City of Watseka Multi-Jurisdictional Natural Hazards Mitigation Plan

Draft

Participants:

Watseka, City of
Iroquois County CUSD #9
Iroquois Memorial Hospital

May 2020

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

Cover photographs are from the February 2018 riverine flood event and were provided courtesy of the Watseka Public Works Department.

CITY OF WATSEKA MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN

WATSEKA, ILLINOIS

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Researched and written for the City of Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee
by Andrea J. Bostwick and Zachary A. Krug
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 the City of Watseka. Since 1990, Iroquois County, including Watseka, has been included in four 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 Iroquois are identified in bold.

Figure I-1
Federal Disaster Declarations: Iroquois County

Declaration #	Year	Natural Hazard(s) Covered by Declaration
1747	2008	***flooding, flash flooding***, severe storms
1416	2002	***flooding***, severe storm, tornado
1025	1994	***flooding, hail***, severe storm
860	1990	***ice storm***

In the last 10 years alone (2010-2019), there have been 38 heavy rain events, 18 severe winter storms, 13 thunderstorms with damaging winds, six extreme cold events, six riverine flood events, five flash flood events, three excessive heat events, and three droughts verified in the City.

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

What is hazard mitigation planning?

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural hazards. This process helps the City 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 a natural hazards mitigation plan.

Why develop a natural hazards mitigation plan?

By developing and adopting a natural hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the plan. These funds can help provide local government entities with the opportunity to complete mitigation projects 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?

A natural hazards mitigation plan is aimed at identifying projects and activities that can be conducted prior to a natural disaster, unlike other emergency plans which provide direction on how to respond to a disaster after it occurs. This is the first time that Watseka has developed a hazard mitigation plan. This plan describes in detail the actions that can be taken to help reduce or eliminate damages caused by specific types of natural hazards.

1.1 PARTICIPATING JURISDICTIONS

Recognizing the benefits of developing a natural hazards mitigation plan, the City of Watseka authorized the development of the Watseka Multi-Jurisdictional Natural Hazards Mitigation Plan (hereto referred to as the Plan). The City then invited local government entities residing within the City to participate. **Figure I-2** identifies the participating jurisdictions represented in the Plan who sought Plan approval.

Figure I-2
Participating Jurisdictions Represented in the Plan

- Iroquois County CUSD #9
- Iroquois Memorial Hospital
- Watseka, City of

1.2 CITY PROFILE

The City of Watseka is located in Iroquois County in east-central Illinois and covers 3.051 square miles. **Figure I-3** provides a location map of the City. The topography of the City is generally flat to gently sloping.

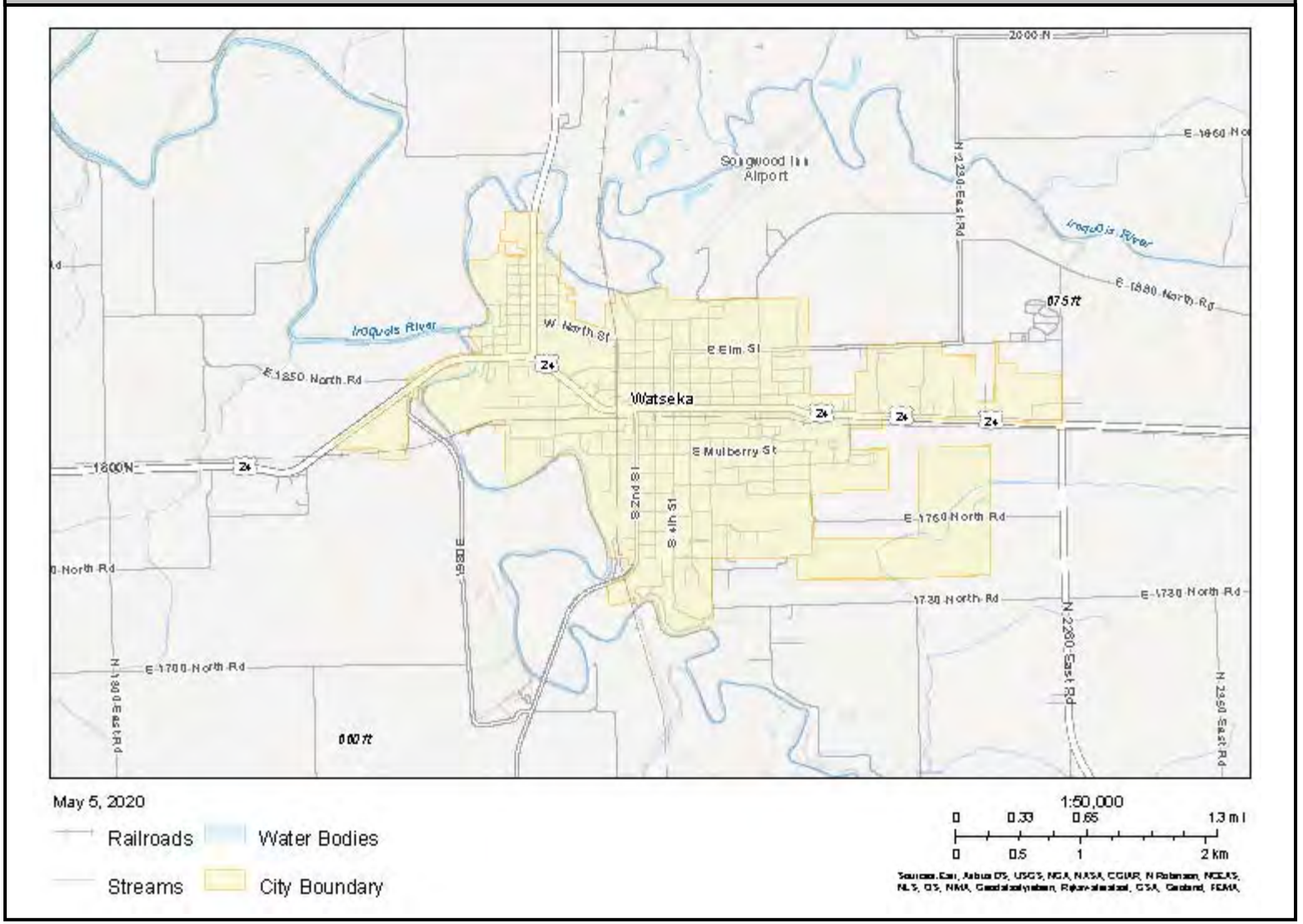
According to the Illinois Department of Commerce and Economic Opportunity, the largest employment industry in Watseka is healthcare. Iroquois Memorial Hospital is a comprehensive regional medical facility that serves 50,000 residents in a five-county, bi-state area and is critical for Watseka's economy. The second largest employment industry is manufacturing followed by accommodation/food services and construction. Big R was founded in Watseka and has been a major local anchor for almost 50 years with not only stores but offices and warehouses located in the City.

According to the 2010 Census, Watseka has a population of 5,255 and 2,537 total housing units. The 2018 total equalized assessed value for properties in Watseka was $62,359,613 according to the Iroquois County Chief County Assessment Officer. Residential structures and associated buildings accounted for 65% ($40,487,916) of the total equalized assessed value.

1.3 LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Watseka is a small, rural community with a population that has decreased by 7.3% between 2010 and 2000 from 5,670 to 5,255. During that same time period, Iroquois County's population declined by 5.2% from 31,224 to 29,718.

Figure I-3
Location Map

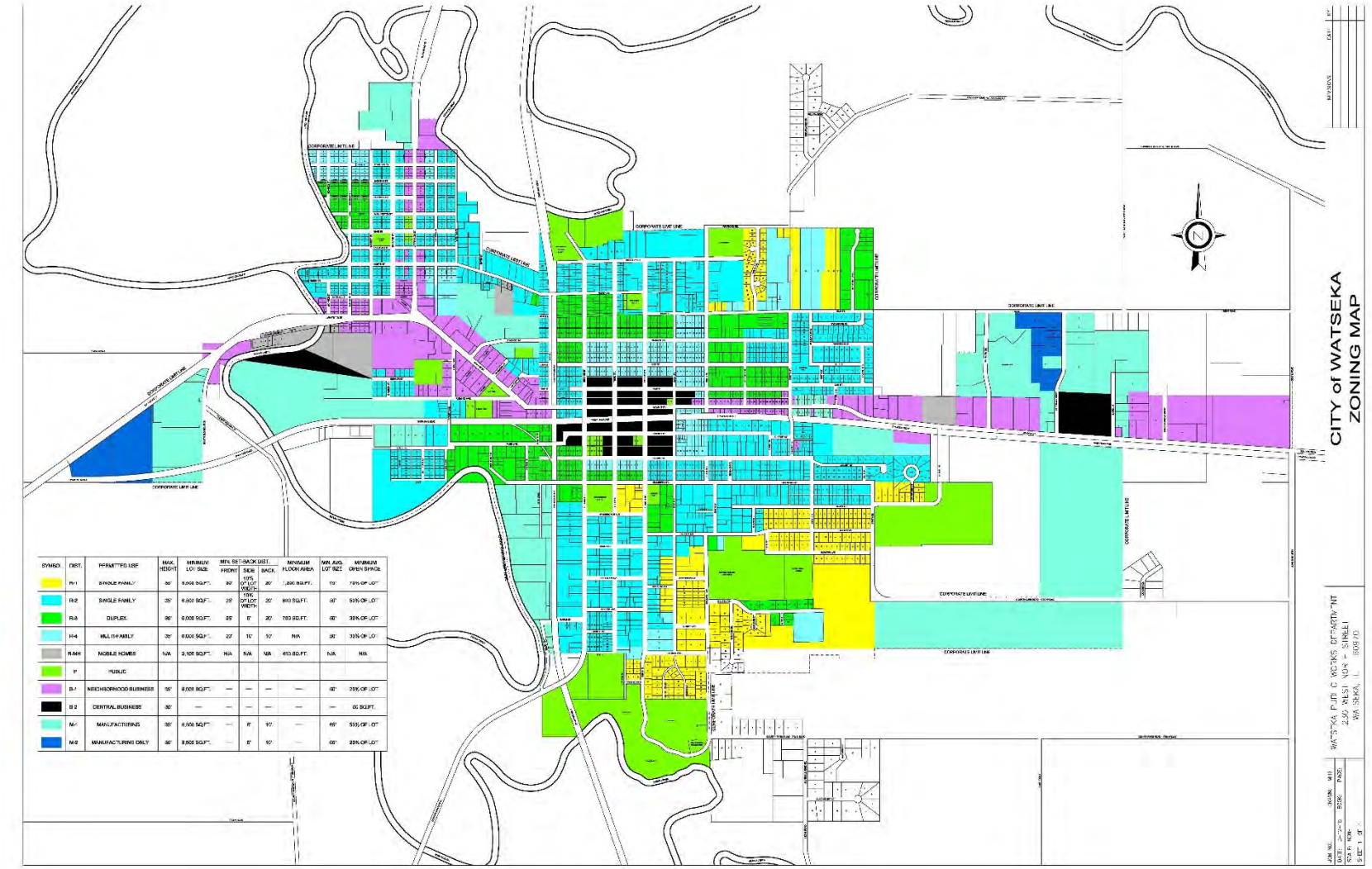


Land use in Watseka is a mix of residential, commercial, and public spaces as illustrated by **Figure I-4**. The west side of the City is where the original settlements occurred, with many of the older neighborhoods now greatly impacted by flooding. The City has already taken steps to direct new growth to the east, away from the flood prone areas.

In terms of development and economic initiatives, approval has been granted to Family Dollar to locate a store in the City. Future initiatives anticipated to begin within the next five years include a hotel, solar farm and affordable housing. The City is currently participating in a floodplain buyout program through the Illinois Department of Natural Resources. Approximately 67 owner-occupied homes are slated for acquisition and demolition. Currently 13 homes have been bought and four have been torn down, with the land returned to green space. There is the potential for future buyout of an additional 40-50 investment properties that will further change the land use in flood-plain areas.

There are no other large-scale economic development initiatives underway in the City. No sizeable increases in residential or industrial developments are expected within the next five years.

Figure I-4
Watseka Zoning Map



2.0 PLANNING PROCESS

The City of Watseka's Multi-Jurisdictional Natural Hazards Mitigation Plan (the Plan) was developed through the Watseka Multi-Jurisdictional Natural Hazards Mitigation Planning Committee (Planning Committee). The Plan was prepared to comply with the Disaster Mitigation Act of 2000 and incorporates the Federal Emergency Management Agency's (FEMA) 10-step planning process approach. **Figure 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 Planning Committee was formed with broad representation and specific expertise to assist the City and the Consultant in developing the Plan.
Task Two: Public Involvement	Early and ongoing public involvement activities were conducted throughout the Plan's development to ensure the public was given every opportunity to participate and provide input.
Task Three: Coordination	Agencies and organizations were contacted to identify plans and activities currently being implemented that impact or might potentially impact hazard mitigation activities.
Task Four: Risk Assessment	The Consultant identified and profiled the natural hazards that have impacted the City and conducted a vulnerability assessment to evaluate the risk to each participating jurisdiction.
Task Five: Goal Setting	After reviewing existing plans and completing the risk assessment, the Consultant assisted the Planning Committee in developing the goals and objectives for the Plan.
Task Six: Mitigation Activities	The participating jurisdictions were asked to identify mitigation actions that had been started and/or completed since the 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 summarized the results of Tasks One through Six. In addition, it described the responsibilities to monitor, evaluate and update the Plan. The draft Plan was reviewed by the participants and a public forum was held to give the public an additional opportunity to provide input. Comments received were incorporated into the draft Plan and submitted to the Illinois Emergency Management Agency (IEMA) and FEMA for review and approval.
Task Eight: Final Plan	Comments received from IEMA and FEMA were incorporated in to the final Plan. The final Plan was then submitted to the City and participating jurisdictions for adoption. The Plan will be reviewed periodically and updated again in five years.

The normal planning process generally takes 12 to 14 months to complete. Due to changes in the funding mechanism, the process was compressed and accelerated to ensure the draft Plan was completed and submitted to IEMA no later than May 31, 2020. To accommodate this schedule, four Planning Committee meetings instead of five were conducted and additional coordination was handled via verbal and written correspondence.

The accelerated schedule was further complicated by the Covid-19 outbreak in the winter/spring of 2020. Executive orders 2020-10, 2020-18 and 2020-32 issued and extended stay-at-home order and prohibited any gatherings of more than 10 people from Saturday March 21 through Sunday, May 31, 2020. As a result, the fourth Planning Committee meeting was not conducted in the traditional manner and was instead handled as a teleconference.

The Plan development was led at the staff level by John Allhands, the City of Watseka's Mayor. American Environmental Corp. (AEC), an environmental consulting firm, with experience in hazard mitigation, risk assessment and public involvement, was employed to guide the City and participating jurisdictions through the planning process.

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

- Attend at least one of the four Planning Committee meetings.
- Identify/submit a list of documents (i.e., plans, studies, reports, maps, etc.) relevant to the natural hazard mitigation planning process.
- 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 development of the mitigation goals.
- Submit a list of 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.
- Formally adopt the Plan.
- Where applicable, incorporate the Plan into existing planning efforts.
- Participate in the Plan maintenance.

2.1 PLANNING COMMITTEE

As previously mentioned, at the start of the planning process, the City of Watseka's Multi-Jurisdictional Natural Mitigation Planning Committee was formed to develop the hazard mitigation plan. The Planning Committee included representatives from each participating jurisdiction and Iroquois County, as well as the business leaders, economic development, emergency services (fire and law enforcement), healthcare, insurance, planning and utilities.

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 Watseka's Mayor, John Allhands.

Figure PP-2
City of Watseka's Planning Committee Member Attendance Record

Representing	Name	Title	10/24/2019	12/19/2019	2/6/2020	5/15/2020
American Environmental Corporation	Bostwick, Andrea	Senior Project Manager	X	X	X	
American Environmental Corporation	Krug, Zachary	Environmental Specialist	X	X	X	
Watseka Area Chamber of Commerce	Burd, Bob	Chamber President		X	X	
D & D NAPA Inc.	Dittrich, Roger	President	X			
Designer Homes / JR Developments, Inc	Muller, Juanita	Owner / Secretary / Treasurer	X	X		
Designer Homes / JR Developments, Inc	Muller, Randy	President / Owner	X	X		
First Trust & Savings Bank	Eilers, JD	Vice President	X	X		
First Trust & Savings Bank	Fredrick, Cody	Lender / Loan Officer	X	X	X	
Ford County EMA	Whitebird, Terry	Coordinator		X		
Iroquois County - Board	Bard, Roger	Board Member, District #4		X		
Iroquois County - Board	Shure, John	Chairman	X	X		
Iroquois County - EMA	Ceci, Eric	Coordinator	X	X	X	
Iroquois County CUSD #9	Bruns, James	Board Member		X		
Iroquois County CUSD #9	Maulding, Rusty	Board Member		X	X	
Iroquois County CUSD #9	McTaggart, Kirk	Board Member	X		X	
Iroquois County's Times Republic	Waters, Carla	Managing Editor		X	X	
Iroquois Farmers State Bank	Hutchinson, John	Executive Vice President	X			
Iroquois Federal	West, Cylis	Loan Officer		X	X	
Iroquois Federal / City of Watseka	Anderson, John	Planning Committee Member / Loan Officer	X		X	
Iroquois Insurance	Pfingsten, Debbie	CSR / Licensed Insurance Producer / Underwriter	X	X	X	
Iroquois Memorial Hospital	Yates, Lori	ES Director, Emergency Management	X		X	
Iroquois Paving Corporation	Horner, Ted	Safety and Regulatory Compliance Manager	X		X	
Iroquois Paving Corporation	Tincher, Dan	Vice President of Operations	X			
Pence Oil Co.	Pence, Terry	President	X			
State Representative Tom Bennett's Office	Bennett, Tom	State Representative	X			
State Representative Tom Bennett's Office	Crawford, Angel	Executive Legislative Assistant	X	X	X	
U.S. Representative Kinzinger's Office	Doggett, Patrick	Deputy District Director	X	X	X	
Watseka Area Chamber of Commerce	Hibbs, Amanda	Executive Director	X	X		
Watseka Public Library	Gilman, Rose	Library Director	X	X	X	
Watseka Volunteer Fire Department	Ketchum, Tim	Fire Chief		X		
Watseka, City of	Allhands, John	Mayor	X	X	X	
Watseka, City of	Bills, Russell	Planning Committee Member	X	X	X	
Watseka, City of	Brandt, Eric	Building Inspector	X	X	X	
Watseka, City of	DeLahr, Marvin	Public Works Director		X	X	
Watseka, City of	Garfield, Mark	Alderman	X			
Watseka, City of	Marks, Greg	Water / Wastewater Supervisor	X	X	X	
Watseka, City of	Mayotte, Dave	Alderman	X			
Watseka, City of	Miller, Don	Alderman	X	X	X	
Watseka, City of	Ulfers, Monna	Alderwoman	X			
Watseka, City of / Geiger Truck Parts	Geiger, Doug	Planning Committee Member / Plant Manager		X	X	

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

Mission Statement

Based on early communications with Planning Committee members, a draft mission statement was developed that described their objectives for the Plan and distributed electronically for review. The Planning Committee then reviewed the mission statement at the first meeting and approved it with no changes.

"The mission of the Watseka Multi-Jurisdictional Natural Hazards Mitigation Planning Committee is to develop a mitigation plan that documents projects and activities to reduce the negative impacts of natural hazards on citizens, infrastructure, private property and critical facilities."

Planning Committee Meetings

The Planning Committee met four times between October 2019 and May 2020. **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.

As mentioned previously, the process was compressed and accelerated to ensure the draft Plan was completed and submitted to IEMA no later than May 31, 2020. To accommodate this schedule, four Planning Committee meetings instead of five were conducted and additional coordination was handled via verbal and written correspondence.

First Planning Committee Meeting – 10/24/2019

At this meeting the planning process was explained to the Planning Committee members, including a brief overview of what a natural hazard mitigation plan is, why it needs to be developed, and the benefits. As part of the plan development, representatives for the City and the participating jurisdictions were asked to complete the forms entitled "List of Existing Planning Documents," "Critical Facilities" and "Identification of Severe Weather Shelters" and return them before the next meeting. Copies of a "Hazard Events Questionnaire," "Damages to Critical Facilities Damage Questionnaire" and "Citizen Questionnaire" were also distributed.

Committee members were asked to identify any natural hazard events that have occurred within the City. A discussion regarding the hazards to be included in the Plan was conducted.

Finally, community participation was discussed. The City and participating jurisdictions were asked to make information available on the planning process at their offices.

Second Planning Committee Meeting – 12/19/2019

At this meeting portions of the draft natural hazard risk assessment section were presented for review.

Following the review of risk assessment, the Planning Committee members participated in an exercise to help calculate the Risk Priority Index which can assist participants in determining hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities. The Planning Committee members discussed vulnerable community assets

and completed the form entitled "Critical Facilities Vulnerability Survey" which will be used in the vulnerability analyses.

Next, mitigation actions were defined and examples were discussed. As part of the plan development, individual mitigation action lists will be created for each participating jurisdiction. Ideas for potential mitigation projects and activities were presented. Representatives for the City and the participating jurisdictions were asked to complete the form entitled "Hazard Mitigation Projects" and return them before the next meeting.

Copies of a draft mission statement and mitigation goals were presented for review. After a discussion, the Planning Committee chose to finalize the mission statement with no revisions while a minor revision was made to Goal #6 to encourage protection of rivers, streams, and floodplains in the City.

Third Planning Committee Meeting – 02/06/2020

The results of the Risk Priority Index exercise conducted at the previous meeting were presented. Flooding scored the highest followed by thunderstorms with damaging winds, heavy rains and severe winter storms.

Next, an explanation of what a mitigation actions prioritization methodology is was provided. A copy of a mitigation actions prioritization methodology was presented for review. The various ways that mitigation actions can be prioritized, and example methodologies were discussed. After a discussion, the Planning Committee chose to finalize the original methodology with minor wording revisions to clarify the terms "Most Significant Hazard" and "Less Significant Hazard". The Planning Committee chose to use a methodology based on hazard frequency and degree of mitigation.

A presentation on how the mitigation projects and activities identified by the participating jurisdictions would be presented in the Plan was provided. Then, the Planning Committee members reviewed the draft jurisdiction-specific mitigation action tables which identified and prioritized the new mitigation projects and activities submitted by the participants. Members were given the opportunity to add additional projects and activities to their tables.

The sections outlining the mitigation strategy and plan maintenance were also reviewed. The participating jurisdictions will meet annually to monitor the status of the mitigation projects and activities, evaluate the effectiveness of the Plan and provide information on the events that have occurred since the committee met previously. The Plan must be reviewed, revised and resubmitted to IEMA and FEMA at least once every five years. The public forum and adoption process were then discussed, and a date for the public forum was set.

Fourth Planning Committee Meeting – 05/15/2020

At this Planning Committee meeting the public was provided the opportunity to participate in a teleconference and given the opportunity to ask questions about the draft Plan which was made available online.

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's development; and
- cultivate ownership of the Plan, thus increasing the likelihood of adoption by the participating jurisdictions.

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

Citizen Questionnaire

A citizen questionnaire was developed to gather facts and gauge public perceptions about natural hazards that affect the City. The questionnaire was distributed to the Planning Committee members who were encouraged to make it to their residents. A copy of the questionnaire is contained in **Appendix C**.

A total of twenty-six (26) 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 flooding was the most frequently encountered natural hazard in Watseka followed by severe summer weather and severe winter weather. However, compiled weather records indicate that severe summer weathers is, in fact, the most frequently occurring natural hazard followed by floods and severe winter weather.
- The most effective means of communication identified by respondents to disseminate information about natural hazards were radio and social media, followed closely by television and the Internet. Information disseminated via newspaper, mail, and fact sheets/brochures, also received strong support among respondents.
- In terms of the most needed mitigation projects and activities, the following four categories received the strongest support:
  - provide flood or drainage protection (95%) – the respondents who selected this category felt that hydraulic studies were the most needed activity followed by retention pond construction;
  - retrofit critical infrastructure (57%);

- floodplain ordinances (52%); and
- maintain roadway passage during snowstorms, etc. (48%).

FAQ Fact Sheet

A "Frequently Asked Questions" fact sheet was created and disseminated to help explain what an natural 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**.

Press Releases

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

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

Due to the Covid-19 outbreak, the final meeting of the Planning Committee which was to be held as an open house public forum on Thursday, April 2, 2020 was cancelled. Executive Orders 2020-10, 2020-18 and 2020-32 issued and extended a stay-at-home order and prohibited any gatherings of more than 10 people from Saturday, March 21 through Sunday, May 31, 2020. Given the May 31 plan submission deadline and the extension of the stay-at-home order, IEMA and FEMA agreed to allow the City to conduct the public forum via teleconference and place the draft Plan for review and comment.

At the public forum teleconference, held on Friday, May 15, a brief summary of the planning process was provided; the Plan's availability was discussed, and individuals were given the opportunity to ask questions or provide comments. Individuals participating in the public forum were provided a two-page handout summarizing the planning process and directed to an online comment survey that could be used to provide feedback on the draft Plan. **Appendices G** and **H** contain copies of these materials.

Public Comment Period

After the public forum, the draft Plan was made available for public review and comment through April 22, 2020 at the City of Watseka's City Office and on the City's website. 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 City. This information included details about 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 City*. Understanding how mitigation actions can reduce risk to life and property helped generate ***thirty-five (35) mitigation projects and activities*** at the local level that had not been previously identified in any other planning process. In addition, Iroquois City CUSD #9 and Iroquois Memorial Hospital chose to participate in the Plan development.

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 developing the Plan.

Business Community

Input was sought from the business community to provide balance and context for discussions on property damages, not only to business, but also to residences. Industry leaders, bankers, and insurance agents, among others, participated in the planning process.

Schools

Iroquois City CUSD #9 was represented on the Planning Committee. Board members worked in considering what types of mitigation projects and activities would be most beneficial for their district.

Healthcare

Input was sought from the healthcare community. Representatives from Iroquois Memorial Hospital participated in the planning process.

Not-For-Profit & Other Organizations

Not-for-profit organizations were represented on the Planning Committee. The Executive Director and President of the Watseka's Chamber of Commerce provided valuable information. In addition, the offices of Illinois State Representative Bennett and U.S. Representative Kinzinger participated in the planning process.

Neighboring Jurisdictions

A letter was sent to EMA/ESDA/OEM coordinators in the neighboring jurisdictions inviting them to participate in the mitigation planning process. The counties contacted included Benton County, IN; Ford County, IL; Iroquois County, IL, Kankakee County, IL; and Newton County, IN. In addition, the Villages of Iroquois, Milford, and Woodland received a notification. **Appendix I** contains a copy of the invitation letter and a memo.

2.4 INCORPORATING EXISTING PLANNING DOCUMENTS

As part of the planning process, the City and each participating jurisdiction was asked to identify and provide existing documents (plans, studies, reports and technical information) relevant to the Plan development. **Figure PP-3** summarizes the availability of existing planning documents by participating jurisdiction. These documents were reviewed and incorporated into the Plan whenever applicable.

Watseka and the participating jurisdictions are fortunate to have the resources and abilities to potentially expand on and improve the existing policies and programs identified in Figure PP-3. This conclusion is based on an examination of their capabilities related to: staff and organization; technical capability; fiscal situation; policies and programs; present legal authority; and political resolve.

Given its size and fiscal situation, the City has worked hard to develop and maintain a wide array of plans, programs and ordinances. Iroquois County CUSD #9 and Iroquois Memorial Hospital also have a wide array of plans and programs in place.

Figure PP-3
Existing Planning Documents by Participating Jurisdiction

Existing Planning Documents	Participating Jurisdiction		
	Watseka	Iroquois County CUSD #9	Iroquois Memorial Hospital
PLANS			
Municipal			
Comprehensive Plan	X		
Emergency Management Plan			
Land Use Plan			
School Districts			
Strategic Plan		X	
Capital Improvement Plan		X	
Crisis Plan		X	
Hospitals			
Strategic Plan			X
Capital Improvement Plan			X
Risk Management Plan			X
Emergency Operations Plan			X
Severe Weather Plan			X
CODES & ORDINANCES			
Municipal			
Building Codes	X		
Drainage Ordinances			
Historic Preservation Ordinance			
Subdivision Ordinance(s)	X		
Zoning Ordinances	X		
MAPS			
Municipal			
Existing Land Use Map	X		
Infrastructure Map			
Zoning Map	X		
School Districts			
District Boundary Map		X	
Floor Plan Map		X	
Hospitals			
Flood Plan Maps			X
Facilities Map			X
OTHER TECHNICAL DOCUMENTS			
Municipal			
Flood Ordinance(s)	X		
Flood Insurance Rate Maps	X		
Repetitive Flood Loss List			
Elevation Certificates for Buildings			

3.0 RISK ASSESSMENT

Overview

Risk assessment is the process of evaluating the vulnerability of people, buildings and infrastructure in order to estimate the potential loss of life, personal injury, economic injury and property damage resulting from natural hazards. This section summarizes the results of the risk assessment conducted on the natural hazards in Watseka. The information contained in this section was gathered by evaluating local, state and federal records from the last 30 to 70 years.

This risk assessment identifies the natural 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 which identifies the impacts to public health and property, evaluates the assets of the participating jurisdictions (i.e., residential buildings, critical facilities and infrastructure) and estimates the potential impacts each natural hazard would have on the health and safety of the residents as well as buildings, critical facilities and infrastructure. Where applicable, the differences in vulnerability between participating jurisdictions are described.

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 City. 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 determine which natural hazards to include in the Plan. Over the course of the first two meetings, the Planning Committee members discussed their experiences with natural hazard events and reviewed information on various hazards. After much discussion, the Committee chose to include the following hazards in this Plan:

- severe storms (thunderstorms, hail, lighting & heavy rain)
- severe winter storms (snow, ice & extreme cold)
- floods
- tornadoes
- excessive heat
- drought
- earthquakes

The Planning Committee chose not to include the following hazards in the Plan: dam failures, levee breaches, sinkholes, land subsidence and landslides. According to the US Army Corps of Engineers there are no dams or levees located within or near the City of Watseka or any of the participating jurisdictions that have the potential cause adverse impacts. A review of Illinois State Geologic Survey mapping indicates there are no karst landscapes in Watseka or Iroquois County and no mining activities have been conducted in the County. The topography of the City is generally flat and discussions with Planning Committee members did not reveal any landslide issues.

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 City. 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 point values ranging from 1 to 4 for each category. The higher the point value, the greater the risk associated with that hazard. **Figure R-1** identifies the factors and 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 removed the high and low values (where feasible), then 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 a RPI score for each hazard. A ranking was then assigned to each hazard based on the RPI score. **Figure R-2** identifies the RPI score and ranking for each studied hazard by participating jurisdiction.

Figure R-2
Risk Priority Index Scores by Hazard by Jurisdiction

Hazard	Participating Jurisdictions					
	Watseka		Iroquois County CUSD 9		Iroquois Memorial Hospital	
	RPI Score	Hazard Ranking	RPI Score	Hazard Ranking	RPI Score	Hazard Ranking
Drought	4.3	10	5.5	10	3.0	11
Earthquakes	4.2	11	3.5	11	4.0	10
Excessive Heat	6.3	8	6.0	8/9	5.0	6/7/8/9
Extreme Cold	6.7	7	6.5	5/6/7	5.0	6/7/8/9
Floods	**9.4**	**1**	**10.0**	**2**	**7.0**	**2/3**
Hail	5.9	9	6.5	5/6/7	5.0	6/7/8/9
Heavy Rain	**7.9**	**3**	**10.5**	**1**	6.0	4/5
Lightning	6.9	6	6.0	8/9	**7.0**	**2/3**
Tornadoes	7.1	5	8.0	4	6.0	4/5
Thunderstorms with Damaging Winds	**8.3**	**2**	6.5	5/6/7	**8.0**	**1**
Severe Winter Storms	7.2	4	**9.0**	**3**	5.0	6/7/8/9

Figure R-1
Risk Priority Index Scoring System

Category	Factors	Point Value
Hazard Frequency	An event is anticipated to occur within the next year. Based on previous history, at least one event is expected to occur in any given year.	4
	An event is likely to occur in the next 1 to 3 years. Based on previous history, an event has at least a 33% chance of occurring in any given year.	3
	An event is possible in the next 3 to 10 years. Based on previous history, an event has a 10% to 33% chance of occurring in any given year.	2
	An event is unlikely to occur within the next 10 years. These events occur infrequently and based on previous history have a less than 10% chance of occurring in any given year.	1
Impacts on Life & Health	Fatalities are expected to occur during the event.	4
	While fatalities are unlikely, injuries, some requiring hospitalization, may occur during the event.	3
	Minor injuries not requiring hospitalization may occur during the event.	2
	Injuries or fatalities are unlikely to occur during the event.	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 multiple infrastructure and critical facilities (i.e., road & school closures, loss of power to drinking water/wastewater treatment facilities, municipal buildings, etc.) is anticipated for an extended period of time (i.e., a day or more).	4
	- Property damage is expected to occur including superficial damage to infrastructure and critical facilities. AND/OR - Loss of access/operations at multiple infrastructure and critical facilities is anticipated for a period of time (i.e., a day or less).	3
	- Some minor property damage is anticipated (i.e., shingles & siding torn off homes, windows broken, etc.) but no 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).	2
	Property damage is likely to be negligible and no loss of access/operations is anticipated at any infrastructure/critical facilities during the event.	1

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-3** 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 "local government entities" for planning purposes, neither Iroquois County Community Unit School District 9 (CUSD) or Iroquois Memorial Hospital (IMH) have an extensive inventory of assets in which to consider when conducting the risk assessment. Iroquois County CUSD's critical facilities (all located within the City) are limited to a district administrative office building, two elementary schools, one junior high school and one high school. IMH's critical facilities and infrastructure within the City include the Hospital, Iroquois Regional Health Center and Iroquois Resident Home.

Since these jurisdictions are located within the City and are a subset of the City's critical facilities and infrastructure, their risk is considered to be the same or similar to the risk experienced by the City 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.) The City is only 3.051 square miles in size and its topography is relatively flat, with only a 10 to 15-foot difference in elevation from the north end west ends to the east end. For those hazards where the risk to Iroquois County CUSD and IMH varies from the risk facing the entire planning area (i.e. the City), a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

Critical Facilities Vulnerability Survey

The participating jurisdictions were also asked to complete a Critical Facilities Vulnerability Survey at the second 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 and identify critical facilities/infrastructure they felt have the greatest vulnerability to natural hazards and the hazard(s) they are most vulnerable to. This information is summarized under the appropriate hazard's vulnerability subsection.

Figure R-3
Critical Facilities & Infrastructure by Jurisdiction

Participating Jurisdiction	Critical Facilities				Critical Infrastructure					
	Government[1]	Emergency Protection[2]	Medical & Healthcare[3]	Schools	Drinking Water	Wastewater Treatment	Bridges	US/State Routes & Interstates	Utility Substations/ Power Plants	Comm. Systems
Watseka	5	5	24	5	6	9	2	5	2	3
Iroquois County CUSD 9	0	0	0	5	0	0	0	0	0	0
Iroquois Memorial Hospital	0	0	3	0	0	0	0	0	0	0

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, etc.
[2] Emergency Protection includes: sheriff's department, police, fire, ambulance, emergency operations centers, and jail/correctional facilities.
[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.

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 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.

Single-cell Thunderstorm

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

Multi-cell Thunderstorm

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

Squall Line

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

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 United States, roughly 10% are classified as severe.

What kinds of damaging winds are produced by a thunderstorm?

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

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

The NWS measures a storm's wind speed in knots or nautical miles. A wind speed of one knot is equal to approximately 1.15 miles per hour. **Figure 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 United States, hail causes more than $1 billion in damages to property and crops annually. Hail has been known to cause injuries, although it rarely causes fatalities or serious injury.

How is the severity of a hail event measured?

The severity or magnitude of a hail event is measured in terms of the size (diameter) of the hailstones. The hail size is estimated by comparing it to known objects. **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.	tea cup
1.00 in.	quarter	4.00 in.	grapefruit
1.50 in.	ping pong ball	4.50 in.	softball

Source: NOAA, National Severe Storm Laboratory.

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

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

The Hailstorm Intensity Scale identifies ten different categories of hail intensity, H0 through H10. **Figure 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.).

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 / tea cup	severe damage to aircraft bodywork
H9	Super Hailstorms	75-100 mm	3.0” – 4.0”	tea cup / grapefruit	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	> 100 mm	> 4.0”	softball	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open

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

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

What is lightning?

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

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

Are alerts issued for severe storms?

Yes. The NWS Weather Forecast Office in Chicago, Illinois is responsible for issuing ***severe thunderstorm watches*** and ***warnings*** for Iroquois County (including Watseka) depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A severe thunderstorm watch is issued when conditions are favorable for the development of thunderstorms in or near the watch area. Individuals should stay alert for the latest weather information and be prepared to take shelter.
- **Warning.** A severe thunderstorm warning is issued when a severe thunderstorm has developed and will be approaching or is occurring. 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, 3 and 4, located in **Appendix J,** summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in Watseka. Severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning and heavy rain. Severe storms are the most frequently occurring natural hazard in Watseka.

Thunderstorms with Damaging Winds

NOAA's Storm Events Databasen was used to document 36 reported occurrences of thunderstorms with damaging winds in Watseka between 1970 and 2019. Of the 36 occurrences, 33 had reported wind speeds of 50 knots or greater. There were three occurrences, however, where the wind speed was not recorded.

The highest wind speed recorded in Watseka occurred on May 23, 2019 when winds reached 72 knots (83 mph) during a thunderstorm event.

