9
Earthquakes	6	11/12	9	11/12/13	5	**1/2**	8	12/13/14	6	9/10/11/12	7	13
Excessive Heat	5	9/10	5	11/12/13	4	13/14	6	4/5/6/7/8/9	5	13	5	4/5
Extreme Cold	4	6/7	**1**	11/12/13	**1**	10/11/12	2	4/5/6/7/8/9	4	5/6/7/8	**1**	10/11
Floods	3	6/7	4	3/4/5/6/7	8	10/11/12	7	4/5/6/7/8/9	2	**1/2**	8	6/7/8/9
Hail	2	8	3	**1/2**	2	5/6/7/8/9	5	4/5/6/7/8/9	**1**	5/6/7/8	2	6/7/8/9
HazMat Incidents: Transportation	7	**1/2/3**	6	3/4/5/6/7	6	3	3	10/11	7	9/10/11/12	6	6/7/8/9
HazMat Incidents: Fixed Facility	8	13	7	8/9	7	**1/2**	**1**	12/13/14	8	9/10/11/12	4	12
Heavy Rain	n/a	4/5	n/a	3/4/5/6/7	n/a	5/6/7/8/9	n/a	10/11	n/a	3/4	n/a	4/5
Lightning	2	11/12	3	**1/2**	2	5/6/7/8/9	5	2/3	1	9/10/11/12	2	10/11
Terrorism	n/a	14	n/a	14	n/a	10/11/12	n/a	12/13/14	n/a	14	n/a	14
Thunderstorms w/ Damaging Winds	2	**1/2/3**	3	8/9	2	5/6/7/8/9	5	**1**	**1**	5/6/7/8	2	2/3
Tornadoes	**1**	**1/2/3**	2	10	3	4	4	2/3	3	**1/2**	3	2/3
Winter Storms	4	4/5	**1**	3/4/5/6/7	**1**	5/6/7/8/9	2	4/5/6/7/8/9	4	3/4	**1**	**1**

Figure R-4
National Risk Index Overall Scores/Ratings by Census Tract

Census Tract No.	Incorporated Municiplity Located in	Risk Index Score	Risk Index Rating	Social Vulnerability Score	Social Vulnerability Rating	Community Resilience Score	Community Resilience Rating
972400	Greenup	22.72	Relatively Moderate	33.95	Relatively Moderate	*	*
972500	Jewett, Toledo	20.59	Relatively Moderate	30.85	Relatively Low	*	*
972600	Neoga	22.82	Relatively Moderate	32.96	Relatively Moderate	*	*
Cumberland County	---	6.37	Very Low	32.48	Relatively Low	56.21	Relatively High
Illinois	---	9.87	---	35.15	---	56.70	---
National	---	10.60	---	38.35	---	54.59	---

* Community Resilience scores are only available at the county level.

Figure R-5
NRI Hazard Scores/Ratings by Hazard by Census Tract
(Sheet 1 of 2)

Census Tract No.	Incorporated Municiplity Located in Census Tract	Severe Storms						Severe Winter Storms			
		Hail Score	Hail Rating	Lightning Score	Lightning Rating	Strong Wind Score	Stong Wind Rating	Ice Storm Score	Ice Storm Rating	Winter Weather Score	Winter Weather Rating
972400	Greenup	16.79	RM	23.42	RM	43.82	VH	15.10	RL	21.62	RH
972500	Jewett, Toledo	14.73	RM	21.49	RM	40.16	RH	13.76	RL	19.60	RH
972600	Neoga	18.15	RM	25.88	RM	48.63	VH	16.60	RM	23.48	RH
Cumberland County	---	6.57	VL	6.24	VL	10.69	RL	5.63	VL	11.57	RL

Rating Abbreviations: NR = No Rating; VL = Very Low; RL = Relatively Low; RM = Relatively Moderate; RH = Relatively High; VH = Very High

Figure R-5
NRI Hazard Scores/Ratings by Hazard by Census Tract
(Sheet 2 of 2)

Census Tract No.	Incorporated Municiplity Located in Census Tract	Extreme Cold		Excessive Heat		Riverine Floods		Tornadoes		Drought		Earthquakes	
		Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating
972400	Greenup	19.76	RM	39.67	RH	15.41	RM	35.74	RM	15.70	RM	19.67	RM
972500	Jewett, Toledo	17.89	RM	36.50	RH	15.34	RM	31.90	RM	14.11	RM	17.31	RM
972600	Neoga	20.43	RH	42.83	RH	11.28	RL	38.81	RH	15.37	RM	18.12	RM
Cumberland County	---	13.87	RL	10.10	RM	5.11	VL	9.69	RL	11.12	VL	3.50	VL

Rating Abbreviations: NR = No Rating; VL = Very Low; RL = Relatively Low; RM = Relatively Moderate; RH = Relatively High; VH = Very High

Participating Jurisdiction	Critical Facilities				Critical Infrastructure						
	Government[1]	Emergency Protection[2]	Medical & Healthcare[3]	Schools	Drinking Water[4]	Wastewater Treatment[5]	Rail Lines	Bridges	Interstates US/State Routes & Key Roads	Power Plants	Comm. Systems
Cumberland County	15	8	6	---	5	---	3	---	9	---	8
Greenup	3	3	2	1	3	3	1	2	5	---	---
Neoga	3	2	3	2	1	1	1	---	3	---	---
Toledo	5	2	3	3	3	5	---	2	5	---	2
Cumberland CUSD #77	---	---	---	3	---	---	---	---	---	---	---
Neoga CUSD #3	---	---	---	3	---	---	---	---	---	---	1
Neoga FPD	3	2	3	2	1	1	1	1	4	1	---
Toledo FPD	5	2	3	3	3	5	---	2	5	---	2
Sigel FPD	2	1	---	1	3	---	1	---	2	---	1

Figure R-6
Critical Facilities & Infrastructure by Jurisdiction

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, libraries, etc.
[2] Emergency Protection includes: sheriff's department, police, fire, ambulance, emergency operations centers, jail/correctional facilities and evacuation shelters.
[3] Medical & Healthcare includes: public health departments, hospitals, urgent/prompt care and medical clinics, nursing homes, skilled nursing facilities, memory care facilities, residential group homes, etc.
[4] Drinking Water includes: drinking water treatment plants, drinking water wells, and water storage towers/tanks.
[5] Wastewater Treatment includes: wastewater treatment plants and lift stations.
--- Indicates the jurisdiction does not own/maintain any critical facilities within that category.

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 and heavy rain that may lead to flash flooding, the NWS does not use lightning/either to define a severe storm. However, a discussion of both lightning and heavy rain is included in this section because both are 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.

<u>Single-cell Thunderstorm</u>
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.

<u>Multi-cell Thunderstorm</u>
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.

<u>Squall Line</u>
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.

Supercell Thunderstorm

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 U.S., 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 SS-1** shows conversions from knots to miles per hour for various wind speeds.

Figure SS-1
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 U.S., 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. **Figure SS-2** provides descriptions for various hail sizes.

Figure SS-2
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.	teacup
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 SS-3** 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.).

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.

Figure SS-3
TORRO Hailstorm Intensity Scale

Intensity Category		Typical Hail Diameter		Description	Typical Damage Impacts
		millimeters (approx.)*	inches (approx.)*		
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 / teacup	severe damage to aircraft bodywork
H9	Super Hailstorms	75-100 mm	3.0” – 4.0”	teacup / 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.

Lightning on average causes 60 fatalities and 400 injuries annually in the U.S. 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 U.S. 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 Cumberland County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A severe thunderstorm watch is issued when severe thunderstorms 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 severe weather has been reported by spotters or indicated by radar. Warnings indicate imminent danger to life and property for those who are in the path of the storm and individuals should seek safe shelter.

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?

Tables 1, 2 and 3, located in **Appendix I,** summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in Cumberland County. Severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning, and heavy rain. In Cumberland County, severe storms are the most frequently occurring natural hazard.

Thunderstorms with Damaging Winds

NOAA's Storm Events Database was used to document 67 reported occurrences of thunderstorms with damaging winds in Cumberland County between 1984 and 2021. Of the 67 occurrences, 50 had reported wind speeds of 50 knots or greater. There were 17 occurrences, however, where the wind speed was not recorded. Included in the 67 thunderstorms with damaging winds events are four events that contributed to two separate federal disaster declarations for Cumberland County.

Severe Storms Fast Facts – Occurrences

Number of recorded Thunderstorms with Damaging Winds (1984 – 2021): ***67***

Number of recorded Severe Hail Events (1984 – 2021): ***20***

Number recorded of Lightning Strike Events (2000 – 2021): ***0***

Number of Heavy Rain Events (2000 – 2021): ***108***

Highest Recorded Wind Speed: ***72 knots (May 12, 1990)***

Largest Hail Recorded: ***2.5 inches (May 11, 2014)***

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

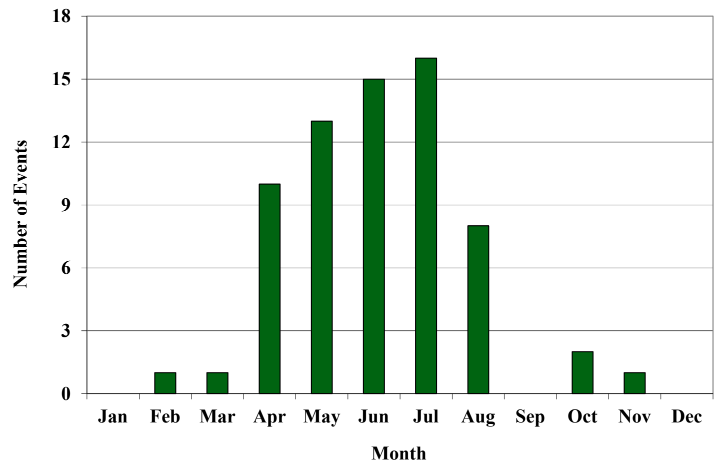
Most Likely Month for Severe Hail to Occur: ***April***

Most Likely Month for Heavy Rain to Occur: ***June***

The highest wind speed recorded in Cumberland County occurred in Toledo on May 12, 1990. when winds reached 72 knots (83 mph) during a thunderstorm event. Thunderstorms with damaging winds have been recorded in every participating jurisdiction within the County on multiple occasions.

Of the 67 events, 44 (66%) took place in May, June, and July making this the peak period for thunderstorms with damaging winds in Cumberland County. Of those 44 events, 16 (36%) occurred during July, making this the peak month for thunderstorms with damaging winds. Of the 67 occurrences, 69% of all thunderstorms with damaging winds occurred during the p.m. hours.

Figure SS-4
Thunderstorms with Damaging Winds by Month
1984 – 2021



Hail
NOAA's Storm Events Database was used to document 20 reported occurrences of severe storms with hail one (1) inch in diameter or greater in Cumberland County between 1984 and 2021. Of the 20 occurrences, seven produced hailstones 1.50 inches or larger in diameter.

The largest hail stones documented in Cumberland County measured 2.50 inches in diameter (tennis ball sized) and fell on May 11, 2014 in Greenup. Hail one (1) inch in diameter or greater has been recorded in every participating jurisdiction on at least one occasion.

Figure SS-5 charts the reported occurrences of hail by month. Of the 20 occurrences, 14 (70%) took place in April and May, making this the peak period for hail in Cumberland County. Of these 14 events, 8 (57%) occurred during April, making this the peak month for hail events. Seventeen (85%) of the 20 severe storms with hail occurred during the p.m. hours.

Lightning
While lightning strike events occur regularly across east-central Illinois, NOAA's Storm Events Database and Committee Member records identified no occurrences of lightning strikes with verified damages in Cumberland County. The data limitations are almost certainly due to the rural nature of the County.

According to data from Vaisala's National Lightning Detection Network, Cumberland County averaged from to 6 to 20 cloud-to-ground lightning flashes per square mile annually between 2009 and 2018. **Figure SS-6** illustrates the cloud-to-ground lightning flash density (number of cloud-to-ground flashes per square mile per year) by county for the continental U.S. In comparison, Illinois averaged 12.7 cloud-to-ground lightning flashes per square mile from 2009 to 2018, ranking it eighth in the Country for lightning flash density.

Figure SS-5
Hail Events by Month
1984 – 2021

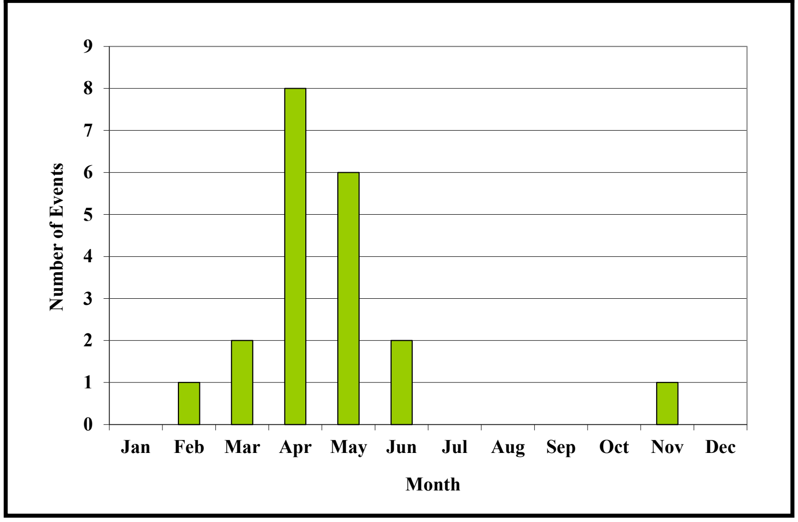
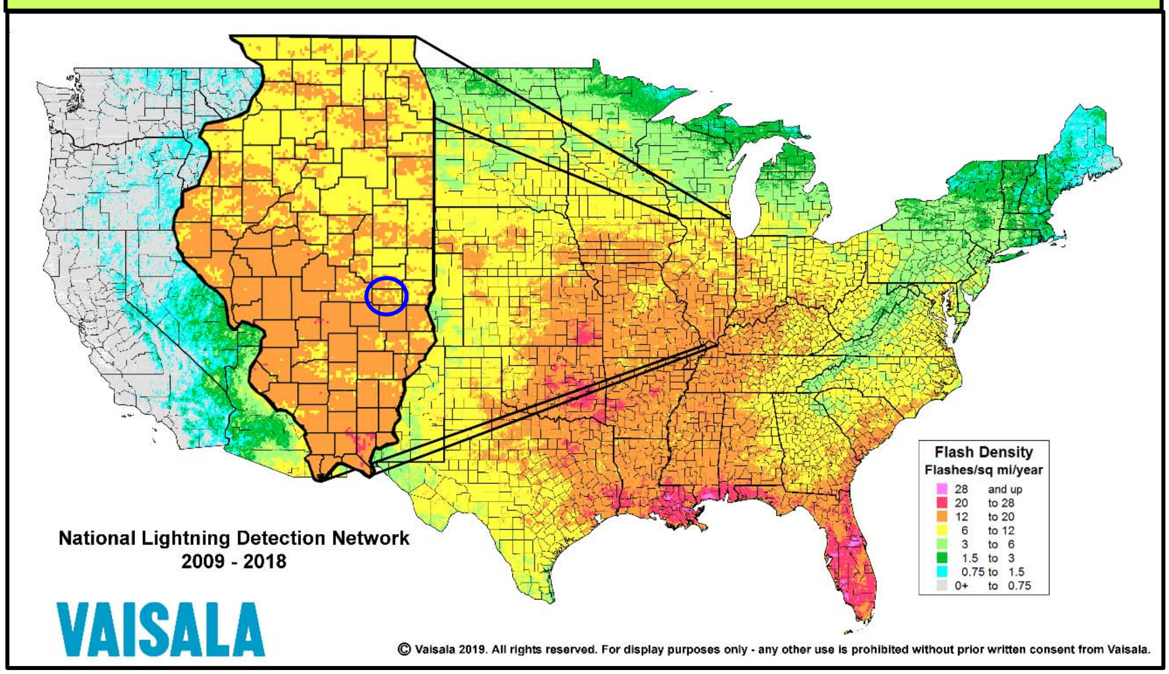


Figure SS-6
Cloud-to-Ground Lightning Flash Density: Continental U.S.

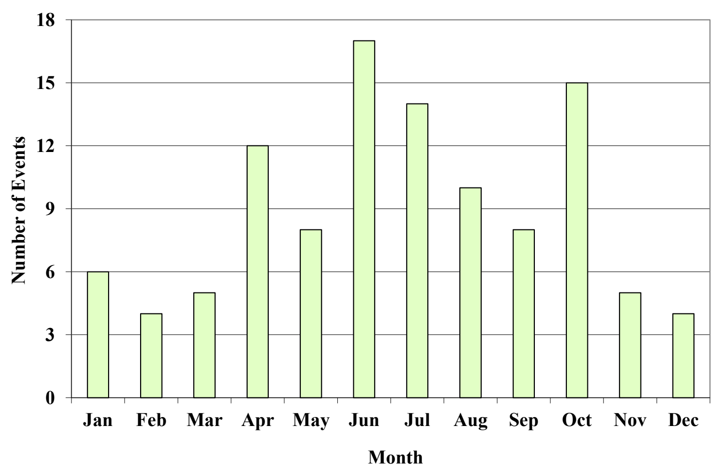


Heavy Rain

NOAA's Storm Events Database, Midwestern Regional Climate Center's cli-MATE database and National Weather Service's COOP data records were used to document 108 heavy rain events for Cumberland County between 2000 and 2021. Of the 108 occurrences, 20 events (19%) produced three inches or more of rain.

Figure SS-7 charts the reported occurrences of heavy rain by month. Of the 108 events, 41 (48%) took place in June, July, and August making this the peak period for heavy rain in Cumberland County. Of these 41 events, 17 (38%) occurred during June, making this the peak month for heavy rains. Of the heavy rain events with recorded start times, 78% began during the a.m. hours.

Figure SS-7
Heavy Rain Events by Month
2000 - 2021



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 2018 Illinois Natural Hazard Mitigation Plan prepared by the Illinois Emergency Management Agency (IEMA) classifies Cumberland County's hazard rating for severe storms as "High." (IEMA's overall hazard rating system has five levels: very low, low, medium, high, and severe.)

What is the probability of future severe storm events occurring?

Thunderstorms with Damaging Winds

Cumberland County has had 67 verified occurrences of thunderstorms with damaging winds between 1984 and 2021. With 67 occurrences over the past 38 years, Cumberland County would expect to experience at least one thunderstorm with damaging winds in any given year. There were 10 years over the last 38 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 26%.

Hail

There have been 20 verified occurrences of hail one (1) inch in diameter or greater between 1984 and 2021. With 20 occurrences over the past 38 years, the probability or likelihood that a severe storm with hail will occur in the County in any given year is 53%. There were five years over the last 38 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 13%.

Heavy Rain

Cumberland County has had 108 heavy rain events between 2000 and 2021. With 108 occurrences over the past 22 years, the County should expect to experience approximately five heavy rain events each 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 severe storms.

Are the participating jurisdictions vulnerable to severe storms?

Yes. All of Cumberland 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 north-central Illinois. Since 2012, Cumberland County has recorded 14 thunderstorms with damaging winds, five severe storms with hail one (1) inch in diameter or greater, and 48 verified heavy rain events.

Figure SS-8 details the number thunderstorms with damaging winds and hail events that were recorded in or near each participating municipality while **Figure SS-9** details the number of thunderstorms with damaging winds and hail events that were recorded in or near unincorporated areas of Cumberland County.

Figure SS-8
Verified Severe Storm Events by Participating Municipality

Participating Municipality	Number of Events	
	Thunderstorm & High Wind	Severe Hail
Greenup [a]	24	5
Neoga [1,b]	22	7
Toledo [2,a]	29	6

[1] Neoga FPD [2] Toledo FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

Figure SS-9
Verified Severe Storm Events in Unincorporated Cumberland County

Unincorporated Area	Number of Events	
	Thunderstorm & High Wind	Severe Hail
Hazel Dell	5	0
Lillyville[3]	1	0

[3] Sigel FPD

Of the participating municipalities, Toledo has had more recorded occurrences of thunderstorms with damaging winds while Neoga has had the greatest number of recorded severe storms with hail events than any of the other municipalities.

In terms of the number of thunderstorms with damaging winds and hail events that were recorded in or near Sigel in the Sigel FPD, there was one thunderstorm with damaging winds that occurred near the Village between 1984 and 2021.

Between 1984 and 2021, one thunderstorm with damaging winds event occurred near Sigel in Shelby County within the Sigel FPD. No hail events were recorded in or near Sigel during the same time period.

Do any of the participating jurisdictions consider severe storms to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considered severe storms to be among their jurisdiction's greatest vulnerabilities.

Cumberland County:

- During severe storms, high winds have the potential to down power lines impacting service to critical facilities and residents.
- Communication tower has been struck by lightning causing communication issues during emergencies.
- Heavy rains have caused localized flooding in areas of the County adversely impacting travel.
- Power outages caused by severe storms can cause food safety hazards and improper drinking water and sewage treatment. A power outage in Greenup last year caused both IGA and Dollar General to lose all cold held items.
- Services provided by the County Annex Courthouse are vulnerable to power outages caused by severe storms because it does not have a backup generator.

Cumberland CUSD #77:

- During heavy rain events the ditches surrounding the school and interior ditches can become inundated and create driving hazards.
- During heavy rain events the wastewater treatment plan experiences a heavy amount of inflow/infiltration creating the potential to discharge contaminated wastewater.

Greenup:

- During severe storms, high winds can down overhead electrical lines and cause power outages that affect critical facilities, communications, and services to residents.

Neoga:

- The City frequently experiences power outages, especially on one side of town, which impact critical facilities and services to residents.
- During thunderstorms with high winds, we often lose power at the Police Department, which affects our radio communication systems since they are not connected to a generator.
- Most power lines in the City are above ground and are vulnerable to severe storms.

Neoga CUSD #3:

- There is the potential for staff and students to sustain injury due to the effects of a severe storm with high winds.
- Severe storms have downed trees causing minor property damage to gutters and the roof.

Neoga FPD:
- ❖ The main road through Neoga, along with several local roads and highways, flood during heavy rain events, making travel difficult, especially for emergency responders.
- ❖ A lightning strike disabled one of our tornado sirens, and it is still currently down, which puts the public at increased risk.
- ❖ Schools, water towers, and emergency response facilities within the district are vulnerable to severe storms with high winds.

Toledo:
- ❖ Severe storms with high winds or lightning can cause power loss and disable the wastewater lift stations. The Villages' lift stations have been damaged by past lightning strikes.
- ❖ Severe storms with damaging winds can down powerlines interrupting service to critical facilities and residents.

Sigel FPD:
- ❖ Severe storms have downed power lines impacting service to residents.

What impacts resulted from the recorded severe storms?

Severe storms as a whole have caused an estimated $812,700 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 indicates that between 1984 and 2021, 31 of the 67 thunderstorms with damaging winds caused $612,700 in property damages. Damage information was either unavailable or none was recorded for the remaining 38 reported occurrences.

NOAA's Storm Events Database documented one injury as the result of a thunderstorm with damaging wind event. On June 18, 1998 high winds blew over a semi-trailer truck on Interstate 57 near Neoga. A passenger in the truck suffered minor injuries.

Hail

Data obtained from NOAA's Storm Events Database records indicates that between 1984 and 2021, one of the 20 hail events caused $200,000 in property damages. Damage information was either unavailable or none was recorded for the remaining 19 events.

Severe Storms Fast Facts – Impacts/Risk

Thunderstorms with Damaging Winds Impacts:
- ❖ Total Property Damage (31 events): ***$612,700***
- ❖ Total Crop Damage : ***n/a***
- ❖ Injuries (1 event): ***1***
- ❖ Fatalities: ***n/a***

Severe Hail Impacts:
- ❖ Total Property Damage (1 event): ***$200,000***
- ❖ Total Crop Damage : ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Lightning Strike Impacts:
- ❖ Total Property Damage: ***n/a***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Heavy Rain Impacts:
- ❖ Total Property Damage: ***n/a***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

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

No injuries or fatalities were reported as a result of any of the recorded hail events.

Lightning
No lightning strikes with verified damages were reported for Cumberland County.

Heavy Rain
Damage information was either unavailable or none was recorded for the 108 heavy rain events between 2000 and 2021. No injuries or fatalities were reported as a result of any of the heavy rain events.

What other impacts can result from severe storms?
In Cumberland 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 2015 through 2019 indicates that wet road surface conditions were present for 11.5% to 16.4% 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 SS-10** 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 SS-10
Severe Weather Crash Data for Cumberland County

Year	Total # of Crashes	Presence of Wet Road Surface Conditions		
		# of Crashes	# of Injuries	# of Fatalities
2015	297	46	11	0
2016	296	34	7	0
2017	314	38	7	2
2018	301	47	13	1
2019	318	52	15	1
Total:	**1,526**	**217**	**53**	**4**

Source: Illinois Department of Transportation.

What is the level of risk/vulnerability to public health and safety from severe storms?
For Cumberland 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. While there are no hospitals in Cumberland County, nearby hospitals in Mattoon (Coles County), Effingham (Effingham County), Shelbyville (Shelby County) and regional centers in Urbana (Champaign County) and Terre Haute, Indiana (Vigo 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 Cumberland County and the participating jurisdictions 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. Six of the participating jurisdictions acknowledged the need for emergency backup generators to allow continued operation of critical facilities such as county/municipal buildings, schools, and emergency services (police and fire).

According to the Critical Facilities Vulnerability Survey completed by the participants, the County has backup generators at the Courthouse, Health Department, Sheriff's Office/ Jail, and EOC. Both Greenup and Toledo have backup generators at their municipal buildings, while Neoga has a backup generator at its wastewater treatment facility and Toledo has a generator at its drinking water facility. Both Neoga and Toledo FPDs have backup generators at their fire stations.

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 Cumberland 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**.

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

Yes and No. While Neoga has 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 the two remaining participating municipalities 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 32 of the 195 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. However, according to the Cumberland County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $105,676,689. Since all of the structures in the planning area are vulnerable to damage, this total represents the countywide property exposure to severe storm events.

3.2 EXCESSIVE HEAT

HAZARD IDENTIFICATION

What is the definition of excessive heat?

Excessive heat is generally characterized by a prolonged period of summertime weather that is substantially hotter and more humid than the average for a location at that time of year. Excessive heat criteria typically shift by location and time of year. As a result, reliable fixed absolute criteria are not generally specified (i.e., a summer day with a maximum temperature of at least 90°F).

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 a leading cause of weather-related fatalities in the U.S. According to the Centers for Disease Control and Prevention, a total of 7,415 people died from heat-related illnesses between 1999 and 2010, an average of 618 fatalities a 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 EH-1** 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 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.

Figure EH-1
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.

- **Heat Rash.** Heat rash is a skin irritation caused by excessive sweating during hot, humid weather and is characterized by red clusters of small blisters on the skin. It usually occurs on the neck, chest, groin or in elbow creases.
- **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 and can significantly retard the skin's ability to shed excess heat.
- **Heat Cramps.** Heat cramps are characterized by heavy sweating and muscle pains or spasms, usually in the abdomen, arms or legs that during intense exercise. 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, muscle cramps, tiredness, weakness, dizziness, headache, nausea or vomiting and faintness. Breathing may become rapid and shallow and the pulse thready (weak). The skin may appear cool, moist and pale. If not treated, heat exhaustion may progress to heat stroke.
- **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 red, hot and dry with very little perspiration present. Other symptoms include a rapid and strong pulse, throbbing headache, dizziness, nausea and confusion. There is a possibility that the individual will become 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 EH-2 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 EH-2
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 Cumberland County.

- **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 within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 100°F or higher for at least two (2) days and the nighttime air temperatures will not drop below 75°F.
- **Warning.** An excessive heat warning is issued within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 105°F or higher for at least two (2) days and the nighttime air temperatures will not drop below 75°F.

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 Regional Excessive Heat Events Reported (1995 – 2021): ***103***
>
> Hottest Temperature Extrapolated for the County: ***111°F (July 15, 1936)***
>
> Most Likely Month for Excessive Heat Events to Occur: ***July***

Table 4, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of regional excessive heat events extrapolated for Cumberland County. NOAA's Storm Events Database, Iowa State University's National Weather Service Watch, Warning, and Advisories database, Midwestern Regional Climate Center's cli-MATE database, and NWS's COOP Data records were used to extrapolate 103 occurrences of excessive heat in Cumberland County between 1995 and 2021.

According to the Midwestern Regional Climate Center, temperature records were only kept intermittently from 2001 to 2003 at the Greenup COOP Observation Station in Cumberland County. As a result, temperature records from the Casey COOP Observation Station in Clark County, the Charleston COOP Observation Station in Coles County, and the Windsor COOP Observation Station in Shelby County were used to extrapolate excessive heat events in Cumberland County. Based on the available records, the hottest recorded temperatures from Casey, Charleston, and Windsor all occurred on July 15, 1936 and were between 110°F and 111°F.

Figure EH-3 charts the reported occurrences of excessive heat by month. Of the 103 events, 44 (43%) began or took place in July making this the peak month for excessive heat events in Cumberland County. There were seven events that spanned two months; however, for illustration purposes only the month the event started is graphed.

What locations are affected by excessive heat?

Excessive heat affects the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The 2018 Illinois Natural Hazard Mitigation Plan classifies Cumberland County's hazard rating for excessive heat as "medium."

Do any of the participating jurisdictions have designated cooling centers?

Yes. Five and the eight participating municipalities, school districts, and fire protection districts have designated cooling centers. A "designated" cooling center is identified as any facility that has been formally identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events.

Figure EH-3
Excessive Heat by Month
1995 – 2021

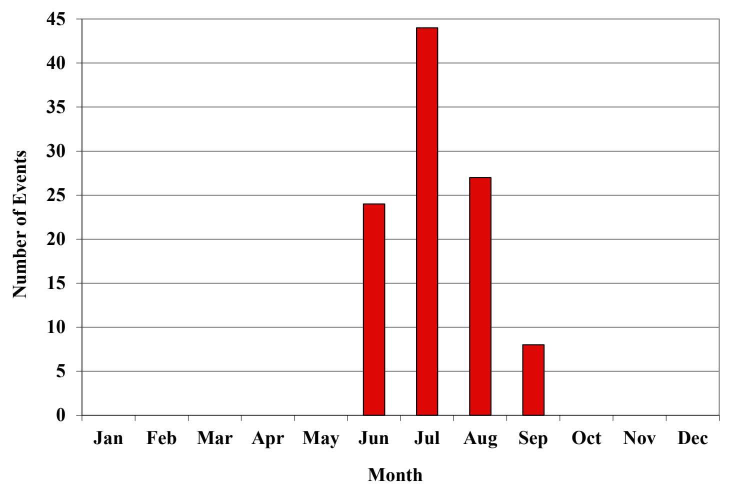


Figure EH-4 identifies the location of each cooling center by jurisdiction. At this time Cumberland CUSD #77, Neoga CUSD #3, Neoga FPD, and Sigel FPD do not have any cooling centers designated. In addition, there are no State of Illinois-designated cooling centers in Cumberland County.

Figure EH-4
Designated Cooling Centers by Participating Jurisdiction

Name/Address	Name/Address
Greenup	*Toledo & Toledo Fire Protection District*
Municipal Building, 115 E. Cumberland St.	Neal Center (YMCA), 130 Courthouse Square
Neoga	Toledo Christian Church, 501 S. Maryland St.
Community Center, 653 6th St.	Toledo Fire Protection District, 144 Courthouse Square
Grace United Methodist Church, 752 Walnut St.	Village Hall, 160 Courthouse Square

What is the probability of future excessive heat events occurring?

The region, including Cumberland County, has experienced 103 verified occurrences of excessive heat between 1995 and 2021. With 103 occurrences over the past 27 years, Cumberland County should expect to experience at least three excessive heat events a year. There were 21 years over the last 27 years where multiple (three or more) excessive heat events occurred. This indicates that the probability that multiple excessive heat events may occur during any given year within the County is 78%.

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 Cumberland County, including the participating jurisdictions, is vulnerable to the dangers presented by excessive heat. Since 2012, the County has experienced 42 excessive heat events.

Do any of the participating jurisdictions consider excessive heat to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered excessive heat to be among their community's greatest vulnerabilities.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded for any of the excessive heat events. No injuries or fatalities related to excessing heat events have been recorded. In comparison, Illinois averages 74 heat-related fatalities annually according to the Illinois State Water Survey's Climate Atlas of Illinois.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Impacts:

- Total Property Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities: ***n/a***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability:

- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

Although injuries or fatalities were not reported as a result of excessive heat events impacting Cumberland County, this does not mean they didn't occur; 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 all the 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 Cumberland County, excessive heat has the ability to impact Greenup and Toledo drinking water supplies as well as those residents in unincorporated Cumberland County who rely on shallow private wells for their drinking water.

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 Cumberland 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 fact that all but one of the participating municipalities have designated cooling centers and the County does not have many 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 75 years of age and older) and small children (those younger than 5 years of age) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure EH-5** identifies the percent of sensitive populations by participating municipality and the County based on the U.S. Census Bureau's 2016-2020 American Community Survey data.

Figure EH-5
Sensitive Populations by Participating Jurisdictions

Participating Jurisdiction	% of Population 75 year of age & Older	% of Population Younger than 5 years of age	Total % of Sensitive Population
Greenup	14.0%	6.2%	20.2%
Neoga	12.6%	8.3%	20.9%
Toledo	7.2%	8.0%	15.2%
Unincorp. Cumberland County	6.5%	5.4%	11.9%
Cumberland County	8.7%	6.3%	15.0%
State of Illinois	6.6%	5.9%	12.5%

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 jurisdictions 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 Cumberland 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 Cumberland County, there is the potential for this to occur. The potential may increase over the next two decades if new power sources 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 jurisdictions 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 extreme. 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.

3.3 SEVERE WINTER STORMS

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 snowstorms 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 Snowstorms.** Heavy snowstorms 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.

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 raindrops are “supercooled”, they instantly refreeze upon contact with anything that is at or below 32°F (i.e., the ground, trees, utility lines, etc.).

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 Cumberland County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** The following watches are issued in advance of a storm and indicate the potential for significant winter weather within the next day or two.
    - **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 at least 35 mph and
        - reduced visibility of ¼ mile or less.
- **Advisories.** Winter advisories are issued for winter weather events that pose a significant inconvenience, especially to motorist, but should not be life-threatening if caution is exercised. The following advisories are generally issued 12 to 36 hours prior to an event.
    - **Freezing Rain Advisory.** A freezing rain advisory is issued when ice accumulations of up to ¼ inch are expected.
    - **Winter Weather Advisory.** A winter weather advisory is issued for one or more of the following:
        - snow accumulations of 3 to 5 inches in 12 hours or less;
        - sleet accumulations up to ¼ inch;
        - freezing rain in combination with sleet and/or snow; or
        - blowing and/or drifting snow.
- **Warnings.** The following winter weather warnings are issued when severe winter weather conditions are expected to cause a significant impact to life or property and make travel difficult to impossible. Individuals are advised to avoid travel and stay indoors.
    - **Blizzard Warning.** A blizzard warning is issued when reduced visibility of less than ¼ mile due to falling and/or blowing snow and strong winds of at least 35 mph or greater are expected for at least three hours.
    - **Ice Storm Warning.** An ice storm warning is issued when ice accumulations of ¼ inch or greater are expected, resulting in hazardous travel conditions, tree damage and extended power outages.
    - **Winter Storm Warning.** A winter storm warning is issued when there is one or more of the following expected:
        - heavy snow accumulations of at least 6 inches in 12 hours or at least 8 inches in 24 hours; or
        - sleet accumulations of at least ½ inch.

HAZARD PROFILE

The following identifies past occurrences of severe winter 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 winter storms occurred previously? What is the extent of these previous severe winter storm?
Table 5, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) recorded in Cumberland County.

<u>Severe Winter Storms</u>

<u>Severe Winter Storm Fast Facts – Occurrences</u>

Number of Severe Winter Storm Events Reported (1950 -2021): ***84***
Maximum 24-Hour Snow Accumulation: ***13.0 inches (December 19, 1973)***
Most Likely Month for Severe Winter Storms to Occur: ***January***

NOAA's Storm Events Database, Midwestern Regional Climate Center's cli-MATE database, and NWS's COOP data records were used to document 84 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in Cumberland County between 1950 and 2021. Of the 84 recorded occurrences there were 68 heavy snowstorms or blizzards; 15 combination events (freezing rain, sleet, ice and/or snow); and one ice or sleet storm. Included in the 84 severe winter storms is one event that contributed to a major federal disaster declaration in Cumberland County.

Figure SWS-1 charts the reported occurrences of severe winter storms by month. Of the 84 events, 67 (80%) took place in in December, January, and February making this the peak period for severe winter storms. Of these 67 events, 36 (54%) 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. Of the winter storm events with recorded times, 54% began during the a.m. hours.

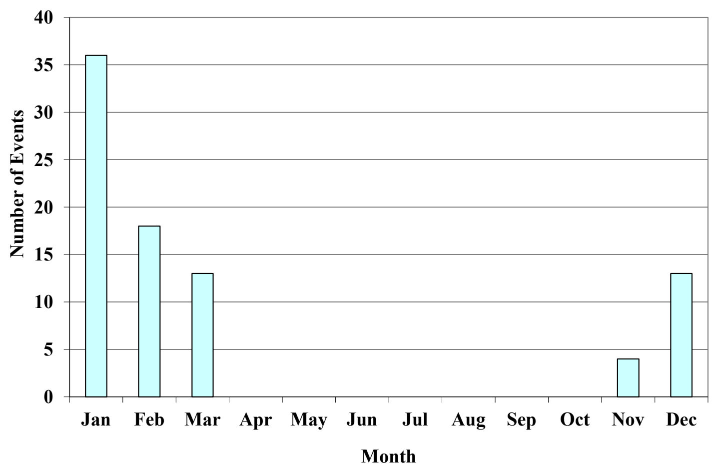
According to the NWS's COOP data records, the maximum 24-hour snow accumulation in Cumberland County is 13.0 inches, which occurred on December 19, 1973 at the Greenup COOP Observation Station.

What locations are affected by severe winter storms?
Severe winter storms affect the entire County. All communities in Cumberland County have been affected by severe winter storms. Severe winter storms generally extend across the entire County and affect multiple locations. The 2018 Illinois Natural Hazard Mitigation Plan prepared by IEMA classifies Cumberland County's hazard rating for severe winter storms as "severe."

What is the probability of future severe winter storms occurring?
Cumberland County has had 84 verified occurrences of severe winter storms between 1950 and 2021. With 84 occurrences over the past 72 years, Cumberland County should expect at least one severe winter storm in any given year. There were 23 years over the past 72 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 32%.

Figure SWS-1
Severe Winter Storms by Month
1950 – 2021



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.

Are the participating jurisdictions vulnerable to severe winter storms?

Yes. All of Cumberland County, including the participating jurisdictions, is vulnerable to the dangers presented by severe winter storms. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2012, Cumberland County has experienced 11 severe winter storms.

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, township, and municipalities must budget for snow removal and de-icing of roads and bridges as well as for roadway repairs.

Do Any of the participating jurisdictions consider severe winter storms to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considers severe winter storms to be among their community's greatest vulnerabilities.

<u>Cumberland County</u>:
- ❖ Severe winter storms have downed power lines impacting service to critical facilities and residents.
- ❖ Interstates 57 and 70 can become impassible due to severe winter storms stranding motorists.
- ❖ Power outages caused by severe winter storms can cause food safety hazards and improper drinking water and sewage treatment.

<u>Greenup</u>:
- ❖ During severe winter storms, ice and high winds can down overhead electrical lines and cause power outages that affect critical facilities, communications, and service to residents.

<u>Neoga:</u>
- ❖ With most power lines above ground, the City is vulnerable to power outages caused by ice storms, which can impact critical facilities and service to residents.

<u>Neoga CUSD #3</u>:
- ❖ Ice storms make the parking lot dangerous and impact access to the school and roads.

<u>Neoga FPD</u>:
- ❖ Interstate 57 and the state highways can become impassible due to ice storms isolating travelers and adversely impacting emergency responders.

<u>Sigel FPD</u>:
- ❖ Severe winter storms have downed power lines impacting service to residents.
- ❖ Roads and bridges covered with ice from severe winter storms cause accidents and impact emergency response times.

<u>Toledo</u>:
- ❖ Ice storms have the potential to down power lines, interrupting service to critical facilities and residents.

What impacts resulted from the recorded severe winter storms?

Data obtained from NOAA's Storm Events Database indicates that between 1950 and 2021, one of the 84 severe winter storms caused $1 million in property damages. Property damage information was either unavailable or none was recorded for the remaining 83 reported occurrences.

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

<u>Severe Winter Storm (Snow & Ice) Impacts:</u>
- ❖ Total Property Damage (1 event): ***$1,000,000***
- ❖ Injuries (1 event): ***4***
- ❖ Fatalities (2 events): ***2***

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

In comparison, the State of Illinois has averaged $102 million annually in winter storm losses according to the Illinois State Water Survey's Climate Atlas of Illinois, ranking winter storms second only to flooding in terms of economic loss in the State. 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.

NOAA's Storm Events Database reported two fatalities and four injuries as the result of three separate severe winter storm event events. All were associated with vehicular accidents on impaired roads.

What other impacts can result from severe winter storms?

In Cumberland 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 2015 through 2019 indicates that treacherous road conditions caused by snow/slush and ice were present for 2.9% to 13.5% of all crashes recorded annually in the County. **Figure SWS-2** 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 SWS-2
Severe Winter Weather Crash Data for Cumberland County

Year	Total # of Crashes	Presence of Treacherous Road Conditions caused by Snow/slush and Ice		
		# of Crashes	# of Injuries	# of Fatalities
2015	297	20	1	0
2016	296	40	7	1
2017	314	9	3	0
2018	301	14	2	0
2019	318	29	3	0
Total:	**1,526**	**112**	**16**	**1**

Source: Illinois Department of Transportation.

Persons who are outdoors during and immediately following severe winter storms 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?

While severe winter storms occur regularly in Cumberland 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?

Yes. All existing buildings, infrastructure, and critical facilities located in Cumberland County and the participating jurisdictions are vulnerable to damage from severe winter storms.

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 Cumberland 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.

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, township, 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.

Based on the frequency with which severe winter storms have occurred in Cumberland 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***.

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

Yes. While Neoga has 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 two remaining participating municipalities 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 the 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?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms. Since only one of the 84 recorded events listing property damage numbers for severe winter storms, it is difficult to accurately estimate future potential dollar losses. However, according to the Cumberland County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $105,676,689. Since all of the structures in the planning area are vulnerable to damage, this total represents the countywide property exposure to severe winter storms.

3.4 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 U.S. 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 the County?

There are two main types of flooding that affect Cumberland County: 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.

<u>General Flooding – Riverine Flooding</u>

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.

<u>General Flooding – Shallow Flooding</u>

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 roll boulders the size of cars. 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 U.S., 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.

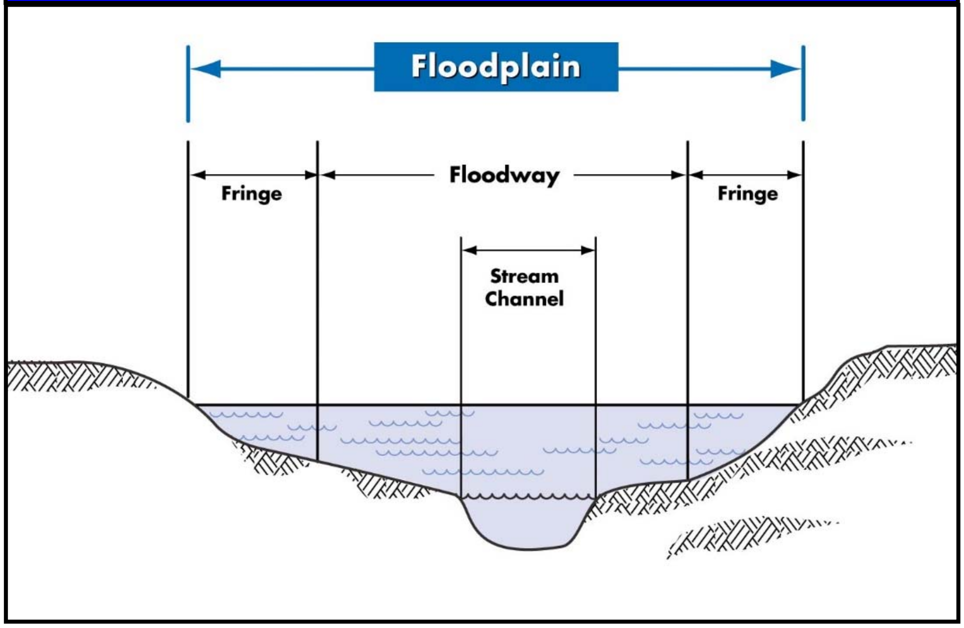
What is a floodplain?

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 F-1** illustrates the various components of a base floodplain.

Figure F-1
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.

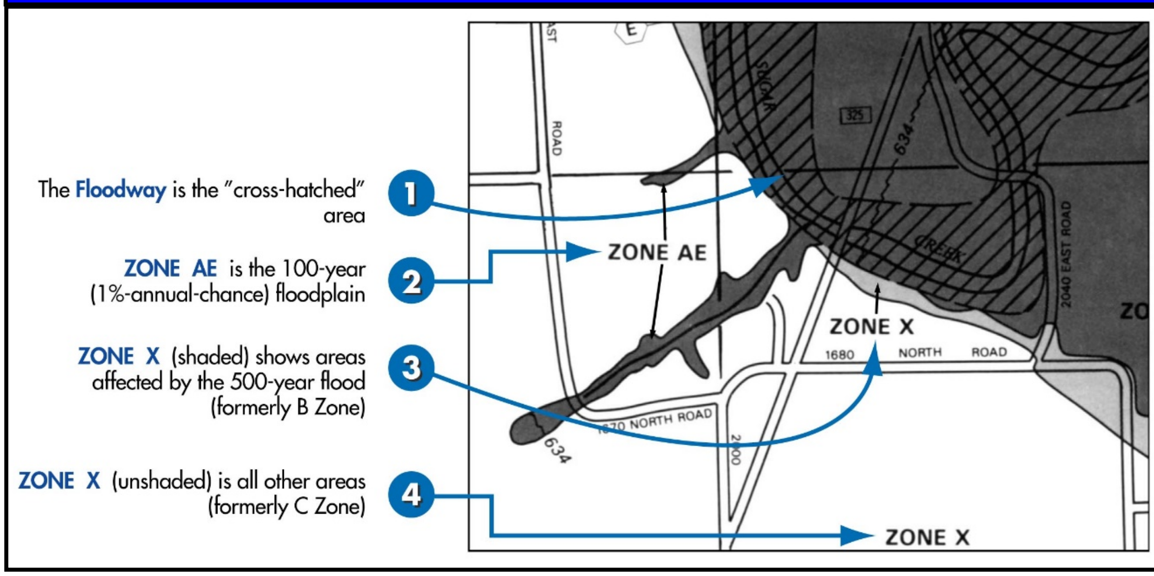
What is a Special Flood Hazard Area?

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 F-2** shows an example of a FIRM.

Figure F-2
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 considered high-risk flood areas.

During a 30-year period, the length of many mortgages, there is at least a 1 in 4 chance that flooding will occur in a SFHA. The purchase of flood insurance is mandatory for all buildings in SFHAs receiving federal or federally-related financial assistance.

- **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 about 2% of all NFIP policies, and account for approximately $9 billion in claims or approximately 16% of the total claims paid over the history of the Program. These structures not only increase the NFIP’s annual losses, but they also 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%. The discounts provide an incentive for communities to implement new flood protection activities that can help save lives and property when a flood occurs.

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 Cumberland County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Flood Watches.** A flood watch is issued when flooding or flash flooding is possible. It does not mean that flooding will occur, just that conditions are favorable. Individuals need to be prepared.
- **Flood Advisories.** A flood advisory is issued when flooding may cause significant inconvenience but is not expected to be to pose an immediate threat to life and/or property. Individuals need to be aware.
- **Warnings.** Warnings indicate a serious threat to life and/or property.
  - **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. Flash flooding occurs very quickly so individuals are advised to take action immediately.

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?

Tables 6 and **7**, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of flood events recorded in Cumberland County. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

<u>General Floods</u>

NOAA's Storm Events Database and Iowa State University's National Weather Service Watch, Warning, and Advisories database were used to document 20 occurrences of general flooding in Cumberland County between 2002 and 2021. Included in the 20 general flood events are three events that contributed to two major federal disaster declarations for Cumberland County. The County was also included in a major federal disaster declaration for flooding from June 1974.

Flash Floods

NOAA's Storm Events Database and Iowa State University's National Weather Service Watch, Warning, and Advisories database were used to document 51 reported occurrences of flash flooding in Cumberland County between 1996 and 2021. Included in the 51 flash flood events are three events that contributed to two federally-declared disasters in Cumberland County. Included in the 51 flash flood events are four events that contributed to three major federal disaster declarations for Cumberland County.

Flood Fast Facts – Occurrences

Number of General Floods Reported (2002 – 2021): ***20***

Number of Flash Floods Reported (1996 – 2021): ***51***

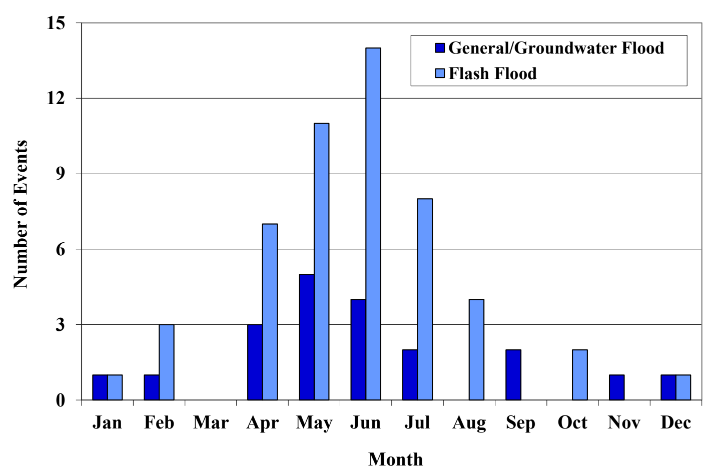
Most Likely Month for General Floods to Occur: ***May***

Most Likely Month for Flash Floods to Occur: ***June***

Number of Federal Disaster Declarations Related to General and Flash Flooding: ***4***

Figure F-3 charts the reported occurrences of flooding by month. Of the 20 general flood events, 12 (60%) began in April, May, and June making this the peak period for general flooding. Of those 12 events, five (42%) began during May making this the peak month for general flooding. There was one event that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

Figure F-3
Flood Events by Month



In comparison, 25 of the 51 flash flood events (49%) took place between May and June making this the peak period for flash floods. Of the 25 events, 14 (56%) occurred in June making this the peak month for flash flooding. Of the flash flood events with recorded times, 60% 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. In Cumberland County, approximately 7.7% of the area in County is designated as being within the base floodplain and susceptible to riverine floods. The 2018 Illinois Natural Hazard Mitigation Plan classifies Cumberland County's hazard rating for floods as "low."

Figure F-4 identifies the floodplains in Cumberland County as well as the participating jurisdictions. This map is based on the Cumberland County DFRIMs that became effective February 4, 2011. While a large portion of the area prone to riverine flooding is in unincorporated portions of the County, Greenup and Neoga are also susceptible to riverine flooding because of their proximity to floodplains. **Appendix J** contains maps identifying the floodplains located in each of the participating municipalities.

Figure F-5 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 F-5
Bodies of Water Subject to Flooding

Participating Jurisdiction	Water Bodies
Greenup	**Embarras River, Unnamed Tributary of the Embarras River**
Neoga	**Copperas Creek, Unnamed Tributaries of Copperas Creek**
Toledo	---
Unincorporated Cumberland County	**Bear Creek, Birch Creek,** Brush Creek, Buck Branch, **Bush Creek, Chilver Creek, Clear Creek, Copperas Creek, Cottonwood Creek, Crooked Creek,** Dicks Creek, **Embarras River,** Fulfer Branch, **Hurricane Creek, Long Point Creek, Lost Creek,** Miller Creek, **Muddy Creek**, **Mule Creek,** Opossum Creek, Otter Branch, **Panther Creek, Range Creek,** Second Salt Creek, **Spring Point Creek, Turkey Creek,** and **Webster Creek.**

Source: FEMA's DFIRMs.

Municipal, Township, 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?

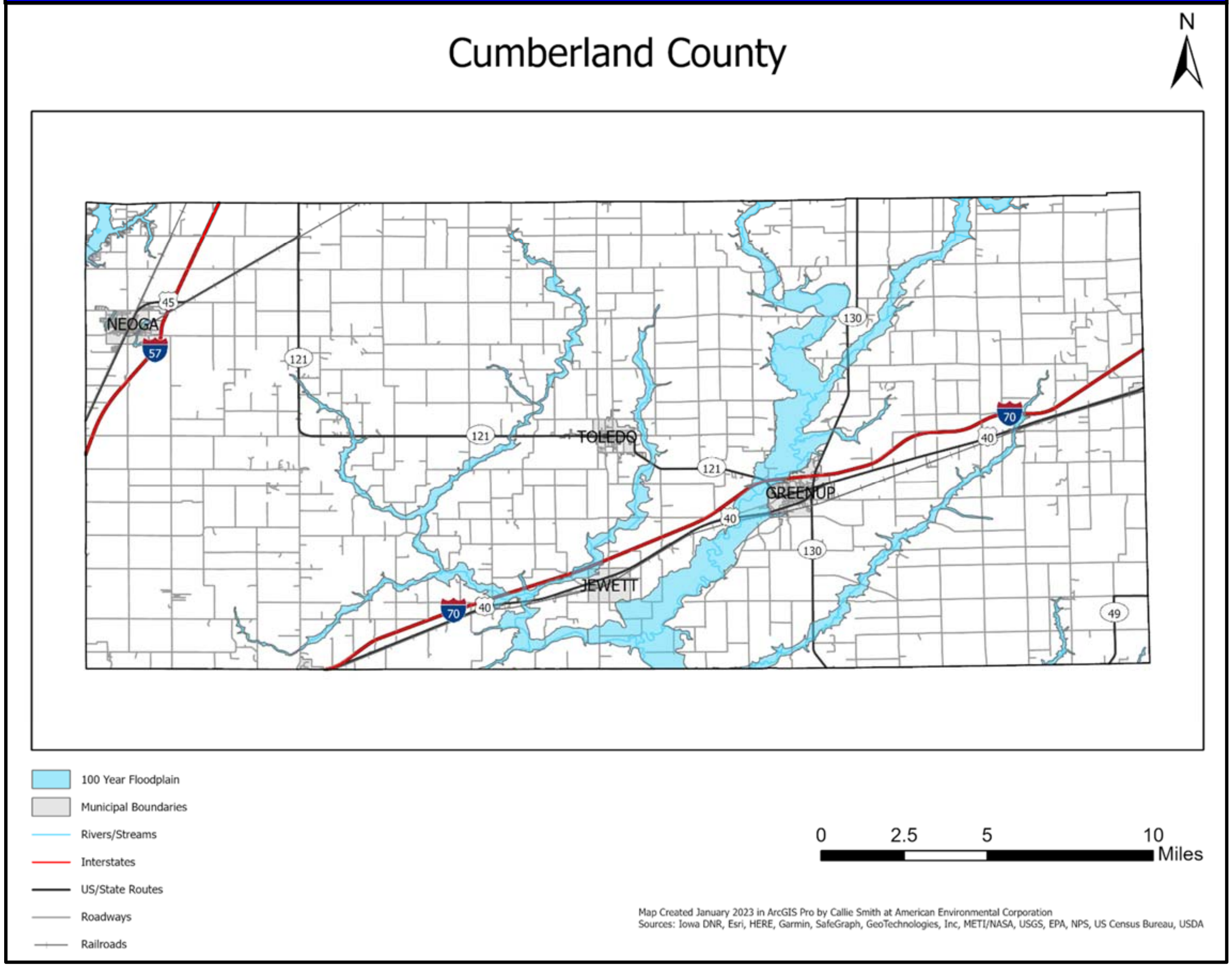
Participating Jurisdictions

Cumberland County, Greenup, and Neoga participate in the NFIP. **Figure F-6 provides information on each NFIP-participating jurisdiction,** including the date each participant joined, the date of their current effective FIRM and the year of their most recently adopted floodplain zoning ordinance.

Non-Participating Jurisdictions

Figure F-7 provides information on those incorporated municipalities within the County that chose not to participate in the planning process but take part in the NFIP. Sigel has no identified flood hazard boundaries within its corporate limits and has chosen not to participate in the Program. While the current effective DFIRM for Jewett (dated February 4, 2011) does identify two small SFHAs within its limits, the Village chose not to adopt floodplain regulations and participate

Figure F-4
Floodplain Areas in Cumberland County



in the NFIP. As a result, the Village is listed as a community not in the NFIP with a sanction date of February 4, 2012 in FEMA's Community Status Book Report for Illinois. The current Village administration does not see the need to participate since the area within the SFHA does not include any residence.

Figure F-6
NFIP Participating Jurisdictions

Participating Jurisdictions	Participation Date	Current Effective FIRM Date	CRS Participation	Most Recently Adopted Floodplain Zoning Ordinance
Cumberland County	09/18/1996	02/04/2011	No	2011
Greenup	08/04/1988	02/04/2011	No	2011
Neoga	08/05/1985	02/04/2011	No	2011

Sources: FEMA, Community Status Book Report: Illinois.
FEMA, National Flood Insurance Program Insurance Manual.

Figure F-7
Non-Participating Jurisdiction NFIP Status

Participating Jurisdictions	Participation Date	Current Effective FIRM Date	CRS Participation	Most Recently Adopted Floodplain Zoning Ordinance
Casey	10/21/2009	08/02/2007	No	2009
Montrose	02/11/2009	---	No	2009

Sources: FEMA, Community Status Book Report: Illinois.
FEMA, National Flood Insurance Program Insurance Manual.

Jurisdictions that participate in the NFIP are expected to adopt and enforce floodplain management regulations. In Cumberland County, all the NFIP-participating jurisdictions have adopted floodplain ordinance and as a result, are in compliance with NFIP requirements. 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 by implementing mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within the SFHA. At this time no new construction is planned within the base floodplain. Continued compliance with NFIP requirements is addressed in the Mitigation Action Tables of the participating jurisdictions found in Section 4.7.

What is the probability of future flood events occurring?

General Floods

Cumberland County has had 20 verified occurrences of general flooding between 2002 and 2021. With 20 occurrences over the past 20 years, the County should expect one general flood event in any given year. It is important to keep in mind there are almost certainly gaps in the general flood data. More events have almost certainly occurred than are documented in this section, which means that the probability is almost certainly higher than reported.

There were eight years over the past 20 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 is 40%.

<u>Flash Floods</u>
There have been 51 verified flash flood events between 1996 and 2021. With 51 occurrences over the past 26 years, the County should expect about two flash flood events in any given year. There were 14 years over the past 26 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 44%.

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. Cumberland County and the participating jurisdictions 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 rivers, streams, and creeks within the County as well as outside of the floodplains in low-lying areas where drainage problems occur. Since 2012, Cumberland County has experienced 12 general flood events and 18 flash flood events.

All of the general flood events recorded impacted either a large portion or the entire County and were not location specific. Of the 51 flash flood events, 50 have impacted either a large portion or the entire County and were not location specific. The remaining event took place in Neoga.

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.

Do any of the participating jurisdictions consider flooding to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considered flooding to be among their jurisdiction's greatest vulnerabilities.

Cumberland County:

- ❖ Heavy rains cause localized flooding in areas of the County adversely impacting travel.
- ❖ Flooding can contaminate municipal and private well water supplies.
- ❖ Flooding can cause an increase in communicable disease through the release of raw sewage, foodborne illness, and stagnant water for mosquitoes.
- ❖ If flooding damages a river bridge and it becomes impassable, it will take a long time to fix and adversely impact travel to all motorists, not just emergency responders.

Greenup:

- ❖ The community's only wastewater lagoon is located in the floodplain and is vulnerable to flooding.

Neoga CUSD #3:

- ❖ Neoga has a high water table making flooding a concern during heavy rain events.

Neoga FPD:

- ❖ The main road through Neoga, along with several local roads and highways, flood during heavy rain events, making travel difficult, especially for emergency responders.

Toledo:

- ❖ Flooding has the potential to impact our municipal water wells.

What impacts resulted from the recorded floods?

Floods as a whole have caused a minimum of $592,803 in property damages. The following provides a breakdown by category. In comparison, the State of Illinois has averaged an estimated $257 million annually in property damage losses, making flooding the single most financially damaging natural hazard in Illinois.

Flood Fast Facts – Impacts/Risk

General Flood Impacts:

- ❖ Total Property Damage (1 event): ***$100,000***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Flash Flood Impacts:

- ❖ Total Property Damage (3 events): ***$492,803***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries (1 event): ***4***
- ❖ Fatalities: ***n/a***

Flood Risk/Vulnerability to:

- ❖ Public Health & Safety – General Flooding: ***Low***
- ❖ Public Health & Safety – Flash Flooding: ***Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Medium to High***

General Floods

Data obtained from NOAA's Storm Events Database indicates that between 1984 and 2021, one of the 20 general flood events caused $100,000 in property damages. Damage information was either unavailable or none was recorded for the remaining 19 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 FEMA public assistance figures provided by the Illinois Emergency Management Agency indicates that between 1996 and 2021, four of the 51 flash flood events caused $492,803 in property damages. Damage information was either unavailable or none was recorded for the remaining 47 reported occurrences. Four injuries were reported as a result of one flash flood event. On May 12, 2002 a car hydroplaned on wet pavement near Toledo, causing minor injuries to the four individuals in the car.

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 regular basis within the County, the number of injuries and fatalities is low. In terms of the risk or vulnerability to public health and safety from general floods, the risk is seen as ***low***. However, two-thirds 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/properties within Cumberland County?

No. According to information obtained from IEMA, there are no repetitive loss structures located in Cumberland 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.

Are existing buildings, infrastructure, and critical facilities vulnerable to flooding?

Yes. **Figure F-8** identifies the estimated number of existing structures by participating jurisdiction located within a floodplain. These counts were prepared by the Consultant using FEMA's National Flood Hazard Layer and building footprints prepared by the Illinois State Water Survey. There are no existing buildings, infrastructure or critical facilities located in a floodplain in Sigel. **Figure F-9** identifies the estimated number of existing structures by township located within the base floodplain. **Figure I-5** in Section 1.2 identifies the township boundaries for reference. It should be noted that while the identified structures are located in a floodplain, the actual number impacted may differ during an actual flood event.

Figure F-8
Existing Buildings, Infrastructure and Critical Facilities Located in a Floodplain by Municipality

Participating Jurisdiction	Residential Houses	Residential Garages	Businesses (Commercial /Industrial)	Miscellaneous (Barns, Sheds, Silos)	Infrastructure/ Critical Facilities
Greenup [a]	3	3	---	4	---
Neoga [1,b]	13	2	2	3	---
Toledo [2,a]	---	---	---	---	---
Unincorp. Cumberland County	10	4	1	60	*

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

* No specific infrastructure/critical facilities, aside from roads and bridges, were identified for Unincorporated Cumberland County.

Figure F-9
Existing Buildings, Infrastructure and Critical Facilities Located in a Floodplain by Township

Township	Residential Houses	Residential Garages	Businesses (Commercial/ Industrial)	Miscellaneous (Barns, Sheds, Silos)	Infrastructure/ Critical Facilities
Cottonwood [2,a,b]	4	1	---	2	---
Crooked Creek [a]	---	---	---	---	---
Greenup [a]	3	4	---	36	---
Neoga [1,a,b]	14	3	3	25	---
Spring Point [2,3,a,b]	---	---	---	---	---
Sumpter [2,a,b]	2	---	---	1	---
Union [a]	2	1	---	3	---
Woodbury [2,a]	1	---	---	---	---

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

Aside from key roads and bridges and buried power and communication lines, there are no infrastructure/critical facilities located within or adjacent to a floodplain in any of the participating jurisdictions.

While only 7.7% of the land area in Cumberland County lies within the base floodplain and is susceptible to riverine flooding, **almost the entire County 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 the base 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 Embarras River and its tributaries; (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 the base 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 and the townships within the County can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in Cumberland County.

The purpose of providing an estimate is to help residents and local 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 participating 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.

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 base 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 participating jurisdiction (i.e., those structures located within the base floodplain or Special Flood Hazard Areas 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 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 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 base 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 base floodplains would overflow their banks, and
- ❖ the base floodplains of each river, stream, and/or creek would experience the same degree of flooding.

This assumption results in the following conditions for each municipality:

- ➢ Toledo would not experience any residential flooding since there are no river, stream, or creek base floodplains located within their municipal limits;
- ➢ <u>Greenup</u>: Embarras River and an Unnamed Tributary of the Embarras River would overflow its banks and flood small portions on the northwest and southwest side of the Village; and

- Neoga: Copperas Creek and Unnamed Tributaries of Copperas Creek would overflood their banks and flood areas within the Village.

> **Assumption #3**
>
> The number of existing residential structures located within the base floodplain(s) 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 base floodplains will experience the same degree of flooding, the number of existing residential structures located within the base floodplain(s) can be used to determine the number of potentially-damaged housing units. **Figures F-8** and **F-9** identify the total number of existing residential structures located within the base floodplains(s) of each participating jurisdiction. These counts were prepared by the Consultant.

> **Assumption #4**
>
> The average market value for a residential structure 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 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 Cumberland County is approximately one-third of the market value). **Figure F-10** provides a sample calculation. The total assessed value is based on 2020 tax assessment information provided by the Cumberland County Clerk. **Figures F-11** and **Figure F-12** provide the average assessed value and average market value for each participating municipality and township.

Figure F-10
Sample Calculation of Average Assessed Value & Average Market Value – Greenup

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Greenup: $10,160,912 ÷ 819 housing units = $12,406

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Greenup: $12,406 x 3 = $37,218
($37,218)

Figure F-11
Average Market Value of Housing Units by Participating Municipality

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2020)	Total Housing Units (2010)	Average Assessed Values	Average Market Value (2020)
Greenup [a]	$10,160,912	819	$12,406	$37,218
Neoga [1,b]	$11,657,342	639	$18,243	$54,729
Toledo [2,a]	$8,498,552	542	$15,680	$47,040

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

Figure F-12
Average Market Value of Housing Units by Township

Township	Total Assessed Value of Residential Buildings (2020)	Total Housing Units (2010)	Average Assessed Values	Average Market Value (2020)
Cottonwood [2,a,b]	$2,847,850	232	$12,275	$36,826
Crooked Creek [a]	$2,283,959	165	$13,842	$41,527
Greenup [a]	$15,847,263	1,239	$12,790	$38,371
Neoga [1,a,b]	$34,310,652	1,373	$24,990	$74,969
Spring Point [2,3,a,b]	$8,510,206	468	$18,184	$54,553
Sumpter [2,a,b]	$13,944,280	933	$14,946	$44,837
Union [a]	$3,412,075	176	$19,387	$58,160
Woodbury [2,a]	$2,964,661	293	$10,118	$30,355

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

Assumption #5

The potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet.
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 F-13** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

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 F-13
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 F-14** provides a sample calculation.

Figure F-14
Structure: Potential Dollar Loss Sample Calculation – Greenup

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage =
Average Structural Damage per Housing Unit
Greenup: $37,218 x 20% = $7,443.60 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)

Greenup: $7,440.60 per housing unit x 3 housing units = $22,330.80
($22,331)

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 F-15** provides a sample calculation.

Figure F-15
Content: Potential Dollar Loss Sample Calculation – Greenup

½ (Average Market Value of a Housing Unit with the Jurisdiction) x Percent Damage = Average Content Damage per Housing Unit

Greenup: ½ ($37,218) x 30% = $5,582.70 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)

Greenup: $5,582.70 per housing unit x 3 housing units = $16,748.10
($16,748)

Finally, the **total potential dollar losses** may be calculated by adding together the potential dollar losses to the structure and the content. **Figures F-16 and F-17** provide a breakdown of the total potential dollar losses by participating municipality and township.

This assessment illustrates the potential residential dollar losses that should be considered when participating jurisdictions 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 $39,079 in Greenup to $249,017 in Neoga**. Toledo does not have any residences considered vulnerable to riverine flooding in this scenario. For the participating townships, potential dollar losses caused by riverine flooding to vulnerable residences would be expected to **range from $10,624 in Woodbury Township to $367,348 in Neoga Township**.

Figure F-16
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Municipality

Participating Jurisdiction	Average Market Value (2020)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Greenup [a]	$37,218	3	$22,331	$16,748	$39,079
Neoga [1,b]	$54,729	13	$142,295	$106,722	$249,017
Toledo [2,a]	$47,040	0	$ 0	$ 0	$ 0

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

Figure F-17
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Township

Township	Average Market Value (2020)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Cottonwood [2,a,b]	$36,826	4	$29,461	$22,096	$51,557
Crooked Creek [a]	$41,527	0	$ 0	$ 0	$ 0
Greenup [a]	$38,371	3	$23,023	$17,267	$40,290
Neoga [1,a,b]	$74,969	14	$209,913	$157,435	$367,348
Spring Point [2,3,a,b]	$54,553	0	$ 0	$ 0	$ 0
Sumpter [2,a,b]	$44,837	2	$17,935	$13,451	$31,386
Union [a]	$58,160	2	$23,264	$17,448	$40,712
Woodbury [2,a]	$30,355	1	$6,071	$4,553	$10,624

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

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 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.

No 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. Cumberland County has experienced multiple events over the last 20 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.

3.5 EXTREME COLD

HAZARD IDENTIFICATION

What is the definition of extreme cold?

Extreme cold is generally characterized by temperatures well below what is considered normal for an area during the winter months and is often accompanied or is left in the wake of a severe winter storm. Extreme cold criteria vary from region to region. As a result, reliable fixed absolute criteria are not generally specified (i.e., a winter day with a maximum temperature of 0°F).

Whenever the temperature drops below normal and the wind speeds increase, heat can leave the body more rapidly. This can lead to dangerous situations for susceptible individuals, such as those without shelter or who are stranded, or those who live in a home that is poorly insulated or without heat.

Extreme cold is a leading cause of weather-related fatalities in Illinois. According to a 2020 study published by the University of Illinois Chicago, 1,935 individuals died from cold-related illnesses between 2011 and 2018. This is 94% of all temperature-related fatalities recorded in the State during that time period.

Extreme cold can also cause infrastructure damage, especially to residential water pipes and water distribution lines and mains. According to State Farm, in 2020 Illinois was once again the national leader in losses related to frozen pipes.

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 EC-1** identifies the formula and calculates the wind chill temperatures for certain air temperatures and wind speeds.

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.

Figure EC-1
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.

What cold-related illnesses are associated with extreme cold?

Frostbite and hypothermia are both cold-related illnesses that can result when individuals are exposed to dangerously low temperatures and wind chills. 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.

What is a wind chill alert?

A wind chill alert is an advisory or warning issued by the NWS when the wind chill is expected to have a significant impact on public safety. The expected severity of cold temperatures and wind speed determines the type of alert issued. There are three types of alerts that can be issued for an extreme cold event. The following provides a brief description of each type of alert based on the **wind chill criteria** established by the NWS Weather Forecast Office in Lincoln, Illinois. The Lincoln Office is responsible for issuing alerts for Cumberland County.

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing **wind chill advisories** and **warnings** for Cumberland County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Wind Chill Watch.** A wind chill watch may be issued if conditions are favorable for wind chill temperatures to meet or exceed warning criteria but are not occurring or imminent.
- **Wind Chill Advisory.** A wind chill advisory is issued when wind chill values are expected to be between -15°F and -24°F.
- **Wind Chill Warning.** A wind chill warning is issued when wind chill values are expected to be -25°F or below.

HAZARD PROFILE

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

When have extreme cold events occurred previously? What is the extent of these events?

Extreme Cold Fast Facts – Occurrences

Number of Regional Extreme Cold Events Reported (1995 - 2021): ***29***

Coldest Temperature Extrapolated for the County: ***-27°F (January 19, 1994 at Charleston)***

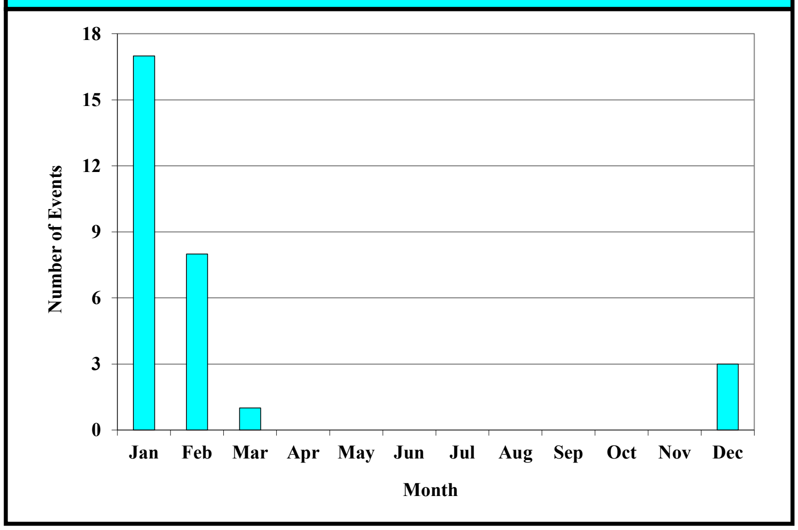
Most Likely Months for Extreme Cold Events to Occur: ***January***

Table 8, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of regional extreme cold events extrapolated for Cumberland County. NOAA's Storm Events Database, Iowa State University's National Weather Service Watch, Warning, and Advisories database Midwestern Regional Climate Center's cli-MATE database, and NWS's COOP data were used to extrapolate 29 occurrences of extreme cold in Cumberland County between 1995 and 2021.

According to the Midwestern Regional Climate Center, temperature records were only kept intermittently from 2001 to 2003 at the Greenup COOP Observation Station in Cumberland County. As a result, temperature records from the Casey COOP Observation Station in Clark County, the Charleston COOP Observation Station in Coles County, and the Windsor COOP Observation Station in Shelby County were used to extrapolate extreme cold events in Cumberland County. Based on the available records, the coldest recorded temperatures were from Charleston was -27°F on January 19, 1994. The coldest recorded temperature from Windsor was -26°F on January 24, 1915.

Figure EC-2 charts the reported occurrences of extreme cold by month. Of the 29 events, 17 (59%) took place in January, making this the peak month for extreme cold events. There was one event that spanned two months; however, for illustration purposes only the month the event started in is graphed.

Figure EC-2
Extreme Cold by Month
1994 - 2021



What locations are affected by extreme cold?
Extreme cold affects the entire County. Extreme cold, like excessive heat and severe winter storms, generally extends across an entire region affecting multiple counties.

Do any of the participating jurisdictions have designated warming centers?

Yes. Six of the eight participating municipalities, schools districts, and fire protection districts have designated warming centers. A "designated" warming center is identified as any facility that has been formally identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents during severe winter storms and extreme cold events.

Figure EC-3 identifies the location of each warming center by jurisdiction. At this time Neoga CUSD #3, Neoga FPD, and Sigel FPD do not have any warming centers designated. In addition, there are no State of Illinois-designated warming centers in Cumberland County.

Figure EC-3
Designated Warming Centers by Participating Jurisdiction

Name/Address	Name/Address
Cumberland CUSD #77	*Toledo & Toledo Fire Protection District*
Cumberland Schools, 1496 IL Rte. 121, Toledo	Neal Center (YMCA), 130 Courthouse Square
Greenup	Toledo Christian Church, 501 S. Maryland St.
Municipal Building, 115 E. Cumberland St.	Toledo Fire Protection District, 144 Courthouse Square
Neoga	Village Hall, 160 Courthouse Square
Community Center, 653 6th St.	
Grace United Methodist Church, 752 Walnut St.	

What is the probability of future extreme cold events occurring?

Cumberland County has experienced 29 verified occurrences of excessive heat between 1995 and 2021. With 29 occurrences over the past 27 years, Cumberland County should expect to experience one extreme cold event in any given year. There were eight years over the last 26 years where multiple (two or more) extreme cold events occurred. This indicates that the probability that multiple excessive heat events may occur during any given year within the County is 31%.

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 extreme cold.

Are the participating jurisdictions vulnerable to extreme cold?

Yes. All of Cumberland County, including the participating jurisdictions, is vulnerable to the dangers presented by extreme cold. Since 2012, Cumberland County has experienced 16 extreme cold events.

Do Any of the participating jurisdictions consider extreme cold to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered extreme cold to be among their community's greatest vulnerabilities.

What impacts resulted from the recorded extreme cold events?

Damage information was either unavailable or none was recorded, and no injuries or fatalities were reported as a result of any of the extreme cold events.

Extreme Cold Fast Facts – Impacts/Risk

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

Extreme Cold Risk/Vulnerability:
- Public Health & Safety: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

In comparison, the State of Illinois averages 18 cold-related fatalities annually according to the Illinois State Water Survey's Climate Atlas of Illinois.

What other impacts can result from extreme cold events?

Other impacts of extreme cold include early school dismissals and school closing, power outages and frozen and ruptured water pipes and water mains. Individuals who are outdoors during and immediately following extreme cold events can experience health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries.

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

For Cumberland County the level of risk or vulnerability posed by extreme cold to public health and safety is considered to be ***low*** to ***medium.*** This assessment is based on the fact that while extreme cold events occur regularly, the number of injuries and fatalities reported is low and all of the participating municipalities have designated warming centers.

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

Yes. All existing buildings, infrastructure and critical facilities located in Cumberland County and the participating jurisdictions are vulnerable to damage from extreme cold. Individual water pipes and distribution lines and 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.

Based on the frequency with which extreme cold events have occurred in Cumberland 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 extreme cold events is ***low***.

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

Yes. While Neoga has building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from extreme cold, the County and the two remaining participating municipalities do not. Infrastructure such as residential water pipes will continue to be vulnerable as long as they are located in areas such as outside walls, attics and crawl spaces that do not contain proper insulation.

What are the potential dollar losses to vulnerable structures from extreme cold?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for extreme cold events. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from extreme cold. However, according to the Cumberland County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $105,676,689. Since all of the structures in the planning area are vulnerable to damage, this total represents the countywide property exposure to extreme cold.

3.6 TORNADOES

HAZARD IDENTIFICATION

What is the definition of a tornado?

A tornado is a narrow violently rotating column of air, often visible as a funnel-shaped cloud that extends from the base of a thunderstorm cloud formation to the ground. The most violent tornadoes can have wind speeds of more than 300 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. A typical tornado travels at around 10 to 20 mile per hour, but this may vary from almost stationary to 60 miles per hour. Tornadoes can occur at any time of the year and happen at any time of the day or night, although most occur between 4 p.m. and 9 p.m.

About 1,200 tornadoes hit the U.S. yearly, with an average 52 tornadoes occurring annually 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 roofs off buildings, flip vehicles 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 U.S. 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 T-1** 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 incorporates 28 different damage indicators (mainly various building types, towers/poles and trees) as calibrated by engineers and meteorologists. For each damage indicator there are eight degrees of damage ranging from barely visible damage to complete destruction of the damage indicator. The wind speeds assigned to each category are estimates, not measurements, based on the damage assessment. **Figure T-1** identifies the Enhanced Fujita Scale.

Figure T-1
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: NOAA, 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 Quad Cities Iowa/Illinois is responsible for issuing **tornado watches** and **warnings** for Cumberland County 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. Individuals need to be alert and prepared. Watches are typically large, covering numerous counties or even states.

- **Warning.** A tornado warning is issued when a tornado has been sighted or indicated by weather radar. Warnings indicate imminent danger to life and property for those who are in the path of the tornado. Individuals should see shelter immediately. Typically, warnings encompass a much smaller area, such as a city or small 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?

Table 9, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in Cumberland County. NOAA's Storm Events Database, Storm Data Publications, Storm Prediction Center, and NWS Central Illinois Tornado Climatology have documented 15 occurrences of tornadoes in Cumberland County between 1950 and 2021. In comparison, there have been 2,745 tornadoes statewide between 1950 and 2021 according to NOAA's Storm Prediction Center. **Figure T-2** charts the reported occurrences of tornadoes by magnitude. Of the 15 reported occurrences there were: 1– F3, 0 – F2s, 5 – F1s, 6 – F0s, and 3 – EF0s.

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 – 2021): ***15***

Highest F-Scale Rating Recorded: ***F3 (August 21, 1977)***

Most Likely Month for Tornadoes to Occur: ***May***

Average Length of a Tornado: ***3.1 miles***

Average Width of a Tornado: ***59 yards***

Average Damage Pathway of a Tornado: ***0.1 sq. mi.***

Longest Tornado Path in the County: ***17.8 miles (March 6, 1961)***

Widest Tornado Path in the County: ***200 yards (June 13, 1963)***

Figure T-2
Tornadoes by Magnitude
1950 – 2021

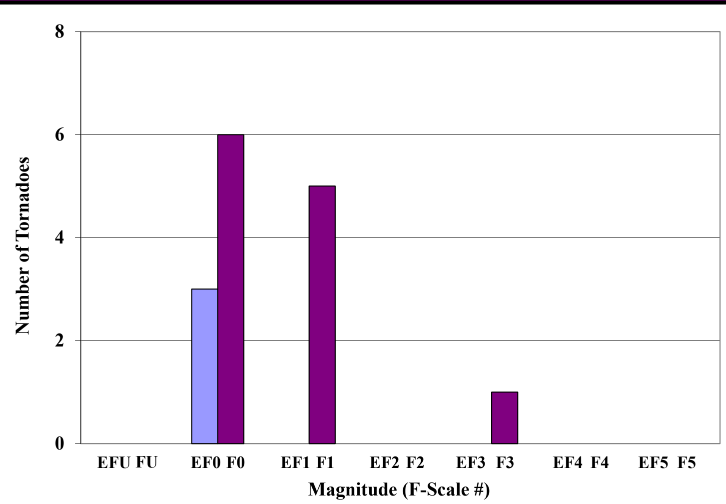
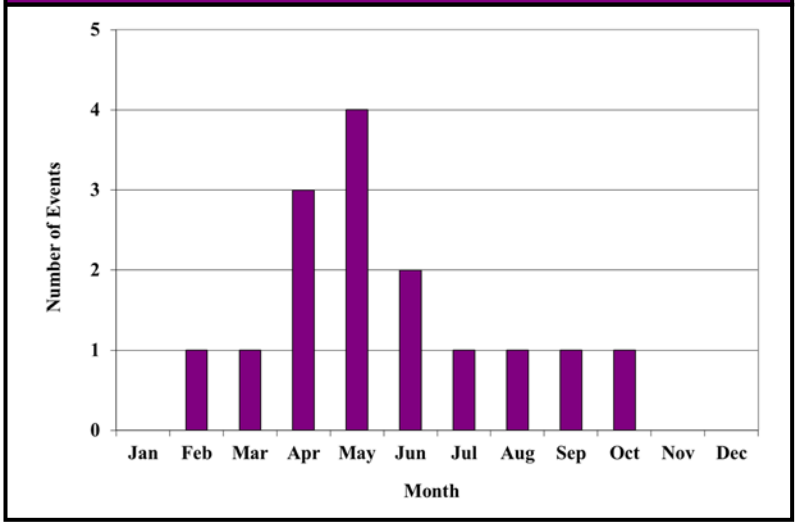


Figure T-3 charts the reported tornadoes by month. Of the 14 events, nine (64%) took place in April, May, and June making this the peak period for tornadoes in Cumberland County. Of those nine events, four (44%) occurred during May, making this the peak month for tornadoes. In comparison, 1,720 of the 2,745 tornadoes (63%) recorded in Illinois from 1950 through 2021 took place in April, May, and June.

Figure T-3
Tornadoes by Month
1960 – 2021



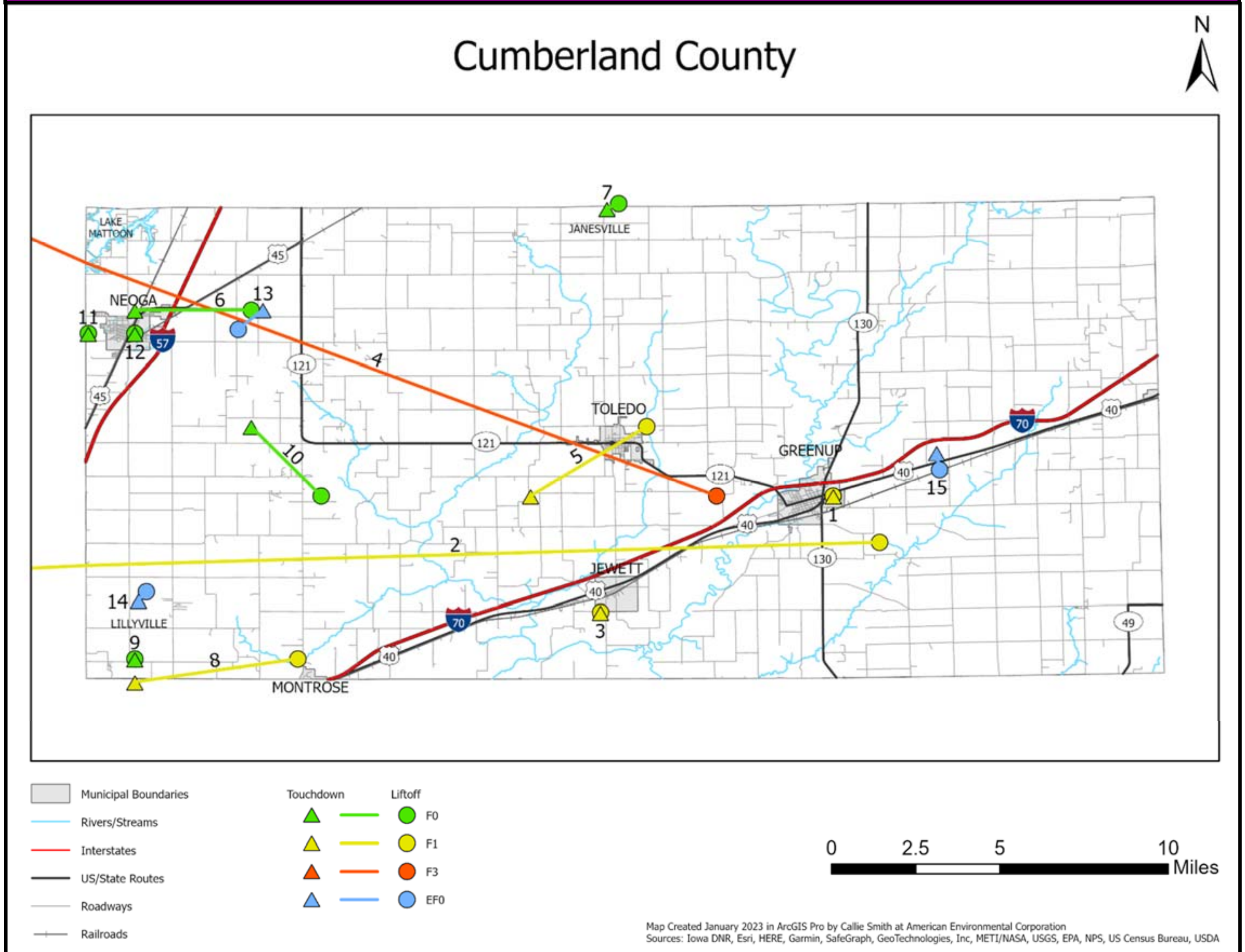
Approximately 87% of all tornadoes in the County occurred during the p.m. hours, with nine of the p.m. events (60%) taking place between 2 p.m. and 8 p.m. In comparison, more than half of all Illinois tornadoes occur between 2 p.m. and 8 p.m.

The tornadoes that have impacted Cumberland County have varied from 0.1 miles (176 yards) to 17.8 miles in length and from 10 yards to 200 yards in width. The average length of a tornado in Cumberland County is 3.1 miles and the average width is 59 yards (0.033 miles).

Figure T-4 shows the pathway of each reported tornado. 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 Cumberland County, the average damage pathway or area impacted by a tornado is 0.10 square miles.

The longest tornado recorded in Cumberland County occurred on March 6, 1961. This F3 tornado, measuring 77 yards in width and 17.8 miles in length, touched down at Jerseyville in Jersey County and traveled east-northeast through Macoupin, Montgomery, Fayette, Effingham, and Shelby counties before lifting off southeast of Greenup in Cumberland County. The total length was 117.9 miles, 17.8 in Cumberland County. The damage pathway of this tornado covered approximately 5.2 square miles, with 0.8 square miles occurring in Cumberland County.

Figure T-4
Tornado Pathways in Cumberland County



The widest tornado recorded in Cumberland County occurred on June 13, 1963. This F1 tornado, measuring 200 yards in width and 0.3 miles in length, touched down about a quarter of a mile southeast of Jewett.

What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. All three of the participating municipalities have had reported occurrences of tornadoes within their corporate limits. The 2018 Illinois Natural Hazard Mitigation Plan prepared by IEMA classifies Cumberland County's hazard rating for tornadoes as "low."

What is the probability of future tornadoes occurring?

Cumberland County has had 15 verified occurrences of tornadoes between 1950 and 2021. With 15 tornadoes over the past 72 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is 20.8%. There was one year over the last 72 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 1.4%.

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 Cumberland County, including the participating jurisdictions, is vulnerable to the dangers presented by tornadoes. Since 2012, three tornadoes have been recorded in Cumberland County.

All of the participating municipalities have had a tornado touch down or pass through their municipal boundaries. **Figure T-5** lists the verified tornadoes that have touched down in or near or passed through each participating municipality. No tornadoes have touched down or passed through Sigel in the Sigel FPD.

Figure T-5
Verified Tornadoes In or Near Participating Municipalities

Participating Municipality	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Municipality	Touched Down/Passed Near Municipality
Greenup [a]	4	1960	1961, 1977, 2021
Neoga [1,b]	5	2006	1996, 2002, 2003, 2018
Toledo [2,a]	2	1984	1977

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

In terms of tornadoes that were recorded in each of the fire protection districts, six tornadoes have touched down or passed through the Neoga FPD while five tornadoes have touched down or passed through the Toledo FPD and three tornadoes touched down or passed through the Sigel FPD.

Unincorporated areas vulnerable to tornadoes include Lillyville which has had two tornadoes touch down near its vicinity. **Figure T-6** details the verified tornadoes that have touched down in or near unincorporated areas in Cumberland County.

Figure T-6
Verified Tornadoes In or Near Unincorporated Areas of Cumberland County

Unincorporated Area	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Unincorporated Area	Touched Down/Passed Near Unincorporated Area
Janesville [2]	1	---	1999
Lake Mattoon [1,b]	1	1977	---
Lillyville [3]	2	---	2022, 2019

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

Do any of the participating jurisdictions consider tornadoes to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents consider tornadoes to be among their community's greatest vulnerabilities.

Cumberland County:
- ❖ Water towers in the County are vulnerable to a tornado event.
- ❖ Tornado events have the potential to down power lines, impacting service to critical facilities and residents.

Greenup:
- ❖ During a tornado event, high winds can down overhead electrical lines and cause power outages that affect critical facilities, communications, and service to residents.

Neoga CUSD #3:
- ❖ There is the potential for staff and students to sustain injury during a tornado since the school does not have a community safe room.

Neoga FPD:
- ❖ Schools, water towers, and emergency response facilities within the district are vulnerable to tornadoes.

Sigel FPD:
- ❖ Area schools are vulnerable to damage from a tornado event.

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, Storm Data Publications, Storm Prediction Center, and NWS Central Illinois Tornado Climatology indicates that between 1960 and 2021, five of the 15 tornadoes caused $2,757,500 in property damages. The August 21, 1977 tornado caused $2.5 million in property damages alone. Property damage information was either unavailable or none was recorded for the remaining 10 reported occurrences.

NOAA's Storm Events Database documented six fatalities and 59 injuries as a result of three separate tornado events in Cumberland County. The following provides a brief description of each.

- ❖ On August 21, 1977 six persons were killed and 56 injured at the Lake Mattoon Marina when an F3 tornado struck the Erwin Subdivision and Prahl Trailer Court on the Cumberland County side. Nearly all of the fatalities and injuries were to individuals occupying mobile homes.
- ❖ Two individuals were injured when an F1 tornado touched down in the Massey Subdivision on April 12, 1984.
- ❖ On October 17, 1996 an F0 tornado blew over a 35-foot travel trailer slightly injuring one person.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts:
- ❖ Total Property Damage (5 events): ***$2,757,500***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries (3 events): ***59***
- ❖ Fatalities (1 event): ***6***

Tornado Risk/Vulnerability:
- ❖ 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***

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 2018 Illinois Natural Hazard Mitigation Plan, Cumberland County **ranks 86th out of 102 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 low. 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.

In terms of adequate access to health care, while there are no hospitals in Cumberland County, nearby hospitals in Mattoon (Coles County), Effingham (Effingham County), Shelbyville (Shelby County) and regional centers in Urbana (Champaign County) and Terre Haute, Indiana (Vigo

County) are equipped to provide care and have sufficient capacity for the influx of additional patients from one or more counties.

<u>Cumberland County/Fire Protection Districts</u>
For Cumberland County, including the fire protection districts, 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 tornadoes do not occur frequently in the County and a large majority of the tornadoes that have impacted the County have touched down in rural areas away from concentrated populations. In addition, the County is not densely populated and there is not a large number of high-risk living accommodations present.

<u>Participating Municipalities (including Schools)</u>
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 all of the participating jurisdictions are small in size (less than two square miles) 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.

Do any participating jurisdictions have community safe rooms?

No. As a result, if a tornado were to touch down or pass through any of the population centers in the County, then there would be a greater likelihood of injuries and fatalities due to the lack of structures specifically designed and constructed to provide life-safety protection. Each jurisdiction should consider whether the potential impacts to public health and safety from a tornado are considered great enough to warrant the consideration of community safe rooms as a mitigation action.

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 tornado damage. 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 touch down 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

Size of Tornado = 0.10 sq. miles

Assumption #1: 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 Cumberland County will be used since it has a higher probability of recurring. In Cumberland County the area impacted by an average-sized tornado is 0.10 square miles. This average is based on more than 70 years of data.

Assumption #2

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

Assumption #2: 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.

Assumption #3: Method for Estimating Potentially-Damaged Housing Units. With the size of the tornado selected 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.

Calculating Average Housing Unit Density

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 T-7** provides a sample calculation. **Figure T-8** 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 T-7
Calculation of Average Housing Unit Density – Cumberland County

Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction =
Average Housing Unit Density
(Rounded Up to the Nearest Whole Number)

Cumberland County: 4,879 housing units ÷ 346.024 sq. miles = 14.100 housing units/sq. mile
(14 housing units)

Figure T-8
Average Housing Unit Density by Participating Jurisdiction

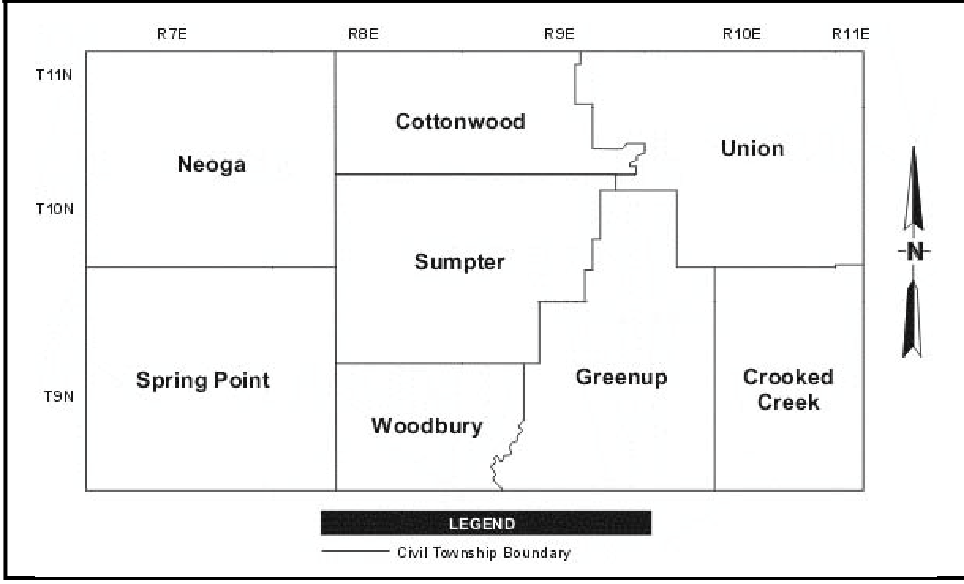
Participating Jurisdiction	Township Location	Total Housing Units (2016-2020)	Mobile Homes (2016-2020)	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)
Greenup [a]	Greenup	819	61	1.747	468.804
Neoga [1,b]	Neoga	639	39	1.429	447.166
Toledo [2,a]	Sumpter	542	62	0.908	---
Unincorp. County		2,768	329	340.935	8.119
County		4,879	532	346.024	14.100

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3
Source: U.S. Census Bureau.

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 Cumberland County.

In Cumberland County, as well as many other east-central Illinois counties, there are pronounced differences in housing unit densities. Approximately 73% of all housing units and 69% of all mobile homes are located in three of the County's eight townships (Greenup, Neoga, and Sumpter). **Figure T-9** 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. While Greenup has an ordinance that requires anchoring systems for mobile home that would help limit the damage from lower rated tornadoes, the County and the remaining two participating municipalities do not.

Figure T-9
Township Boundaries Cumberland County



Source: Illinois Secretary of State

This substantial difference in density skews the average county housing unit density in Cumberland County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure T-10** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

For five of the eight 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 the three most populated townships.

Estimating the Number of Potentially-Damaged Housing Units

Before an estimate of the number of potentially-damaged housing units can be calculated for the participating municipalities, an additional factor needs to be taken into consideration: the presence of commercial developments and/or large tracts of undeveloped land. Occasionally villages and cities will annex large tracts of undeveloped land or have commercial developments located 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.

Figure T-10
Average Housing Unit Density by Township

Township	Incorporated Municipalities Located in Township	Total Housing Units (2016-2020)*	Mobile Homes (2016-2020)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)
Cottonwood [2,a,b]		232	21	32.668	7.102
Crooked Creek [a]		165	10	34.167	4.829
Greenup [a]	Greenup	1,239	149	47.435	26.120
Neoga [1,a,b]	Neoga	1,373	111	54.682	25.109
Spring Point [2,3,a,b]		468	76	55.963	8.363
Sumpter [2,a,b]	Toledo	933	107	45.690	20.420
Union [a]		176	15	52.766	3.335
Woodbury [2,a]	Jewett	293	43	22.653	12.934
Townships - 3 most populated		3,545	367	147.807	72
Townships - 5 least populated		1,334	165	198.217	37

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3
Source: U.S. Census Bureau.

In Cumberland County, all four municipalities have large commercial/industrial and/or undeveloped land areas and/or commercial developments within their municipal boundaries. These areas account for approximately two-fifths to nine-tenths 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. **Figure T-11** provides a breakdown of the refined land area figures for select municipalities. These refined land area figures will be used to update the average housing unit density calculations for these municipalities.

Figure T-11
Refined Land Area Figures for Participating Municipalities with Large Tracts of Commercial/Industrial and Undeveloped Land Areas

Participating Jurisdiction	Land Area (Sq. Miles) (2010)	Estimated Open Land Area & Commercial/ Industrial Tracts (Sq. Miles)	Refined Land Area (Sq. Miles)
Greenup [a]	1.747	1.210	0.537
Neoga [1,b]	1.429	0.890	0.539
Toledo [2,a]	0.908	0.370	0.538

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

With updated 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 Cumberland County tornado. **Figure T-12** provides a sample calculation.

Figure T-12 **Sample Calculation of Potentially-Damaged Housing Units – Cumberland County**
Average Housing Unit Density x Area Impacted by the Average-Sized Cumberland County Tornado = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number)
Cumberland County: 14.100 housing units/sq. mile x 0.10 sq. miles = 2.12 housing units **(3 housing units)**

The average housing unit density cannot be used to calculate the number of potentially-damaged housing units for municipalities that cover less than one square mile like those in Cumberland County. 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, the area impacted by the averaged-sized tornado is divided 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 T-13** provides a sample calculation.

Figure T-13 **Sample Calculation of Potentially-Damaged Housing Units** **for Municipalities Covering Less Than One Square Mile – Greenup**
Area Impacted by the Average-Sized Cumberland County Tornado ÷ Land Area within the Jurisdiction x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number)
Greenup: 0.10 sq. mile ÷ 0.537 sq. miles x 819 housing units = 152.51 **(153 housing units)**

Figures T-14 and **T-15** 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.

Figure T-14 Estimated Number of Housing Units by Participating Jurisdiction Potentially Damaged by a Tornado					
Participating Jurisdiction	**Total Housing Units (2016-2020)**	**Land Area/Refined Land Area (Sq. Miles) (2010)**	**Average Housing Unit Density (Units/Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.10 Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.10 Sq. Mi.) (Rounded Up)**
Greenup [a]	819	0.537	---	152.51	153
Neoga [1,b]	639	0.539	---	118.55	119
Toledo [2,a]	542	0.538	---	100.74	101
Unincorp. County	2,768	340.935	8.119	1.22	2
County	4,879	346.024	14.100	2.12	3

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

Figure T-15 Estimated Number of Housing Units by Township Potentially Damaged by a Tornado					
Township	**Total Housing Units (2016-2020)**	**Land Area (Sq. Miles) (2010)**	**Average Housing Unit Density (Units/Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.10 Sq. Mi.) (Raw)**	**Potentially-Damaged Housing Units (Units/0.10 Sq. Mi.) (Rounded Up)**
Cottonwood [2,a,b]	232	32.668	7.102	1.07	2
Crooked Creek [a]	165	34.167	4.829	0.72	1
Greenup [a]	1,239	47.435	26.120	3.92	4
Neoga [1,a,b]	1,373	54.682	25.109	3.77	4
Spring Point [2,3,a,b]	468	55.963	8.363	1.25	2
Sumpter [2,a,b]	933	45.690	20.420	3.06	4
Union [a]	176	52.766	3.335	0.50	1
Woodbury [2,a]	293	22.653	12.934	1.94	2
Townships - 3 most populated	3,545	147.807	23.984	3.60	4
Townships - 5 least populated	1,334	198.217	6.730	1.01	2

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #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.)

Unincorporated Cumberland County/Fire Protection Districts

For Cumberland County the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is considered to be **low**. This assessment is based on the amount of damage that has been sustained tempered by the frequency with which tornadoes have occurred in the County, the low population density throughout most the County, and the absence of high risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have caused significant damage on several occasions.

Participating Municipalities (including Schools)

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.

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 Cumberland 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: 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 Cumberland County is approximately one-third of the market value). **Figure T-16** provides a sample calculation. The total assessed value is based on 2020 tax assessment information provided by the Cumberland County Clerk.

Figure T-16
Sample Calculation of Average Assessed Value & Average Market Value – Greenup

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value (Rounded to the Nearest Dollar)

Greenup: $10,160,912 ÷ 819 housing units = $12,406

Average Market Value

Average Assessed Value x 3 = Average Market Value

Greenup: $12,406 x 3 = $37,218

($37,218)

Figures T-17 and **T-18** provide 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 T-17
Average Market Value of Housing Units by Municipality

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2020)	Total Housing Units (2010)	Average Assessed Values	Average Market Value (2020)
Greenup [a]	$10,160,912	819	$12,406	$37,218
Neoga [1,b]	$11,657,342	639	$18,243	$54,729
Toledo [2,a]	$8,498,552	542	$15,680	$47,040
Unincorp. County	$52,836,307	2,768	$19,088	$57,264
County	$84,120,946	4,879	$17,241	$51,723

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3
Source: Cumberland County Clerk.

Assumption #5

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

Assumption #5: 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 is complex and provides an additional complication when updating the Plan.

Figure T-18
Average Market Value of Housing Units by Township

Township	Total Assessed Value of Residential Buildings (2020)	Total Housing Units (2010)	Average Assessed Values	Average Market Value (2020)
Cottonwood [2,a,b]	$2,847,850	232	$12,275	$36,826
Crooked Creek [a]	$2,283,959	165	$13,842	$41,527
Greenup [a]	$15,847,263	1,239	$12,790	$38,371
Neoga [1,a,b]	$34,310,652	1,373	$24,990	$74,969
Spring Point [2,3,a,b]	$8,510,206	468	$18,184	$54,553
Sumpter [2,a,b]	$13,944,280	933	$14,946	$44,837
Union [a]	$3,412,075	176	$19,387	$58,160
Woodbury [2,a]	$2,964,661	293	$10,118	$30,355
Townships - 3 most populated	$64,102,195	3,545	$18,082	$54,247
Townships - 5 least populated	$20,018,751	1,334	$15,007	$45,020

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3
Source: Cumberland County Clerk.

<u>Calculating Potential Dollar Losses</u>
With all the decisions and assumptions made, the potential dollar losses can now be calculated. First, the potential dollar losses to the **structure** of a potentially-damaged housing unit 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 T-19** provides a sample calculation.

Figure T-19
Structure: Potential Dollar Loss Sample Calculation – Greenup

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit
Greenup: $37,218 x 100% = $37,218 per housing unit

Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = Structure Potential Dollar Losses
Greenup: $37,218 per housing unit x 153 housing units = $5,694,354
($5,694,354)

Next, the potential dollar losses to the **content** of a potentially-damaged housing unit 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 T-20** provides a sample calculation.

Figure T-20 **Content: Potential Dollar Loss Sample Calculation - Greenup**
½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit Greenup: ½ ($37,218) x 100% = $18,609 per housing unit
Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = Content Potential Dollar Losses Greenup: $18,609 per housing unit x 153 housing units = $2,847,177 **($2,847,177)**

Finally, the **total potential dollar losses** may be calculated by adding together the potential dollar losses to the structure and content. **Figures T-21** and **T-22** give a breakdown of the total potential dollar losses by municipality and township.

Figure T-21
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Jurisdiction

Participating Jurisdiction	Average Market Value (2020)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Greenup [a]	$37,218	153	$5,694,354	$2,847,177	$8,541,531
Neoga [1,b]	$54,729	119	$6,512,751	$3,256,376	$9,769,127
Toledo [2,a]	$47,040	101	$4,751,040	$2,375,520	$7,126,560
Unincorp. County	$57,264	2	$114,528	$57,264	$171,792
County	$51,723	3	$155,169	$77,585	$232,754

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

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 Cumberland County would be expected to exceed at least $7.1 million in any of the participating municipalities.**

For comparison, an estimate of potential dollar losses was calculated for the entire County, the unincorporated portions of the County, the three most populated townships and the five least populated townships. As discussed previously, the estimate for the entire County is skewed because it does not take into consideration the differences in the housing density.