Figure SS-4 charts the reported occurrences of thunderstorms with damaging winds in Watseka by month. Of the 36 events, 24 (67%) took place in May, June, and July making this the peak period for thunderstorms with damaging winds in Watseka. Of the 36 events, 10 (28%) occurred during May, making

Severe Storms Fast Facts – Occurrences

Number of recorded Thunderstorms with Damaging Winds (1970 - 2019): ***36***

Number of recorded Severe Hail Events (1963 - 2019): ***3***

Number recorded of Lightning Strike Events (1992 – 2019): ***4***

Number of Heavy Rain Events (1990 – 2019): ***124***

Highest Recorded Wind Speed: ***72knots (May 13, 2019)***

Largest Hail Recorded: ***1.75 inches (May 19, 2005)***

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

Most Likely Time for Thunderstorms with Damaging Winds to Occur: ***mid-afternoon***

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

this the peak month for thunderstorms with damaging winds.

Figure SS-4
Thunderstorms with Damaging Winds by Month
1970 -2019

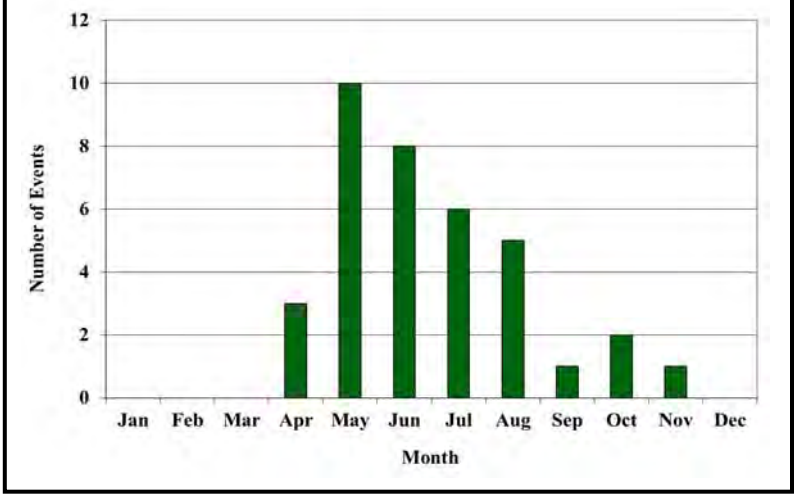
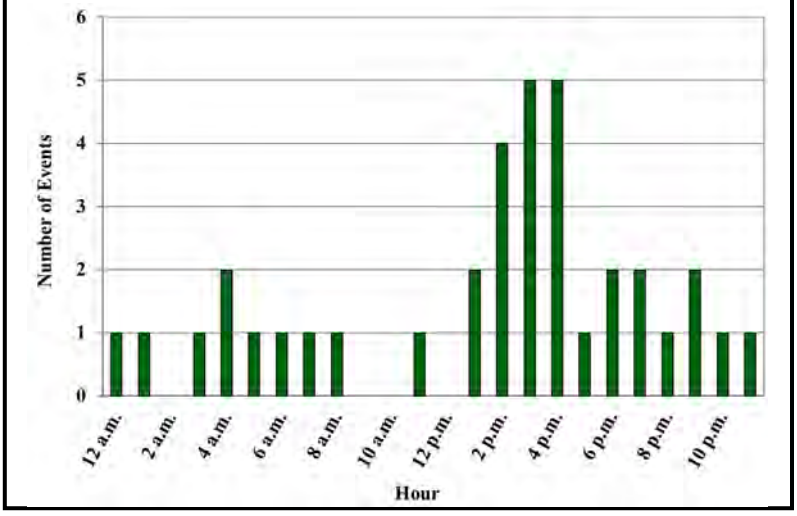


Figure SS-5 charts the reported occurrences of thunderstorms with damaging winds by hour. Of the 36 occurrences, approximately 69% of all thunderstorms with damaging winds occurred during the p.m. hours, with 14 of the events (39%) taking place between 2 p.m. and 5 p.m.

Figure SS-5
Thunderstorms with Damaging Winds by Hour
1970 - 2019



Hail

NOAA's Storm Events Database was used to document three reported occurrences of severe storms with hail one (1) inch in diameter or greater in Watseka between 1963 and 2019. All three occurrences produced hailstones 1.50 inches or larger in diameter.

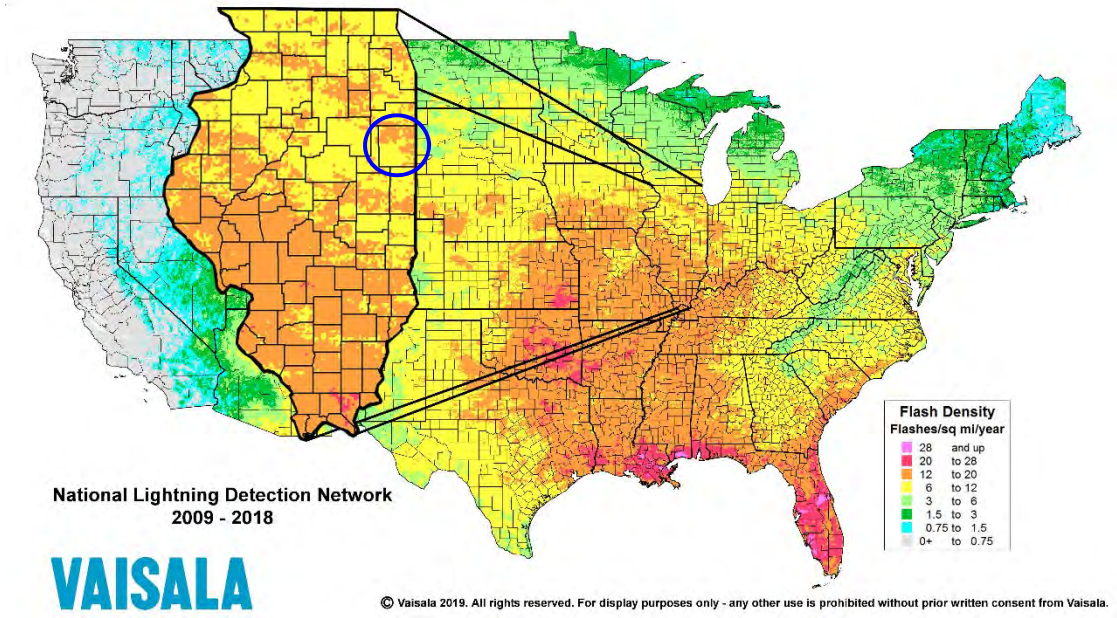
The largest hail stones documented in Watseka measured 1.75 inches in diameter (golf ball sized) and fell on two occasions, April 26, 1994 and May 19, 2005. Of the three occurrences, two (67%) took place in April. All three of the hail events occurred during the p.m. hours, taking place between 4 p.m. and 8 p.m.

Lightning

While lightning strike events occur regularly across eastern Illinois, NOAA's Storm Events Database and NOAA Storm Data Publications only identified four recorded occurrences of lightning strikes in Watseka between 1992 and 2019. Two of the events took place during June and the remaining two events took place in April and July. All four events occurred during the p.m. hours.

According to data from Vaisala's National Lightning Detection Network, Iroquois County (including Watseka) averaged between 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 United States. In comparison, Illinois averaged 12.7 cloud-to-ground lightning flashes per square mile from 2009 to 2018, ranking it eighth in the U.S. for lightning flash density.

Figure SS-6
Cloud-to-Ground Lightning Flash Density: Continental United States

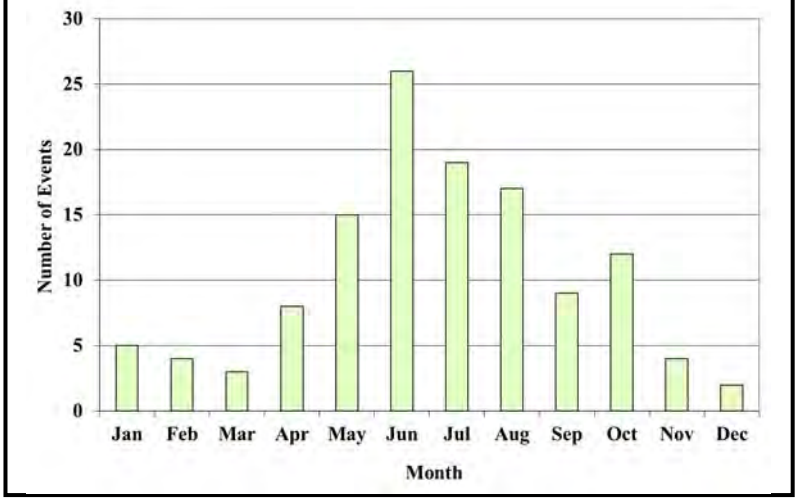


Heavy Rain

While heavy rain events occur on a fairly regular basis across eastern Illinois, NWS's COOP data records have documented 124 reported occurrences of heavy rain in Watseka between 1950 and 2019. Of the 124 occurrences, 23 events (19%) produced three inches or more of rain.

Figure SS-7 charts the reported occurrences of heavy rain by month. Of the 124 events, 62 (50%) took place in June, July, and August making this the peak period for heavy rain in Watseka. Of the 124 events, 26 (21%) occurred during June, making this the peak month for heavy rains. Start times were unavailable for all 124 heavy rain events.

Figure SS-7
Heavy Rain Events by Month
1950 - 2019



What locations are affected by severe storms?

Severe storms affect the entire community. A single severe storm event will generally extend across an entire county and affect multiple locations. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency (IEMA) classifies Iroquois County's (including Watseka and the participating jurisdictions) hazard rating for severe storms as "severe." (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

Watseka has had 36 verified occurrences of thunderstorms with damaging winds between 1970 and 2019. With 36 occurrences over the past 50 years, the probability or likelihood of a thunderstorm with damaging winds occurring in Watseka in any given year is 72%. There were four years over the last 50 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 Watseka is 8%.

Hail

There have been three verified occurrences of hail one (1) inch in diameter or greater between 1963 and 2019. With three occurrences over the past 57 years, the probability or likelihood that a severe storm with hail will occur in Watseka in any given year is 5%. %. It is important to keep in mind that there are almost certainly gaps in the hail data that distort this probability. More events have almost certainly occurred than are documented in this section which means the probability that the City will experience a severe storm with hail one inch or greater in any given year is likely higher than 5%

Heavy Rain

Watseka has had 124 reported occurrences of heavy rain between 1990 and 2019. With 124 occurrences over the past 30 years, Watseka should expect to experience at least four heavy rain events each year. There were 13 years with heavy rain events that produced at least three inches or more of rain over the last 30 years. This indicates that the probability of a heavy rain event of three inches or more occurring during any given year within the City is 43%.

HAZARD VULNERABILITY

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

Are the participating jurisdictions vulnerable to severe storms?

Yes. All of Watseka 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 northeastern Illinois. Since 2010, Watseka has recorded 38 heavy rain events and 13 thunderstorms with damaging winds.

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

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participants consider severe storms to be their greatest vulnerability.

As part of the Critical Facilities Vulnerability Survey, participating jurisdictions were also asked to identify critical facilities and infrastructure within their jurisdictions they felt have the greatest vulnerability to natural hazards and to which hazards. Both Watseka and Iroquois Memorial Hospital identified power lines as infrastructure with specific vulnerability to sever storms.

What impacts resulted from the recorded severe storms?

Severe storms as a whole have caused a minimum of $75,500 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 1970 and 2019, five of the 36 thunderstorms with damaging winds caused $65,500 in property damages. Damage

information was either unavailable or none was recorded for the remaining 31 reported occurrences.

NOAA's Storm Events Database documented no injuries as the result of any of the thunderstorms with damaging wind events.

Hail

Damage information was either unavailable or none was recorded for any of the three events between 1963 and 2019. No injuries or fatalities were reported as a result of any of the recorded hail events either.

Severe Storms Fast Facts – Impacts/Risk

Thunderstorms with Damaging Winds Impacts:
- Total Property Damage (5 events): ***$65,500***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Severe Hail Impacts:
- Total Property Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Lightning Strike Impacts:
- Total Property Damage (1 event): ***$10,000***
- Injuries (1 event): ***1***
- Fatalities: ***n/a***

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

Lightning

Data obtained from NOAA's Storm Events Database, NOAA's Storm Data Publications and NWS's COOP data records indicates that between 1992 and 2019, one of the four lightning strike events caused $10,000 in property damages.

NOAA's Storm Data Publication documented one injury as the result of a lightning strike event. On June 7, 1995, a woman was seriously injured as lightning struck just as she reached for the door handle of her car.

What other impacts can result from severe storms?

In Watseka, 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 2014 through 2018 indicates that wet road surface conditions were present for 5.8% to 20.5% of all crashes recorded annually in the City.

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-8** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when wet road surface conditions were present.

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

For Watseka the level of risk or vulnerability posed by severe storms to public health and safety is considered to be ***low***. This assessment is based on the fact that despite their relative frequency, the number of injuries and fatalities is low. In addition, Iroquois Memorial Hospital in Watseka as well as hospitals in neighboring counties and the region are equipped to provide care to persons injured during a severe storm.

Figure SS-8 Severe Weather Crash Data for Watseka				
Year	**Total # of Crashes**	**Presence of Wet Road Surface Conditions**		
		# of Crashes	**# of Injuries**	**# of Fatalities**
2014	69	7	1	0
2015	88	18	3	0
2016	69	4	0	0
2017	64	8	3	0
2018	68	13	1	0
Total:	**358**	**50**	**8**	**0**

Source: Illinois Department of Transportation.

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

Yes. All existing buildings, infrastructure and critical facilities located in Watseka 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. The Iroquois County CUSD #9 acknowledged the need for emergency backup generators to allow continued operation of critical facilities at all District buildings. While Watseka has an emergency backup generator at the sewer treatment plant, it does not have generators at its lift stations and drinking water wells.

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 Watseka, 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 Watseka has building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage, new structures are still vulnerable to the risks posed by thunderstorms with damaging winds of high speed, and lightning strikes.

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 six of the 167 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. Since all existing structures within Watseka are vulnerable to damage, it is highly probable that there will be future dollar losses from severe storms.

3.2 SEVERE WINTER STORMS & EXTREME COLD

HAZARD IDENTIFICATION

What is the definition of a severe winter storm?

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

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

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

What is snow?

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

What is sleet?

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

What is freezing rain?

Freezing rain is precipitation that falls in the form of a liquid (i.e., rain drops), but freezes into a glaze of ice upon contact with the ground or other hard surfaces. This occurs when snowflakes descend into a warmer layer of air and melt completely. When the rain drops that result from

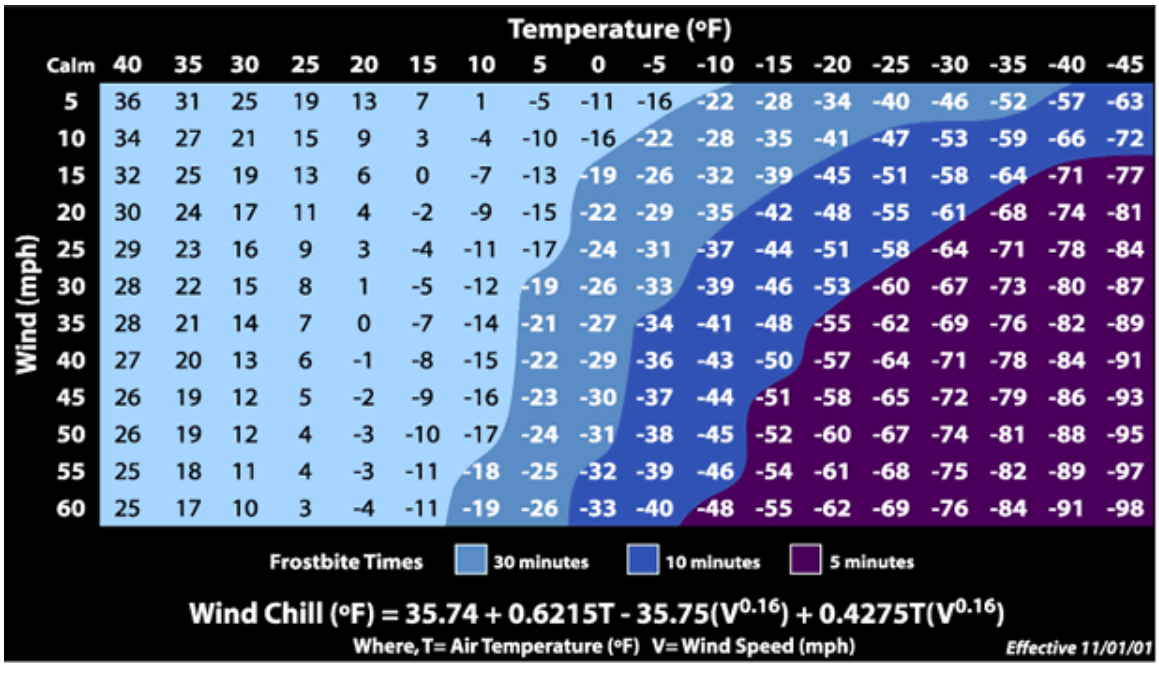
this melting fall through another thin layer of freezing air just above the surface they become "supercooled", but they do not have time to refreeze before reaching the ground. However, because the rain drops are "supercooled", they instantly refreeze upon contact with anything that is at or below 32°F (i.e., the ground, trees, utility lines, etc.).

What is wind chill?

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

The unit of measurement used to describe the wind chill factor is known as the wind chill temperature. The wind chill temperature is calculated using a formula. **Figure SWS-1** identifies the formula and calculates the wind chill temperatures for certain air temperatures and wind speeds.

Figure SWS-1
Wind Chill Chart



Source: NOAA, National Weather Service.

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

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

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

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

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

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

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

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

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

Are alerts issued for severe winter storms?

Yes. The NWS Weather Forecast Office in Chicago, Illinois is responsible for issuing ***winter storm watches*** and ***warnings*** for Iroquois County (including Watseka) depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watches.** The following watches are issued when conditions are favorable for hazardous winter weather conditions but are not occurring or imminent.

  - **Winter Storm Watch.** A winter storm watch is issued when severe winter storm conditions may occur, including heavy snow, significant ice or sleet accumulations,

and any of those accompanied by strong winds that may lead to significant visibility reductions.

- **Wind Chill Watch.** A wind chill watch is issued when widespread wind chill values of around -30°F or colder are possible.

- **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 will be issued when an event is occurring or imminent.
  - **Winter Weather Advisory.** Any one of a combination of the following winter weather elements are expected:
    - 3 to 6 inches of snow;
    - light sleet accumulations;
    - light ice accumulations; and/or
    - localized significant visibility reductions due to snow and/or blowing snow.

    A winter weather advisory may be issued for less than 3 inches of snow if significant impacts are expected.
  - **Wind Chill Advisory.** A wind chill advisory is issued when wind chill values of around -20°F or colder are expected.

- **Warnings.** Winter weather warnings are issued for events that can be life threatening. The following warnings will be issued when an event is occurring, is imminent, or has a high probability of occurring.

- The following winter weather warnings are issued when severe winter weather conditions are expected to cause a significant impact to life or property. Individuals are advised to avoid travel and stay indoors.
  - **Blizzard Warning.** A blizzard warning is issued when wind speeds of 35 mph or greater are accompanied by considerable falling or blowing snow that frequently reduces visibility to less than ¼ mile for three hours or more.
  - **Winter Storm Warning.** A winter storm warning is issued when:
    - snow amounts of 6 inches or more in 12 hour or 8 inches or more in 24 hours is expected; or
    - heavy sleet accumulations of ½ inch or greater are expected.

    These conditions may or may not be accompanied by wind or other phenomena. A warning may also be issued if conditions approach blizzard criteria and/or have significant impacts, even if snowfall amounts are not expected to reach the criteria above.
  - **Ice Storm Warning.** An ice storm warning is issued when ice accumulations of ¼ inch or more are expected.
  - **Wind Chill Warning.** A wind chill warning is issued when wind chill values are expected to be -30°F or below.

HAZARD PROFILE

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

When have severe winter storms and extreme cold occurred previously? What is the extent of these previous severe winter storms and extreme cold events?
Tables 5 and **6**, located in **Appendix J**, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) and extreme cold events recorded in Watseka.

Severe Winter Storms

NOAA's Storm Events Database, NOAA's Storm Data Publications and NWS's COOP Data records were used to document 105 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in Watseka between 1950 and 2019. Of the 105 recorded occurrences there were:

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

Severe Winter Storm Fast Facts – Occurrences

Number of Severe Winter Storm Events Reported (1950 -2019): ***105***
Number of Extreme Cold Events Reported (1996 – 2019): ***23***
Maximum 24-Hour Snow Accumulation: ***15.5 inches (December 18 & 19, 1973)***
Coldest Temperature Recorded in the County: ***-28°F (January 5, 1999)***
Most Likely Month for Severe Winter Storms to Occur: ***February***
Most Likely Month for Extreme Cold Events to Occur: ***January***

Figure SWS-2 charts the reported occurrences of severe winter storms by month. Of the 105 events, 83 (79%) took place in in December, January, and February. Of these 105 events, 34 (32%) occurred during February, making this the peak month for severe winter storms. There were two events that spanned two months; however, for illustration purposes only the month when the event started is graphed.

Figure SWS-3 charts the reported occurrences of severe winter storms by hour. Of the 105 occurrences, start times were unavailable for 33 events. Of the remaining 72 severe winter storm events with recorded times, approximately 57% began during the a.m. hours, with 16 (22%) beginning between 12 a.m. and 2 a.m.

According to the NWS's COOP data records, the maximum 24-hour snow accumulation in Watseka is 15.5 inches, which occurred on December 18 and 19, 1973.

Figure SWS-2
Severe Winter Storms by Month
1950 - 2019

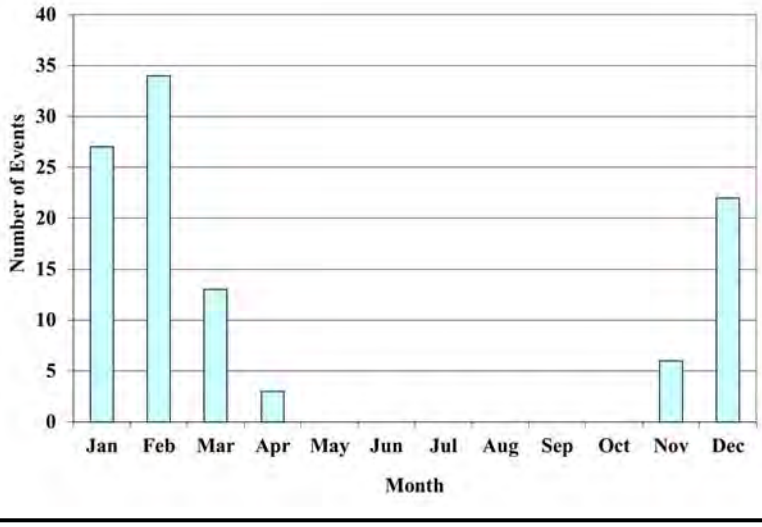
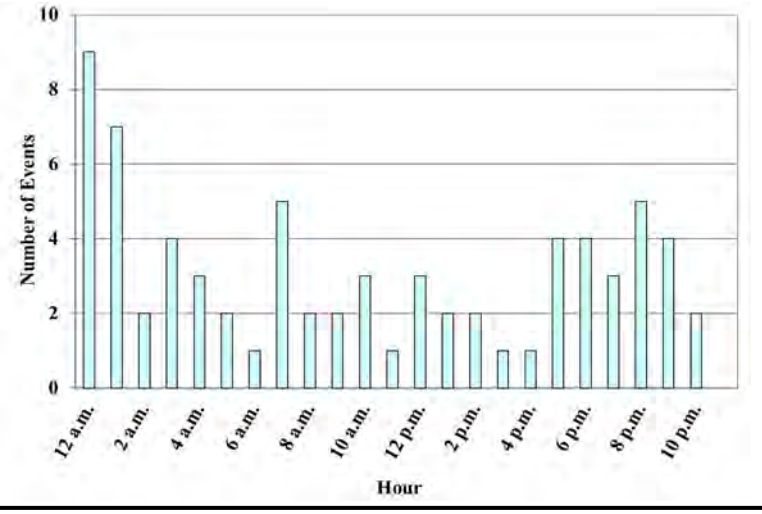


Figure SWS-3
Severe Winter Storms by Hour
1950 - 2019



Extreme Cold

While extreme cold events occur on a fairly regular basis across eastern Illinois, NOAA's Storm Events Database has only 23 *recorded* occurrences of extreme cold (dangerously low temperatures and wind chill values) in Watseka between 1996 and 2019. These represent the ***reported occurrences*** of extreme cold. The NWS acknowledges that extreme cold events are not well

recorded. Only those events with impacts are reported. As a result, extreme cold events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

Fourteen of the 23 events (61%) took place in January, making this the peak month for extreme cold events. The remaining events took place in December and February. Approximately 67% of all the extreme cold events with recorded times began during the a.m. hours.

According to the Midwestern Regional Climate Center, almost continuous temperature records for Watseka have been kept from 1936 to present by the NWS COOP Observer Station two miles northwest of Watseka. Based on the available records, the coldest temperature recorded in Watseka was -28°F on January 5, 1999. **Figure SWS-4** lists the coldest days recorded at the Watseka observation station.

Figure SWS-4
Coldest Days Recorded at Watseka Observation Station

	Date	Temperature			Date	Temperature
1	1/5/1999	-28°F		6	12/24/1989	-25°F
2	2/10/1982	-27°F		7	2/12/2014	-25°F
3	1/6/1999	-27°F		8	2/13/1905	-23°F
4	12/22/1989	-26°F		9	2/11/1982	-23°F
5	2/11/2014	-26°F		10	1/17/2009	-23°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by severe winter storms and extreme cold?
Severe winter storms and extreme cold affect all of Iroquois County, including Watseka. Severe winter storms and extreme cold generally extend across the entire area and affect multiple locations. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Iroquois County's (including Watseka and the participating jurisdictions) hazard rating for severe winter storms as "high."

Do any of the participating jurisdictions have designated warming centers?
No. Neither Watseka or any of the participating jurisdictions 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. In addition, there are no State of Illinois-designated warming centers in Iroquois County.

What is the probability of future severe winter storms occurring?
Severe Winter Storms
Watseka has had 105 verified occurrences of severe winter storms between 1950 and 2019. With 105 occurrences over the past 70 years, Watseka should expect at least one severe winter storm each year. There were 30 years over the past 70 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 in Watseka is 43%.

Extreme Cold Events

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

HAZARD VULNERABILITY

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

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

Yes. All of Watseka, including the participating jurisdictions, is vulnerable to the dangers presented by severe winter storms and extreme cold. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2010, Watseka has experienced 18 severe winter storms and six extreme cold events.

Severe winter storms have immobilized portions of the city, blocking roads; downing power lines, trees and branches; causing power outages and property damage; and contributing to vehicle accidents. In addition, the municipality 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?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participants consider severe winter storms to be among their jurisdiction's greatest vulnerabilities. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to severe winter storms.

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

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

Severe Winter Storms

Damage information was either unavailable or none was recorded for any of the 105 reported extreme severe winter storm events between 1950 and 2019.

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

Severe Winter Storm (Snow & Ice) Impacts:
- Total Property Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

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

Severe Winter Storm Risk/Vulnerability:
- 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.

No injuries or fatalities were reported as a result of any of the recorded severe winter storms.

Extreme Cold

Damage information was either unavailable or none was recorded for any of the 23 reported extreme cold events between 1996 and 2019. No injuries or fatalities were reported as a result of any of the recorded extreme cold events either.

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 severe winter storms?

In Watseka, 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 2014 through 2018 indicates that treacherous road conditions caused by snow/slush and ice were present for 4.5% to 10.3% of all crashes recorded annually in the city. **Figure SWS-5** 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-5
Severe Winter Weather Crash Data for Watseka

Year	Total # of Crashes	Presence of Treacherous Road Conditions caused by Snow/slush and Ice		
		# of Crashes	# of Injuries	# of Fatalities
2014	69	5	1	0
2015	88	4	1	0
2016	69	4	1	0
2017	64	3	1	0
2018	68	7	4	0
Total:	**358**	**23**	**8**	**0**

Source: Illinois Department of Transportation.

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

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

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

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

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

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

Winter Storm

Structural damage to buildings caused by severe winter storms (snow and ice) is very rare, but can occur particularly to flat rooftops. Information gathered from Watseka 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 city. 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 municipality for snow removal and de-icing. Road resurfacing and pothole repairs are additional costs incurred each year as a result of severe winter storms.

Extreme Cold

Extreme cold events can also have a detrimental impact on buildings, infrastructure and critical facilities. Pipes and water mains are especially susceptible to freezing during extreme cold events. This freezing can lead to cracks or ruptures in the pipes in buildings as well as in buried service lines and mains. As a result, flooding can occur as well as disruptions in service. Since most

buried service lines and water mains are located under local streets and roads, fixing a break requires portions of the street or road to be blocked off, excavated and eventually repaired. These activities can be costly and must be carried out under less than ideal working conditions.

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

No. Watseka has building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms,

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 Watseka have experienced extended periods without power due to severe winter storms. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas. In terms of new roads and bridges, there is very little that can be done to reduce or eliminate their vulnerability to severe winter storms.

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

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms and extreme cold events. Since none of the 128 recorded events listed property damage numbers for severe winter storms and extreme cold, there is no way to accurately estimate future potential dollar losses. However, since all existing structures within Watseka are vulnerable to damage, it is likely that there will be future dollar losses from severe winter storms and extreme cold.

3.3 FLOODS

HAZARD IDENTIFICATION

What is the definition of a flood?

The Federal Emergency Management Agency (FEMA) defines a "flood" as a general or temporary condition where two or more acres of normally dry land or two or more properties are inundated by:

- overflow of inland or tidal waters;
- unusual and rapid accumulation or runoff of surface waters from any source;
- mudflows; or
- a sudden collapse or subsidence of shoreline land.

The severity of a flooding event is determined by a combination of topography and physiography, ground cover, precipitation and weather patterns and recent soil moisture conditions. On average, flooding causes more than $5 billion in damages each year in the United States. Floods cause utility damage and outages, infrastructure damage (both to transportation and communication systems), structural damage to buildings, crop loss, decreased land values and impede travel.

What types of flooding occur in the City?

There are two main types of flooding that affect Watseka: general flooding and flash flooding. General flooding can be broken down into two categories: riverine flooding and shallow flooding. The following provides a brief description of each type.

General Flooding – Riverine Flooding

Riverine flooding occurs when the water in a river or stream gradually rises and overflows its banks. This type of flooding affects low lying areas near rivers, streams, lakes and reservoirs and generally occurs when:

- persistent storm systems enter the area and remain for extended periods of time,
- winter and spring rains combine with melting snow to fill river basins with more water than the river or stream can handle,
- ice jams create natural dams which block normal water flow, and
- torrential rains from tropical systems make landfall.

General Flooding – Shallow Flooding

Shallow flooding occurs in flat areas where there are no clearly defined channels (i.e., rivers and streams) and water cannot easily drain away. There two main types of shallow flooding: sheet flow and ponding. If the surface runoff cannot find a channel, it may flow out over a large area at a somewhat uniform depth in what's called sheet flow. In other cases, the runoff may collect in depressions and low-lying areas where it cannot drain out, creating a ponding effect. Ponding floodwaters do not move or flow away, they remain in the temporary ponds until the water can infiltrate the soil, evaporate or are pumped out.

Flash Floods

Flash flooding occurs when there is a rapid rise of water along a stream or low-lying area. This type of flooding generally occurs within six hours of a significant rain event and is usually produced when heavy localized precipitation falls over an area in a short amount of time. Considered the most dangerous type of flood event, flash floods happen quickly with little or no warning. Typically, there is no time for the excess water to soak into the ground nor are the storm sewers able to handle the sheer volume of water. As a result, streams overflow their banks and low-lying (such as underpasses, basements etc.) areas can rapidly fill with water.

Flash floods are very strong and can tear out trees, destroy buildings and bridges and 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 United States, the 500-year flood is the national standard for protecting critical facilities, such as hospitals and power plants. A 500-year flood has a 1/500 (0.2%) chance of occurring in any given year.

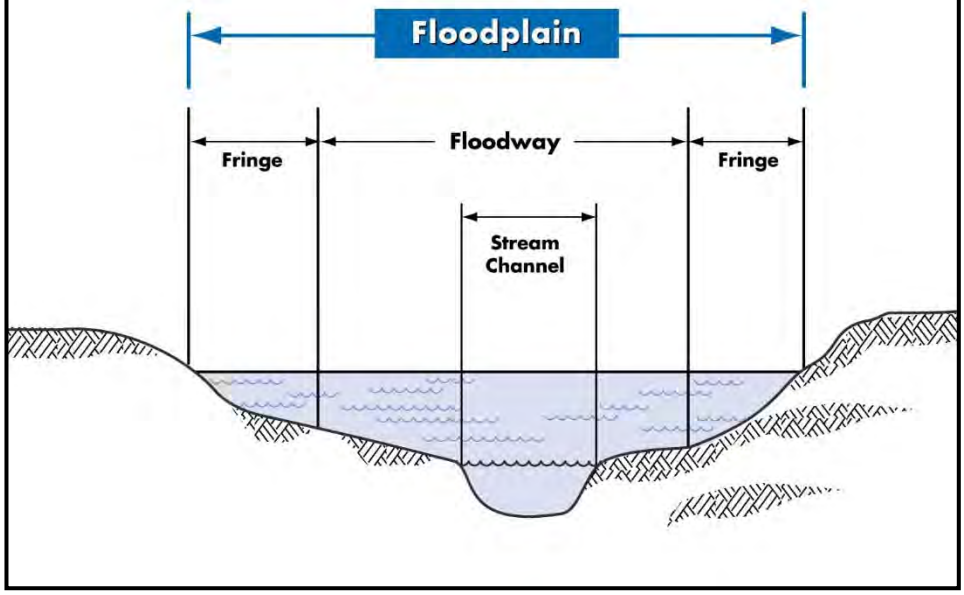
What is a floodplain?

The general definition of a floodplain is any land area susceptible to being inundated or flooded by water from any source (i.e., river, stream, lake, estuary, etc.). This general definition differs slightly from the regulatory definition of a floodplain.

A regulatory or base floodplain is defined as the land area that is covered by the floodwaters of the base flood. This land area is subject to a 1% chance of flooding in any given year. The base floodplain is also known as the 100-year floodplain or a Special Flood Hazard Area (SFHA). It is this second definition that is generally most familiar to people and the one that is used by the NFIP and the State of Illinois.

A base floodplain is divided into two parts: the floodway and the flood fringe. **Figure 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?

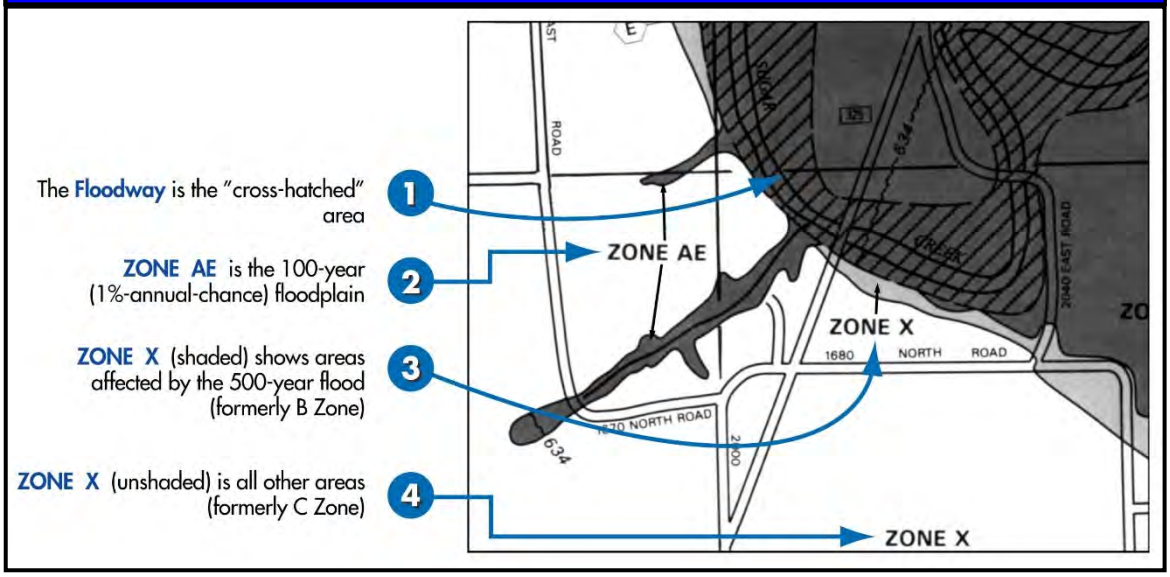
A Special Flood Hazard Area (SFHA) is the base floodplain. As discussed previously, this is the land area that is covered by the floodwaters of the base flood and has a 1% chance of flooding in any given year. The term SFHA is most commonly used when referring to the based floodplain on the Flood Insurance 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 shows 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, they drain funds needed to prepare for catastrophic events. As a result, FEMA and the NFIP are working with states and local governments to mitigate these properties.

What is floodplain management?

Floodplain management is the administration of an overall community program of corrective and preventative measures to reduce flood damage. These measures take a variety of forms and generally include zoning, subdivision or building requirements, special-purpose floodplain ordinances, flood control projects, education and planning. Where floodplain development is permitted, floodplain management provides a framework that minimizes the risk to life and property from floods by maintaining a floodplain's natural function. Floodplain management is a key component of the National Flood Insurance Program.

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) is a federal program, administered by FEMA, that:

- mitigates future flood losses nationwide through community-enforced building and zoning ordinances; and

- provides access to affordable, federally-backed insurance protection against losses from flooding to property owners in participating communities.

It is designed to provide an insurance alternative to disaster assistance to meet escalating costs of repairing damage to buildings and their contents due to flooding. The U.S. Congress established the NFIP on August 1, 1968 with the passage of the National Flood Insurance Act of 1968. This Program has been broadened and modified several times over the years, most recently with the passage of the Flood Insurance Reform Act of 2004.

Prior to the creation of the NFIP, the national response to flood disasters was generally limited to constructing flood-control projects such as dams, levees, sea-walls, etc. and providing disaster relief to flood victims. While flood-control projects were able to initially reduce losses, their gains were offset by unwise and uncontrolled development practices within floodplains. In light of the continued increase in flood losses and the escalating costs of disaster relief to taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for protection.

Participation in the NFIP is voluntary and based on an agreement between local communities and the federal government. If a community agrees to adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in a SFHA (base floodplain), then the government will make flood insurance available within the community as a financial protection against flood losses.

If a community chooses not to participate in the NFIP or a participating community decides not to adopt new floodplain management regulations or amend its existing regulations to reference new flood hazard data provided by FEMA, then the following sanctions will apply.

- Property owners will not be able to purchase NFIP flood insurance policies and existing policies will not be renewed.
- Federal disaster assistance will not be provided to repair or reconstruct insurable buildings located in identified flood hazard areas for presidentially-declared disasters that occur as a result of flooding.
- Federal mortgage insurance and loan guarantees, such as those written by the Federal Housing Administration and the Department of Veteran Affairs, will not be provided for acquisition or construction purposes within an identified flood hazard area. Federally-insured or regulated lending institutions, such as banks and credit unions, are allowed to make conventional loans for insurable buildings in identified flood hazard areas of non-participating communities. However, the lender must notify applicants that the property is in an identified flood hazard area and that it is not eligible for federal disaster assistance.
- Federal grants or loans for development will not be available in identified flood hazard areas under programs administered by federal agencies such as the Environmental Protection Agency, Small Business Administration and the Department of Housing and Urban Development.

What is the NFIP's Community Rating System?

The NFIP's Community Rating System (CRS) is a voluntary program developed by FEMA to provide incentives (in the form of flood insurance premium discounts) for NFIP participating communities that have gone beyond the minimum NFIP floodplain management requirements to develop extra measures to provide protection from flooding. CRS discounts on flood insurance premiums range from 5% up to 45%. 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 Chicago, Illinois is responsible for issuing ***flood watches*** and ***warnings*** for Iroquois County (including Watseka) depending on the weather conditions. The following provides a brief description of each type of alert.

- **Flood Watch.** A flood watch is issued when atmospheric and hydrologic conditions are favorable for long duration river flooding or areal flooding (the gradual ponding or buildup of water in low-lying, flood-prone areas as well as small creeks and streams that develops gradually, usually from prolonged and persistent moderate to heavy rainfall).
- **Flash Flood Watch.** A flash flood watch is issued when atmospheric and hydrologic conditions are favorable for short duration flash flooding and/or a dam break is possible.
- **Flood Advisory.** A flood advisory is issued when thunderstorms have produced heavy rainfall that may result in ponding of water on roadways and in low-lying areas, as well as rises in small stream levels but is not expected to pose an immediate threat to life and/or property.
- **Flood Warning**. A flood warning is issued when long duration river flooding or areal flooding (the gradual ponding or buildup of water in low-lying, flood-prone areas as well as small creeks and streams) is occurring or is imminent and may result from excessive rainfall, rapid snow melt, ice jams on rivers or other similar causes.
- **Flash Flood Warning.** A flash flood warning is issued when short duration flash flooding has developed due to excessive rainfall or a dam break has occurred.

HAZARD PROFILE

The following identifies past occurrences of floods; details the severity or extent of future potential floods (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 7 and **8**, located in **Appendix J**, summarize the previous occurrences as well as the extent or magnitude of flood events recorded in Watseka and the participating jurisdictions. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

General Floods

NOAA's Storm Events Database, NOAA's Storm Data Publications, NOAA's COOP Data, NWS's River Observations, Illinois Department of Transportation (IDOT) data and Committee member records have documented 21 occurrences of general flooding in Watseka between 1990 and 2019. Included in the 21 general flood events are four events in Watseka that contributed to three separate federally-declared disasters for Iroquois County.

Based on historical gauge data, the record setting Iroquois River flood in this area occurred on June 13, 1958 when the Iroquois River crested at 26.31 feet at Iroquois. The second and third highest crest at this location occurred in February 2018 and January 2008 respectively.

The flood of record for Sugar Creek occurred on January 8, 2008 when the Creek crested at 28.66 feet at Milford. The second and third highest crest at this location occurred in February 2018 and April 1994 respectively.

Figure F-3 illustrates the extent of the flooding experienced in 2018 as documented by the Public Works Director Marvin Delahr. Approximately 41% of the corporate limits of the City were under floodwater including Fire Station #2, the Public Works Facility and Nettie Davis Elementary School. Portions of City's wastewater treatment plant, Glenn Raymond Jr. High School and Kingdom Gardens Assisted Living Facility were also under floodwater.

Flash Floods

NOAA's Storm Events Database, IDOT data and Committee member records documented 11 reported occurrences of flash flooding in Watseka between 2000 and 2019. Included in the 11 flash flood events is one event in Watseka that contributed to one federally-declared disaster in Iroquois County. ***One declared disaster(s), Declaration #1747, included both flash flood and general flood events.***

Flood Fast Facts – Occurrences

Number of General Floods Reported (1990 – 2019): ***21***

Number of Flash Floods Reported (2000 – 2019): ***11***

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

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

Most Likely Time for General Floods to Occur: ***Morning***

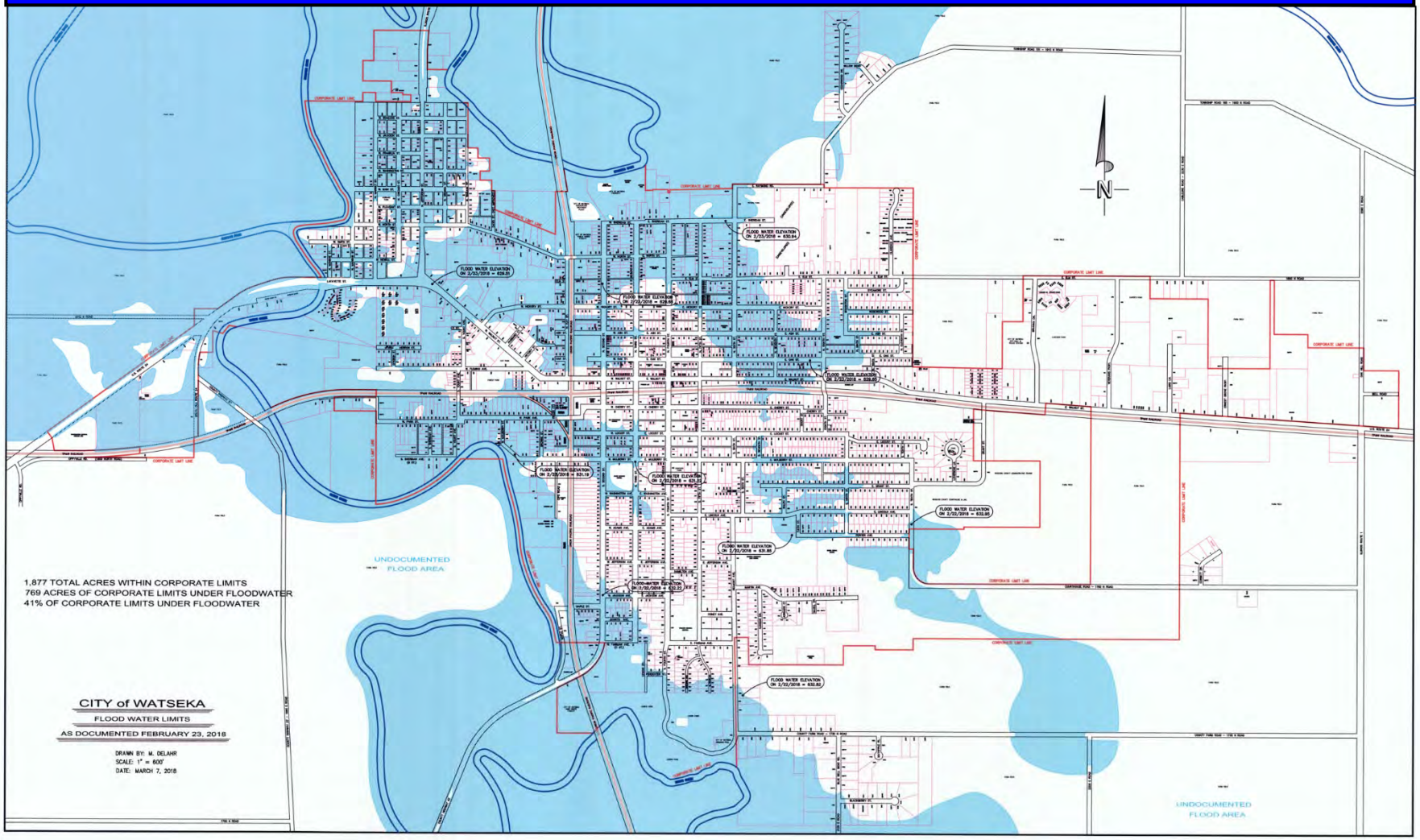
Most Likely Time for Flash Floods to Occur: ***Afternoon***

Number of Federal Disaster Declarations Related to General and Flash Flooding: ***3***

Figure F-4 charts the reported occurrences of flooding by month. Of the 21 general flood events, nine (43%) began in January, February, March and April making this the peak period for general floods in Watseka. The peak months for general flood include June (four events), January (three events) and July (3 events). There were four events that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

In comparison, seven of the 11 flash flood events (64%) took place between May, June and July making this the peak period for flash floods. Of the seven events, three (45%) occurred in May and three (45%) occurred in June making these the peak months for flash flooding.

Figure F-3
2018 Flood Water Limits



Source: Watseka Public Works Director.

Figure F-5 charts the reported occurrences of flooding by hour. Of the general flood events with recorded start times, approximately 75% began during the a.m. hours while 67% of the flash flood events with recorded start times began during the p.m. hours.

Figure F-4
Flood Events by Month

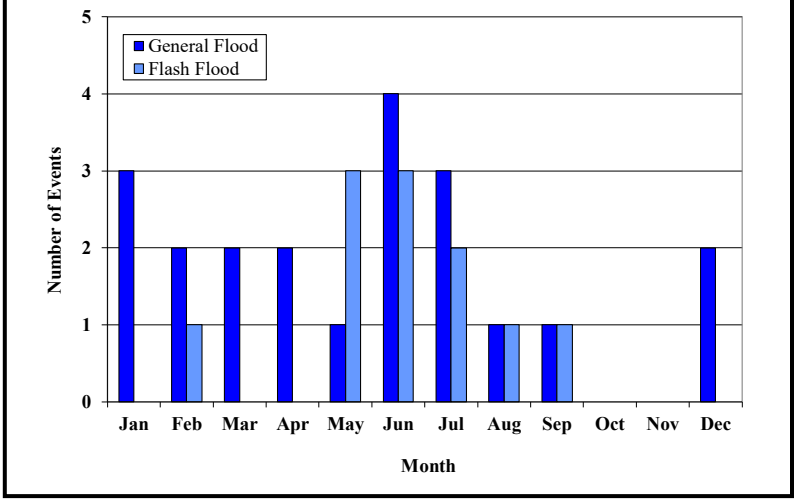
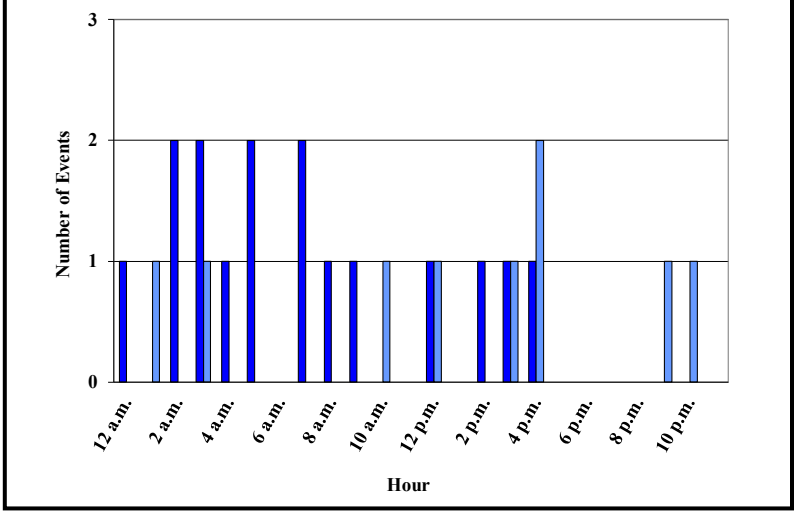


Figure F-5
Flash Flood Events by Hour



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

While specific locations within Watseka, Iroquois County CUSD #9 and Iroquois Memorial Hospital are affected by general flooding, all of the participating jurisdictions can be impacted by flash flooding because of the topography and seasonally high-water table of the area.

Figure F-6 identifies the floodplains in Watseka as well as the participating jurisdictions. This map is based on the Watseka DFIRMs that became effective in August 2011. **Appendix K** contains the DFIRMs for the City which cover the participating jurisdictions as well. The DFIRMs are the most detailed and consistent data available for determining the extent of future potential flooding.

The Iroquois River and Sugar Creek are the two bodies of water within or immediately adjacent to Watseka that are known to cause flooding or have the potential to flood. Special Flood Hazard Areas (SFHAs) associated with the Iroquois River and Sugar Creek are located in both Watseka and the Iroquois County CUSD #9. Iroquois Memorial Hospital is located in the 500-year floodplain of Sugar Creek.

Does Watseka take part in the NFIP?
Yes. The City participates in the NFIP which allows the participating jurisdictions to purchase flood insurance and access disaster recovery programs made available following a flood-related disaster declaration. **Figure F-7** ***provides information on Watseka's participation in the NFIP***, the date the City jointed, the date of its current effect FIRMs and the year of its most recently adopted floodplain zoning ordinance.

While the City is not a CRS participant, it is currently in the process of addressing a floodway impairment issue that affects its eligibility. Once this issue has been addressed, it is the City's intention to participate.

Figure F-7
Watseka NFIP Participation

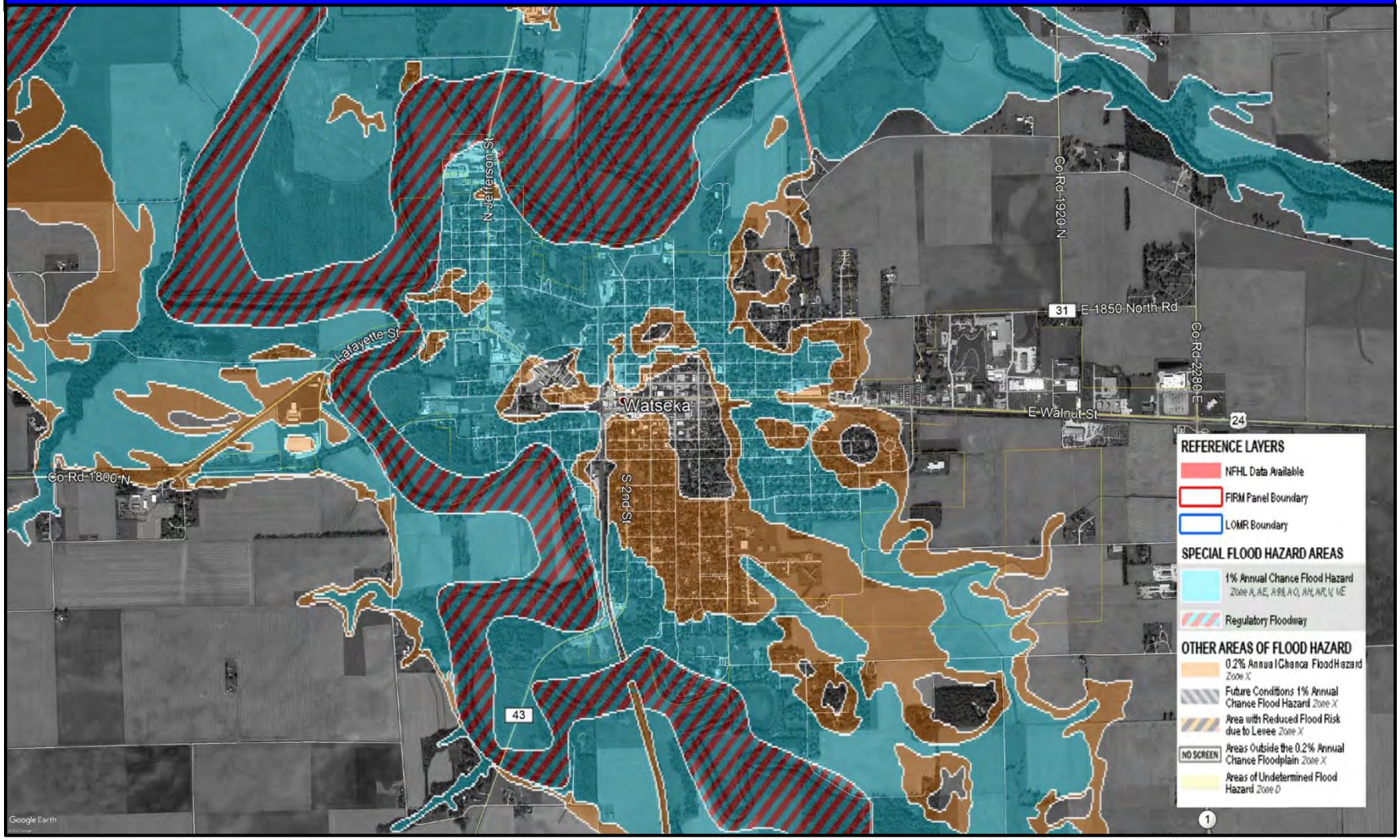
Participating Jurisdiction	Participation Date	Current Effective FIRM Date	CRS Participation	Most Recently Adopted Floodplain Zoning Ordinance
Watseka	06/15/1979	08/16/2011	No	07/26/2011

Sources: FEMA, Community Status Book Report: Illinois.

Jurisdictions that participate in the NFIP are expected to adopt and enforce floodplain management regulations. Watseka has adopted the State of Illinois model floodplain ordinance. This ordinance goes above and beyond NFIP minimum standards and has much more restrictive floodway regulations. As a result, the City is in compliance with NFIP requirements.

Watseka 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. This is consistent with the City's Comprehensive Plan which recommends directing new development to the east side of town on land that is higher than the typical flood elevation. Continued compliance with NFIP requirements is addressed in the Mitigation Action Tables found in Section 4.6.

Figure F-6
Floodplain Areas in Watseka



Source: FEMA National Flood Hazard Layer

What is the probability of future flood events occurring?

General Floods

Watseka, including the participating jurisdictions, has had 21 verified occurrences of general flooding between 1990 and 2019. With 21 occurrences over the past 30 years, the probability or likelihood of a general flood event occurring in Watseka in any given year is 70%. There were three years over the past 30 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 City is 10%.

Flash Floods

There have been 11 verified flash flood events between 2000 and 2019. With 11 occurrences over the past 20 years, the probability or likelihood of a flash flood event occurring in Watseka in any given year is 55%. There were two years over the past 20 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 City is 10%.

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. Watseka, Iroquois County CUSD #9 and Iroquois Memorial Hospital are all vulnerable to the dangers presented by flooding. Precipitation levels and topography are factors that cumulatively make virtually the entire City susceptible to some form of flooding. Flooding occurs along the floodplains of the Iroquois River and Sugar Creek as well as outside of the floodplains in low-lying areas where drainage problems occur. Since 2010, Watseka has experienced five flash flood events and six general flood events.

Vulnerability to flooding can change depending on several factors, including land use. As land used primarily for agricultural and open space purposes is converted for residential and commercial/industrial uses, the number of buildings and impervious surfaces (i.e., parking lots, roads, sidewalks, etc.) increases. As the number of buildings and impervious surfaces increases, so too does the potential for flash flooding. Rather than infiltrating the ground slowly, rain and snowmelt that falls on impervious surfaces runs off and fills ditches and storm drains quickly creating drainage problems and flooding.

As described in Section 1.3 Land Use and Development Trends, the City has several potential land use changes under consideration including a hotel, solar farm and affordable housing. These changes may be off-set by the City's current participation in a floodplain buyout program through

the Illinois Department of Natural Resources. Approximately 67 owner-occupied homes are slated for acquisition and demolition. Currently 13 homes have been bought and four have been torn down, with the land returned to green space. There is the potential for future buyout of an additional 40-50 investment properties that will further change the land use in floodplain areas.

No other substantial changes in land use are expected within the next five years.

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

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, all three participants consider flooding to be their greatest vulnerability. Flooding of the main roads through the City (especially US Route 24 and Illinois Route 1) adversely impairs travel especially for students, employees, patients and vendors. Iroquois County CUSD #9 also indicated that two of their school buildings flood which displace 100s of students impacting learning.

As part of the Critical Facilities Vulnerability Survey, participating jurisdictions were also asked to identify critical facilities and infrastructure within their jurisdictions they felt have the greatest vulnerability to natural hazards and to which hazards. Watseka identified the wastewater treatment plant as infrastructure with specific vulnerability to flooding while Iroquois County CUSD #9 identified school buildings.

What impacts resulted from the recorded floods?

Floods as a whole have caused a *minimum* of $12.9 million 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.

General Floods

Data obtained from Watseka, Iroquois County CUSD #9 and Iroquois records indicates that between 1990 and 2019, six of the 21 general flood events caused over $12.8 million in property damages. Damage information was either unavailable or none was recorded for the remaining 15 reported occurrences.

Flood Fast Facts – Impacts/Risk

General Flood Impacts:
- Total Property Damage (6 events): ***$12,874,587***
- Infrastructure/Critical Facilities Damage (2 events)*: ***$241,462***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flash Flood Impacts:
- Total Property Damage (1 event): ***$25,000***
- Infrastructure/Critical Facilities Damage*: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

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

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

Included in the property damage figure provided above is $241,462 in verified critical facilities damage sustained by Iroquois County CUSD #9. The following provides a brief description of the damages.

- The School District sustained $83,756 in damages to its schools as a result of the 2008 flood.
- During the 2018 flood, Nettie Davis Elementary School sustained $150,790 in building-related damages and $6,916 in content damage to classrooms.

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 indicates that between 2000 and 2019, one flash flood event caused approximately $25,000 in property damages. Damage information was either unavailable or none was recorded for the remaining 20 reported occurrences.

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

What other impacts can result from flooding?

One of the primary threats from flooding is drowning. Nearly half of all flash flood fatalities occur in vehicles as they are swept downstream. Most of these fatalities take place when people drive into flooded roadway dips and low drainage areas. It only takes two feet of water to carry away most vehicles.

Floodwaters also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto streets and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during a flood event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

Structural damage, such as cracks forming in a foundation, can also result from flooding. In most cases, however, the structural damage sustained during a flood occurs to the flooring, drywall and wood framing. In addition to structural damage, a flood can also cause serious damage to a building's content.

Infrastructure and critical facilities are also vulnerable to flooding. Roadways, culverts and bridges can be weakened by floodwaters and have been known to collapse under the weight of a vehicle. Buried power and communication lines are also vulnerable to flooding. Water can infiltrate lines and cause disruptions in power and communication.

What is the level of vulnerability to public health and safety from floods?

While both general and flash floods occur on a fairly regular basis within the participating jurisdictions, the number of injuries and fatalities is very low. In terms of the risk or vulnerability

to public health and safety from *general floods*, the risk is seen as low. However, half of the recorded flood events were the result of flash flooding. Since there is very little warning associated with flash flooding the risk to public health and safety from *flash floods* is elevated to medium.

Are there any repetitive loss structures/properties within Watseka?

Yes. According to information obtained from FEMA's NFIP, there are 93 repetitive loss structure located in Watseka. 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.

Figure F-8 identifies the repetitive flood loss structures for Watseka and provides the total flood insurance claim payments. The exact location and/or address of the insured structures are not included in this Plan to protect the owners' privacy. According to FEMA, there have been 265 flood insurance claim payments totaling $5,047,550 for the 93 repetitive flood loss structures.

Figure F-8
Watseka Repetitive Flood Loss Structures

Structure Type	Number of Structures	Number of Claim Payments	Flood Insurance Claim Payments		Total Flood Insurance Claim Payments
			Structure	Content	
Single Family	82	231	$3,764,441	$258,401	$4,022,842
2-4 Family	2	7	$112,569	$13,487	$126,056
Other Residential	3	10	$320,880	$0	$320,880
Business	4	13	$396,848	$46,038	$442,886
Other Non-Residential	2	4	$103,389	$31,497	$134,886
Total:	**93**	**265**	**$4,698,127**	**$349,423**	**$5,047,550**

Source: Federal Emergency Management Agency

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

Yes. **Figure F-9** identifies the number of existing residential structures in Watseka located within a base floodplain and 500-year floodplain. These counts were prepared by the Consultant using the effective DFIRMs.

There are some residential structures within the City that are elevated; however, the mapping does not distinguish between homes built at ground level and those that are elevated. While elevated structures may escape flooding, there is the potential for damage to their supports and loss of access. Therefore, it was decided that all structures located in the floodplain would be included in the counts.

Figure F-9
Existing Structures Located in a Floodplain – Watseka

Floodplain Type	Residential			Business
	Single Family	Duplex	Apartment Building	
Base Floodplain	918	3	9	53
500-Year Floodplain	677	8	10	51

Figure F-10 identifies the number of critical facilities and infrastructure located within a base floodplain and 500-year floodplain by jurisdiction. These counts were prepared by the Consultant using the effective DFIRMs.

Figure F-10
Critical Facilities & Infrastructure Located in the Base & 500-Year Floodplain by Jurisdiction

Critical Facilities/Infrastructure Category	Watseka		Iroquois County CUSD #9		Iroquois Memorial Hospital	
	Base	500-Year	Base	500-Year	Base	500-Year
Government[1]	3	2	---	---	---	---
Law Enforcement	0	1	---	---	---	---
Fire Stations	1	0	---	---	---	---
Ambulance Service	0	0	---	---	---	---
Schools	2	3	2	3	---	---
Medical[2]	0	1	---	---	0	1
Healthcare Facilities[3]	6	6	---	---	0	1
Drinking Water	0	0	---	---	---	---
Wastewater Treatment/Lift Stations	5	4	---	---	---	---
Utility Substations/Comm. Towers	2	1	---	---	---	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, etc.
[2] Medical Facilities includes: public health departments, hospitals, urgent/prompt care and medical clinics.
[3] Healthcare Facilities includes: nursing homes, skilled care facilities, memory care facilities, residential group homes.

Aside from key roads and bridges and buried power and communication lines, each of the participating jurisdictions have specific infrastructure/critical facilities located within a floodplain. The following lists the critical facilities and infrastructure located in the floodplain by jurisdiction.

Watseka

Base Floodplain:
- Public Works Facility
- Wastewater Treatment Plant
- IDOT Maintenance Yard
- Fire Station #2
- Nettie Davis Elementary School
- Wanda Kendall Elementary School
- Kingdom Gardens Senior Living
- five residential group homes
- four lift stations
- one communication tower
- one electrical substation

500-Year Floodplain:
- Iroquois County Courthouse
- Watseka Public Library
- Iroquois County Jail
- Glenn Raymond Jr. High School
- Watseka High School
- Iroquois County CUSD #9 Office
- Iroquois Memorial Hospital
- Iroquois Residents Home
- Watseka Rehab & Health Care
- four residential group homes
- four lift stations
- one electrical substation

Iroquois County CUSD #9

Base Floodplain:
- Nettie Davis Elementary School
- Wanda Kendall Elementary School

500-Year Floodplain:
- Glenn Raymond Jr. High School
- Watseka High School
- Iroquois County CUSD #9 Office

Iroquois Memorial Hospital

500-Year Floodplain:

- Iroquois Memorial Hospital
- Iroquois Residents Home

While a portion of the land area in Watseka lies within the base floodplain and is susceptible to riverine flooding, almost the entire City 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 Iroquois River and Sugar Creek; (c) the fact that most of the City 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 *Watseka* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding.

The purpose of providing an estimate is to help residents and municipal officials make informed decisions about how they can better protect themselves and their community. This estimate is meant to provide a ***general idea*** of the magnitude of the potential damage that could occur from a flood event in Watseka.

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.

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. Riverine flooding accounts for two-thirds of all the recorded flood events and has caused the greatest amount of recorded damages in the City. In addition, 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.

Assumption #1

A riverine flood event will impact vulnerable residential structures within the City.

Therefore, a riverine flood event will be used since it is (a) relatively easy to identify vulnerable residential structures within the City (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.

Scope of the Flood Event. To establish the number of vulnerable residential structures (potentially-damaged housing units), the scope of the riverine flood event within the City 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.

Assumption #2

All base floodplains within the City will flood and experience the same degree of flooding.

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 the Iroquois River and Sugar Creek would overflow their banks and the base floodplains located within the City would experience the same degree of flooding.

Number of Potentially-Damaged Housing Units. Since this scenario assumes that all the base floodplains within Watseka 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. **Figure F-9** identifies the total number of existing single-family residential structures located within the base floodplains(s) in Watseka.

Assumption #3

The number of existing single-family residential structures located within the base floodplain(s) in each municipality will be used to determine the number of potentially-damaged housing units.

Value of Potentially-Damaged Housing Units. Now that the number of potentially-damaged housing units has been determined, the monetary value of the units must be calculated. Typically, when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure in Watseka will be used.

Assumption #4

The average market value for a residential structure in Watseka will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of residential buildings within the City and dividing that number by the total number of housing units in the City. The average market value is then determined by taking the averaged assessed value and multiplying that number by three (the assessed value of structures in Illinois is approximately one-third of the market value). **Figure F-11** calculates the average assessed value and average market value for Watseka. The total assessed value is based on 2018 tax assessment information provided by the Iroquois County Chief County Assessment Officer.

Figure F-11
Calculation of Average Assessed Value & Average Market Value – Watseka

Average Assessed Value

Total Assessed Value of Residential Buildings ÷ Total Housing Units = Average Assessed Value

$40,487,916 ÷ 2,537 housing units = $15,959

Average Market Value

Average Assessed Value x 3 = Average Market Value

$15,959 x 3 = $47,877

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-12** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

Assumption #5

Damage Scenario #1
The potentially-damaged housing units are one story with no basements and the flood depth is one foot.
Structural Damage = 14%
Content Damage = 21%

Damage Scenario #2
The potentially-damaged housing units are one story with no basements and the flood depth is two feet.
Structural Damage = 22%
Content Damage = 33%

Two damage scenarios were calculated for the potentially-damaged housing units based on conversations with the Watseka Building Inspector and the Public Works Director. The first scenario assumes that the potentially-damaged housing units are ***one-story homes with no basements and the flood depth is one foot***. With these assumptions the expected percent damage sustained by the *structure* is estimated to be 14% and the expected percent damage sustained by the structure's *contents* is estimated to be 21%.

The second scenario assumes that the potentially-damaged housing units are ***one-story homes with no basements and the flood depth is two feet***. With these assumptions the expected percent damage sustained by the *structure* is estimated to be 22% and the expected percent damage sustained by the structure's *contents* is estimated to be 33%.

Figure F-12
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 for each scenario 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-13** calculates the structure dollar losses to potentially-damaged housing units in Watseka for damage scenario #1.

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 for each scenario 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-14** calculates the content dollar losses to potentially-damaged housing units in Watseka for damage scenario #1.

Figure F-13
***Structure:* Potential Dollar Loss Calculation Example – Damage Scenario #1**

Average Market Value of a Housing Unit x Percent Damage =
Average Structural Damage per Housing Unit

$47,877 x 14% = $6,702.78 per housing unit

Average Structural Damage x Number of Potentially-Damaged Housing Units =
Structure Potential Dollar Losses
(Rounded to the Nearest Dollar)

$6,702.78 per housing unit x 918 housing unit = $6,153,152.00
($6,153,152)

Figure F-14
***Content:* Potential Dollar Loss Calculation Example – Damage Scenario #1**

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

½ ($47,877) x 21% = $5,027.085 per housing unit

Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units = *Content* Potential Dollar Losses
(Rounded to the Nearest Dollar)

$5,027.085 per housing unit x 918 housing unit = $4,614,864.00
($4,614,864)

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figure F-15** provides a breakdown of the total potential dollar losses for Watseka by damage scenario.

This assessment illustrates the *potential residential dollar losses* that should be considered when the City is deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences would be expected to ***exceed at least $10.7 million*** depending on the damage scenario used.

Figure F-15
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event in Watseka

Damage Scenario	Average Market Value (2018)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Damage Scenario #1	$47,877	918	$6,153,152	$4,614,864	$10,768,016
Damage Scenario #2	$47,877	918	$9,669,239	$7,251,929	$16,921,168

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 such as schools.

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.

In terms of specific critical facility and infrastructure vulnerability, the following assets owned by the participating jurisdictions are located within a ***base floodplain***:

- *Watseka*: Public Works Facility, Wastewater Treatment Plant; four lift stations; and Fire Station #2;
- *Iroquois County CUSD #9*: Nettie Davis Elementary School and Wanda Kendall Elementary School.

Additional above-ground critical facilities and infrastructure, aside from key roads and bridges, located within a base floodplain in Watseka include IDOT's maintenance yard, Kingdom Gardens Senior Living, five residential group homes, one communication tower and one electrical substation.

Considerations

While the potential dollar loss scenario was only for a riverine flood event, the City has been made aware through the planning process of the impacts that can result from flash flood events. Watseka has experienced multiple events over the last 20 years as have adjoining and nearby municipalities and 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.

3.4 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 United States. 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?

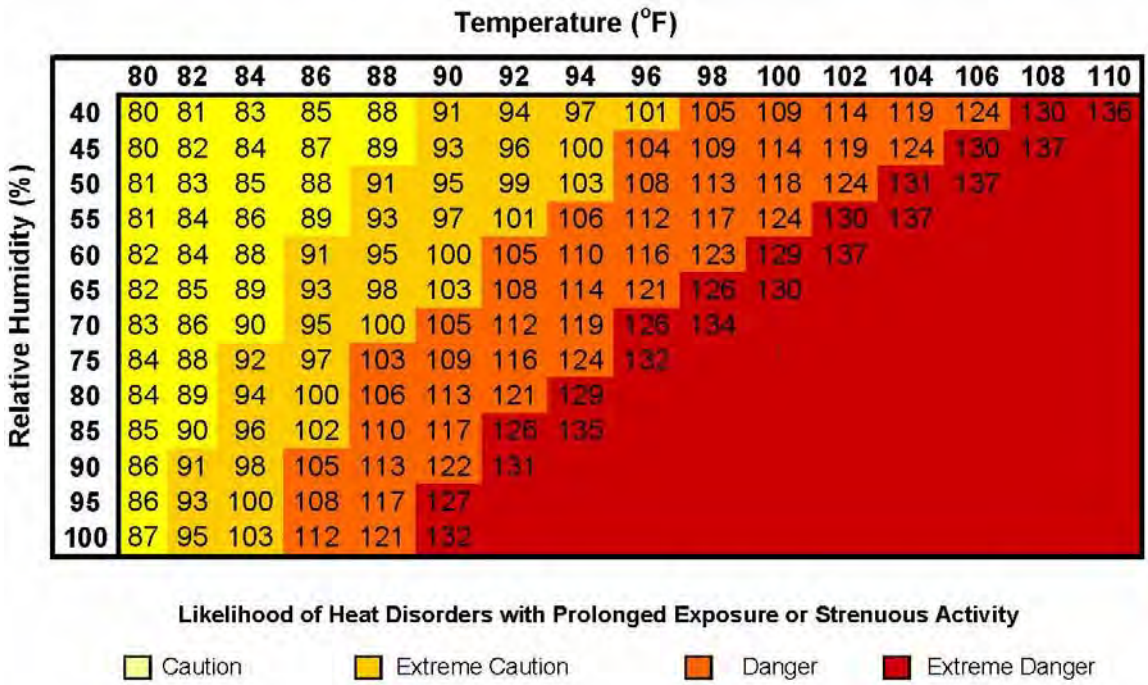
In an effort to raise the public's awareness of the hazards of excessive heat, the National Weather Service (NWS) devised the "Heat Index". The Heat Index, sometimes referred to as the "apparent temperature", is a measure of how hot it feels when relative humidity is added to the actual air temperature. **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



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 extreme 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 Chicago, Illinois. The Chicago Office is responsible for issuing alerts for Iroquois County (including Watseka.)

- **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 the maximum heat index to potentially reach 110°F or greater and the minimum heat index to remain at or above 75°F for at least 48 hours. Watches are typically issued within 24 to 72 hours prior to an event.
- **Advisory.** An excessive heat advisory is issued within 12 hours of the onset of an event when the maximum heat index is exceeding or expected to exceed 105°F.
- **Warning.** An excessive heat warning is issued within 12 hours of the onset of an event where the maximum heat index is expected to reach 110°F or greater and the minimum heat index is expected to remain at or above 75°F for at least 48 hours.

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?

Table 9, located in **Appendix J**, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Watseka. NOAA's Storm Events Database and NWS's COOP Data records were used to document nine occurrences of excessive heat in Watseka between 1995 and 2019.

Excessive Heat Fast Facts – Occurrences

Number of Excessive Heat Events Reported (1995 – 2019): ***9***

Hottest Temperature Recorded in the County: ***107°F (July 14, 1936)***

Most Likely Month for Excessive Heat Events to Occur: ***July***

Seven of the nine events (78%) began in July making this the peak month for excessive heat events in Watseka. Start times were unavailable for any of the events.

These represent the ***reported occurrences*** of excessive heat. The NWS acknowledges that excessive heat events are not well recorded. Only those events with impacts, such as injuries or fatalities, are reported. As a result, excessive heat events often go unreported and therefore, more events have almost certainly occurred than are documented in this section.