Figure T-22
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township

Township	Average Market Value (2020)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Cottonwood [2,a,b]	$36,826	2	$73,652	$36,826	$110,478
Crooked Creek [a]	$41,527	1	$41,527	$20,764	$62,291
Greenup [a]	$38,371	4	$153,484	$76,742	$230,226
Neoga [1,a,b]	$74,969	4	$299,876	$149,938	$449,814
Spring Point [2,3,a,b]	$54,553	2	$109,106	$54,553	$163,659
Sumpter [2,a,b]	$44,837	4	$179,348	$89,674	$269,022
Union [a]	$58,160	1	$58,160	$29,080	$87,240
Woodbury [2,a]	$30,355	2	$60,710	$30,355	$91,065
Townships - 3 most populated	$54,247	4	$216,988	$108,494	$325,482
Townships - 5 least populated	$45,020	2	$90,040	$45,020	$135,060

[1] Neoga FPD [2] Toledo FPD [3] Sigel FPD
[a] Cumberland CUSD #77 [b] Neoga CUSD #3

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.

3.7 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.

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 28 drought events with losses exceeding $1 billion each (CPI-Adjusted) across the U.S. between 1980 and 2021. 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 U.S. 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 U.S. 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 U.S. It is unique in that it combines a variety of numeric-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 the current drought conditions across the U.S. The USDM is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture (USDA), and the National Oceanic and Atmospheric Administration (NOAA).

The USDM has a scale of five intensity categories, D0 through D4, that are utilized to identify areas of drought. **Figure DR-1** provides a brief description of each category.

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.

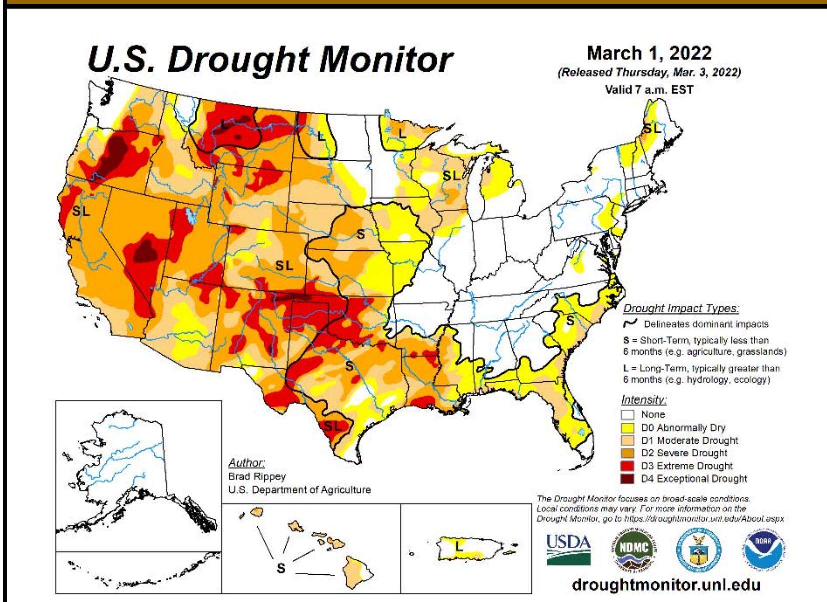
In addition to identifying and categorizing general areas of drought, the USDM also identifies whether a drought's impacts are short-term (typically less than 6 months – agriculture, grasslands) or long-term (typically more than 6 months – hydrology, ecology). **Figure DR-2** shows an example of the USDM weekly map. The USDM is designed to provide a consistent big-picture look at drought conditions in the U.S. It is not designed to infer specifics about local conditions.

Figure DR-1
U.S. Drought Monitor – Drought Intensity Categories

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.

Figure DR-2
U. S. Drought Monitor



The U.S. Drought Monitor 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. Map Courtesy of NDMC.

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 (1980 – 2021): ***6***

Table 10, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of the drought events recorded in Cumberland County. NOAA's Storm Events Database, the Illinois State Water Survey, the Illinois Emergency Management Agency (IEMA), the NDMC at the University of Nebraska-Lincoln, and the USDA have documented six official droughts for Cumberland County between 1980 and 2021.

The recorded drought events ranged in length from three to 16 months. On the six drought events, two began in May, two began in June, and two began in August. Of the four drought events that were assigned drought intensity category ratings by the USDM, the 2012 drought reached D3, extreme drought.

The State of Illinois Drought Preparedness and Response Plan identified seven additional outstanding statewide droughts since 1900 based on statewide summer values of the PDSI provided by NOAA's National Center for Environmental Information. Those seven droughts occurred in 1902, 1915, 1931, 1934, 1936, 1954 and 1964; however, the extent to which Cumberland 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 2018 Illinois Natural Hazard Mitigation Plan classifies Cumberland County's hazard rating for drought as "medium."

What is the probability of future drought events occurring?

Cumberland County, including the participating jurisdictions, has experienced six droughts between 1980 and 2021. With six occurrences over 42 years, the probability or likelihood that the County may experience a drought in any given year is 14%. However, if earlier recorded droughts are factored in, then the probability that Cumberland County may experience a drought in any given year decreases to 11%.

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 Cumberland County, including the participating jurisdictions, is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provides protection for any area within the County. Since 2012, Cumberland County has experienced one drought.

Do any of the participating jurisdictions consider drought to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considered severe storms to be among their jurisdiction's greatest vulnerabilities.

Cumberland County: A large percentage of the population are farmers who rely on rain for crop and livestock production and are adversely impacted by drought.

Sigel FPD: Sigel's drinking water supply is at risk to a prolonged drought, potentially impacting the District's ability to fight fires.

What impacts resulted from the recorded drought events?

Damage information was only available for one of the six drought events experienced between 1980 and 2021. According to NOAA's Storm Events Database, the 2012 drought caused an estimated $23.7 million in corn crop damages in Cumberland County. Damage information was either unavailable or none was recorded for the remaining five reported occurrences.

Drought Fast Facts – Impacts/Risk

Drought Impacts:
- Total Property Damage: ***n/a***
- Total Crop Damage: ***$ 23.7 million (2012 drought – corn crop damage only)***

Drought Risk/Vulnerability:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

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.

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 a major industry in Cumberland County. Farmland accounts for approximately 77% of all the land in the County. According to the 2017 Census of Agriculture, there were 724 farms in Cumberland County occupying approximately 171,760 acres. Of the land in farms, approximately 85% or 145,996 acres are in crop production. Less than 1% of the land in crop production is irrigated.

According to the 2017 Census of Agriculture, total crop and livestock sales accounted for $120.6 million in revenue. This is a 35.4% increase in revenue from the 2012 Census of Agriculture when the total crop and livestock sales accounted for $89.1 million. Cumberland County ranks 28th in Illinois for livestock cash receipts. A severe drought would have a major 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, 2007, 2011 and 2012 droughts. **Figure DR-3** illustrates the reduction yields seen for corn and soybeans during the five recorded drought events. The USDA's National Agricultural Statistics Service records show that yield reductions for corn and soybeans were most severe for the 1983 drought when there was a 48.8% reduction in corn yields and a 36.1% reduction in soybean yields.

Figure DR-3
Crop Yield Reductions Due to Drought – Cumberland County

Year	Corn		Soybeans	
	Yield (bushel)	% Reduction Previous Year	Yield (bushel)	% Reduction Previous Year
1982	121.0	---	36.0	---
1983	**62.0**	**48.8%**	**23.0**	**36.1%**
1984	103.0	---	28.5	---
1987	141.0	---	34.0	---
1988	**90.0**	**36.2%**	**26.0**	**23.5%**
1989	125.0	---	36.5	---
2004	173.0	---	50.0	---
2005	**136.0**	**21.4%**	**45.0**	**10.0%**
2006	148.0	---	50.0	---
2007	166.0	---	**46.0**	**8.0%**
2008	170.0	---	44.0	---
2010	146.7	---	49.9	---
2011	146.9	---	**45.6**	**8.6%**
2012	**34.3**	**76.7%**	**43.3**	**5.0%**

Source: USDA, National Agricultural Statistics Service.

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 Cumberland County, ***none of the participating municipalities rely exclusively on surface water sources*** for their drinking water supply. All obtain drinking water from wells in unconfined sand and gravel aquifers ranging from 39.5 feet to 47.5 feet in depth. Greenup and Toledo obtain their water from wells at these depths, making them potentially vulnerable to the effects of a prolonged drought. Neoga purchases its water from E.J. Water, which obtains its water from the Kaskaskia River and deeper wells in sand and gravel aquifers in the Embarras River basin.

While some of the participating municipalities 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 Cumberland County and the participating jurisdictions 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, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in aquifer water levels 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 wells, 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 majority 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.).

3.8 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 U.S. are exposed to potentially damaging ground shaking from earthquakes. More than 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 U.S. (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, reverse (thrust) and strike-slip (lateral).

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. Reverse or thrust 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 EQ-1** 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 U.S. 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.

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.

Figure EQ-1
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, UPSeis

Although numerous intensity scales have been developed over the years, the one currently used in the U.S. 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 EQ-2** 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.

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.

Figure EQ-2
Comparison of Richter Scale and Modified Mercalli Intensity Scale

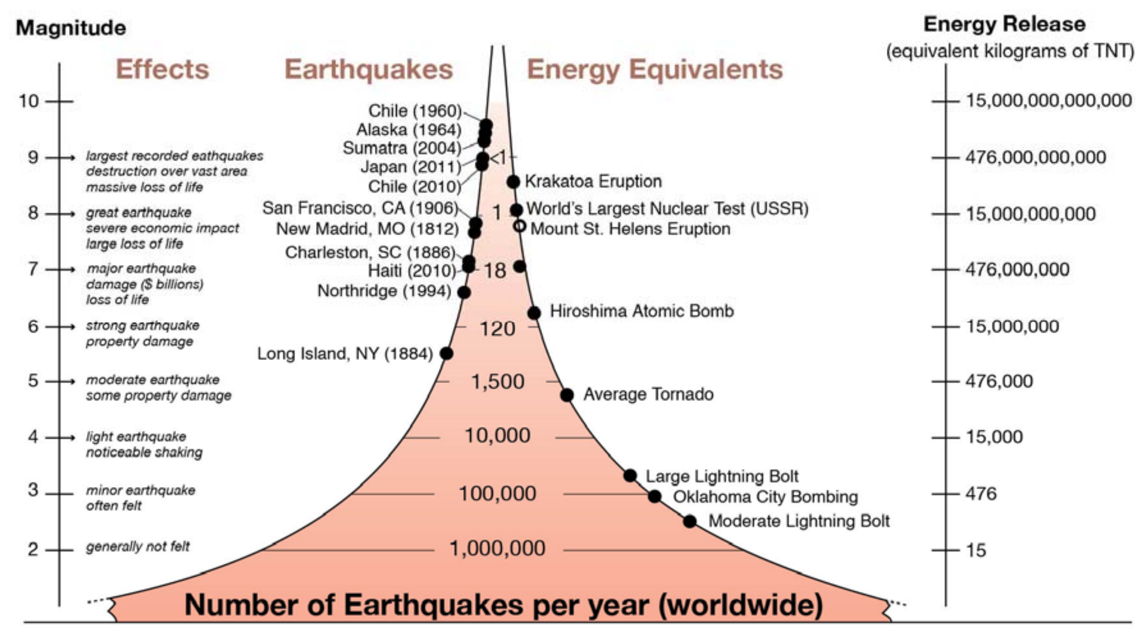
Richter Scale	Modified Mercalli Scale	Observations
1.0 – 1.9	I	Felt by very few people; barely noticeable. No damage.
2.0 – 2.9	II	Felt by a few people, especially on the upper floors of buildings. No damage.
3.0 – 3.9	III	Noticeable indoors, especially on the upper floors of buildings, but may not be 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.

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 EQ-3** 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 EQ-3
Approximate Number of Earthquakes Recorded Annually



Source: Incorporated Research Institutions for Seismology, Education and Outreach Series, "How Often Do Earthquakes Occur?"

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 located in Cumberland County. However, there are three geological structures, the Mattoon Anticline, the Charleston Monocline and the Bogota-Rinard Syncline, which run through the County. The following provides a brief description of each while **Figure EQ-4** illustrates the location of these geologic structures.

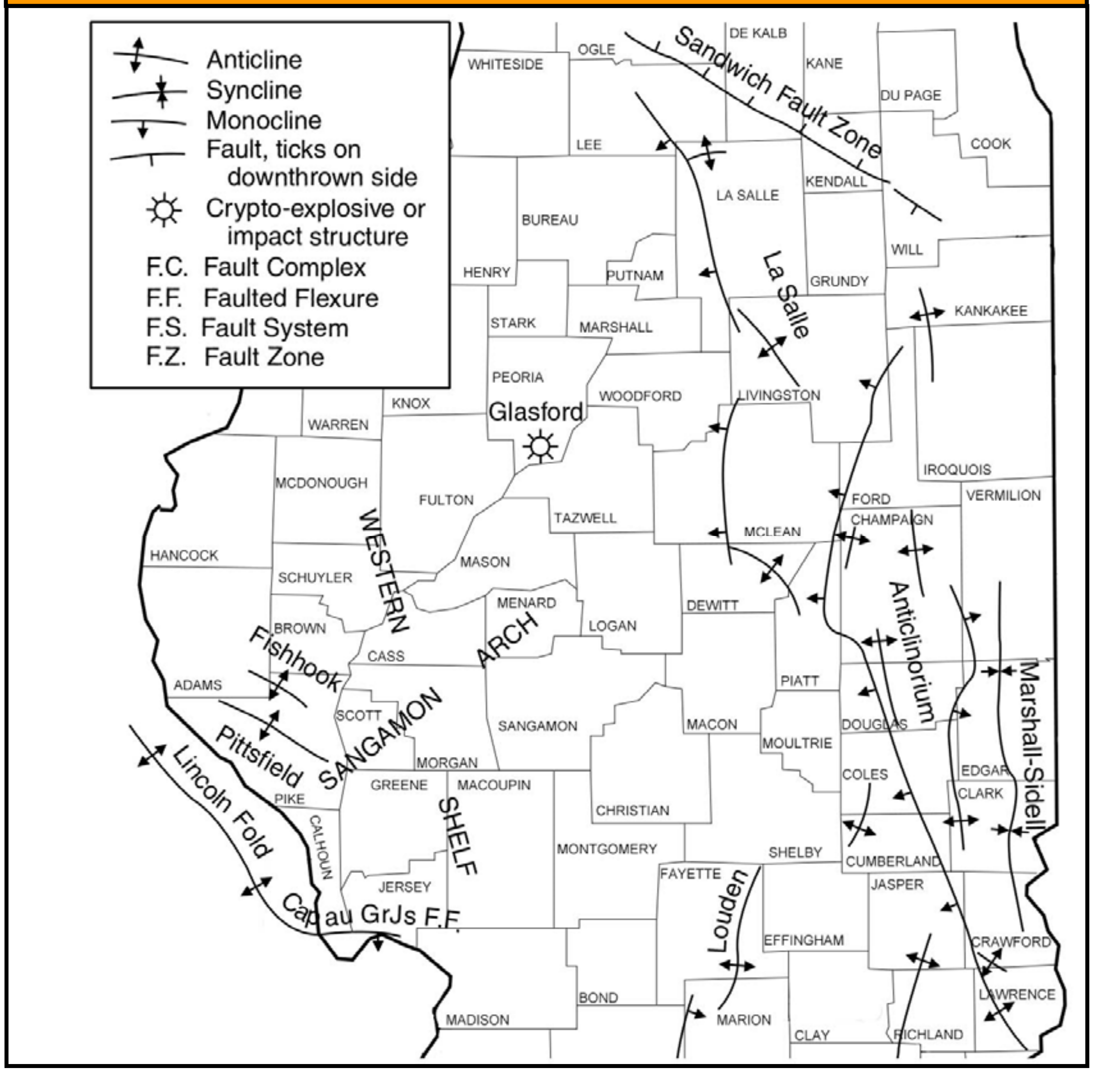
❖ Mattoon Anticline: The Mattoon Anticline generally runs northeast to southwest along the western edge of Cumberland County. This anticline begins in Coles County east of Mattoon and extends southward into Cumberland County.

❖ Charleston Monocline: The Charleston Monocline marks the west edge of the southern part of the La Salle Anticlinorium. This monocline runs southeast to northwest from Lawrence County, along the eastern edge of Cumberland County and terminates at the north end of the Tuscola Anticline in Douglas County. The La Salle Anticlinorium itself is more than 200 miles long and stretches from Lee County in northern Illinois to Lawrence County in southeastern

Illinois. It is composed of a group of closely related anticlines, domes, monoclines, and synclines, several of which, like the Charleston Monocline, are individually named.

❖ Bogota-Rinard Syncline: While not illustrated on Figure EQ-4, the Bogota-Rinard Syncline winds a sinuous course south from northern Coles County to Wayne County bisecting Cumberland County.

Figure EQ-4
Geological Structures in Central Illinois



Source: Illinois State Geological Survey.

When have earthquakes occurred previously? What is the extent of these previous quakes?

<u>Earthquake Fast Facts – Occurrences</u>

Earthquakes Originating in the County (1795 – 2021): ***None***

Fault Zones Located within the County: ***None***

Geological Structures Located within the County: ***3***

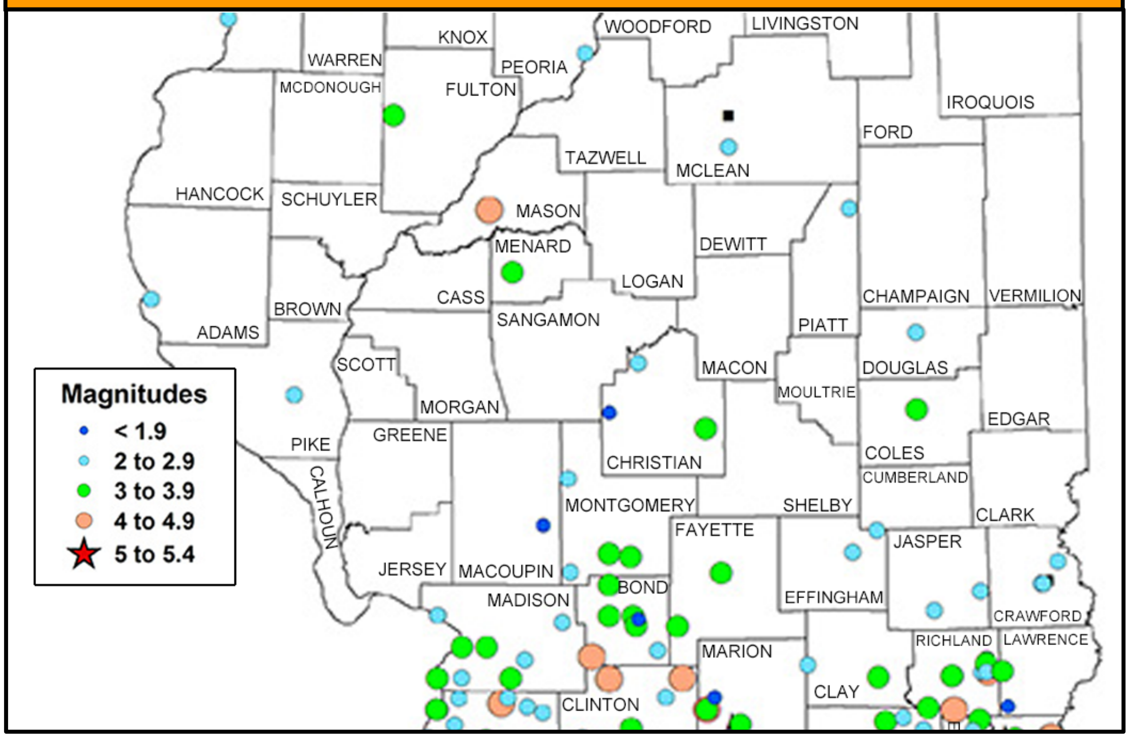
Earthquakes Originating in Adjacent Counties (1795-2021): ***6***

Fault Zones Located in Nearby Counties: ***None***

Geologic Structures Located in Adjacent Counties: ***7***

According to the Illinois State Geological Survey, the U.S. Geological Survey and Center for Earthquake Research and Information (CERI) at the University of Memphis, no earthquakes have originated in Cumberland 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 of these events while **Figure EQ-5** illustrates the epicenters this and nearby earthquakes.

Figure EQ-5
Earthquakes Originating in Cumberland Illinois



Source: Illinois State Geological Survey.

<u>East-Central Illinois</u>

Six earthquakes have originated in nearby Coles, Effingham, and Jasper Counties. The following provides a brief description of each.

❖ On November 12, 1903, an earthquake with an estimated magnitude between 2.0 to 2.9 originated near Teutopolis in Effingham County. This earthquake had an intensity of II on the Modified Mercalli Scale.

❖ A magnitude 3.1 earthquake occurred on February 28, 1977 approximately 0.5 miles west-northwest of Montrose, just south of the Cumberland/Effingham border in Effingham County. No intensity scale rating was located for this event.

- On August 29, 1984, a magnitude 2.7 earthquake took place southwest of Willow Hill in Jasper County. No intensity scale rating was located for this event.
- A magnitude 2.9 earthquake occurred on July 15, 1987 south of Newton in Jasper County. No intensity scale rating was located for this event.
- On April 24, 1990, a magnitude 2.9 earthquake took place southwest of Newton in Jasper County. No intensity scale rating was located for this event.
- A magnitude 2.9 earthquake occurred on April 24, 1990, northwest of Charleston in Coles County. No intensity scale rating was located for this event.

Southern Illinois

In addition to the above referenced events, Cumberland County residents also felt ground shaking caused by several earthquakes that have originated in southern 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 U.S. 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 U.S. and southern Ontario, Canada.
- The strongest earthquake in the central U.S. 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 U.S. and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental U.S. 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.

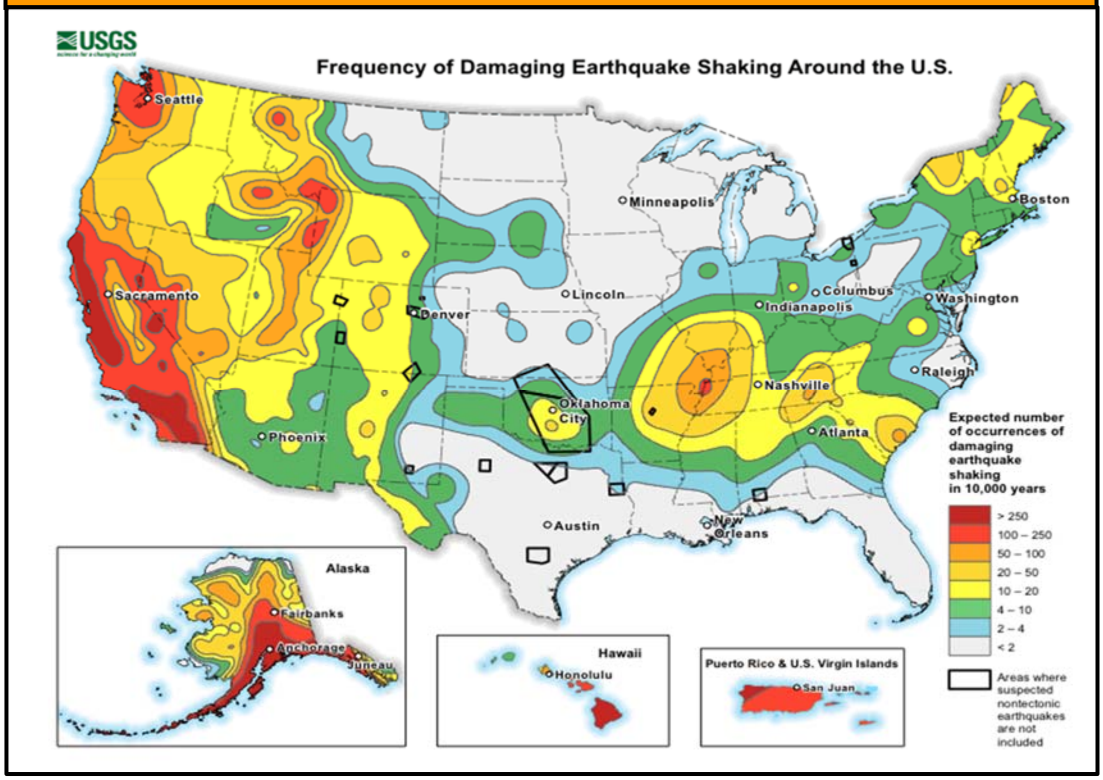
The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the U.S. east of the Rockies. Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes? What is the extent of future potential earthquakes?

Earthquake events generally affect the entire County. Earthquakes, like drought, impact large areas extending across an entire region and affecting multiple counties. Cumberland County's proximity to multiple fault zones, both large and small, makes the entire area likely to be affected by an earthquake if these faults become seismically active. The 2018 Illinois Natural Hazard Mitigation Plan classifies Cumberland County's hazard rating for earthquakes as "medium."

According to the USGS, Cumberland County can expect 20 to 50 occurrences of damaging earthquake shaking over a 10,000-year period. **Figure EQ-6** illustrates the frequency of damaging earthquake shaking around the U.S.

Figure EQ-6
Frequency of Damaging Earthquake Shaking Around the U.S.



Source: U.S. Geological Survey.

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 U.S. 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 Cumberland County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central U.S. 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.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability:
- Public Health & Safety – Light/Moderate Quake within the County or immediate region: ***Low***
- Public Health & Safety – Major Quake in the region: ***Medium***
- Buildings/Infrastructure/Critical Facilities – Light/ Moderate Quake within the County or immediate region: ***Low***
- Buildings/Infrastructure/Critical Facilities – Major Quake in the region: ***Medium***

This vulnerability, found throughout most of Illinois and all of Cumberland 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 Cumberland 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 Cumberland County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating municipalities to develop largely without regard to earthquake safety.

Do any of the participating jurisdictions consider earthquakes to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered earthquakes to be among their community's greatest vulnerabilities.

What impacts resulted from the recorded earthquake events?

While Cumberland County residents felt the earthquakes that have occurred in Illinois, 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 Cumberland 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 EQ-7** 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 Cumberland 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 structures in the immediate region, the risk or vulnerability to public health and safety is considered ***low***. This risk is elevated to ***medium*** for a major earthquake originating along seismic zones in the region (i.e., Wabash Valley or New Madrid.)

Are existing buildings, infrastructure, and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in Cumberland County and the participating jurisdictions are vulnerable to damage from earthquakes. However, given the County's size (just over 10,700 individuals), its population density, the fact that there are very few buildings higher than two stories (with the exception of grain elevators and a few multi-story buildings in Toledo) tempered by the potential for magnitude 5.0 and above earthquakes to occur in the immediate region, the damage is anticipated to be slight to considerable for well-built ordinary structures and considerable to severe for poorly-built structures.

If a strong earthquake (6.0 – 6.9) were to occur in the region, then unreinforced masonry buildings are most at risk during an earthquake 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. **Figure EQ-8**, located at the end of this section, identifies the number of unreinforced masonry buildings that serve as critical facilities within the participating jurisdictions.

If the epicenter of a magnitude 7.6 earthquake were to originate anywhere along the New Madrid seismic zone, the highest projected Modified Mercalli intensity felt in Cumberland County would be a VI according to the *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency.

Figure EQ-7
Potential Earthquake Impacts

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, U.S., and State Routes (especially if the quake originates along the Wabash Valley 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

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. **Figure R-6** lists the number of each type of critical infrastructure by jurisdiction.

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 is considered to be ***low*** for a light to moderate earthquake that originates within the County or immediate region. This risk is elevated to ***medium*** for a major earthquake originating along seismic zones in the region (i.e., Wabash Valley or New Madrid.)

Are future buildings, infrastructure, and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in Cumberland County and the participating jurisdictions are vulnerable to damage from earthquakes. While Neoga has 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 that impacted Cumberland County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. However, according to the Cumberland County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $105,676,689. Since all of the structures in the planning area are susceptible to earthquake impacts to varying degrees, this total represents the countywide property exposure to earthquake events.

Given Cumberland 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.

Figure EQ-8 **Number of Unreinforced Masonry Buildings Serving as Critical Facilities by Jurisdiction**									
Participating Jurisdiction	Government[1]	Law Enforcement	Fire Stations	Ambulance Service	Schools	Drinking Water	Wastewater Treatment	Medical[2]	Healthcare Facilities[3]
Cumberland County	1	---	---	---	---	---	---	---	---
Greenup	2	1	1	1	---	1	---	1	1
Neoga	1	---	---	---	---	---	1	---	---
Toledo	4	---	2	1	---	---	---	1	---
Cumberland CUSD #77	---	---	---	---	---	---	---	---	---
Neoga CUSD #3	---	---	---	---	---	---	---	---	---
Neoga Fire Protection District	1	---	---	---	---	---	1	---	1
Toledo Fire Protection District	4	---	2	1	---	---	---	1	---
Sigel Fire Protection District	---	---	---	---	1	---	---	---	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, etc.
[2] Medical includes: public health departments, hospitals, urgent/prompt care, and medical clinics.
[3] Healthcare Facilities include: nursing homes, skilled care facilities, memory care facilities, residential group homes, etc.
--- Indicates jurisdiction does not own/maintain any critical facilities within that category.

3.9 MAN-MADE HAZARDS

While the focus of this Plan update is on natural hazards, an **overview of selected man-made hazards** has been included. The Planning Committee recognizes that man-made hazards can also pose risks to public health and property. The extent and magnitude of the impacts that result from man-made hazard events can be influenced by natural hazard events. For example, severe winter storms can cause accidents involving trucks transporting hazardous substances. These accidents may lead to the release of these substances, which can result in injury and potential contamination of the natural environment.

Consequently, the Planning Committee decided to summarize the more prominent man-made hazards in Cumberland County. The man-made hazards profiled in this Plan update include:

- Hazardous Substances
  - Generation
  - Transportation
  - Storage/Handling
- Waste Disposal
- Hazardous Material Incidents
- Hazardous Waste Remediation
- Terrorism

While the man-made hazards risk assessment does not have the same depth as the natural hazards risk assessment, it does provide useful information that places the various man-made hazards in perspective.

3.9.1 Hazardous Substances

Hazardous substances broadly include any flammable, explosive, biological, chemical, or physical material that has the potential to harm public health or the environment. For the purposes of this Plan, the term hazardous substance includes hazardous product and hazardous waste. A hazardous waste is defined as the byproduct of a manufacturing process that is either listed or has the characteristics of ignitability, corrosivity, reactivity, or toxicity and cannot be reused. A hazardous product is all other hazardous material.

Hazardous substances can pose a public health threat to individuals at their workplace and where they reside. The type and quantity of the substance, the pathway of exposure (inhalation, ingestion, dermal, etc.), and the frequency of exposure are factors that will determine the risk of adverse health effects experienced by individuals. Impacts can range from minor, short-term health issues to chronic, long-term illnesses.

In addition to impacting public health, hazardous substances can also cause damage to buildings, infrastructure, and the environment. Incidents involving hazardous substances can range from minor (scarring on building floors and walls) to catastrophic (i.e., destruction of entire buildings, structural damage to roadways, etc.) and lead to injuries and fatalities. The number of incidents involving hazardous substances in Illinois and across the U.S. every year underscores the need for trained and equipped emergency responders to minimize damages.

Since 1970, significant changes have occurred in regard to how hazardous substances are transported and disposed. Comprehensive regulations and improved safety and industrial hygiene practices have reduced the frequency of incidents involving hazardous substances. Based on the small number of facilities in Cumberland County that generate and use hazardous substances, the population size, transportation patterns, and land use, the probability of a release occurring in Cumberland County should remain moderate compared to other counties in Illinois. The relatively low numbers of transportation incidents should not diminish municipal or county commitment to emergency management.

HAZARD PROFILE – HAZARDOUS SUBSTANCES

The following subsections identify the general pathways – generation, transportation, and storage/handling – by which hazardous substances pose a risk to public health and the environment in Cumberland County.

Hazardous Substances Fast Facts - Occurrences

Generation
Number of Facilities that Generate Reportable Quantities of Hazardous Substances (2020): ***0***

Transportation
Number of Roadway Incidents Involving Hazardous Substance Shipments (2011 – 2020): ***24***

Number of Railway Accidents/Incidents Involving Hazardous Substance Shipments (2011 – 2020): ***0***

Number of Pipeline Incidents Involving Hazardous Substances (2011 – 2020): ***0***

Storage/Handling
Number of Facilities that Store/Handle Hazardous Substances (2020): ***11***

Number of Facilities that Store/Handle Extremely Hazardous Substances (2020): ***4***

3.9.1.1 Generation

Cumberland County has no facilities that generate reportable quantities of hazardous substances as a result of their operations according to the U.S. Environmental Protection Agency (USEPA) Toxic Release Inventory.

3.9.1.2 Transportation

Roadways

Illinois has the nation's third largest interstate system and third largest inventory of bridges. According to the Illinois Department of Transportation, there were just over 147,000 miles of highways and streets in Illinois in 2021. Most of the truck traffic in Cumberland County is carried on Interstate 57 and Interstate 70. Other major roadways that carry truck traffic include U.S. Route 40, U.S. Route 45, Illinois Route 121, and Illinois Route 130. While this modern roadway system provides convenience and efficiency for commuters, it also aids in-state and intra-state commerce, which includes the transportation of hazardous substances. A Commodity Flow Study to gauge chemical transport has not yet been conducted for Cumberland County.

For the purposes of this report a roadway incident is generally defined as an accident/incident that occurs while in the process of transporting a hazardous substance(s) on a highway, roadway, access drive, field entrance, rest area, or parking lot. Vehicles that experience a release while refueling are not considered roadway incidents but are instead considered fixed facility incidents.

According to records obtained from the Illinois Emergency Management Agency (IEMA), there were 24 recorded roadway incidents involving the shipment of hazardous waste and/or products in Cumberland County from 2011 through 2020. **Figure MMH-1** provides information on these incidents.

Figure MMH-1
Roadway Incidents* Involving Shipments of Hazardous Substances
2011 – 2020

Date	Area	Location	Hazardous Product Released	Quantity Released
1/13/2011	Greenup^	I-70 near Exit 119	Diesel fuel	50 gallons
2/5/2011	Greenup^	I-70 MP 123	Truck crash carrying unknown hazmat thought to be leaking, but did not	---
2/5/2011	Greenup^	I-70 MP 119	7 unknown liquids, some flammable	> 500 gallons
2/15/2011	Trilla^	US 45 and IL 121	Hydraulic fluid and transformer oil	Unknown
4/21/2011	Toledo^	I-70 MP 113.5	Diesel fuel	100-150 gallons
4/22/2011	Greenup^	I-70 MP 114	Diesel fuel	Unknown
5/28/2011	Greenup^	I-70 MP 119	Diesel fuel	30 gallons
6/7/2011	Neoga	I-57 MP 179	Diesel fuel	350 gallons
6/7/2011	Neoga^	I-57 MP 178	Diesel fuel	Unknown
6/8/2011	Neoga^	I-57 MP 179	Diesel fuel	150 gallons
7/4/2011	Greenup^	I-70 MP 121	Diesel fuel	70 gallons
9/27/2011	Greenup^	I-70 MP 120	Anhydrous ammonia & Diesel fuel	Unknown (ammonia), , 50 gallons (diesel)
10/14/2011	Woodbury^	I-70 MP 111.5	Diesel fuel	< 20 gallons
11/17/2011	Neoga^	True Bridge Road	Diesel fuel	Unknown
3/19/2012	Greenup^	CR 2000E	Anhydrous ammonia	Unknown
6/5/2012	Greenup^	I-70 MP 119.5	Transmission fluid	1,000 pounds
11/2/2012	Neoga^	I-57 MP 173	Diesel fuel	Unknown
2/22/2013	Greenup^	I-70 MP 126	Diesel fuel	Unknown
6/15/2016	Casey^	CR 2480E & CR1050N	Unknown petroleum substance	Unknown
11/7/2016	Neoga^	US 45 & CR 350E	Potash & Dap	Unknown
5/29/2017	Toledo^	1125 550N Road	Diesel fuel	Unknown
4/1/2019	Greenup^	I-70 MP 127	Motor oil	< 5 gallons
3/6/2020	Greenup^	I-70 MP 120	Diesel fuel	Unknown
7/2/2020	Greenup^	I-70 MP 125	Diesel fuel	Unknown

* For the purposes of this report a roadway incident is generally defined as an accident/incident that occurs while in the process of transporting a hazardous substance(s) on a highway, roadway, access drive, field entrance, rest area or parking lot. Vehicles that experience a release while refueling are not considered roadway incidents but are instead considered fixed facility incidents.

^ Accident verified in the vicinity of this area.

Source: Illinois Emergency Management Agency, Hazardous Materials Incident Reports.

<u>Railways</u>

Illinois' rail system is the country's second largest, with the East St. Louis and Chicago terminals being two of the nation's busiest. In Cumberland County there is one Class I rail line operated by CSX. According to the Association of American Railroads, 3,796,300 carloads (125.9 million tons) of freight originated in Illinois in 2019 (the latest year for which data is available). Chemicals accounted for 101,100 carloads (9.7 million tons) or 2.8% of the total freight handled. In comparison, 27,549,000 carloads of freight originated in the U.S. in 2019 with approximately 2,014,000 carloads (7.1%) involved in the transport of chemicals.

The Illinois Commerce Commission (ICC) is required to maintain records on railway accidents/incidents that involve hazardous substances. Their records are divided into three categories. These three categories are described in **Figure MMH-2**.

Figure MMH-2
ICC Hazardous Substances Railroad Accident/Incidents Classification Categories

Category	Description
A	railroad derailments resulting in the release of the hazards substance(s) being transported
B	railroad derailments where hazards substance(s) were being transported but no release occurred
C	releases of hazardous substance(s)s from railroad equipment occurred; however, no railroad derailment was involved

Since 2011, there have been no rail accidents involving hazardous substances in Cumberland County according to the ICC. In comparison, ICC records indicate that since 2011 the annual number of railway accidents in Illinois involving hazardous substances has ranged between 45 and 122. **Figure MMH-3** provides a breakdown by category of the ICC-recorded railway accidents/incidents involving hazardous substances. Included is a comparison of the number of accidents/incidents in Cumberland County to those in Cook and the Collar Counties as well as the rest of Illinois.

Figure MMH-3
ICC Recorded Railway Accidents/Incidents Involving Hazardous Substances
2011 – 2020
(Sheet 1 of 2)

Year	Category	Accident/Incident Location			
		Illinois	Cumberland County	Cook & Collar Counties	All Other Counties
2011	A	8	0	1	7
	B	10	0	9	1
	C	60	0	33	27
2012	A	4	0	2	2
	B	13	0	11	2
	C	73	0	42	31
2013	A	5	0	3	2
	B	23	0	16	7
	C	82	0	51	31
2014	A	2	0	2	0
	B	36	0	22	14
	C	84	0	40	44
2015	A	4	0	3	1
	B	27	0	15	12
	C	69	0	36	33
2016	A	4	0	1	3
	B	14	0	6	8
	C	65	0	33	32

Figure MMH-3 ICC Recorded Railway Accidents/Incidents Involving Hazardous Substances 2011 – 2020 (Sheet 2 of 2)					
Year	**Category**	**Accident/Incident Location**			
		Illinois	**Cumberland County**	**Cook & Collar Counties**	**All Other Counties**
2017	A	2	0	1	1
	B	14	0	9	5
	C	69	0	34	35
2018	A	1	0	0	1
	B	8	0	4	4
	C	55	0	24	31
2019	A	6	0	4	2
	B	6	0	4	2
	C	33	0	12	21
2020	A	4	0	2	2
	B	7	0	5	2
	C	46	0	30	16

Source: Illinois Commerce Commission.

According to IEMA's hazardous materials incident records for the same time period, there were no rail accidents/incidents involving the release of hazardous substances in the County.

The top 20 hazardous substances moved by rail through Illinois include: sodium hydroxide, petroleum gases (liquefied), sulfuric acid, anhydrous ammonia, chlorine, sulfur, vinyl chloride, propane, fuel oil, denatured alcohol, methanol, gasoline, phosphoric acid, hydrochloric acid, styrene monomer, carbon dioxide (refrigerated liquid), ammonium nitrate, sodium chlorate, and diesel fuel.

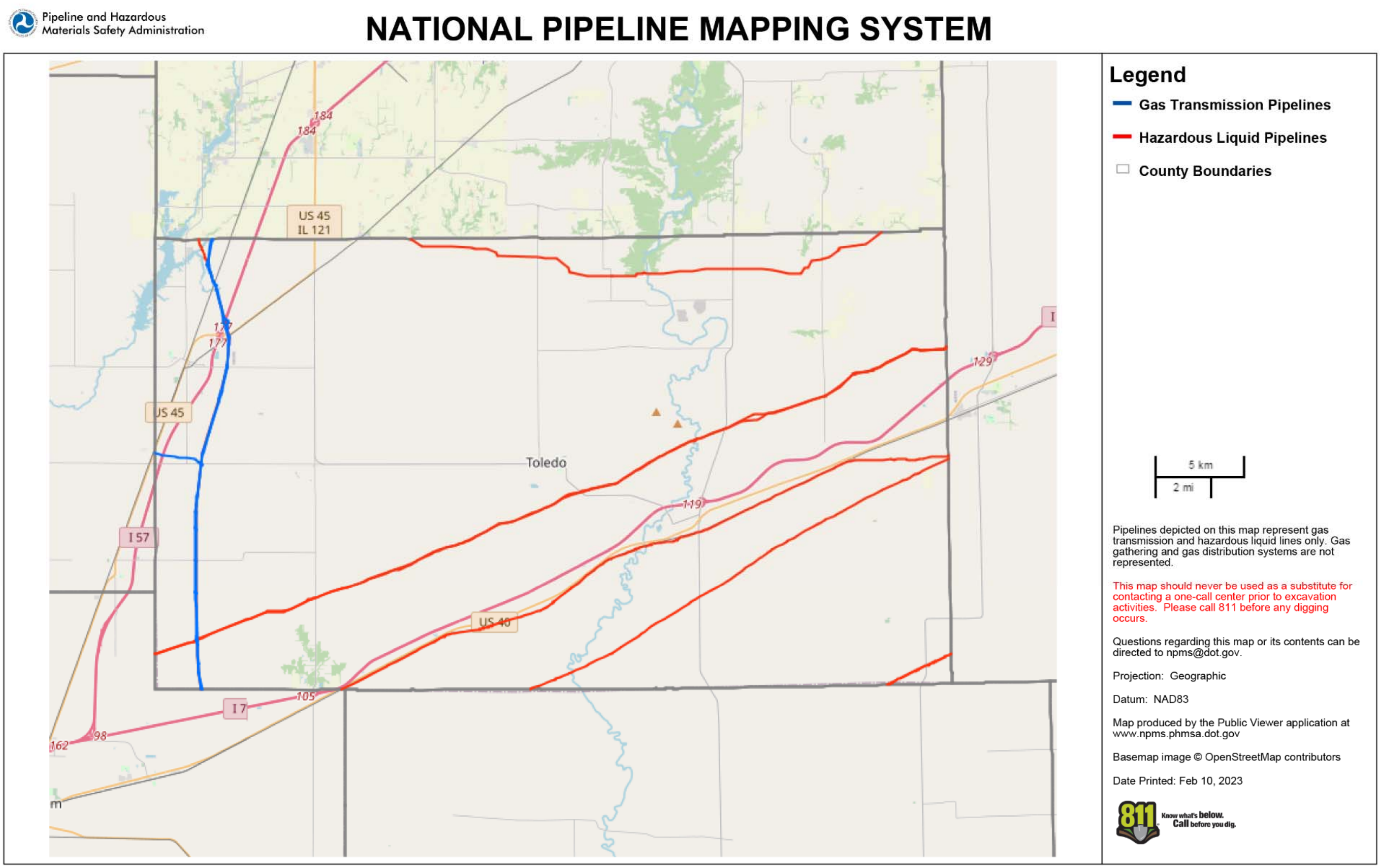
<u>Pipelines</u>

Energy gases (natural gas and liquefied petroleum gas), petroleum liquids (crude oil and gasoline), and liquid and gas products used in industrial processes are carried in above-ground and buried pipelines across Illinois. In Cumberland County, there are seven interstate hazardous liquids pipelines and two intrastate natural gas pipelines according to the U.S. Department of Transportation's National Pipeline Mapping System. Four of the hazardous liquids pipelines are owned by Marathon Pipeline LLC (three refined petroleum products, one crude oil), one is owned by Buckeye Partners (refined petroleum products), one is owned by New Star (anhydrous ammonia), and another is permanently abandoned. The natural gas pipelines are owned by the Trunkline Gas Company. **No pipeline releases occurred in the County during a 10-year period from 2011 through 2020. Figure MMH-4** shows the pipelines in Cumberland County.

There have been several high-profile incidents across the U.S., including one in Illinois, that have raised public concerns about our aging pipeline infrastructure. The following provides a brief description of each incident.

- On July 26, 2010, a 30-inch liquid product pipeline rupture near Marshall, Michigan and released at least 840,000 gallons of oil into a creek that led to the Kalamazoo River, a tributary of Lake Michigan.

Figure MMH-4
Pipeline Location Map



- On September 9, 2010, another pipeline release received national attention. A 34-inch liquid product pipeline in the Chicago suburb of Romeoville, Illinois released more than 360,000 gallons of crude oil that flowed through sewers and into a retention pond narrowly avoiding the Des Plaines River. This release triggered numerous odor complaints from residents in the adjacent municipalities of Lemont and Bolingbrook. The property damage/cleanup costs were estimated at $46.6 million.
- Also, on September 9, 2010, a 30-inch high pressure natural gas pipeline ruptured in the San Francisco suburb of San Bruno, California that resulted in an explosion that killed eight people, injured 51, destroyed more than 30 homes and damaged an entire neighborhood. The property damage was estimated at around $55 million.
- On March 12, 2014, a gas main rupture in Manhattan, New York resulted in an explosion that killed eight people and leveled two multi-use, five story buildings.
- On May 19, 2015, a 24-inch liquid product pipeline ruptured near Refugio State Beach in Santa Barbara County, California and released approximately 100,000 gallons of crude oil. The release occurred along a rustic stretch of coastline that forms the northern boundary of the Santa Barbara Channel, home to a rich array of sea life. Oil ran down a ravine and entered the Pacific Ocean, blackening area beaches, creating a 9-mile oil slick and impacting birds, marine mammals, fish, and coastal and subtidal habitats.

Continual monitoring and maintenance of these pipelines is necessary to prevent malfunctions from corrosion, aging, or other factors that could lead to a release. In addition to normal wear and tear experienced by pipelines, the possibility of sabotage and seismic activity triggering a release must be considered when contemplating emergency response scenarios.

3.9.1.3 Storage/Handling

Beyond knowing where hazardous substances are generated and the methods and routes used to transport them, it is important to identify where hazardous substances are handled and stored. This information will help government officials and emergency management professionals make informed choices on how to better protect human health, property and the environment and what resources are needed should an incident take place.

Records obtained from IEMA's Tier II database were used to gather information on the facilities that generate, use and store chemicals in excess of reportable threshold quantities within Cumberland County. The Tier II information was then compared with USEPA's Toxic Release Inventory (TRI) and information from Illinois Environmental Protection Agency (IEPA) databases. This review identified 11 facilities within Cumberland County in 2020 that store and handle hazardous substances.

Of these 11 facilities, four reported the presence of Extremely Hazardous Substances (EHSs) at their facilities. An EHS is any USEPA-identified chemical that could cause serious, irreversible health effects from an accidental release. There are approximately 400 chemicals identified as EHSs. Stationary sources that possess one or more of these substances at or above threshold reporting quantities are required to notify IEMA.

Figure MMH-5 identifies the types of EHSs and the facilities that store and handle them. Aside from EHSs, there are other chemicals, such as water reactive chemicals, that can pose risks that are equal to or greater than the risks posed by EHSs. These risks can be identified through a Threat and Hazard Identification and Risk Assessment (THIRA).

Figure MMH-5
Extremely Hazardous Substances by Facility – 2020

Facility Name	Extremely Hazardous Substance(s)
Toledo	
Nutrien Ag Solutions 725	anhydrous ammonia
South Central FS, Inc/Toledo South	Paraquat dichloride
Neoga	
Nutrien Ag Solutions 725	anhydrous ammonia
Greenup	
Helena Agri-Enterprises, LLC	anhydrous ammonia

Sources: Illinois Emergency Management Agency, Tier II Hazardous Chemical Reports.
U.S. Environmental Protection Agency, TRI Explorer.

3.9.2 Waste Disposal

Waste disposal has caused surface water and ground water contamination in Illinois and across the U.S. Beginning in the late 1970s substantial regulatory changes strengthened the design, operating and monitoring requirements for landfills where the majority of waste is disposed. These regulatory changes have helped reduce the public health threat posed by landfills.

HAZARD PROFILE – WASTE DISPOSAL

The following subsections identify the general pathways – solid, medical, and hazardous – by which waste disposal poses a risk to public health and the environment in Cumberland County.

3.9.2.1 Solid Waste

While recycling activities have reduced the amount of solid waste (waste generated in households), the majority continues to be disposed of in landfills. As of 2021, there were 36 landfills operating in Illinois.

According IEPA's Annual Landfill Capacity Report issued in July 2022, there are no commercial landfills currently operating in Cumberland County. There is currently one Illinois landfill that serves Cumberland and the adjacent counties, Landfill #33 Ltd. in Effingham County.

Waste Disposal Fast Facts - Occurrences

Solid Waste
Number of Solid Waste Landfills Operating in Cumberland County (2020): ***0***

Number of Landfills Serving Cumberland and adjacent counties (2020): ***1***

Potentially-Infectious Medical Waste (PIMW)
Number of Facilities within the County Permitted to Handle PIMW: ***0***

Hazardous Waste
Number of Commercial Off-Site Hazardous Waste Treatment or Disposal Facilities located in the County: ***0***

3.9.2.2 Potentially- Infectious Medical Waste

Potentially-Infectious Medical Waste (PIMW) is generated in connection with medical research; biological testing; and the diagnosis, treatment or immunization of human beings or animals. PIMW is typically generated at hospitals, nursing homes, medical or veterinary clinics, dental offices, clinical or pharmaceutical laboratories, and research facilities.

According to IEPA's list of permitted PIMW Facilities, there are no facilities permitted to accept medical waste for disposal in Cumberland County.

3.9.2.3 Hazardous Waste

A hazardous waste is defined as the byproduct of a manufacturing process that is either listed or has the characteristics of ignitability, corrosivity, reactivity, or toxicity and cannot be reused.

According to IEPA's Storage, Treatment, Recycling, Incinerating, Transfer Stations and Processing list, there are currently no off-site hazardous waste treatment or disposal facilities located in Cumberland County.

3.9.3 Hazardous Material Incidents

A hazardous material or hazmat incident refers to any accident involving the release of hazardous substances, which broadly include any flammable, explosive, biological, chemical, or physical material that has the potential to harm public health or the environment. These incidents can take place where the substances are used, generated, stored, or while they are being transported. In addition, hazmat incidents also include the release of hazardous substances, such as fuel, used to operate vehicles. These releases can be the result of an accident or a leak.

HAZARD PROFILE – HAZARDOUS MATERIALS INCIDENTS

From 2011 through 2020, there were 44 hazmat incidents recorded in Cumberland County. Of these incidents, 24 (55%) involved transportation incidents/accidents while 20 (45%) occurred at fixed facilities. Twenty of the 24 transportation incidents-accidents (83%) involved petroleum-based products.

Hazmat Incident Fast Facts - Occurrences

Number of Hazardous Material Incidents in Cumberland County (2011 – 2020): ***44***

Number of Transportation-Related Incidents/Accidents: ***24***

Number of Fixed Facility-Related Incidents/Accidents: ***20***

Average Number of Hazardous Material Incidents Experienced Annually: ***4***

Based on the recorded incidents, Cumberland County experienced an average of 4.4 hazmat incidents annually from 2011 through 2020. The types of existing industries; the major transportation corridors through the County which include interstate and Illinois highways, rail and pipeline; and chemical use within and adjacent to the County suggest that hazmat incidents are likely to continue to take place at the rate reflected in the 10-year study period. Constant vigilance, proper training and equipment, and prompt response are needed to minimize the potential impacts of each incident.

3.9.4 Waste Remediation

The improper disposal or containment of special and hazardous waste through the years has led to soil, groundwater, and surface water contamination of sites across the U.S. In order to safeguard human health and the environment, these contaminants must be removed or neutralized so they cannot cause harm. This process is known as waste remediation.

HAZARD PROFILE – WASTE REMEDIATION

In Illinois, waste remediation is handled through several programs including the federal Superfund program, the State Response Action Program, the state Site Remediation Program, and the Leaking Underground Storage Tanks Program. The following provides a brief description of each.

Superfund (CERLCA) Program/National Priorities List
Superfund is a USEPA-led program to clean up sites within the U.S. contaminated by hazardous waste that has been dumped, left out in the open, or otherwise improperly managed and which pose a risk to human health and/or the environment. Sites of national priority among the known or threatened releases of hazardous substances, pollutants or contaminants throughout the U.S. and its territories are identified on the National Priorities List (NPL). Those sites that pose the largest threat to public health and the environment are typically found on the NPL.

According to the NPL database, there are 45 Superfund sites in Illinois. However, there are **no sites** in Cumberland County being **managed through the Superfund program**.