According to the Midwestern Regional Climate Center, almost continuous temperature records for Watseka have been kept from 1936 to present by the NWS COOP Observer Station two miles northwest of Watseka. Based on the available records, the hottest temperature recorded in Watseka was 107°F on July 14, 1936. **Figure EH-3** lists the hottest days recorded at the Watseka COOP observation station.

Figure EH-3
Hottest Days Recorded at Watseka NWS COOP Observer Station

	Date	Temperature		Date	Temperature
1	7/14/1936	107°F	8	7/4/1911	104°F
2	7/22/1901	106°F	9	7/5/1911	104°F
3	7/29/1913	105°F	10	9/14/1939	104°F
4	8/10/1913	105°F	11	7/14/1954	104°F
5	8/18/1988	105°F	12	6/26/1988	104°F
6	9/6/1899	104°F	13	8/19/1988	104°F
7	7/3/1911	104°F			

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by excessive heat?

Excessive heat affects all of Iroquois County, including Watseka. 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 Iroquois County's (including Watseka and the participating jurisdictions)hazard rating for excessive heat as "medium."

Do any of the participating municipalities have designated cooling centers?
No. Neither Watseka or any of the participating jurisdictions have designated cooling centers A "designated" cooling center is identified as any facility that has been *formally* identified by the municipality (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events. In addition, there are no State of Illinois-designated warming centers in Iroquois County.

What is the probability of future excessive heat events occurring?

Watseka has experienced nine verified occurrences of excessive heat between 1995 and 2019. With nine occurrences over the past 25 years, the probability or likelihood that Watseka will experience an excessive heat event in any given year is 36%. It is important to keep in mind that there are almost certainly gaps in the excessive heat data that distort this probability. More events have almost certainly occurred than are documented in this section which means the probability that the City will experience an excessive heat event in any given year is likely higher than 36%.

HAZARD VULNERABILITY

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

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of Watseka, including the participating jurisdictions, is vulnerable to the dangers presented by excessive heat. Since 2010, Watseka has experienced three verified 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. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to excessive heat.

What impacts resulted from the recorded excessive heat events?

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

In comparison, Illinois averages 74 heat-related fatalities annually according the Illinois State Water Survey's Climate Atlas of Illinois. Excessive heat has

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Impacts:
- Total Property 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/high***
- Buildings/Infrastructure/Critical Facilities: ***Low***

triggered more fatalities than any other natural hazard in Illinois. More fatalities are attributed to excessive heat than the combined number of fatalities attributed to floods, tornadoes, lightning and extreme cold.

While no recorded injuries or fatalities were reported as a result of excessive heat in Watseka, it does not mean that none occurred. It simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for 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 Watseka, excessive heat should not impact the municipal water supply since the City does not obtain its water from surface water bodies.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in Watseka, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be ***low***. This assessment is based on the absence of designated cooling centers in most of the participating municipalities tempered by the fact that Watseka does not have any 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 to high***. Sensitive populations such as older adults (those 70 years of age and older) and small children (those 5 years of age and younger) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure EH-4** identifies the percent of sensitive populations by participating jurisdiction based on 2010 census data.

Figure EH-4
Sensitive Populations by Participating Jurisdictions

Participating Jurisdiction	% of Population 70 year of age & Older	% of Population 5 years age & Younger	Total % of Sensitive Population
Watseka, City of	17.6%	6.0%	23.6%
Iroquois County	13.7%	5.5%	19.2%
State of Illinois	8.8%	6.5%	15.3%

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 City and the participating jurisdictions are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the City.

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Watseka, there is the potential for this to occur. The potential may increase over the next two decades if new power plants are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered ***low***, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the City 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.

3.5 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 26 drought events with losses exceeding $1 billion each (CPI-Adjusted) across the United States between 1980 and 2018. This is due in part to the sheer size of the areas affected.

What types of drought occur?

There are four main types of drought that occur: meteorological, agricultural, hydrological and socioeconomic. They are differentiated based on the use and need for water. The following provides a brief description of each type.

- **Meteorological Drought.** Meteorological drought is defined by the degree of dryness or rainfall deficit and the duration of the dry period. Due to climate differences, what might be considered a drought in one location of the country may not be in another location.
- **Agricultural Drought.** An agricultural drought refers to a period when rainfall deficits, soil moisture deficits, reduced ground water or reservoir levels needed for irrigation impact crop development and yields.
- **Hydrological Drought.** Hydrological drought refers to a period when precipitation deficits (including snowfall) impact surface (stream flow, reservoir and lake levels) and subsurface (aquifers) water supply levels.
- **Socioeconomic Drought.** Socioeconomic drought refers to a period when the demand for an economic good (fruit, vegetables, grains, etc.) exceeds the supply as a result of weather-related shortfall in the water supply.

How are droughts measured?

There are numerous quantitative measures (indicators and indices) that have been developed to measure drought. How these indicators and indices measure drought depends on the discipline affected (i.e., agriculture, hydrology, meteorology, etc.) and the region being considered. There is no single index or indicator that can account for and be applied to all types of drought.

Although none of the major indices are inherently superior to the rest, some are better suited than others for certain uses. The first comprehensive drought index developed in the United States was the Palmer Drought Severity Index (PDSI). The PDSI is calculated based on precipitation and temperature data, as well as the local Available Water Content of the soil. It is most effective

measuring drought impacts on agriculture. For many years it was the only operational drought index and it is still very popular around the world.

The Standardized Precipitation Index (SPI), developed in 1993, uses precipitation records for any location to develop a probability of precipitation for any time scale in order to reflect the impact of drought on the availability of different water resources (groundwater, reservoir storage, streamflow, snowpack, etc.) In 2009 the World Meteorological Organization recommended SPI as the main meteorological drought index that countries should use to monitor and follow drought conditions.

The first operational 'composite' approach applied in the United States was the U.S. Drought Monitor (USDM). The USDM utilizes five key indicators, numerous supplementary indicators and local reports from expert observers around the country to produce a drought intensity rating that is ideal for monitoring droughts that have many impacts, especially on agriculture and water resources during all seasons over all climate types. NOAA's Storm Events Database records include USDM ratings and utilized them along with additional weather information to describe the severity of the drought conditions impacting affected counties. Therefore, this Plan will utilize USDM ratings to identify and describe previous drought events recorded within the City. The following provides a more detailed discussion of the USDM to aid the Plan's developers and the general public in understanding how droughts are identified and categorized.

U.S. Drought Monitor (USDM)

Established in 1999, the USDM is a relatively new index that combines quantitative measures with input from experts in the field. It is designed to provide the general public, media, government officials and others with an easily understandable "big picture" overview of drought conditions across the United States. It is unique in that it combines a variety of 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 United States. The USDM is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture, and the National Oceanic and Atmospheric Administration.

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

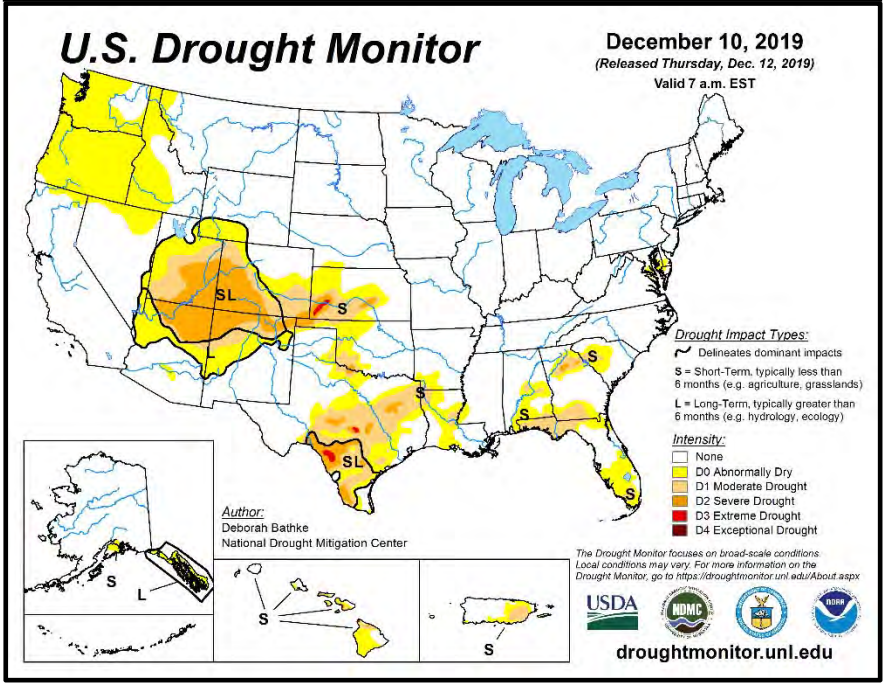
look at drought conditions in the United States. It is not designed to infer specifics about local conditions.

Figure DR-1
U.S. Drought Monitor – Drought Severity Classifications

Category	Possible Impacts
D0 (Abnormally Dry)	• Going into drought: - short-term dryness slowing planting, growth of crops or pastures. • Coming out of drought: - some lingering water deficits - pastures or crops not fully recovered
D1 (Moderate Drought)	• Some damage to crops, pastures • Streams, reservoirs, or wells low; some water shortages developing or imminent • Voluntary water-use restrictions requested
D2 (Severe Drought)	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3 (Extreme Drought)	• Major crop/pasture losses • Widespread water shortages or restrictions
D4 (Exceptional Drought)	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Source: U.S. Drought Monitor.

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 United States 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 – 2019):6

Table 10, located in **Appendix J**, summarizes the previous occurrences as well as the extent or magnitude of the drought events recorded in Iroquois County, including Watseka. NOAA's Storm Events Database, the Illinois State Water Survey, the Illinois Emergency Management Agency (IEMA) and the USDA have documented six official droughts for Iroquois County between 1980 and 2019.

The State of Illinois Drought Preparedness and Response Plan identified seven 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 Iroquois County and Watseka were impacted was unavailable.

What locations are affected by drought?

Drought affects all of Iroquois County, including WatsekaDroughts, 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 Iroquois County's (including Watseka and the participating jurisdictions)hazard rating for drought as "low."

What is the probability of future drought events occurring?

Watseka has experienced six droughts between 1980 and 2019. With six occurrences over 40 years, the probability or likelihood that the City may experience a drought in any given year is 15%. However, if earlier recorded droughts are factored in, then the probability that Watseka 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 Watseka, 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 City. Since 2010, Watseka has experienced three droughts.

Do any of the participating jurisdictions consider drought 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 drought to be among their community's greatest vulnerabilities. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to drought.

What impacts resulted from the recorded drought events?

Damage information was either unavailable or none was recorded for any of the six drought events experienced between 1980 and 2019.

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.

Drought Fast Facts – Impacts/Risk

Drought Impacts:
- Total Property Damage: ***n/a***
- Total Crop Damage: ***n/a***

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

Crop Yield Reductions

Since there is very little farmland within the municipal limits of the City, this analysis did not focus on impacts associated with agriculture, including crop yield reductions. However, crop yield reductions for Iroquois County were found to be most severe for the 1988 drought when there was a 55.5% reduction in corn yields and a 47.6% reduction in soybean yields.

Drinking Water Shortages

Communities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. The City obtains all of its water from relatively deep sand and gravel aquifers, making its water supply less vulnerable to water shortages than those municipalities that rely on surface water sources or shallow wells. Discussions with the Mayor, Public Works Director and Water Supervisor did not identify any impacts, such as enacted water restrictions or water shortages, as a result of any of the recent droughts

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the City, drought events do not typically cause injuries or fatalities. The primary concern centers 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 Watseka 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 City 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 property damage dollar losses will be excessive. The primary concern associated with drought for the City is the impacts to its drinking water supplies. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers etc.).

3.5 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 United States 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 United States annually.

How are tornadoes rated?

Originally tornadoes were rated using the Fujita Scale (F-Scale), which related the degree of damage caused by a tornado to the intensity of the tornado's wind speed. The Scale identified six categories of damage, F0 through F5. **Figure 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 Chicago, Illinois is responsible for issuing ***tornado watches*** and ***warnings*** for Watseka depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A tornado watch is issued when atmospheric conditions are favorable for the development of severe thunderstorms potentially capable of producing tornadoes. 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 11, located in **Appendix J**, summarize the previous occurrences as well as the extent or magnitude of tornado events recorded in Watseka. NOAA's Storm Events Database have documented two occurrences of tornadoes in Watseka between 1950 and 2019. In comparison, there have been 46 tornadoes in Iroquois County between 1950 and 2019 and 2,443 tornadoes statewide between 1950 and 2017 according to NOAA's Storm Prediction Center.

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 - 2019): ***2***

Highest F-Scale Rating Recorded: ***F-1***

Most Likely Months for Tornadoes to Occur: ***April & October***

Most Likely Time for Tornadoes to Occur: ***early evening***

Average Length of a Tornado: ***0.75 miles***

Average Width of a Tornado: ***60 yards***

Average Damage Pathway of a Tornado: ***0.03 sq. mi.***

Longest Tornado Path in the city: ***1 mile (April 26, 1994)***

Widest Tornado Path in the County: ***100 yards (October 3, 1990)***

Both of the tornadoes that impacted the City were F1 rated tornadoes while the highest rated tornado recorded in Iroquois County was an F3. Of the two tornadoes, one occurred in April while the other occurred in October. In comparison, 1,584 of the 2,443 tornadoes (65%) recorded in Illinois from 1950 through 2017 took place in April, May, and June. Both tornadoes occurred during the p.m. hours. The tornadoes that have impacted Watseka have varied from 0.5 miles to 1.0 mile in length and from 20 yards to 100 yards in width.

What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire City. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Iroquois County's (including Watseka and the participating jurisdictions) hazard rating for tornadoes as "medium."

What is the probability of future tornadoes occurring?

Watseka has had two verified occurrences of tornadoes between 1950 and 2019. With two tornadoes over the past 70 years, the probability or likelihood that a tornado will touchdown somewhere in Watseka in any given year is 3%.

HAZARD VULNERABILITY

The following describes the vulnerability of Watseka, 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 Watseka, including the participating jurisdictions, is vulnerable to the dangers presented by tornadoes.

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

As part of the Critical Facilities Vulnerability Survey, participating jurisdictions were also asked to identify critical facilities and infrastructure within their communities they felt have the greatest vulnerability to natural hazards and to which hazards. Iroquois Memorial Hospital identified power lines and communication as infrastructure with specific vulnerability to tornadoes.

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, indicates that between 1950 and 2019, the two tornadoes caused $2,550,000 in property damages. The majority of the damage was sustained as a result of the October 3, 1990 tornado. No injuries or fatalities were reported as a result of either tornado event. In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts:
- Total Property Damage (2 events): ***$2,550,000***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Tornado Risk/Vulnerability:
- Public Health & Safety: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

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

In general, if a tornado were to touchdown or pass through any of portion of the City, the risk to the public health and safety would be considered ***high***. This is based on the fact the City is relatively small in size and has relatively dense and evenly distributed populations within its corporate boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of the City it will have a greater likelihood of causing injuries or even fatalities.

Do any participating jurisdictions have community safe rooms?

No. None of the participating jurisdictions have community safe rooms. As a result, if a tornado were to touch down or pass through any portion of the City, 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 Watseka 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. Watseka has no community safe rooms that could be used for shelter from a tornado.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication and transportation will be disrupted in and around the affected area.

In general, if a tornado were to touch down or pass through any portion of the City 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 Watseka where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within the municipal limits it will have a greater likelihood of causing substantial property damage.

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

Yes and No. While the City has building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from lower-rated tornadoes, future buildings, infrastructure and critical facilities share the same vulnerability as existing ones to higher-rate tornadoes.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and

communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most cases.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. With only two tornadoes impacting the over the last 70 years, there is insufficient information available to prepare a reasonable estimate of future potential dollar losses to vulnerable structures from tornadoes. However, since all existing structures within Watseka are vulnerable to damage, it is highly likely that there will be future dollar losses if a tornado touches down or passes through any part of the City.

3.7 EARTHQUAKES

HAZARD IDENTIFICATION

What is the definition of an earthquake?

An earthquake is a sudden shaking of the ground caused when rocks forming the earth's crust slip or move past each other along a fault (a fracture in the rocks). Most earthquakes occur along the boundaries of the earth's tectonic plates. These slow-moving plates are being pulled and dragged in different directions, sliding over, under and past each other. Occasionally, as the plates move past each other, their jagged edges will catch or stick causing a gradual buildup of pressure (energy).

Eventually, the force exerted by the moving plates overcomes the resistance at the edges and the plates snap into a new position. This abrupt shift releases the pent-up energy, producing vibrations or seismic waves that travel outward from the earthquake's point of origin. The location below the earth's surface where the earthquake starts is known as the hypocenter or focus. The point on the earth's surface directly above the focus is the epicenter.

The destruction caused by an earthquake may range from light to catastrophic depending on a number of factors including the magnitude of the earthquake, the distance from the epicenter, the local geologic conditions as well as construction standards and time of day (i.e., rush hour). Earthquake damage may include power outages, general property damage, road and bridge failure, collapsed buildings and utility damage (ruptured gas lines, broken water mains, etc.).

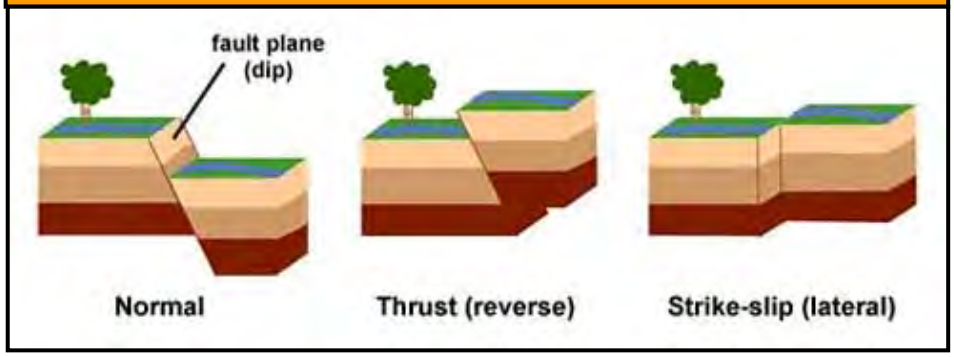
Most of the damage done by an earthquake is caused by its secondary or indirect effects. These secondary effects result from the seismic waves released by the earthquake and include ground shaking, surface faulting, liquefaction, landslides and, in rare cases, tsunamis.

According to the U.S. Geological Survey, more than 143 million Americans in the contiguous United States are exposed to potentially damaging ground shaking from earthquakes. Over 44 million of those Americans, located in 18 states, are exposed to very strong ground shaking from earthquakes. Illinois ranks 10th in terms of the number of individuals exposed to very strong ground shaking. The Federal Emergency Management Agency's Hazus analysis indicates that the annualized earthquake losses to the national building stock is $6.1 billion per year. A majority of the average annual loss is concentrated in California ($3.7 million). The central United States (including Illinois) ranks third in annualized earthquake losses at $480 billion, behind the pacific northwest (Washington and Oregon) with annualized earthquake losses at $710 billion.

What is a fault?

A fault is a fracture or zone of fractures in the earth's crust between two blocks of rock. They may range in length from a few millimeters to thousands of kilometers. Many faults form along tectonic plate boundaries. Faults are classified based on the angle of the fault with respect to the surface (known as the dip) and the direction of slip or movement along the fault. There are three main groups of faults: normal, thrust (reverse) and strike-slip (lateral). **Figure EQ-1** provides an illustration of each type of fault.

Figure EQ-1
Fault Illustration



Source: U. S. Geological Survey.

Normal faults occur in response to pulling or tension along the two blocks of rock causing the overlying block to move down the dip of the fault plane. Most of the faults in Illinois are normal faults. Thrust or reverse faults occur in response to squeezing or compression of the two blocks of rock causing the overlying block to move up the dip of the fault plane. Strike-slip or lateral faults can occur in response to either pulling/tension or squeezing/compression causing the blocks to move horizontally past each other.

Geologists have found that earthquakes tend to recur along faults, which reflect zones of weakness in the earth's crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

What are tectonic plates?

Tectonic plates are large, irregularly-shaped, relatively rigid sections of the earth's crust that float on the top, fluid layer of the earth's mantle. There are about a dozen tectonic plates that make up the surface of the planet. These plates are approximately 50 to 60 miles thick and the largest are millions of square miles in size.

How are earthquakes measured?

The severity of an earthquake is measured in terms of its magnitude and intensity. A brief description of both terms and the scales used to measure each are provided below.

Magnitude

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-2** categorizes earthquakes by class based on their magnitude (i.e., Richter Scale value). Any earthquake with a magnitude less than 3.0 on the Richter Scale is classified as a micro earthquake while any earthquake with a magnitude of 8.0 or greater on the Richter Scale is considered a "great" earthquake. Earthquakes with a magnitude of 2.0 or less are not commonly felt by individuals. The largest earthquake to occur in the United States since 1900 took place off the coast of Alaska in Prince William Sound on March 28, 1964 and registered a 9.2 on the Richter Scale.

Figure EQ-2
Earthquake Magnitude Classes

Class	Magnitude (Richter Scale)
micro	smaller than 3.0
minor	3.0 – 3.9
light	4.0 – 4.9
moderate	5.0 – 5.9
strong	6.0 – 6.9
major	7.0 – 7.9
great	8.0 or larger

Source: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis

Intensity

Intensity refers to the effect an earthquake has on a particular location. The intensity of an earthquake is determined from observations made of the damage inflicted on individuals, structures and the environment. As a result, intensity does not have a mathematical basis; instead it is an arbitrary ranking of observed effects. In addition, intensity generally diminishes with distance. There may be multiple intensity recordings for a region depending on a location's distance from the epicenter.

Although numerous intensity scales have been developed over the years, the one currently used in the United States is the Modified Mercalli Intensity Scale. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (i.e., felt only by a few people at rest, felt quite noticeably by persons indoors, etc.).

The higher numbers of the scale are based on observed structural damage (i.e., broken windows, general damage to foundations etc.). Structural engineers usually contribute information when assigning intensity values of VIII or greater. **Figure EQ-3** provides a description of the damages associated with each level of intensity as well as comparing Richter Scales values to Modified Mercalli Intensity Scale values.

Generally, the Modified Mercalli Intensity value assigned to a specific site after an earthquake is a more meaningful measure of severity to the general public than magnitude because intensity refers to the effects actually experienced at that location.

Figure EQ-3
Comparison of Richter Scale and Modified Mercalli Intensity Scale

Richter Scale	Modified Mercalli Scale	Observations
1.0 – 1.9	I	Felt by very few people; barely noticeable. No damage.
2.0 – 2.9	II	Felt by a few people, especially on the upper floors of buildings. No damage.
3.0 – 3.9	III	Noticeable indoors, especially on the upper floors of buildings, but may not be recognized as an earthquake. Standing cars may rock slightly; vibrations similar to the passing of a truck. No damage.
4.0	IV	Felt by many indoors and a few outdoors. Dishes, windows, and doors disturbed. Standing cars rocked noticeably. No damage.
4.1 – 4.9	V	Felt by nearly everyone. Small, unstable objects displaced or upset; some dishes and glassware broken. Negligible damage.
5.0 – 5.9	VI	Felt by everyone. Difficult to stand. Some heavy furniture moved. Weak plaster may fall and some masonry, such as chimneys, may be slightly damaged. Slight damage.
6.0	VII	Slight to moderate damage to well-built ordinary structures. Considerable damage to poorly-built structures. Some chimneys may break. Some walls may fall.
6.1 – 6.9	VIII	Considerable damage to ordinary buildings. Severe damage to poorly built buildings. Some walls collapse. Chimneys, monuments, factory stacks, columns fall.
7.0	IX	Severe structural damage in substantial buildings, with partial collapses. Buildings shifted off foundations. Ground cracks noticeable.
7.1 – 7.9	X	Most masonry and frame structures and their foundations destroyed. Some well-built wooden structures destroyed. Train tracks bent. Ground badly cracked. Landslides.
8.0	XI	Few, if any structures remain standing. Bridges destroyed. Wide cracks in ground. Train tracks bent greatly. Wholesale destruction.
> 8.0	XII	Total damage. Lines of sight and level are distorted. Waves seen on the ground. Objects thrown up into the air.

Sources: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis.
U.S. Geological Survey.

When and where do earthquakes occur?

Earthquakes can strike any location at any time. However, history has shown that most earthquakes occur in the same general areas year after year, principally in three large zones around the globe. The world's greatest earthquake belt, the circum-Pacific seismic belt (nicknamed the "Ring of Fire"), is found along the rim of the Pacific Ocean, where about 81 percent of the world's largest earthquakes occur.

The second prominent belt is the Alpide, which extends from Java to Sumatra and through the Himalayan Mountains, the Mediterranean Sea and out into the Atlantic Ocean. It accounts for about 17 percent of the world's largest earthquakes, including those in Iran, Turkey and Pakistan. The third belt follows the submerged mid-Atlantic Ridge, the longest mountain range in the world, nearly splitting the entire Atlantic Ocean north to south.

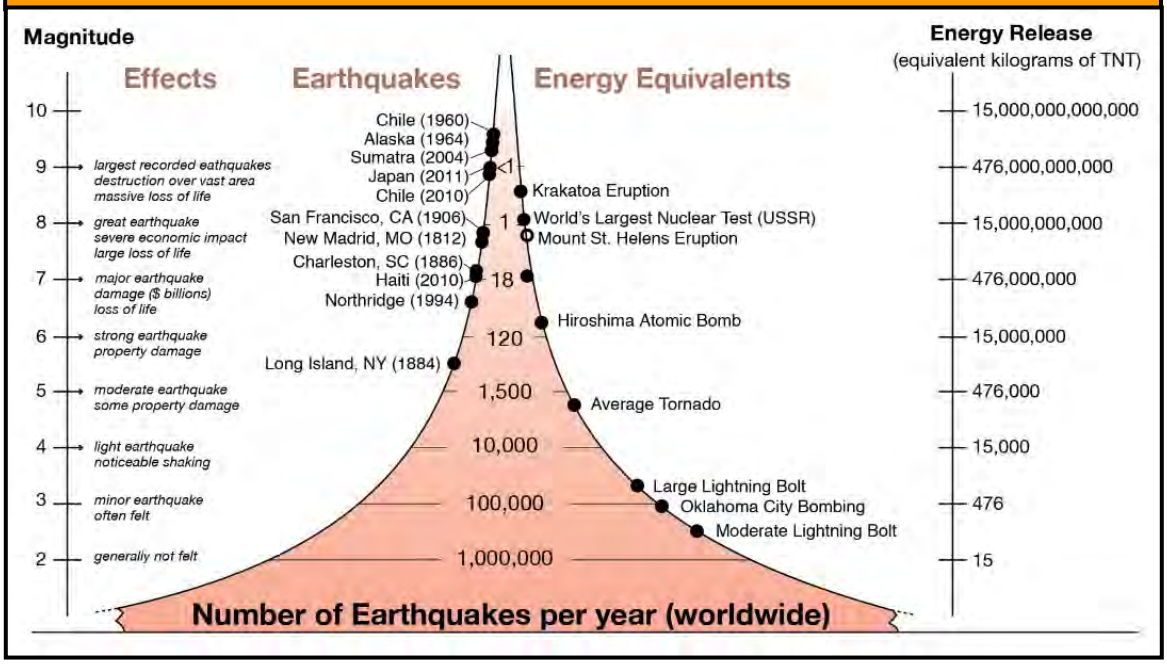
While most earthquakes occur along plate boundaries some are known to occur within the interior of a plate. (As the plates continue to move and plate boundaries change over time, weakened

boundary regions become part of the interiors of the plates.) Earthquakes can occur along zones of weakness within a plate in response to stresses that originate at the edges of the plate or from deep within the earth's crust. The New Madrid earthquakes of 1811 and 1812 occurred within the North American plate.

How often do earthquakes occur?

Earthquakes occur every day. Magnitude 2 and smaller earthquakes occur several hundred times a day worldwide. These earthquakes are known as micro earthquakes and are generally not felt by humans. Major earthquakes, greater than magnitude 7, generally occur at least once a month. **Figure EQ-4** 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-4
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 future potential events (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

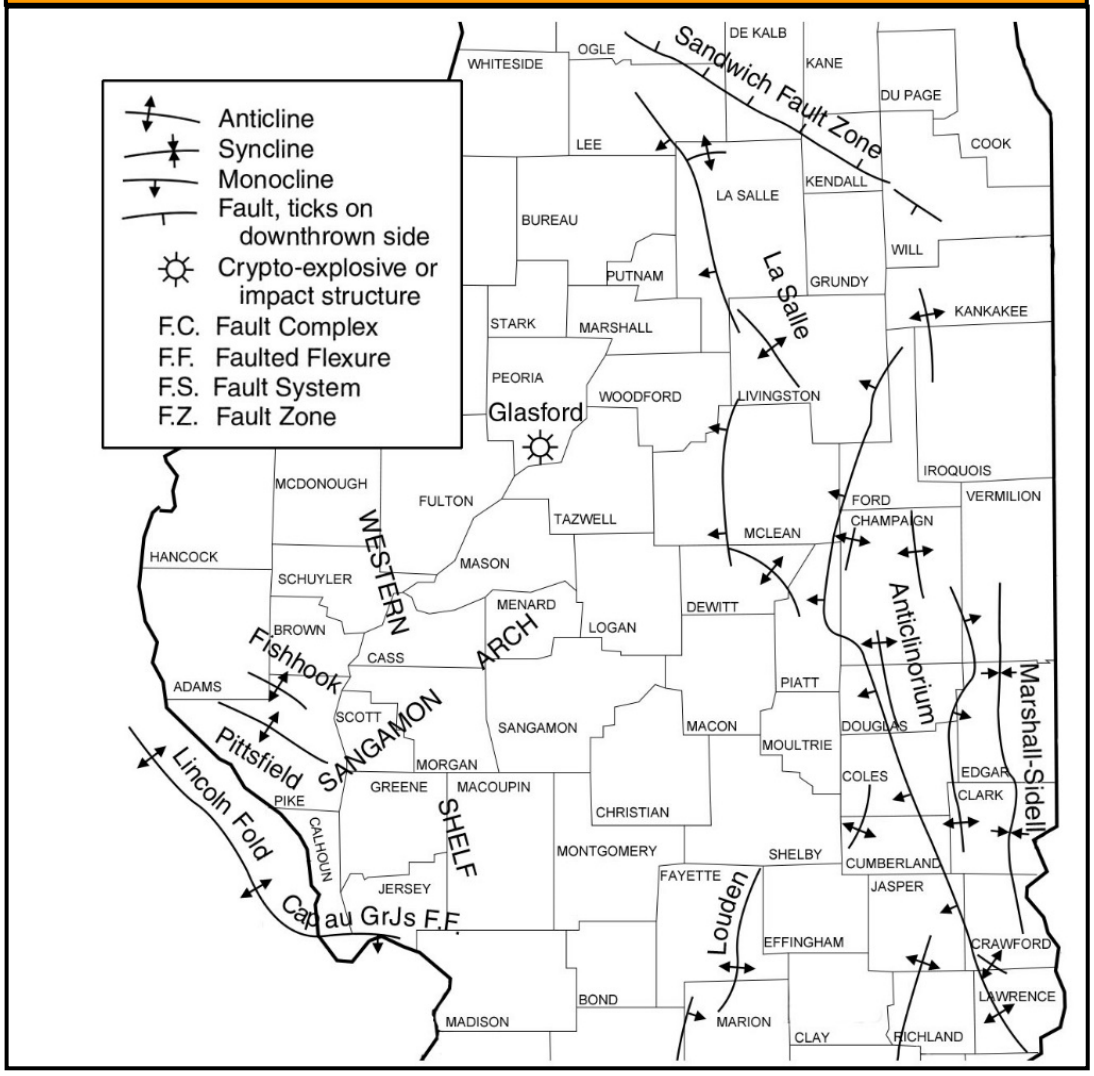
Are there any fault zones located within the City or County?

No. While there are no known fault zones located in Watseka or Iroquois County, there is one known geologic structure, the La Salle Anticlinorium. The La Salle Anticlinorium is composed of a group or zone of closely related anticlines, domes, monoclines and synclines, several of which are individually

named. In 2004 an earthquake was recorded along one of the Anticlinorium's monoclines in LaSalle County. **Figure EQ-5** illustrates the location of this geologic structure.

In addition, there is a known fault zone located in the region, the Sandwich Fault Zone. The Sandwich Fault Zone is approximately 85 miles long and runs northwest-southeast across northern Illinois, from central Ogle County to southern Will County and is the largest fault zone in northern Illinois. This fault varies in width from ½ mile to 2 miles wide. **Figure EQ-5** illustrates the location of the fault zone.

Figure EQ-5
Geological Structures in Central Illinois



Source: Illinois State Geological Survey.

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

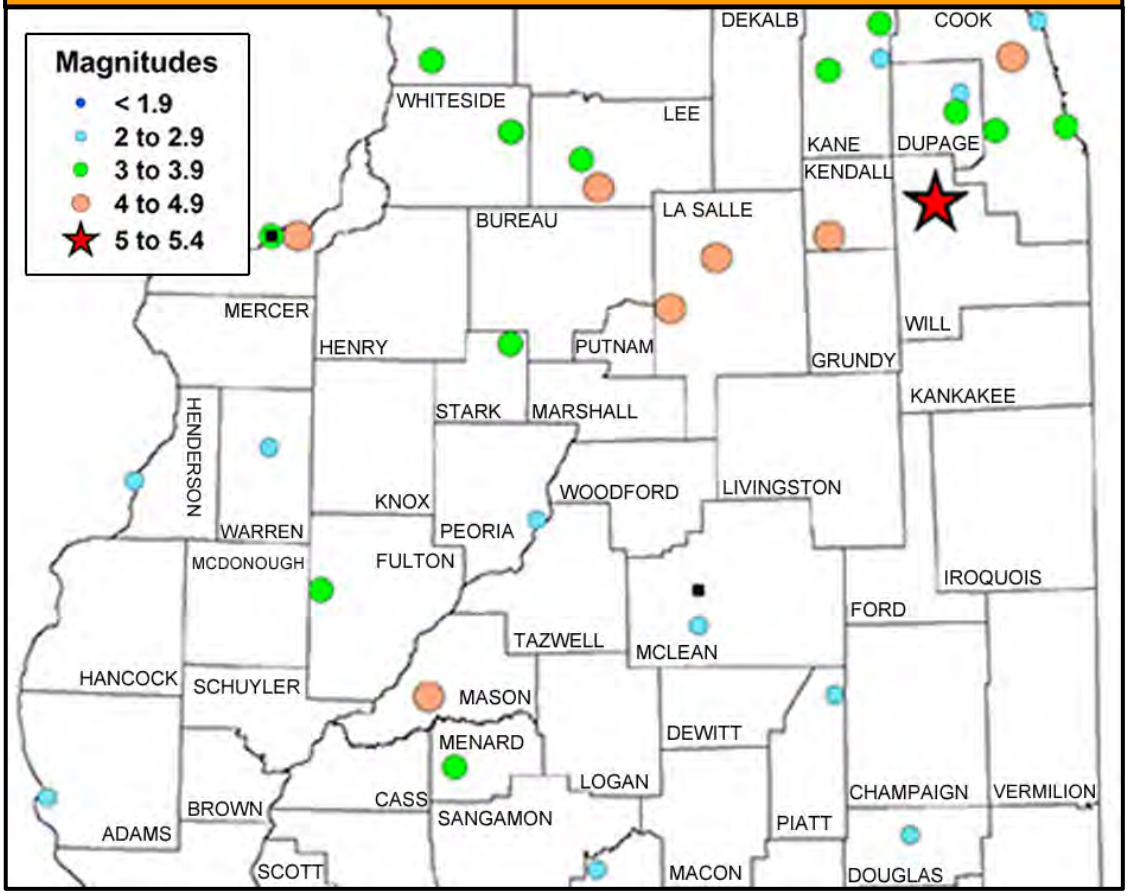
According to the Illinois State Geological Survey, the U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis, no earthquakes have originated in Iroquois County during the last 200 years. While no earthquakes have originated in

the County, residents have felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description, by region, of these events. **Figure EQ-6** illustrates the epicenters of the nearby earthquakes.

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2015): ***0***
Fault Zones Located within the County: ***None***
Earthquakes Originating in adjacent Counties (1795-2013): 0
Fault Zones Located in adjacent Counties: ***None***

Figure EQ-6
Earthquakes Originating in North-Central Illinois



Source: Illinois State Geological Survey.

North-Central Illinois

One earthquake has originated in nearby Warren County Indiana. On November 25, 1974 an earthquake with an estimated magnitude of 2.4 originated approximately five miles west of Williamsport Indiana. Damage information was either unavailable or none was reported for this event.

Northern Illinois

In addition to the above referenced event, there have been approximately two dozen other earthquakes that have occurred in northern Illinois in the last century, though none of them were

greater than a magnitude 5.1. These earthquakes generally caused minor damage within 10 to 20 miles of the epicenter and were felt over several counties. Earthquakes greater than a magnitude 5 are generally not expected in this region. The following highlights a few of the other recent earthquakes that have taken place in northern Illinois.

- On March 25, 2015 a magnitude 2.9 earthquake took place at Lake in the Hills in McHenry County. This earthquake was felt over several counties. Damage information was unavailable for this event.
- A magnitude 3.2 earthquake took place on November 4, 2013 on the east side of McCook in Cook County. This earthquake was felt mainly in the Chicago metro area. Damage information was unavailable for this event.
- On February 10, 2010 a magnitude 3.8 earthquake took place approximately two miles northeast of Virgil in Kane County. This earthquake was felt over much of Illinois, Indiana and central and southern Wisconsin. Some minor structural damage was reported.
- The largest earthquake to take place in northern Illinois in the past several hundred years occurred on May 26, 1909. The exact location of this magnitude 5.1 earthquake isn't known, but the greatest damage occurred in and near Aurora where many chimneys fell and gas lines were ruptured. Minor structural damage was reported across northern and central Illinois and southern Wisconsin. Ground shaking was felt over seven states.