Waste Remediation Fast Facts - Occurrences

Superfund
Number of Superfund Sites in the County: ***0***

Illinois Site Response Action Program
Number of SRAP Sites in the County: ***3***

Illinois Site Remediation Program
Number of SRP Sites in the County: ***3***

Number of SRP Sites with NFR Letters: ***1***

Illinois Leaking Underground Storage Tanks Program
Number of LUST Sites in County: ***21***

Number of LUST Sites with NFR/Non-Lust/4Y Letters: ***13 (62%)***

State Response Action Program (SRAP)
The main objective of the State Response Action Program (SRAP) is to clean up hazardous substances at sites that present an imminent and substantial threat to human health and the environment, but which may not be addressed by other federal or state cleanup programs. The sites handled by the SRAP include abandoned landfills, old manufacturing plants, former waste oil recycling operations, contaminated agrichemical facilities, and other areas where surface water, groundwater, soil, and air may be contaminated with hazardous substances. Since the mid-1980s, cleanup activities have been conducted at more than 500 sites in Illinois through this Program. Once the threat to human health and the environment has been mitigated, some sites are transferred to other state cleanup programs to complete remediation activities.

There are three SRAP sites in Cumberland County. All of the sites have completed the Program.

Illinois Site Remediation Program (SRP)

The Site Remediation Program (SRP) is a voluntary cleanup program that provides applicants the opportunity to receive technical assistance in determining what course of action is needed to remediate sites where hazardous substances, pesticides, or petroleum may be present. The goal of the SRP is to receive a no further remediation determination from IEPA. Most site remediation in Illinois is handled through this Program. Since the mid-1980s, remediation activities have been conducted and monitored at approximately 5,800 sites in Illinois. Properties that satisfy respective IEPA laws and regulations can receive a No Further Remediation (NFR) letter. They must demonstrate, through proper investigation and, when warranted, remedial action, that environmental conditions at their remediation site do not present a significant risk to human health or the environment. This letter describes what remediation activities have been taken and whether any portion of the property, based on future property use, might need additional remediation.

There are three SRP sites in Cumberland County. One of the three SRP sites have received NFR letters. The remaining two sites do not pose an immediate threat to public health or the environment.

Leaking Underground Storage Tank Program (LUST)

The Leaking Underground Storage Tanks Program (LUST) oversees remedial activities associated with petroleum product releases from underground storage tanks (UST). This Program began in the late 1980s as a result of the threats posed by vapors in homes and businesses, contaminated groundwater, and contaminated soil. In Illinois, more than 14,500 acres of soil contaminated by leaking underground tanks have been remediated between 1988 and 2010 (the most recent year for which data was available).

In Cumberland County there are 21 sites involving the remediation of petroleum product releases from underground storage tanks. Thirteen of the 21 LUST sites (approximately 62%) have received NFR letters, other clearance letters, or remediation is virtually complete.

3.9.5 Terrorism

Terrorism has different definitions across the globe. For the purpose of this Plan, terrorism will be defined as any event that includes violent acts which threaten or harm lives, health or property conducted by domestic or foreign individuals or groups aimed at civilians, the federal government or symbolic locations intended to cause widespread fear.

HAZARD PROFILE – TERRORISM

Terrorism Fast Facts – Occurrences*

Number of Recorded Terrorism Events Worldwide (1970 – 2019): ***201,183***

Number of Recorded Terrorism Events in the U.S. (1970 – 2019): ***3,004***

Number of Recorded Terrorism Events in Illinois (1970 – 2019): ***117***

* Based on data from the National Consortium for the Study of Terrorism and Responses to Terrorism (START) Global Terrorism Database.

The attack on the World Trade Center and the Pentagon on September 11, 2001 by foreign terrorists galvanized national action against terrorism and resulted in the creation of the U.S. Department of Homeland Security. While the number of terrorist activities garnering national attention in the U.S. has been relatively small, approximately 201,183 terrorist events have occurred worldwide between 1970 and 2019, according to the National Consortium for the Study of Terrorism and Responses to Terrorism (the Consortium). During this same time span, the Consortium documented 3,004 terrorist events within the U.S.

Acts of terrorism have resulted in fatalities and injuries as a result of kidnappings, hijackings, bombings, and the use of chemical and biological weapons. The Global Terrorism Database has documented 3,633 American fatalities in the U.S. between 1995 and 2019 from terrorist attacks. The attacks on September 11, 2001 account for 3,001of the 3,633 fatalities. A search of the Global Terrorism Database identified 117 incidents of terrorism in Illinois between 1970 and 2019. These incidents resulted in six fatalities and 38 injuries.

The Federal Bureau of Investigation's (FBI) provides supporting documentation on domestic terrorist attacks in a series of reports on terrorism. These reports provide a chronological summary of terrorist incidents in the U.S. with detailed information on attacks between 1980 and 2005. During this time period, 192 incidents were documented within the U.S. Six of these incidents occurred in Illinois; five in the Chicago area and one downstate.

On September 24, 2009, a single individual from Macon County sought to carry out his anger at the federal government by detonating a van filled with explosive outside of the Federal Courthouse in Springfield. This attempt was thwarted by the FBI.

On May 16, 2018 at around 8:00 a.m., 19-year-old boy, armed with a 9-mm semi-automatic rifle, fired several shots near the Dixon High School Gymnasium where approximately 180 students were practicing for graduation. The school's resource officer confronted the shooter, who fled from the school on foot. The shooter fired several shots at the resource officer, who returned fire, wounding the shooter in the shoulder. The gunman suffered non-life threatening injuries. No students or staff were injured in the incident. Faculty and staff barricaded doors and took cover as the incident unfolded.

More recently an active shooter incident occurred at the Highland Park Independence Day parade on July 4, 2022. A 22-year-old man, armed with a semi-automatic rifle, gained access to the roof of a building along the parade route and opened fire on spectators and those in the parade killing seven individuals and wounding an additional 48 individuals. The shooter evaded immediate capture and fled the scene but was apprehended later the same day. He confessed to the shooting and is being held without bail as he awaits trial.

It is impossible to predict with any reasonable degree of accuracy how many terrorism events might be expected to occur in Cumberland County or elsewhere in Illinois. Although targets for terrorist activity are more likely centered in larger urban areas, recruitment, training and other support activities, such as the ones described above, have occurred in rural areas.

The economic resources available to some terrorist groups coupled with the combination of global tensions, economic uncertainty and frustration towards government appear to have recently raised the frequency of attempts. Enhanced efforts by law enforcement officials and civilian vigilance for unusual activity or behavior will be needed to repel terrorists whether they are domestic or foreign in origin.

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 and man-made 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 terms of hazard and loss prevention. These goals are intended to reduce or eliminate long-term vulnerabilities to natural and man-made 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 implementation and administration. 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 of 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 made is provided below.

4.1 MITIGATION GOALS REVIEW

As part of the Plan update process, the mitigation goals developed in the original Plan were reviewed and re-evaluated. The Planning Committee chose to replace the three primary goals and list of objectives in order to simplify the mitigation strategy and address a more comprehensive range of mitigation activities and projects.

The original list of mitigation goals as well as potential updates to the list were distributed to the Planning Committee members at the first meeting on December 7, 2021. Members were asked to review the potential updates before the second meeting and consider whether any changes needed to be made or if additional goals should be included. At the Planning Committee's March 8, 2022 meeting the group discussed the updated goals and approved them with no changes. **Figure MIT-1** lists the approved mitigation goals.

Figure MIT-1 **Mitigation Goals**	
Goal 1	Lessen the impacts of hazards on new and existing infrastructure (buildings, roads, bridges, utilities, water supplies, sanitary sewer systems, etc.) in order to promote hazard-resistant communities.
Goal 2	Incorporate hazard mitigation strategies into existing and new community plans and regulations.
Goal 3	Develop long-term strategies to educate residents and businesses on the hazards affecting the County, the actions they can take before a hazard event occurs to protect themselves, their households, homes and businesses and the resources available to implement identified actions in an effort to promote hazard resiliency.
Goal 4	Protect the lives, health, and safety of the individuals living in the County from the dangers caused by natural and man-made hazards.
Goal 5	Place a priority on protecting community lifelines (i.e., safety and security; food, water, and shelter; health and medical; energy; communication; and transportation), public services and schools.
Goal 6	Preserve and protect the rivers, streams, and floodplains in the County.
Goal 7	Ensure future development does not increase the vulnerability of hazard-prone areas within the County or create unintended exposures to natural and man-made hazards.
Goal 8	Protect historic, cultural, and natural resources from the effects of natural and man-made 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 original Plan. A copy of these original actions is included in **Appendix K**. A review of the existing hazard mitigation actions revealed the following shortcomings:

- ❖ Detailed descriptions of the actions to be implemented were not provided. Most of the actions identified did not have adequate project/activity descriptions and therefore failed to effectively communicate the solution to the problem of reducing future losses to those tasked with implementing the actions.
- ❖ Many of the actions did not identify specific entities responsible for implementation. 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 no sense of responsibility or ownership of the action was taken.
- ❖ Actions focused on emergency preparedness or response and not mitigation. Several of the actions identified were aimed at addressing emergency preparedness or response and not mitigation needs and therefore were eliminated.

The remaining existing mitigation actions were evaluated, assigned to the appropriate participating jurisdiction(s), and presented to the Planning Committee members for their review and evaluation at the second meeting held on March 8, 2022. Each participating jurisdiction was asked to identify those actions that were either in progress or that had been completed since the original Plan was prepared in 2015. 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.

Figures MIT-2 through **MIT-5**, located at the end of this section, summarize the results of this evaluation by jurisdiction. Each action listed includes a reference number to the original mitigation action list found in **Appendix K**. Neoga Fire Protection District (FPD), Toledo FPD and Sigel FPD did not participate in the development of the original Plan and therefore are not included in the summary. Cumberland CUSD #77 and Neoga CUSD #3 participated in the original Plan's development but did not include any mitigation actions in the Plan and also are not included in the summary. While Jewett participated in the original Plan, they chose not to participate in the Plan update process and are not included in the summary.

4.3 New Mitigation Action Identification

Following the review and evaluation of the existing mitigation actions, the Planning Committee members were asked to consult with their respective jurisdictions to identify **new, jurisdiction-specific mitigation actions**.

Representatives of Cumberland County, Greenup and Neoga were also asked to identify mitigation actions that would ensure their continued compliance with the National Flood Insurance Program. The compiled lists of new mitigation actions were then 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 Action Analysis

Next, those existing mitigation actions retained, and the new mitigation actions identified were assigned to one of four broad mitigation activity categories that allowed Planning Committee members to compare and consolidate similar actions. **Figure MIT-6** 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 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.

Each mitigation action was also evaluated to determine whether it would mitigate risk to one or more of FEMA's seven Community Lifelines. Community Lifelines are the most fundamental services in the community that, when stabilized, enable all aspects of society to function. These fundamental services enable the continuous operation of critical government and business functions essential to human health and safety or economic security. The Community Lifelines include Safety & Security; Food, Water, Shelter; Health & Medical; Energy (Power & Fuel); Communications; Transportation; and Hazardous Materials. **Figure MIT-7** provides a brief description of each Community Lifeline.

Figure MIT-6 Types of Mitigation Activities	
Category	**Description**
Local Plans & Regulations (LP&R)	Local Plans & Regulations include actions that influence the way land and buildings are being developed and built. Examples include stormwater management plans, floodplain regulations, capital improvement projects, participation in the NFIP Community Rating System, comprehensive plans, and local ordinances (i.e., building codes, etc.)
Structure & Infrastructure Projects (S&IP)	Structure & Infrastructure Projects include actions that protect infrastructure and structures from a hazard or remove them from a hazard area. Examples include acquisition and elevation of structures in flood prone areas, burying utility lines to critical facilities, construction of community safe rooms, install "hardening" materials (i.e., impact resistant window film, hail resistant shingles/doors, etc.) and detention/retention structures.
Natural System Protection (NSP)	Natural System Protection includes actions that minimize damage and losses and also preserve or restore natural systems. Examples include sediment and erosion control, stream restoration and watershed management.
Education & Awareness Programs (E&A)	Education & Awareness Programs include actions to inform and educate citizens, elected officials and property owners about hazards and the potential ways to mitigate them. Examples include outreach/school programs, brochures, and handout materials, becoming a StormReady community, evacuation planning and drills, and volunteer activities (i.e., culvert cleanout days, initiatives to check in on the elderly/disabled during hazard events such as storms and extreme heat events, etc.)

4.5 Mitigation Action Prioritization Methodology Review

The methodology developed to prioritize mitigation actions in the original Plan was reviewed by the Planning Committee as part of the Plan update process. The original prioritization methodology was based on the STAPLE+E planning factors (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) and applied a rating of high, medium, 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 Planning Committee decided to replace the original 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 Planning Committee members at the third meeting held on July 12, 2022. The group reviewed and discussed the methodology and chose to approve it with no changes.

Figure MIT-8 identifies and describes the four-tiered prioritization methodology adopted by the Planning 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 MIT-7 Community Lifelines	
Category	**Components/Subcomponents**
Safety & Security	- Law Enforcement/Security (police stations, law enforcement, site security, correctional facilities) - Fire Service (fire stations, firefighting resources) - Search & Rescue (local search & rescue) - Government Service (emergency operation centers, essential government functions, government offices, schools, public records, historic/cultural resources) - Community Safety (flood control, other hazards, protective actions)
Food, Water, Shelter	- Food [commercial food distribution, commercial food supply chain, food distribution programs (e.g., food banks)] - Water [drinking water utilities (intake, treatment, storage & distribution), wastewater systems, commercial water supply chain]; - Shelter [housing (e.g., homes, shelters), commercial facilities (e.g., hotels)]; - Agriculture (animals & agriculture)
Health & Medical	- Medical Care (hospitals, dialysis, pharmacies, long-term care facilities, VA health system, veterinary services, home care) - Patient Movement (emergency medical services) - Fatality Management (mortuary and post-mortuary services) - Public Health (epidemiological surveillance, laboratory, clinical guidance, assessment/interventions/treatments, human services, behavioral health) - Medical Supply Chain [blood/blood products, manufacturing (e.g., pharmaceutical, device, medical gases), distribution, critical clinical research, sterilization, raw materials]
Energy	- Power Grid (generation systems, transmission systems, distribution systems) - Fuel [refineries/fuel processing, fuel storage, pipelines, fuel distribution (e.g., gas stations, fuel points), off-shore oil platforms]
Communications	- Infrastructure [wireless, cable systems and wireline, broadcast (e.g., TV and radio), satellite, data centers/internet] - Alerts, Warnings, & Messages (local alert/warning ability, access to IPAWS, NAWAS terminals) - 911 & Dispatch (public safety answering points, dispatch) - Responder Communications (LMR networks) - Finance (banking services, electronic payment processing)
Transportation	- Highway/Roadway/Motor Vehicle (roads, bridges) - Mass Transit (bus, rail, ferry) - Railway (freight, passenger) - Aviation [commercial (e.g., cargo/passenger), general, military] - Maritime (waterways, ports and port facilities)
Hazardous Materials	- Facilities [oil/hazmat facilities (e.g., chemical, nuclear), oil/hazmat/toxic incidents from facilities] - Hazmat, Pollutants, Contaminants (oil/hazmat/toxic incidents from non-fixed facilities, radiological or nuclear incidents)

<table>
<tr><th colspan="4">Figure MIT-8
Mitigation Action Prioritization Methodology</th></tr>
<tr><td colspan="2" rowspan="2"></td><th colspan="2">Hazard</th></tr>
<tr><td>Most Frequent Hazard
(M)
(i.e., severe storms, severe winter storms, excessive heat, floods)</td><td>Less Frequent Hazard
(L)
(i.e., extreme cold, tornadoes, drought, earthquakes)</td></tr>
<tr><th rowspan="2">Mitigation Action</th><td>Mitigation Action with the Potential to Virtually Eliminate or Significantly Reduce Impacts
(H)</td><td>HM
mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from the most frequent hazards</td><td>HL
mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from less frequent hazards</td></tr>
<tr><td>Mitigation Action with the Potential to Reduce Impacts
(L)</td><td>LM
mitigation action has the potential to reduce damages, fatalities and/or injuries from the most frequent hazards</td><td>LL
mitigation action has the potential to reduce damages, fatalities and/or injuries from less frequent hazards</td></tr>
</table>

4.6 Mitigation Action 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; and
- conducting a preliminary cost/benefit analysis.

<u>Oversight & Administration</u>

It is important to keep in mind that most of the participating jurisdictions have extremely limited capabilities related to organization and staffing for oversight and administration of the identified mitigation actions. All of participating municipalities are small in size, with populations of less than 1,800 individuals. In most cases these jurisdictions 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 to individually oversee and administer the identified mitigation actions. As a result, most of the participating jurisdictions identified their governing body (i.e., village board, city council or board of trustees) as the entity responsible for oversight and administration simply because it is the only practical option given their organizational constraints. Other participants felt that oversight and administration fell under the purview of the entity's governing body (board/council) and not individual departments.

Funding Sources

While the Coles County Regional Planning and Development Commission has the ability to provide grant writing services to Cumberland County, most of the participating jurisdictions do not have administrators with grant writing capabilities. As a result, assistance was needed in identifying possible funding sources for the identified mitigation actions. 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: U.S. 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 the entire County is less than 11,000 individuals. None of the participating municipalities have populations greater than 1,800 individuals. Most of the jurisdictions struggle 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 most 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 RESULTS OF MITIGATION STRATEGY

Figures MIT-9 through **MIT-17**, located at the end of this section, summarize the results of the mitigation strategy. The mitigation actions are arranged alphabetically by participating jurisdiction following the County and include both existing and new actions.

Figure MIT-2
Cumberland County – Status of Existing Mitigation Actions
(Sheet 1 of 3)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Harden and Retrofit Critical Facilities to better protect county buildings and critical facilities (Mitigation Code #AH-1)	✓				
Install generators on existing and new critical facilities (Mitigation Code #AH-2)		✓			
Bury existing utility lines (Mitigation Code #AH-3)	✓				
Educate the public on safety procedures and potential dangers (Mitigation Code #AH-4)		✓			
Maintain and update the 2014 Cumberland County comprehensive plan (Mitigation Code #AH-5)	✓				
Build Heating/Cooling Shelters (Mitigation Code #AH-6)	✓				
Develop Mutual Aid Agreements to lend assistance across jurisdiction boundaries (Mitigation Code #AH-7)	✓				
Develop Vulnerable Population List (Mitigation Code #AH-8)	✓				
Develop school and family disaster plans and kits (Mitigation Code #AH-9)	✓				
Have an alternate EOC in place in case primary one is damaged and cannot be used (Mitigation Code #AH-11)	✓				
Distribute weather radios to those in high-risk areas (Mitigation Code #AH-12)	✓				
Remove and trim trees that cause potential harm to utilities and structures (Mitigation Code #AH-13)		✓			

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Cumberland County has two infrastructure improvement projects in progress that have the potential to decrease the vulnerability of hazard prone areas. The County has two infrastructure improvement projects in progress that have the potential to decrease vulnerability to Safety & Security and Communications Community Lifelines. These projects however will not significantly change the vulnerability of hazard prone areas in the County. The County also has three administrative activities completed or in progress. Two of these activities have the potential to decrease the vulnerability to Communications and Hazardous Materials Community Lifelines. These activities however will not significantly change the vulnerability of hazard prone areas within the County.

Figure MIT-2
Cumberland County – Status of Existing Mitigation Actions
(Sheet 2 of 3)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Notify public of safe room and shelter locations (Mitigation Code #AH-14)	✓	✓			
Work to enhance 911, Emergency Alert, and Radio/Broadcast systems (Mitigation Code #AH-15)		✓			
Have regular meetings of the Local Emergency Planning Committee to discuss emergency planning throughout the county (Mitigation Code #AH-16)	✓				
Develop web-based and paper materials to educate public (Mitigation Code #AH-17)	✓				
Repair and install emergency sirens where needed (Mitigation Code #AH-19)		✓			
Anchoring Manufactured Housing to lessen impacts of high winds on structures (Mitigation Code #TS-1)	✓				
Improve ordinances to exceed minimum standards for high winds/tornadoes (Mitigation Code #TS-2)	✓				
Require saferooms installed in new public buildings (Mitigation Code #TS-3)	✓				
Have a plan in place in case of dam/levee failure (Mitigation Code #FL-1)	✓				
Replace damaged culverts to direct flood water (Mitigation Code #FL-2)		✓			
Elevate roads above the base flood elevation (Mitigation Code #FL-3)	✓				

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Cumberland County has two infrastructure improvement projects in progress that have the potential to decrease the vulnerability of hazard prone areas. The County has two infrastructure improvement projects in progress that have the potential to decrease vulnerability to Safety & Security and Communications Community Lifelines. These projects however will not significantly change the vulnerability of hazard prone areas in the County. The County also has three administrative activities completed or in progress. Two of these activities have the potential to decrease the vulnerability to Communications and Hazardous Materials Community Lifelines. These activities however will not significantly change the vulnerability of hazard prone areas within the County.

Figure MIT-2
Cumberland County – Status of Existing Mitigation Actions
(Sheet 3 of 3)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Install pumping stations to remove water faster (Mitigation Code #FL-4)	✓	✓			
Actively maintain NFIP status (Mitigation Code #FL-6)		✓			
Update and improve floodplain ordinances to exceed Federal standards (Mitigation Code #FL-7)	✓				
Buyout properties in the floodplain (Mitigation Code #FL-8)	✓				
Watershed/Floodplain Structure Analysis – ID Floodplain structures and complete a watershed analysis (Mitigation Code #FL-9)	✓				
Install Snow Fence to minimize the amount of infrastructure exposed (Mitigation Code #WS-1)	✓				
Develop/Update Emergency Plan in case of hazmat release (Mitigation Code #H-1)			✓	2021	Plan updated with County EOP
Develop Alternative Traffic Routes in case of hazmat release (Mitigation Code #H-2)	✓				
Hazmat Commodity Flow Study – create or update a list of all hazardous materials transported through the county/city and routes taken (Mitigation Code #H-4)	✓				
Update and improve burning ordinance (Mitigation Code #DH-1)	✓				
Audit water usage to reduce unnecessary water waste in case of drought (Mitigation Code #DH-2)	✓				
Ensure a reliable water source (Mitigation Code #F-4)	✓				

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Cumberland County has two infrastructure improvement projects in progress that have the potential to decrease the vulnerability of hazard prone areas. The County has two infrastructure improvement projects in progress that have the potential to decrease vulnerability to Safety & Security and Communications Community Lifelines. These projects however will not significantly change the vulnerability of hazard prone areas in the County. The County also has three administrative activities completed or in progress. Two of these activities have the potential to decrease the vulnerability to Communications and Hazardous Materials Community Lifelines. These activities however will not significantly change the vulnerability of hazard prone areas within the County.

Figure MIT-3
Greenup – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Harden and Retrofit Critical Facilities to better protect county buildings and critical facilities (Mitigation Code #AH-1)	✓				
Install generators on existing and new critical facilities (Mitigation Code #AH-2)	✓				
Bury existing utility lines (Mitigation Code #AH-3)	✓				
Educate the public on safety procedures and potential dangers (Mitigation Code #AH-4)	✓				
Build Heating/Cooling Shelters (Mitigation Code #AH-6)	✓				
Develop Mutual Aid Agreements to lend assistance across jurisdiction boundaries (Mitigation Code #AH-7)	✓				
Develop Vulnerable Population List (Mitigation Code #AH-8)	✓				
Develop school and family disaster plans and kits (Mitigation Code #AH-9)	✓				
Remove and trim trees that cause potential harm to utilities and structures (Mitigation Code #AH-13)	✓				
Notify public of safe room and shelter locations (Mitigation Code #AH-14)	✓				
Develop web-based and paper materials to educate public (Mitigation Code #AH-17)	✓				
Procure a back-up water supply in case of emergency (Mitigation Code #AH-18)	✓				

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Greenup did not begin or complete any of the identified mitigation actions due to budgetary and personnel constraints experience by a Village of this size (approx. 1,750 individuals.) The Village struggles to maintain even the most critical of services to its residents. As a result, there has been no changes in the vulnerability of hazard prone areas with the village.

Figure MIT-3
Greenup – Status of Existing Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Repair and install emergency sirens where needed (Mitigation Code #AH-19)	✓				
Improve ordinances to exceed minimum standards for high winds/tornadoes (Mitigation Code #TS-2)	✓				
Require saferooms installed in new public buildings (Mitigation Code #TS-3)	✓				
Actively maintain NFIP status (Mitigation Code #FL-6)	✓				
Update and improve floodplain ordinances to exceed Federal standards (Mitigation Code #FL-7)	✓				
Develop/Update Emergency Plan in case of hazmat release (Mitigation Code #H-1)	✓				
Develop Alternative Traffic Routes in case of hazmat release (Mitigation Code #H-2)	✓				
Audit water usage to reduce unnecessary water waste in case of drought (Mitigation Code #DH-2)	✓				
Develop management techniques for removing vegetation that will not cause risk of erosion and landslide (Mitigation Code #F-2)	✓				
Ensure a reliable water source (Mitigation Code #F-4)	✓				

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Greenup did not begin or complete any of the identified mitigation actions due to budgetary and personnel constraints experience by a Village of this size (approx. 1,750 individuals.) The Village struggles to maintain even the most critical of services to its residents. As a result, there has been no changes in the vulnerability of hazard prone areas with the village.

Figure MIT-4
Neoga – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Harden and Retrofit Critical Facilities to better protect county buildings and critical facilities (Mitigation Code #AH-1)	✓				
Install generators on existing and new critical facilities (Mitigation Code #AH-2)			✓		
Educate the public on safety procedures and potential dangers (Mitigation Code #AH-4)		✓			
Build Heating/Cooling Shelters (Mitigation Code #AH-6)			✓		Partnerships with Grace United Methodist Church and the Community Center
Develop Vulnerable Population List (Mitigation Code #AH-8)	✓				
Develop school and family disaster plans and kits (Mitigation Code #AH-9)	✓				
Notify public of safe room and shelter locations (Mitigation Code #AH-14)	✓				
Develop web-based and paper materials to educate public (Mitigation Code #AH-17)	✓				
Repair and install emergency sirens where needed (Mitigation Code #AH-19)		✓			Checked monthly
Require saferooms installed in new public buildings (Mitigation Code #TS-3)	✓				
Replace damaged culverts to direct flood water (Mitigation Code #FL-2)		✓			

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Neoga has two infrastructure improvement projects and one administrative activity in progress that have the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The City also has two infrastructure improvement projects and three administrative activities completed or in progress. Three of these projects and activities have the potential to decrease the vulnerability to Communications, Food, Water, Shelter and Safety & Security Community Lifelines. None of these actions however will significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-4
Neoga – Status of Existing Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	**Status**			**Year Completed**	**Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)**
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**		
Keep drainage ditches clear to move water more efficiently (Mitigation Code #FL-5)		✓			Cleaned regularly on rotation
Actively maintain NFIP status (Mitigation Code #FL-6)		✓			
Develop/Update Emergency Plan in case of hazmat release (Mitigation Code #H-1)	✓				Older, needs revised
Develop Alternative Traffic Routes in case of hazmat release (Mitigation Code #H-2)		✓			
Ensure a reliable water source (Mitigation Code #F-4)			✓		Primary water supply is backed up by Lake Mattoon

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Neoga has two infrastructure improvement projects and one administrative activity in progress that have the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The City also has two infrastructure improvement projects and three administrative activities completed or in progress. Three of these projects and activities have the potential to decrease the vulnerability to Communications, Food, Water, Shelter and Safety & Security Community Lifelines. None of these actions however will significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-5
Toledo – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Harden and Retrofit Critical Facilities to better protect county buildings and critical facilities (Mitigation Code #AH-1)	✓				
Install generators on existing and new critical facilities (Mitigation Code #AH-2)	✓				
Educate the public on safety procedures and potential dangers (Mitigation Code #AH-4)			✓		Done every year
Build Heating/Cooling Shelters (Mitigation Code #AH-6)		✓			
Develop Vulnerable Population List (Mitigation Code #AH-8)			✓		Updated through LEPC
Develop school and family disaster plans and kits (Mitigation Code #AH-9)		✓			
Remove and trim trees that cause potential harm to utilities and structures (Mitigation Code #AH-13)		✓			
Notify public of safe room and shelter locations (Mitigation Code #AH-14)			✓		
Develop web-based and paper materials to educate public (Mitigation Code #AH-17)			✓		
Repair and install emergency sirens where needed (Mitigation Code #AH-19)			✓	2007	Siren put up in Village lot off of the Courthouse Square
Anchoring Manufactured Housing to lessen impacts of high winds on structures (Mitigation Code #TS-1)	✓				

(Mitigation Code “No.”) refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village’s vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Toledo has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The Village also has two infrastructure improvement projects and ten administrative activities completed or in progress. Four of these projects and activities have the potential to decrease the vulnerability to Communications, Energy, and Food, Water, Shelter Community Lifelines. None of these actions however will significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-5
Toledo – Status of Existing Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Require saferooms installed in new public buildings (Mitigation Code #TS-3)	✓				
Replace damaged culverts to direct flood water (Mitigation Code #FL-2)		✓			
Develop/Update Emergency Plan in case of hazmat release (Mitigation Code #H-1)			✓		Go through this every year
Develop Alternative Traffic Routes in case of hazmat release (Mitigation Code #H-2)			✓		Go through this every year
Update and improve burning ordinance (Mitigation Code #DH-1)			✓		
Ensure a reliable water source (Mitigation Code #F-4)		✓			

(Mitigation Code "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Toledo has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The Village also has two infrastructure improvement projects and ten administrative activities completed or in progress. Four of these projects and activities have the potential to decrease the vulnerability to Communications, Energy, and Food, Water, Shelter Community Lifelines. None of these actions however will significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-9
Cumberland County Hazard Mitigation Actions
(Sheet 1 of 6)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Harden key County critical facilities and infrastructure systems to increase community resilience, ensure the continued functionality of Community Lifelines and maintain continuity of government/operations.	DR, EC, EH, EQ, F, SS, SWS, T	C FWS H&M S&S T	S&IP	Medium	1, 4, 5	---	Yes	County Board Chair / EMA Director / County Highway Engineer	5-10 years	County / USDA – RD Critical Facilities Programs / FEMA HMGP	High/High	Existing (2015)
HM	Purchase and install emergency backup generators at all key County-owned critical facilities and infrastructure systems to ensure continued operation of Community Lifelines and maintain continuity of government/ operations during extended power outages.	EC, EH, EQ, F, MMH, SS, SWS, T	C H&M S&S T	S&IP	Medium	1, 5	Yes	Yes	County Board Chair / EMA Director	5 years	County / USDA – RD Critical Facilities Programs / FEMA HMGP	Medium/High	Existing (2015)
LM	Make public information materials available online and distribute paper materials to residents that detail the risk to life and property associated with the natural hazards that impact the County and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, SS, SWS, T	---	E&A	Large	3, 4	---	---	EMA Director	2-5 years	County	Low/Medium	Existing (2015)
LM	Maintain and update the 2014 Cumberland County Comprehensive Plan.	DR, EC, EH, EQ, F, SS, SWS, T	---	LP&R	Large	2, 7	---	---	County Board Chair / County Board	5 years	County	Low/Medium	Existing (2015)

† 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 under 11,000 individuals), projected population growth 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

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-9
Cumberland County Hazard Mitigation Actions
(Sheet 2 of 6)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 new warming/cooling centers in areas not currently served by a designated center.	EC, EH	FWS	E&A	Medium	4	---	---	EMA Director	2 years	County	Low/High	Existing (2015)
LM	Develop mutual aid agreements with local government entities to improve coordination and enhance emergency preparedness, response, recovery and mitigation activities within the County.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	LP&R	Large	1, 4, 5	Yes	Yes	County Board Chair / EMA Director	2-5 years	County	Low/Medium	Existing (2015)
LM	Develop and implement an outreach program that works with schools to identify the risk to their infrastructure and students/staff from natural hazard events, the actions they can take to reduce those risks, the procedures in place in case of an evacuation, and the steps they can take to maintain operations after a hazard event occurs.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	E&A	Large	1, 4, 5	---	---	EMA Director	5 years	County	Low/Medium	Existing (2015)
HM	Designate and retrofit a County-owned space to serve as an alternate Emergency Operations Center (EOC) to serve as the County's central command and control facility for carrying out emergency management and ensure continuity of government/operations in the event the County's primary EOC is damaged by a hazard event and is rendered inoperable.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	EMA Director	5 years	County	Medium/High	Existing (2015)

† 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 under 11,000 individuals), projected population growth 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

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-9
Cumberland County Hazard Mitigation Actions
(Sheet 3 of 6)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Inform residents of the locations designed as warming/cooling centers, emergency shelters and community safe rooms.	EC, EH, EQ, F, SS, SWS, T	FWS	E&A	Large	3, 4	---	---	EMA Director	1 year	County	Low/Medium	Existing (2015)
HM	Subscribe to an automated emergency notification system to establish a Communications Community Lifeline that alerts residents of natural and man-made hazard event conditions and information.	EC, EH, EQ, F, MMH, SS, SWS, T	C	E&A	Large	3, 4	---	---	County Board Chair / EMA Director	2-5 years	County	Low/High	Existing (2015)
LM	Conduct regular meetings of the Cumberland County Local Emergency Planning Committee (LEPC) to improve coordination and enhance emergency preparedness, response, recovery, and mitigation activities within the County.	DR, EC, EH, EQ, F, MMH, SS, SWS, T	---	E&A	Large	2, 4, 5	---	---	EMA Director	1-5 years	County	Low/Medium	Existing (2015)
HM	Purchase and install storm warning sirens in select areas of the County without alert coverage to establish Communications Community Lifelines essential to human health and safety.	SS, T	C	E&A	Medium	4	---	---	EMA Director	5 years	County / USDA – RD Critical Facilities Programs	Medium/High	Existing (2015)
LM	Pass an ordinance requiring all new public buildings to include a community safe room (equipped with emergency backup generator & HVAC units) that can be used by County staff/residents to establish Shelter Community Lifelines essential to human health and safety.	SS, T	FWS	LP&R	Small	4	Yes	---	County Board Chair / EMA Director	3-5 years	County	Low/Medium	Existing (2015)

† 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 under 11,000 individuals), projected population growth 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

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
- LM Mitigation action with the potential to reduce impacts from the most frequent hazards
- HL Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
- LL Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-9
Cumberland County Hazard Mitigation Actions
(Sheet 4 of 6)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Upsize roadway culverts/drainage structures to increase carrying capacity and alleviate flood/drainage problems associated with heavy rain events.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	County Highway Engineer	5 years	County / IDOT Local Roads	Medium/High	Existing (2015)
HM	Elevate major detour and evacuation routes above the base flood elevation to ensure the continued functionality of Transportation Community Lifelines during heavy rain/flood events.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	County Highway Engineer	5-10 years	County / IDOT Local Roads	High/High	Existing (2015)
HM	Establish dedicated emergency traffic routes to ensure functionality of Safety & Security Community Lifelines in the event key transportation routes are inaccessible due to natural or man-made hazard incidents.	EH, EQ, F, MMH, SS, SWS, T	S&S	LP&R	Medium	2, 4, 5	---	---	EMA Director	2-5 years	County	Low/High	Existing (2015)
LL	Conduct a Commodity Flow Study to determine the types and quantities of hazard substances and chemicals being transported within and through the County to access potential impacts on Community Lifelines and mitigate risk to Hazard Materials Community Lifelines.	MMH	H&M S&S	E&A	Medium	1, 2, 4, 5, 8	---	---	EMA Director	3-5 years	County / USDOT HMEP	Low/Medium	Existing (2015)

† 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 under 11,000 individuals), projected population growth 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

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
- LM Mitigation action with the potential to reduce impacts from the most frequent hazards
- HL Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
- LL Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

- DR Drought
- EC Extreme Cold
- EH Excessive Heat
- EQ Earthquake
- F Flood
- MMH Man-Made Hazard
- SS Severe Storms
- SWS Severe Winter Storm
- T Tornado

Type of Mitigation Activity:

- E&A Education & Awareness
- LP&R Local Plans & Regulations
- NSP Natural Systems Protection
- S&IP Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

- C Communications
- E Energy (Power & Fuel)
- FWS Food, Water, Shelter
- HM Hazardous Material
- H&M Health & Medical
- S&S Safety & Security
- T Transportation

Figure MIT-9
Cumberland County Hazard Mitigation Actions
(Sheet 5 of 6)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 electrical hookups (pigtails) at township facilities for use with portable emergency backup generators to ensure the continued operation of Community Lifelines and maintain continuity of operations/ government during extended power outages.	EC, EH, DQ, F, MMH, SS, SWS, T	S&S T	S&IP	Large	1, 4, 5	---	Yes	Highway Engineer / Road Commissioners	5 years	County / Township / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Purchase portable emergency backup generators to ensure resilient and reliable power supplies at township facilities to ensure the continued operation of Community Lifelines and maintain continuity of operations/government during extended power outages.	EC, EH, DQ, F, MMH, SS, SWS, T	S&S T	S&IP	Large	1, 4, 5	---	Yes	Highway Engineer / Road Commissioners	5 years	County / Township / FEMA HMGP / USDA – RD Critical Facilities Programs	High/High	New
HM	Install hardening materials (shatter-proof window film, etc.) at Highway Department to increase building resilience to natural hazards, maintain continuity of operations, protect staff, and mitigate risk to a Community Lifeline.	EQ, MMH, SS, T	S&S T	S&IP	Small	1, 4, 5	---	Yes	Highway Engineer	5 years	CUSD / FEMA HMGP	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 County's size (just under 11,000 individuals), projected population growth 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

- HM Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
- LM Mitigation action with the potential to reduce impacts from the most frequent hazards
- HL Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
- LL Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-9
Cumberland County Hazard Mitigation Actions
(Sheet 6 of 6)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 and address cybersecurity risks and threats to information systems owned/operated by the County.	MMH	S&S C	E&A	Large	1, 5, 8	n/a	Yes	EMA Coordinator	3-5 years	County / CISA Cybersecurity	Low/Medium	New
LM	Conduct a critical infrastructure vulnerability assessment that examines infrastructure vulnerabilities, interdependencies, capability gaps, and the consequences of their disruption to better understand and manage risk to County critical infrastructure.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S FWS H&M E C T	E&A	Large	1, 4, 5	Yes	Yes	EMA Coordinator	3-5 years	County / CISA Infrastructure Security	Low/Medium	New
HM	Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and exceed federal standards and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small	2, 3, 4, 6, 7	Yes	Yes	County Board Chair / County Board	1-5 years	County	Low/Medium	New / Existing (2015)
LM	Continue to make the most recent Flood Insurance Rate Maps available at the Clerk's Office to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	EMA Coordinator / County Clerk	1-3 years	County	Low/Medium	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	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	EMA Coordinator / County Clerk	1-5 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 under 11,000 individuals), projected population growth 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

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-10
Cumberland CUSD #77 Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 automatic emergency backup generators at District schools (a designated warming center within the County) to establish resilient and reliable power supplies in order to maintain continuity of operations, ensure sustained functionality of all systems (i.e., heating, freezers, etc.) during extended power outage and mitigate risk to Community Lifelines.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS S&S	S&IP	Large	1, 4, 5	---	Yes	Superintendent / School Board	2-5 years	CUSD / USDA – RD Critical Facilities Programs / FEMA HMGP	High/High	New
HM	Upgrade the District-owned wastewater treatment facility to address infiltration and inflow problems experienced during heavy rain events that lead to sewer backups, increase system to resilience and mitigate risk to a Community Lifeline. The District currently treats all waste generated onsite.	F, SS	FWS S&S	S&IP	Large	1, 4, 5	---	Yes	Superintendent / School Board	2-5 years	CUSD / USDA – RD Water & Waste Disposal Program / IEPA SRF – WPCLP	High/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 budgetary constraints experienced by small, rural school districts. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-11
Greenup Hazard Mitigation Actions
(Sheet 1 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 hardening materials (shatter-resistant/ shatter-proof windows, hail resistant doors/shingles, etc.) at Village-owned critical facilities and infrastructure systems to increase building resilience to natural hazards, maintain continuity of government/operations, protect staff and residents, and mitigate risk to Community Lifelines.	EQ, F, SS, SWS, T	S&S	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	5-10 years	Village / FEMA HMGP	High/High	Existing (2015)
HM	Purchase and install emergency backup generators at Village-owned critical facilities and infrastructure systems to ensure continued operation of Community Lifelines and maintain continuity of government/operations during extended power outages.	EC, EH, EQ, F, MMH, SS, SWS, T	C H&M S&S T	S&IP	Medium	1, 5	Yes	Yes	President / Village Board	5-10 years	County / USDA – RD Critical Facilities Programs / FEMA HMGP	Medium/High	Existing (2015)
LM	Make public information materials available online and distribute paper materials to residents that detail the risk to life and property associated with the natural hazards that impact the Village and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, SS, SWS, T	---	E&A	Large	3, 4	---	---	President / Village Board	2-5 years	Village	Low/Medium	Existing (2015)

† 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 budgetary constraints experienced by a village of this size (approx. 1,750 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-11
Greenup Hazard Mitigation Actions
(Sheet 2 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 mutual aid agreements with local government entities to improve coordination and enhance emergency preparedness, response, recovery and mitigation activities within the County.	DR, EC, EH, EQ, F, MMH, SS, SWS, T	S&S	LP&R	Large	1, 4, 5	Yes	Yes	President / Village Board	2-5 years	Village	Low/Medium	Existing (2015)
LM	Develop a list of access and functional needs populations within the Village in order to identify the best method(s) to alert these individuals to upcoming hazard events.	DR, EC, EH, EQ, F, SS, SWS, T	C	E&A	Small	3, 4	---	---	President / Village Board	3-5 years	Village	Low/High	Existing (2015)
HM	Trim and manage trees to minimize the number and duration of service disruptions, improve community resilience and mitigate risk to Community Lifelines	SS, SWS, T	C E T	S&IP	Medium	1, 4, 5	Yes	Yes	President / Village Board	1-5 years	Village	Low/High	Existing (2015)
LM	Inform residents of the locations designated as warming/cooling centers, emergency shelters and community safe rooms.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	E&A	Large	3, 4	---	---	President / Village Board	1 year	Village	Low/Medium	Existing (2015)
LM	Secure agreement with neighboring water system(s) to provide an alternate/backup drinking water supply to the Village to establish a constant and reliable supply of water for residents, aid in fire suppression during hazard events, and mitigate risk to a Community Lifeline.	DR, EC, EH, EQ, F, MMH, SS, SWS, T	FWS	LP&R	Large	1, 4, 5	---	---	President / Village Board	5 years	Village	Low/High	Existing (2015)

† 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 budgetary constraints experienced by a village of this size (approx. 1,750 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-11
Greenup Hazard Mitigation Actions
(Sheet 3 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 storm warning sirens in areas without alert coverage to establish Communications Community Lifelines essential to human health and safety.	SS, T	C	E&A	Medium	4	---	---	President / Village Board	5 years	Village / USDA – RD Critical Facilities Programs	Medium/High	Existing (2015)
LM	Pass an ordinance requiring all new public buildings to include a community safe room (equipped with emergency backup generator & HVAC units) that can be used by Village staff/residents to establish Shelter Community Lifelines essential to human health and safety.	SS, T	FWS	LP&R	Small	4	Yes	---	President / Village Board	3-5 years	Village	Low/Medium	Existing (2015)
HM	Establish dedicated emergency detour routes to ensure functionality of Safety & Security Community Lifelines in the event key transportation routes are inaccessible due to natural or man-made hazard incidents.	EH, EQ, F, MMH, SS, SWS, T	S&S	LP&R	Medium	2, 4, 5	---	---	President / Village Board	2-5 years	Village	Low/High	Existing (2015)
HL	Monitor drinking water usage/capacity to identify water conservation measures and determine whether mitigation measures need to be unacted in the future to ensure the resiliency of the Village's drinking water supply to drought.	DR	FWS	E&A	Large	1, 5	---	Yes	President / Village Board	5-10 year	Village	Low/Medium	Existing (2015)

† 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 budgetary constraints experienced by a village of this size (approx. 1,750 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
- LM Mitigation action with the potential to reduce impacts from the most frequent hazards
- HL Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
- LL Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

- DR Drought
- EC Extreme Cold
- EH Excessive Heat
- EQ Earthquake
- F Flood
- MMH Man-Made Hazard
- SS Severe Storms
- SWS Severe Winter Storm
- T Tornado

Type of Mitigation Activity:

- E&A Education & Awareness
- LP&R Local Plans & Regulations
- NSP Natural Systems Protection
- S&IP Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

- C Communications
- E Energy (Power & Fuel)
- FWS Food, Water, Shelter
- HM Hazardous Material
- H&M Health & Medical
- S&S Safety & Security
- T Transportation

Figure MIT-11
Greenup Hazard Mitigation Actions
(Sheet 4 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to exceed federal standards and reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small	2, 3, 4, 6, 7	Yes	Yes	President / Village Board	2-5 years	Village	Low/Medium	New / Existing (2015)
LM	Continue to make the most recent Flood Insurance Rate Maps available at the Village Clerk's Office to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	President / Village Clerk	2-5 years	Village	Low/Low	New
LM	Continue to make Village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	President / Village Clerk	2-5 years	Village	Low/Low	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 budgetary constraints experienced by a village of this size (approx. 1,750 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-12
Neoga Hazard Mitigation Actions
(Sheet 1 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 the Community Center to include a community safe room (equipped with emergency backup generator & HVAC units) for use by City staff and residents to establish a Shelter Community Lifeline essential to human health and safety.	SS, T	FWS	S&IP	Small	4	---	Yes	Mayor / City Council	2-5 years	City / FEMA HMGP	High/High	New
HM	Establish dedicated emergency detour routes to ensure functionality of Safety & Security Community Lifelines in the event key transportation routes are inaccessible due to natural or man-made hazard incidents.	EH, EQ, F, MMH, SS, SWS, T	S&S	LP&R	Medium	2, 4, 5	---	---	Mayor / City Council	2-5 years	City	Low/High	Existing (2015)
LM	Prepare an Emergency Operations Plan for the City that covers hazmat releases.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	LP&R	Large	2, 4, 5, 8	Yes	Yes	Mayor / City Council	2-5 years	City	Low/High	Existing (2015)
LM	Distribute public information materials to residents that detail the risk to life and property associated with the natural hazards that impact the City and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, SS, SWS, T	---	E&A	Large	3, 4	---	---	Mayor / City Council	2-5 years	City	Low/Medium	Existing (2015)

† 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 budgetary constraints experienced by a city of this size (less than 1,600 individuals). The City works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-12
Neoga Hazard Mitigation Actions
(Sheet 2 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to exceed federal standards and reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small	2, 3, 4, 6, 7	Yes	Yes	President / Village Board	2-5 years	Village	Low/Medium	New / Existing (2015)
LM	Continue to make the most recent Flood Insurance Rate Maps available at the Village Clerk's Office to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	President / Village Clerk	2-5 years	Village	Low/Low	New
LM	Continue to make Village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	President / Village Clerk	2-5 years	Village	Low/Low	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 budgetary constraints experienced by a city of this size (less than 1,600 individuals). The City works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-13
Neoga CUSD #3 Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 generator(s) at District schools to establish resilient and reliable power supplies in order to maintain continuity of operations, ensure sustained functionality of all systems (i.e., HVAC, communications, freezers, etc.) during extended power outage and mitigate risk to Community Lifelines.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Superintendent / School Board	2-4 years	CUSD / USDA – RD Critical Facilities Programs / FEMA HMGP	High/High	New
LM	Work with City officials to designate District schools as warming and cooling centers for area residents to establish a Community Lifeline essential to human health and safety.	EC, EH	FWS	LP&R	Medium	4	---	---	Superintendent School Board / Mayor City Council	2-4 years	CUSD / City	Low/High	New
LM	Improve coordination with the City in an effort to increase implementation of hazard mitigation actions as well as other emergency management projects and activities.	DR, EC, EH, EQ, F, MMH, SS, SWS, T	S&S	E&A	Large	4, 5	---	---	Superintendent School Board / Mayor City Council	2-4 years	CUSD / City	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 budgetary constraints experienced by small, rural school districts. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-14
Neoga Fire Protection District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Establish dedicated emergency detour routes within the District to ensure functionality of Safety & Security Community Lifelines in the event key transportation routes are inaccessible due to natural and man-made hazard incidents.	EQ, F, MMH, SS, SWS, T	S&S	LP&R	Medium	2, 4, 5	---	---	Fire Chief / Board of Trustees	2-5 years	FPD	Low/High	New
LM	Make public information materials available to District residents that detail the risks to life and property associated with the natural hazards that impact the District and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, FR, SS, SWS, T	---	E&A	Large	3	---	---	Fire Chief / Board of Trustees	2-5 years	FPD	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 budgetary constraints experienced by a rural, all-volunteer fire protection district. Additional funding is necessary if implementation is to be achieved.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-15
Sigel Fire Protection District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 an automatic emergency backup generator at the Fire Station to establish a resilient and reliable power supply, ensure sustained functionality during extended power outages, maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Fire Chief / Board of Trustees	2 years	FPD / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Purchase and install storm warning sirens to establish Communications Community Lifelines essential to human health and safety.	SS, T	C	E&A	Large	4	---	---	Fire Chief / Board of Trustees	5 years	FPD / USDA – RD Critical Facilities Programs	Medium/High	New
LL	Update and improve District burn ordinance.	MMH	---	LP&R	Large	1, 4, 5	---	---	Fire Chief / Board of Trustees	2-5 years	FPD	Low/Medium	New
LM	Make public information materials available to District residents that detail the risks to life and property associated with the natural hazards that impact the District and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, SS, SWS, T	---	E&A	Large	3	---	---	Fire Chief / Board of Trustees	1-5 years	FPD	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 budgetary constraints experienced by a rural, all-volunteer fire protection district. Additional funding is necessary if implementation is to be achieved.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Toledo Hazard Mitigation Actions
(Sheet 1 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 an automatic emergency backup generator at the Toledo Christian Church, a designated warming/cooling center & emergency shelter for Village residents, to establish a resilient and reliable power supply, ensure continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, F, MMH, SS, SWS, T	FWS	S&IP	Medium	1, 4, 5	---	Yes	Public Works Director	1-2 years	Village / Toledo FPD / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Purchase and install emergency backup generators at Village-owned critical facilities and infrastructure systems to ensure continued operation of Community Lifelines and maintain continuity of government/ operations during extended power outages.	EC, EH, EQ, F, MMH, SS, SWS, T	C H&M S&S T	S&IP	Medium	1, 5	Yes	Yes	President / Village Board	5-10 years	County / USDA – RD Critical Facilities Programs / FEMA HMGP	Medium/High	Existing (2015)
LM	Distribute public information materials to residents that detail the risk to life and property associated with the natural hazards that impact the Village and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, SS, SWS, T	---	E&A	Large	3, 4	---	---	President / Village Board	1-5 years	Village	Low/Medium	Existing (2015)

† 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 budgetary constraints experienced by a village of this size (less than 1,200 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
- LM Mitigation action with the potential to reduce impacts from the most frequent hazards
- HL Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
- LL Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

- DR Drought
- EC Extreme Cold
- EH Excessive Heat
- EQ Earthquake
- F Flood
- MMH Man-Made Hazard
- SS Severe Storms
- SWS Severe Winter Storm
- T Tornado

Type of Mitigation Activity:

- E&A Education & Awareness
- LP&R Local Plans & Regulations
- NSP Natural Systems Protection
- S&IP Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

- C Communications
- E Energy (Power & Fuel)
- FWS Food, Water, Shelter
- HM Hazardous Material
- H&M Health & Medical
- S&S Safety & Security
- T Transportation

Figure MIT-16
Toledo Hazard Mitigation Actions
(Sheet 2 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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 and implement an outreach program that works with schools to identify the risk to their infrastructure and students/staff from natural hazard events, the actions they can take to reduce those risks, the procedures in place in case of an evacuation and the steps they can take to maintain operations after a hazard event occurs.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	E&A	Large	1, 4, 5	---	---	President / Village Board	5 years	Village	Low/Medium	Existing (2015)
HM	Trim and manage trees to minimize the number and duration of service disruptions, improve community resilience and mitigate risk to Community Lifelines.	SS, SWS, T	C E T	S&IP	Medium	1, 4, 5	Yes	Yes	Public Works Director	1-5 years	Village	Low/High	Existing (2015)
LM	Inform residents of the locations designated as warming/cooling centers, emergency shelters and community safe rooms.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	E&A	Large	3, 4	---	---	President / Village Board	1 year	Village	Low/Medium	Existing (2015)
LM	Pass an ordinance requiring all new public buildings to include a community safe room (equipped with emergency backup generator & HVAC units) that can be used by Village staff/residents to establish Shelter Community Lifelines essential to human health and safety.	SS, T	FWS	LP&R	Small	4	Yes	---	President / Village Board	3-5 years	Village	Low/Medium	Existing (2015)

† 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 budgetary constraints experienced by a village of this size (less than 1,200 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Toledo Hazard Mitigation Actions
(Sheet 3 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Upsize roadway culverts/drainage structures to increase carrying capacity and alleviate flood/drainage problems associated with heavy rain events.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	Public Works Director	5 years	Village / IDOT Local Roads	Medium/High	Existing (2015)

† 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 budgetary constraints experienced by a village of this size (less than 1,200 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. 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 frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-17
Toledo Fire Protection District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	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	Coordinate with Jewett to formally designate the Community Center as a warming/cooling center and emergency shelter for area residents to establish a Community Lifeline essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	LP&R	Medium	1, 4, 5	---	---	Fire Chief / Board of Trustees	1-5 years	FPD	Low/Medium	New
LM	Secure a Memorandum of Agreement with Jewett to install an automatic emergency backup generator at the Jewett Community Center to establish a resilient and reliable power supply, ensure continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	LP&R	Medium	1, 4, 5	---	---	Fire Chief / Board of Trustees	1-5 years	FPD	Low/Medium	New
HM	Purchase and install an automatic emergency backup generator at the Jewett Community Center, a designated warming/cooling center & emergency shelter for Village residents, to establish a resilient and reliable power supply, ensure continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Medium	1, 4, 5	---	Yes	Fire Chief / Board of Trustees	1-5 years	FPD / USDA – RD Critical Facilities Programs	Medium/High	New
LM	Make public information materials available to District residents that detail the risks to life and property associated with the natural hazards that impact the District and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, SS, SWS, T	---	E&A	Large	3	---	---	Fire Chief / Board of Trustees	1-5 years	FPD	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 budgetary constraints experienced by a rural, all-volunteer fire protection district. Additional funding is necessary if implementation is to be achieved.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

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. The following provides a 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 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 Plan update will be monitored and evaluated by a Plan Maintenance Subcommittee on an annual basis. The Plan Maintenance Subcommittee will be composed of the participating jurisdictions who sought Plan approval and other key members of the Planning Committee. The Cumberland County Emergency Management Agency (EMA) will chair the Plan Maintenance Subcommittee.

The Cumberland County EMA will assume lead responsibility for monitoring and tracking the implementation status of the mitigation actions identified in the Plan update. It will be the responsibility of each Plan participant to provide the Cumberland County EMA with an annual progress report on the status of their existing mitigation actions and identify whether any actions need to be modified. New mitigation actions may be added to the Plan during the annual monitoring and evaluation period or at any time during the plan maintenance cycle by contacting the Cumberland County EMA Coordinator and providing the appropriate information.

Monitoring & Evaluating

- A Plan Maintenance Subcommittee will be formed to monitor and evaluate the Plan update.
- The ***Plan update will be monitored and evaluated*** on an ***annual basis***.
- Each Plan participant will be responsible for providing an annual progress report on the status of their mitigation actions.
- Plan participants can add ***new mitigation actions*** to the Plan ***during the annual monitoring phase or by contacting*** the Cumberland County EMA Coordinator.

The Cumberland County EMA together with the Plan Maintenance Subcommittee will also evaluate the Plan update on an annual basis to determine the effectiveness of the Plan at achieving its stated purpose and goals. In order to evaluate the effectiveness of the Plan update, the Subcommittee will review the mitigation actions that have been successfully implemented and determine whether the action achieved the identified goal(s) and had the intended result (i.e., were losses avoided or the vulnerability of hazard-prone areas reduced.)

The Subcommittee will also ask each Plan participant to identify any significant changes in development that have occurred within the previous 12 months; whether any new plans, policies, regulations, or reports have been adopted; and if any hazard-related damages to critical facilities and infrastructure have been sustained.

In order to streamline the plan maintenance process, the Cumberland County EMA will provide each Plan participant with a Plan Maintenance Checklist along with the necessary forms to complete and return. **Appendix L** contains a copy of Checklist and associated forms.

The Cumberland County EMA will then prepare a progress report detailing the results of the annual Plan monitoring and evaluation period and provide copies to the Subcommittee. The annual progress report will include:

- information on any hazard-related damages sustained by critical facilities and infrastructure within the planning area during the previous year.
- implementation status of the mitigation actions identified in the Mitigation Strategy.
- identification of any new mitigation actions proposed by the Plan participants.
- information on changes in development and planning and regulatory capabilities for the Plan participants.

If any existing mitigation actions are modified or new mitigation actions are identified for the Plan participants, then Section 4.7 of the Mitigation Strategy will be updated, and the Plan update resubmitted to the Illinois Emergency Management Agency (IEMA) and FEMA for reference.

5.1.2 Updating the Plan

The Plan must be updated within five years of the of the Plan approval date indicated on the signed FEMA final approval letter. (This date can be found in Section 6, Plan Adoption.) This ensures that all the participating jurisdictions will remain eligible to receive federal grant funds to implement those mitigation actions identified in this Plan.

The Cumberland County EMA, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan. The update will incorporate all of the information gathered during the monitoring and evaluation phase and will also include:

- a review of the Mitigation Strategy, including potential updates to the mitigation goals;
- an assessment of whether other natural or man-made hazards need to be addressed or included in the Plan;

<u>Updating the Plan</u>

- The Cumberland County EMA, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan.
- The Plan ***must be updated within 5 years*** of the ***date of the final approval letter*** provided by FEMA.
- Any jurisdictions that did not take part in the previous Plan may do so during the 5-year update.
- Once the Plan update has received FEMA/IEMA approval, each participating jurisdiction ***must adopt the Plan to remain eligible to receive federal mitigation funds.***

- ❖ a review of new hazard data that may affect the Risk Assessment Section; and
- ❖ identification of any changes in development that have occurred in hazard prone areas that would increase or decrease the participating jurisdictions' vulnerability.

In addition, any jurisdictions that did not take part in the previous Plan may do so at this time. It will be the responsibility of these jurisdictions to provide all of the information needed to be integrated into the Plan update.

A public forum will be held to present the Plan update to the public for review and comment. The comments received at the public forum will be reviewed and incorporated into the Plan update. The Plan update will then be submitted to IEMA and FEMA for review and approval. **Once the Plan update has received state and federal approval, FEMA requires that each of the participating jurisdictions adopt the Plan to remain eligible to receive federal funds to implement identified mitigation actions.**

5.2 INCORPORATING THE MITIGATION STRATEGY INTO EXISTING PLANNING MECHANISMS

As part of the planning process, the Planning Committee identified each participating jurisdiction's existing capabilities (i.e., existing authorities, policies, programs, technical information, etc.) and resources available to support or accomplish mitigation and reduce long-term vulnerability. **Figures PP-3** through **PP-10** identify the existing authorities, policies, programs, technical information, and resources available by capability type by jurisdiction. **It will be the responsibility of each participating jurisdiction to incorporate, where applicable, the mitigation strategy and other information contained in the Plan update into the planning mechanisms identified for their jurisdiction.**

Adoption of this Plan update will trigger each participating jurisdiction to review and, where appropriate, integrate the Plan into other available planning mechanisms. The Plan Maintenance Subcommittee's annual review will help maintain awareness of the Plan among the participating jurisdictions and encourage active integration of the Plan 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.

Based on conversations with Planning Committee members, none of the jurisdictions that participated in the original Plan have incorporated it into other planning mechanisms within their jurisdictions. This is due in part to the size, fiscal and staffing situations, and technical capacity of the participants. While The County and Neoga have comprehensive/master plans, they have not been updated since the original hazard mitigation Plan was completed.

There is no indication that the County or any of the participating jurisdictions will be adopting, reviewing, or strengthening current policies or programs in the near future. All of the participating jurisdictions have limited capabilities to integrate the mitigation strategy and other information contained in the Plan update into existing planning mechanisms. These jurisdictions are small in size and do not have the financial resources or trained personnel to develop planning mechanisms such as comprehensive plans or building and zoning ordinances.

5.3 CONTINUED PUBLIC INVOLVEMENT

The County and participating jurisdictions understand the importance of continued public involvement and will seek public input on the Plan update throughout the plan maintenance cycle. A copy of the approved Plan will be maintained and available for review at the Cumberland County Clerk's Office. Individuals will be encouraged to provide feedback and submit comments for the next Plan update to the Cumberland County EMA Coordinator.

The comments received will be compiled and included in the annual progress report and considered for incorporation into the next Plan update. Any meetings held by the Plan Maintenance Subcommittee will be noticed and open to the public. Separate committee meetings and a public forum will be held prior to the next Plan update submittal to provide the public an opportunity to comment on the proposed revision to the Plan update.

6.0 PLAN ADOPTION

The final step in the planning process is the adoption of the approved Plan update by each participating jurisdiction. Each jurisdiction must formally adopt the Plan to remain eligible for federal grant funds to implement mitigation actions identified in this Plan.

6.1 PLAN ADOPTION PROCESS

Before the Plan update could be adopted by the participating jurisdictions, it was made available for public review and comment through a public forum and comment period. Comments received were incorporated into the Plan update and the Plan was then submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for their review and approval.

Upon receipt of the Approval Pending Adoption (APA) letter from FEMA, the Plan update was presented to the County and participating jurisdictions for adoption. **Each participating jurisdiction was required to formally adopt** the Plan to remain eligible to receive federal grant funds to implement the mitigation actions identified in this Plan. Any jurisdiction that chose not to adopt the Plan update did not affect the eligibility of those who did.

Figure PA-1 identifies the participating jurisdictions and the date each formally adopted the Plan update. Signed copies of the adoption resolutions are located in **Appendix M**. FEMA signed the final approval letter on (Date) which began the five-year approval period and set the expiration date of (Date) for the Plan.

Figure PA-1
Plan Adoption Dates

Participating Jurisdiction	Plan Adoption Date

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. <https://www.fema.gov/data-visualization-disaster-declarations-states-and-counties>.
2. Federal Emergency Management Agency. OpenFEMA Dataset: Disaster Declarations Summaries – V2. Excel Dataset. <https://www.fema.gov/openfema-dataset-disaster-declarations-summaries-v1>.
3. Federal Emergency Management Agency. Getting Started: Building Support for Mitigation Planning. FEMA 386-1. September 2002.
4. Illinois Emergency Management Agency. Mitigation Planning. 2018 Illinois Natural Hazard Mitigation Plan. October 2018. <https://iema.illinois.gov/content/dam/soi/en/web/iema/recovery/documents/plan-illmitigationplan.pdf>.
5. en/web/iema/recovery/documents/plan-illmitigationplan.pdf>.

1.2 County Profile

1. Illinois Department of Commerce and Economic Opportunity. Community Profiles. Database. <https://app.locationone.com/areas/communities?organization=59eaba35bec80e09b4bbf0df&buildings:filters=%5B%5B%22railServed%22%2C%5B%22Y%22%5D%5D%5D&buildings:sort=sqft:high&sites:filters=%5B%5D&sites:sort=acres:high>.
2. Illinois Department of Public Health. IDPH Population Projections, Illinois, Chicago, and Illinois Counties by Age and Sex: July 1, 2015 to July 1, 2030 (2019 Edition). <https://dph.illinois.gov/content/dam/soi/en/web/idph/files/publications/population-projections-report-2010-2030.pdf>.
3. United States Census Bureau. 2010 Census Tract Reference Maps. <https://www.census.gov/geographies/reference-maps/2010/geo/2010-census-tract-maps.html>.
4. United States Census Bureau. Gazetteer Files. <https://www.census.gov/geographies/reference-files/time-series/geo/gazetteer-files.html>.
5. United States Census Bureau. American Community Survey. Data Profiles. <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/>.
6. United States Department of Agriculture. National Agricultural Statistics Service. Census of Agriculture. 2017 State and County Profiles – Illinois. <https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/>.
7. United States Department of Agriculture. Census of Agriculture Historical Archive. <https://agcensus.library.cornell.edu/>.

8. United States Department of Agriculture. Natural Resources Conservation Service. Soil Surveys by State. <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soil/soil-surveys-by-state>.

1.3 Land Use and Development Trends

1. United States Census Bureau. Explore Census Data. <https://data.census.gov/>.
2. United States Census Bureau. Illinois: Population of Counties by Decennial Census: 1900 to 1990. 1995.
3. United States Census Bureau. American Community Survey. Data Profiles. <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/>.

2.0 PUBLIC INVOLVEMENT

1. Federal Emergency Management Agency. Local Mitigation Plan Review Guide. October 1, 2011. <https://www.fema.gov/sites/default/files/2020-06/fema-local-mitigation-plan-review-guide_09_30_2011.pdf>.

2.4 EXISTING CAPABILITIES

1. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Capability Assessment Worksheet. Form.

3.0 RISK ASSESSMENT

1. Changnon, Stanley A., et al. Climate Atlas of Illinois. Champaign, Illinois: Illinois State Water Survey, 2004.
2. Federal Emergency Management Agency. Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001.
3. Illinois Department of Transportation. Illinois Roadway Crash Data. County Crash Statistics. <http://www.idot.illinois.gov/transportation-system/safety/Illinois-Roadway-Crash-Data>.
4. Illinois Emergency Management Agency. Mitigation Planning. 2018 Illinois Natural Hazard Mitigation Plan. October 2018. <https://iema.illinois.gov/content/dam/soi/en/web/iema/recovery/documents/plan-illmitigationplan.pdf>.
5. Illinois Emergency Management Agency. Preparedness. Weather. Severe Weather Preparedness Guide. February 2021. <https://www2.illinois.gov/iema/preparedness/documents/severeweatherpreparedness.pdf>
6. Illinois Environmental Protection Agency. Drinking Water Branch. Public Water Supply Systems Search. Database. <http://water.epa.state.il.us/dww/index.jsp>.
7. Illinois Environmental Protection Agency. Source Water Assessment Program Factsheets. Database. <http://dataservices.epa.illinois.gov/swap/factsheet.aspx>.
8. Illinois State Geological Survey. Coal Mines in Illinois (ILMINES). Online Map Viewer. <http://isgs.illinois.edu/ilmines>.
9. Illinois State Geological Survey. County Coal Data and Maps. <https://isgs.illinois.edu/research/coal/maps/county>.

10. Illinois State Geological Survey. Karst Landscapes of Illinois: Dissolving Bedrock and Collapsing Soil. <http://www.isgs.illinois.edu/outreach/geology-resources/karst-landscapes-illinois-dissolving-bedrock-and-collapsing-soil>.

11. Illinois State Geological Survey. Landslide Inventory of Illinois. By Myrna M. Killey et al. Circular 534. 1985.

12. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Capability Assessment Worksheet. Form.

13. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Critical Facilities & Infrastructure. Form.

14. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Critical Facilities Vulnerability Survey. Form.

15. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Drinking Water Supply Worksheet. Form.

16. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Identification of Severe Weather Shelters. Form.

17. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Natural Hazard Events Questionnaire. Form.

18. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Risk Priority Index Exercise. Form.

19. Midwestern Regional Climate Center. cli-MATE: Online Data Portal. Database. <https://mrcc.purdue.edu/CLIMATE/>.

20. National Oceanic and Atmospheric Administration. National Centers for Environmental Information. COOP Data/Record of Climatological Observations Form. Database. <http://www.ncdc.noaa.gov/IPS/coop/coop.html>.

21. National Oceanic and Atmospheric Administration. National Centers for Environmental Information. Storm Events Database. Database. <https://www.ncdc.noaa.gov/stormevents/>.

22. National Oceanic and Atmospheric Administration. National Weather Service. National Weather Service Glossary. <https://w1.weather.gov/glossary/>.

23. National Oceanic and Atmospheric Administration. National Weather Service. Thunderstorms, Tornadoes, Lightning…Nature's Most Violet Storms. <https://www.weather.gov/media/owlie/ttl6-10.pdf>.

24. National Aeronautics and Space Administration. Global Landslide Catalog. Cooperative Open Online Landslide Repository. <https://maps.nccs.nasa.gov/arcgis/apps/MapAndAppGallery/index.html?appid=574f26408683485799d02e857e5d9521>.

25. U.S. Army Corps of Engineers. National Inventory of Dams. Database. <https://nid.usace.army.mil/#/>.

26. U.S. Army Corps of Engineers. National Levee Database. Database. <https://levees.sec.usace.army.mil/#/>.

27. U.S. Geological Survey. U.S. Landslide Inventory and Interactive Map. Online Map Viewer. <https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=ae120962f459434b8c904b456c82669d>.

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

1. National Oceanic and Atmospheric Administration. A Hail of a Storm: Hailstones Pack a Perilous (and Costly) Punch. August 2009.
2. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Hail Basics. <https://www.nssl.noaa.gov/education/svrwx101/hail/>.
3. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Hail Types. <https://www.nssl.noaa.gov/education/svrwx101/hail/types/>.
4. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Lightning Basics. <https://www.nssl.noaa.gov/education/svrwx101/lightning/>.
5. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Thunderstorm Basics. <https://www.nssl.noaa.gov/education/svrwx101/thunderstorms/>.
6. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Thunderstorm Types. <https://www.nssl.noaa.gov/education/svrwx101/thunderstorms/types/>.
7. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Damaging Winds Basics. <https://www.nssl.noaa.gov/education/svrwx101/wind/>.
8. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Damaging Winds Types. <https://www.nssl.noaa.gov/education/svrwx101/wind/types/>.
9. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Cloud-to-Ground Lightning Flashes By State: 2009-2018. <https://www.weather.gov/media/safety/09-18Flashes_Flash_Density_State.pdf>.
10. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Severe Thunderstorms. Watch vs. Warning. <https://www.weather.gov/safety/thunderstorm-ww>.
11. National Oceanic and Atmospheric Administration. National Weather Service. Storm Prediction Center. Frequently Asked Questions. How does the NWS define a severe thunderstorm? <https://www.spc.noaa.gov/faq/>.
12. The Tornado and Storm Research Organisation. The TORRO Hailstorm Intensity Scale. <https://www.torro.org.uk/research/hail/hscale>.
13. Vaisala. National Lightning Detection Network. Flash Density Map in Miles: 2009-2018.

3.2 Excessive Heat

1. Centers for Disease Control and Prevention. National Environmental Public Health Tracking. Extreme Heat. <https://ephtracking.cdc.gov/showClimateChangeExtremeHeat.action>.
2. Centers for Disease Control and Prevention. Natural Disasters and Severe Weather. FAQs. <https://www.cdc.gov/disasters/extremeheat/faq.html>.
3. Centers for Disease Control and Prevention. Natural Disasters and Severe Weather. Warning Signs and Symptoms. <https://www.cdc.gov/disasters/extremeheat/warning.html>.
4. National Oceanic and Atmospheric Administration. National Weather Service. Heat Index. <https://www.weather.gov/safety/heat-index>.
5. National Oceanic and Atmospheric Administration. National Weather Service. Heat Watch vs. Warning. <https://www.weather.gov/safety/heat-ww>.
6. National Oceanic and Atmospheric Administration. National Weather Service. Heat Wave: A Major Summer Killer. Brochure. <https://www.weather.gov/media/owlie/heatwave.pdf>.
7. North Carolina Cooperative Extension Service. Heat Stress Disorders. <https://content.ces.ncsu.edu/heat-stress-disorders>.
8. United States Environmental Protection Agency. Excessive Heat Events Guidebook. June 2006. <https://www.epa.gov/sites/production/files/2016-03/documents/eheguide_final.pdf>.

3.3 Severe Winter Storms

1. Illinois Emergency Management Agency. Mitigation. Winter Storms. <https://iema.illinois.gov/recovery/hazardinfo.html#Winter>.
2. Illinois Emergency Management Agency. Preparedness. Winter Storm Preparedness Guide. November 2021. <https://www2.illinois.gov/iema/Preparedness/Documents/winter_storm_preparedness_guidebook.pdf>
3. Illinois State Water Survey. Illinois Third Consecutive Severe Winter: 1978-1979. By Stanley A. Changnon, Jr., David Changnon and Phillis Stone. Report of Investigation 94. 1980. <https://www.isws.illinois.edu/pubdoc/RI/ISWSRI-94.pdf>.
4. Illinois State Water Survey. Record Winter Storms in Illinois, 1977-1978. By Stanley A. Changnon, Jr. and David Changnon. Report of Investigation 88. 1978. <https://www.isws.illinois.edu/pubdoc/RI/ISWSRI-88.pdf>.
5. Illinois State Water Survey. The Severe Winter of 1981-1982 in Illinois. By Steven D. Hilberg, Peter G. Vinzani, and Stanley A. Changnon, Jr. Report of Investigation 104. 1983. <https://www.isws.illinois.edu/pubdoc/RI/ISWSRI-104.pdf>.
6. Illinois State Water Survey. State Climatologist Office for Illinois. Glossary of Winter Weather Terms. <https://www.isws.illinois.edu/statecli/Winter/glossary.htm>.

7. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Types of Winter Weather. <https://www.nssl.noaa.gov/education/svrwx101/winter/types/>.

8. National Oceanic and Atmospheric Administration. National Weather Service. NWS Weather Forecast Office Lincoln, IL. What Is the Difference Between a Winter Storm Watch, Warning, and Advisory? <https://www.weather.gov/ilx/wwa_social>.

9. Ready.gov. Ready Kids. Winter Weather. <https://www.ready.gov/kids/disaster-facts/winter-weather>.

3.4 FLOODS

1. Code of Federal Regulations. Title 44 – Emergency Management and Assistance. Chapter 1 – Federal Emergency Management Agency, Department of Homeland Security. Subchapter B – Insurance and Hazard Mitigation. Part 59 – General Provisions. Subpart A – General. 59.1 – Definitions. <https://www.govinfo.gov/content/pkg/CFR-2017-title44-vol1/pdf/CFR-2017-title44-vol1-part59.pdf>.

2. Federal Emergency Management Agency. Adoption of Flood Insurance Rate Maps by Participating Communities. FEMA 495. September 2019. <https://www.fema.gov/sites/default/files/2020-07/fema_adoption-flood-insurance-rate-maps-participating-communities_bulletin.pdf>.

3. Federal Emergency Management Agency. Answers to Questions About the NFIP. FEMA F-084. March 2022. <https://agents.floodsmart.gov/sites/default/files/fema-answers-to-questions-about-the-NFIP.pdf>.

4. Federal Emergency Management Agency. Community Status Book Report Illinois. <http://www.fema.gov/cis/IL.pdf>.

5. Federal Emergency Management Agency. Design Guide for Improving Critical Facility Safety from Flooding and High Winds: Providing Protection to People and Buildings. FEMA 543. January 2007. <https://www.fema.gov/media-library/assets/documents/8811>.

6. Federal Emergency Management Agency. FEMA Flood Maps and Zones Explained. <https://www.fema.gov/blog/fema-flood-maps-and-zones-explained>.

7. Federal Emergency Management Agency. Flood Insurance Rate Map (FIRM). <https://www.fema.gov/glossary/flood-insurance-rate-map-firm>.

8. Federal Emergency Management Agency. Flood Map Service Center. Map Viewer. <https://msc.fema.gov/portal/home>.

9. Federal Emergency Management Agency. Flood Zones. <https://www.fema.gov/glossary/flood-zones>.

10. Federal Emergency Management Agency. How to Read a Flood Insurance Rate Map Tutorial. Updated June 2003.

11. Federal Emergency Management Agency. How to Read a Flood Map. <https://www.fema.gov/sites/default/files/documents/how-to-read-flood-insurance-rate-map-tutorial.pdf>.

12. Federal Emergency Management Agency. National Flood Insurance Program Community Rating System: A Local Official's Guide to Saving Lives, Preventing Property Damage, Reducing the Cost of Flood Insurance. FEMA B 573. 2018. <https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_local-guide-flood-insurance-2018.pdf>.

13. Federal Emergency Management Agency. National Flood Insurance Program: Frequently Asked Questions Repetitive Loss. October 2005. <https://www.fema.gov/txt/rebuild/repetitive_loss_faqs.txt>.

14. Federal Emergency Management Agency. National Flood Insurance Program Terminology Index. <https://www.fema.gov/flood-insurance/terminology-index>.

15. Federal Emergency Management Agency. Participation in the NFIP. <https://www.fema.gov/glossary/participation-nfip#:~:text=To%20join%2C%20the%20community%20must,exceeds%20the%20minimum%20NFIP%20criteria.>.

16. Federal Emergency Management Agency. What is a flood map? <https://www.floodsmart.gov/all-about-flood-maps>.

17. Federal Emergency Management Agency. Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001.

18. Federal Emergency Management Agency. National Flood Insurance Program. Answers to Tough Questions: Talking Points for Community Officials. September 2013.

19. Illinois Administrative Code. Title 17: Conservation. Chapter I: Department of Natural Resources. Subchapter h: Water Resources. Part 3706: Regulation of Construction within Flood Plains. <https://www.dnr.illinois.gov/adrules/documents/17-3706.pdf>.

20. Illinois Department of Natural Resources. Office of Water Resources. 100-Year Floodplain in Illinois. Map. August 6 2009. <https://www.dnr.illinois.gov/WaterResources/Pages/GISMaps.aspx>.

21. Illinois Department of Natural Resources. Office of Water Resources. Local Floodplain Administrator's Manual. 2006. <https://www.dnr.illinois.gov/WaterResources/Documents/LocalFloodplainAdministratorsManualBluebook_2006.pdf>.

22. Illinois Department of Natural Resources. Office of Water Resources. Quick Guide to Floodplain Management in Illinois. 2001. <http://www.dnr.illinois.gov/WaterResources/Documents/Resman_ILFPMQuickGuide.pdf>.

23. Library of Congress. Congressional Research Service. National Flood Insurance Program: Selected Issues and Legislation in the 115th Congress. R45099. Update July 31, 2018. <https://crsreports.congress.gov/product/pdf/R/R45099>.

24. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Flood Basics. <https://www.nssl.noaa.gov/education/svrwx101/floods/>.

25. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Flood Types. <https://www.nssl.noaa.gov/education/svrwx101/floods/types/>.

26. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Frequently Asked Questions About Floods. <https://www.nssl.noaa.gov/education/svrwx101/floods/faq>.

27. National Oceanic and Atmospheric Administration. National Weather Service. Advanced Hydrologic Prediction Service. November 2021. <https://water.weather.gov/ahps>.

28. National Oceanic and Atmospheric Administration. National Weather Service. During a Flood. <https://www.weather.gov/safety/flood-during>.

29. National Oceanic and Atmospheric Administration. National Weather Service. Floods the Awesome Power. <https://www.weather.gov/media/jetstream/tstorms/floods_booklet.pdf>.

30. National Oceanic and Atmospheric Administration. National Weather Service. Flood Warning vs. Watch. <https://www.weather.gov/safety/flood-watch-warning>.

31. U.S. Army Corps of Engineers. RiverGages.com <https://rivergages.mvr.usace.army.mil/WaterControl/new/layout.cfm>.

32. U.S. Code. Title 42 – The Public Health and Welfare. Chapter 50 – National Flood Insurance. Subchapter III – Coordination of Flood Insurance with Land-Management Programs in Flood-Prone Areas. Section 4106 – Nonparticipation in Flood Insurance Program. <http://uscode.house.gov/search/criteria.shtml>.

3.5 EXTREME COLD

1. Centers for Disease Control and Prevention. Extreme Cold: A Prevention Guide to Promote Your Personal Health and Safety. <https://www.cdc.gov/disasters/winter/pdf/extreme-cold-guide.pdf>.

2. Centers for Disease Control and Prevention. Natural Disasters and Severe Weather. Prevent Hypothermia & Frostbite. <https://www.cdc.gov/disasters/winter/staysafe/hypothermia.html>.

3. Environmental Research. Clinical Outcomes of Temperature Related Injuries Treated in the Hospital Setting, 2011-2018. Lee S. Friedman, et al. 11 July 2020. <https://www.sciencedirect.com/science/article/abs/pii/S0013935120307775?via%3Dihub>.

4. Illinois Emergency Management Agency. Winter Storm Preparedness Guide. <https://www2.illinois.gov/iema/Preparedness/Documents/winter_storm_preparedness_guidebook.pdf>

5. National Oceanic and Atmospheric Administration. National Weather Service. During Extremely Cold Weather. <https://www.weather.gov/safety/cold-during>.

6. National Oceanic and Atmospheric Administration. National Weather Service. Wind Chill Chart. <https://www.weather.gov/safety/cold-wind-chill-chart>.

7. National Oceanic and Atmospheric Administration. National Weather Service. Wind Chill Questions. <https://www.weather.gov/safety/cold-faqs>.
8. National Oceanic and Atmospheric Administration. National Weather Service. Wind Chill Temperature Index. <https://www.weather.gov/media/safety/wind-chill-brochure.pdf>.
9. National Oceanic and Atmospheric Administration. National Weather Service. Winter Weather Resources and Frequently Asked Questions. <https://www.weather.gov/safety/cold-outreach>.
10. National Oceanic and Atmospheric Administration. National Weather Service. NWS Weather Forecast Office Lincoln, IL. What Is the Difference Between a Winter Storm Watch, Warning, and Advisory? <https://www.weather.gov/ilx/wwa_social>.
11. Ready.gov. Ready Kids. Winter Weather. <https://www.ready.gov/kids/disaster-facts/winter-weather>.
12. University of Illinois Chicago. UIC Today. Cold-Weather Accounts for almost all Temperature-Related Deaths. 18 August 2020. <https://today.uic.edu/cold-weather-accounts-for-almost-all-temperature-related-deaths>.

3.6 TORNADOES

1. Illinois Secretary of State. Illinois State Archives. Illinois Regional Archives Depository System. County Fact Sheets. <https://www.ilsos.gov/departments/archives/IRAD/iradregn.html#countyfacts>.
2. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Tornado Basics. <https://www.nssl.noaa.gov/education/svrwx101/tornadoes/>.
3. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Frequently Asked Questions about Tornadoes. <https://www.nssl.noaa.gov/education/svrwx101/tornadoes/faq/>.
4. National Oceanic and Atmospheric Administration. National Weather Service. NWS Forecast Office Lincoln, IL. Tornado Climatology for Central and Southeast Illinois. <https://www.weather.gov/ilx/tor-climo>.
5. National Oceanic and Atmospheric Administration. National Weather Service. Safety Tornado Watch vs. Warning. <https://www.weather.gov/safety/tornado-ww>.
6. National Oceanic and Atmospheric Administration. Storm Prediction Center. The Online Tornado FAQ: Frequently Asked Questions about Tornadoes. By Roger Edwards. <https://www.spc.noaa.gov/faq/tornado/>.
7. National Oceanic and Atmospheric Administration. Storm Prediction Center. Fujita Tornado Damage Scale. Figure. By Roger Edwards. <https://www.spc.noaa.gov/faq/tornado/f-scale.html>.
8. National Oceanic and Atmospheric Administration. Storm Prediction Center. Enhanced F Scale for Tornado Damage. Figure. By Roger Edwards. <https://www.spc.noaa.gov/faq/tornado/ef-scale.html>.

3.7 DROUGHT

1. Illinois State Water Survey. State of Illinois Drought Preparedness and Response Plan. Adopted by the State Water Plan Task Force October 2, 2011. <https://www.isws.illinois.edu/hilites/drought/archive/2011/docs/St_Ill_Drought_Plan_2011.pdf>.

2. Illinois State Water Survey. Department of Energy and Natural Resources. The 1988-1989 Drought in Illinois: Causes, Dimensions, and Impacts. Research Report 121. By Peter J. Lamb, Scientific Editor. 1992. <https://www.isws.illinois.edu/pubdoc/RR/ISWSRR-121.pdf>.

3. Illinois State Water Survey. Illinois State Climatologist. Moderate Drought in Western Illinois. 30 August 2013. <https://climateillinois.wordpress.com/2013/08/>.

4. National Drought Mitigation Center. Drought Basics. <https://drought.unl.edu/Education/DroughtBasics.aspx>.

5. National Drought Mitigation Center. Types of Drought. <https://drought.unl.edu/Education/DroughtIn-depth/TypesofDrought.aspx>.

6. National Integrated Drought Information System. U.S. Drought Portal. U.S. Drought Monitor. <https://www.drought.gov/drought/data-maps-tools/current-conditions>.

7. National Oceanic and Atmospheric Administration. National Centers for Environmental Information. Billion-Dollar Weather and Climate Disasters: Mapping. Database. <https://www.ncdc.noaa.gov/billions/mapping>.

8. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Understand Drought and Know How to Respond. <https://www.weather.gov/safety/drought>.

9. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Drought Safety. Drought Types. <https://www.weather.gov/safety/drought-types>.

10. United State Department of Agriculture. USDA Designates Counties in Illinois as Agricultural Disaster Areas. Release No 0281.05. 27 July 2005.

11. United State Department of Agriculture. Agriculture Secretary Vilsack Announces New Drought Assistance, Designates an Additional 218 Counties as Primary Natural Disaster Areas. Release No. 0260.12. 1 August 2012. <https://www.usda.gov/media/press-releases/2012/08/01/agriculture-secretary-vilsack-announces-new-drought-assistance>.

12. United State Department of Agriculture. Farm Service Agency. USDA Designated 44 Counties in Illinois as Primary Natural Disaster Areas. Release No. 0150.11. 2 November 2011. <https://www.fsa.usda.gov/FSA/printapp?fileName=ed_20111102_rel_0150.html&newsType=ednewsrel>.

13. United State Department of Agriculture. Farm Service Agency. USDA Designated 44 Counties in Iowa as Primary Natural Disaster Areas with Assistance to Farmers and Ranchers in Adjacent States. Release 0201.13. 12 December 2013.

14. United States Department of Agriculture. National Agricultural Statistics Service. Census of Agriculture. 2017 State and County Profiles – Illinois.

<https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/>.

15. United States Department of Agriculture. Census of Agriculture Historical Archive. <https://agcensus.library.cornell.edu/>.
16. United States Department of Agriculture. National Agricultural Statistics Service. 2017 Census of Agriculture. Table 1. County Summary Highlights: 2017. <https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/Illinois/>.
17. United States Department of Agriculture. National Agricultural Statistics Service. 2017 Census of Agriculture. Table 2. Market Value of Agricultural Products Sold Including Direct Sales: 2017 and 2012. <https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/Illinois/>.
18. United States Department of Agriculture. Census of Agriculture Historical Archive. Table 1. County Summary Highlights: 2012. 13 March 2019 <https://agcensus.library.cornell.edu/wp-content/uploads/2012-Illinois-st17_2_001_001.pdf>.
19. United States Department of Agriculture. Census of Agriculture Historical Archive. Table 2. Market Value of Agricultural Products Sold Including Direct Sales: 2012 and 2007. <https://agcensus.library.cornell.edu/wp-content/uploads/2012-Illinois-st17_2_002_002.pdf>.
20. United States Department of Agriculture. National Agricultural Statistics Service. Data & Statistics. Quick Stats. Quick Stats Lite. Database. <https://www.nass.usda.gov/Quick_Stats/Lite/>.
21. United States Drought Monitor. U.S. Drought Monitor. Map. <https://droughtmonitor.unl.edu/>.
22. United States Drought Monitor. Drought Classification. <https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx >.
23. United States Drought Monitor. What is the U.S. Drought Monitor? Brochure. < https://droughtmonitor.unl.edu/data/docs/USDM_FSA_fact_sheet.pdf >.
24. World Meteorological Organization. Handbook of Drought Indicators and Indices. <https://library.wmo.int/doc_num.php?explnum_id=3057 .

3.8 EARTHQUAKES

1. Atkinson, William. The Next New Madrid Earthquake: A Survival Guide for the Midwest. Carbondale, Illinois: Southern Illinois University Press, 1989.
2. EPRI, U.S. Department of Energy, and U.S. Nuclear Regulatory Commission. Technical Report: Central and Eastern United States Seismic Source Characterization for Nuclear Facilities. 2012. <http://www.ceus-ssc.com/Report/Downloads.html>.
3. Federal Emergency Management Agency. Hazus Estimated Annualized Earthquake Losses for the United States. FEMA P-366. April 2017. <https://www.fema.gov/sites/default/files/2020-07/fema_earthquakes_hazus-estimated-annualized-earthquake-losses-for-the-united-states_20170401.pdf>.

4. Illinois State Geological Survey. Handbook of Illinois Stratigraphy. By H. B. Willman, et. al. Bulletin 95. 1975. <http://hdl.handle.net/2142/35115>.
5. Illinois State Geological Survey. Seismicity of Illinois. By Paul C. Heigold and Timothy H. Larson. Environmental Geology Notes 133. 1990. 18 March 2019 <http://hdl.handle.net/2142/78950>.
6. Illinois State Geological Survey. Structural Features in Illinois. By W. John Nelson. Bulletin 100. 1995. <https://www.ideals.illinois.edu/items/43593>.
7. Illinois State Geological Survey. Earthquakes In Illinois: 1795 – 2015. Map.
8. Illinois State Geological Survey. Earthquake Occurrence in Illinois: An Earthquake Every Year. Fact Sheet. 1995-3. <https://www.isgs.illinois.edu/sites/isgs/files/files/qk-fct-occur.pdf>.
9. Illinois State Geological Survey. Wabash Valley Earthquakes: A Dozen Moderate Quakes in a Century. Fact Sheet. 1996-1. <https://www.isgs.illinois.edu/sites/isgs/files/files/eq-fct-wabash.pdf>.
10. Incorporated Research Institutions for Seismology. How Often Do Earthquakes Occur? Fact Sheet. June 2011. <https://www.iris.edu/hq/inclass/fact-sheet/how_often_do_earthquakes_occur>.
11. Louie, John N. University of Nevada, Reno. Nevada Seismological Lab. Earthquake Effects in Kobe, Japan. <https://sites.google.com/view/louie-class-geol100/earthquake-effects-in-kobe-japan>.
12. Michigan Technological University. UPSeis. Earthquake Magnitude Scale. <http://www.geo.mtu.edu/UPSeis/magnitude.html>.
13. Michigan Technological University. UPSeis. Modified Mercalli Intensity Scale. <http://www.geo.mtu.edu/UPSeis/Mercalli.html>.
14. Missouri State Emergency Management Agency. Earthquake Intensity Map. Map. .
15. St. Louis University. Introduction to New Madrid Seismic Zone. <http://www.eas.slu.edu/eqc/eqc_quakes/NewMadridGeneral.html>.
16. University of Alaska Fairbanks. Alaska Earthquake Center. Earthquake Magnitude Classes. <https://earthquake.alaska.edu/earthquake-magnitude-classes>.
17. University of Memphis. Center for Earthquake Research and Information. New Madrid Earthquake Catalog Search. Database. <http://folkworm.ceri.memphis.edu/catalogs/html/cat_nm.html>.
18. U.S. Geological Survey. 1811 – 1812 New Madrid, Missouri Earthquakes. <https://www.usgs.gov/programs/earthquake-hazards/science/1811-1812-new-madrid-missouri-earthquakes>.
19. U.S. Geological Survey. Earthquake Hazard in the Heartland of the Homeland. Fact Sheet 2006-3125. By Joan Gomberg and Eugene Schweig. January 2007. <https://pubs.usgs.gov/fs/2006/3125>.

20. U.S. Geological Survey. Earthquake Hazard in the New Madrid Seismic Zone Remains a Concern. Fact Sheet 2009-3071. By A. D. Frankel, et al. August 2009. <https://pubs.usgs.gov/fs/2009/3071>.

21. U.S. Geological Survey. Earthquake Hazards Program. <https://www.usgs.gov/glossary/earthquake-hazards-program>.

22. U S. Geological Survey. Earthquakes. By Kay M. Shedlock and Louis C. Pakiser. 1995. <https://pubs.usgs.gov/gip/earthq1/index.html>.

23. U.S. Geological Survey. Earthquakes in the Central United States – 1699-2002. By Russell L. Wheeler, et. al. U.S. Geological Survey Geologic Investigations Series I-2812. Version 1.0. 24 November 2003. <https://pubs.usgs.gov/imap/i-2812/>.

24. U.S. Geological Survey. Earthquakes in the Central United States – 1699-2002: Earthquake Catalog. By Russell L. Wheeler, et. al. U.S. Geological Survey Geologic Investigations Series I-2812. 24 November 2003. <https://pubs.usgs.gov/imap/i-2812/catalog.txt>.

25. U.S. Geological Survey. Earthquakes in the Central United States – 1699 – 2010. Supersedes Geologic Investigations Series I-2812. By Richard L. Dart and Christina M. Volpi. 2010. <https://pubs.usgs.gov/gip/115/>.

26. U.S. Geological Survey. Earthquakes in the Central United States – 1699 – 2010: Updatecatalog. 2010. <https://pubs.usgs.gov/gip/115/downloads/GIP115_data/Updatecatalog.txt>.

27. U.S. Geological Survey. M 5.2 – 7km ESE of Claremont, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/nm603116#executive>.

28. U.S. Geological Survey. M 5.2 – 7km NNE of Bellmont, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/nm606657#executive>.

29. U.S. Geological Survey. Moment magnitude, Richter Scale - what are the different magnitude scales, and why are there so many? <https://www.usgs.gov/faqs/moment-magnitude-richter-scale-what-are-different-magnitude-scales-and-why-are-there-so-many>.

30. U.S. Geological Survey. Nearly Half of Americans Exposed to Potentially Damaging Earthquakes. 10 August 2015. <https://www.usgs.gov/news/nearly-half-americans-exposed-potentially-damaging-earthquakes>.

31. U.S. Geological Survey. Search Earthquake Catalog. Database. <https://earthquake.usgs.gov/earthquakes/search/>.

32. U.S. Geological Survey. Seismicity of the United States, 1568-1989 (Revised). By C.W. Stover and J.L. Coffman. U.S. Geological Survey Professional Paper 1527. 1993. <https://pubs.er.usgs.gov/publication/pp1527>.

33. U.S. Geological Survey. The Modified Mercalli Intensity Scale. <https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale>.

34. U.S. Geological Survey. The Science of Earthquakes. By Lisa Wald. <https://earthquake.usgs.gov/learn/kids/eqscience.php>.

35. U.S. Geological Survey. The Severity of an Earthquake. <https://pubs.usgs.gov/gip/earthq4/severitygip.html>.
36. U.S. Geological Survey. United States: Magnitude 7+. <https://www.usgs.gov/programs/earthquake-hazards/lists-maps-and-statistics>.
37. U.S. Geological Survey. What is a fault and what are the different types? <https://www.usgs.gov/faqs/what-fault-and-what-are-different-types>.
38. U. S. Geological Survey. Where do earthquakes occur? <https://www.usgs.gov/faqs/where-do-earthquakes-occur?qt-news_science_products=7#qt-news_science_products>.
39. U.S. Nuclear Regulatory Commission. Magnitude/Intensity Comparison. <https://www.nrc.gov/docs/ML1821/ML18214A882.pdf>.

3.9 Man-Made Hazards

1. Association of American Railroads. Freight Railroads in Illinois. <https://www.aar.org/data-center/railroads-states/>.
2. Association of American Railroads. Freight Railroads Moving America Safely. <https://www.aar.org/fact-sheets/>.
3. Association of American Railroads. Freight Railroads in United States. <https://www.aar.org/data-center/railroads-states/>.
4. California Department of Fish and Wildlife. Office of Spill Prevention and Response. National Resource Damage Assessment (NRDA) and Restoration. Refugio. <https://www.wildlife.ca.gov/OSPR/NRDA/Refugio>.
5. Federal Bureau of Investigation. Terrorism 2002 – 2005. <https://www.fbi.gov/file-repository/stats-services-publications-terrorism-2002-2005-terror02_05.pdf/view>.
6. Illinois Commerce Commission. Transportation. Railroad Safety. Annual Report on Accidents/Incidents Involving Hazardous Materials on Railroads in Illinois. <https://www.icc.illinois.gov/reports/report.spx?rt=19>.
7. Illinois Department of Transportation. Transportation Fast Facts. <https://idot.illinois.gov/transportation-system/Network-Overview/index>.
8. Illinois Emergency Management Agency. Hazardous Materials Incident Reports. Database. <https://public.iema.state.il.us/OIAHazmatSearch/>.
9. Illinois Emergency Management Agency. Tier 2 Hazardous Chemical Reports. Database. <https://public.iema.state.il.us/FOIAHazmatSearch/T2Search.aspx>.
10. Illinois Environmental Protection Agency. Do I Have a Special Waste? <https://www2.illinois.gov/epa/topics/waste-management/waste-disposal/special-waste/Pages/do-i-have.aspx>.
11. Illinois Environmental Protection Agency. Generators and Managers of Hazardous Waste in Illinois. <https://www2.illinois.gov/epa/topics/waste-management/waste-disposal/hazardous-waste/Pages/annual-report.aspx>.

12. Illinois Environmental Protection Agency. Landfill Capacity Report. <https://www2.illinois.gov/epa/topics/waste-management/landfills/landfill-capacity/Pages/default.aspx>.
13. Illinois Environmental Protection Agency. Leaking Underground Storage Tanks. <https://www2.illinois.gov/epa/topics/cleanup-programs/lust/Pages/default.aspx>.
14. Illinois Environmental Protection Agency. Leaking UST Database. Database. <https://www2.illinois.gov/epa/topics/cleanup-programs/bol-database/Pages/leaking-ust.aspx>.
15. Illinois Environmental Protection Agency. Permitted Facilities for Storage, Treatment, Recycling, Incinerating, Transfer Stations and Processing. Database. <https://www2.illinois.gov/epa/topics/waste-management/permitted-facilities/Pages/default.aspx>.
16. Illinois Environmental Protection Agency. Site Remediation Program. <https://www2.illinois.gov/epa/topics/cleanup-programs/srp/Pages/default.aspx>.
17. Illinois Environmental Protection Agency. Site Remediation Program Database Search. Database. <https://www2.illinois.gov/epa/topics/cleanup-programs/bol-database/Pages/srp.aspx>.
18. Illinois Environmental Protection Agency. State Response Action. <https://www2.illinois.gov/epa/topics/cleanup-programs/state-response-action/Pages/default.aspx>.
19. Illinois Environmental Protection Agency. State Response Action Program. Database. <https://www2.illinois.gov/epa/topics/cleanup-programs/bol-database/Pages/ssu.aspx>.
20. National Transportation Safety Board. Pipeline Accident Brief: Large Crude Oil Spill from Damaged Enbridge Energy Pipeline. NTSB Number: PAB-13-03. Adopted 30 September 2013. <https://www.ntsb.gov/investigations/AccidentReports/Reports/PAB1303.pdf>.
21. National Transportation Safety Board. Pipeline Accident Report: Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release. NTSB Number: PAR-12-01. Adopted 10 July 2012. <https://www.ntsb.gov/investigations/AccidentReports/Reports/PAR1201.pdf>.
22. National Transportation Safety Board. Pipeline Accident Report: Natural Gas-Fueled Building Explosion and Resulting Fire. NTSB Number: PAR-15-01. Adopted 9 June 2015. <https://www.ntsb.gov/investigations/AccidentReports/Reports/PAR1501.pdf>.
23. National Transportation Safety Board. Pipeline Accident Report: Pacific Gas and Electric Company Natural Gas Transmission Pipeline Rupture and Fire. NTSB Number: PAR-11-01. Adopted 30 August 2011. <https://www.ntsb.gov/investigations/accidentreports/reports/par1101.pdf>.

24. National Transportation Safety Board. Preliminary Report: Pipeline Explosion and Fire, Manhattan, NY, March 12, 2014.
25. University of Maryland. START: National Consortium for the Study of Terrorism and Responses to Terrorism. American Deaths in Terrorist Attacks, 1995 - 2019. Fact Sheet. October 2020. <https://www.start.umd.edu/publication/american-deaths-terrorist-attacks-1995-2019>.
26. University of Maryland. START: National Consortium for the Study of Terrorism and Responses to Terrorism. Global Terrorism Database. Database. <http://www.start.umd.edu/gtd/>.
27. U.S. Department of Transportation. Federal Highway Administration. Highway Statistics Series. <https://www.fhwa.dot.gov/policyinformation/statistics.cfm>.
28. U.S. Department of Transportation. Federal Highway Administration. Bridge Condition by Highway System. <https://www.fhwa.dot.gov/bridge/nbi/condition.cfm>.
29. U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. Distribution, Transmission & Gathering, LNG, and Liquid Accident and Incident Data. <https://www.phmsa.dot.gov/data-and-statistics/pipeline/distribution-transmission-gathering-lng-and-liquid-accident-and-incident-data>.
30. U.S. Department of Transportation. Pipeline and Hazardous Materials Safety Administration. National Pipeline Mapping System. Public Map Viewer. Map. <https://www.npms.phmsa.dot.gov/>.
31. U.S. Environmental Protection Agency. National Priorities List (NPL) Sites – by State. Database. <https://www.epa.gov/superfund/npl-site-status-information>.
32. U.S. Environmental Protection Agency. Superfund: National Priorties List (NPL). <https://www.epa.gov/superfund/superfund-national-priorities-list-npl>.
33. U.S. Environmental Protection Agency. TRI Explorer. Database. <https://enviro.epa.gov/triexplorer/tri_release.chemical?>.
34. U.S. Environmental Protection Agency. What is Superfund? <https://www.epa.gov/superfund/what-superfund>.

4.0 Mitigation Strategy

1. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Existing Mitigation Project/Activity Status. Form.
2. Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. Hazard Mitigation Projects. Form.

APPENDIX A

Attendance Sheet

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee Meeting

December 7, 2021

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Bill Fritcher	Neoga CUSD#3	Superintendent
2.	Chuck Pruemer	Toledo Fire District	Captain
3.	Bev Howard	Cumberland County	County Clerk
4.	TONY WRIGHT	GREENUP FIRE PROT. DIST.	Asst. Chief
5.	[illegible]	Cumb unit 77 School	Maintenance Director
6.	[illegible]	Cumb County	County Engineer
7.	Mikela J Martin	TOLEDO AREA AMBULANCE	COORDINATOR
8.	Bill Albin	Neoga Fire	chief
9.	Joseph Vogt	Sigel Fire	Asst. Chief
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Attendance Sheet

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee Meeting

December 7, 2021

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Michael Ryder	Village of Greenup	Supt of Utilities
2.	Sheri Drotor	Cumberland County Health Dept.	Administrator
3.	Joseph Vogt	Cumberland County EMA	Coordinator
4.	Andrea Bostwick	American Environmental	EMS Manager
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Attendance Sheet

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee Meeting

March 8, 2022

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	KEN RUNKLE	AEC	RISK ASSESSOR
2.	TONY WRIGHT	GREENUP FIRE	ASST CHIEF
3.	Chuck Pruemer	Toledo Fire	Captain
4.	Bill Albin	Neoga Fire	Chief
5.	Joseph Vogt	EMA / Sigel Fire	Coordinator / Ast. Chief
6.	Jamie Beaver	Red Cross	Disaster Manager
7.	Bill Fritcher	Neoga Schools	Supt.
8.	Kevin Haarman	Neoga Schools	Principal
9.	Chuck LAYTON	Village of Toledo / FIRE	Superintendent / chief
10.	Jenny Maynard	Cumberland Co Treasurer	Chief Deputy
11.	Andrea BostWICK	AEC	EMS Manager
12.	Bev Howard	County Clerk	County Clerk
13.	Sheri Drofor	Cumberland County Health Dept.	Administrator
14.	Larry Tarr	Cumberland #77	Maintenance
15.			
16.			

Appendix A

Attendance Sheet

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee Meeting

July 12, 2022

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Andrea Bostwick-Campbell	American Environmental	EMS Manager
2.	Brenda Evans	City of NEOGA	City Admin.
3.	Andy Schabbing	Neoga Police	Chief
4.	Joe Vogt	Cumberland EMA	Coordinator
5.	Joe Vogt	Sigel Fire Dept.	Ast. Chief
6.	Chuck Layton	Toledo FIRE/village	Chief/Superintendent
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Appendix A

Attendance Sheet

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee Meeting

July 12, 2022

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	KEN RUNKLE	AEC	RISK ASSESSMENT
2.	Robert Lewis	Toledo Ambulance	Coordinator
3.	RICHARD MURRAY	CUMB HIGHWAY DEPT	COUNTY ENGINEER
4.	Juli Bishop	Cumb. Co. Health Dept	Director of Environmental Health
5.	Clint Willenborg	Neoga Fire Protection District	Chief
6.	Larry Tarr	Cumberland Unit #77	Maintenance
7.	Beverly Howard	Cumb Co	County Clerk
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Appendix A

Attendance Sheet

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee Meeting

October 18, 2022

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	KEN RUNKLE	AEC	RISK ASSESSOR
2.	Sheri Drotor	Cumberland Co. Health Department	Administrator
3.	Bev Howard	County	County Clerk
4.	Jenny Maynard	County	Chief Deputy
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Attendance Sheet

Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee Meeting

October 18, 2022

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	RICHARD MURRAY	CUMB. CO. HIGHWAY DEPT.	COUNTY ENGINEER
2.	Joseph Vogt	Cumb. Co. EMA	Coordinator
3.	Joseph Vogt	Sigel FPD	Asst. Chief
4.	Andrea Bostwick	AEC	EMS Manager
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

APPENDIX B

Meeting Minutes

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee

December 7, 2021
2:30 p.m.
Toledo Christian Church
501 South Maryland Street, Toledo

Committee Members

Cumberland County Offices:
- County Clerk
- EMA
- Health Department
- Highway Department

Cumberland CUSD #77
Greenup, Village of
Greenup Fire Protection District
NEOGA CUSD #3
Neoga Fire Protection District
Sigel Fire Protection District
Toledo Area Ambulance
Toledo Fire Protection District
American Environmental Corp.

<u>Welcome and Introductions</u>

Joe Vogt, Chairman of the Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee, welcomed attendees. He indicated that the purpose of this Committee is to update the Cumberland County All Hazards Mitigation Plan.

Handout materials were distributed to each member, including a Natural Hazard Events Questionnaire. A Link to a citizen questionnaire was provided to potential members via email as well. The questionnaires will help gauge residents and committee member understanding of the natural hazards that impact the County and also identifies communication preferences.

Andrea Bostwick, American Environmental Corporation (AEC) began the meeting by provided background information on the planning grant and the planning process. Cumberland County EMA applied for and received a planning grant from FEMA to update the County's hazard mitigation plan. This grant is administered through the Illinois Emergency Management Agency (IEMA) and pays for 75% of the planning cost. The remaining 25% will be met through in-kind services. The goal of the grant is to obtain a FEMA-approved hazard mitigation plan. The process generally takes about 16 months from start to finish.