Southern Illinois

Watseka 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 United States and southern Ontario, Canada.
- A magnitude 5.2 earthquake took place on June 10, 1987 in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern United States and southern Ontario, Canada.
- The strongest earthquake in the central United States during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968 with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern United States and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental United States took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi

Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

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

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

Earthquake events generally affect the entire County. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Watseka's proximity to 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 Iroquois County's (including Watseka and the participating jurisdictions) hazard rating for earthquakes as "low."

According to the USGS, Iroquois County can expect two to four occurrences of damaging earthquake shaking over a 10,000-year period. **Figure EQ-7** illustrates the frequency of damaging earthquake shaking around the U.S.

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central United States within the next 50 years is between 86% and 97%.

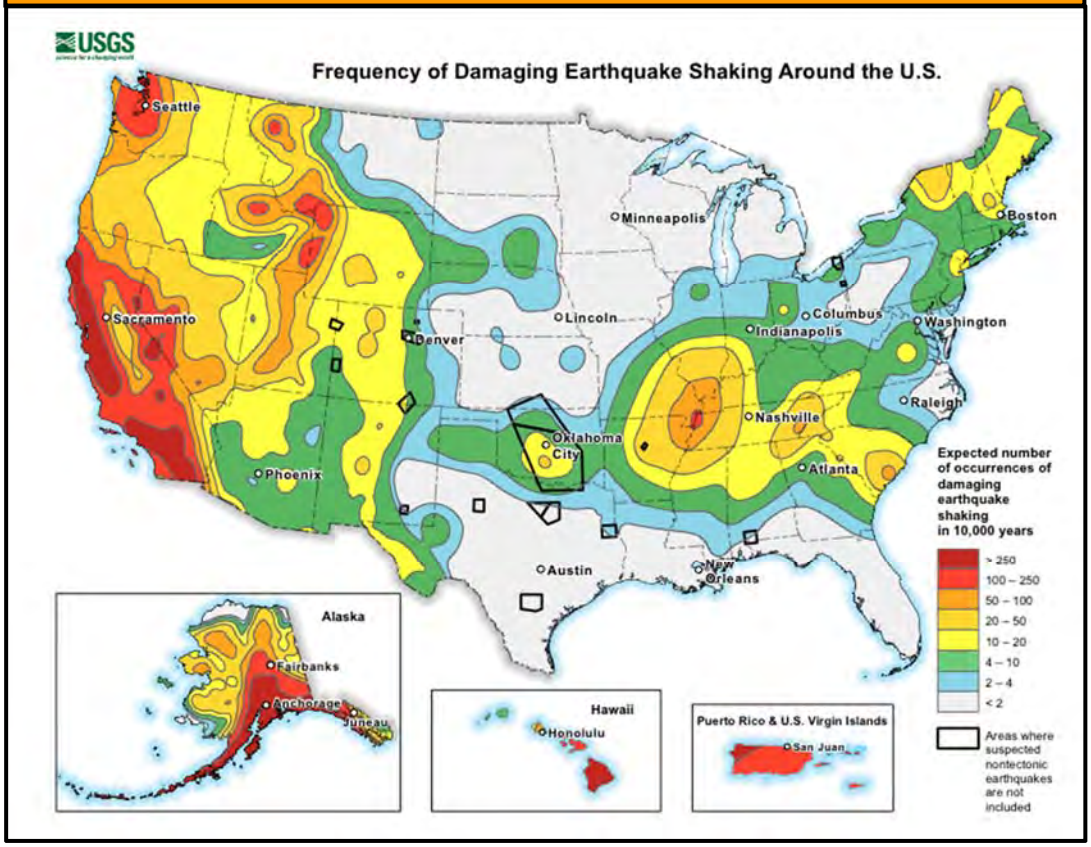
HAZARD VULNERABILITY

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 Watseka, including the participating jurisdictions, is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central United States conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

Figure EQ-7
Frequency of Damaging Earthquake Shaking Around the U.S.



Source: United State Geological Survey.

This vulnerability, found throughout most of Illinois and all of Iroquois County (including Watseka), is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines and natural gas pipelines.

Earthquake Fast Facts – Impacts/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: ***Low/Medium***
- Buildings/Infrastructure/Critical Facilities – Light/ Moderate Quake within the County or immediate region: ***Low***
- Buildings/Infrastructure/Critical Facilities – Major Quake in the region: ***Low/Medium***

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Iroquois County (including Watseka) 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 Watseka is not vulnerable to damaging earthquakes. This perception has allowed the County and participating jurisdictions 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. In addition, none of the jurisdictions identified any critical facilities or infrastructure within their communities as having a specific vulnerability to earthquakes.

What impacts resulted from the recorded earthquake events?

While Watseka residents felt the earthquakes that occurred across 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 Iroquois County felt those quakes; however historical records do not indicate the intensity or impacts that these quakes had on the County. If another earthquake the magnitude of those recorded in 1811 and 1812 occurs again along the New Madrid seismic zone, the damage that will be experienced in northern Illinois is not expected to be substantial.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health and public safety. **Figure EQ-8** details the potential impacts that may be experienced by the City 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 Watseka or Iroquois County, the likelihood that an earthquake will originate in City is very small, decreasing the chances for catastrophic damages. However, if a light earthquake originates within the City or County or from the faults in the region, the risk or vulnerability to public health and safety is considered ***low***. This risk is elevated from ***low to low/medium*** for a major earthquake originating in the immediate region. There have not been any earthquakes associated with the fault zones in northern Illinois in the last 200 years and these fault zones are not expected to produce an earthquake greater than a magnitude 5.0.

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

Yes. All existing buildings, infrastructure and critical facilities located in Watseka are vulnerable to damage from earthquakes. However, given the City's size (just over 5,000 individuals), it's population density, the fact that there are virtually no buildings higher than two stories (with the exception of grain elevators) and earthquakes larger than magnitude 5.0 are not expected in this region, the damage is anticipated to be slight with only superficial structure damage such as broken windows and cracks in weak plaster and masonry.

Figure EQ-8
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 US 24 and State Route 1 (especially if the quake originates along the Wabash Valley seismic zone) 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	*Health* • Use of City health facilities (especially if the quake originates along the Wabash Valley seismic zone) 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

While unlikely, 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-9** 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 Iroquois County, including Watseka, would be a VI according to the *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency.

Figure EQ-9
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]
Iroquois County CUSD	---	---	---	---	4	---	---	---	---
Iroquois Memorial Hospital	---	---	---	---	---	---	---	1	1
Watseka	0	2	1	0	---	3	1	1	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.

An earthquake also has the ability to damage critical infrastructure 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-3** 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 considered ***low/medium*** for a strong earthquake originating in the region.

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

Yes. All future buildings, infrastructure and critical facilities located in Watseka are vulnerable to damage from earthquakes. While Watseka 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 Iroquois County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. However, according to the Iroquois County Chief County Assessment Officer, the total equalized assessed value for properties in Watseka was $62,359,613 in 2018. Residential structures and associated buildings accounted for 65% ($40,487,916) of the total equalized assessed value. 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 Watseka's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the City 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.

4.0 MITIGATION STRATEGY

The mitigation strategy identifies how participating jurisdictions are going to reduce the potential loss of life and property damage that results from the natural hazards identified in the Risk Assessment section of this Plan. The strategy includes:

- Developing mitigation goals. Mitigation goals describe the objective(s) or desired outcome(s) that the participants would like to accomplish in term of hazard and loss prevention. These goals are intended to reduce or eliminate long-term vulnerabilities to natural hazards.
- 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 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.
- Developing 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 which actions are likely to provide the greatest benefit based on the financial cost and staffing efforts needed.

A detailed discussion of each aspect of the mitigation strategy is provided below.

4.1 MITIGATION GOALS

Developing mitigation goals was the first step in creating the mitigation strategy. Based on early communications with the Planning Committee members, the consultant developed a preliminary list of eight hazard mitigation goals. This list of goals was distributed at the first meeting held on October 24, 2019. Members were asked to review the list 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 December 19, 2019 meeting, the group discussed the preliminary list of goals and approved them with one minor language addition. **Figure MIT-1** lists the approved mitigation goals.

Figure MIT-1 Mitigation Goals	
Goal 1	Educate people about the natural hazards they face and the ways they can protect themselves, their homes, and their businesses and from those hazards.
Goal 2	Protect the lives, health, and safety of the people and animals in the City from the dangers of natural hazards.
Goal 3	Protect existing infrastructure and design new infrastructure (buildings, roads, bridges, utilities, water supplies, sanitary sewer systems, etc.) to be resilient to the impacts of natural hazards.
Goal 4	Incorporate natural hazard mitigation into existing as well as new community plans and regulations.
Goal 5	Place a priority on protecting public services, including critical facilities, utilities, roads and schools.
Goal 6	Preserve and protect the rivers, creeks and floodplains in our City without impacting those downstream.
Goal 7	Ensure that new developments do not create new exposures to damage from natural hazards.
Goal 8	Protect historic, cultural, and natural resources from the effects of natural hazards.

4.2 MITIGATION ACTION IDENTIFICATION

Following the development of the mitigation goals, the Planning Committee members were asked to consult with their respective jurisdictions to identify a comprehensive range of ***jurisdiction-specific mitigation actions***. The City was asked to identify mitigation actions that would ensure their continued compliance with the National Flood Insurance Program.

The compiled lists of 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.

4.3 MITIGATION ACTION ANALYSIS

The mitigation actions identified were then assigned to one of four broad mitigation action categories which allowed Planning Committee members to compare and consolidate similar actions. **Figure MIT-2** identifies each mitigation action 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.

Figure MIT-2 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.)

4.4 MITIGATION ACTION PRIORITIZATION METHODOLOGY

Next, the Planning Committee worked with the Consultant to develop a method to prioritize mitigation actions. Various methodologies were discussed with the Committee members at the third meeting held on February 6, 2020. **Figure MIT-3** identifies and describes the four-tiered prioritization methodology adopted by the Planning Committee.

This methodology is based on two key factors: 1) the frequency of the hazard and 2) the degree of mitigation attained. The methodology developed provides a means of objectively determining which actions have a greater likelihood of 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-3 Mitigation Action Prioritization Methodology			
		Hazard	
		Most Frequent Hazard **(M)** (i.e., severe storms, severe winter storms/extreme cold, floods)	Less Frequent Hazard **(L)** (i.e., excessive heat, drought, tornadoes earthquakes)
Mitigation Action	Mitigation Action with the Potential to Virtually Eliminate or Significantly Reduce Impacts **(H)**	**HM** mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from the most significant hazards	**HL** mitigation action will virtually eliminate damages and/or significantly reduce the probability of fatalities and injuries from less significant hazards
	Mitigation Action with the Potential to Reduce Impacts **(L)**	**LM** mitigation action has the potential to reduce damages, fatalities and/or injuries from the most significant hazards	**LL** mitigation action has the potential to reduce damages, fatalities and/or injuries from less significant hazards

4.5 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.
- Conducting a preliminary cost/benefit analysis.

Oversight & Administration

It is important to keep in mind that the City has extremely limited capabilities related to organization and staffing for oversight and administration of the identified mitigation actions. The City is small in size, with a population of just under 5,300 individuals. Their organizational structure is such that there are very few offices and/or departments. Furthermore, trained staff and support usually available from planning commissions is only available on a contractual basis from the Champaign County Regional Planning Commission. As a result, the Watseka identified the mayor/city council as the entity responsible for oversight and administration simply because it is the only practical option given their organizational constraints.

Funding Sources

Since the City does not have an administrator or an individual with grant writing capabilities and none of the other participating jurisdictions are associated with entities that provide grant writing

services, 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-to-one contacts so that an appropriate funding source could be identified for each mitigation action.

A handout was prepared and distributed that provided specific information on the non-FEMA grant sources available including the grant name, the government agency responsible for administering the grant, grant ceiling, contact person and application period among other key points. Specific grants from the following agencies were identified: United State Department of Agricultural – Rural Development (USDA – RD), Illinois Department of Agriculture (IDOA), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR) and Illinois Department of Transportation (IDOT).

The funding source identified for each action is the most likely source to be pursued. However, if grant funding is unavailable through the most likely or other suggested sources, then implementation of medium and large-scale projects and activities is unlikely due to the budgetary constraints experienced by most, if not all, of the participants due to their size, population growth and limited revenue streams. It is important to remember that the population for the entire City is just over 5,300 individuals. The City works hard to maintain and provide the most critical of services to their residents. Additional funding is necessary if implementation is to be achieved.

Time Frame for Completion

The time frame for completion identified for each action is the timespan in which participants would like to see the action successfully completed. In many cases, however, the time frame identified is dependent on obtaining the necessary funding. As a result, a time range has been identified for many of the mitigation actions to allow for unpredictability in securing funds.

Cost/Benefit Analysis

A preliminary qualitative cost/benefit analysis was conducted on each mitigation action. The costs and benefits were analyzed in terms of the general overall cost to complete an action as well as the action's likelihood of permanently eliminating or reducing the risk associated with a specific hazard. The general descriptors of high, medium and low were used. These terms are not meant to translate into a specific dollar amount, but rather to provide a relative comparison between the actions identified by each jurisdiction.

This analysis is only meant to give the participants a starting point to compare which actions are likely to provide the greatest benefit based on the financial cost and staffing effort needed. It was repeatedly communicated to the Planning Committee members that when a grant application is submitted to IEMA/FEMA for a specific action, a detailed cost/benefit analysis will be required to receive funding.

4.6 RESULTS OF MITIGATION STRATEGY

Figures MIT-4 through **MIT-6**, 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 City and include both existing and new actions.

Figure MIT-4
Watseka Hazard Mitigation Actions
(Sheet 1 of 6)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
HM	Acquire and remove/relocate existing structures from flood hazard areas. *	F	S&IP	Medium	2, 6	n/a	Yes	Mayor City Council / Public Works Director	15-20 years	FEMA Flood Mitigation Assistance	High/High
HM	Relocate Fire Station #2 out of the 100-year floodplain of the Iroquois River. *	F	S&IP	Medium	2, 3, 5	Yes	n/a	Mayor City Council / Fire Chief / Public Works Director	1-5 years	FEMA Flood Mitigation Assistance / USDA – RD Critical Facilities Programs	High/High
HM	Construct a flood control berm around the public works building to improve resilience and prevent future potential flooding. The public works building is located in the 100-year floodplain of the Iroquois River.	F	S&IP	Large	2, 3, 5	n/a	Yes	Mayor City Council / Public Works Director	1-5 years	FEMA Flood Mitigation Assistance	Medium/High
HM	Relocate the Public Works Facility out of the 100-year floodplain of the Iroquois River. *	F	S&IP	Large	2, 3, 5	Yes	n/a	Mayor City Council / Public Works Director	10 years	FEMA Flood Mitigation Assistance	High/High

* 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 5,300 individuals). The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most significant hazards
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Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Type of Mitigation Activity:

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

Figure MIT-4
Watseka Hazard Mitigation Actions
(Sheet 2 of 6)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
HM	Raise the berm elevation at the wastewater treatment plant to improve resilience and prevent future potential flooding. The wastewater treatment plant is located in the 100-year floodplain of the Iroquois River.	F	S&IP	Large	3, 5, 6	n/a	Yes	Mayor City Council / Public Works Director	1 year	FEMA Pre-Disaster Mitigation	Medium/High
HM	Elevate the Mulberry Street pump station out of the floodway/100-year floodplain of Sugar Creek.	F	S&IP	Small	3, 5	n/a	Yes	Mayor City Council / Public Works Director	3 years	FEMA Flood Mitigation Assistance	Medium/High
HM	Construct a new control building at the wastewater treatment facility that is elevated out of the 100-year floodplain of the Iroquois River to improve resilience and minimize damage to the plant from a flood event.	F	S&IP	Large	3, 5	Yes	n/a	Mayor City Council / Public Works Director	5 years	FEMA Flood Mitigation Assistance	High/High
HM	Separate the remaining combined sanitary and storm sewer systems in the City to reduce flow to the wastewater treatment plant and prevent damage to the collection systems and plant during a flood event.	F, SS	S&IP	Medium	3, 5	n/a	Yes	Mayor City Council / Public Works Director	3-5 years	USDA – RD Water & Waste Disposal Program / Illinois EPA Water Pollution Control Loan Program	High/High

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Type of Mitigation Activity:

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

Figure MIT-4
Watseka Hazard Mitigation Actions
(Sheet 3 of 6)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
HM	Repair/reline storm sewer sections where infiltration is occurring to prevent backflow problems, including but not limited to South 2nd Street and other various locations.	F, SS	S&IP	Medium	2, 3, 5	n/a	Yes	Mayor City Council / Public Works Director	3-5 years	USDA – RD Water & Waste Disposal Program	High/High
HM	Purchase and install a natural gas generator at the wastewater treatment plant to increase system resilience, maintain operations during extended power outages and eliminate potential fuel contamination from existing diesel generator.	EH, F, SS, SWS, T	S&IP	Large	2, 3, 5	n/a	Yes	Mayor City Council / Public Works Director	1 year	USDA – RD Community Facilities Programs	Medium/High
HM	Purchase and install natural gas generators at six lift station locations and Well #6 to increase system resilience and maintain operations during extended power outages.	EH, F, SS, SWS, T	S&IP	Medium	2, 3, 5	n/a	Yes	Mayor City Council / Public Works Director	1 year	USDA – RD Community Facilities Programs	Medium/High
HM	Construct a concrete channel in Main Ditch to prevent soil erosion and washouts resulting from heavy rain and flood events.	F, SS	S&IP	Small	2, 3, 5	n/a	Yes	Mayor City Council / Public Works Director	10 years	City	Medium/Medium
LM	Inventory, scan and store off-site vital records (including sewer and water records) to protect and maintain service in the event a natural hazard impacts critical facilities in the City.	EQ, F, SS, SWS, T	E&A	Large	5, 8	Yes	Yes	Mayor / City Council	1-5 years	City	Medium/High

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Type of Mitigation Activity:

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

Figure MIT-4
Watseka Hazard Mitigation Actions
(Sheet 4 of 6)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
LM	Conduct discussions with the Illinois State Water Survey about updating flood insurance rate maps for the City.	F	LP&R	Medium	2, 3, 5, 6, 7	Yes	Yes	Mayor City Council / Public Works Director	1-2 years	City	Medium/Medium
HM	Create "blue spaces" (stormwater retention/infiltration basins, swales etc.) with managed habitat (native vegetative filter strips, pollinator gardens, etc.) as well as recreational areas on floodplain buyout properties to improve community resilience, provide habitat and additional storage capacity and slow stormwater runoff in an effort to reduce flood impacts in hazard-prone areas.	F, SS	NSP	Small	6, 8	n/a	Yes	Mayor City Council / Public Works Director	5-15 years	FEMA Flood Mitigation Assistance	Medium/High
HM	Design and a construct community safe room equipped with emergency backup generators and HVAC units that can also serve as a warming/cooling center for City resident on Elm Street north of City Hall.	EC, EH, SS, T	S&IP	Small	2	Yes	n/a	Mayor City Council / Public Works Director	5-15 years	FEMA Pre-Disaster Mitigation / USDA – RD Community Facilities Programs	High/High

† 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 5,300 individuals). The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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EQ	Earthquake	T	Tornado

Type of Mitigation Activity:

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

Figure MIT-4
Watseka Hazard Mitigation Actions
(Sheet 5 of 6)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
HM	Retrofit City Hall to include an Emergency Operations Center equipped with stand-alone communications center.	F, SS, SWS, T	S&IP	Large	2, 3, 5	n/a	Yes	Mayor City Council / Public Works Director	5-15 years	FEMA Emergency Management Performance Grant / USDA – RD Critical Facilities Programs	High/High
LM	Conduct a study to determine the appropriateness of raising W. North Street between 335 and 395 to provide an alternative route through Watseka when the intersection of US Rte. 24 & Illinois Rte. 1 is impassable due to riverine flood events.	F	E&A	Large	2, 3, 5	n/a	Yes	Mayor City Council / Public Works Director	1-5 years	City / IDOT Local Roads	Medium/Medium
LM	Remove riprap/debris deposited in Iroquois River floodway in order to become eligible to participate in the National Flood Insurance Program's Community Ratings System. *	F	S&IP	Small	6, 8	n/a	n/a	Mayor City Council / Building Inspector	1-3 years	Illinois EPA Section 319 Grant / Legislative Award	Medium/High
HM	Relocate the Watseka Swimming Pool out of the 100-year floodplain of Sugar Creek. *	F	S&IP	Medium	2, 3, 5	Yes	n/a	Mayor City Council / Public Works Director	10 years	Illinois DNR Park & Recreational Facilities Construction Program	High/High

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Type of Mitigation Activity:

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

Figure MIT-4
Watseka Hazard Mitigation Actions
(Sheet 6 of 6)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
HM	Participate in the National Flood Insurance Program's Community Rating System to lower flood insurance premiums for City residents. *	F	LP&R	Medium	1, 2, 4, 6	Yes	Yes	Mayor City Council / Building Inspector	3-5 years	City	Low/High
HM	Review the revised Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. *	F	LP&R	Medium	1, 2, 4 6, 7	Yes	Yes	Mayor City Council / Building Inspector	1-5 years	City	Low/High
HM	Continue to make the most recent Flood Insurance Rate Maps available to assist the public in considering where to construct new buildings. *	F	LP&R	Medium	1, 2, 6, 7	Yes	Yes	Mayor City Council / Building Inspector	1-5 years	City	Low/Medium
LM	Make City officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain. *	F	LP&R	Medium	1, 2, 6, 7	Yes	Yes	Mayor City Council / Building Inspector	1-5 years	City	Low/Medium

* Mitigation action to ensure continued compliance with NFIP.

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DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Type of Mitigation Activity:

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

Figure MIT-5
Iroquois Community Unit School District #9 Hazard Mitigation Actions
(Sheet 1 of 4)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
LM	Conduct a study to identify the best alternative to alleviate recurring flood damage at district school buildings. Nettie Davis and Wanda Kendal Elementary Schools and Glenn Raymond Junior High School are all located in the 100/500-year floodplain of the Iroquois River/Sugar Creek. Both Nettie Davis Elementary School and Glenn Raymond Junior High School have been damaged by previous flood events.	F, SS	E&A	Large	2, 3, 5	n/a	n/a	Superintendent / Principal	1-2 years	Community Unit School District	High/High
HM	Floodproof Nettie Davis Elementary School to increase the structure's resilience to flood damage associated with Iroquois River flooding. The school is located in the 100/500-year floodplain of the Iroquois River and has been severely damaged by previous flood events which have displaced students for months while repairs were undertaken.	F, SS	S&IP	Medium	2, 3, 5	n/a	Yes	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High
HM	Floodproof Glenn Raymond Junior High to increase the structure's resilience to flood damage associated with Sugar Creek flooding. The school is located in the 500-year floodplain of Sugar Creek and has experienced minor damage from previous flood events.	F, SS	S&IP	Medium	2, 3, 5	n/a	Yes	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High
HM	Floodproof Wanda Kendall Elementary School to increase the structure's resilience to flood damage associated with Sugar Creek flooding. The school is located in the 100-year floodplain of the Iroquois River.	F, SS	S&IP	Medium	2, 3, 5	n/a	Yes	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High

† 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.

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DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
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EQ	Earthquake	T	Tornado

Type of Mitigation Activity:

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

Figure MIT-5
Iroquois Community Unit School District #9 Hazard Mitigation Actions
(Sheet 2 of 4)

Priority	Activity/Project Description	Hazard(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
						New	Existing				
HM	Construct a new Nettie Davis Elementary School out of the 100/500-year floodplain of the Iroquois River. The school has been severely damaged by previous flood events displacing students for months while repairs were undertaken.	F, SS	S&IP	Medium	2, 3, 5	Yes	n/a	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High
HM	Construct a new Glenn Raymond Junior High out of the 500-year floodplain of Sugar Creek. The school has experienced minor flood damage from previous events.	F, SS	S&IP	Medium	2, 3, 5	Yes	n/a	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High
HM	Construct a new Wanda Kendall Elementary School out of the 100-year floodplain of the Iroquois River.	F, SS	S&IP	Medium	2, 3, 5	Yes	n/a	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High
HM	Construct a new Iroquois CUSD#9 District Office out of the 500-year floodplain of Iroquois River/Sugar Creek.	F, SS	S&IP	Small	2, 3, 5	Yes	n/a	Superintendent	5 years	FEMA Flood Mitigation Assistance	High/Medium
HM	Construct a new Pre-Kindergarten through 5th Grade school to replace Nettie Davis and Wanda Kendal Elementary Schools. Both schools are currently located in the 100/500-year floodplain of the Iroquois River. Nettie Davis Elementary School has been severely damaged by previous flood events displacing students for months while repairs were undertaken.	F, SS	S&IP	Large	2, 3, 5	Yes	n/a	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High

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Figure MIT-5
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(Sheet 3 of 4)

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						New	Existing				
HM	Construct a new Pre-Kindergarten through 8th Grade school to replace Nettie Davis and Wanda Kendal Elementary Schools and Glenn Raymond Junior High School. All three schools are currently located in the 100/500-year floodplain of the Iroquois River/Sugar Creek. Both Nettie Davis Elementary School and Glenn Raymond Junior High School have been damaged by previous flood events.	F, SS	S&IP	Large	2, 3, 5	Yes	n/a	Superintendent / Principal	3-5 years	FEMA Flood Mitigation Assistance	High/High
HM	Purchase and install emergency backup generators at all District school buildings to provide uninterrupted power to critical systems and sustain functionality during extended power outages.	EH, EQ, F, SS, SWS, T	S&IP	Large	2, 3, 5	Yes	Yes	Superintendent / Principals	5 years	USDA – RD Critical Facilities Programs	Medium/High
HM	Install "hardening" materials (window safety film, hail resistant shingles/doors, etc.) at District school buildings to increase infrastructure resilience to natural hazards.	EQ, SS, T	S&IP	Large	2, 3, 5	Yes	Yes	Superintendent / Principals	5-10 years	FEMA Pre-Disaster Mitigation	Medium/Medium
HM	Bury power lines to Watseka High School to limit service disruptions during natural hazard events.	EQ, SS, SWS, T	S&IP	Medium	2, 3, 5	n/a	Yes	Superintendent / Principal	1-2 years	FEMA Pre-Disaster Mitigation	Medium/Medium
HL	Install air conditioning units at the Watseka High School to serve as a cooling center for area residents.	EH	S&IP	Small	2, 3, 5	n/a	Yes	Superintendent / Principal	5-10 years	USDA – RD Critical Facilities Programs	Medium/Medium
HM	Purchase and install a grounding system at Watseka High School & Wanda Kendall Elementary School to protect critical systems and improve the building's resilience to lightning strikes.	SS	S&IP	Medium	2, 3, 5	n/a	Yes	Superintendent / Principals	5 years	USDA – RD Critical Facilities Programs	Medium/Medium

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						New	Existing				
LM	Conduct hydrologic/hydraulic analysis to identify design solutions to alleviate recurring drainage/flood problems around the Watseka High School gym and north parking lot areas.	F, SS	E&A	Small	2, 3, 5	n/a	Yes	Superintendent / Principal	3-5 years	Community Unit School District	Low/Medium
HM	Construct the identified design solutions to alleviate recurring drainage/flood problems around the Watseka High School guy and north parking lot areas.	F, SS	S&IP	Small	2, 3, 5	n/a	Yes	Superintendent / Principal	5-7 years	FEMA Flood Mitigation Assistance	Medium/Medium

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Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Type of Mitigation Activity:

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

Figure MIT-6
Iroquois Memorial Hospital Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(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
						New	Existing				
HM	Purchase and install an emergency backup generator at the Iroquois Regional Health Center (IRHC) building to provide uninterrupted power and maintain operations during a power outage. The IRHC building is located outside the floodplain and would serve as the initial evacuation site for the Hospital	EQ, F, SS, SWS, T	S&IP	Medium	2, 3, 5	n/a	Yes	Environmental Services Manager / CEO	5 years	USDA – RD Community Facilities Programs	Medium/High

† 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 hospitals. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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

Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Type of Mitigation Activity:

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

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 review and adjust the planning process as needed, make necessary changes and updates to the Plan and track the implementation and results of the mitigation actions that have been undertaken.

5.1.1 Monitoring and Evaluating the Plan

The Plan will be monitored and evaluated by a Plan Maintenance Subcommittee on an annual basis. The Plan Maintenance Subcommittee will be composed of key members from the Planning Committee, including representatives from all of the participating jurisdictions. The Subcommittee will be co-chaired by the City Council & the Building Inspector. All meetings held by the Subcommittee will be open to the public. The information gathered at each Subcommittee meeting will be documented and provided to all participating jurisdictions for their review and use in the Plan.

The City Council & the Building Inspector will be responsible for monitoring the status of the mitigation actions identified in the Plan and providing the Illinois Emergency Management Agency (IEMA) with an annual progress report. It will be the responsibility of each participating jurisdiction to provide a progress report on the status of their mitigation actions at each Subcommittee meeting.

Monitoring & Evaluating

- A Plan Maintenance Subcommittee will be formed to monitor and evaluate the Plan.
- The ***Plan will be monitored and evaluated*** on an ***annual basis***.
- Each participating jurisdiction will be responsible for providing an annual progress report on the status of their mitigation actions.
- ***New mitigation actions can be added*** by participating jurisdictions ***during the annual evaluation.***

The Plan Maintenance Subcommittee will also evaluate the Plan on an annual basis to determine the effectiveness of the planning process and identify any implemented mitigation actions. In addition, the Subcommittee will decide whether any changes need to be made. As part of the evaluation of the planning process, the Subcommittee will review the goals to determine whether they are still relevant or if new goals need to be added; assess whether other natural hazards need to be

addressed or included in the Plan; and review any new hazard data that may affect the Risk Assessment portion of the Plan. The Subcommittee will also evaluate whether other City departments should be invited to participate.

In terms of evaluating the effectiveness of the mitigation actions that have been implemented, the Subcommittee will assess whether a project is on time, in line with the budget and moving ahead as planned; whether the project achieved the goals outlined and had the intended result; and whether losses were avoided as a result of the project. In addition, each of the participating jurisdiction will be given an opportunity to add new mitigation actions to the Plan and modify or discontinue mitigation actions already identified. In some cases a project may need to be removed from the list of mitigation actions because of unforeseen problems with implementation.

5.1.2 Updating the Plan

The Plan must be updated within five years of the 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 money to implement those mitigation actions identified in the Plan.

The City Council & the Building Inspector, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan. The update will incorporate all of the information gathered and changes proposed at the previous annual monitoring and evaluation meetings. In addition, any jurisdictions that did not take part in the previous planning process 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.

Updating the Plan

- The City Council & the Building Inspector, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan.
- The Plan ***must be updated within 5 years of the Plan approval date indicated on the signed FEMA final approval letter***.
- Any jurisdictions that did not take part in the previous planning process who now wish to participate may do so.
- Once the Plan update has received FEMA/IEMA approval, each participating jurisdiction ***must re-adopt the Plan to***

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 re-adopt the Plan to remain eligible to receive federal monies to implement identified mitigation actions.***

5.2 Incorporating the Mitigation Strategy into Existing Planning Mechanisms

As part of the planning process, the City identified current plans, policies/ordinances and maps that supplement or help support mitigation planning efforts. **Figure 7** identifies the existing planning mechanism available. It will be the responsibility of the City to incorporate, where applicable, the mitigation strategy and other information contained in the Plan into the planning mechanisms identified.

Adoption of this Plan 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 them to actively integrate it into their day-to-day operations and planning mechanisms. Any time a mitigation action is slated for implementation by a participating jurisdiction, it will be integrated into their capital improvement plan/budget.

The City has limited capabilities to integrate the mitigation strategy and other information contained in the Plan into existing planning mechanisms. The City is small in size and does not have the financial resources or trained personnel to develop multiple planning mechanisms.

5.3 CONTINUED PUBLIC INVOLVEMENT

The City and participating jurisdictions understand the importance of continued public involvement and will seek public input on the Plan throughout the plan maintenance process. A copy of the approved Plan will be maintained and available for review at the Building Inspector's Office. Individuals will be encouraged to provide feedback and submit comments for the next Plan update to the City Council & the Building Inspector.

The comments received will be compiled and presented at the annual Plan Maintenance Subcommittee meetings where members will consider them for incorporation into the Plan update. All meetings held by the Plan Maintenance Subcommittee will be noticed and open to the public. A separate public forum will be held prior to the 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 by each participating jurisdiction. Each jurisdiction must formally adopt the Plan to become eligible for federal grant monies to implement mitigation actions identified in this Plan.

6.1 PLAN ADOPTION PROCESS

Before the Plan 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 draft Plan 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 review and approval by IEMA and FEMA, the Plan was presented to the City and participating jurisdictions for adoption. ***Each participating jurisdiction was required to formally adopt*** the Plan to become eligible to receive federal grant monies to implement the mitigation actions identified in this Plan. Any jurisdiction that chose not to adopt the Plan did not affect the eligibility of those who did.

Figure PA-1 identifies the participating jurisdictions and the date each formally adopted the Plan. Signed copies of the adoption resolutions are located in **Appendix L**. FEMA signed the final approval letter on (date) which began the five-year approval period and set the an expiration date of (date) for the Plan.

Figure PA-1
Plan Adoption Dates

Participating Jurisdiction	Plan Adoption Date
Watseka, City of	
Iroquois County CUSD #9	
Iroquois Memorial Hospital	

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PLANNING COMMITTEE MEETING
ATTENDANCE SHEETS

APPENDIX A

Attendance Sheet

Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

October 24, 2019

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Zachary Krug	American Environmental Corp	specialist
2.	BOB HARWOOD	CITIZEN	
3.	John Allhands	Mayor City of Watseka	Mayor
4.	DON MILLER	ALDERMAN - WATSEKA	
5.	Rose Gilman	Watseka Public Library	Library Director
6.	MARK GARFIELD	CITY OF WATSEKA	ALDERMAN
7.	Dave Mayatt	City of Watseka	Alderman
8.	Cody Fredrick	First Trust	Loan Officer
9.	John Hutchinson	IFSB	EVP
10.	Patrick Doggett	Cong. Adam Kinzinger	Deputy District Director
11.	GREG MARKS	Watseka Public Works	W/ww Supervison
12.	Terry Pence	Pence Oil Co	Pres.
13.	Ross Bilds	Planning	
14.	Angel Crawford	State Rep Bennett	Reg. Assist
15.	John Bennett	State Rep 106	
16.			

Appendix A

Attendance Sheet

Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

October 24, 2019

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Monna Ulfens	alderwoman	
2.	Andrea Bostwick	American Environmental	Sr. Project Manager
3.	[illegible]	City of Watseka	building Insp.
4.	Amanda Hibbs	Watseka Area Chamber	ED
5.	Kirk McTaggart	Unit 9 Schools	Board member
6.	Debbie Pfingsten	Iroquois Insurance	CISR Ins producer/underwriter
7.	ROGER DITRICH	D&D NAPA INC.	PRESIDENT
8.	J.D. Eller	1st Trust + Savings Bank	V. Pres
9.	Juanita Muller	Designer Homes	owner/Sec/Treas
10.	Randy Muller	Designer Homes	President/owner
11.	Eric Ceci	Iroquois County EMA	Coordinator
12.	TED HORNER	IROQUOIS PAVING CORP.	
13.	John Anderson	Iroquois Federal/City of Watseka	Loan Officer City Planning Comm.
14.	Dan Tinchen	IPC	VP
15.	Lori Yates	IMH	ES Director
16.	JOHN SHARE	IROQUOIS COUNTY	

Appendix 1

Attendance Sheet

Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

December 19, 2019

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Eric Brandt	C.T. of Watseka	Building Insp.
2.	John Shafer	Iroquois County	CHAIRMAN
3.	Amanda Hibbs	WACC	E.D.
4.	Rusty Maulding	Iroquois CUSD 9	Board Member
5.	Rose Gilman	Watseka Public Library	Director
6.	Deborah Pfingsten	Iroquois Insurance	CSR
7.	Patrick Doggett	Cong. Adam Kinzinger	Deputy District Director
8.	Cody Fredrick	First Trust + Savings Bank	Lender
9.	Eric Ceci	Iroquois County EMA	Coordinator
10.	Cylis West	Iroquois Federal	Loan officer
11.	[illegible]	[illegible]	Member Services
12.	[illegible]	[illegible]	[illegible]
13.	Andrea Bostwick	American Environmental	Emerg. Mngmt Services Manager
14.			
15.			
16.			

Appendix A

Attendance Sheet

Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

December 19, 2019

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	John Allhands	City of Watseka	Mayor
2.	GREG MARKS	City of Watseka	WATER/WASTEWATER
3.	MARVIN DELAHR	CITY OF WATSEKA	PUBLIC WORKS DIRECTOR
4.	TERRY WHITEBIRT	FORD COUNTY EMA	COORDINATOR
5.	Don Miller	WATSEKA	ALDERMAN
6.	Bob Burd	Country Financial / Chamber of Comm	fes.chamber
7.	RUSS BILLS		EX-OFF
8.	JAMES BRUNS	UNIT #9	BOARD Member
9.	Brad Crawford	State Rep. Bennett	Exec. Dir. Assist.
10.	Tim Ketchum	City of Watseka FD	
11.	Juanita Muller	Business owner	=> JR Development
12.	Randy Muller	Business	=> "
13.	J.D. Ellis	Business	1st Trust + Savings Bank Watseka
14.	Zachary Krug	American Environmental Corp	specialist
15.	Doug Geiger	Business	
16.			