<u>What is Mitigation?</u>

Andrea explained that for the purpose of this process, mitigation is any sustained action that reduces the long-term risk to people and property from natural and man-made hazards and their impacts. Sustained actions can include projects and activities such as building a community safe room or establishing warming and cooling centers. Mitigation is one of the phases of emergency management and is an important component in creating hazard-resistant communities.

What is an All Hazards Mitigation Plan?

Andrea then explained that an All Hazards mitigation plan details the natural and man-made hazard events that have previously impacted the County and identifies activities and projects that reduce the risk to people and property from these hazards before an event occurs. A hazard mitigation plan is different from the County's Emergency Operations Plan (EOP) because it identifies actions that can be taken before a disaster strikes whereas the EOP identifies how the County will respond during and immediately after an event occurs.

The natural and man-made hazards that will be included in the Plan update are floods; tornadoes; severe summer storms (including thunderstorms, hail and lightning events); severe winter storms (including ice and snowstorms); extreme cold; excessive heat; drought; earthquakes; transportation, generation and storage/handling of hazardous substances; hazardous materials incidents; and waste disposal and remediation.

Why Update an All Hazards Mitigation Plan?

Since the early 1990s damages caused by weather extremes have risen substantially. In 2020 the U.S. experienced $95 billion in severe storm damages from twenty-two (22) severe weather and natural hazard events. 2020 shattered the record number of annual billion-dollar events set in 2011 and 2017 by six events. In addition, the losses experienced in 2020 were the 4th highest only behind 2017, 2005, and 2012. In the last decade, the U.S. has experienced the top three years with the highest total number of billion-dollar events and two of the top three years with the highest total losses ever recorded. Consequently, the Federal Emergency Management Agency (FEMA) continues to encourage counties throughout the U.S. to prepare and develop hazard mitigation plans because what they've found is that for every dollar spent on mitigation, $6 dollars can be reaped in savings.

Updating this plan provides several major benefits:

1.) Access to federal mitigation assistance fund. Specific projects and activities will be developed and updated through the planning process to help each participating jurisdiction reduce damages. By including these actions in this Plan, the participating jurisdictions will become eligible to receive state and federal funds to implement the actions.

2.) Increased awareness of the impacts associated with natural hazards. Verifiable information about the natural hazards that occur in Cumberland County will be gathered to help participants in municipal and county meetings make decisions about how to better protect citizens and property from storm damages.

The Planning Process

The goal of the Committee meetings is to update the Plan to meet state and federal requirements so that it can be approved by the IEMA and FEMA. The Planning

Committee is an integral part of the planning process and ensures that the Plan is tailored to the needs of the County and participating jurisdictions.

A five meeting process has been developed to achieve this goal. Specific activities for the Committee meetings include:

1st Committee meeting	Orientation to the Planning Process Required Information Needed to Participate
2nd Committee meeting	Discuss the Risk Assessment Approve Mission Statement & Goals Participants Return Required Forms Begin discussing Mitigation Projects and Activities
3rd Committee meeting	Discuss and approve Mitigation Strategy Committee returns draft list of Mitigation Projects and Activities
4th Committee meeting	Finish discussing Mitigation Projects and Activities Committee discusses approval/adoption of the Plan
5th Committee meeting (Public Forum)	Present the Plan update for public review Committee helps answer questions from the public

Jurisdictions who wish to be part of the Plan must meet certain participation requirements that include:

- Participating in the planning meetings and public forum
- Completing required forms
- Coordinating with their constituents and the public; and
- Adopting the Plan once it's completed

Information Needed from the Committee

As part of the Plan update, Andrea indicated that there is information that will be needed from each participating jurisdiction. The information provided will be used to meet FEMA plan requirements. She then talked about each of the forms that must be completed at the beginning of the planning process. These Include:

Critical Facilities. Completed lists of Critical Facilities will be used to identify facilities vulnerable to natural hazards and will be provided to IEMA and FEMA as a separate supplement. Copies of the Plan made available to the public will not include these lists for security reasons.

Capability Assessment: Each jurisdiction has a unique set of capabilities and resources available to accomplish hazard mitigation and reduce long-term vulnerabilities to hazard events. As part of the update of the plan, the existing capabilities of each jurisdiction need to be identified and described.

Shelter Surveys. Identifies locations designated as severe weather shelters within each jurisdiction including warming centers, cooling centers and community safe rooms.

Drinking Water Supply Worksheet: Information on the drinking water supplies that serve the participating communities needs to be identified to assist in assessing drought vulnerability.

Andrea asked participants to complete the forms and return them by the next meeting if possible and to let her know if they had any questions.

Severe Weather Events

Andrea told the Committee that, while AEC will review multiple data sources, including NOAA, NWS, and state and federal databases, these sources don't always include every event nor do they always include damage information, especially dollar amounts. In many cases, individuals at the local level are her best resource for this kind of information.

She then asked Committee members to share their memories of hazardous events that have occurred in the County including any damages to critical infrastructure and facilities.

Hazard events related include:

- ❖ A 2010 ice storm left Greenup, Neoga and Toledo without power for 2 to 3 days.
- ❖ Lightning struck a power substation in Greenup in 2021 which required the substation to be replaced.
- ❖ In January 2014 a severe winter storm shutdown Interstate 57 and emergency responders had to bring stranded motorists into Neoga for shelter.
- ❖ Flooding in 2015 washed out 911 phone lines and knocked out water to the school.

She asked participants to identify any hazard events that have impacted their jurisdiction by completing the form titled, "Hazard Event Questionnaire". The information provided will help supplement the information included in the risk assessment.

Andrea also asked Committee members if they had any storm damage photos they would be willing to share for inclusion in the Plan.

Community Participation

Andrea stressed the importance of attending each committee meeting and indicated that member participation helps the County meet its 25% match for this grant in addition to assuring that member jurisdictions are eligible for IEMA/FEMA funds. She indicated that tag-teaming and designating substitute representatives is permissible when other obligations arise. Andrea pointed out that a designated substitute representative does not have be an official or employee of the jurisdiction.

Andrea requested that each jurisdiction consider sharing meeting information with their boards, councils, etc. at regularly scheduled meetings and consider posting the press release or adding a calendar item to their web pages. She also asked jurisdictions who are on Facebook to consider posting about the Plan on their pages as well.

Andrea indicated that another opportunity to include the public in the process is to post the link to the Citizen Questionnaire on their web pages or Facebook. The more individuals who complete the survey, the better our understanding will be of the public's perception of the hazards that impact the County. Finally, she asked the participants to consider posting or making available at their offices the “Frequently Asked Questions” document in their meeting packet. It provides a quick summary of what the Plan is and why it’s important to participate.

Mission Statement & Goals

Copies of a draft mission statement and updated goals were distributed in the meeting packet. Committee Members were asked to review these prior to the next meeting. The mitigation goals describe the objectives or end results the Committee would like to accomplish in terms of hazard and loss reduction/prevention. Every project included in the Plan should be aimed at one or more of the goals identified by this Committee. Specific goals related to each jurisdiction can be added to this list as well.

What Happens Next?

The risk assessment will be the main topic of the next committee meeting.

The second meeting of the Committee was scheduled for:

> **Tuesday, March 8, 2022**
> **Toledo Christian Church, 501 S. Maryland St., Toledo**
> **2:30 P.M.**

Andrea asked Committee members to please review the “Tasks to be Completed” handout before the next meeting and indicated that her contact information could be found on the last page of the meeting handout if any questions come up. With no further questions she adjourned the meeting.

Meeting Minutes

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee

March 8, 2022
2:30 p.m.
Toledo Christian Church
501 South Maryland Street, Toledo

Committee Members

American Red Cross
Cumberland County Offices:
- County Clerk
- EMA
- Health Department
- Treasurer

Cumberland CUSD #77
Greenup Fire Protection District
NEOGA CUSD #3
Neoga Fire Protection District
Sigel Fire Protection District
Toledo, Village of
Toledo Fire Protection District
American Environmental Corp.

<u>Welcome and Introductions</u>

Joe Vogt, Chairman of the Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee, welcomed attendees. He turned the meeting over to Andrea Bostwick, American Environmental Corporation (AEC), who opened the meeting. Handout materials were distributed to each member in attendance.

Andrea provided a brief recap to reorient Committee Members as to what has been accomplished. Before beginning the risk assessment presentation, Andrea asked the participating jurisdictions to submit their completed “Critical Facilities”, “Capability Assessments” and “Shelter Surveys” if they haven’t done so already.

<u>Risk Assessment</u>

Andrea began the presentation by noting that there have been six federally-declared disasters in Cumberland County since 1974. A total of 475 verified natural hazard events have been document over the last 20 to 70 years. A minimum of $5 million in damages have resulted from 37 documented natural hazard events. In addition, $23.7 million in crop damages were recorded for just one event, the 2012 drought.

The damage amounts are actually much higher based on several facts:

1.) damage descriptions for many floods, tornadoes and severe storm events did not include dollar amounts;

2.) damages to roads from heat and freeze/thaws conditions were not included; and

3.) crop damage figures were unavailable for a majority of the events.

The frequency, magnitude, and property damages for each category of natural hazard were described.

Severe Storms

Severe storms are the most frequently occurring natural hazard in Cumberland County with 186 events verified since 1979. Approximately $780,000 in damages has resulted from 28 events. Two of the six federal disaster declarations for Cumberland County included severe storms. At least four fatalities and 54 injuries can be attributed to severe storms. Almost all the injuries and fatalities are attributed crashes associated with wet pavement conditions.

The highest recorded wind speed in the County, not associated with a tornado, is 72 knots (83 mph) and occurred at Toledo on May 12, 1990. The largest hail recorded in the county is 2.50 inches (tennis ball-sized) at Greenup on May 11, 2014.

Severe Winter Storms

There were at least 86 verified events involving severe winter storms (snow and/or ice) since 1950 and 38 extreme cold events since 1996. One of the six federal disaster declarations for Cumberland County was from the severe winter storm that caused $1 million in damages/emergency protective measures on Groundhog Day 2011. No additional damage/emergency protective measure estimates were available. Two fatalities and 20 injuries can be attributed to crashes involving ice and snow-covered roadways.

At least 8 major storms have occurred in every decade since 1950. Between 2010 and 2019, 12 severe winter storms took place. There have been two severe winter storms recorded during the current decade.

The record maximum 24-hour snowfall in the County is 13.0 inches, which occurred at the Greenup COOP Station on December 19, 1973. Since there are no National Weather Service COOP observer stations in the County that have kept temperature records, data from surrounding counties were reviewed. The coldest temperature recorded in surrounding counties is -29°F at the Effingham COOP Station on January 24, 1915.

Floods

There have been a least 69 verified flood events in Cumberland County, 19 riverine/shallow flood events since 2002 and 50 flash flood events since 1990. Since there are no major rivers with gauges located in the County it was difficult to identify older flood events. Four of the six federal disaster declarations for Cumberland County are related to flooding. At least $440,000 in damages has resulted from three flood events. No fatalities or injuries were recorded for any of the events.

Excessive Heat

There have been 74 recorded excessive heat events reported in Cumberland County since 1995. No damages, injuries, or fatalities have occurred as the result of any of the excessive heat events.

The hottest temperature recorded in surrounding counties is between 110 and 111°F at the Windsor, Charleston, and Effingham COOP Stations on July 15, 1936.

Drought

Seven major droughts have occurred during the last four decades – 1983, 1988, 2002, 2005, 2007, 2011, and 2012. There has been at least one drought per decade with the exception of the 1990s when no substantial droughts were recorded. Three of these droughts (2005, 2011, and 2012) resulted in the County being designated a Primary Natural disaster area by USDA.

The 2012 drought caused an estimated $23.7 million in crop damages. Following each declared drought, crop yield reductions were generally experienced, some substantial. Corn yield reductions were most severe for the 2012 drought when there was a 76.7% reduction. Soybean reductions were most severe for the 1983 drought when there was a 36.1% reduction.

Year	Corn	Soybeans
1983	48.8%	36.1%
1988	36.2%	23.5%
2002	15.8%	---
2005	21.4%	10.0%
2007	---	8.0%
2011	---	8.6%
2012	76.7%	5.0%

Tornadoes

Since 1950, 15 tornadoes have been verified in Cumberland County. One of the six federal disaster declarations for Cumberland County included tornadoes. Approximately $2.8 million in property damages has resulted from five of these tornadoes. The August 21, 1977, tornado caused a majority of the property damage ($2.5 million) recorded.

Six fatalities and 59 injuries can be attributed to three tornado events.

The average tornado in Cumberland County is approximately 3 miles long and 59 yards wide. The average area covered by a tornado in Cumberland County is 0.10 square miles.

The highest recorded F-Scale rating for a tornado in the County was an F3 which occurred on August 21, 1977. The longest tornado was an F1 that was 17.8 miles in the County (117.9 miles overall) on March 6, 1961. The widest tornado recorded in the County and was an F1 that 200 yards wide on June 13, 1963.

Earthquakes

In the previous 200 years, no earthquakes have originated in Cumberland County while six earthquakes have originated in adjacent counties. While there are no known fault zones located in Cumberland County, there are two geologic structures: the Mattoon Anticline and the LaSalle Anticlinorium.

Ken Runkle of AEC then provided information select man-made hazards in Cumberland County.

Man-Made Hazards Risk Assessment

Ken informed the Committee that while the focus of this planning effort is directed at natural hazards, FEMA allows a small portion of the planning process to be devoted to an overview of selected man-made hazards.

Although this overview does not have the same depth as the assessment of natural hazards, it provides useful information to place various man-made hazards in perspective. The man-made hazard risk assessment focused on the following categories of:

- generation, storage/handling, and transportation of hazardous substances;
- waste disposal;
- hazardous materials (hazmat) incidents; and
- waste remediation.

Hazardous substances broadly include flammable, explosive, biological, chemical, or physical material that has the potential to harm public health or the environment. For the purposes of this Plan, the term includes both hazardous product and hazardous waste.

Generation, Storage/Handling & Transportation

In 2020, there were no facilities in Cumberland County that generated reportable quantities of hazardous substances according to the USEPA.

Based on records obtained from IEMA's Tier II database, there were 11 stationary facilities within Cumberland County that stored and/or handled hazardous substances. Four of these facilities stored and/or handled chemicals identified as "Extremely Hazardous Substances".

Waste Disposal

There are no active commercial solid (household) waste landfill operating in Cumberland County. There is one landfill that serves the area: Landfill #33 LTD in Effingham County. There are no facilities within the County permitted to handle Potentially Infectious Medical Waste and no commercial off-site hazardous waste treatment or disposal facilities.

Hazardous Materials (Hazmat) Incidents

A hazardous materials (hazmat) incident refers to any accident involving the release of hazardous substances. Incidents can take place at fixed facilities or as they are being transported. Between 2011 and 2020 there were 44 hazmat incidents recorded in Cumberland County. Of the 44 incidents, 24% occurred during transport. All of the transportation hazmat incidents involved roadways.

Waste Remediation

Waste remediation in Illinois is primarily conducted through three programs: the federal Superfund Program (for sites posing the largest threat to public health and the environment), the Illinois Site Remediation Program (SRP) and the Illinois Leaking Underground Storage Tank (LUST) Program.

Superfund: There are no active Superfund sites in Cumberland County.

Illinois SRP: There are three SRP sites located in Cumberland County. One of the sites has received "No Further Remediation" (NFR) or 4(y) letters.

Illinois LUST: There are approximately 21 LUST sites located in Cumberland County. Approximately 62% of these sites have received NFR, Non-Lust Determination or Section 4(y) letters or remediation is virtually complete.

Risk Priority Index Exercise

Following the risk assessment, Andrea led the Committee through a Risk Priority Index (RPI) exercise. The RPI is a quantitative means of providing guidance for ranking the hazards that have the potential to impact the County. This ranking can assist participants in determining which hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities. Each hazard is scored on three categories: frequency, impacts on life and health and impacts on property and infrastructure based on a scoring system provided. Andrea walked the committee through the scoring system using excessive heat as an example and then provided time for the Committee to fill out the PRI form during the meeting. The results will be compiled, and the findings will be presented at the next meeting.

Mission Statement & Goals

Andrea asked Committee members to review the draft mission statement and updated mitigation goals provided in the meeting materials. Both of these are required elements of the Plan. As part of the Plan update process, both items need to be reviewed and re-evaluated. The mission statement was reviewed, and it was determined that no revisions to the wording were needed.

Next Andrea discussed the mitigation goals, which are intended to reduce long-term vulnerabilities to natural and man-made hazards. Each project included in the updated Plan should be aimed at one or more of the goals developed by the committee. The updated goals were reviewed, and no revisions were made to the wording.

The mission statement and goals will be added to the Plan update.

Mitigation

Andrea explained that mitigation actions include activities and projects that reduce the long-term risk to people and property from the natural and man-made hazards discussed in the risk assessment.

To help the jurisdictions think about and assemble their lists, Andrea provided several examples and referred participants to a 2-page list of potential mitigation projects included in the handout material along with mitigation project lists from other jurisdictions. These examples can be used to help Committee members when they prepare their list. Finally, Andrea provided excerpts from a FEMA publication on mitigation ideas as another resource.

Status of Existing Projects

Ken distributed **"Status of Existing Mitigation Actions"** forms to each of the previously participating jurisdictions detailing the mitigation projects and activities included in the original Plan. Andrea explained that as part of the update process the status of these projects needs to be determined. She described how the form should be completed so that this information can be included in the Plan update.

New Projects

The form titled **"Hazard Mitigation Projects"** was distributed and Andrea indicated this form should be used to submit new projects and activities for the Plan. She told the committee that individual mitigation project lists will be developed for each participating jurisdiction and that this is a list of projects each jurisdiction would like to see accomplished if funding becomes available. FEMA is trying to stimulate the implementation of mitigation projects and activities to reduce the extraordinary amount of money being expended on hazard event damages.

The projects and activities included in the Plan should be mitigation-related, not emergency preparedness, response, recovery, or maintenance. Mitigation projects can include studies, regulatory activities, structural and infrastructure projects, and information/education activities. She provided advice for completing the mitigation project list including providing a detailed description of the project, the jurisdiction responsible for the project and the time frame to complete the project.

Committee members were encouraged to contact Andrea or Ken if questions arise before they return to the next Committee meeting.

<u>What Happens Next?</u>

The vulnerability assessment and mitigation project prioritization methodology will be the main topics of the next committee meeting.

The third meeting of the Committee was scheduled for:

Tuesday, July 12, 2022
2:30 p.m.
Toledo Christian Church
501 South Maryland Street, Toledo

<u>Public Comment</u>

With no questions or comments, Andrea adjourned the meeting.

Meeting Minutes

Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee

July 12, 2022
2:30 p.m.
Toledo Christian Church
501 South Maryland Street, Toledo

Committee Members

Cumberland County Offices:
- Clerk
- EMA
- Health Department
- Highway Department

Cumberland CUSD #77

Neoga, City of
Neoga Fire Protection District
Sigel Fire Protection District
Toledo, Village of
Toledo Fire Protection District
Toledo Area Ambulance
American Environmental Corp.

Welcome and Introductions

Joe Vogt, Chairman of the Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee, welcomed attendees. He turned the meeting over to Andrea Bostwick, American Environmental Corporation (AEC), who opened the meeting. Handout materials were distributed to each member in attendance.

Andrea provided a brief recap to reorient Committee Members as to what has been accomplished. Before beginning the vulnerability analysis presentation, Andrea asked the participating jurisdictions to submit any of their completed critical facilities surveys, capability assessments, and shelter surveys if they hadn't done so already.

Vulnerability Analysis

Andrea began the vulnerability analysis discussion by noting that the focus of this meeting is the vulnerability posed by tornadoes. The analysis estimates future potential damages in terms of dollar loss to residences, including contents, for each participating jurisdiction based on FEMA acceptable formulas. The potential damages were calculated on the magnitude most likely to be encountered, not on a worst-case event.

Tornadoes

Since 1950, 15 tornadoes have been verified in Cumberland County. While occurring less frequently than severe storms and severe winter storms, tornadoes have caused almost $2.7 million in property damages, 6 fatalities, and 59 injuries.

Using information from the 15 verified tornadoes, damages were calculated based on an "average" tornado. The average tornado in Cumberland County impacts approximately 0.10 square miles. Housing densities were calculated from U.S. Census Bureau information for each of the participating jurisdictions. This information, along with a set of assumptions were used to estimate the number of vulnerable residential structures.

Potential dollar losses were then calculated for these vulnerable residential structures using the provided tax assessment values and an additional assumption about the degree of damage sustained by the structures and their contents.

Potential dollar losses caused by an average-sized tornado to residences and their contents would be expected to exceed at least $7.1 million in any of the participating municipalities with the exception of Jewett. Losses ranged from $3.6 million in Jewett to $9.7 million in Neoga. Potential dollar losses by township would be expected to range from $62,291 in Crooked Creek Township to $449,814 in Neoga Township.

Risk Priority Index Exercise Results

Andrea then presented the results of the Risk Priority Index Exercise, which was conducted at the March 8, 2022 meeting. She provided the Committee with a brief recap on what the Risk Priority Index is and how it can help participants determine which hazards present the highest risk and therefore which ones to focus on when formulating mitigation projects and activities.

Based on the Committee's responses, thunderstorms with damaging winds and heavy rain scored the highest, followed by tornadoes and winter storms. The highest scoring man-made hazard was transportation related hazmat incidents. The hazards that scored the lowest included earthquakes, fixed facility hazmat incidents, and terrorism.

A side-by-side comparison of how the hazards ranked between the original exercise conducted for the 2015 Plan and this exercise was provided for comparison. The top hazards from the original exercise included tornadoes, followed by severe storms, and floods.

Critical Facilities Vulnerability Survey

As part of the Plan update, Andrea indicated that vulnerable community assets need to be identified for the participating jurisdictions. She asked Committee members to complete a 2-page survey distributed to help identify each community's most vulnerable assets as well as identify a list of key issues that clearly describe each community's greatest vulnerabilities. This information will be used in the vulnerability analysis.

Mitigation Actions Prioritization Methodology

The Mitigation Actions Prioritization Methodology outlines the approach used to classify each mitigation action identified by the participating jurisdictions and is a FEMA-required element of the Plan.

Mitigation actions can be prioritized in a number of ways. Andrea explained that the updated methodology is based on two key factors:

1) Frequency of hazard—severe storms occur more frequently than earthquakes.
2) Degree of mitigation—some projects will *significantly reduce* damages while other projects only have the potential to reduce damages.

This methodology helps objectively identify which projects and activities have a greater likelihood to significantly reduce the long-term vulnerabilities associated with the most frequently-occurring hazards. After reviewing the updated methodology, the Committee determined that no changes needed to be made.

Andrea acknowledged that while this methodology does not take cost or politics into consideration, these factors may affect the order in which projects are implemented. She also noted that it is important to keep in mind that implementing all of the mitigation projects is desirable regardless of which prioritization category they fall under.

Community Lifelines

Before discussing mitigation projects and the mitigation action tables with the Committee, Andrea took a few minutes to discuss the concept of community lifelines. FEMA has identified seven community lifelines that are the most fundamental services in the community that, when stabilized, enable all aspects of society to function. The seven community lifelines include: safety & security; food, water, shelter; health & medical; energy (power & fuel); communications; transportation; and hazardous materials.

While the concept of community lifelines was developed to support emergency response and planning, FEMA has begun applying it to all phases of emergency management. Efforts to protect community lifelines and prevent and mitigate potential impacts to them is one of the focuses of the BRIC grant program. A handout with a brief description of the community lifelines was included in the meeting packet. Community lifelines will be included in most project description to create a clear connection to the concept.

Mitigation Projects

Committee Members were asked to submit their existing and new Mitigation Projects forms. Andrea then described how the updated methodology, the existing and new lists of mitigation projects, finalized goals and other information will be presented for Committee review.

Andrea chose a frequently requested mitigation project, a community safe room (tornado-shelter), as an example to show how a typical project is prioritized and entered into the Plan on a Mitigation Action Table. She described how each column in the Mitigation Action Table would be completed for this example project.

Andrea explained that the information in the Mitigation Action Tables would be prepared by AEC, but that the Tables cannot be completed until all of the participants submit their draft lists of projects. Committee Members will have the opportunity at the next meeting to review all of the mitigation projects submitted so that they can make adjustments to their lists if they choose.

It was noted that each jurisdiction will have their own list of jurisdiction-specific mitigation projects and they do not need to get approval from the County or any of the other participants for any of their projects. Participants were also reminded that this is a list of projects and activities they would like to see accomplished if funding becomes available. For a jurisdiction to be eligible for a project, it must be on its list.

This is a mitigation plan and there are some projects that IEMA/FEMA do not consider mitigation. Projects associated with emergency preparedness, disaster response & recovery and maintenance will not be included in the Plan. Andrea noted that as the committee members put their lists together, if they are unsure about whether a project would be considered mitigation, go ahead, and include it on their list. AEC will review the lists and help make the appropriate determinations.

<u>What Happens Next?</u>

It is anticipated that participants will need time to assemble their mitigation project lists. Consequently, the Committee agreed to schedule the next meeting on:

> **Tuesday, October 4, 2022**
> **Toledo Christian Church**
> **501 South Maryland Street, Toledo**
> **2:30 p.m.**

<u>Public Comment</u>

No additional questions or comments were raised. With concurrence from Chairman Vogt, Andrea adjourned the meeting.

Meeting Minutes

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Planning Committee

October 18, 2022
2:30 p.m.
Toledo Christian Church
501 South Maryland Street, Toledo

Committee Members

Cumberland County Offices:
- Clerk
- EMA
- Health Department
- Highway Department
- Treasurer

Sigel Fire Protection District
American Environmental Corp.

Welcome

Joe Vogt, Chair of the Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee, welcomed attendees. He turned the meeting over to Andrea Bostwick, American Environment Corp. (AEC), who opened the meeting.

Handout materials were distributed to each Committee member. Andrea provided a brief recap to reorient Committee members as to what has been accomplished and what will be covered at this meeting.

Mitigation Project Submittal & Action Tables

Andrea thanked the Committee Members for assembling their lists of mitigation projects and activities. She explained that the information in the draft Mitigation Action Tables handout was prepared by AEC using the lists of mitigation projects and activities provided by the participation jurisdictions. A draft of the Mitigation Strategy section that details the review and re-evaluation of the goals and prioritization methodology as well as how the mitigation projects were analyzed in the tables was also provided in the meeting handouts for review by the Committee.

Committee members were asked to review the Mitigation Action Tables containing the descriptions of the mitigation projects and activities. Andrea and Ken Runkle of AEC, moved throughout the room to discuss questions with each member. Some additional mitigation projects were provided and will be added to these tables. Andrea advised Committee Members who wished to add additional projects to provide them to her as soon as possible and no later than November 18.

Participants were reminded that this is a list of projects and activities they would like to see accomplished if the money becomes available. Also, for a jurisdiction to be eligible for a project, it must be on its list.

Since this is a mitigation plan, some projects were either removed or not included if they were not considered mitigation. Projects associated emergency preparedness/response, recovery, and maintenance will not be included in the Plan.

Public Forum and Adoption

The final Committee meeting will be conducted as an open-house style public forum to present the draft Plan for review and comment. A paper copy of the draft Plan will be available for review at the meeting and posted online on the County's website. There will be a two-week public comment period following the public forum.

Unless otherwise specified, Committee members will receive an electronic copy of the draft plan to make available for public comment.

Once the comment period is over, any comments received will be incorporated into the Plan and submitted to IEMA/FEMA. Following IEMA and FEMA review, any edits requested will be made and then FEMA will issue an Approval Pending Adoption letter. At this point an email will be sent to all the participating jurisdictions, along with a copy of a model adoption resolution, asking them to formally adopt the Plan by resolution. A copy of the executed resolution should then be provided to AEC. Once all the adoption resolutions are received, Andrea will submit them to IEMA and FEMA. FEMA will then issue the Final Approval letter starting the clock for the five-year update.

Plan Maintenance and Update

Andrea described the Plan maintenance and update commitments detailed in a draft of the Plan Maintenance and update section provided in the meeting handouts for review by the committee. The Plan will be monitored and evaluated on an annual basis by a Plan Maintenance Subcommittee, which will be made up of the participating jurisdictions and key member of the Planning Committee. The Cumberland County EMA Office will send out a Plan Maintenance Checklist to each of the participating jurisdictions who will be responsible for providing information to the Subcommittee. This information will include: the status of their mitigation actions; any hazard-related damages to critical facilities and infrastructure; the adoption of any new plans, policies, or regulations; and any significant changes in development. The Subcommittee will also evaluate the Plan to determine its effectiveness at achieving its stated purpose and goals. Participants can also add new mitigation actions during the annual monitoring phase or by contacting the EMA Director.

The EMA Office will then prepare an annual progress report detailing the results of the annual monitoring and evaluation period and provide copies to the Subcommittee. Any modifications or additions to the mitigation project list will require an update of the Mitigation Strategy and a resubmittal of the Plan to IEMA and FEMA for reference.

At least once every five years, the Plan must be reviewed, revised, and resubmitted to IEMA/FEMA for the participating jurisdictions to remain eligible for mitigation project funds. At the five-year update, any jurisdiction that is not already part of this Plan and who wants to become part of the updated Plan may do so. New jurisdictions must supply the same information that all the current jurisdictions supplied.

What Happens Next?

Public Forum

The final Committee meeting will be conducted as an open-house style public forum where the draft Plan update will be presented for review and comment.

The public forum will be held on:

> **Tuesday, February 14, 2023**
> **Toledo Christian Church**
> **501 South Maryland Street, Toledo**
> **4 p.m. to 6 p.m.**

Public Comment

With no other questions, the meeting was adjourned.

APPENDIX C

Cumberland County Citizen Questionnaire

You can help protect lives and property from natural hazard events in the County by taking a few moments to complete this questionnaire.

Asterisk (*) desonates required questions for form completion.

* 1. **Please indicate where you live in the County (Please check only one.):**

- ☐ Greenup
- ☐ Toledo
- ☐ Jewett
- ☐ Unincorp. Cumberland County
- ☐ Neoga
- ☐ Other (please specify)

* 2. **Please place a checkmark next to each of the natural hazards listed below that you have experienced in the County. (Please check all that apply.)**

- ☐ Severe Summer Storms (thunderstorms, hail, lightning strikes)
- ☐ Floods
- ☐ Severe Winter Storms(snow,sleet, ice)
- ☐ Excessive Heat
- ☐ Extreme Cold
- ☐ Tornadoes
- ☐ Drought
- ☐ Earthquakes
- ☐ Other (please specify)

3. **Which of the natural hazards above have you encountered most frequently?**

4. **Rank the natural hazards listed below in order from 1 to 11 based on which hazard you feel poses the greatest threat. (1 = greatest threat and 8 = least threat)** ***Each number should only be used once.***

- ☐ Severe Summer Storms
- ☐ Floods
- ☐ Severe Winter Storms
- ☐ Excessive Heat
- ☐ Extreme Cold
- ☐ Tornadoes
- ☐ Drought

Appendix C

- [ ] Earthquakes

* 5. **What types of mitigation projects or activities are most needed in the County? (Please check the five you feel are most important.)**

- [ ] Public information fact sheets and brochures describing actions residents can take to protect themselves and their property against natural hazard impacts.
- [ ] Floodplain Ordinances
- [ ] Building Codes and Enforcement
- [ ] Sirens or other Alert Systems
- [ ] Flood or Drainage Protection (i.e., culvert and drainage ditch maintenance, retention pond construction, dam or levee conctruction/maintenance and/or hydraulic studies to determine cause of drainage problems.)
- [ ] Maintain power during storms by burying power lines, trimming trees and/or purchasing a back-up generator
- [ ] Other (please specify)
- [ ] Tornado Safe Shelters
- [ ] Maintain roadway passage during snow storms and heavy rains
- [ ] Provide sufficient water supply during drought
- [ ] Identify residents with special needs in order to provide assistance during a ntural hazard event
- [ ] Retrofit critical infrastructure (public water supplies, schools, sewage treatment facilities, bridges, hospitals and other important services) to reduce potential damages

* 6. **What are the most effective ways *for you* to receive information about how to make your household and property safer from natural hazards (Please check all that apply.)**

- [ ] Newspapers
- [ ] Television
- [ ] Radio
- [ ] Internet
- [ ] Social Media (Facebook, Twitter, etc.)
- [ ] Schools
- [ ] Mailings
- [ ] Other (please specify)
- [ ] Fact Sheet/Brochure
- [ ] Extension Service
- [ ] Public Workshops/Meeting
- [ ] Fire Department/Law Enforcement
- [ ] Public Health Department
- [ ] Municipal/County Government

Thank you for your time in assisting with the update of the County's Hazard Mitigation Plan.
Cumberland County Multi-Jurisdictional All Hazard Mitigation Planning Committee

Done

Appendix C

APPENDIX D

Frequently Asked Questions

Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan Update

1) **What is the Cumberland County All Hazard Mitigation Plan?**
The Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan evaluates damage to life and property from natural and man-made hazards in the County and identifies projects and activities that can reduce these damages. The Plan is considered to be multi-jurisdictional because it includes municipalities, townships, and other jurisdictions (fire protection districts, schools, etc.) who want to participate.

2) **What is hazard mitigation?**
Hazard mitigation is any action taken to ***reduce*** the long-term risk to life and property from a natural or man-made hazard ***before*** an event occurs.

3) **Why is this Plan being updated?**
The Plan update fulfills federal planning requirements of the Stafford Act as amended by the Disaster Mitigation Act and the Disaster Recovery and Reform Act. While meeting federal requirements, this Plan update also provides these benefits:
   - Funding for mitigation projects and activities ***before*** disasters occur.
   - Funding for mitigation projects and activities ***following*** federally-declared disasters.
   - Increased awareness about natural and man-made hazards and closer cooperation among the various organizations and political jurisdictions involved in emergency planning and response.

4) **Who is updating this Plan?**
The Cumberland County Multi-Jurisdiction All Hazards Mitigation Planning Committee is updating the Plan with assistance from technical experts in emergency planning, environmental matters, and infrastructure. The Committee includes members from education, emergency services, municipal, township and county government, health care, and law enforcement.

5) **How can I participate?**
You are invited to attend public meetings of the Cumberland County All Hazards Mitigation Planning Committee. In addition, you are encouraged to provide photographs, other documentation, and information about damages you experienced from natural and man-made hazards in Cumberland County. Surveys will be available at participating jurisdictions and through the County to help gather specific information from residents. All of this information will be used to update the Plan. A draft of the Plan update will be presented at a public forum for further public input.

More information can be obtained by contacting:

Mr. Joseph Vogt, Director
Cumberland County Emergency Management Agency
ema@cumberlandco.org
(217) 663-7728

APPENDIX E

140 Courthouse Square

Cumberland County Board

P.O. Box 146

Toledo, IL 62468

Contact: Joe Vogt

(217)-663-7728

County Prepares for Natural Disasters

Toledo, IL (11/22/2021) — Cumberland County will update its plan to reduce the damages caused by natural hazard events such as floods, tornadoes, snow storms, thunderstorms, and ice storms. The plan is called a Hazard Mitigation Plan and the process to update it will be funded through a grant from the Federal Emergency Management Agency (FEMA).

"This Plan will detail the natural hazards that have impacted the County and municipalities and identify projects and activities to reduce the risk to people and property before severe weather strikes", said Joe Vogt, Cumberland County Emergency Management Agency Coordinator. "By having an updated hazard mitigation plan, the County will remain eligible for federal funds to construct these projects." Vogt added.

The Cumberland County Hazard Mitigation Planning Committee will hold its first meeting on Tuesday, December 7th at 2:30 P.M. The meeting will be held at the Toledo Christian Church in Toledo. The Planning Committee includes County, township, municipal, school, and fire protection district representatives as well as technical partners and other stakeholders. Meetings of this committee will be conducted as working sessions so that any interested resident can attend and ask questions. The purpose of these working sessions is to gather and discuss information that will be used to update the plan.

"This mitigation plan is different because it focuses on ways to reduce and prevent damages before they occur, rather than on how the County and municipalities will respond to a disaster after it occurs," added Vogt.

140 Courthouse Square

Cumberland County Board

P.O. Box 146
Toledo, IL 62468

Contact: Joe Vogt
217-663-7728

Reducing Damages Caused by Severe Weather

Toledo, IL (February 28, 2022) — The frequency and damages caused by severe storms and other natural hazards in Cumberland County will be discussed when the Cumberland County All Hazards Mitigation Planning Committee meets at the Toledo Christian Church, 501 South Maryland Street, Toledo, at 2:30 p.m. Tuesday, March 8.

This Committee, comprised of County and municipal representatives as well as technical partners and stakeholders, will meet over the next several months to develop a Cumberland County All Hazards Mitigation Plan. All Committee Meetings are open to the public.

“The goal of this Committee Meeting is to identify how often severe weather events occur within the County and what kinds of damages have resulted. Based on this information we will begin putting together lists of activities and projects to reduce damages caused by these events,” said Cumberland County EMA Coordinator Joe Vogt.

The focus of this effort is on natural hazards — severe thunderstorms with damaging winds or hail, tornadoes, snow and ice storms, floods, drought, and excessive heat.

Interested persons can provide input at these Cumberland County Hazards Mitigation Planning Committee meetings or submit their comments and questions to their municipal or county representatives.

Participants include the County, Greenup, Toledo, and Neoga as well as Greenup Fire Protection District, Neoga Fire Protection District, Toledo Fire Protection District, Sigel Fire Protection District, Toledo Area Ambulance, Cumberland CUSD #77, and Neoga CUSD #3.

“This Plan will be our best resource for determining how to prepare for storms and other natural hazards. After the Plan is completed, comprehensive information will be available in one document to help guide those who are making decisions about how to better protect Cumberland County residents,” added Vogt.

Search Facebook

Cumberland County Emergency Management Agency

Follow | Message | ···

Intro

155 Followers

Page · Government organization

ema@cumberlandco.org

Not yet rated (0 Reviews)

Photos

See all photos

Privacy · Terms · Advertising · Ad Choices · Cookies · More · Meta © 2022

Posts

Filters

Cumberland County Emergency Management Agency
March 2 at 6:54 AM ·

Cumberland County Board
P.O. Box 146
Toledo, IL 62468

Contact: Joe Vogt
217-663-7728

Reducing Damages Caused by Severe Weather

Toledo, IL (February 28, 2022) — The frequency and damages caused by severe storms and other natural hazards in Cumberland County will be discussed when the Cumberland County All Hazards Mitigation Planning Committee meets at the Toledo Christian Church, 501 South Maryland Street, Toledo, at 2:30 p.m. Tuesday, March 8.

This Committee, comprised of County and municipal representatives as well as technical partners and stakeholders, will meet over the next several months to develop a Cumberland County All Hazards Mitigation Plan. All Committee Meetings are open to the public.

"The goal of this Committee Meeting is to identify how often severe weather events occur within the County and what kinds of damages have resulted. Based on this information we will begin putting together lists of activities and projects to reduce damages caused by these events," said Cumberland County EMA Coordinator Joe Vogt.

The focus of this effort is on natural hazards — severe thunderstorms with damaging winds or hail, tornadoes, snow and ice storms, floods, drought, and excessive heat.

Interested persons can provide input at these Cumberland County Hazards Mitigation Planning Committee meetings or submit their comments and questions to their municipal or county representatives.

Participants include the County, Greenup, Toledo, and Neoga as well as Greenup Fire Protection District, Neoga Fire Protection District, Toledo Fire Protection District, Sigel Fire Protection District, Toledo Area Ambulance, Cumberland CUSD #77, and Neoga CUSD #3.

"This Plan will be our best resource for determining how to prepare for storms and other natural hazards. After the Plan is completed, comprehensive information will be available in one document to help guide those who are making decisions about how to better protect Cumberland County residents," added Vogt.

Cumberland County
Emergency Management Agency
P.O. BOX 56
TOLEDO, IL 62468

FOR IMMEDIATE RELEASE

Contact: Joe Vogt

Projects to Reduce Damages Caused by Natural Hazards

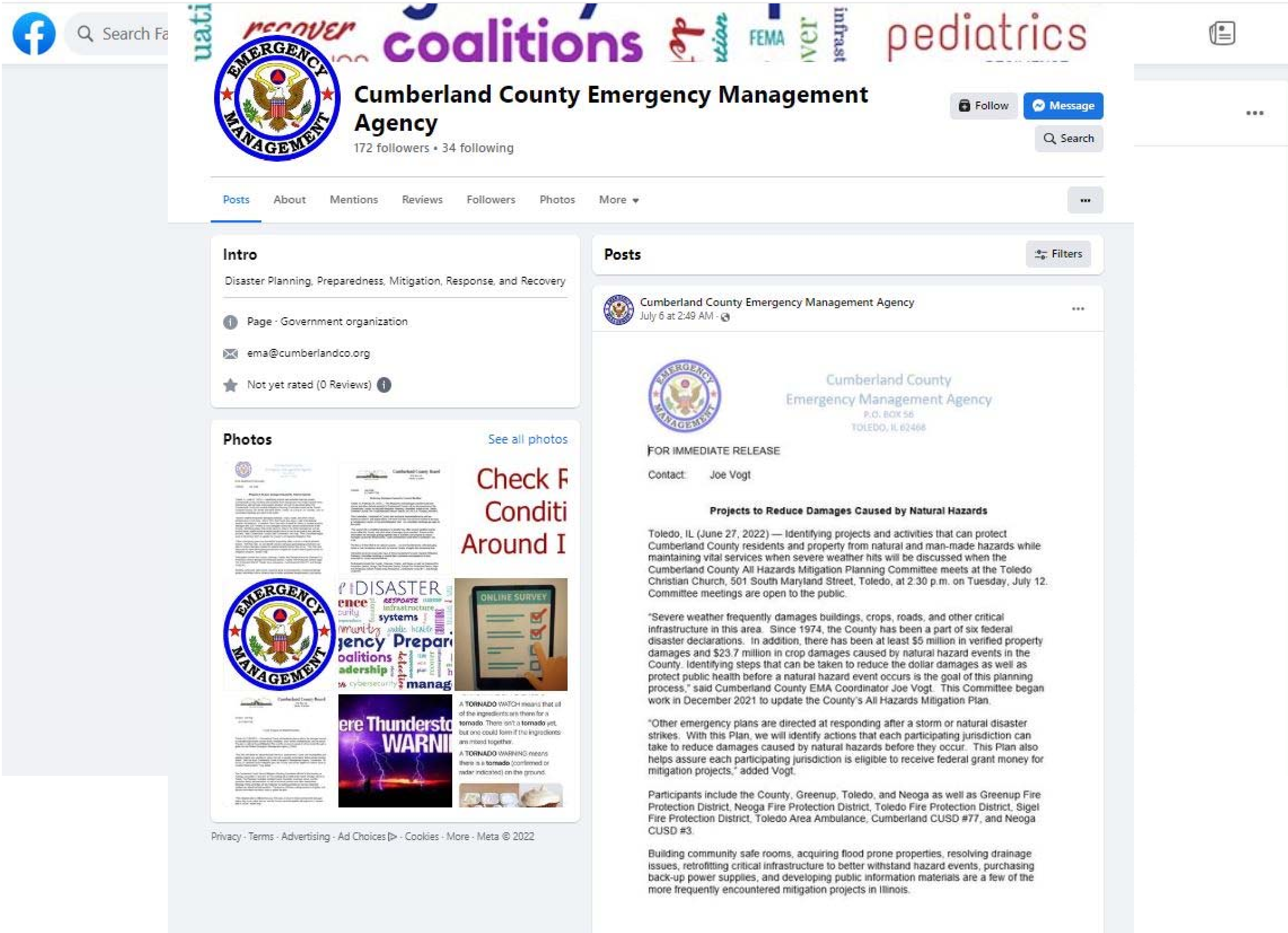
Toledo, IL (June 27, 2022) — Identifying projects and activities that can protect Cumberland County residents and property from natural and man-made hazards while maintaining vital services when severe weather hits will be discussed when the Cumberland County All Hazards Mitigation Planning Committee meets at the Toledo Christian Church, 501 South Maryland Street, Toledo, at 2:30 p.m. on Tuesday, July 12. Committee meetings are open to the public.

"Severe weather frequently damages buildings, crops, roads, and other critical infrastructure in this area. Since 1974, the County has been a part of six federal disaster declarations. In addition, there has been at least $5 million in verified property damages and $23.7 million in crop damages caused by natural hazard events in the County. Identifying steps that can be taken to reduce the dollar damages as well as protect public health before a natural hazard event occurs is the goal of this planning process," said Cumberland County EMA Coordinator Joe Vogt. This Committee began work in December 2021 to update the County's All Hazards Mitigation Plan.

"Other emergency plans are directed at responding after a storm or natural disaster strikes. With this Plan, we will identify actions that each participating jurisdiction can take to reduce damages caused by natural hazards before they occur. This Plan also helps assure each participating jurisdiction is eligible to receive federal grant money for mitigation projects," added Vogt.

Participants include the County, Greenup, Toledo, and Neoga as well as Greenup Fire Protection District, Neoga Fire Protection District, Toledo Fire Protection District, Sigel Fire Protection District, Toledo Area Ambulance, Cumberland CUSD #77, and Neoga CUSD #3.

Building community safe rooms, acquiring flood prone properties, resolving drainage issues, retrofitting critical infrastructure to better withstand hazard events, purchasing back-up power supplies, and developing public information materials are a few of the more frequently encountered mitigation projects in Illinois.



Search Fa

Cumberland County Emergency Management Agency

172 followers • 34 following

Follow

Message

Search

Posts About Mentions Reviews Followers Photos More

Intro

Disaster Planning, Preparedness, Mitigation, Response, and Recovery

Page · Government organization

ema@cumberlandco.org

Not yet rated (0 Reviews)

Photos

See all photos

Privacy · Terms · Advertising · Ad Choices · Cookies · More · Meta © 2022

Posts

Filters

Cumberland County Emergency Management Agency
July 6 at 2:49 AM

Cumberland County
Emergency Management Agency
P.O. BOX 56
TOLEDO, IL 62468

FOR IMMEDIATE RELEASE

Contact: Joe Vogt

Projects to Reduce Damages Caused by Natural Hazards

Toledo, IL (June 27, 2022) — Identifying projects and activities that can protect Cumberland County residents and property from natural and man-made hazards while maintaining vital services when severe weather hits will be discussed when the Cumberland County All Hazards Mitigation Planning Committee meets at the Toledo Christian Church, 501 South Maryland Street, Toledo, at 2:30 p.m. on Tuesday, July 12. Committee meetings are open to the public.

"Severe weather frequently damages buildings, crops, roads, and other critical infrastructure in this area. Since 1974, the County has been a part of six federal disaster declarations. In addition, there has been at least $5 million in verified property damages and $23.7 million in crop damages caused by natural hazard events in the County. Identifying steps that can be taken to reduce the dollar damages as well as protect public health before a natural hazard event occurs is the goal of this planning process," said Cumberland County EMA Coordinator Joe Vogt. This Committee began work in December 2021 to update the County's All Hazards Mitigation Plan.

"Other emergency plans are directed at responding after a storm or natural disaster strikes. With this Plan, we will identify actions that each participating jurisdiction can take to reduce damages caused by natural hazards before they occur. This Plan also helps assure each participating jurisdiction is eligible to receive federal grant money for mitigation projects," added Vogt.

Participants include the County, Greenup, Toledo, and Neoga as well as Greenup Fire Protection District, Neoga Fire Protection District, Toledo Fire Protection District, Sigel Fire Protection District, Toledo Area Ambulance, Cumberland CUSD #77, and Neoga CUSD #3.

Building community safe rooms, acquiring flood prone properties, resolving drainage issues, retrofitting critical infrastructure to better withstand hazard events, purchasing back-up power supplies, and developing public information materials are a few of the more frequently encountered mitigation projects in Illinois.

Cumberland County
Emergency Management Agency
P.O. BOX 56
TOLEDO, IL 62468

FOR IMMEDIATE RELEASE

Contact: Joe Vogt
217-663-3879

Protecting Public Health and Property in Cumberland County

Toledo, IL (October 10, 2022)—Projects and activities to protect Cumberland County residents and vital services will be the main topic of discussion at the Cumberland County All Hazards Mitigation Planning Committee meeting on Tuesday, October 18, 2022, at the Toledo Christian Church, 501 South Maryland Street, Toledo. The meeting begins at 2:30 pm and is open to the public.

The Committee began work in December 2021 to update the County's All Hazards Mitigation Plan. This Plan details past severe weather events that have previously impacted the County and identifies mitigation projects and activities that can be taken before a severe weather event occurs to protect residents and critical services and infrastructure.

"There has been at least $5 million in verified property damages and $23.7 million in crop damages caused by severe weather events in the County. Obtaining FEMA's approval of our Plan update will make all of the participants eligible to receive federal grant money for mitigation projects and activities," according to Joe Vogt, Cumberland County EMA Coordinator.

Projects identified by Committee members at this meeting will become part of the Cumberland County All Hazards Mitigation Plan. While portions of the Plan have been presented at each meeting, the entire Plan will be presented for public review and comment before it is submitted to the state and federal government for approval.

"A public forum will be conducted this winter for interested persons to review the updated Plan and ask questions of Committee Members. A two-week public comment period will be held following the public forum to accommodate interested persons who are unable to attend. We want to make sure that anybody who is interested has an opportunity to review and comment on the draft Plan update," added Vogt

Search Facebook

Cumberland County Emergency Management Agency
October 11 at 5:45 AM ·

Cumberland County
Emergency Management Agency
P.O. BOX 56
TOLEDO, IL 62468

FOR IMMEDIATE RELEASE

Contact: Joe Vogt
217-663-3879

Protecting Public Health and Property in Cumberland County

Toledo, IL (October 10, 2022)—Projects and activities to protect Cumberland County residents and vital services will be the main topic of discussion at the Cumberland County All Hazards Mitigation Planning Committee meeting on Tuesday, October 18, 2022, at the Toledo Christian Church, 501 South Maryland Street, Toledo. The meeting begins at 2:30 pm and is open to the public.

The Committee began work in December 2021 to update the County's All Hazards Mitigation Plan. This Plan details past severe weather events that have previously impacted the County and identifies mitigation projects and activities that can be taken before a severe weather event occurs to protect residents and critical services and infrastructure.

"There has been at least $5 million in verified property damages and $23.7 million in crop damages caused by severe weather events in the County. Obtaining FEMA's approval of our Plan update will make all of the participants eligible to receive federal grant money for mitigation projects and activities," according to Joe Vogt, Cumberland County EMA Coordinator.

Projects identified by Committee members at this meeting will become part of the Cumberland County All Hazards Mitigation Plan. While portions of the Plan have been presented at each meeting, the entire Plan will be presented for public review and comment before it is submitted to the state and federal government for approval.

"A public forum will be conducted this winter for interested persons to review the updated Plan and ask questions of Committee Members. A two-week public comment period will be held following the public forum to accommodate interested persons who are unable to attend. We want to make sure that anybody who is interested has an opportunity to review and comment on the draft Plan update," added Vogt

Cumberland County
Emergency Management Agency
P.O. BOX 56
TOLEDO, IL 62468

FOR IMMEDIATE RELEASE
Contact: Joe Vogt
217-663-3879

Plan to Protect Public Health and Property in Cumberland County

Ready for Public Review

Toledo, IL (January 30, 2023) -- The updated Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan outlining projects and activities to reduce damages caused by severe weather and other natural hazards will be available for public review and comment starting February 14, 2023. The Plan, along with a summary sheet and a comment survey, will be available on the Cumberland County webpage. The comment period will remain open through February 28, 2023.

If you are unable to access the Plan via the website, a paper copy of the Plan will be available for review at the Cumberland County Clerk's Office located at 140 E. Main St. in Toledo from 8 am to 4 pm on weekdays. Public comments received will be used to make any revisions needed before the Plan is submitted to the Illinois and Federal Emergency Management Agencies.

The Cumberland County All Hazards Mitigation Planning Committee has been conducting working meetings open to the public since December 2021. The Committee prepared this Plan with technical assistance from state and federal agencies as well as a consultant specializing in emergency management planning.

The municipalities of Greenup, Neoga, and Toledo, as well as Cumberland CUSD #77, Neoga CUSD #3, Greenup Fire Protection District (FPD), Neoga FPD, Toledo FPD, and Sigel FPD have participated in the planning process.

"This Plan describes how the County and the participating jurisdictions have been impacted by severe weather and other hazards and identifies specific mitigation actions that can be taken to reduce damages to people and property before events occur," explained Joe Vogt, Cumberland County EMA Coordinator.

A public forum will be held at the Toledo Christian Church, 501 South Maryland Street, Toledo from 4 p.m. to 6 p.m. on Tuesday, February 14, 2023. Individuals can still review the Plan and provide comments without participating in the public forum.

Search Facebook

Cumberland County Emergency Management Agency
January 30 at 3:48 PM ·

Cumberland County
Emergency Management Agency
P.O. BOX 56
TOLEDO, IL 62468

FOR IMMEDIATE RELEASE
Contact: Joe Vogt
217-663-3879

Plan to Protect Public Health and Property in Cumberland County

Ready for Public Review

Toledo, IL (January 30, 2023) -- The updated Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan outlining projects and activities to reduce damages caused by severe weather and other natural hazards will be available for public review and comment starting February 14, 2023. The Plan, along with a summary sheet and a comment survey, will be available on the Cumberland County webpage. The comment period will remain open through February 28, 2023.