Appendix A

Attendance Sheet

Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

February 6, 2020

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	John Gilhands	City of Watseka	Mayor
2.	GREG MARKS	City of Watseka	WATER/WASTEWATER
3.	MARVIN DeLaHa	City of Watseka	Pub Works Dir.
4.	Doug Geiger	LKQ/Geiger Truck Parts	Plant manager
5.	TED HOFNER	IROQUOIS PAVING CORP.	SAFETY MGR
6.	Lori Yates	Iroquois Memorial Hospital	ES Manager/Emerg. Mgmt
7.	Bob Burd	Country Financial/Chamber	
8.	John Anderson	Iroquois Federal/City of Watseka	Loan Officer, Planning Comm
9.	Rose BILLS	City Planning	
10.	Cody Fredrick	First Trust + Savings Bank	Loan Officer
11.	Cylis West	Iroquois Federal	Loan Officer
12.	Deborah Pfingsten	Iroquois Insurance	Insurance CSR
13.	Eric Geci	Iroquois County EMA	Coordinator
14.	Bryce Crawford	State Rep. Bennett	Exec. Leg. Rep.
15.	Patrick Doggett	Corey Adam Kinzinger	Deputy Dist. Director
16.			

Appendix A

Attendance Sheet

Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

February 6, 2020

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Zachary King	American Environmental Corp	Specialist
2.	Eric Brandt	City of Watseka	Building Inspector
3.	Rusty Maulding	Iroquois County CUSD 9	Board Member
4.	Kirk Mc Taggart	" "	" "
5.	Rose Gilman	Watseka Library	Library Director
6.	Carla Waters	Times Republic	Managing Editor
7.	Dan Mabry	WATSEKA	ASSISTANT
8.	Andrea Bostwick	American Environmental	EMS Manager
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

PLANNING COMMITTEE MEETING MINUTES

APPENDIX B

Meeting Minutes

City of Watseka Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee

October 24, 2019
2:00 p.m.
Watseka City Hall
201 Brianna Drive, Watseka

Committee Members

1st Trust & Savings Bank
City of Watseka:
- Aldermen
- Building Inspector
- Mayor
- Planning Committee
- Water/Wastewater Supervisor

D&D NAPA Inc.
Designer Homes/JR Developments, Inc.
Iroquois County Offices:
- County Board
- EMA

Iroquois County CUSD 9
Iroquois Farmers State Bank
Iroquois Federal
Iroquois Insurance
Iroquois Memorial Hospital
Iroquois Paving Corporation
Pence Oil Co.
State Representative Tom Bennett
State Representative Tom Bennett's Office
U.S. Representative Adam Kinzinger's Office
Watseka Area Chamber of Commerce
Watseka Public Library
American Environmental Corporation

Welcome and Introductions

John Allhands, Mayor of the City of Watseka, welcomed attendees. He indicated that the purpose of this Committee is to develop the City of Watseka's Natural Hazards Mitigation Plan.

Handout materials were distributed to each member, including a Citizen Questionnaire and contact information form. The questionnaire will help gauge residents and committee member understanding of the natural hazards that impact the City and also identifies communication preferences.

Andrea Bostwick, American Environmental Corporation (AEC), began the meeting discussing how the NHMP planning process generally works. She indicated that the normal planning process takes approximately seventeen months to complete and that funding for the development of these mitigation plans has been provided through Federal Emergency Management Agency (FEMA) grants in the past. This year a problem occurred which led FEMA to announce that Illinois would not receive any funds to conduct mitigation planning. The State of Illinois stepped in and announced that it would provide funds to develop the plans this year. This allows Watseka to begin the planning process now and not wait another year to year-and-a-half to begin.

This change in funding means that the Plan must now be completed by May 1st, 2020, which only gives the City eight months instead of 17 months to complete the planning process. The Dilemma becomes how to make sure the City satisfies all of the FEMA requirements, while making sure that it can meet the 25% grant match through in-kinds services and still get the Plan drafted by May. Andrea informed the Committee that while this is a state-funded effort, the Plan must still be approved by FEMA in order to be eligible for FEMA mitigation funds.

IEMA asked AEC for its proposal on how to resolve this dilemma. AEC proposed and IEMA accepted an accelerated schedule based on four Committee meetings instead of five. This will provide sufficient time to meet FEMA's requirements and the in-kind match for the grant.

Why Should We Develop Our Natural Hazards Mitigation Plan?

Andre described why mitigation planning is needed and how participating jurisdictions can benefit. In addition, Andrea described the NHMP development process.

Since the early 1990s damages caused by weather extremes have risen substantially. In 2018 the United States experienced $90.7 billion in severe storm damages from fourteen (14) severe weather and natural hazard events. The losses experienced in 2018 were the 4th highest only behind 2017, 2012, and 2005. Consequently, the Federal Emergency Management Agency (FEMA) continues to encourage counties throughout the United States to prepare and update natural hazard mitigation plans. The natural hazards we are discussing include floods, tornadoes, severe summer storms (including thunderstorms, hail and lightning events), severe winter storms (including ice and snow storms), extreme heat, drought and earthquakes.

From the damages caused by natural disasters, FEMA has calculated that for every dollar spent on mitigation, $6 dollars can be reaped in savings.

Developing this plan provides three major benefits:

1.) Specific projects and recommendations will be developed through the planning process to help each participating jurisdiction reduce damages. By including these projects in this Plan, the participating jurisdictions will have an opportunity to receive state and federal funds to complete the projects

2.) When the next federally-declared natural disaster occurs, the City of Watseka will receive the full amount of money that they are eligible for from FEMA. Iroquois County, including Watseka, has been a part of four (4) federal disaster declarations since 1990.

3.) Verifiable information about the natural hazards that occur in the City will be gathered to help participants make decisions about how to better protect citizens and property from storm damages.

The Planning Process

The goal of the Committee meetings is to develop a Plan that meets state and federal criteria so that it can be approved by the Illinois Emergency Management Agency

(IEMA) and FEMA. A four meeting process has been developed to achieve this goal. Specific activities for the Committee meetings include:

1st Committee meeting	Orientation to the Planning Process Review Critical Facilities & Existing Planning Documents Complete the Severe Weather Shelter Survey
2nd Committee meeting	Discuss the Risk Assessment Approve Mission Statement & Goals City returns the Critical Facilities List, the Existing Planning Documents List and Shelter Survey Review mitigation project prioritization methodology Begin discussing mitigation projects and activities
3rd Committee meeting	Review Vulnerability Analyses Finish discussing Mitigation Projects and Activities Review mitigation strategy Committee discusses approval/adoption of the Plan
4th Committee meeting (Public Forum)	Present the Plan for public review Committee helps answer questions from the public

Severe Weather Events

Committee members were asked to share their memories of severe weather events that have occurred in the City including any damages to critical infrastructure and facilities. Flooding, tornadoes, and severe thunderstorms were mentioned. Other hazard events related include:

- The City of Watseka experienced a winter storm on January 21st, 1967.
- An Ice Storm caused damage to the City in 1978.
- On March 12, 1991, an ice storm caused the some City residents on the westside to lose power for 5 days.
- During the January/February flooding in 2008, there were 100 initial flood claims. In addition, 475 people had to be evacuated in January
- A wind event in May, 2019 caused damage to trees, park equipment, and homes. In addition, there was a power outage at the hospital.
- A drought occurred in the County in 1988.
- February, 2018 flooding resulted in loss of access to 400 homes.

Andrea, 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. Participants were also asked see if they have any photographs of storm damage they would be willing to provide for inclusion in the Plan.

Information Needed from the Committee

Forms

Zachary Krug, AEC, distributed the following forms to the City to complete:

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.

List of Existing Planning Documents. This list identifies planning documents (Land Use Plans, Flood Ordinances, and related documents) that a jurisdiction already has in place.

Shelter Surveys. Identifies locations designated as severe weather shelters.

Andrea asked participants to return the completed forms by the next meeting and to let her know if anyone would like electronic copies of the forms.

Mission Statement & Goals

Drafts of the mission statement and goals were distributed. Committee Members were asked to review and discuss these drafts at the next meeting. Every project included in the Plan should be aimed at one or more of the goals developed by this Committee. Specific goals can be added to this list as well.

Community Participation

Andrea stressed the importance of attending each committee meeting and indicated that member participation helps the City 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.

Providing the public with opportunities to have input is an important part of the planning process. Andrea requested that each jurisdiction consider making the **"Frequently Asked Questions"** handout in the meeting packet available for public review along with the **"Citizen Questionnaire"** passed out at the beginning of the meeting.

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:

Thursday, December 19th
Watseka City Hall
201 Brianna Drive, Watseka
5:30 p.m.

With no further questions the meeting was adjourned.

Meeting Minutes

The City of Watseka Multi-Jurisdictional Natural Hazards Mitigation Planning Committee

December 19, 2019
5:30 P.M.
Watseka City Hall
201 Brianna Drive, Watseka

Committee Members

1st Trust & Savings Bank
City of Watseka:
- Alderman
- Building Inspector
- Fire Department
- Mayor
- Planning Committee Members
- Public Works Director
- Water/Wastewater Supervisor

Country Financial
Designer Homes/JR Developments, Inc.
Ford County EMA
Iroquois County Offices:
- County Board
- EMA

Iroquois County CUSD 9
Iroquois County's Time Republic
Iroquois Federal
Iroquois Insurance
State Representative Tom Bennett's Office
U.S. Representative Adam Kinzinger's Office
Watseka Area Chamber of Commerce
Watseka Public Library
American Environmental Corporation

Welcome and Introductions

John Allhands, Mayor of the City of Watseka, welcomed attendees. He indicated that the purpose of this Committee is to develop the City of Watseka's Natural Hazards Mitigation Plan.

Handout materials were distributed to each member.

Risk Assessment

Andrea began the risk assessment presentation by noting that there have been four (4) federally-declared disasters in Iroquois County, including Watseka, since 1990. Approximately 316 natural hazard events have been verified over approximately 60 years in the City of Watseka. A minimum of $15.5 million in property damages and one injury have resulted from 16 documented natural hazard events verified in Watseka. The actual damage amounts are actually much higher based on several facts:

1.) damage descriptions for many of the flood, thunderstorms and lightning events did not include dollar amounts; and
2.) damages to roads from heat and freeze/thaws conditions were not included.

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 Watseka with 138 events verified since 1963. One of the four federal disaster declarations included severe storms. A minimum of $80,000 in property damages has resulted from 6 severe storm events. One injury can be attributed to a lightning strike in 1995.

The highest wind speed recorded in the City, not associated with a tornado, is 72 knots (83 mph) on May 23, 2019. The largest hail recorded in the City is 1.75 inches on April 26, 1994 and May 19, 2005.

Severe Winter Storms

At least 129 verified severe winter storms (snow, ice, or extreme cold) have occurred since 1950. One of the four federal disaster declarations for Watseka included severe winter storms. Damage information was unavailable for any of the events and no injuries or fatalities were reported.

Between 2000 and 2009 at least 20 severe winter storms took place. There has been 19 new events in the current decade. The record maximum 24-hour snowfall in the City is 15.5 inches at the NWS COOP Station near Watseka on December 18 & 19, 1973. The coldest recorded temperature is -28°F at the NWS COOP Station on January 5, 1999.

Floods

Three of the four federal disaster declarations for the County and Watseka include flooding. There have been a least 32 verified flood events in Watseka, 21 riverine/shallow flood events since 1990 and 11 flash food events since 2001. Approximately $12.9 million in property damages resulted from seven of the flood events. No injuries or fatalities were recorded for any of the events.

Excessive Heat

There have been 9 ***recorded*** excessive heat events reported in Watseka since 1995. These are only the recorded events. Excessive heat is not well reported. Additional events have undoubtedly occurred; however, unless there are impacts associated with the event, such as injuries and fatalities, they often go unreported. Damage information was unavailable for any of the events and no injuries or fatalities were reported.

The hottest temperature recorded in Watseka was 107°F at the NWS COOP Station on July 14, 1936.

Drought

Six major droughts have occurred during the last four decades – 1983, 1988, 2005, 2011, 2012 and 2013. In terms of impacts, the city obtains all of its drinking water from relatively deep sand and gravel aquifers making its water supply less vulnerable to water shortages than those municipalities that rely on surface water sources or shallow wells. Discussions with the Mayor, Public Works Director and

Water Supervisor did not identify any impacts such as enacted water restrictions as a result of any of the droughts.

Tornadoes

Since 1950, 2 tornadoes have directly impacted Watseka. A minimum of $2.55 million in property damages has resulted from these 2 tornadoes. No injuries or fatalities were recorded for any of the events. Both tornados had an F-Scale rating of F1.

Earthquakes

In the previous 200 years, no earthquakes have originated in Iroquois County and no earthquakes have originated in adjacent counties. There are three geologic structures in the immediate region: the Crescent City Anticline, the Sandwich Fault Zone and the LaSalle Anticlinorium.

Risk Priority Index Exercise

Following the risk assessment, Andrea led the Committee through a Risk Priority Index exercise that will help calculate the Risk Priority Index for the hazards that have the potential to impact the City. She explained that the Risk Priority Index is a quantitative means of providing guidance for ranking the hazards. 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. The findings will be presented at the next meeting.

Critical Facilities Vulnerability

Andrea next discussed critical facilities vulnerability and asked the Committee Members to complete a three question survey to help identify:

1.) What each jurisdiction's greatest vulnerabilities are and why; and
2.) Each jurisdiction's most vulnerable assets.

She also asked each participating jurisdiction to provide a list of permanent backup generators associated with critical infrastructure. Andrea explained this information would be used as part of the vulnerability analyses.

Mitigation

Developing Project Lists

Mitigation actions include activities and projects that reduce or eliminate the long-term risk to people and property from the natural hazards discussed in the risk assessment. The purpose of the next meeting is to develop a list of mitigation projects for each participating jurisdiction. Andrea went over examples of mitigation projects and activities with the Committee.

To help the jurisdictions think about and assemble their lists, a 2-page list of potential mitigation projects was included in the handout material along with mitigation project lists from jurisdictions in other counties and excerpts from a FEMA publication on mitigation ideas. A 1-page list of required projects for NFIP-participating jurisdictions

was also handed out. These examples can be used to help Committee members when they prepare their list.

The form titled **"New Hazard Mitigation Project Form"** was distributed and Andrea indicated this form should be used to submit new projects and activities for the Plan. She emphasized that submitting a project does not obligate any jurisdiction to complete the project. FEMA is trying to stimulate mitigation to reduce the extraordinary amount of money being expended on storm damages. Each jurisdiction will need to have at least one project to be included in the Plan. The project should be tailored to each jurisdiction.

Mitigation projects can include studies, structural 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. Andrea did note that this is a mitigation Plan not an emergency response plan and that projects needed to be tailored to mitigation.

Committee members were encouraged to contact Andrea if questions arise before they return to the next Committee meeting.

Mission Statement & Goals

Zak asked Committee members to review the draft mission statement and goals that were provided at the previous meeting were included in today's meeting materials. Both are necessary to satisfy required elements of the Plan. Zak asked if any revisions need to be made or if additional goals need to be added.

The draft mission statement was reviewed and no revisions were made to the wording.

Zak indicated that the mitigation goals are intended to reduce or eliminate long-term vulnerabilities to natural hazards and that each project included in the Plan should be aimed at one or more of the goals developed by the committee.

The draft goals were reviewed. The Iroquois County EMA Coordinator proposed a wording addition to the goals related to protecting the rivers, streams and floodplains in the City. The goals were approved with the wording addition.

The mission statement and goals will be added to the Plan.

What Happens Next?

The mitigation project tables will be the main topic of the next committee meeting. Andrea also indicated that the project prioritization methodology would be discussed.

The third meeting of the Committee was scheduled for:

Thursday, February 6, 2020
5:30 P.M.
Watseka City Hall
201 Brianna Drive, Watseka

With no further questions the meeting was adjourned.

Meeting Minutes

The City of Watseka's Multi-Jurisdictional Natural Hazards Mitigation Planning Committee

February 6, 2020
5:30 p.m.
Watseka City Hall
201 Brianna Drive, Watseka

Committee Members

1st Trust & Savings Bank
City of Watseka:
- Aldermen
- Building Inspector
- Mayor
- Planning Committee
- Water/Wastewater Supervisor
- Public Works Director

Geiger Truck Parts
Iroquois County EMA
Iroquois County CUSD 9
Iroquois County Times Republic
Iroquois Federal
Iroquois Insurance
Iroquois Memorial Hospital
Iroquois Paving Corporation
State Representative Tom Bennett's Office
U.S. Representative Adam Kinzinger's Office
Watseka Area Chamber of Commerce
Watseka Public Library
American Environmental Corporation

Welcome

John Allhands, Mayor of the City of Watseka, welcomed attendees. He indicated that the purpose of this Committee is to develop the City of Watseka's Natural Hazards Mitigation Plan.

Handout materials, including the draft mitigation project tables, were distributed to each Committee member.

Andrea Bostwick, American Environment Corp. (AEC), provided a brief recap to reorient Committee Members as to what has been accomplished. She noted that the Committee has accomplished all of its objectives up to this point and is on schedule.

Risk Priority Index Exercise Results

Andrea then presented the results of the Risk Priority Index Exercise which was conducted at the December 12, 2019 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, flooding scored the highest, followed by thunderstorms with damaging winds, heavy rain and severe winter storms.

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 required element of the Plan's mitigation strategy. As part of the Plan development process, a methodology needs to be selected.

Andrea explained that mitigation actions can be prioritized in a number of ways and provided information on two different methodologies. The Committee asked questions and after discussing the pros and cons of both options and minor wording changes, the Committee chose the methodology 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 natural hazards.

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.

Mitigation Projects

Andrea reminded the Committee Members that mitigation actions are those projects and activities that reduce the long-term risk to people and property from the natural hazards discussed in the risk assessment. She then described how the lists of mitigation actions provided by each jurisdiction, the Mitigation Actions Prioritization Methodology, the goals and other information were used to complete the Mitigation Actions Tables handout.

Andrea using a frequently requested project – a community safe room – to walk the Committee through how a typical project is prioritized and entered into the mitigation action tables. 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 handout was prepared by AEC. Andrea thanked the Committee Members for assembling their lists of mitigation projects and activities. Committee members were then asked to review the Action Tables containing the descriptions of the mitigation projects and activities. Andrea 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 to provide them to her as soon as possible.

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 now consider 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 will be presented for review and comment. The Public Forum needs be held in the evening so that those who are interested have the opportunity to attend. 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 one-week public comment period following the public forum.

Once the comment period is over any comments received will be incorporated into the Plan and submit it to IEMA/FEMA. Following IEMA and FEMA review and any edits requested will be made and then FEMA will issue an Approval Pending Adoption (APA) letter. At this point an email will be issued to all the participating jurisdictions with a copy of a model adoption resolution attached asking them to formally adopt the Plan by resolution and provide a copy of the signed resolution to Andrea or Mayor Allhands.

Plan Maintenance and Update

Andrea then described the Plan maintenance and update commitments that are detailed in the Plan. A subgroup of the Planning Committee will meet annually under the direction of the Watseka City Council and Building Inspector to report on the progress of their projects, make any additions or edits to their project lists, as well as, evaluating the effectiveness of the Plan and provide information on any events that have occurred since the Committee met previously. The information gathered at these annual meetings will be provided to IEMA and will make the five year Plan update process easier.

Every five years, the Plan must be reviewed, revised and resubmitted to IEMA/FEMA to remain eligible for mitigation project funds. At the five year update, any jurisdiction that did not take part in the previous update but who now wished to become part of the Plan may do so. Any new jurisdiction must supply the same information that all of the current jurisdictions supplied.

What Happens Next?

The public forum will be held on:

Thursday, April 2nd, 2020
Watseka City Hall
201 Brianna Drive
5:30 P.M. – 7:30 P.M.

Unless otherwise specified, Committee members will receive an electronic copy of the draft plan to make available for public comment. A two week public comment period will follow the public forum.

Public Comment

With no additional questions or comments raised, Mayor Allhands adjourned the meeting.

After conversations between AEC and Mayor Allhands, the public forum scheduled for Thursday, April 2nd to present the City of Watseka's Natural Hazards Mitigation Plan for review and comment was cancelled due to the COVID-19 outbreak and Executive Oder 2020-10 which prohibits any gathering of more than ten people through Tuesday, April 7th. An e-mail and press release was sent out to Committee members and the public to notify them of the change.

CITIZEN QUESTIONNAIRE

APPENDIX C

QUESTIONNAIRE

Watseka Multi-Jurisdictional Natural Hazards Mitigation Plan

You can help protect lives and property from storm damage in Watseka by taking a few moments to complete this questionnaire.

1. Please place a check mark next to each of the natural hazards listed below that you have experienced in Watseka. (Please check all that apply.)

   ☐ Drought
   ☐ Earthquakes
   ☐ Excessive Heat
   ☐ Floods
   ☐ Severe Summer Storms (thunderstorms, hail and/or lightning strikes)
   ☐ Severe Winter Storms (snow, sleet, ice and/or extreme cold)
   ☐ Tornadoes
   ☐ Other (please specify): _____

2. Which of the natural hazards listed have you encountered most frequently?

   ☐ Drought
   ☐ Earthquakes
   ☐ Excessive Heat
   ☐ Floods
   ☐ Severe Summer Storms
   ☐ Severe Winter Storms
   ☐ Tornadoes
   ☐ Other (please specify): _____

3. Rank the natural hazards listed below in order from 1 to 7 based on which hazard ***you feel*** poses the greatest threat. (1 = greatest threat and 7 = least threat).
   Each number should only be used once.

   _____ Drought
   _____ Earthquakes
   _____ Excessive Heat
   _____ Floods
   _____ Severe Summer Storms (thunderstorms, hail and/or lightning strikes)
   _____ Severe Winter Storms (snow, sleet, ice and/or extreme cold)
   _____ Tornadoes

4. What types of mitigation projects or activities are most needed in Watseka? (***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 (If selected, please check the type(s) of flood or drainage activity that is needed below.)
    - ☐ Culvert and drainage ditch maintenance
    - ☐ Retention pond construction
    - ☐ Dam or levee construction/maintenance
    - ☐ 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
- ☐ 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 natural hazard event
- ☐ Retrofit critical infrastructure(public water supplies, schools, sewage treatment facilities, bridges, hospitals and other important services) to reduce potential damages
- ☐ Other (please specify): _____

5. What are the most effective ways ***for you*** to receive information about how to make your household and property safer from natural disasters? (Please check all that apply.)

- ☐ Newspapers
- ☐ Television
- ☐ Radio
- ☐ Internet
- ☐ Schools
- ☐ Social Media (Facebook, Twitter, etc.)
- ☐ Mail
- ☐ Fact Sheet/Brochure
- ☐ Extension Service
- ☐ Public Workshops/Meetings
- ☐ Fire Department/Law Enforcement
- ☐ Public Health Department
- ☐ Municipal/County Government
- ☐ Other (please specify): _____

Thank you for assisting in the development of the City's Natural Hazards Mitigation Plan.

Watseka Natural Hazards Mitigation Planning Committee

FREQUENTLY ASKED QUESTIONS FACT SHEET

APPENDIX D

Frequently Asked Questions

Watseka Multi-Jurisdictional Natural Hazards Mitigation Plan

1) What is the Watseka Naturals Hazard Mitigation Plan?

The Watseka Multi-Jurisdictional Natural Hazards Mitigation Plan evaluates damage to life and property from natural hazards and identifies projects and activities that can reduce these damages within the City. The Plan is considered to be multi-jurisdictional because it includes other entities who want to participate such as the schools, park district and hospital.

2) What is hazard mitigation?

Hazard mitigation is any action taken to ***reduce*** the long-term risk to life and property from a natural hazard.

3) Why is this Plan being developed?

The Plan fulfills federal planning requirements of Section 104 of the Disaster Mitigation Act of 2000 and the Stafford Act. Three key benefits this Plan will provide Watseka are:

- Funding ***following*** declared disasters.
- Funding for mitigation projects and activities ***before*** disasters occur.
- Increased awareness about natural hazards and closer cooperation among the various organizations and political jurisdictions involved in emergency planning and response.

4) Who is developing this Plan?

The Watseka Multi-Jurisdictional Natural 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 business and economic development, emergency services, insurance, municipal, county and state government, health care, and law enforcement.

5) How can I participate?

You are invited to attend public meetings of the Watseka Natural Hazards Mitigation Planning Committee. In addition you are encouraged to provide photographs, other documentation, and anecdotal information about damages you experienced from natural hazards in Watseka. Surveys will be available at participating jurisdictions to help gather specific information from residents. All of this information will be used to develop the Plan. The draft Plan will be presented at a public forum for further public input.

More information can be obtained by contacting:

Mayor John Allhands
City of Watseka
201 Brianna Drive
Watseka, Illinois 60970
(815) 432-2711

MEDIA OUTLETS SERVING THE COUNTY

APPENDIX E

Media Outlets Serving the City of Watseka

Kankakee Daily Journal (Daily)
8 Dearborn Square,
Kankakee, Illinois 60901
815-937-3300
https://www.daily-journal.com/

The Iroquois County Times Republic (Daily)
1492 E. Walnut St. Watseka, Illinois 60970
815-432-5227
http://www.newsbug.info/iroquois_countys_times-republic/

PRESS RELEASES AND NEWS ARTICLES PUBLISHED

APPENDIX F

City of Watseka

Watsekacity.org
Phone (815) 432-2711
Fax (815) 432-2041
E-Mail - mayor@watsekacity.org

201 Brianna Drive P.O. Box 338
Watseka, IL 60970
John K. Allhands
Mayor

Contact: Mayor John Allhands
(815)-432-2711

Reducing Damages Caused By Severe Weather

Watseka, IL (10/15/2019) — The City of Watseka is developing a Natural Hazard Mitigation Plan to reduce the damages caused by natural hazards such as floods, thunderstorms, snow and ice storms and tornados, among others. The plan and the process to develop it will be funded through a grant from the Illinois Emergency Management Agency.

"The goal of this Plan is to identify projects and activities that will reduce the impacts to people and property before severe weather strikes", said Watseka Mayor John Allhands. "Having a plan will help the City receive state and federal funds," he added.

The City of Watseka Hazard Mitigation Planning Committee will hold its first meeting on Thursday, October 24th at City Hall, 201 Brianna Drive, in Watseka. The meeting will begin at 1:30 p.m. This Committee will meet periodically over the next several months to develop this Plan.

The Watseka Hazard Mitigation Planning Committee includes representatives from the City along with technical partners and other shareholders. 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 develop the plan.

XXXXXXXXXXXXXXXX

CERTIFICATE OF PUBLICATION

The Daily Journal Company, L.L.C. certifies that it is the publisher of The Daily Journal is a secular newspaper, has been continuously published daily for more than fifty (50) weeks prior to the first publication of the attached notice, is published in the City of Kankakee, County of Kankakee, Township of Kankakee, State of Illinois, is of general circulation throughout that county and surrounding area, and is a newspaper as defined by 715 ILCS 5/5.

A notice, a true copy of which is attached, was published one time in The Daily Journal, namely one time per week for one successive week.
The first publication of the notice was made in the newspaper, dated and published on October 17, 2019, and the last publication of the notice was made in the newspaper dated and published on October 17, 2019.
The notice was also placed on a statewide public notice website as required by 715 ILCS 5/2.1.

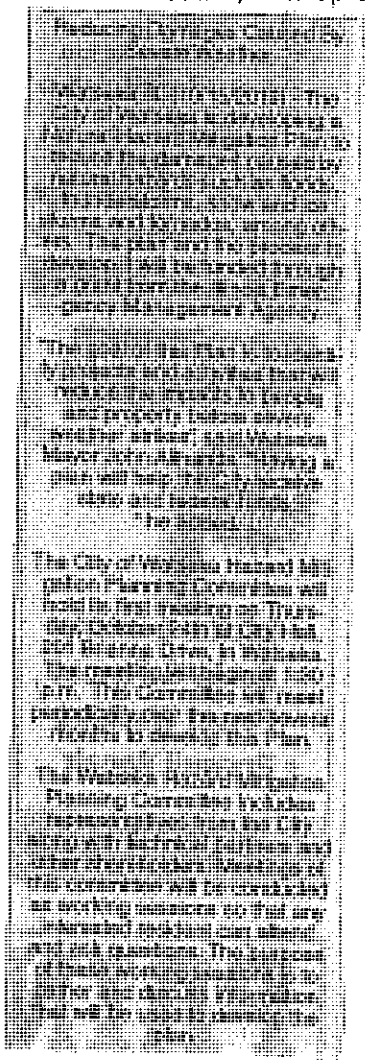
In witness, The Daily Journal Company, L.L.C. has signed this certificate by The Daily Journal, its publisher, at Kankakee, Illinois, on October 18, 2019.

The Daily Journal Company, L.L.C.

Cynthia Lipstak

Authorized Agent

(attach notice below this line, do not paste above)



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reptombennett • Follow

reptombennett Getting around the district - gave a Springfield update to Milford Lions Club, attended part of the first Hazardous Mitigation Plan meeting in Watseka and visited with administrator Kim Wittenberg, accountant Tom Stalter and board member Mike Stalter about nursing home issues as we toured the Good Samaritan nursing home in Pontiac. Lot of things going on in the 106.

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53°

BREAKING NEWS / Coroner called to shooting scene in Decatur

NEWS

Plans begin to create natural disaster mitigation

by: Jennifer Jensen

Posted: Oct 24, 2019 / 10:10 PM CDT / Updated: Oct 24, 2019 / 10:10 PM CDT

WATSEKA, Ill. (WCIA) — The city is creating a plan to prevent natural disasters from wiping it out.

This is a much needed course of action after record flooding swept through in February 2018. Flood damage forced many people out of their homes and other past natural disasters have caused even more problems in Watseka.

The city has the chance to get hefty grants from the Federal Emergency Management Agency (FEMA), but first they have to prove they're qualified.

53°

have a determined course of preventative action in place.

Alderwoman Monna Ulfers says, “These disasters are unpreventable, there’s nothing we can do to stop them.” Floods, ice storms, tornadoes and other severe weather can set destruction in motion. Massive flooding washed out neighborhoods in Watseka. Almost two years later, Mayor John Allhands says the city is still trying to recover and “Some people have been in limbo since the 2018 flood because we didn’t have any of the assets, money or resources to do something.”

The Illinois Emergency Management Agency agreed to pay for the city to develop a plan to combat the damage when storms sweep through. The process is being expedited. Mayor Allhands says, “Under the normal circumstances this would take about eighteen months. We’re looking at getting this done in seven months.”

The Watseka Hazard Mitigation Planning Committee was formed to identify projects that will reduce the impacts to people and property before severe weather strikes. Mayor Allhands says, “We have a berm around our water sewer treatment plant now, but with this record flood, the water got really close. So this might help us to put up a flood protection wall.”

Alderwoman Ulfers says this money will help repair the past and help fix the future. “We’re not going to get rid of the problem with the flood. So we have to figure out how we’re going to move forward.”

Right now, it’s unknown how much money the city would get from this. A state grant paid for a consultant to create the natural hazard mitigation plan. That cost about $30,000.

There will be three more natural hazard mitigation meetings. The next will be on December 19th at 5:00 pm. Anybody is welcome to attend. The last will be a public hearing. The date for that has not been set yet.

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http://www.newsbug.info/iroquois_countys_times-republic/work-begins-on-watseka-natural-hazards-mitigation-plan/article_ab5f595e-4920-5bba-8689-551b254d6c3c.html

FEATURED

Work begins on Watseka natural hazards mitigation plan

By CARLA WATERS, Managing Editor cwaters@intranix.com Oct 25, 2019

Photo by Carla Waters

Andrea Bostwick, project manager/risk assessor from American Environmental Corporation, talks with members of the mult-jurisdictional natural hazards mitigation planning committee in Watseka Thursday afternoon.

Photo by Carla Waters

A plan that is developed by a local committee will give Watseka the opportunity to apply for grants and other funding through the Federal Emergency Management Agency.

Mayor John Allhands, along with several Watseka aldermen, businesses people, citizens and some county officials, met Thursday afternoon to begin the Watseka Multi-jurisdictional Natural Hazards Mitigation Planning Committee meetings.

The group met with Andrea Bostwick project manager/risk assessor with American Environmental Corporation from Springfield, and Zak Krug, an environmental specialist with that corporation.

The group went over the planning process and set a mission statement any goals.

Bostwick explained mitigation as “a sustained action that reduces the long-term risk to people and property from natural hazards and their impacts.”

While Watseka has had several floods in the past few years, the plan is not just for flooding, but for any kind of hazard, she said.

The committee will help develop things that can “reduce negative impacts of natural hazards on citizens, infrastructure, private property and critical facilities.”

Bostwick went over goal setting with the group, which includes describing “the objectives or desired outcomes that the participants would like to accomplish in terms of hazard and loss prevention. These goals are intended to reduce long-term vulnerabilities to natural hazards.”

Once the plan is developed, the city can get funding after a declared disaster, get funding for mitigation projects and activities before a disaster and bring more awareness about natural hazards and develop more cooperation between organizations and governmental bodies that work with emergency planning and response.

After the meeting, Allhands said, “We have a series of four meetings that we have to do, the last one being a public hearing. We get together, we discuss the past hazards, looking at what kind of damage was done, from the drought back in the early ‘90s, late ‘80s, the wind storm we just had last May. We have to compile kind of a composite of all the events that we’ve had that we can remember and that we can get historical data on and then put that together in this plan.

“That kind of shows the need of needing the plan and helps FEMA and IEMA as far as what kind of monies they can award,” he said.

Allhands said the group is made up of a variety of people from different areas of the community.

“We kind of wanted people from all walks of like to come in and do this, because floods effect people in different ways,” he said. “Just getting those varying opinions we felt was important.”

Once the meetings are completed, he said, American Environmental will compile the information and update the plan.

“This is going to be really streamlined. Usually it takes about 17 months. We are looking at get this completed and on FEMA’s desk by May,” he said.

It will take about 45 days for FEMA to review it.

“The main importance of getting this plan into place is that we cannot apply for any FEMA grant money to help us out,” he said.

“We know we need protection at the water-sewer treatment plant,” he said. “We might be able to do some things in residential areas. We don’t know how far this Department of Natural Resource migration grant will go. We can probably try for some more mitigation grant money through FEMA. I believe there is an outlet for buying more houses and tearing them down, but when you get into FEMA and IEMA, unlike the DNR where it’s 100 percent, it’s usually a 75-25 split. But still, if we can do that for some of the citizens it’s still important.”

Allhands said that state officials have said that if this plan is not in place it is a “deal-killer” for getting that funding. “We have to do that in order to get the money,” he said.

“When I started working on this last Christmas, we got together and got a grant together in order to get this,” he said, noting that this planning session will not cost the taxpayers. “Most of this is just an investment of our time and our citizens time.

Meetings are open to the public, Bostwick said. “We encourage them to come. We will set aside time at the end of each meeting to answer questions,” she said.

Bostwick said that in the U.S. the number of natural hazards continues to increase. “Twenty-17 was a historic year. Sixteen billion dollar events in the United States. It shattered the loss record that was set in 2005. In 2018 we hit the fourth highest number of billion dollar events and fourth highest total losses. So 2017, 2018, it’s just been a rolling cycle.

“The other thing is, we’ve seen an increase in heavy rain events across Illinois,” she said. “The 2018 was done by heavy rains; 2015 was heavy rains. There were three days in July 2015 that were over two-and-a-quarter inches of rain. You can handle one of those, you can’t handle the successively over a month.

“That’s kind of the need for the plan. The benefits are, if the plan is in place they have access to apply for funding for the mitigation projects that are in the plan,” she said.

“And then if there is a federally declared disaster they would receive all the money they are eligible for from FEMA,” she said. “Iroquois County has only had four federal disaster declarations since 1990, but that doesn’t mean they are not going to get another one.”

The next meeting, which is in December, she said will focus on data and what has occurred in the past. Part of the plan is keeping that data so that it doesn’t have to be sought each time another incidence occurs.

City of Watseka

201 Brianna Drive P.O. Box 338
Watsekacity.org Watseka, IL 60970
Phone (815) 432-2711 John K. Allhands
Fax (815) 432-2041 Mayor
E-Mail - mayor@watsekacity.org

Contact: Mayor John Allhands
(815)-432-2711

Reducing Damages Caused By Severe Weather

Watseka, IL (12/09/2019)—The frequency and damages caused by severe storms and other natural hazards in Watseka will be discussed when Watseka's Hazards Mitigation Planning Committee meets Thursday, December 19th at 5:30 p.m. at City Hall, 201 Brianna Drive in Watseka. This Committee, comprised of municipal representatives as well as technical partners and stakeholders, will meet over the next several months to develop the City's Natural 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 City and what kinds of damages have resulted. Based on this information we will begin to develop lists of activities and projects to reduce damages caused by these events," said Mayor John Allhands.

The focus of this effort is on natural hazards— severe thunderstorms with damaging winds or hail, tornadoes, snow and ice storms, floods, drought, excessive heat and earthquakes.

Interested persons can provide input at these Planning Committee meetings, or submit their comments and questions to their municipal representatives.

"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 Watseka's residents," added Allhands.

After a draft of the Plan is prepared, a public forum will be held where the Plan will be presented for review and comment. The draft Plan will be revised based on comments from the public and state and federal agencies. Following these revisions, the Plan will be presented for adoption.

XXXXXXXXXXXXXXXX

http://www.newsbug.info/iroquois_countys_times-republic/work-continues-on-watseka-multi-jurisdictional-natural-hazards-mitigation-plan/article_06bdc3b1-1de3-50bc-a828-892ec820ff78.html

FEATURED

Work continues on Watseka multi-jurisdictional natural hazards mitigation plan

By CARLA WATERS, Managing Editor cwaters@intranix.com
Dec 20, 2019

Photo by Carla Waters

Andrea Bostwick, senior project manager from American Environmental Corporation of Springfield, talks with the Watseka multi-jurisdictional natural hazards mitigation plan committee Thursday night.

Photo by Carla Waters

Work continues on the Watseka multi-jurisdictional natural hazards mitigation plan

The planning committee met Thursday night with Andrea J. Bostwick, senior project manager, and Zachary Krug, both from American Environmental Corporation of Springfield.

This was the second meeting of four for the group. The committee brings together a number of entities to look at natural hazards that Watseka and the area must deal with.

About 30 people were at Thursday's meeting, including Watseka Mayor John Allhands and a couple of aldermen, as well as county officials, chamber representatives, school board members and other business leaders.

Bostwick said the public's involvement is very important in the process. Another meeting is in February and then a public hearing will be in April.

She presented some risk assessment natural hazards data that they have collected so far.

She said so far they have been able to document 315 natural hazard events for the city. There have been four federal disaster declarations in the county since 1990. Property damage for 15 events in the city is $!5.5 million. "This is a base," she said, noting that they know more damage has been done through the years.

She said that there are several different natural hazard events that happen.

"Severe storms are the most frequently occurring natural hazard in Watseka," she said. "We were able to document 138 events, that includes thunderstorms, hail, lightning and heavy rain. In comparison when we were looking at the county, they had roughly 327 individual events that would could document, so about 40 percent of those include Watseka, which is really a comparable number from what we've seen.

"One of the four federal disaster declarations in 1994 included hail," she said. "In terms of damages, a minimum of $80,000 in property damages was documented."

There was only one injury reported for the city in a severe storm, she said. "It was a lightning strike event from 1985."

The data is not always available for some events, she said, noting that the data that they presented is what can be documented at this time.

Another way to look at injuries and fatalities from natural hazard events is to look at vehicle accidents, which can sometimes be caused by a natural hazard. There were eight injuries in the city that have been attributed to wet road surface conditions between 2014 and 2018.

The highest recorded wind speed recorded in the city is 83 mph, which was May of this year. In the county, it is 100 mph in Crescent City in 2012.

The largest hail in the city is recorded at 1.75 inches, which is about golfball size, she said. That occurred in 1994 and 2005. In the county the largest hail recorded is four inches, which is tea cup size. That was in 1980.

Severe winter storms include blizzards, heaving snow storms, ice storms and extreme cold. They were able to document 129 severe winter storms in the city. There have been 105 snow and ice events since 1950. There have been 24 extreme cold events recorded since 1990.

At least nine severe winter storms have occurred every decade since 1950, Bostwick said.

“This decade we’ve already had 19 severe winter storms,” she said. ‘The decade with the most is actually 2000-2009.”

In December of 1973 the maximum 24-hour accumulation in the city was 15.5 inches. The coldest recorded temperature in Watseka is -28 degrees F, which was recorded Jan. 5, 1999. On Feb. 11, 2014, -26 degrees F and on Feb. 12 it was -25 degrees F.

Floods impact the area also. Riverine flooding, shallow/inland flooding and flash flooding all occur at different times.

They were able to document 32 verified food events, with 21 general flood events happening since 1990. There have been 11 flash flood events since 2001. Three of the four federal disaster declarations included flooding. Four seven events, there has been $!2.9 million in property damage.

"A majority of that is from 2008, 2015 and 2018," she said. "2008 was $6.5 million, 2015 was $2 million and 2018 was $4.3 million. Those are the insurance claims and some other data. There's also smaller amounts for individual events for 2009, 2005 and 2003."

Excessive heat was also data that they looked at. Bostwick said they were able to only document nine such events since 1995. She said she has talked to the National Weather Service about the data. "They acknowledge they are under reported," she said. Unless there are injuries, fatalities or other data during an excessive heat event it often goes under reported in the data base.

The hottest recorded temperature in the city was 107 degrees F from July 14, 1936. "Across the state, the two years that set records that are still holding are '36 and '54," Bostwick said.

What goes along with excessive heat is drought, she said. There have been six events since 1980 — '83, '88, 2005, 2011, 2012 and a flash drought in 2013. The county as designated as a primary disaster area by the US Department of Agriculture for at least three droughts, she said.

Because the city has drinking water source from a relatively deep sand and gravel aquifers, the water supply is not an issue, she said.

Another natural hazard is tornadoes. Since 1950 there have been two verified tornadoes that impacted Watseka directly — 1990 and 1994. Both were F1. The county has had 46 tornadoes in that same time period. Property damage was recorded at $2.55 million for the two tornadoes. The county as a whole has about $9.6 million in property damage from tornadoes.

The final natural hazard is earthquakes. "No earthquakes have originated in Iroquois County in the past 200 years according to the Illinois State Geological Survey," she said. The adjacent counties have also not had earthquakes originate there. There is one known geologic structure located in the county at Crescent City and one fault zone located in the immediate region.

The group was looked at some mitigation goals for the plan, of which there are many that could be included, she said.

The asked the group to look at what critical facilities there are and what hazards can effect them.

The group was also tasked with looking at what mitigation ideas can be put into the plan. The plan must include mitigation ideas that can be projects for each of the participating entities. “To be considered for grant funding from FEMA, it has to be in the plan,” she said.

The group was tasked with looking at different projects and then will get that information to Bostwick and Krug by mid-January. The next meeting for the group is Feb. 6.

City of Watseka

Watsekacity.org

Phone (815) 432-2711
Fax (815) 432-2041
E-Mail - mayor@watsekacity.org

201 Brianna Drive P.O. Box 338
Watseka, IL 60970

John K. Allhands
Mayor

Contact: Mayor John Allhands
(815)-432-2711

Projects to Reduce Damages Caused By Natural Disasters

Watseka, IL (January 27, 2020)— Projects to prevent injuries and fatalities while maintaining vital services for Watseka residents during severe storms will be the main topic of discussion at the Watseka Natural Hazards Mitigation Planning Committee meeting on Thursday, February 6th, 2020 at 5:30 P.M. The meeting will be held at City Hall, 201 Brianna Drive in Watseka and is open to the public.

This Committee began work in October 2019 to develop the City's Plan. This Natural Hazards Mitigation Plan will identify projects and activities to protect Watseka residents and property from storms and other natural disasters.

"Severe storms frequently damage buildings, roads, and other critical infrastructure in the City. Consequently we are seeking to identify preventative steps that can reduce the dollar damages as well as protecting public health before severe weather strikes," according to John Allhands, Mayor of Watseka.

In addition to the City, the Watseka Public Library, the Watseka Area Chamber of Commerce, Iroquois County CUSD #9, Iroquois Memorial Hospital, as well as the County, State Representative Bennett's office, U.S. Representative Kinzinger's office and local business owners and public representatives have been participating in the planning process.

Acquiring flood-prone properties, providing back-up power supplies and retrofitting water treatment facilities and other critical facilities to better withstand natural disasters are a few of the more frequently encountered mitigation projects in Illinois.

"A public forum will be conducted later this Spring for interested persons to review the Plan and ask questions of Committee members," added Allhands.

Interested persons can submit questions and comments to the Committee members or directly to the Logan County Emergency Management Agency.

http://www.newsbug.info/iroquois_countys_times-republic/public-invited-to-watseka-meeting-regarding-proposed-hazards-mitigation-plan/article_b169655c-e551-547a-95c2-8339ad0bed13.html

FEATURED

Public invited to Watseka meeting regarding proposed hazards mitigation plan

By CARLA WATERS, Managing Editor cwaters@intranix.com
Feb 7, 2020

Photo by Carla Waters

Andrea Bostwick of American Environmental Corporation of Springfield addresses the Watseka natural hazards mitigation plan committee Thursday night at city hall.

Photo by Carla Waters

The public is invited to an open house regarding the City of Watseka's natural hazards mitigation plan.

That meeting is set for 5:30-7:30 p.m. April 2 at Watseka City Hall.

The planning committee met for the third time Thursday evening at city hall. The group has met with Andrea Bostwick and Zak Krug of American Environmental Corporation of Springfield, working on the plan.

Bostwick emphasized to the group again Thursday night that the plan will give eligibility to the city and participating entities to Federal Emergency Management Agency funds once the plan is adopted.

The open house will allow the public to go to city hall, view the plan and give feedback if they wish. Once that meeting is conducted and any changes that need to be made are finalized, the plan will go on to Illinois Emergency Management Agency and Federal Emergency Management Agency staff for review. Once it is approved by EMA and adopted by the entities involved those entities will be eligible for funding, Bostwick said.

That funding is important for the area, Mayor John Allhands said, and is something that hasn't been available since an updated plan was not in place.

"I can't emphasize enough how important it is," Allhands said after the meeting. "One thing this will open up for us, getting this plan approved through IEMA and FEMA, is that we are going to be able to go after FEMA money to help do preventative and protective measures in regards to other floods, as far as impacting the damages and stuff like that. It could even mean more mitigation funds as far as buying homes and the demolition to kind of help other folks put some money in their pockets.

"The first DNR grant was $5.3 million, but we can only stretch that so far," he said. "This is going to help out quite extensively.

"Right now with a couple of the school board members, we're even talking about trying to intermingle our funds or stretch out tax dollars together and get those kids out of the Nettie Davis impact area. Wanda Kendall we're finding out is maybe in or close to the flood plain, so this might be some fundings from FEMA, along with the city on TIF and the school district through their resources that maybe we can get out kids in an area that is safe, dry and not have the interruption of lecture time and stuff like that."

The plan has projects that are listed from the city, the school district and Iroquois Memorial Hospital.

Bostwick said that the plan must have the projects listed before FEMA and IEMA will consider the projects. She also emphasized that while the projects are listed in the plan now, that doesn't mean that in the future it can't have more projects added. As projects come up they can be added to the plan.

Bostwick told the committee that once the plan is adopted, the committee must meet once a year to review it and make sure that all the items listed are still viable options as far as projects that are needed.

Every fifth year, the group must meet and go over the adoption process as it is doing now, she said.

Allhands also noted that other entities can opt in in five years. “They can opt in to it, if they aren’t a part of this plan now, when we go to renew in five years, they can jump in at that point. When we started putting this together, I think we were trying to encompass what we could around town that could help out with a lot of different facets in the area.

“I just appreciate the town folks that came in because that helped up obtain our part of the grant,” he said, noting that the plan is being paid for through a grant.

Allhands said he encourages everyone to attend April 2 and look at the plan. “We’re going to have it posted on our website,” he said, noting that the school district and hospital have also talked about posting the plan on their websites also.

During the meeting, Bostwick noted that flooding seems to be the most talked about hazard for the Watseka area, but that there are other hazards also, including thunderstorms with damaging winds, heavy rain, winter storms, extreme cold, excessive heat, hail and lightning.

She said FEMA lists four types of categories for mitigation projects and activities. Those include education and awareness programs, local plans and regulations, natural system protection and structure and infrastructure projects.

The goals for the Watseka multi-jurisdictional natural hazards mitigation plan include educating people about natural hazards and ways they can protect themselves, their homes and their businesses; protecting the lives, health, and safety of individuals living in the city from the dangers of natural hazards; protecting existing infrastructure and designing new infrastructure to be resilient to the impacts of natural hazards; incorporating natural hazard mitigation into existing and new community plans and regulations; placing a priority on protecting public services, including critical facilities, utilities, roads and schools; preserving and protecting the rivers, creeks, floodplains in the city without impacting those down stream; ensuring that new developments don’t create new exposures to damage from natural hazards and protecting historic, cultural and natural resources from the effects of natural hazards.

Some of the projects listed in the plan have a high cost and have a time frame to complete of several years. For example, one project listed in relocate the public works facility out of the 100-year floodplain of the Iroquois River, which has a time frame of 10 years should FEMA funding ever be available for that project. Raising the berm elevation at the wastewater treatment plant to improve resilience and prevent future potential flooding is also a project listed. Other projects for the city that are currently listed on the plan include acquiring and removing/relocating existing structures from flood hazard areas; relocating fire station 2 out of the 100-year floodplain of the Iroquois River; constructing a flood control berm around the public works building to improve resilience and prevent future potential flooding; elevating the Mulberry Street pump station out of the floodway/100-year floodplain of Sugar Creek; constructing a new control

building at the wastewater treatment facility hat is elevated out of the 100-year floodplain; separating the remaining combined sanitary and storm sewer systems in the city; repairing/relining storm sewer sections where infiltration is occurring to prevent back flow problems, including but not limited to South Second Street an other various locations; purchasing and installing a natural gas generator at the wastewater treatment plant to increase system resilience, maintain operations during extended power outages and eliminate potential fuel contamination from existing diesel generator; constructing a concrete channel in the main ditch to prevent soil erosion and washouts resulting from heavy rain and flood; conducting discussions with the Illinois State Water Survey about updating flood insurance rate maps for the city; creating “blue spaces” (storm water retention/infiltration basins, swales, etc) with managed habitat as well as recreational areas on floodplain buyout properties to improve community resilience, provide habitat and additional storage capacity and slow storm water runoff in an effort to reduce flood impacts in hazard prone areas; design and construct a community safe room equipped with emergency backup generators and HVAC units that can also serve as a warming/cooling station for city residents on Elm Street north of City Hall; retrofit city hall to include an emergency operations center equipped with stand alone communications center; conduct a study to determine the appropriateness of raising West North Street between 335 and 395 to provide an alternative route through Watseka when the U.S. 24/Route1 intersection is impassable due to flood events; remove riprap/debris deposited in the Iroquois River floodway in order to become eligible to participate in the National Flood Insurance Program’s Community Ratings System; participate in the National Flood Insurance Program’s Community Rating system to lower flood insurance premiums for residents; continue to make the most recent Flood Insurance Rate Maps available to asset the public in considering where to construct new buildings.

Unit 9 projects in the plan include: installing air conditioning units at the high school to serve as a cooling center for area residents; purchasing and installing a grounding system at the high school and Wanda Kendall to protect critical elements and improve the buildings’ resilience to lightning strikes; conduct hydrologic/hydraulic analysis to identify design solutions to alleviate recurring drainage/flood problems around the high school gym and north parking lot areas; construct the identified design solutions to alleviate recurring drainage/flood problems around the highs school gym and north parking lot areas.

Projects in the plan for Iroquois Memorial Hospital in clyde purchasing and installing an emergency backup generator at the Iroquois Regional Health Center building to provide uninterrupted power and maintain operations during a power outage.

Bostwick emphasized that the projects have to be listed in the plan before FEMA funds will be considered for them should they become available.

City of Watseka

201 Brianna Drive P.O. Box 338
Watsekacity.org Watseka, IL 60970
Phone (815) 432-2711 John K. Allhands
Fax (815) 432-2041 Mayor
E-Mail - mayor@watsekacity.org

CONTACT: Mayor John Allhands FOR IMMEDIATE RELEASE
815-432-2711

City of Watseka's Plan to Reduce Severe Weather Damages Ready for Public Review

May 4, 2020—The City of Watseka's Multi-Jurisdictional Natural 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 from May 15 through May 22, 2020. The Plan, along with a summary sheet and a comment survey, can be viewed on the City of Watseka's Website. If you are unable to access the Plan via the website, please contact Mayor John Allhands, at (815) 432-2711 to view a paper copy of the Plan. The comment period will remain open through Friday, May 22, 2020. Public comments will be used to make any revisions needed before this Plan is submitted to the Illinois Emergency Management Agency and FEMA.

A public forum will also be conducted on May 15th at 2 P.M. Due to the COVID-19 crisis which prohibits any gatherings of more than ten people, the public forum will be conducted via teleconference. Persons interested in participating in the public forum should contact Zachary Krug, American Environmental Corp. at (217) 585-9517 Ext. 8 or zkrug@aecspfld.com. Individuals can still review this Plan and comment without participating in the public forum.

"This Plan describes how the City and the participating jurisdictions have been impacted by severe weather and other natural hazards and identifies specific mitigation actions that can be taken to reduce damages to life and health, infrastructure, and property before events occur," according to Mayor Allhands.

The Watseka Natural Hazards Mitigation Planning Committee prepared this draft Plan with technical assistance from state and federal agencies as well as a consultant specializing in emergency management planning. The Committee is comprised of representatives from various City departments in addition to the Watseka Public Library, the Watseka Area Chamber of Commerce, Iroquois County CUSD #9, Iroquois Memorial Hospital, as well as the County, State Representative Bennett's office, U.S. Representative Kinzinger's office and local business owners and public representatives. The Committee began meeting last fall to prepare this Plan.

PUBLIC FORUM – PLANNING PROCESS
SUMMARY HANDOUT

APPENDIX G

CITY OF WATSEKA MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN PUBLIC FORUM TELECONFERENCE

MAY 15, 2020
2:00 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 Watseka residents. Since 1989, Iroquois County, including Watseka, has been a part of four federally-declared disasters and experienced at least $15.4 million in verified property damage within the City.

In the last 10 years alone (2010-2019), there have been 38 heavy rain events, 18 severe winter storms, 13 thunderstorms with damaging winds, six extreme cold events, six riverine flood events, five flash flood events, three excessive heat events, and three droughts verified in the City. While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning.

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 hazards. This process helps the City and participating municipalities 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 a natural hazards mitigation plan.

Why prepare a natural hazards mitigation plan?

By preparing and adopting a natural hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the Plan. These funds, 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 development of the Watseka Multi-Jurisdiction Natural Hazards Mitigation Plan?

Recognizing the benefits that could be gained from preparing a natural hazards mitigation plan, Watseka invited all the local government entities within the City to participate. Iroquois County Community Unit School District #9 and Iroquois Memorial Hospital chose to participate in the Plan development.

How was the Plan developed?

The Watseka Multi-Jurisdictional Natural Hazards Mitigation Plan was developed through the Watseka Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. The Planning Committee included representatives from each participating jurisdiction and Iroquois County, as well as business leaders, economic development, emergency services (fire and law enforcement), healthcare, insurance, planning and utilities. The Planning Committee met four times between October 2019 and May 2020.

CITY OF WATSEKA MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

Which natural hazards are included in the Plan?

After reviewing the risk assessment, the Planning Committee chose to include the following natural hazards in the Plan:

- severe storms (thunderstorms, hail, lighting & heavy rain)
- severe winter storms (snow, ice & extreme cold)
- floods
- excessive heat
- droughts
- tornadoes
- earthquakes

What is included in the Plan?

The Plan is divided into sections that cover the planning process; the risk assessment; the mitigation strategy, including lists of mitigation actions identified for each participating jurisdiction; and plan maintenance and adoption. Much of the Plan is devoted to the risk assessment and mitigation strategy.

This risk assessment identifies the natural hazards that pose a threat to the City 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 assessment that estimates the potential impacts each natural hazard would have on the health and safety of the residents of Watseka as well as the buildings, critical facilities and infrastructure in the City.

What happens next?

Any comments received during the public comment period will be incorporated into the draft Plan 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 City and each participating jurisdiction for formal adoption. After adopting the Plan, each participating jurisdiction can apply for federal mitigation funds and begin implementation of the mitigation actions identified in the Plan.

PUBLIC FORUM – PLAN COMMENT SURVEY

APPENDIX H

City of Watseka's Natural Hazard Mitigation Plan Comment Survey

The City of Watseka's Multi-Jurisdictional Natural Hazards Mitigation Plan evaluates damage to life and property from natural hazards that occur in the City. This Plan also identifies projects and activities submitted by the City and each participating jurisdiction that will help reduce these damages. This comment survey should be used to provide feedback on the draft Plan.

* 1. What comments, concerns or questions do you have regarding the draft Plan?

2. If you would like a follow-up to your comment, please provide your contact information below:

Name

Address

City/Town

State/Province

ZIP/Postal Code

Email Address

Phone Number

DONE

0 of 2 answered

HAZARD MITIGATION PLANNING MEMO SENT ADJACENT COUNTIES

APPENDIX I

City of Watseka

Watsekacity.org

Phone (815) 432-2711
Fax (815) 432-2041
E-Mail - mayor@watsekacity.org

201 Brianna Drive P.O. Box 338
Watseka, IL 60970

John K. Allhands
Mayor

To: Kankakee County EMA, Ken McCabe (Kmccabe@k3county.net)
Ford County EMA, Terry Whitebird (twhitebird@fordcounty.illinois.gov)
Iroquois County EMA, Eric Ceci (ececi@co.iroquois.il.us)
Newton County EMA, Ray Chambers (ncema@newtoncounty.in.gov)
Benton County EMA, Jason Fisher (bema@bentoncounty.in.gov)
Village of Milford, David Maro
Village of Woodland, Eric Morales
Village of Iroquois, George Runkle

From: John Allhands, City of Watseka Mayor

Subject: Hazard Mitigation Plan

Date: 4/29/2020

The purpose of this memorandum is to let you know that the City of Watseka is developing its Natural Hazards Mitigation Plan. Since we share common boundaries, you are invited to review this draft Plan and provide comments during the public comment period which runs from May 15th through May 22nd, 2020. The Plan along with a summary sheet and a comment survey can be viewed on the City's Website.

The public forum has been re-scheduled for Friday, May 15th at 2 p.m. Due to the COVID-19 crisis, the public forum will be conducted via teleconference. You will receive a separate email invitation with the phone number and access code for the teleconference in the next couple of days.

If you have any questions, you can reach my office at 815-432-2711 or mayor@watsekacity.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 update, please contact Zachary Krug, our planning consultant at (217) 585-9517 Ext. 8 or zkrug@aecspfld.com

HAZARD EVENT RISK ASSESSMENT TABLES

APPENDIX J

Table 1
Severe Storms – Thunderstorms with Damaging Winds Reported in Watseka
1970 - 2019
(Sheet 1 of 3)

Date(s)	Start Time	Maximum Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
6/14/1970	3:10 p.m.	n/a	n/a	n/a	n/a	
5/25/1975	11:45 a.m.	61 kts.	n/a	n/a	n/a	
6/29/1982	4:00 p.m.	52 kts.	n/a	n/a	n/a	
11/30/1991	12:18 a.m.	57 kts.	n/a	n/a	n/a	
7/2/1992	3:00 p.m.	n/a	n/a	n/a	n/a	trees, tree limbs and power lines were blown down
10/29/1996	6:10 p.m.	53 kts.	n/a	n/a	n/a	
4/30/1997	4:59 p.m.	52 kts.	n/a	n/a	n/a	
5/18/1997	10:20 p.m.	n/a	n/a	n/a	n/a	
7/18/1997	4:10 p.m.	50 kts.	n/a	n/a	n/a	
6/1/1999	8:15 p.m.	50 kts.	n/a	n/a	n/a	
6/11/1999	1:34 p.m.	51 kts.	n/a	n/a	n/a	trees were blown down
8/12/1999	7:30 p.m.	50 kts.	n/a	n/a	n/a	several trees, large tree limbs and power lines were blown down throughout the City
4/20/2000	6:30 a.m.	50 kts.	n/a	n/a	n/a	widespread reports of structural damage, downed trees and power lines were reported throughout the area
8/9/2000	4:45 a.m.	50 kts.	n/a	n/a	n/a	
7/8/2001	2:40 p.m.	65 kts.	n/a	n/a	n/a	tree and powerline damage were reported throughout the area
7/17/2003	9:30 p.m.	61 kts.	n/a	n/a	n/a	several trees, large tree limbs and power lines were blown down; some of the trees fell onto houses causing damage to each building
5/19/2005	5:35 p.m.	55 kts.	n/a	n/a	n/a	several trees were blown down
7/20/2005	7:30 p.m.	50 kts.	n/a	n/a	n/a	tree limbs and power lines were blown down
8/10/2006	8:12 a.m.	55 kts.	n/a	n/a	n/a	- tree limbs were blown down along IL Rte. 1, north of the City blocking the road - several trees and tree limbs were blown down in the City - power lines were also blown down
Subtotal:			**0**	**0**	**$0**	

Table 1
Severe Storms – Thunderstorms with Damaging Winds Reported in Watseka
1970 - 2019
(Sheet 2 of 3)

Date(s)	Start Time	Maximum Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
5/15/2007	2:05 p.m.	55 kts.	n/a	n/a	n/a	- trees were blown down just north of the City - a large tree was uprooted near North 5th St. and Sheridan St.
5/15/2007	2:10 p.m.	50 kts.	n/a	n/a	n/a	tree limbs were blown down just west of the City
8/5/2008	3:15 p.m.	52 kts.	n/a	n/a	n/a	a large tree was blown down on Walnut St.
8/5/2008	3:19 p.m.	61 kts.	n/a	n/a	$500	- numerous trees and tree limbs were blown down - a window was blown out of a sunroom
10/26/2010	5:58 a.m.	50 kts.	n/a	n/a	n/a	tree limbs and power lines were blown down
6/4/2011	4:08 p.m.	65 kts.	n/a	n/a	$50,000	- several trees approximately 2-feet in diameter were blown down, some blocking streets - several utility poles were either blown down or snapped off at their base - numerous tree limbs and power lines were blown down - the roof of a house on 4th St. was damaged when a chimney was blown down and fell onto the roof - the roof of another house on 4th St. was damaged by a falling tree - a large tree was blown down near South 5th St. and Locust St.
6/4/2011	4:45 p.m.	61 kts.	n/a	n/a	n/a	large trees were blown down near Kay St. and IL Rte. 24
6/15/2011	4:26 a.m.	50 kts.	n/a	n/a	n/a	multiple large tree limbs were reported down across the City
5/6/2012	3:44 p.m.	60 kts.	n/a	n/a	$5,000	- numerous large trees were blown down throughout the City - density was the highest on the north side of town, where 3 utility poles were also blown down - there was minor roof damage to a few buildings
4/18/2013	7:20 a.m.	50 kts.	n/a	n/a	$5,000	trees and power lines were blown down in the City
5/30/2013	9:25 p.m.	55 kts.	n/a	n/a	n/a	trees and power lines were blown down
9/20/2014	2:40 p.m.	60 kts.	n/a	n/a	n/a	- numerous trees of various sizes were blown down along with power poles that were snapped - damage was noted just south of Lincoln Ave. between 2nd St. and 5th St.
Subtotal:			**0**	**0**	**$60,500**	

Table 1
Severe Storms – Thunderstorms with Damaging Winds Reported in Watseka
1970 - 2019
(Sheet 3 of 3)

Date(s)	Start Time	Maximum Magnitude (Knots)	Injuries	Fatalities	Property Damage	Description
7/23/2017	6:14 p.m.	61 kts.	n/a	n/a	$5,000	multiple utility poles were blown down
6/10/2018	3:22 a.m.	55 kts.	n/a	n/a	n/a	a large tree fell onto a house and power lines, which started a fire
5/16/2019	1:00 p.m.	50 kts.	n/a	n/a	n/a	power lines were blown down in the City
5/23/2019	1:02 a.m.	72 kts.	n/a	n/a	n/a	- numerous trees, tree limbs, power lines and utility poles were blown down - park equipment was damaged, and roofs were also torn off - the worst of the damage was located on the west side of the City - Committee members indicated the event caused a power outage at the hospital
5/23/2019	1:02 a.m.	56kts.	n/a	n/a	n/a	a flag pole was blown down onto a vehicle
Subtotal:			**0**	**0**	**$5,000**	
GRAND TOTAL:			**0**	**0**	**$65,500**	

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

Table 2
Severe Storms – Hail Events Reported in Watseka
1963 - 2019

Date(s)	Start Time	Maximum Magnitude (Diameter)	Injuries	Fatalities	Property Damage	Description
4/17/1963	4:30 p.m.	1.50 in.	n/a	n/a	n/a	minor damage to roofs and cartops was reported throughout the area
4/26/1994	7:59 p.m.	1.75 in.	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1025)***
5/19/2005	5:48 p.m.	1.75 in.	n/a	n/a	n/a	
Grand Total:			**0**	**0**	**$0**	

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

Table 3
Severe Storms – Lightning Events Reported in Watseka
(1992 - 2019)

Date(s)	Start Time	Injuries	Fatalities	Property Damage	Description
7/2/1992	n/a	n/a	n/a	$10,000	four miniature horses were killed after being struck by lightning; the horses were valued at $10,000
6/7/1995	2:30 p.m.	1	n/a	n/a	a woman was seriously injured by lightning. She was struck as she reached for the door handle of her car in a parking lot
4/21/2000	n/a	n/a	n/a	n/a	COOP observer noted that lightning destroyed WGFA-FM's CO-AX tower
6/20/2000	1:30 p.m.	n/a	n/a	n/a	lightning struck a mobile home, causing a fire which destroyed the home
GRAND TOTAL:		**1**	**0**	**$10,000**	

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

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 1 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
2/21/1990 thru 2/22/1990	n/a	2.95 in.	n/a	n/a	n/a	
3/9/1990 thru 3/10/1990	n/a	1.87 in.	n/a	n/a	n/a	
7/9/1990 thru 7/10/1990	n/a	2.41 in.	n/a	n/a	n/a	
7/19/1990 thru 7/22/1990	n/a	3.30 in.	n/a	n/a	n/a	
8/12/1990	n/a	1.58 in.	n/a	n/a	n/a	
10/8/1990 thru 10/10/1990	n/a	3.55 in.	n/a	n/a	n/a	
11/4/1990 thru 11/5/1990	n/a	2.24 in.	n/a	n/a	n/a	
11/27/1990 thru 11/28/1990	n/a	1.70 in.	n/a	n/a	n/a	
12/28/1990 thru 12/29/1990	n/a	3.00 in.	n/a	n/a	n/a	COOP observer noted severe flooding
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 2 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
4/13/1991 thru 4/14/1991	n/a	1.96 in.	n/a	n/a	n/a	
5/17/1991	n/a	1.60 in.	n/a	n/a	n/a	
10/3/1991 thru 10/4/1991	n/a	3.18 in.	n/a	n/a	n/a	
10/25/1991 thru 10/26/1991	n/a	2.09 in.	n/a	n/a	n/a	
11/19/1991 thru 11/20/1991	n/a	1.72 in.	n/a	n/a	n/a	
6/17/1992	n/a	1.57 in.	n/a	n/a	n/a	
7/22/1992 thru 7/23/1992	n/a	2.40 in.	n/a	n/a	n/a	
11/1/1992 thru 11/2/1992	n/a	1.73 in.	n/a	n/a	n/a	
5/30/1993 thru 5/31/1993	n/a	1.54 in.	n/a	n/a	n/a	
6/7/1993 thru 6/8/1993	n/a	2.57 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 3 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
6/17/1993 thru 6/18/1993	n/a	1.74 in.	n/a	n/a	n/a	
6/28/1993 thru 6/29/1993	n/a	2.96 in.	n/a	n/a	n/a	
7/10/1993 thru 7/11/1993	n/a	1.82 in.	n/a	n/a	n/a	
7/24/1993 thru 7/25/1993	n/a	2.00 in.	n/a	n/a	n/a	
8/19/1993	n/a	1.86 in.	n/a	n/a	n/a	
9/2/1993 thru 9/3/1993	n/a	3.88 in.	n/a	n/a	n/a	
10/16/1993 thru 10/17/1993	n/a	2.82 in.	n/a	n/a	n/a	
4/11/1994 thru 4/12/1994	n/a	1.97 in.	n/a	n/a	n/a	
7/4/1994	n/a	1.50 in.	n/a	n/a	n/a	
11/1/1994	n/a	1.63 in.	n/a	n/a	n/a	
1/13/1995	n/a	1.78 in.	n/a	n/a	n/a	
5/13/1995	n/a	1.62 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 4 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
5/23/1995 thru 5/24/1995	n/a	2.02 in.	n/a	n/a	n/a	
6/7/1995	n/a	2.02 in.	n/a	n/a	n/a	
8/4/1995	n/a	1.53 in.	n/a	n/a	n/a	
8/20/1995	n/a	1.80 in.	n/a	n/a	n/a	
6/17/1996 thru 6/18/1996	n/a	2.00 in.	n/a	n/a	n/a	
7/21/1996 thru 7/22/1996	n/a	2.35 in.	n/a	n/a	n/a	
2/27/1997	n/a	1.55 in.	n/a	n/a	n/a	
8/16/1997 thru 8/17/1997	n/a	2.03 in.	n/a	n/a	n/a	
5/7/1998 thru 5/8/1998	n/a	1.88 in.	n/a	n/a	n/a	
8/7/1998 thru 8/8/1998	n/a	1.70 in.	n/a	n/a	n/a	
4/16/1999 thru 4/17/1999	n/a	2.74 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 5 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
6/12/1999 thru 6/13/1999	n/a	2.22 in.	n/a	n/a	n/a	
7/20/1999 thru 7/21/1999	n/a	2.20 in.	n/a	n/a	n/a	
8/12/1999 thru 8/13/1999	n/a	2.69 in.	n/a	n/a	n/a	
4/20/2000 thru 4/21/2000	n/a	2.44 in.	n/a	n/a	n/a	
6/20/2000	n/a	1.75 in.	n/a	n/a	n/a	
7/2/2000 thru 7/3/2000	n/a	2.86 in.	n/a	n/a	n/a	
7/9/2000 thru 7/10/2000	n/a	2.03 in.	n/a	n/a	n/a	
2/25/2001	n/a	1.69 in.	n/a	n/a	n/a	
6/4/2001 thru 6/5/2001	n/a	4.18 in.	n/a	n/a	n/a	
10/13/2001 thru 10/14/2001	n/a	1.94 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 6 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
10/21/2001 thru 10/22/2001	n/a	2.00 in.	n/a	n/a	n/a	
10/24/2001 thru 10/25/2001	n/a	2.11 in.	n/a	n/a	n/a	
1/31/2002	n/a	1.57 in.	n/a	n/a	n/a	
4/28/2002	n/a	1.52 in.	n/a	n/a	n/a	
5/11/2002 thru 5/12/2002	n/a	2.38 in.	n/a	n/a	n/a	
7/30/2002	n/a	1.80 in.	n/a	n/a	n/a	
8/19/2002 thru 8/20/2002	n/a	3.77 in.	n/a	n/a	n/a	
6/14/2003	n/a	1.78 in.	n/a	n/a	n/a	
7/8/2003 thru 7/9/2003	n/a	3.53 in.	n/a	n/a	n/a	
9/1/2003	n/a	2.02 in.	n/a	n/a	n/a	
5/31/2004	n/a	1.70 in.	n/a	n/a	n/a	
6/10/2004 thru 6/11/2004	n/a	3.26 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 7 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
8/3/2004 thru 8/4/2004	n/a	1.75 in.	n/a	n/a	n/a	
8/24/2004 thru 8/26/2004	n/a	3.69 in.	n/a	n/a	n/a	
9/16/2005	n/a	1.68 in.	n/a	n/a	n/a	
3/11/2006 thru 3/12/2006	n/a	2.22 in.	n/a	n/a	n/a	
4/15/2006 thru 4/16/2006	n/a	3.37 in.	n/a	n/a	n/a	
7/4/2006	n/a	1.60 in.	n/a	n/a	n/a	
8/10/2006 thru 8/11/2006	n/a	2.10 in.	n/a	n/a	n/a	
10/17/2006	n/a	1.98 in.	n/a	n/a	n/a	
3/22/2007 thru 3/23/2007	n/a	3.05 in.	n/a	n/a	n/a	COOP observer noted flooded roads
4/24/2007 thru 4/25/2007	n/a	2.46 in.	n/a	n/a	n/a	
6/23/2007 thru 6/24/2007	n/a	2.55 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 8 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
8/20/2007 thru 8/21/2007	n/a	3.04 in.	n/a	n/a	n/a	
1/8/2008	n/a	3.57 in.	n/a	n/a	n/a	
5/30/2008 thru 5/31/2008	n/a	3.30 in.	n/a	n/a	n/a	COOP observer noted flash flooding
6/3/2008 thru 6/4/2008	n/a	1.86 in.	n/a	n/a	n/a	
9/5/2008	n/a	2.92 in.	n/a	n/a	n/a	
9/13/2008 thru 9/14/2008	n/a	5.29 in.	n/a	n/a	n/a	COOP observer noted flooding
5/13/2009 thru 5/14/2009	n/a	2.04 in.	n/a	n/a	n/a	
5/15/2009	n/a	1.62 in.	n/a	n/a	n/a	
6/2/2009	n/a	1.97 in.	n/a	n/a	n/a	
10/22/2009 thru 10/23/2009	n/a	2.16 in.	n/a	n/a	n/a	
6/21/2010	n/a	2.42 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 9 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
9/1/2010 thru 9/2/2010	n/a	1.65 in.	n/a	n/a	n/a	
5/22/2011 thru 5/23/2011	n/a	2.17 in.	n/a	n/a	n/a	
12/15/2011	n/a	1.84 in.	n/a	n/a	n/a	
5/6/2012 thru 5/7/2012	n/a	3.98 in.	n/a	n/a	n/a	
6/17/2012	n/a	1.50 in.	n/a	n/a	n/a	
8/26/2012 thru 8/27/2012	n/a	1.86 in.	n/a	n/a	n/a	
10/13/2012 thru 10/14/2012	n/a	1.90 in.	n/a	n/a	n/a	
1/30/2013	n/a	1.55 in.	n/a	n/a	n/a	
4/19/2013	n/a	1.52 in.	n/a	n/a	n/a	
5/26/2013 thru 5/27/2013	n/a	2.60 in.	n/a	n/a	n/a	
6/1/2013	n/a	1.94 in.	n/a	n/a	n/a	
10/31/2013	n/a	1.52 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 10 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
5/11/2014 thru 5/13/2014	n/a	3.53 in.	n/a	n/a	n/a	
6/11/2014	n/a	2.36 in.	n/a	n/a	n/a	
6/24/2014	n/a	1.88 in.	n/a	n/a	n/a	
10/2/2014 thru 10/3/2014	n/a	2.05 in.	n/a	n/a	n/a	
5/31/2015 thru 6/1/2015	n/a	2.88 in.	n/a	n/a	n/a	
6/7/2015 thru 6/8/2015	n/a	1.54 in.	n/a	n/a	n/a	
6/12/2015 thru 6/13/2015	n/a	2.22 in.	n/a	n/a	n/a	
6/21/2015 thru 6/22/2015	n/a	2.66 in.	n/a	n/a	n/a	
7/8/2015 thru 7/9/2015	n/a	2.86 in.	n/a	n/a	n/a	
7/12/2015 thru 7/13/2015	n/a	3.10 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 11 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
7/26/2015 thru 7/27/2015	n/a	2.40 in.	n/a	n/a	n/a	COOP observer noted flooding
8/18/2015	n/a	1.51 in.	n/a	n/a	n/a	
9/17/2015 thru 9/18/2015	n/a	2.63 in.	n/a	n/a	n/a	
6/21/2016 thru 6/22/2016	n/a	2.97 in.	n/a	n/a	n/a	
7/13/2016 thru 7/14/2016	n/a	2.28 in.	n/a	n/a	n/a	
7/17/2016 thru 7/18/2016	n/a	3.05 in.	n/a	n/a	n/a	COOP observer noted flooded roads
8/12/2016 thru 8/13/2016	n/a	2.40 in.	n/a	n/a	n/a	
8/15/2016 thru 8/16/2016	n/a	2.70 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	