If you are unable to access the Plan via the website, a paper copy of the Plan will be available for review at the Cumberland County Clerk's Office located at 140 E. Main St. in Toledo from 8 am to 4 pm on weekdays. Public comments received will be used to make any revisions needed before the Plan is submitted to the Illinois and Federal Emergency Management Agencies.

The Cumberland County All Hazards Mitigation Planning Committee has been conducting working meetings open to the public since December 2021. The Committee prepared this Plan with technical assistance from state and federal agencies as well as a consultant specializing in emergency management planning.

The municipalities of Greenup, Neoga, and Toledo, as well as Cumberland CUSD #77, Neoga CUSD #3, Greenup Fire Protection District (FPD), Neoga FPD, Toledo FPD, and Sigel FPD have participated in the planning process.

"This Plan describes how the County and the participating jurisdictions have been impacted by severe weather and other hazards and identifies specific mitigation actions that can be taken to reduce damages to people and property before events occur," explained Joe Vogt, Cumberland County EMA Coordinator.

A public forum will be held at the Toledo Christian Church, 501 South Maryland Street, Toledo from 4 p.m. to 6 p.m. on Tuesday, February 14, 2023. Individuals can still review the Plan and provide comments without participating in the public forum.

APPENDIX F

Cumberland County Multi-Jurisdictional
All Hazards Mitigation Plan
Public Forum Summary Handout
February 14, 2023
4:00 p.m. – 6:00 p.m.

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 Cumberland County residents. Since 1974, Cumberland County has been included in six major federally-declared disasters and experienced at least $5.1 million in recorded property damages and $23.7 million in recorded crop damages.

In the last 10 years alone (2012 – 2021), there have been 48 heavy rain events, 42 excessive heat events, 18 flash flood events, 16 extreme cold events, 14 thunderstorms with damaging winds, 12 riverine flood events, 11 severe winter storms, 5 severe storms with hail one inch in diameter or greater, 3 tornadoes, and 1 drought verified in the County. While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning and implementation.

What is hazard mitigation planning?
Hazard mitigation planning is the process of determining how to reduce or eliminate property damage and loss of life from natural and man-made hazards. This process helps the County and participating jurisdictions reduce their risk 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 an all hazards mitigation plan.

Why prepare an updated all hazards mitigation plan?
By preparing and adopting an updated all 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, made available through the Disaster Mitigation Act of 2000, can help provide local government entities with the opportunity to complete mitigation projects that would not otherwise be financially possible.

Who participated in the update of the County's All Hazards Mitigation Plan?
Recognizing the benefits that could be gained from preparing an updated all hazards mitigation plan, Cumberland County invited all the local government entities within the County to participate. The following jurisdictions chose to participate in the Plan update with the County:

- Cumberland CUSD #77
- Greenup, Village of
- Neoga, City of
- Neoga CUSD #3
- Neoga Fire Protection District
- Toledo, Village of
- Toledo Fire Protection District
- Sigel Fire Protection District

How was the Plan update developed?
The Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan update was developed through the Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee. The Planning Committee included representatives from each participating jurisdiction, as well as education, emergency services, and healthcare. The Planning Committee met five times between December 2021 and February 2023.

CUMBERLAND COUNTY MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN

Which natural and man-made hazards are included in the Plan update?
After reviewing the risk assessment, the Planning Committee chose to include the following natural and man-made hazards in the Plan:

Natural Hazards:
- severe storms (thunderstorms, hail, lightning, heavy rain)
- excessive heat
- severe winter storms (snow & ice)
- floods (riverine & flash)
- extreme cold
- tornadoes
- drought
- earthquakes

Man-Made hazards:
- hazardous substances (generation, transportation, and storage/handling)
- waste disposal
- hazardous material incidents
- waste remediation
- terrorism

What is included in the Plan update?
The Plan update is divided into sections that cover the planning process; the risk assessment; the mitigation strategy, including the jurisdiction-specific mitigation action lists; and plan maintenance and adoption. The majority of the Plan update is devoted to the risk assessment and mitigation strategy.

The risk assessment identifies the natural and man-made hazards that pose a threat to the County and includes a profile of each natural hazard, which describes the location and severity of past occurrences, reported damages to public health and property, and the likelihood of future occurrences. It also provides a vulnerability analysis that estimates the potential impacts each natural hazard would have on the health and safety of the residents of Cumberland County, as well as the buildings, critical facilities, and infrastructure in the County.

The key component of the mitigation strategy is a list of the projects and activities developed by each participating jurisdiction to reduce the potential loss of life and property damage that results from the natural and man-made hazards identified in the risk assessment. These projects and activities are intended to be implement *before* a hazard event occurs.

What happens next?
Any comments received at today's public forum and during the public comment period will be reviewed and, where applicable, incorporated into the draft Plan update before it is submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for review. Once IEMA and FEMA have reviewed and approved the Plan, it will be presented to the County and each participating jurisdiction for formal adoption. After adopting the Plan update, each participating jurisdiction will be eligible to apply for federal mitigation funds and can begin implementing the mitigation actions identified in the Plan.

APPENDIX G

Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan Update Comment Survey

The Cumberland County Multi-Jurisdictional All Hazards Mitigation Plan Update evaluates damage to life and property from natural and man-made hazards that occur in the County. This Plan also identifies projects and activities for the County and each participating jurisdiction to help reduce these damages. This comment survey should be used to provide feedback on the draft Plan.

An Asterisk (*) denotes a question that is required for form completion.

* 1. What comments, concerns or questions do you have regarding the draft Plan?

* 2. Name:

3. Address:

4. City/Village/Town:

5. State/Province:

6. Zip Code:

* 7. Email Address:

8. Phone Number:

Comments will be accepted through February 28, 2023.

Done

Appendix G

CUMBERLAND COUNTY MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN

COMMENT SHEET

PLAN COMMENT PERIOD
FEBRUARY 14, 2023 THRU FEBRUARY 28, 2023

The County's Multi-Jurisdictional All Hazards Mitigation Plan evaluates damage to life and property from natural and man-made hazards that occur in the County. This Plan also identifies projects and activities for the County and each participating jurisdiction that will help reduce these damages. This comment sheet should be used to provide feedback on the draft Plan update.

What comments, concerns or questions do you have regarding the draft Plan update?
(Use additional sheets if necessary.)

____

____

____

____

____

____

____

____

____

____

Please Print Your Name, Address, and Phone Number Below:

Name: ____ Phone: ________________

Address: ____

____ Zip Code: ______________

Comments will be accepted through February 28, 2023.

Place
Stamp
Here

Joe Vogt, Coordinator
Cumberland County EMA
c/o Cumberland County Clerk
PO Box 146
Toledo, IL 62468

APPENDIX H

Cumberland County
Emergency Management Agency
P.O. BOX 56
TOLEDO, IL 62468

FOR IMMEDIATE RELEASE
Contact: Joe Vogt
217-663-3879

To: Clark County EMA: Dane Tally (ccemamail@gmail.com)
Coles County EMA: Jim Hilgenberg (cmfd401@gmail.com)
Effingham County EMA: Pam Jacobs (ema@co.effingham.il.us)
Jasper County EMA: Ed Francis (edfrancis20@hotmail.com)
Shelby County EMA: Sheriff Brian McReynolds (sc545@scso87.org)

From: Joe Vogt, EMA Coordinator, Cumberland County

Subject: Hazard Mitigation Plan Update

Date: January 24, 2023

The purpose of this memorandum is to inform you that Cumberland County is updating its countywide All Hazards Mitigation Plan. Since we share common boundaries, you are invited to review our draft Plan and provide comments during the public comment period, which runs from February 14 through February 28, 2023. Starting February 14, the Plan along with a summary sheet and a comment survey can be viewed on the Cumberland County webpage.

A public forum is scheduled for:
Tuesday, February 14, 2023
4 p.m. to 6 p.m.
Toledo Christian Church,
501 South Maryland Street, Toledo, IL

If you have any questions, please contact me at 217-663-3879 or jvogt@cumberlandco.org American Environmental Corp., an emergency management and environmental consulting firm experienced in preparing these plans, is leading our planning process. If you have specific questions about the Plan, please contact Ken Runkle, a consultant team member, at 217-585-9517 Ext. 8 or krunkle@aecspfld.com

Runkle, Ken

From: Joe Vogt <jvogt@cumberlandco.org>
Sent: Monday, January 30, 2023 4:10 PM
To: ccemamail@gmail.com; cmfd401@gmail.com; Pam Jacobs; edfrancis20@hotmail.com; sc545@scso87.org
Cc: Runkle, Ken
Subject: Hazard Mitigation Plan Update
Attachments: Neighboring Counties.pdf

For the past 16 months American Environmental Corp. has lead our planning team with updating the Cumberland County All Hazard Mitigation Plan. Since we share common borders, you are invited to review our draft plan and provide comments. The attached memo, details how or when you can view the plan. If you have any questions, please contact me at 217-663-3879.

Thanks,
Joseph Vogt
EMA Director
Cumberland County

APPENDIX I

Table 1 Severe Storms - Thunderstorms with Damaging Winds Reported in Cumberland County 1984 - 2021								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Windspeed (knots)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
03/15/1984	8:15 PM	Toledo	n/a	n/a	n/a	n/a	n/a	
05/25/1984	6:26 PM	Toledo	n/a	n/a	n/a	n/a	n/a	
07/30/1986	1:15 AM	Greenup	n/a	n/a	n/a	n/a	n/a	
07/31/1986	3:45 AM	Neoga	n/a	n/a	n/a	n/a	n/a	
07/31/1986	5:00 AM	Toledo	n/a	n/a	n/a	n/a	n/a	
07/26/1987	4:30 PM	Toledo	n/a	n/a	n/a	n/a	n/a	
05/09/1990	8:00 PM	Toledo^	n/a	n/a	n/a	$2,500	n/a	Thunderstorm winds damaged a modular home.
05/12/1990	7:05 PM	Toledo	72 kts	n/a	n/a	$25,000	n/a	A manufactured home was destroyed and trees were blown over by thunderstorm winds.
06/20/1990	2:30 AM	Neoga	n/a	n/a	n/a	$2,500	n/a	Winds damaged trees and structures.
07/02/1992	6:15 PM	Toledo	n/a	n/a	n/a	$2,500	n/a	Many tree limbs and power lines were blown down.
04/30/1997	3:34 PM	Janesville Janesville^	n/a	n/a	n/a	$4,200	n/a	- Thunderstorm winds damaged a house when a tree fell onto it and blew over a shed in Janesville. - Also, a walnut tree was uprooted breaking 3 windows of a van parked nearby and the winds moved a bass boat about 150 yards.
06/12/1998	5:12 PM	Greenup	n/a	n/a	n/a	n/a	n/a	A tree was blown down causing damage to the roof of a church on Route 40 one mile east of Greenup.
06/18/1998	9:00 PM	Neoga Neoga^	n/a	1	n/a	n/a	n/a	- Thunderstorm winds blew over a semi on I-57 near Neoga. - While the driver was okay, his passenger sustained minor injuries.
06/29/1998	5:34 PM	countywide	n/a	n/a	n/a	n/a	n/a	
11/10/1998	7:15 AM	Greenup	n/a	n/a	n/a	n/a	n/a	A historic ice cream stand was destroyed by the thunderstorm winds.
06/01/1999	8:15 PM	Neoga^ Greenup Toledo	61 kts	n/a	n/a	n/a	n/a	A small tree was uprooted and several large tree limbs were blown down.

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

Table 1
Severe Storms - Thunderstorms with Damaging Winds Reported in Cumberland County
1984 - 2021

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/09/1999	3:20 PM	Toledo	n/a	n/a	n/a	n/a	n/a	Thunderstorm winds blew down a couple of trees.
04/07/2000	8:30 AM	Neoga Neoga^	n/a	n/a	n/a	n/a	n/a	Thunderstorm winds blew down a large tree and several tree limbs one mile north of Neoga.
04/20/2000	10:25 AM	Neoga^ Greenup Toledo	61 kts	n/a	n/a	n/a	n/a	- Numerous trees and tree limbs were blown down. - In Greenup, a shed was destroyed and a tree was blown over onto a house causing minor damage to the roof. - A couple of flag poles were bent by the winds at a local business.
05/09/2000	2:25 PM	Greenup^	n/a	n/a	n/a	n/a	n/a	Several power lines were blown down in 5 miles northeast of Greenup.
08/26/2000	10:28 PM	Toledo Greenup	52 kts	n/a	n/a	n/a	n/a	Several trees were blown down.
07/08/2001	4:55 PM	Toledo	50 kts	n/a	n/a	n/a	n/a	A Ham radio tower was blown down.
10/24/2001	2:00 PM	Greenup^	50 kts	n/a	n/a	n/a	n/a	A large tree was blown down on Illinois Route 130 at the junction with Hazel Dell Road.
05/01/2002	3:30 PM	Lillyville Lillyville^	50 kts	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1416)*** - Thunderstorm winds blew a well secured mobile home two feet off its foundation in Lillyville. - Also, numerous trees and tree limbs were blown down.
05/09/2002	1:30 AM	Neoga	50 kts	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1416)*** Several power lines were blown down in town.
06/04/2002	7:05 PM	Toledo Greenup^	55 kts	n/a	n/a	n/a	n/a	- Several large trees were blown down as well as power lines and tree limbs. - Also, northeast of Greenup a barn was destroyed.

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

Table 1 Severe Storms - Thunderstorms with Damaging Winds Reported in Cumberland County 1984 - 2021								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Windspeed (knots)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
06/11/2002	4:20 PM	Neoga^	50 kts	n/a	n/a	n/a	n/a	Several large trees were blown down onto US Route 45 south southwest of Neoga.
07/22/2002	7:55 PM	Neoga	50 kts	n/a	n/a	n/a	n/a	Numerous large tree limbs were blown down around town.
05/10/2003	9:20 AM	Greenup^	50 kts	n/a	n/a	n/a	n/a	Numerous large tree limbs were blown down.
05/10/2003	9:35 AM	Neoga Greenup Toledo	60 kts	n/a	n/a	n/a	n/a	- Numerous trees, tree limbs and power lines were blown down. - In Neoga the winds blew the roof off of a business and a concession stand. - One of the fallen trees landed on a house causing minor damage and several sheds were destroyed.
07/09/2003	9:00 PM	Toledo	52 kts	n/a	n/a	n/a	n/a	A large tree and tree limbs were blown down.
07/21/2003	3:40 AM	Toledo^	52 kts	n/a	n/a	n/a	n/a	A large tree was blown down across Illinois Route 121 west of Toledo.
05/30/2004	5:28 PM	Toledo	50 kts	n/a	n/a	n/a	n/a	Several trees and power lines were blown down.
07/13/2004	5:04 PM	Toledo Greenup	50 kts	n/a	n/a	n/a	n/a	Several large tree limbs were blown down.
05/13/2005	6:06 PM	Greenup	50 kts	n/a	n/a	n/a	n/a	A few large tree limbs blown down.
07/26/2005	8:15 PM	Hazel Dell^	50 kts	n/a	n/a	n/a	n/a	A few trees blown down.
04/02/2006	5:44 PM	Neoga Toledo	60 kts	n/a	n/a	n/a	n/a	- Trees and power lines blown down. - The roof was torn off part of a school in Neoga.
04/19/2006	1:08 AM	Hazel Dell^ Greenup^	52 kts	n/a	n/a	n/a	n/a	Several oak trees blown down near Greenup.
08/24/2007	4:15 PM	Neoga Greenup Toledo	61 kts	n/a	n/a	$25,000	n/a	Numerous trees, tree limbs and power lines were blown down between Neoga, Toledo, and Greenup.
02/05/2008	6:45 PM	Toledo Greenup	61 kts	n/a	n/a	$20,000	n/a	Numerous trees and power lines were blown down.

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

Table 1 Severe Storms - Thunderstorms with Damaging Winds Reported in Cumberland County 1984 - 2021								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Windspeed (knots)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
06/04/2008	1:18 PM	Toledo	56 kts	n/a	n/a	$8,000	n/a	***This event was part of a federally-declared disaster (Declaration #1771)*** A large tree was blown down onto a house.
06/06/2008	3:20 PM	Neoga	61 kts	n/a	n/a	$50,000	n/a	***This event was part of a federally-declared disaster (Declaration #1771)*** - Numerous trees and power lines were blown down. - In addition, a semi trailer was blown over on Interstate 57.
05/07/2009	7:00 PM	Neoga^	61 kts	n/a	n/a	$40,000	n/a	Several semi-trailers were blown off of I-57 at milepost 179.
06/18/2009	6:05 AM	Neoga	61 kts	n/a	n/a	$60,000	n/a	- Numerous trees and power lines were blown down. - A shed was blown apart and siding was torn off a house.
07/08/2009	3:00 PM	Neoga	52 kts	n/a	n/a	$3,000	n/a	A downburst associated with a strong thunderstorm tore the top out of a tree at a residence.
08/04/2009	8:50 AM	Neoga^	52 kts	n/a	n/a	$15,000	n/a	A roof was damaged by high winds at Camp New Hope.
08/04/2009	9:15 AM	Greenup	61 kts	n/a	n/a	$18,000	n/a	Numerous trees and tree limbs were blown down.
08/19/2009	4:48 PM	Neoga	52 kts	n/a	n/a	$15,000	n/a	Numerous trees and power lines were blown down.
04/05/2010	12:30 AM	Toledo	52 kts	n/a	n/a	$30,000	n/a	- A downburst caused minor wind damage on the southwest side of Toledo. - A wood fence and travel trailer were blown over. - In addition, several small limbs were blown down and 3 houses lost shingles.
06/12/2010	4:40 PM	Neoga Neoga^	52 kts	n/a	n/a	$32,000	n/a	- An oak tree split in half and fell on a house. - Numerous tree brances were blown down around town. - Two railroad crossing arms were blown off.

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

Table 1
Severe Storms - Thunderstorms with Damaging Winds Reported in Cumberland County
1984 - 2021

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
10/26/2010	5:30 AM	Greenup Greenup^	52 kts	n/a	n/a	$5,000	n/a	A large tree was blown down onto powerlines south of Greenup.
06/21/2011	4:34 PM	Neoga	52 kts	n/a	n/a	$15,000	n/a	Several large tree limbs were blown down.
06/21/2011	5:30 PM	Jewett Jewett^	52 kts	n/a	n/a	$25,000	n/a	Numerous tree limbs and power lines were blown down.
08/16/2012	3:05 PM	Neoga Hazel Dell^ Janesville Greenup Toledo	70 kts	n/a	n/a	$50,000	n/a	- Numerous trees and tree branches were blown down across Cumberland County. - Large branches were knocked down onto 3 houses in Janesville. - Power lines were blown down, resulting in a power outage in Greenup.
05/20/2013	11:01 PM	Greenup^	52 kts	n/a	n/a	$2,000	n/a	A large walnut tree was blown down.
05/30/2013	9:31 PM	Neoga	52 kts	n/a	n/a	$16,000	n/a	Several large tree branches were blown down and a flag pole was bent.
07/10/2013	7:15 AM	Jewett Jewett^	52 kts	n/a	n/a	$20,000	n/a	Several trees and tree branches were blown down.
08/22/2013	2:45 PM	Toledo	52 kts	n/a	n/a	$8,000	n/a	A few trees were blown down.
04/09/2015	8:00 PM	Neoga	52 kts	n/a	n/a	$35,000	n/a	A small shed was destroyed, a few trees were snapped, and numerous large tree branches were blown down.
04/09/2015	8:40 PM	Toledo	52 kts	n/a	n/a	$25,000	n/a	Several large tree branches were blown down.
07/06/2016	6:24 AM	Neoga	52 kts	n/a	n/a	$20,000	n/a	Power lines were blown down.
07/13/2016	4:30 PM	Neoga	61 kts	n/a	n/a	$25,000	n/a	Large tree limbs were blown onto a truck.
04/29/2017	5:50 PM	Toledo	52 kts	n/a	n/a	$7,000	n/a	A power pole was snapped.
04/29/2017	6:51 PM	Toledo	52 kts	n/a	n/a	$7,000	n/a	A power pole was snapped.
06/10/2018	2:09 PM	Toledo	61 kts	n/a	n/a	n/a	n/a	A large tree was blown over on East Jackson Street.
06/16/2019	1:03 AM	Jewett^	52 kts	n/a	n/a	n/a	n/a	Numerous tree branches were blown down, including a 10-inch diameter branch.

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

Table 1
Severe Storms - Thunderstorms with Damaging Winds Reported in Cumberland County
1984 - 2021

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
08/17/2019	8:08 AM	Neoga	52 kts	n/a	n/a	n/a	n/a	A large tree was blown over and numerous tree branches were blown down.
GRAND TOTAL:				**1**	**0**	**$612,700**	**$0**	

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

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

Table 2 Severe Storms - Hail Events Reported in Cumberland County 1984 - 2021								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Hail Stone Diameter (inches)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
04/21/1984	2:45 PM	Casey^	1.75 in.	n/a	n/a	n/a	n/a	
04/27/1984	5:29 PM	Greenup^	1.75 in.	n/a	n/a	n/a	n/a	
11/09/1984	7:05 PM	Toledo	1.00 in.	n/a	n/a	n/a	n/a	
04/22/1988	6:11 PM	Neoga^	1.00 in.	n/a	n/a	n/a	n/a	
04/22/1988	6:40 PM	Neoga	1.15 in.	n/a	n/a	n/a	n/a	
03/28/1997	5:15 PM	Neoga^	1.75 in.	n/a	n/a	n/a	n/a	
02/27/1999	1:35 PM	Toledo	1.75 in.	n/a	n/a	n/a	n/a	
05/01/2002	3:41 PM	Jewett^	1.00 in.	n/a	n/a	n/a	n/a	
04/16/2006	4:00 PM	Toledo^	1.00 in.	n/a	n/a	n/a	n/a	
06/04/2008	1:18 PM	Toledo	1.00 in.	n/a	n/a	n/a	n/a	
05/07/2009	7:25 PM	Toledo	1.00 in.	n/a	n/a	n/a	n/a	
05/07/2009	7:35 PM	Greenup	1.00 in.	n/a	n/a	n/a	n/a	
06/15/2010	11:40 AM	Montrose^	1.00 in.	n/a	n/a	n/a	n/a	
04/19/2011	8:28 AM	Neoga	1.25 in.	n/a	n/a	n/a	n/a	
04/19/2011	8:13 PM	Neoga	1.00 in.	n/a	n/a	n/a	n/a	
03/02/2012	8:02 AM	Neoga Neoga^	1.75 in.	n/a	n/a	n/a	n/a	
05/11/2014	4:38 PM	Toledo^ Greenup^	2.00 in.	n/a	n/a	$200,000	n/a	The hail caused roof, siding, and vehicle damage.
05/11/2014	4:40 PM	Greenup	2.50 in.	n/a	n/a	n/a	n/a	
04/09/2015	8:35 PM	Neoga^	1.25 in.	n/a	n/a	n/a	n/a	
05/30/2015	3:35 PM	Greenup	1.00 in.	n/a	n/a	n/a	n/a	
GRAND TOTAL:				**0**	**0**	**$200,000**	**$0**	

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

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

Table 3 Severe Storms - Heavy Rain Events Reported in Cumberland County 2000 - 2021								
Date(s)	**Start Time**	**Magnitude Rainfall (inches)**	**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
04/08/2000	9:30 AM	1.73 in.	Greenup	n/a	n/a	n/a	n/a	
05/27/2000	12:00 AM	2.02 in.	Greenup	n/a	n/a	n/a	n/a	
06/17/2000	12:00 AM	1.75 in.	Greenup	n/a	n/a	n/a	n/a	
06/21/2000	12:00 AM	1.55 in.	Greenup	n/a	n/a	n/a	n/a	
06/24/2000	1:00 AM	1.59 in.	Greenup	n/a	n/a	n/a	n/a	
07/05/2000	8:00 AM	1.80 in.	Greenup	n/a	n/a	n/a	n/a	
08/03/2000	8:00 PM	1.77 in.	Greenup	n/a	n/a	n/a	n/a	
09/11/2000	7:00 AM	2.01 in.	Greenup	n/a	n/a	n/a	n/a	
10/05/2000	12:30 AM	4.25 in.	Greenup	n/a	n/a	n/a	n/a	
06/05/2001	6:00 AM	1.61 in.	Greenup	n/a	n/a	n/a	n/a	
06/06/2001	6:00 AM	1.74 in.	Greenup	n/a	n/a	n/a	n/a	
07/09/2001	4:00 AM	2.10 in.	Greenup	n/a	n/a	n/a	n/a	
10/11/2001 thru 10/11/2001	2:00 PM	2.00 in.	Greenup	n/a	n/a	n/a	n/a	
10/13/2001 thru 10/13/2001	1:00 PM	2.74 in.	Greenup	n/a	n/a	n/a	n/a	
12/16/2001 thru 12/16/2001	4:00 AM	1.77 in.	Greenup	n/a	n/a	n/a	n/a	
05/06/2002	4:30 AM	3.18 in.	Greenup	n/a	n/a	n/a	n/a	
05/13/2002 thru 05/13/2002	n/a	3.82 in.	Greenup	n/a	n/a	n/a	n/a	
05/11/2003	n/a	2.03 in.	Greenup	n/a	n/a	n/a	n/a	

[1] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 3
Severe Storms - Heavy Rain Events Reported in Cumberland County
2000 - 2021

Date(s)	Start Time	Magnitude Rainfall (inches)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/09/2003 thru 07/09/2003	9:00 PM	2.72 in.	Greenup	n/a	n/a	n/a	n/a	
08/31/2003 thru 08/31/2003	n/a	5.24 in.	Casey Windsor	n/a	n/a	n/a	n/a	
09/26/2003 thru 09/26/2003	n/a	1.70 in.	Casey	n/a	n/a	n/a	n/a	
11/17/2003 thru 11/17/2003	n/a	1.50 in.	Casey Windsor	n/a	n/a	n/a	n/a	
08/25/2004 thru 08/25/2004	n/a	1.53 in.	Casey Windsor	n/a	n/a	n/a	n/a	
10/18/2004	n/a	1.86 in.	Casey	n/a	n/a	n/a	n/a	
01/02/2005	n/a	1.73 in.	Casey	n/a	n/a	n/a	n/a	
01/04/2005	n/a	2.01 in.	Casey	n/a	n/a	n/a	n/a	
09/25/2005	n/a	2.11 in.	Casey	n/a	n/a	n/a	n/a	
04/06/2006	n/a	2.23 in.	Casey Windsor	n/a	n/a	n/a	n/a	
05/10/2006	n/a	3.49 in.	Casey	n/a	n/a	n/a	n/a	
07/12/2006	n/a	1.70 in.	Casey	n/a	n/a	n/a	n/a	
10/16/2006	n/a	1.87 in.	Casey	n/a	n/a	n/a	n/a	
01/12/2007	n/a	1.80 in.	Neoga	n/a	n/a	n/a	n/a	
03/14/2007	n/a	1.88 in.	Neoga	n/a	n/a	n/a	n/a	

[1] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 3
Severe Storms - Heavy Rain Events Reported in Cumberland County
2000 - 2021

Date(s)	Start Time	Magnitude Rainfall (inches)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/16/2007	4:30 AM	3.95 in.	Neoga	n/a	n/a	n/a	n/a	
08/04/2007	n/a	1.78 in.	Neoga	n/a	n/a	n/a	n/a	
08/24/2007	n/a	1.61 in.	Neoga	n/a	n/a	n/a	n/a	
09/08/2007	n/a	2.41 in.	Neoga	n/a	n/a	n/a	n/a	
02/05/2008	n/a	1.60 in.	Neoga	n/a	n/a	n/a	n/a	
03/17/2008	n/a	2.65 in.	Neoga	n/a	n/a	n/a	n/a	
03/31/2008	n/a	1.82 in.	Neoga	n/a	n/a	n/a	n/a	
04/10/2008	n/a	1.56 in.	Neoga	n/a	n/a	n/a	n/a	
06/06/2008	n/a	3.41 in.	Neoga	n/a	n/a	n/a	n/a	
06/27/2008	n/a	1.66 in.	Neoga	n/a	n/a	n/a	n/a	
07/13/2008	n/a	1.99 in.	Neoga	n/a	n/a	n/a	n/a	
10/23/2008	n/a	1.65 in.	Neoga	n/a	n/a	n/a	n/a	
12/27/2008	n/a	1.67 in.	Neoga	n/a	n/a	n/a	n/a	
02/10/2009	n/a	2.70 in.	Neoga	n/a	n/a	n/a	n/a	
05/14/2009	n/a	1.50 in.	Neoga	n/a	n/a	n/a	n/a	
08/20/2009	n/a	3.05 in.	Neoga	n/a	n/a	n/a	n/a	
10/08/2009	n/a	2.00 in.	Neoga	n/a	n/a	n/a	n/a	
06/24/2010	n/a	1.97 in.	Neoga	n/a	n/a	n/a	n/a	
07/20/2010	n/a	2.39 in.	Neoga	n/a	n/a	n/a	n/a	
09/03/2010	n/a	2.10 in.	Neoga	n/a	n/a	n/a	n/a	
11/25/2010	n/a	2.04 in.	Neoga	n/a	n/a	n/a	n/a	
03/05/2011	n/a	1.50 in.	Neoga	n/a	n/a	n/a	n/a	
04/20/2011	n/a	2.98 in.	Neoga	n/a	n/a	n/a	n/a	
04/26/2011	n/a	1.58 in.	Neoga	n/a	n/a	n/a	n/a	
04/28/2011	n/a	1.52 in.	Neoga	n/a	n/a	n/a	n/a	
06/26/2011	n/a	2.62 in.	Neoga	n/a	n/a	n/a	n/a	

[1] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 3
Severe Storms - Heavy Rain Events Reported in Cumberland County
2000 - 2021

Date(s)	Start Time	Magnitude Rainfall (inches)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/30/2011	n/a	3.06 in.	Neoga	n/a	n/a	n/a	n/a	
07/15/2012	n/a	2.62 in.	Neoga	n/a	n/a	n/a	n/a	
08/03/2012	n/a	1.70 in.	Neoga	n/a	n/a	n/a	n/a	
09/02/2012	n/a	1.97 in.	Neoga	n/a	n/a	n/a	n/a	
01/13/2013	n/a	1.50 in.	Neoga	n/a	n/a	n/a	n/a	
01/30/2013	n/a	1.96 in.	Neoga	n/a	n/a	n/a	n/a	
04/17/2013	n/a	1.86 in.	Neoga	n/a	n/a	n/a	n/a	
04/19/2013	n/a	3.57 in.	Neoga	n/a	n/a	n/a	n/a	
06/23/2013	n/a	2.30 in.	Neoga	n/a	n/a	n/a	n/a	
04/28/2014	n/a	2.20 in.	Neoga	n/a	n/a	n/a	n/a	
08/17/2014	n/a	1.56 in.	Neoga	n/a	n/a	n/a	n/a	
06/08/2015	n/a	2.65 in.	Neoga	n/a	n/a	n/a	n/a	
06/29/2015	n/a	2.39 in.	Neoga	n/a	n/a	n/a	n/a	
11/16/2015	n/a	1.56 in.	Neoga	n/a	n/a	n/a	n/a	
11/18/2015	n/a	1.98 in.	Neoga	n/a	n/a	n/a	n/a	
12/27/2015 thru 12/27/2015	n/a	6.72 in.	Neoga	n/a	n/a	n/a	n/a	
07/04/2016	n/a	1.98 in.	Neoga	n/a	n/a	n/a	n/a	
08/16/2016	n/a	2.80 in.	Neoga	n/a	n/a	n/a	n/a	
10/20/2016	n/a	3.03 in.	Neoga	n/a	n/a	n/a	n/a	
04/29/2017 thru 04/29/2017	n/a	4.61 in.	Neoga	n/a	n/a	n/a	n/a	
05/04/2017	n/a	2.64 in.	Neoga	n/a	n/a	n/a	n/a	
10/05/2017	n/a	1.70 in.	Neoga	n/a	n/a	n/a	n/a	

[1] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 3 Severe Storms - Heavy Rain Events Reported in Cumberland County 2000 - 2021								
Date(s)	**Start Time**	**Magnitude Rainfall (inches)**	**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
10/10/2017	n/a	1.53 in.	Neoga	n/a	n/a	n/a	n/a	
10/23/2017	n/a	1.98 in.	Neoga	n/a	n/a	n/a	n/a	
02/21/2018	n/a	1.80 in.	Neoga	n/a	n/a	n/a	n/a	
04/02/2018 thru 04/02/2018	n/a	5.00 in.	Neoga	n/a	n/a	n/a	n/a	
06/11/2018 thru 06/11/2018	n/a	6.42 in.	Neoga	n/a	n/a	n/a	n/a	
07/30/2018	n/a	4.40 in.	Neoga	n/a	n/a	n/a	n/a	
09/08/2018	n/a	1.61 in.	Neoga	n/a	n/a	n/a	n/a	
09/25/2018	n/a	2.40 in.	Neoga	n/a	n/a	n/a	n/a	
05/22/2019	n/a	1.53 in.	Neoga	n/a	n/a	n/a	n/a	
06/16/2019	n/a	2.32 in.	Neoga	n/a	n/a	n/a	n/a	
06/22/2019	n/a	1.96 in.	Neoga	n/a	n/a	n/a	n/a	
08/13/2019	n/a	2.56 in.	Neoga	n/a	n/a	n/a	n/a	
10/11/2019	n/a	1.83 in.	Neoga	n/a	n/a	n/a	n/a	
10/27/2019	n/a	2.16 in.	Neoga	n/a	n/a	n/a	n/a	
11/30/2019	n/a	1.55 in.	Neoga	n/a	n/a	n/a	n/a	
12/29/2019	n/a	1.58 in.	Neoga	n/a	n/a	n/a	n/a	
01/10/2020 thru 01/10/2020	n/a	4.54 in.	Neoga	n/a	n/a	n/a	n/a	
04/29/2020	n/a	1.62 in.	Neoga	n/a	n/a	n/a	n/a	
06/28/2020	n/a	2.63 in.	Neoga	n/a	n/a	n/a	n/a	
07/20/2020	n/a	2.00 in.	Neoga	n/a	n/a	n/a	n/a	

[1] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 3
Severe Storms - Heavy Rain Events Reported in Cumberland County
2000 - 2021

Date(s)	Start Time	Magnitude Rainfall (inches)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/31/2020	n/a	3.75 in.	Neoga	n/a	n/a	n/a	n/a	
10/21/2020	n/a	3.10 in.	Neoga	n/a	n/a	n/a	n/a	
02/28/2021	n/a	1.56 in.	Neoga	n/a	n/a	n/a	n/a	
03/18/2021	n/a	1.51 in.	Neoga	n/a	n/a	n/a	n/a	
06/28/2021	n/a	1.55 in.	Neoga	n/a	n/a	n/a	n/a	
07/16/2021	n/a	1.69 in.	Neoga	n/a	n/a	n/a	n/a	
10/15/2021	n/a	1.80 in.	Neoga	n/a	n/a	n/a	n/a	
GRAND TOTAL:				**0**	**0**	**$0**	**$0**	

Sources: Midwestern Regional Climate Center, cli-MATE.
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.

[1] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
07/12/1995 thru 07/16/1995	n/a	100 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
7/30/1995	n/a	94 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
8/3/1995	n/a	94 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/11/1995 thru 08/19/1995	n/a	96 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
6/22/1996	n/a	91 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
06/30/1996 thru 07/01/1996	n/a	95 °F	72 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/18/1996 thru 07/19/1996	n/a	96 °F	75 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/05/1996 thru 08/07/1996	n/a	96 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/20/1996 thru 08/22/1996	n/a	93 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
06/24/1997 thru 06/25/1997	n/a	93 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
7/2/1997	n/a	94 °F	74 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/13/1997 thru 07/14/1997	n/a	97 °F	67 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/26/1997 thru 07/28/1997	9:00 AM	97 °F	73 °F	115 °F	Charleston Windsor	n/a	n/a	n/a	n/a	- There were numerous reports of heat related injuries in most area hospitals. - Also, there were numerous reports of roads buckling due to the high temperatures.
06/24/1998 thru 06/28/1998	n/a	96 °F	73 °F	110 °F	Charleston Windsor	n/a	n/a	n/a	n/a	- Several heat related illnesses were reported in area hospitals due to the heat. - Also, several highways in the area had sections of roadway buckle due to the excessive heat.
07/19/1998 thru 07/22/1998	n/a	96 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
8/24/1998	n/a	94 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
09/06/1998 thru 09/07/1998	n/a	95 °F	69 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
6/8/1999	n/a	94 °F	72 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/03/1999 thru 07/06/1999	n/a	94 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/20/1999 thru 07/31/1999	10:00 AM	101 °F	67 °F	110 °F	Charleston Windsor	n/a	n/a	n/a	n/a	
8/9/2000	n/a	91 °F	74 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/29/2000 thru 08/30/2000	n/a	95 °F	66 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/08/2001 thru 07/10/2001	n/a	96 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/21/2001 thru 07/25/2001	n/a	96 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/31/2001 thru 08/01/2001	n/a	93 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)**[1]	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
08/07/2001 thru 08/09/2001	n/a	94 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
06/03/2002 thru 06/04/2002	n/a	93 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
06/30/2002 thru 07/05/2002	n/a	97 °F	68 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/20/2002 thru 07/23/2002	n/a	97 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
7/28/2002	n/a	94 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
8/1/2002	n/a	95 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/04/2002 thru 08/05/2002	n/a	96 °F	72 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/04/2003 thru 07/08/2003	n/a	97 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/26/2003 thru 08/27/2003	n/a	98 °F	65 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
06/11/2004 thru 06/12/2004	n/a	92 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/21/2004 thru 07/22/2004	n/a	95 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
06/25/2005 thru 06/30/2005	n/a	97 °F	67 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/17/2005 thru 07/21/2005	n/a	97 °F	69 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/24/2005 thru 07/26/2005	n/a	101 °F	72 °F	115 °F	Charleston Windsor	n/a	n/a	n/a	n/a	
08/10/2005 thru 08/11/2005	n/a	98 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
8/19/2005	n/a	95 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
6/21/2006	n/a	94 °F	72 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/18/2006 thru 07/19/2006	n/a	94 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
07/28/2006 thru 08/03/2006	n/a	97 °F	71 °F	110 °F	Charleston Windsor	n/a	n/a	n/a	n/a	
08/03/2007 thru 08/12/2007	n/a	98 °F	67 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
8/15/2007	n/a	98 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/22/2007 thru 08/24/2007	n/a	98 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
6/19/2009	n/a	92 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
06/22/2009 thru 06/26/2009	n/a	94 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/08/2009 thru 08/09/2009	n/a	93 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
06/20/2010 thru 06/23/2010	n/a	95 °F	69 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/15/2010 thru 07/15/2010	n/a	95 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4
Regional Excessive Heat Events Extrapolated for Cumberland County
1995 - 2021

Date(s)	Start Time	Magnitude - Temperature °F Day (Max)	Night (Min)	Heat Index (Max)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/22/2010 thru 07/24/2010	n/a	94 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/28/2010 thru 07/29/2010	n/a	93 °F	72 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
08/03/2010 thru 08/05/2010	n/a	98 °F	71 °F	105 °F	Charleston Windsor	n/a	n/a	n/a	n/a	
08/09/2010 thru 08/14/2010	n/a	97 °F	70 °F	105 °F	Charleston Windsor	n/a	n/a	n/a	n/a	
06/08/2011 thru 06/09/2011	n/a	97 °F	72 °F	n/a		n/a	n/a	n/a	n/a	
07/11/2011 thru 07/12/2011	n/a	97 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/18/2011 thru 07/24/2011	n/a	101 °F	72 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/27/2011 thru 08/03/2011	n/a	95 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
09/01/2011 thru 09/03/2011	n/a	100 °F	67 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
06/29/2012 thru 07/08/2012	n/a	104 °F	66 °F	110 °F	Charleston Windsor	n/a	n/a	n/a	n/a	
07/16/2012 thru 07/20/2012	n/a	102 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/23/2012 thru 07/26/2012	n/a	104 °F	73 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
7/31/2012	n/a	99 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
8/4/2012	n/a	94 °F	72 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/17/2013 thru 07/20/2013	n/a	95 °F	71 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
09/10/2013 thru 09/12/2013	n/a	98 °F	70 °F	n/a	Charleston Windsor	n/a	n/a	n/a	n/a	
07/13/2015 thru 07/14/2015	n/a	94 °F	70 °F	n/a	Casey Charleston	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
07/18/2015 thru 07/19/2015	n/a	93 °F	72 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
07/28/2015 thru 07/29/2015	n/a	94 °F	71 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
8/3/2015	n/a	93 °F	90 °F	n/a	Casey Charleston	n/a	n/a	n/a	n/a	
6/12/2016	n/a	95 °F	69 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
06/20/2016 thru 06/21/2016	n/a	93 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
06/26/2016 thru 06/27/2016	n/a	96 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
07/21/2016 thru 07/22/2016	n/a	94 °F	71 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
07/24/2016 thru 07/25/2016	n/a	94 °F	71 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
08/11/2016 thru 08/13/2016	n/a	94 °F	72 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4
Regional Excessive Heat Events Extrapolated for Cumberland County
1995 - 2021

Date(s)	Start Time	Magnitude - Temperature °F			Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
09/07/2016 thru 09/08/2016	n/a	93 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
06/13/2017 thru 06/14/2017	n/a	97 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
07/13/2017 thru 07/14/2017	n/a	97 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
07/20/2017 thru 07/23/2017	n/a	99 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
9/22/2017	n/a	95 °F	69 °F	n/a	Casey Windsor	n/a	n/a	n/a	n/a	
06/17/2018 thru 06/19/2018	n/a	95 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
06/30/2018 thru 07/05/2018	n/a	95 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
8/6/2018	n/a	91 °F	71 °F	n/a	Casey Charleston	n/a	n/a	n/a	n/a	
08/27/2018 thru 08/29/2018	n/a	92 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
09/03/2018 thru 09/06/2018	n/a	94 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
9/21/2018	n/a	95 °F	71 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
6/30/2019	n/a	95 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
7/3/2019	n/a	93 °F	71 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
7/10/2019	n/a	92 °F	73 °F	n/a	Casey Charleston	n/a	n/a	n/a	n/a	
07/18/2019 thru 07/21/2019	n/a	95 °F	71 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
09/12/2019 thru 09/13/2019	n/a	94 °F	69 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
7/5/2020	n/a	95 °F	70 °F	n/a	Casey Charleston	n/a	n/a	n/a	n/a	
07/07/2020 thru 07/10/2020	n/a	95 °F	69 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 4 Regional Excessive Heat Events Extrapolated for Cumberland County 1995 - 2021										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
7/19/2020	n/a	92 °F	72 °F	n/a	Casey Windsor	n/a	n/a	n/a	n/a	
7/27/2020	n/a	92 °F	73 °F	n/a	Casey Windsor	n/a	n/a	n/a	n/a	
6/12/2021	n/a	97 °F	70 °F	n/a	Casey Charleston	n/a	n/a	n/a	n/a	
06/29/2021 thru 06/30/2021	n/a	94 °F	70 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
08/11/2021 thru 08/12/2021	n/a	98 °F	73 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
08/25/2021 thru 08/26/2021	n/a	95 °F	68 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	n/a	
8/30/2021	n/a	93 °F	72 °F	n/a	Casey Windsor	n/a	n/a	n/a	n/a	
GRAND TOTAL:						**0**	**0**	**$ -**	**$ -**	

Sources: Iowa State University, Iowa Environmental Mesonet, National Weather Service Data, Search for Warnings.
Midwestern Regional Climate Center, cli-MATE.
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.

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
01/31/1951 thru 02/01/1951	11:00 AM	Winter Storm	6.0 in.				X	Greenup	n/a	n/a	n/a	
12/02/1952	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
03/02/1953	8:00 PM	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/18/1956	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/24/1956	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/30/1956	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/31/1958	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
11/28/1958	n/a	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	
12/20/1960	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/11/1964 thru 01/12/1964	6:00 PM	Heavy Snow	7.5 in.					Greenup	n/a	n/a	n/a	
03/10/1964	3:00 AM	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/14/1965 thru 01/15/1965	10:00 PM	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	
01/31/1965 thru 02/01/1965	10:00 PM	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	

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

2 Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
02/24/1965 thru 02/25/1965	9:30 AM	Winter Storm	5.0 in.				50 mph	Greenup	n/a	n/a	n/a	
03/03/1965 thru 03/04/1965	11:00 PM	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
02/01/1966	12:33 AM	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	
01/12/1968 thru 01/13/1968	6:00 PM	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	
01/14/1968	3:00 AM	Heavy Snow	10.0 in.					Greenup	n/a	n/a	n/a	
03/11/1968 thru 03/12/1968	11:00 PM	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	
01/04/1972	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
12/18/1973 thru 12/19/1973	10:00 PM	Heavy Snow	14.0 in.					Greenup	n/a	n/a	n/a	
12/30/1973	9:30 AM	Heavy Snow	10.0 in.					Greenup	n/a	n/a	n/a	
11/27/1975	n/a	Heavy Snow	5.0 in.					Greenup	n/a	n/a	n/a	
12/26/1975	n/a	Heavy Snow	7.5 in.					Greenup	n/a	n/a	n/a	
03/16/1976	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/05/1977	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	

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

[2] Observed Location information was obtained from NWS’s COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center’s cli-MATE data system and NOAA’s Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
01/10/1977	n/a	Heavy Snow	5.0 in.					Greenup	n/a	n/a	n/a	
01/20/1977	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
12/06/1977	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/17/1978	n/a	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	
03/08/1978	n/a	Heavy Snow	6.0 in.					Greenup	n/a	n/a	n/a	
01/12/1979 thru 01/13/1979	8:00 PM	Winter Storm	5.0 in.				X	Diona	n/a	n/a	n/a	High winds and drifting snow
01/21/1979	n/a	Winter Storm	4.5 in.				X	Diona	n/a	n/a	n/a	
01/24/1979	12:30 AM	Heavy Snow	5.0 in.				X	Diona Greenup	n/a	n/a	n/a	
01/28/1979	7:00 AM	Heavy Snow	7.0 in.					Diona Greenup	n/a	n/a	n/a	
02/08/1979	8:30 AM	Heavy Snow	5.0 in.					Diona Greenup	n/a	n/a	n/a	
02/25/1980	n/a	Heavy Snow	4.0 in.					Diona	n/a	n/a	n/a	
03/01/1980	n/a	Heavy Snow	7.0 in.					Greenup	n/a	n/a	n/a	
11/27/1980	n/a	Heavy Snow	8.0 in.					Greenup	n/a	n/a	n/a	
02/10/1981	12:30 AM	Heavy Snow	9.0 in.					Diona Greenup	n/a	n/a	n/a	
12/17/1981	n/a	Heavy Snow	6.0 in.					Diona Greenup	n/a	n/a	n/a	

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

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
02/09/1982	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
02/27/1984 thru 02/28/1984	n/a	Heavy Snow	12.0 in.					Greenup	n/a	n/a	n/a	
02/23/1986 thru 02/24/1986	n/a	Heavy Snow	4.8 in.					Diona	n/a	n/a	n/a	
01/09/1987 thru 01/10/1987	8:30 AM	Heavy Snow	10.0 in.					Diona Greenup	n/a	n/a	n/a	
12/27/1988 thru 12/28/1988	9:00 AM	Heavy Snow	7.0 in.					Diona Greenup	n/a	n/a	n/a	
02/05/1989	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
12/15/1989	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
03/24/1990	n/a	Heavy Snow	7.0 in.					Greenup	n/a	n/a	n/a	
12/26/1990	8:30 AM	Heavy Snow	5.0 in.					Diona Greenup	n/a	n/a	n/a	
01/10/1993	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
02/16/1993	n/a	Heavy Snow	6.0 in.					Diona Greenup	n/a	n/a	n/a	

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

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
02/25/1993 thru 02/26/1993	7:00 AM	Heavy Snow	7.0 in.					Diona Greenup	n/a	n/a	n/a	
01/16/1994	n/a	Heavy Snow	7.0 in.					Greenup	n/a	n/a	n/a	
01/02/1996	2:00 AM	Winter Storm	5.0 in.				40 mph	Greenup	n/a	n/a	n/a	Gusty northwest winds accompanied the storm, creating near whiteout conditions, making travel hazardous, and closing
01/18/1996 thru 01/19/1996	10:00 AM	Winter Storm	1.5 in.		X		35 mph	Greenup	n/a	n/a	n/a	
03/19/1996 thru 03/20/1996	1:00 AM	Winter Storm	6.0 in.					Greenup	n/a	n/a	n/a	There was considerable blow and drifting of snow which temporarily closed some roads in the area.
01/08/1997 thru 01/09/1997	9:00 PM	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/10/1997	n/a	Heavy Snow	4.0 in.					Greenup	n/a	n/a	n/a	
01/15/1997 thru 01/17/1997	3:00 AM	Winter Storm	2.0 in.	X		X	30 mph	Greenup	n/a	n/a	n/a	*Event Descriptin Provided Below*

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

2 Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
- After the snow stopped, the winds picked up to between 20 and 30 mph with higher gusts, causing near whiteout conditions. - Also, temperatures fell below zero across the entire area, so with the strong winds and cold temperatures, wind chill readings dipped well below minus 40 degrees in many												
11/13/1997 thru 11/14/1997	3:30 PM	Winter Storm	5.0 in.	X		X			n/a	n/a	n/a	
01/01/1999 thru 01/03/1999	6:00 AM	Winter Storm	6.0 in.	X				Greenup	n/a	n/a	n/a	*Event Description Provided Below*
- Locations near and south of Charleston/Mattoon saw periods of mixed precipitation, including freezing rain, while farther north snow was predominate. - Total snow accumulations topped 6 inches mainly along and north of Interstate 70. - Lesser amounts fell to the south, where more freezing precipitation was reported. - After the snowfall and precipitation diminished, winds increased from the northwest and temperatures dropped, causing dangerous wind chills and treacherous driving conditions with extensive blowing and drifting snow through the third day of the year.												
03/11/2000	7:00 AM	Heavy Snow	5.0 in.					Greenup	4	n/a	n/a	Four people were injured in a traffic accident near Neoga.
12/13/2000	5:00 PM	Winter Storm	7.0 in.	X		X		Greenup	n/a	n/a	n/a	
03/25/2002 thru 03/26/2002	9:00 PM	Winter Storm	3.1 in.	X	0.5 in.	X	X	Greenup	n/a	n/a	n/a	The combination of ice and snow resulted in downed power lines and tree limbs, along with dozens of traffic accidents the morning of the

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

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5 Severe Winter Storm Events Reported in Cumberland County 1950 - 2021													
Date(s)	**Start Time**	**Event Type**	**Magnitude**[1]					**Observed Location(s)**[2]	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/ Event Description**
			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
12/24/2002 thru 12/25/2002	2:00 PM	Heavy Snow	8.0 in.					Greenup	n/a	n/a	n/a	
01/25/2004	12:00 PM	Ice Storm			X	X			n/a	n/a	n/a	*Event Description Provided Below*
- This system brought significant icing to the southeastern portions of Central Illinois on January 25th. - Also, significant sleet accumulation was reported in numerous locations along and south of Interstate 70. - There were numerous reports of power outages, downed tree limbs and traffic accidents in all of these counties.												
03/31/2006	5:50 AM	Winter Storm	10.0 in.						n/a	n/a	n/a	
01/31/2008	4:30 PM	Heavy Snow	4.5 in.					Neoga	n/a	n/a	n/a	
01/26/2009 thru 01/28/2009	7:30 PM	Heavy Snow	10.0 in.					Neoga	n/a	n/a	n/a	
02/15/2010	n/a	Heavy Snow	4.0 in.					Neoga	n/a	n/a	n/a	
02/01/2011 thru 02/02/2011	12:30 PM	Winter Storm	2.0 in.		0.5 in.	0.5 in.			n/a	n/a	$ 1,000,000	- The heavy glaze of ice downed numerous trees and tree branches, causing power outages across the County. - Snow-covered and icy roads resulted in numerous traffic accidents.

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

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
02/05/2011	5:00 AM	Heavy Snow	4.6 in.					Neoga	n/a	n/a	n/a	*Event Description Provided Below*
- Roads became snow-covered and hazardous on February 5th, resulting in a traffic accident involving two semi-trailers on I-70 beteen Casey and Greenup. - One of the trucks was carrying a small amount of hazardous materials, which prompted Illinois State troopers to close the interstate for several hours. - No hazardous materials were spilled and no injuries were reported.												
03/24/2013 thru 03/25/2013	3:00 AM	Heavy Snow	10.0 in.						n/a	n/a	n/a	The heavy snow led to the closing of many area schools and businesses and caused numerous traffic accidents across the area.
01/02/2014	n/a	Heavy Snow	6.0 in.					Neoga	n/a	n/a	n/a	
01/05/2014 thru 01/06/2014	6:00 AM	Heavy Snow	14.0 in.						n/a	n/a	n/a	- The heavy snowfall along with significant blowing and drifting caused numerous road closures and traffic accidents across the County. - According to Committee Member records, Toledo lost power and drained its water tower in less than 8 hours
02/05/2014	n/a	Heavy Snow	6.0 in.					Neoga	n/a	n/a	n/a	

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

2 Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
02/28/2015 thru 03/01/2015	5:30 PM	Heavy Snow	7.0 in.						n/a	n/a	n/a	Numerous traffic accidents occurred due to snow-covered and hazardous roadways.
02/24/2016	8:00 AM	Blizzard	5.0 in.				55 mph		n/a	1	n/a	*Event Description Provided Below*
- Snow-covered roads and poor visibility due to falling and blowing snow contributed to numerous traffic accidents across the County, especially on I-57. - A fatal traffic accident occurred on IL-130 south of Greenup when a semi truck collided with another vehicle killing a 57 year-old male in the vehicle. - In addition, many trees and power lines were blown down, resulting in scattered power outages.												
01/15/2018	n/a	Heavy Snow	4.0 in.					Neoga	n/a	n/a	n/a	
01/11/2019 thru 01/13/2019	7:45 PM	Heavy Snow	6.0 in.						n/a	n/a	n/a	- Numerous traffic accidents occurred due to snow-covered roads - The snow was heavy and wet, which made plowing of roads difficult.
12/15/2019 thru 12/16/2019	2:00 PM	Heavy Snow	7.0 in.						n/a	n/a	n/a	Numerous traffic accidents occurred due to snow-covered and slick roads.
01/27/2021	10:00 AM	Winter Storm	4.0 in.						n/a	1	n/a	An 18-year old female was killed when she lost control of her vehicle and hit a guardrail on I-57 near Neoga.

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

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 5
Severe Winter Storm Events Reported in Cumberland County
1950 - 2021

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
02/14/2021 thru 02/16/2021	8:00 PM	Heavy Snow	11.0 in.						n/a	n/a	n/a	Numerous traffic accidents occurred due to snow-covered and hazardous roads.
GRAND TOTAL:									**4**	**2**	**$ 1,000,000**	

Sources: Cumberland County Multi-Jurisdictional All Hazards Mitigation Planning Committee Member responses to Natural Hazard Events Questionnaire.
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.

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

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 6
General Flood Events Reported in Cumberland County
2002 - 2021

Date(s)	Start Time	Water Body	Location(s)	Impacts[1]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
				Home	Business	Infra-structure					
5/7/2002	9:00 AM	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1416)*** Numerous county roads experienced flooding into the afternoon hours.
5/12/2002	1:00 PM	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1416)*** Illinois Route 121 west of Toledo was closed for a time due to flooding and Illinois Route 130 between Greenup and Charleston was closed as well
06/06/2008 thru 06/18/2008	11:45 PM	area rivers, streams, & creeks	countywide			X	n/a	n/a	$100,000	n/a	***This event was part of a federally-declared disaster (Declaration #1771)*** - Rainfall amounts of 5 to 7 inches between June 4th and the 6th produced extensive flooding in Cumberland County, particularly in rural areas north and east of Greenup - Numerous county roads were under water between June 7th and the 13th.
09/14/2008 thru 09/15/2008	n/a	area rivers, streams, & creeks	northwestern portion of county				n/a	n/a	n/a	n/a	
05/14/2009 thru 05/16/2009	n/a	area rivers, streams, & creeks	countywide				n/a	n/a	n/a	n/a	

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 6
General Flood Events Reported in Cumberland County
2002 - 2021

Date(s)	Start	Water	Location(s)	Impacts[1]			Injuries	Fatalities	Property	Crop	Impacts/
11/25/2010	n/a	area rivers, streams, & creeks	countywide				n/a	n/a	n/a	n/a	
06/26/2011	n/a	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	- Local law enforcement officals reported flooding across roads in Neoga and Toledo. - Some roads were barricaded around Neoga.
07/30/2011	12:30 AM	area rivers, streams, & creeks	western portion of county			X	n/a	n/a	n/a	n/a	- Floodwaters from flash flooding during the late evening of July 29th took several hours to recede from roads in Cumberland County. - Most rural roads and U.S. Highway 45 were finally reopened to traffic around daybreak on July 30th.
04/19/2013 thru 04/20/2013	n/a	area rivers, streams, & creeks	countywide				n/a	n/a	n/a	n/a	
06/01/2013	n/a	area rivers, streams, & creeks	eastern portion of county				n/a	n/a	n/a	n/a	
06/19/2015 thru 06/20/2015	5:30 PM	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	- Several periods of rainfall occurred as a result of the remnants of Tropical Storm Bill. - Numerous creeks in the county flooded out of their banks. - Extensive flooding of rural roads throughout the county was reported.

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 6
General Flood Events Reported in Cumberland County
2002 - 2021

Date(s)	Start	Water	Location(s)	Impacts[1]			Injuries	Fatalities	Property	Crop	Impacts/
09/01/2015	n/a	area rivers, streams, & creeks	southeastern portion of county				n/a	n/a	n/a	n/a	
12/27/2015 thru 12/31/2015	n/a	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	Many county roads were flooded.
04/29/2017 thru 05/04/2017	11:15 PM	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	- Several streets in Neoga and Greenup were impassable. - Numerous rural roads and highways were inundated, particularly along U.S. Highway 40 near the Clark County line. - An additional 0.50 to 1.00 inch of rain occurred on April 30th into May 1st, keeping many roads flooded. - As a result, areal flooding continued until the early morning hours of May 4th.
05/04/2017 thru 05/06/2017	2:45 PM	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	- Heavy rainfall of 2.00 to 3.00 inches during the early morning hours of May 4th resulted in additional flash flooding across most of Cumberland County. - Officials reported that most roads were impassable and numerous creeks rapidly flooded. - Additional rainfall around 1.00 inch later in the day May 4th into May 5th caused creeks and roads to stay flooded for nearly 48 hours. - Flood waters subsided by the afternoon on May 6th.

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 6
General Flood Events Reported in Cumberland County
2002 - 2021

Date(s)	Start	Water	Location(s)	Impacts[1]			Injuries	Fatalities	Property	Crop	Impacts/
04/03/2018	n/a	area rivers, streams, & creeks	northern portion of county				n/a	n/a	n/a	n/a	
02/07/2019	n/a	area rivers, streams, & creeks	countywide				n/a	n/a	n/a	n/a	
05/29/2019 thru 05/30/2019	n/a	area rivers, streams, & creeks	southern portion of county				n/a	n/a	n/a	n/a	
01/11/2020 thru 01/12/2020	6:00 AM	area rivers, streams, & creeks	countywide			X	n/a	n/a	n/a	n/a	- Weather observers measured 3 to 6 inches of rain across Cumberland County...including 4.74 in Neoga. - Numerous creeks and streams flowed out of their banks, flooding low-lying spots across the county.
07/30/2020	n/a	area rivers, streams, & creeks	western portion of county				n/a	n/a	n/a	n/a	
GRAND TOTAL:							**0**	**0**	**$100,000**	**$0**	

Sources: Iowa State University, Iowa Environmental Mesonet, National Weather Service Data, Search for Warnings.
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.

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7 Flash Flood Events Reported in Cumberland County 1996 - 2021										
Date(s)	**Start Time**	**Location(s)**	**Impacts[1]**			**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/ Event Description**
			Home	**Business**	**Infra-structure**					
06/20/1990	n/a	countywide				n/a	n/a	n/a	n/a	
05/08/1996	4:15 AM	countywide			X	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1112)*** Numerous roads were flooded, including US 45 just south of Neoga, which was closed for a time.
06/02/1999	n/a	countywide				n/a	n/a	n/a	n/a	
07/11/2000	n/a	countywide				n/a	n/a	n/a	n/a	
10/04/2000 thru 10/05/2000	9:55 PM	countywide			X	n/a	n/a	$300,000	n/a	- Numerous roads were reported to have either ponding of water on them, or were completely covered in water for a period of time. - North of Greenup, in Union township, a road around a bridge was washed out, causing over $90,000 in damage. - One car had to be pulled out of high water along County Highway 6. - The vehicle was three-quarters submerged, but there were no injuries. - In Sumpter township, the flood water scoured a hole along a culvert and under a roadway, which caved in when a truck passed over it.
02/09/2001	1:30 PM	countywide			X	n/a	n/a	n/a	n/a	- Flash flooding was reported in Toledo, as well as throughout much of the county after 1 to 3 inches of rain fell on frozen ground during the late morning and early afternoon hours. - Portions of State Route 45 were reported underwater in and around the Toledo area.

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

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
Flash Flood Events Reported in Cumberland County
1996 - 2021

Date(s)	Start Time	Location(s)	Impacts[1] Home	Impacts[1] Business	Impacts[1] Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
06/05/2001	3:45 PM	Neoga^			X	n/a	n/a	n/a	n/a	Water was reported over the roadway at the intersection of US Route 45 and Illinois Route 121.
05/07/2002	4:45 AM	countywide			X	n/a	n/a	$152,803	n/a	*Event Description Provided Below*
05/12/2002	8:30 AM	countywide			X	4	n/a			
This event was part of a federally-declared disaster (Declaration #1416) FEMA Public Assistance totals by Jursdiction: - Cottonwood Township Road District: $42,342 - Crooked Creek Road District: $4,020 - Cumberland County Highway Department: $11,145 - Greenup Township Road District: $21,946 - Neoga Township Road District: $4,273 - Spring Point Township Road District: $27,366 - Sumpter Township: $1,170 - Sumpter Township Road District: $23,569 - Union Township Road District: $14,040 - Woodbury Township Road District: $2,932							May 7, 2002: Numerous roads were flooded due to over 2.5 inches of rain in a short amount of time. Illinois Route 130 north of Greenup was flooded in places, as well as, numerous roads in the Sumter Township area. May 12, 2002: Over 4 inches of rain fell on already saturated ground causing flash flooding. Numerous roads were flooded. Four people sustained minor injuries after the car they were in hydroplaned on wet pavement near Toledo. Also, one motorist drove into a flooded section of road a few miles north of Toledo. He tried to back out of the water, but his car was picked up and floated downstream into a farm field. He was rescued and sustained no injuries.			
06/13/2002	n/a	countywide				n/a	n/a	n/a	n/a	
05/10/2003	10:00 AM	countywide			X	n/a	n/a	n/a	n/a	Numerous roads were flooded for a time due to the heavy rain.
07/09/2003 thru 07/10/2003	11:19 PM	countywide			X	n/a	n/a	n/a	n/a	Many streets and roads were flooded.
05/27/2004	n/a	countywide				n/a	n/a	n/a	n/a	
05/30/2004	6:15 PM	countywide			X	n/a	n/a	n/a	n/a	Numerous roads were flooded countywide due to heavy rains, including IL Route 121 near Toledo.

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

1 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event.
A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
Flash Flood Events Reported in Cumberland County
1996 - 2021

Date(s)	Start Time	Location(s)	Impacts[1] Home	Impacts[1] Business	Impacts[1] Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
07/22/2004	n/a	countywide				n/a	n/a	n/a	n/a	
01/13/2005	n/a	countywide				n/a	n/a	n/a	n/a	
04/06/2006	n/a	countywide				n/a	n/a	n/a	n/a	
07/17/2007	n/a	northwestern portion of county				n/a	n/a	n/a	n/a	
02/06/2008	n/a	countywide				n/a	n/a	n/a	n/a	
06/06/2008	7:48 PM	central portion of county			X	n/a	n/a	$40,000	n/a	***This event was part of a federally-declared disaster (Declaration #1771)*** - Multiple roads closed due to high water flowing over them, including IL Route 121 near Greenup. - Two mudslides occurred north of Greenup. - A vehicle was found submerged at the Cumberland County Fairgrounds. - At least 2 bridges and multiple roads suffered damage from the flooding in Greenup.
07/12/2008	5:36 PM	countywide			X	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1771)*** Water was flowing over a large part of U.S. Route 45 south of Neoga.
05/14/2009	1:00 AM	countywide			X	n/a	n/a	n/a	n/a	- Heavy rain of 2.00 to 4.00 inches within two to three hours produced significant flash flooding of most roads across Cumberland County. - Many rural roads were closed to traffic due to high water.

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

1 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7 Flash Flood Events Reported in Cumberland County 1996 - 2021										
Date(s)	**Start Time**	**Location(s)**	**Impacts[1]**			**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/ Event Description**
			Home	**Business**	**Infra-structure**					
08/19/2009 thru 08/20/2009	6:30 PM	countywide			X	n/a	n/a	n/a	n/a	- Heavy rainfall in a short amount of time caused flash flooding across Cumberland County. - Several roads had water flowing across them in Neoga.
06/15/2010	3:30 PM	south-central portion of county			X	n/a	n/a	n/a	n/a	- A narrow band of flash flooding, in south central Cumberland County, occurred during the late afternoon and early evening. - Rainfall rates of about 1.50 per hour for nearly two hours resulted in impassable rural roads south of Interstate 70 and west of Illinois Route 130.
06/24/2010	12:00 AM	countywide			X	n/a	n/a	n/a	n/a	Numerous rural roads were impassable, as were portions of State Highway 121 and 130.
06/27/2010 thru 06/28/2010	n/a	southwestern portion of county				n/a	n/a	n/a	n/a	
04/19/2011 thru 04/20/2011	8:15 PM	northern portion of county			X	n/a	n/a	n/a	n/a	- Several thunderstorms produced heavy rainfall with totals of 2.50 to 4.00 inches in less than four hours in northern Cumberland County. - Numerous roads in Neoga and Toledo, as well as outlying rural areas were flooded.
04/25/2011 thru 04/26/2011	n/a	countywide				n/a	n/a	n/a	n/a	
04/27/2011	n/a	countywide				n/a	n/a	n/a	n/a	

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

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
Flash Flood Events Reported in Cumberland County
1996 - 2021

Date(s)	Start Time	Location(s)	Impacts[1]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
			Home	Business	Infra-structure					
06/18/2011	2:30 AM	southwestern portion of county			X	n/a	n/a	n/a	n/a	- Thunderstorms produced nearly 3.00 to 5.00 of rain in southwest Cumberland County during the early morning hours of June 18th. - Almost all rural roads were impassable due to the high water.
06/25/2011 thru 06/26/2011	10:15 PM	northwestern portion of county			X	n/a	n/a	n/a	n/a	- Thunderstorms during the late evening hours produced 2.00 to 3.00 of rain on extremely saturated ground in northwest Cumberland County. - This resulted in rapid flash flooding of creeks and roads. - U.S. Highway 45 and I-57 had several areas of standing water and streets in Neoga had several inches of flowing water. - In addition, nearly all rural roads were impassable.
07/03/2011	n/a	northern portion of county				n/a	n/a	n/a	n/a	
07/29/2011 thru 07/30/2011	8:00 PM	western portion of county				n/a	n/a	n/a	n/a	- Slow moving thunderstorms produced 3.00 to 7.00 inches of rain in Cumberland County. - Hardest hit was western Cumberland County just south of Neoga. - Many rural roads were severely flooded, and U.S. Highway 45 was closed. - In addition, most streets in Toledo and Greenup were flooded and impassable due to the heavy rain.

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

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
Flash Flood Events Reported in Cumberland County
1996 - 2021

Date(s)	Start Time	Location(s)	Impacts[1]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
			Home	Business	Infra-structure					
04/18/2013 thru 04/19/2013	n/a	countywide				n/a	n/a	n/a	n/a	
05/02/2013	4:45 PM	central portion of county			X	n/a	n/a	n/a	n/a	- A slow moving thunderstorm produced more than 3.00 inches of rain in 90 minutes in a small part of central Cumberland County, between Mattoon and Charleston. - The flash flooding was relatively short lived, but numerous streets in Toledo, as well as rural roads, were inundated and impassable.
06/22/2013 thru 01/00/1900	4:00 PM	northwestern portion of county			X	n/a	n/a	n/a	n/a	- Slow moving thunderstorms produced 2 to 4 inches of rain in a two hour period during the late afternoon in extreme northwest Cumberland County. - Flooding was reported on U.S. Highway 45, on numerous streets in Neoga, and on many rural roads.
10/05/2013	n/a	western portion of county				n/a	n/a	n/a	n/a	
02/20/2014 thru 02/21/2014	n/a	countywide				n/a	n/a	n/a	n/a	

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

1 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
Flash Flood Events Reported in Cumberland County
1996 - 2021

Date(s)	Start Time	Location(s)	Impacts[1] Home	Business	Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
06/19/2015	7:15 AM	countywide			X	n/a	n/a	n/a	n/a	- Several periods of rainfall occurred as a result of the remnants of Tropical Storm Bill. - Rainfall totals ranged from 2.00 to 3.00 on already saturated ground in most of Cumberland County. - Numerous creeks in the county flooded out of their banks. - Extensive flooding of rural roads throughout the county was reported.
06/25/2015 thru 06/26/2015	n/a	southwestern portion of county				n/a	n/a	n/a	n/a	
08/31/2015 thru 09/01/2015	n/a	northeastern portion of county				n/a	n/a	n/a	n/a	
12/26/2015 thru 12/27/2015	n/a	northwestern portion of county				n/a	n/a	n/a	n/a	
07/26/2016	n/a	eastern portion of county				n/a	n/a	n/a	n/a	

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

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
Flash Flood Events Reported in Cumberland County
1996 - 2021

Date(s)	Start Time	Location(s)	Impacts[1]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
			Home	Business	Infra-structure					
04/29/2017 thru 04/30/2017	6:30 PM	countywide			X	n/a	n/a	n/a	n/a	- Rain amounts of 4.00 to 5.00 inches in about a two hour period during the evening hours, on already saturated ground, resulted in flash flooding across Cumberland County. - Several streets in Neoga and Greenup were impassable. - Numerous rural roads and highways were inundated, particularly along U.S. Highway 40 near the Clark County line.
05/04/2017	7:30 AM	countywide			X	n/a	n/a	n/a	n/a	- Heavy rainfall of 2.00 to 3.00 inches during the early morning hours of May 4th, on already saturated ground, resulted in flash flooding across most of Cumberland County. - Officials reported that most roads were impassable and numerous creeks rapidly flooded.
04/03/2018	n/a	countywide				n/a	n/a	n/a	n/a	
06/12/2018	4:00 AM	western portion of county			X	n/a	n/a	n/a	n/a	- Heavy rain resulted in flash flooding across western Cumberland County. - Rainfall amounts 3.00 to 4.00 inches on already saturated ground, during the pre-dawn hours of June 12th, resulted in the flooding of creeks, streams and roads from Neoga to Jewett. - Parts of U.S. Highway 45 in the vicinity of Neoga were under water.
05/23/2019	n/a	western portion of county				n/a	n/a	n/a	n/a	

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

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
Flash Flood Events Reported in Cumberland County
1996 - 2021

Date(s)	Start Time	Location(s)	Impacts[1]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
			Home	Business	Infra-structure					
05/29/2019	5:45 PM	southern portion of county			X	n/a	n/a	n/a	n/a	- Slow moving thunderstorms produced 3.00 to 4.00 inches of rain in about three hours during the late afternoon and early evening of May 29th. - This resulted in rapid flash flooding of nearly all rural roads in extreme southern Cumberland County. - The most extensive flooding extended from Greenup toward Jewett and just north of Montrose.
08/12/2019 thru 08/13/2019	n/a	northern portion of county				n/a	n/a	n/a	n/a	
08/26/2021	n/a	northwestern portion of county				n/a	n/a	n/a	n/a	
GRAND TOTAL:						**4**	**0**	**$492,803**	**$0**	

Sources: Illinois Emergency Management Agency.
Iowa State University, Iowa Environmental Mesonet, National Weather Service Data, Search for Warnings.
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.

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

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 8
Regional Extreme Cold Events Extrapolated for Cumberland County
1995 - 2021

Date(s)	Start Time	Magnitude - Temperature °F			Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
		Low (Min)	High (Max)	Wind Chill (Max)					
02/01/1996 thru 02/04/1996	n/a	-18 °F	15 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/11/1997 thru 01/13/1997	n/a	-8 °F	7 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/17/1997 thru 01/18/1997	n/a	-8 °F	12 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/28/1997	n/a	-6 °F	18 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/05/1999	n/a	-17 °F	20 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/09/1999	n/a	-8 °F	18 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
12/22/2000	n/a	-2 °F	9 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/23/2003 thru 01/24/2003	n/a	-4 °F	16 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/30/2004 thru 01/31/2004	n/a	-12 °F	18 °F	n/a	Charleston Windsor	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 8
Regional Extreme Cold Events Extrapolated for Cumberland County
1995 - 2021

Date(s)	Start Time	Magnitude - Temperature °F			Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
		Low (Min)	High (Max)	Wind Chill (Max)					
02/05/2007	n/a	-5 °F	12 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
02/15/2007	n/a	-2 °F	16 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/20/2008	n/a	0 °F	16 °F	n/a	Windsor	n/a	n/a	n/a	
01/15/2009 thru 01/16/2009	n/a	-10 °F	17 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/06/2014 thru 01/07/2014	n/a	-13 °F	12 °F	-45 °F	Charleston Windsor	n/a	n/a	n/a	
01/22/2014	n/a	0 °F	10 °F	n/a	Windsor	n/a	n/a	n/a	
01/27/2014 thru 01/28/2014	n/a	-3 °F	13 °F	n/a	Windsor	n/a	n/a	n/a	
02/07/2014 thru 02/08/2014	n/a	-8 °F	13 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
02/11/2014 thru 02/12/2014	n/a	-12 °F	15 °F	n/a	Charleston Windsor	n/a	n/a	n/a	
01/07/2015 thru 01/08/2015	n/a	-4 °F	10 °F	n/a	Casey Windsor	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 8 Regional Extreme Cold Events Extrapolated for Cumberland County 1995 - 2021									
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/Event Description**
		Low (Min)	**High (Max)**	**Wind Chill (Max)**					
02/18/2015 thru 02/19/2015	n/a	-7 °F	17 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	
02/24/2015	n/a	-11 °F	15 °F	n/a	Casey Windsor	n/a	n/a	n/a	
01/17/2016 thru 01/18/2016	n/a	0 °F	15 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	
12/27/2017 thru 12/28/2017	n/a	-2 °F	12 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	
12/31/2017 thru 01/02/2018	n/a	-11 °F	12 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	
01/05/2018 thru 01/06/2018	n/a	-6 °F	16 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	
01/15/2018 thru 01/16/2018	n/a	-14 °F	10 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	
01/30/2019	n/a	-12 °F	9 °F	n/a	Casey Charleston	n/a	n/a	n/a	
03/04/2019	n/a	-1 °F	13 °F	n/a	Charleston Windsor	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 8
Regional Extreme Cold Events Extrapolated for Cumberland County
1995 - 2021

Date(s)	Start Time	Magnitude - Temperature °F Low (Min)	High (Max)	Wind Chill (Max)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
02/14/2021 thru 02/15/2021	n/a	-8 °F	15 °F	n/a	Casey Charleston Windsor	n/a	n/a	n/a	
GRAND TOTAL:						**0**	**0**	**$ -**	

Sources: Iowa State University, Iowa Environmental Mesonet, National Weather Service Data, Search for Warnings.
Midwestern Regional Climate Center, cli-MATE.
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.

[1] Observed Location information, if available, was obtained from 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's cli-MATE data system.

Table 9 Tornadoes Reported in Cumberland County 1950 - 2021											
Map No.	**Date(s)**	**Start Time**	**Location(s)**	**Magnitude Fujita Scale**	**Length (Miles)[1]**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
1	02/09/1960	10:25 PM	Greenup	F 1	1.0 mi.	27 yd.	n/a	n/a	$2,500	n/a	Tornado caused damage to at least 3 homes on the south and east side of the Village
2	03/06/1961	3:11 AM	Jewett^ Greenup^	F 1	17.8 mi.	77 yd.	n/a	n/a	$2,500	n/a	_Touchdown/Liftoff – Multiple Counties_ Touched down at Jerseyville in Jersey County and traveled east-northeast through Macoupin, Montgomery, Fayette, Effingham and Shelby counties before lifting off southeast of Greenup in Cumberland County – total length: 117.9 miles A truck was overturned near Greenup
3	06/13/1963	5:15 PM	Jewett^	F 1	0.3 mi.	200 yd.	n/a	n/a	$2,500	n/a	A small tornado touched down briefly and destroyed farm buildings about a quarter of a mile southeast of Jewett

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 9
Tornadoes Reported in Cumberland County
1950 - 2021

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
4	08/21/1977	12:20 PM	Lake Mattoon Toledo^ Greenup^	F 3	15.7 mi.	77 yd.	56	6	$2,500,000	n/a	*Event Description Provided Below*
Touchdown/Liftoff – Two Counties Touched down west-southwest of Windsor in Shelby County and traveled southeast lifting off west-northwest of Greenup in Cumberland County – total length: 26.9 miles - At Lake Mattoon, the tornado struck the Erwin subdivision and the Prahl Trailer Court on the Cumberland County side where 6 people were killed and 56 people were injured - Between 45 and 50 mobile homes were destroyed or severely damaged and around 6 houses were damaged - 4 of the houses were severely damaged, most of them because mobile homes were blown onto them - Nearly all of the fatalities and injuries were to indivuals occupying mobile homes											
5	04/12/1984	6:12 PM	Toledo Toledo^	F 1	3.0 mi.	10 yd.	2	n/a	$250,000	n/a	*Event Description Provided Below*
- The tornado first touched down in the Massey subdivision on the south edge of the Village - It damaged two blocks of homes, injuring 2 people - The tornado then skipped over an open field and damaged 3 more homes - It ripped roofs, blew walls apart, and blew down power lines - A 2x6 foot board was rammed through a wall of one house - Several outbuildings were destroyed											
6	10/17/1996	5:40 PM	Neoga^	F 0	2.5 mi.	50 yd.	1	n/a	n/a	n/a	*Event Description Provided Below*
- A tornado touched down 1 mile north northeast of Neoga, just east of Rt. 45 - At this point the tornado blew over a 35 foot travel trailer slightly injuring one person - It then continued to the east crossing over Interstate 57 causing damage to a used car lot and a truck stop - It then moved east of town causing minor damage to 5 homes (mainly roof damage), as well as, blowing over numerous TV antennas, power poles, tool sheds, and trees in the area - Also, a grain bin was blown over - The tornado lifted and dissipated 3 miles east northeast of Neoga											

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 9
Tornadoes Reported in Cumberland County
1950 - 2021

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
7	04/08/1999	10:32 PM	Janesville^	F 0	0.1 mi.	33 yd.	n/a	n/a	n/a	n/a	*Event Description Provided Below*
<u>Touchdown/Liftoff – Two Counties</u> Touched down southwest of Janesville in Cumberland County and travelled northeast lifting off on the northeast side of Janesville in Coles County – total length: 0.3 miles - A tornado touched down on the southwest side of Janesville (Cumberland County side of town) - It hopped and skipped along a northeast path through town causing scattered damage - Three homes sustained moderate damage and an above ground pool was destroyed - A front porch on one of the homes was destroyed - Several trees were blown down as well - the tornado lifted on the northeast side of town (in Coles County)											
8	05/01/2002	3:30 PM	Lillyville^ Montrose^	F 1	1.0 mi.	100 yd.	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1416)*** - A tornado touched down 1 mile southwest of Lillyville - It destroyed a large barn, killing 3 horses and 4 pigs - As the tornado moved east southeast it took half of a barn roof off, throwing the debris one mile away - It damaged several grain silos and took the roof off of another barn before lifting and dissipating

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 9
Tornadoes Reported in Cumberland County
1950 - 2021

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
9	05/01/2002	3:30 PM	Lillyville^	F 0	0.3 mi.	50 yd.	n/a	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1416)*** - A tornado blew down several trees and caused shingle damage to a church - It also destroyed a 140 foot by 100 foot machine shed, throwing the debris up to a mile away - Many of the 2 by 6 beams from the roof were driven into the ground - One beam was driven 4 feet into the ground and had to be removed by a winch
10	06/11/2002	4:40 PM	Neoga^	F 0	2.0 mi.	50 yd.	n/a	n/a	n/a	n/a	- A tornado blew down several trees and caused shingle damage to a church - It also destroyed a 140 foot by 100 foot machine shed, throwing the debris up to a mile away - Many of the 2 by 6 beams from the roof were driven into the ground - One beam was driven 4 feet into the ground and had to be removed by a winch

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 9
Tornadoes Reported in Cumberland County
1950 - 2021

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
11	05/10/2003	8:45 AM	Neoga^	F 0	0.1 mi.	10 yd.	n/a	n/a	n/a	n/a	A tornado briefly touched down in a field but no damage or injuries were reported
12	04/02/2006	5:42 PM	Neoga	F 0	0.8 mi.	100 yd.	n/a	n/a	n/a	n/a	The tornado briefly touched down damaging the roof of a school and blowing down several large trees
13	05/27/2018	3:30 PM	Neoga^	EF 0	0.8 mi.	25 yd.	n/a	n/a	n/a	n/a	A weak landspout developed in an open field but no damage was observed
14	09/01/2019	1:31 PM	Lillyville^	EF 0	0.3 mi.	20 yd.	n/a	n/a	n/a	n/a	A landspout tornado touched down in an open field and knocked over corn in the field
15	07/29/2021	4:40 PM	Greenup^	EF 0	0.5 mi.	50 yd.	n/a	n/a	n/a	n/a	Minor crop damage was reported
GRAND TOTAL:							**59**	**6**	**$2,757,500**	**$0**	

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.
NOAA, National Weather Service, Weather Forecast Office Lincoln, Illinois, Tornado Climatology for Central and Southeast Illinois, Cumberland County.
NOAA, National Weather Service, Storm Prediction Center, SVRGIS, Tornadoes (1950-2021) Database.

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10 Drought Events Reported in Cumberland County 1980 - 2021												
Year(s)	**Start Month**	**Duration (Months)**	**Magnitude Drought Intensity Category[1]**					**Percent Crop Yield Reduction from Previous Year**		**Designated USDA Primary Natural Disaster Area**	**Crop Damages**	**Impacts/Event Description**
			D0	**D1**	**D2**	**D3**	**D4**	**Corn**	**Soybeans**			
1983	June	n/a						48.8 %	36.1 %	n/a	n/a	All 102 counties in Illinois were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June
1988	June	16						36.2 %	23.5 %	n/a	n/a	Approximately half of all Illinois counties were impacted by drought conditions
2005	May	7	X	X				21.4 %	10.0 %	Yes	$23,700,000	Total damage to corn crop was estimated at $23.7 million
2007	August	4	X	X				---	8.0 %	No	n/a	
2011	August	3	X	X	X			---	8.6 %	Yes	n/a	
2012	May	9	X	X	X	X		76.7 %	5.0 %	Yes	n/a	
GRAND TOTAL:											**$23,700,000**	

Sources: Illinois State Water Survey, Illinois State Climatologist.
National Drought Mitigation Center, United States Drought Monitor.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
United States Department of Agriculture, National Agricultural Statistics Service, Quik Stats Lite.

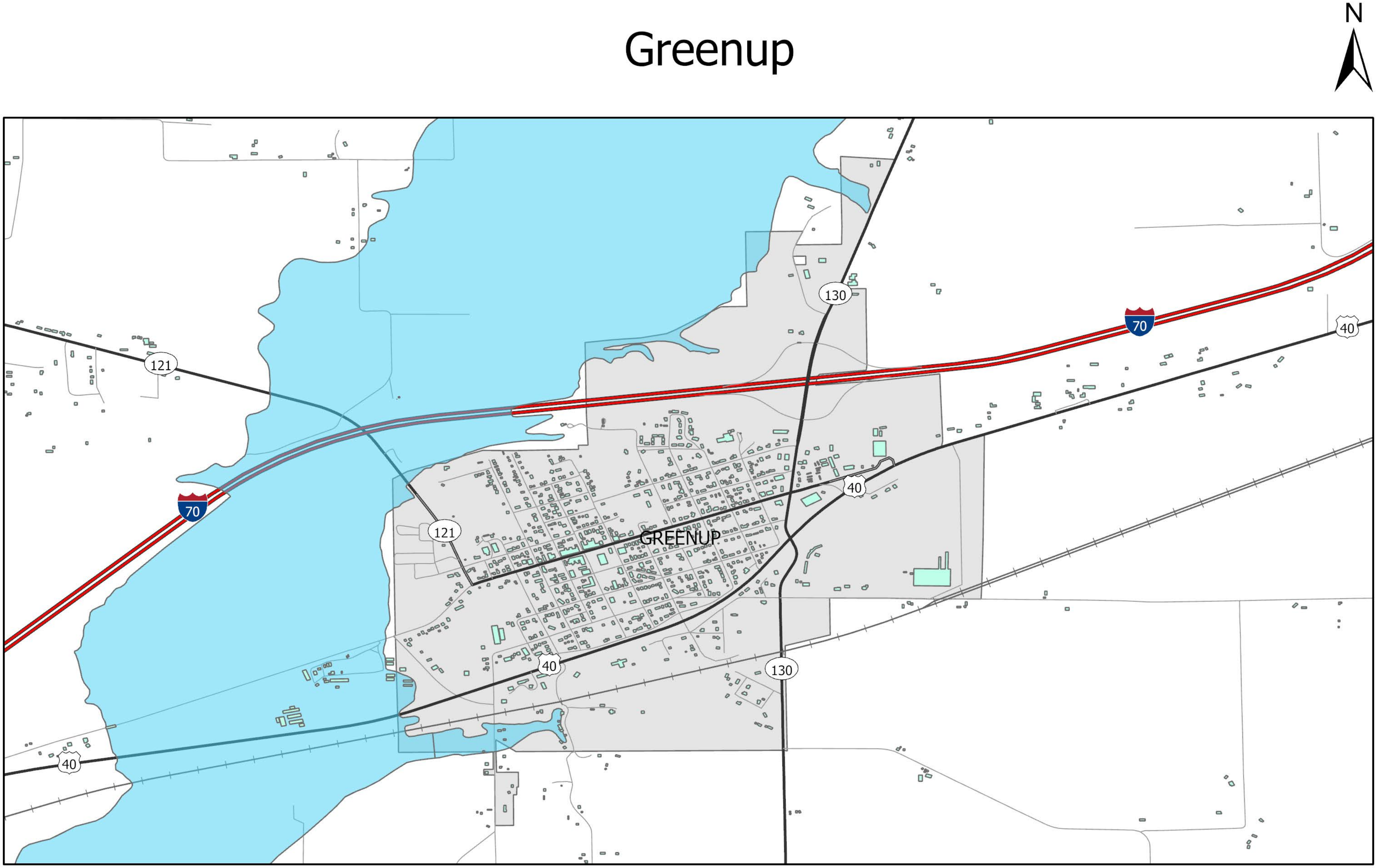
[1] An "X" identifies the level of drought intensity reached by at least a portion of the County during the event, if available.

US Drought Monitor – Drought Intensity Category Descriptions

D0	abnormally dry	D3	extreme drought
D1	moderate drought	D4	exceptional drought
D2	severe drought		

APPENDIX J

Greenup



100 Year Floodplain

Municipal Boundaries

Building Footprints

Interstates

US/State Routes

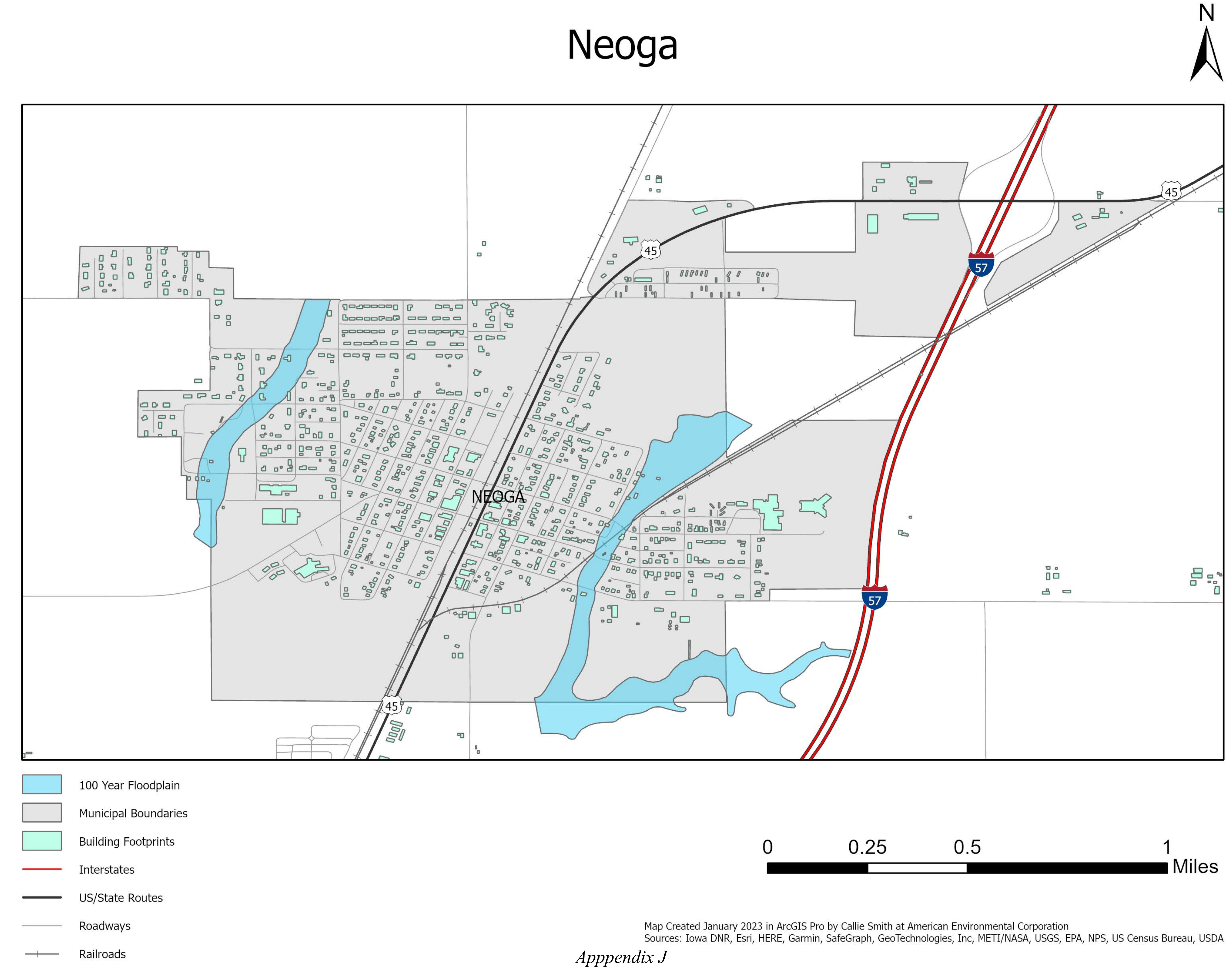
Roadways

Railroads

0 0.25 0.5 1 Miles

Map Created January 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

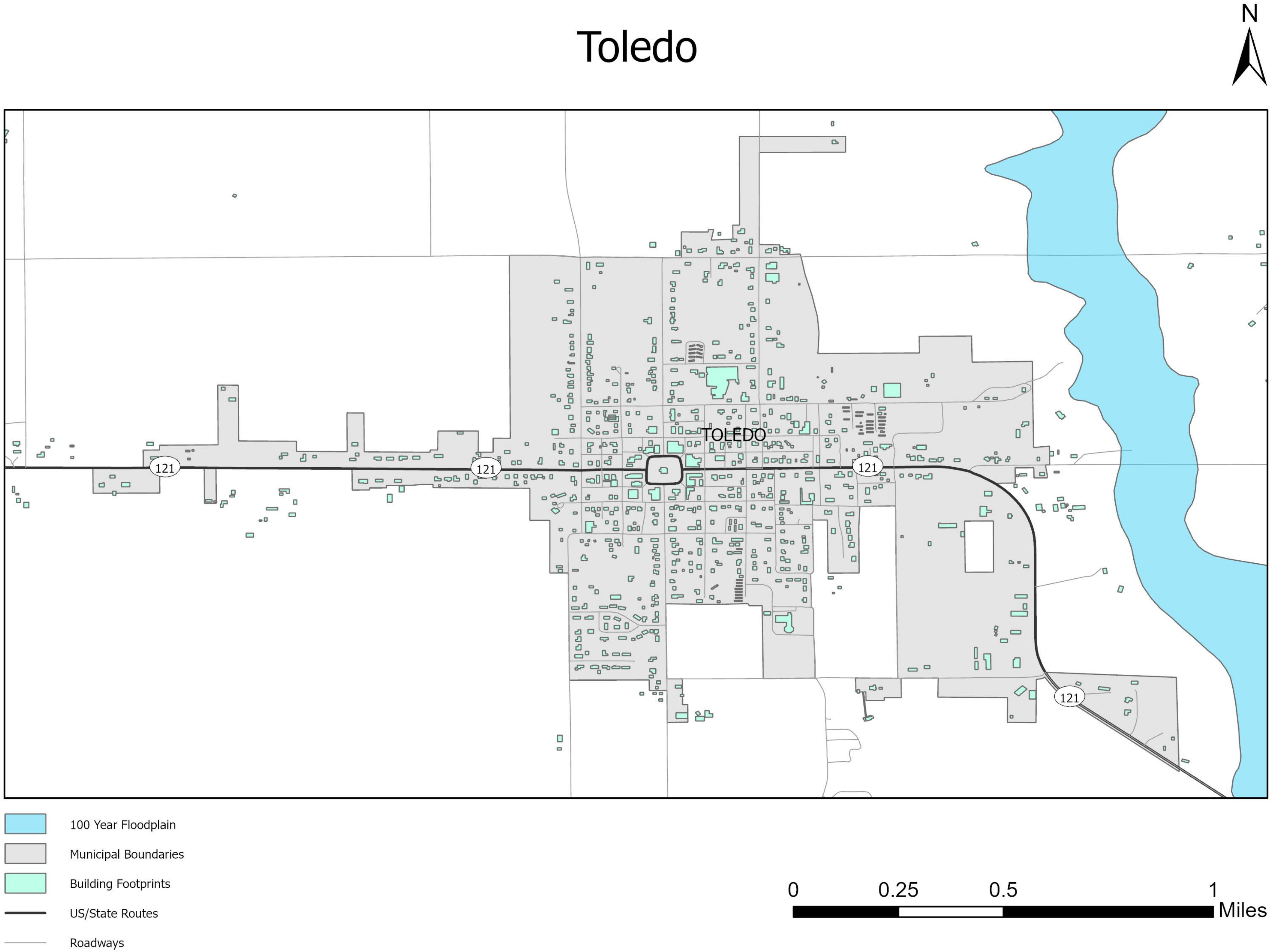
Neoga



Map Created January 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

Apppendix J

Toledo



Map Created February 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

Apppendix J

APPENDIX K

Table 5-6: Cumberland County's Multi-Jurisdictional Mitigation Strategies

Code	Mitigation Strategy	Details	Jurisdictions Involved	Funding Source*	Responsible Organization or Agency
ALL HAZARDS					
AH-1	Harden and Retrofit Critical Facilities	Better protect county buildings and critical facilities from wind and earthquake damages	All Jurisdictions	F, S, L	TBD
AH-2	Install Back-up Generators	Install generators on existing and new critical facilities	All Jurisdictions	F, S, L	TBD
AH-3	Relocate Existing Utility Lines	Move above ground utilities underground	County, Greenup	F, S, L, or P	TBD
AH-4	Public Awareness & Education	Educate the public on safety procedures and potential dangers	All Jurisdictions	L	County EMA
AH-5	Maintain Comprehensive Plan	Maintain and update the 2014 Cumberland County comprehensive plan	County	F, L	TBD
AH-6	Build Heating/Cooling Shelters	Provide safety during power outages	All Jurisdictions	F, S, L	TBD
AH-7	Develop Mutual Aid Agreements	Lend assistance across jurisdiction boundaries	County, Greenup, Jewett	L	TBD
AH-8	Develop Vulnerable Population List	Plan a better response to vulnerable residents	All Jurisdictions	L	TBD
AH-9	Disaster Plans and Kits	Develop school and family disaster plans and kits	All Jurisdictions	L	TBD
AH-10	First Responder Training	Train community to be first responder during emergency	County, Greenup, Neoga	L	TBD
AH-11	Alternate EOC	Have an alternate EOC in place in case primary one is damaged and cannot be used	County, Jewett	L	County EMA
AH-12	Distribute Weather Radios	Distribute weather radios to those in high risk areas	County, Jewett	F, L	TBD
AH-13	Active Tree Management	Remove and Trim trees that cause potential harm to utilities and structures	County, Greenup, Toledo, Jewett	L, P	TBD
AH-14	Publicize Safe Rooms and Shelters	Notify public of safe room and shelter locations	All Jurisdictions	L	TBD
AH-15	Enhanced Communication Systems	Work to enhance 911, Emergency Alert, and Radio/Broadcast systems	All Jurisdictions	F, S, L	County EMA
AH-16	Local Emergency Planning Committee	Have regular meetings to discuss emergency planning throughout the county	County, Greenup, Jewett, Neoga, Toledo	L	TBD
AH-17	Education Materials	Develop web-based and paper materials to educate public	All Jurisdictions	L	TBD
AH-18	Procure Back-up Water Supply	Have back-up water supply in case of emergency	Greenup	L	TBD
AH-19	Install/Repair Emergency Sirens	Repair and install emergency sirens where needed	County, Greenup, Jewett, Neoga, Toledo	F, S, L	County EMA
TORNADO / SEVERE THUNDERSTROMS					
TS-1	Anchoring Manufactured Housing	Lessens impacts of high winds on structures	County, Jewett, Toledo	F, S, L	TBD
TS-2	Improve Ordinances	Improve to exceed minimum standards	County, Greenup	F, S, L	TBD
TS-3	Install Saferoom	Require saferooms installed in new public buildings	All Jurisdictions	F, S, L	TBD
FLOODING					
FL-1	Dam/Levee Failure Plan	Have a plan in place in case of dam/levee failure	County, Jewett	L	TBD
FL-2	Culvert Replacement	Replace damaged culverts to direct flood water	County, Jewett, Neoga, Toledo	F, S, L	TBD

Code	Mitigation Strategy	Details	Jurisdictions Involved	Funding Source*	Responsible Organization or Agency
FL-3	Elevate Roads	Elevate roads above the base flood elevation	County, Jewett	F, S, L	TBD
FL-4	Install Pumping Stations	Have pumping stations to remove water faster	County	F, S, L	County
FL-5	Clear Drainage Ditches	Keep drainage ditches clear to move water more efficiently	Neoga	L	Neoga
FL-6	Participate in NFIP	Actively maintain NFIP status; Join NFIP (Jewett)	County, Greenup, Jewett, Neoga	L	County /City/ Village Board
FL-7	Update Floodplain Ordinances	Update and improve floodplain ordinances to exceed Federal standards	County, Greenup, Jewett	L	County / Village Board
FL-8	Property Acquisition	Buyout properties in the floodplain	County	F, S	County EMA
FL-9	Watershed/Floodplain Structure Analysis	ID Floodplain structures and complete a watershed analysis. Included in comprehensive plan.	County, Jewett	F, S, L	County EMA
		WINTER STORMS			
WS-1	Install Snow Fence	Minimize the amount of infrastructure exposed	County	L	Highway Dept.
		HAZARDOUS MATERIALS RELEASE			
H-1	Develop/Update Emergency Plan	Have a plan in place in case of hazmat release	County, Greenup, Jewett, Neoga, Toledo	L	County EMA
H-2	Develop Alternative Traffic Routes	Have alternate routes in case of hazmat release	County, Greenup, Jewett, Neoga, Toledo	L	County EMA
H-3	Hazmat Removal and Disposal Procedure	Create or update a procedure for removal and disposal of a hazmat release	County, Greenup, Jewett, Toledo	L	County EMA
H-4	Hazmat Commodity Flow Study	Create or update a list of all hazardous materials transported through the county/city and routes taken	County, Greenup, Jewett	F, S, L	County EMA
		DROUGHT / EXTREME HEAT			
DH-1	Burn Ordinance	Update and improve burning ordinance	County, Jewett, Toledo	L	County / Village Board
DH-2	Audit Water Loss/Reuse	Audit water usage to reduce unnecessary water waste in case of drought	County, Greenup, Jewett	L	TBD
		FIRE			
F-1	Maintain Right of Way Access	Keep roads open for public evacuations and to get emergency equipment into area	County, Greenup, Jewett, Neoga, Toledo	L	TBD
F-2	Establish Fire/Landslide/Erosion Vegetation Management Techniques	Develop management techniques for removing vegetation that will not cause risk of erosion and landslide	Greenup	L	TBD
F-3	Burn Ordinance	Update and improve fire/burning ordinance	County, Jewett, Toledo	L	County / Village Board
F-4	Ensure a reliable water source	Retrofit water supply systems or have active maintenance	County, Greenup, Jewett, Neoga, Toledo	F, S, L	TBD

* F – Federal, S – State, L – Local, P – Private

APPENDIX L

Plan Maintenance Checklist

We are in the process of conducting our annual evaluation/status update of the Watseka Multi-Jurisdictional Natural Hazard Mitigation Plan. Please review the following tasks and complete and return this checklist along with the necessary forms. If you have any questions, please let us know.

Jurisdiction: ______________________________

Prepared By: ______________________________

Title: ______________________ Date: ______________

TASK 1: DAMAGE INFORMATION

Has your jurisdiction sustained any natural hazard-related damages to critical facilities and infrastructure within the last year?

☐ Yes ☐ No ☐ Don't Know

If Yes, please complete and return the attached critical facilities damages questionnaire.

TASK 2: STATUS OF EXISTING PROJECTS/ACTIVITIES

Please look over the attached Mitigation Action Tables for your jurisdiction and determine whether any of the mitigation projects/activities listed have been completed or are in progress (in the planning stages.)

Does your jurisdiction have any mitigation projects/activities in progress (in the planning stages) or completed?

☐ Yes ☐ No

If Yes, please fill out and return the attached Mitigation Action Progress Report for each project/activity that has been completed or is in progress.

TASK 3: IDENTIFICATION OF NEW PROJECTS/ACTIVITIES

Are there any new mitigation projects/activities your jurisdiction would like to see add to the Plan? (Remember, only projects included in the Plan are potentially eligible for federal mitigation projects funding.)

☐ Yes ☐ No

If yes, please complete and return the attached New Mitigation Project Form.

Plan Maintenance Checklist

TASK 4: JURISDICTION EVALUATION

Have there been any significant changes in development in your jurisdiction within the last 12 months (i.e. expansion of existing businesses, siting of new businesses, new subdivision development or expansion of existing subdivisions, demolition of businesses/residents to create green spaces, etc.)

☐ Yes ☐ No

If yes, please specify the type of development changes.

____

____

Has your jurisdiction adopted any new policies, plans, regulations, or reports that could be incorporated into this Plan?

☐ Yes ☐ No

If yes, please provide the name of the policy, plan, regulation or report and its purpose.

____

____

Do any new critical facilities or infrastructure need to be added to your jurisdiction's Critical Facilities Survey?

☐ Yes ☐ No

If yes, please provide the name and address of the facility.

____

____

Critical Facilities Damage Questionnaire

Supplemental information about ***damages to critical infrastructure/facilities*** (i.e., government buildings, schools, communication tower and radio equipment, water & sewer treatment facilities, hospitals, etc.) that have ***taken place*** in the municipalities and County is needed for the risk assessment/vulnerability analysis portion of the Plan. If you could take a moment and think about the critical infrastructure damages caused by past natural hazard occurrences and provide any available information in the form below, it would be greatly appreciated.

Please complete <u>one record</u> for <u>each natural hazard event that damaged a critical facility</u>. Do not combine multiple events on one record. Additional forms are located on the back of this page.

Prepared By: ______________________________ Date: ______________

1.) Date of Event (month/day/year if possible)**:** ______________________

2.) Critical Facility Damaged: ______________________________

3.) Type of Hazard:

☐ thunderstorm (straight-line winds)	☐ tornado	☐ landslide
☐ hail	☐ snow storm	☐ sinkhole
☐ lightning strike	☐ ice storm	☐ mine subsidence
☐ heavy rain	☐ extreme cold	☐ earthquake
☐ flood	☐ drought	☐ levee failure
	☐ excessive heat	☐ dam failure

4.) Types of Damages: ______________________________

____

5.) Estimate of Damages: $ ______________________________

Mitigation Action Progress Report

As part of the Plan Maintenance "monitoring" phase, the implementation status of each project and activity listed in the Plan for the participating jurisdictions needs to be identified.

1) Please review the Mitigation Action Tables provided for your jurisdiction to determine whether any of the projects/activities listed have been ***"Completed"*** or are ***"In Progress"*** (in the planning stages.)
2) For each project or activity that is ***"Completed"*** or "***In Progress"***, please fill out the following Progress Report.

Jurisdiction: ______________________________

Prepared By: ______________________________

Title: ____________________ Date: ____________________

Progress Report Period	From Date:	To Date:
Project/Activity Description		
Responsible Agency		
Project Status	☐ In Progress ☐ Approved by Council/Board ☐ Included in Capital Improvement Plan/Slated for Construction & Implementation ☐ Grant Completed & Submitted ☐ Letting/Contractor Selected ☐ Notice to Proceed Issued ☐ Construction Underway ☐ Anticipated Completion Date: ____________ ☐ Other (please specify): ____________ ☐ Completed ☐ Project Delayed ☐ Project Cancelled	

SUMMARY OF PROJECT PROGRESS FOR THIS REPORT PERIOD

What was accomplished during this reporting period for this project?

Were any obstacles, problems or delays encountered?	☐ Yes	☐ No	☐ Don't Know
If Yes, please describe:			

If the project was delayed, is it still relevant?	☐ Yes	☐ No	☐ Don't Know
If Yes, should the project be changed/revised?			

Other comments:

New Hazard Mitigation Projects Form
Multi-Jurisdictional Hazard Mitigation Plan

Participating Jurisdiction ______________________________

Prepared by: ______________________________

Title ______________________________ Date: ______________

	Project Description	Position/Organization Responsible for Implementation & Administration of the Project *(i.e. Mayor / City Council; Public Works Director; Fire Chief / Board of Trustees)*	Time Frame to Complete the Project *(i.e. 1 year; 5 years; 2-5 years)*
1.			
2.			
3.			
4.			

APPENDIX M