Table 4
Severe Storms – Heavy Rain Events Reported in Watseka
1990 - 2019
(Sheet 12 of 12)

Date(s)	Start Time	Maximum Magnitude (inches)	Injuries	Fatalities	Property Damage	Description
6/13/2017 thru 6/14/2017	n/a	4.22 in.	n/a	n/a	n/a	
6/18/2017 thru 6/19/2017	n/a	2.06 in.	n/a	n/a	n/a	
9/17/2017 thru 9/18/2017	n/a	2.75 in.	n/a	n/a	n/a	
2/19/2018 thru 2/20/2018	n/a	4.05 in.	n/a	n/a	n/a	COOP observer noted that several roads were closed due to flooding
6/26/2019 thru 6/27/2019	n/a	2.51 in.	n/a	n/a	n/a	
7/21/2019 thru 7/22/2019	n/a	1.80 in.	n/a	n/a	n/a	
9/28/2019	n/a	3.13 in.	n/a	n/a	n/a	
Subtotal:			**0**	**0**	**$0**	
GRAND TOTAL:			**0**	**0**	**$0**	

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

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 1 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/21/1950	n/a	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
11/25/1950	n/a	Heavy Snow	4.0 in.				X	COOP (Watseka)	n/a	n/a	n/a	
12/5/1950	n/a	Heavy Snow	6.0 in.					COOP (Watseka)	n/a	n/a	n/a	
11/6/1951	3:00 a.m.	Winter Storm	6.5 in.			X		COOP (Watseka)	n/a	n/a	n/a	
2/16/1953	12:30 a.m.	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
3/2/1954 thru 3/3/1954	6:00 p.m.	Heavy Snow	6.0 in.				X	COOP (Watseka)	n/a	n/a	n/a	
2/10/1955	7:00 a.m.	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
1/29/1956 thru 1/30/1956	8:30 p.m.	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
2/11/1956	1:00 a.m.	Heavy Snow	7.0 in.					COOP (Watseka)	n/a	n/a	n/a	
12/8/1956 thru 12/9/1956	1:30 a.m.	Winter Storm	5.0 in.			X		COOP (Watseka)	n/a	n/a	n/a	
1/22/1957 thru 1/23/1957	1:00 a.m.	Winter Storm	4.0 in.	X		X	X	COOP (Watseka)	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 2 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
4/7/1957 thru 4/8/1957	2:00 a.m.	Heavy Snow	7.2 in.					COOP (Watseka)	n/a	n/a	n/a	
11/12/1959	9:00 a.m.	Heavy Snow	6.0 in.					COOP (Watseka)	n/a	n/a	n/a	
3/16/1960 thru 3/17/1960	1:00 a.m.	Heavy Snow	6.0 in.					COOP (Watseka)	n/a	n/a	n/a	
12/20/1960	1:00 a.m.	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
1/18/1961 thru 1/19/1961	9:30 p.m.	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
1/31/1963 thru 2/1/1963	6:00 p.m.	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/23/1963	8:00 p.m.	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/15/1964 thru 2/16/1964	12:00 p.m.	Heavy Snow	5.5 in.					COOP (Watseka)	n/a	n/a	n/a	
2/22/1965 thru 2/25/1965	9:00 p.m.	Winter Storm	6.6 in.				50 mph gusts	COOP (Watseka)	n/a	n/a	n/a	COOP observer noted severe drifting in the area up to 6 feet
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 3 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/26/1967 thru 1/28/1967	5:30 a.m.	Blizzard	9.5 in.			X	50 mph gusts	COOP (Watseka)	n/a	n/a	n/a	
1/5/1969 thru 1/6/1969	5:30 p.m.	Winter Storm	2.0 in.	X		X		COOP (Watseka)	n/a	n/a	n/a	COOP observer noted snow drifts up to 5 feet and that area schools were closed
3/25/1970 thru 3/26/1970	1:00 p.m.	Winter Storm	2.0 in.	X		X		COOP (Watseka)	n/a	n/a	n/a	
3/29/1972	12:30 a.m.	Winter Storm	2.8 in.	X	X			COOP (Watseka)	n/a	n/a	n/a	
12/18/1973 thru 12/20/1973	11:30 a.m.	Heavy Snow	16.0 in.					COOP (Watseka)	n/a	n/a	n/a	
11/13/1974 thru 11/14/1974	8:00 a.m.	Heavy Snow	6.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/8/1975 thru 2/9/1975	8:30 a.m.	Heavy Snow	12.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/11/1975 thru 2/12/1975	5:00 p.m.	Heavy Snow	4.7 in.					COOP (Watseka)	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 4 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/13/1976	10:00 a.m.	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
2/5/1976	10:00 a.m.	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
3/21/1977 thru 3/22/1977	9:00 p.m.	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
12/4/1977 thru 12/5/1977	10:30 p.m.	Heavy Snow	6.0 in.					COOP (Watseka)	n/a	n/a	n/a	COOP observer noted blizzard like conditions and that all roads were closed
2/13/1978 thru 2/14/1978	4:30 a.m.	Heavy Snow	8.8 in.					COOP (Watseka)	n/a	n/a	n/a	COOP observer noted all schools were closed
3/24/1978 thru 3/25/1978	2:00 p.m.	Ice Storm			X			COOP (Watseka)	n/a	n/a	n/a	
1/13/1979	12:00 a.m.	Winter Storm	8.7 in.	X				COOP (Watseka)	n/a	n/a	n/a	COOP observer noted blizzard like conditions
2/14/1980 thru 2/15/1980	9:30 p.m.	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
2/25/1980	7:30 a.m.	Heavy Snow	4.4 in.				60 mph gusts	COOP (Watseka)	n/a	n/a	n/a	COOP observer noted blizzard conditions and that all schools were closed on the 25th & 26th
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 5 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
11/27/1980 thru 11/28/1980	12:00 a.m.	Heavy Snow	6.2 in.					COOP (Watseka)	n/a	n/a	n/a	
2/9/1981 thru 2/10/1981	12:30 a.m.	Heavy Snow	6.5 in.					COOP (Watseka)	n/a	n/a	n/a	
12/23/1981	12:00 a.m.	Heavy Snow	6.3 in.					COOP (Watseka)	n/a	n/a	n/a	
2/17/1982	n/a	Heavy Snow	4.3 in.					COOP (Watseka)	n/a	n/a	n/a	
3/29/1982 thru 3/30/1982	3:30 a.m.	Heavy Snow	7.8 in.					COOP (Watseka)	n/a	n/a	n/a	
4/5/1982 thru 4/6/1982	7:30 p.m.	Heavy Snow	9.0 in.					COOP (Watseka)	n/a	n/a	n/a	
4/9/1982	12:00 a.m.	Heavy Snow	5.5 in.					COOP (Watseka)	n/a	n/a	n/a	
3/20/1983 thru 3/21/1983	3:30 a.m.	Heavy Snow	7.8 in.					COOP (Watseka)	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 6 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/21/1983 thru 12/22/1983	12:00 a.m.	Heavy Snow	5.7 in.					COOP (Watseka)	n/a	n/a	n/a	
12/24/1983	n/a	Blizzard	X				X	COOP (Watseka)	n/a	n/a	n/a	COOP observer reported severe drifts and 1000 stranded throughout the County
2/27/1984 thru 2/28/1984	7:00 a.m.	Blizzard	7.5 in.				50 mph gusts	COOP (Watseka)	n/a	n/a	n/a	
1/9/1987 thru 1/10/1987	n/a	Heavy Snow	7.0 in.					COOP (Watseka)	n/a	n/a	n/a	
1/18/1987 thru 1/20/1987	n/a	Heavy Snow	9.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/10/1988 thru 2/11/1988	n/a	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/21/1989	n/a	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 7 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/14/1990 thru 2/15/1990	n/a	Ice Storm		X	X		45 mph gusts	SDP	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #860)***
12/23/1990	n/a	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
3/13/1991	n/a	Ice Storm		X	3.0 in.		X	COOP (Watseka)	n/a	n/a	n/a	- COOP observer noted that thousands of utility poles were down and most of the area was without power for up to a week - Committee members indicated that some residents were without power for five days
12/10/1992	n/a	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
1/10/1993	n/a	Heavy Snow	6.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/21/1993	n/a	Heavy Snow	4.6 in.					COOP (Watseka)	n/a	n/a	n/a	
12/25/1993 thru 12/26/1993	n/a	Heavy Snow	8.5 in.					COOP (Watseka)	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 8 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
11/10/1995 thru 11/11/1995	n/a	Winter Storm	3.3 in.	X		X		COOP (Watseka)	n/a	n/a	n/a	
1/15/1997 thru 1/18/1997	6:00 a.m.	Winter Storm	3.5 in.				45 mph gusts	COOP (Watseka) SED	n/a	n/a	n/a	Severe wind chill and blowing and drifting snow caused many school closures
12/10/1997	n/a	Heavy Snow	4.2 in.					COOP (Watseka)	n/a	n/a	n/a	
3/9/1998	4:00 a.m.	Winter Storm	4.7 in.	X		X	X	COOP (Watseka) SED	n/a	n/a	n/a	- strong winds combined with the heavy snow damaged power lines and tree limbs throughout the area - COOP observer noted that schools were closed
1/1/1999 thru 1/2/1999	7:00 p.m.	Heavy Snow	8.8 in.				60 mph gusts	COOP (Watseka) SED	n/a	n/a	n/a	COOP observer noted blizzard conditions
1/20/1999	n/a	Heavy Snow	4.3 in.					COOP (Watseka)	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 9 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
3/8/1999 thru 3/9/1999	5:00 p.m.	Heavy Snow	7.3 in.				X	COOP (Watseka) SED	n/a	n/a	n/a	- Strong winds caused blowing and drifting snow - many area schools were closed - numerous traffic accidents occurred
1/19/2000 thru 1/20/2000	12:00 p.m.	Heavy Snow	8.0 in.					COOP (Watseka) SED	n/a	n/a	n/a	
1/30/2000	n/a	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
12/11/2000 thru 12/12/2000	3:00 a.m.	Winter Storm	4.5 in.	X		X	35 mph gusts	COOP (Watseka) SED	n/a	n/a	n/a	- significant blowing and drifting snow - Governor Ryan issued a disaster declaration for the entire state
12/13/2000	9:00 a.m.	Heavy Snow	5.2 in.					COOP (Watseka) SED	n/a	n/a	n/a	
12/24/2002 thru 12/25/2002	6:00 p.m.	Winter Storm	5.0 in.					COOP (Watseka) SED	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 10 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/26/2002	n/a	Heavy Snow	4.3 in.					COOP (Watseka)	n/a	n/a	n/a	
1/2/2003	n/a	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
2/14/2003 thru 2/15/2003	8:00 p.m.	Winter Storm	4.5 in.				X	COOP (Watseka) SED	n/a	n/a	n/a	significant blowing and drifting snow with near blizzard conditions in some areas
1/4/2005 thru 1/6/2005	7:00 p.m.	Winter Storm	X	X	X			COOP (Watseka) SED	n/a	n/a	n/a	large tree branches down and power outages were reported throughout the area
12/8/2005	n/a	Heavy Snow	5.0 in.				X	COOP (Watseka)	n/a	n/a	n/a	blowing and drifting snow
2/6/2007	7:00 a.m.	Winter Storm	5.5 in.					COOP (Watseka) SED	n/a	n/a	n/a	
2/13/2007	2:00 a.m.	Blizzard	12.0 in.					COOP (Watseka) SED	n/a	n/a	n/a	
2/25/2007	2:00 p.m.	Ice Storm		X	0.25 in.		X	COOP (Watseka) SED	n/a	n/a	n/a	
12/9/2007	4:40 a.m.	Ice Storm		X	0.25 in.			COOP (Watseka) SED	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 11 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
12/15/2007 thru 12/16/2007	11:00 a.m.	Heavy Snow	6.5 in.					COOP (Watseka) SED	n/a	n/a	n/a	
1/8/2008	n/a	Heavy Snow	5.0 in.					COOP (Watseka)	n/a	n/a	n/a	
1/29/2008	6:30 p.m.	Winter Storm	3.0 in.				35 mph gusts	SED	n/a	n/a	n/a	
1/31/2008 thru 2/1/2008	4:00 p.m.	Heavy Snow	7.0 in.					COOP (Watseka) SED	n/a	n/a	n/a	
2/26/2008	n/a	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
12/18/2008 thru 12/19/2008	10:00 p.m.	Ice Storm		X	0.50 in.			COOP (Watseka) SED	n/a	n/a	n/a	- ice accumulations caused numerous tree limbs and power lines to break which also brought down utility poles throughout the area - power outages were widespread across the area
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 12 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/1/2011 thru 2/2/2011	12:00 p.m.	Blizzard	8.8 in.				55 mph gusts	COOP (Watseka) SED	n/a	n/a	n/a	- blizzard conditions paralyzed the area bringing down tree limbs and power lines and causing numerous power outages - most roads were impassable
1/13/2012	n/a	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
3/6/2013	n/a	Heavy Snow	4.2 in.					COOP (Watseka)	n/a	n/a	n/a	
3/24/2013 thru 3/25/2013	1:00 p.m.	Winter Storm	7.0 in.					COOP (Watseka) SED	n/a	n/a	n/a	
12/13/2013 thru 12/14/2013	5:00 p.m.	Heavy Snow	5.0 in.					COOP (Watseka) SED	n/a	n/a	n/a	
1/4/2014 thru 1/5/2014	8:00 p.m.	Heavy Snow	7.2 in.				X	COOP (Watseka) SED	n/a	n/a	n/a	strong winds created blizzard like conditions and reduced visibility
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

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COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 13 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
1/19/2014	n/a	Winter Storm	4.0 in.				X	COOP (Watseka)	n/a	n/a	n/a	
1/26/2014 thru 1/27/2014	8:00 p.m.	Winter Storm	1.6 in.				58 mph gusts	COOP (Watseka) SED	n/a	n/a	n/a	wind gusts caused temporary blizzard-like conditions that cause severe impacts to area roads
2/4/2014 thru 2/5/2014	10:00 a.m.	Heavy Snow	9.7 in.					COOP (Watseka) SED	n/a	n/a	n/a	
2/17/2014	5:00 a.m.	Heavy Snow	9.4 in.					COOP (Watseka) SED	n/a	n/a	n/a	
1/6/2015	n/a	Heavy Snow	4.9 in.					COOP (Watseka)	n/a	n/a	n/a	
2/1/2015 thru 2/2/2015	12:00 a.m.	Heavy Snow	5.1 in.				35 mph gusts	COOP (Watseka) SED	n/a	n/a	n/a	
2/5/2015	n/a	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 5
Severe Winter Storm Events Reported in Watseka
1950 - 2019
(Sheet 14 of 14)

Date(s)	Start Time	Event Type	Magnitude (Maximum)					Data Source[2]	Injuries	Fatalities	Property Damages	Description
			Snow	Freezing Rain[1]	Ice[1]	Sleet[1]	Strong Winds[1]					
2/9/2017	n/a	Heavy Snow	4.0 in.					COOP (Watseka)	n/a	n/a	n/a	
12/30/2017	n/a	Heavy Snow	4.5 in.					COOP (Watseka)	n/a	n/a	n/a	
2/5/2018 thru 2/6/2018	3:30 p.m.	Winter Storm	9.0 in.					COOP (Watseka) SED	n/a	n/a	n/a	
12/29/2018	7:00 a.m.	Winter Storm		X				SED	n/a	n/a	n/a	ice accumulation on roads made travel hazardous
1/12/2019 thru 1/13/2019	1:00 a.m.	Heavy Snow	10.2 in.					COOP (Watseka) SED	n/a	n/a	n/a	
Subtotal:									**0**	**0**	**$0**	
GRAND TOTAL:									**0**	**0**	**$0**	

[1] An "X" in the freezing rain, ice, sleet and/or strong winds columns indicates the presences of that particular type of weather condition during a severe winter storm event.
[2] Observation Location information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

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

Table 6
Extreme Cold Events Reported in of Watseka
1996 - 2019
(Sheet 1 of 4)

Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
12/23/1990 thru 12/24/1990	n/a	Extreme Cold/ Wind Chill	-10°F	12°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
2/17/1993 thru 2/18/1993	n/a	Extreme Cold/ Wind Chill	-5°F	13°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
2/23/1993 thru 2/24/1993	n/a	Extreme Cold/ Wind Chill	-4°F	13°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
1/7/1994 thru 1/8/1994	n/a	Extreme Cold/ Wind Chill	-2°F	13°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
1/14/1994 thru 1/21/1994	n/a	Extreme Cold/ Wind Chill	-20°F	13°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
2/2/1996 thru 2/4/1996	12:00 a.m.	Extreme Cold/ Wind Chill	-17°F	10°F	n/a	COOP (Watseka) SED	n/a	n/a	n/a	
1/10/1997 thru 1/13/1997	n/a	Extreme Cold/ Wind Chill	-9°F	7°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
Subtotal:							**0**	**0**	**$0**	

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

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

Table 6
Extreme Cold Events Reported in Watseka
1996 - 2019
(Sheet 2 of 4)

Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
1/16/1997 thru 1/18/1997	n/a	Extreme Cold/ Wind Chill	-13°F	10°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
12/31/1998 thru 1/10/1999	n/a	Extreme Cold/ Wind Chill	-28°F	30°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
1/20/2000 thru 1/21/2000	n/a	Extreme Cold/ Wind Chill	-12°F	13°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
1/23/2003	1:00 a.m.	Extreme Cold/ Wind Chill	-5°F	10°F	-25°F	COOP (Watseka) SED	n/a	n/a	n/a	
1/6/2004	2:00 p.m.	Extreme Cold/ Wind Chill	-1°F	15°F	n/a	COOP (Watseka) SED	n/a	n/a	n/a	
1/29/2004 thru 1/30/2004	6:00 p.m.	Extreme Cold/ Wind Chill	-10°F	10°F	-34°F	COOP (Watseka) SED	n/a	n/a	n/a	
2/3/2007 thru 2/10/2007	n/a	Extreme Cold/ Wind Chill	-10°F	12°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
Subtotal:							**0**	**0**	**$0**	

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

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

Table 6
Extreme Cold Events Reported in Watseka
1996 - 2019
(Sheet 3 of 4)

Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
2/14/2007 thru 2/16/2007	n/a	Extreme Cold/ Wind Chill	-15°F	22°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
2/10/2008	n/a	Extreme Cold/ Wind Chill	-1°F	8°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
1/15/2009 thru 1/16/2009	5:00 a.m.	Extreme Cold/ Wind Chill	-23°F	15°F	-45°F	COOP (Watseka) SED	n/a	n/a	n/a	
1/21/2011 thru 1/24/2011	6:00 p.m.	Extreme Cold/ Wind Chill	0°F	23°F	n/a	COOP (Watseka) SED	n/a	n/a	n/a	
1/6/2014 thru 1/7/2014	1:00 a.m.	Extreme Cold/ Wind Chill	-16°F	8°F	-42°F	COOP (Watseka) SED	n/a	n/a	n/a	
1/5/2015 thru 1/7/2015	n/a	Extreme Cold/ Wind Chill	-10°F	11°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
12/26/2017 thru 12/27/2017	n/a	Extreme Cold/ Wind Chill	-16°F	5°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
Subtotal:							**0**	**0**	**$0**	

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

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

Table 6
Extreme Cold Events Reported in Watseka
1996 - 2019
(Sheet 4 of 4)

Date(s)	Start Time	Event Type	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
			Low (Min)	High (Max)	Wind Chill (Max)					
1/1/2018 thru 1/2/2018	3:00 a.m.	Extreme Cold/ Wind Chill	-22°F	9°F	-45°F	COOP (Watseka) SED	n/a	n/a	n/a	
1/30/2019	12:00 a.m.	Extreme Cold/ Wind Chill	-20°F	5°F	-56°F	COOP (Watseka) SED	n/a	n/a	n/a	
Subtotal:							**0**	**0**	**$0**	
GRAND TOTAL:							**0**	**0**	**$0**	

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

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

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

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 1 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
12/30/1990 thru 1/8/1991	n/a	Iroquois River, Sugar Creek, area rivers, streams and creeks	24.63 feet 12/30/1990 6th highest crest on record	24.59 feet 12/30/1990 8th highest crest on record	n/a	n/a	X	n/a	n/a	n/a	US Hwy 24 at intersection with IL Rte. 1 was flooded with two inches of water for two days according to the IDOT District 3 Operators Engineer
1/5/1993 thru 1/7/1993	n/a	Iroquois River, Sugar Creek, area rivers, streams and creeks	22.07 feet 1/5/1993	22.29 feet 1/7/1993	n/a	n/a	X	n/a	n/a	n/a	COOP observer noted that the road to the COOP site was closed due to flooding on the 6th and 7th
4/12/1994 thru 4/15/1994	n/a	Sugar Creek, area rivers, streams and creeks	28.16 4/12/1994 3rd highest crest on record	n/a	X	n/a	X	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1025)*** the COOP observer noted 100-year flood levels in the County with more than 7 inches of rainfall
Subtotal:								**0**	**0**	**$0**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 2 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
6/17/1996 thru 6/19/1996	n/a	Sugar Creek, area rivers, streams and creeks	25.85 feet 6/18/1996 5th highest crest on record	n/a	n/a	n/a	X	n/a	n/a	n/a	
7/6/1998	5:00 a.m.	area rivers, streams and creeks	n/a	n/a	X	n/a	X	n/a	n/a	n/a	3 - 4 inches of rain fell in less than 3 hours
5/12/2002 thru 5/13/2002	3:00 a.m.	Sugar Creek, area rivers, streams and creeks	20.36 feet 5/13/2002	n/a	n/a	n/a	X	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1416)*** 2.38 inches of rain fell during the overnight hours flooding drainage ditches, streams and creeks
8/19/2002	8:00 a.m.	area rivers, streams and creeks	n/a	n/a	n/a	n/a	X	n/a	n/a	n/a	3.77 inches of rain fell flooding roads in the City
Subtotal:								**0**	**0**	**$0**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 3 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
7/9/2003 thru 7/26/2003	n/a	Iroquois River, Sugar Creek, area rivers, streams and creeks	19.93 feet 7/11/2003	25.74 feet 7/12/2003 4th highest crest on record	X	n/a	X	n/a	n/a	$1,626	- 9.47 inches of rain fell during the month of July resulting in flooding throughout the City - a residence incurred $1,626 in damages according to Iroquois Insurance records
6/11/2004 thru 6/13/2004	7:00 a.m.	Iroquois River, Sugar Creek, area rivers, streams and creeks	24.28 feet 6/12/2004 7th highest crest on record	22.74 feet 6/13/2004	X	n/a	X	n/a	n/a	n/a	as many as 200 homes in the north and northeast portions of the City were affected by flood waters
1/13/2005 thru 1/15/2005	3:45 a.m.	Iroquois River, Sugar Creek, area rivers, streams and creeks	22.66 feet 1/14/2005	23.54 feet 1/14/2005 10th highest crest on record	X	n/a	X	n/a	n/a	$8,192	- 120 homes were affected by floodwaters and 30 homes had to be evacuated - a residence incurred $8,192 in damages according to Iroquois Insurance records
Subtotal:								**0**	**0**	**$9,818**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 4 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
3/23/2007 thru 3/26/2007	4:55 a.m.	Iroquois River, area streams and creeks	n/a	20.40 feet 3/25/2007	n/a	n/a	X	n/a	n/a	n/a	- heavy rain of 2.58 inches flooded many small streams in the City - several roads closed in the City due to high water - COOP observer noted flooded roads, including the closure of US Rte. 45 and that the city had to be barricaded
1/8/2008 thru 1/18/2008	5:15 a.m.	Iroquois River, Sugar Creek, area rivers, streams and creeks	28.66 feet 1/8/2008 highest crest – flood of record at this gauge	25.81 feet 1/9/2008 3rd highest crest on record	X	n/a	X	n/a	n/a	$6,531,131	*Event Description Provided Below*
This event was part of a federally declared disaster (Declaration #1747) - heavy rain totaling 3.10 inches fell on saturated and frozen ground on the 8th causing widespread and significant flooding - 232 NFIP flood insurance claims totaling $6,432,988 were paid for damages to structures and content according to information provided by the City of Watseka's Building Inspector - Iroquois County CUSD #9 identified $83,756 in damages to City schools - Iroquois Insurance records show $14,387 was paid for four claims associated with vehicle damage resulting from the flooding - the IDOT District 3 Operations Engineer reported that on January 8th the intersection of IL Rte. 1 & US Rte. 24 closed for 3 hours due to 8 inches of water covering approximately 350 ft. of US Rte. 24 and the westbound lanes of 6th St. & US 24, were closed for 6 hours due to 3 inches of water covering approximately 200 feet of US Rte. 24 - Committee members indicated that 475 individuals had to be evacuated from their homes										
Subtotal:								**0**	**0**	**$6,531,131**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 5 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
2/5/2008	7:00 a.m.	area rivers, streams and creeks	n/a	n/a	n/a	n/a	X	n/a	n/a	n/a	*Event Description Provided Below*
This event was part of a federally declared disaster (Declaration #1747) - IDOT District 3 Operations Engineer reported the following road closures on February 2nd: ▪ the intersection of US Rte. 24 & IL Rte. 1 was covered with six inches of water for two hours ▪ US Rte. 24 between 6th and 7th streets was covered with eight inches of water for over two days ▪ US Rte. 24 between Madison St. to Yount Ave. and from US Rte. 24 to IL Rte. 1 was covered with four feet for 4 ½ days ▪ US Rte. 24 from Co. Rd. 1950 to West Sugar Creek Ct. was covered with eight inches of water for over two days - heavy rain of 2.25 inches fell on saturated and frozen ground resulting in flooding										
9/14/2008 thru 9/15/2008	3:30 p.m.	area rivers, streams, and creeks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*Event Description Provided Below*
- the remnants of hurricane Ike moved across the City producing a second round of heavy rain after a period of heavy rain just 24 hours earlier - COOP observer measured 5.29 inches of rain in 48-hours - many creeks, streams and rivers swelled over their banks											
Subtotal:								**0**	**0**	**$0**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 6 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
3/10/2009 thru 3/19/2009	2:15 a.m.	Iroquois River, Sugar Creek, area rivers, streams and creeks	23.63 feet 3/18/2009 9th highest crest on record	24.80 feet 3/11/2009 7th highest crest on record	X	n/a	X	n/a	n/a	$5,189	Iroquois Insurance records indicated a residence incurred $5,189 in damages as a result of this event
6/22/2010 thru 6/25/2010	9:45 a.m.	Iroquois River, Sugar Creek, area rivers, streams and creeks	22.92 feet 6/23/2010	18.17 feet 6/25/2010	n/a	n/a	n/a	n/a	n/a	n/a	COOP observer noted heavy rain after 7 a.m. on the 21st totaling 2.42 inches
4/19/2013 thru 4/21/2013	2:45 a.m.	Sugar Creek, area rivers, streams and creeks	22.46 feet 4/19/2013	n/a	n/a	n/a	n/a	n/a	n/a	n/a	COOP observer measured 1.98 inches of rain in 48-hours for the 18th and 19th
Subtotal:								**0**	**0**	**$5,189**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

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Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 7 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
6/9/2015 thru 7/5/2015	4:30 p.m.	Iroquois River, Sugar Creek, area rivers, streams and creeks	20.47 feet 6/9/2015	25.23 feet 6/21/2015 5th highest crest on record	n/a	n/a	X	n/a	n/a	n/a	The IDOT District 3 Operations Engineer reported that the junction of US Rte. 24 and IL Rte. 1 was closed for more than two days due to a foot of water
7/9/2015 thru 7/19/2015	12.15 a.m.	Iroquois River, area streams and creeks	n/a	25.17 feet 7/12/2015 6th highest crest on record	X	n/a	X	n/a	n/a	$1,993,939	*Event Description Provided Below*
- The IDOT District 3 Operations Engineer reported the following road closures on July 11th & 12th - US Rte. 24 just west of the Sugar Creek Bridge was covered with one foot of water for five days - US Rte. 24 between 7th St. and 8th St. was covered with ten inches of water for five days - 118 NFIP flood insurance claims totaling $1,993,939 were paid for damages to structures and content according to information provided from the City of Watseka's Building Inspector											
Subtotal:								**0**	**0**	**$1,993,939**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 8 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
12/28/2015 thru 1/4/2016	2:00 p.m.	Iroquois River, Sugar Creek, area rivers, streams and creeks	26.31 feet 12/29/2015 4th highest crest on record	23.08 feet 12/30/2015	n/a	n/a	X	n/a	n/a	n/a	The IDOT District 3 Operations Engineer reported the following road closures on December 29th: ▪ US Rte. 24 & IL Rte. 1 intersection was closed for five days ▪ US Rte. 24 just west of the Sugar Creek Bridge and US Rte. 24 between 5th St. and 8th St. were covered with two feet of water for over two days
Subtotal:								**0**	**0**	**$0**	

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Table 7
General Flood Events Reported in Watseka
1990 - 2019
(Sheet 9 of 9)

Date(s)	Start Time	Body of Water	Magnitude					Injuries	Fatalities	Property Damages	Event Description
			Flood Crest Sugar Creek Milford[1]	Flood Crest Iroquois River Iroquois[2]	Impacts						
					Home[3]	Business[3]	Infra-structure[3]				
2/20/2018 thru 3/5/2018	12:00 p.m.	Iroquois River, area streams and creeks	28.52 feet 2/21/2018 2nd highest crest on record	26.06 feet 2/22/2018 2nd highest crest on record	X	n/a	X	n/a	n/a	$4,334,510	*Event Description Provided Below*

- Iroquois County CUSD #9 identified $150,790 in building related damages and $6,916 in classroom related damages for Nettie Davis Elementary School which was completely flooded
- 151 NFIP flood insurance claims totaling $4,176,804 were paid for damages to structures and content according to information provided by the City of Watseka's Building Inspector
- Watseka High School and Wanda Kendall Elementary School had limited access due to flooded roads
- Glenn Raymond Middle School boy's locker room and boiler room were flooded
- over 100 homes suffered some kind of water damage from the flooding
- business and ground floor apartments were also flooded; some residents had to be rescued by boats
- numerous roads were closed
- the emergency manager said this flooding was likely the worst the City had seen
- committee members indicated that flooding resulted in the loss of access to 400 homes

Subtotal:	**0**	**0**	**$4,334,510**
GRAND TOTAL:	**0**	**0**	**$12,874,587**

[1] Flood stage at the Milford gauge location is 18.0 feet, moderate flood stage is 22.0 feet and major flood stage is 26.0 feet. At 17.0 low-lying sections of Legion Park are inundated in Watseka; at 18.0 roadways are threatened at Legion Park in Watseka; at 24.0 US-24/Lafayette Street is threatened in west Watseka; at 25.0 structures are threatened in southwest Watseka and widespread flooding of agricultural areas; and at 26.0 widespread inundation of structures and roadways begins in southwest Watseka.

[2] Flood stage at the Iroquois gauge location is 18.0 feet, moderate flood stage is 24.0 feet and major flood stage is 25.0 feet. At 18.0 feet agricultural areas near the river begin to flood; at 21.5 feet County Road 1950N is threatened north of Watseka; and at 26.0 feet widespread inundation of structures and roads begins in east Watseka.

[3] 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 Event Description column if available.

Sources: Illinois Department of Transportation, District 3.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Weather Service, River Observations, North Central River Forecast Center, Iroquois River at the Iroquois and Sugar Creek at Milford.
Watseka Multi-Jurisdictional Natural Hazards Mitigation Planning Committee Member responses to Natural Hazard Events Questionnaire.

Table 8
Flash Flood Events Reported in Watseka
2000 - 2019
(Sheet 1 of 2)

Date(s)	Start Time	Magnitude (Impacts)			Injuries	Fatalities	Property Damages	Magnitude/Description
		Home[1]	Business[1]	Infra-structure[1]				
6/5/2001	12:30 p.m.	n/a	X	X	n/a	n/a	$25,000	- heavy rainfall of 4.18 inches fell in 48-hours leading to flash flooding - extensive flooding was reported at the Iroquois Mental Health Center - approximately 150 ft. of US Hwy 24 was flooded with two inches of water for 2 hours 0.6 miles east of the junction of US Rte. 24 & IL Rte. 1 according to the IDOT District 3 Operations Engineer
8/19/2002	3:05 a.m.	n/a	n/a	X	n/a	n/a	n/a	roads were flooded in the City
6/12/2004	1:30 a.m.	n/a	n/a	n/a	n/a	n/a	n/a	flash flooding occurred on Sugar Creek
2/4/2008 thru 2/5/2008	10:00 p.m.	X	n/a	X	n/a	n/a	n/a	***This event was part of a federally-declared disaster (Declaration #1747)*** heavy rainfall of 2.25 inches flooded many homes and basements in the City
5/30/2008 thru 5/31/2008	n/a	n/a	n/a	n/a	n/a	n/a	n/a	COOP observer indicated that 3.30 inches of rain fell and that there was flash flooding
9/14/2008	10:00 a.m.	X	X	X	n/a	n/a	n/a	heavy rainfall of 5.29 inches fell in 48-hours leading to significant flooding in the City
6/15/2010	n/a	n/a	n/a	X	n/a	n/a	n/a	The IDOT District 3 Operations Engineer indicated that approximately two inches of rain fell in an hour causing street flooding in the City. The junction of US Rte. 24 and IL Rte. 1 was covered with three inches of water for ½ an hour
Subtotal:					**0**	**0**	**$25,000**	

[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 Event Description column if available.

Table 8
Flash Flood Events Reported in Watseka
2000 - 2019
(Sheet 2 of 2)

Date(s)	Start Time	Magnitude (Impacts)			Injuries	Fatalities	Property Damages	Magnitude/Description
		Home[1]	Business[1]	Infra-structure[1]				
5/22/2011	3:52 p.m.	n/a	n/a	n/a	n/a	n/a	n/a	- heavy rain fell across the City causing streets to flood - many intersections were barricaded and closed due to the flooding - one spotter reported that 1.61 inches of rain fell in 75 minutes - emergency manager reported a storm total of 2.12 inches and the COOP observer reported 2.17 inches
5/6/2012	4:30 p.m.	n/a	n/a	X	n/a	n/a	n/a	- a portion of the road buckled and was washed away at the intersection of County Road 1730 North and IL Rte. 1 southeast of the City - the COOP observer measured 1.37 inches of rainfall in 30 minutes
7/11/2015	9:18 p.m.	n/a	n/a	X	n/a	n/a	n/a	the intersection of IL Rte. 24 and IL Rte. 1 was flooded and closed
7/26/2015	4:50 p.m.	n/a	n/a	X	n/a	n/a	n/a	the intersection of US Rte. 24 and IL Rte. 1 was flooded for 1.5 days with a foot of water according to the IDOT District 3 Operations Engineer
Subtotal:					**0**	**0**	**$0**	
GRAND TOTAL:					**0**	**0**	**$25,000**	

[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 Event Description column if available.

Sources: Illinois Department of Transportation, District 3.
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.
Watseka Multi-Jurisdictional Natural Hazards Mitigation Planning Committee Member responses to Natural Hazard Events Questionnaire.

Table 9
Excessive Heat Events Reported in Watseka
1995 - 2019
(Sheet 1 of 2)

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)					
7/13/1995 thru 7/15/1995	11:00 a.m.	100°F	72°F	120°F	COOP (Watseka)	n/a	n/a	n/a	COOP observer noted a heat advisory
7/26/1997 thru 7/27/1997	n/a	95°F	72°F	110°F	COOP (Watseka)	n/a	n/a	n/a	COOP observer noted humidity of 92-97%
6/24/1998 thru 6/28/1998	n/a	94°F	76°F	105°F	COOP (Watseka)	n/a	n/a	n/a	COOP observer noted heat indices of 103°F - 105°F
7/21/1999 thru 7/25/1999	n/a	93°F	70°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
7/28/1999 thru 7/30/1999	n/a	97°F	72°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
7/30/2006 thru 8/2/2006	n/a	93°F	71°F	n/a	COOP (Watseka)	n/a	n/a	n/a	COOP observer noted a heat advisory
7/4/2012 thru 7/7/2012	12:00 p.m.	100°F	67°F	115°F	COOP (Watseka) SED	n/a	n/a	n/a	
Subtotal:						**0**	**0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

Table 9
Excessive Heat Events Reported in Watseka
1995 – 2019
(Sheet 2 of 2)

Date(s)	Start Time	Magnitude (Temperature °F)			Data Source[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)					
6/29/2018 thru 7/1/2018	n/a	92°F	73°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
7/19/2019 thru 7/20/2019	n/a	92°F	73°F	n/a	COOP (Watseka)	n/a	n/a	n/a	
						0	**0**	**$0**	
GRAND TOTAL:						**0**	**0**	**$0**	

[1] Information obtained from National Weather Service's (NWS's) COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database.

Acronyms:
COOP NWS COOP Observation Station Records SED NOAA's Storm Events Database

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

Table 10
Drought Events Reported in Watseka
1980 – 2019

Year	Date Range	Magnitude (Drought Intensity Category)					Impacts/Event Description
		D0	D1	D2	D3	D4	
1983	n/a						all 102 counties in Illinois were proclaimed state disaster areas because of high temperatures and insufficient precipitations beginning in mid-June
1988	June 1988 thru September 1989						approximately half of all Illinois counties were impacted by drought conditions
2005	May 2005 thru April 2006	X	X	X			93 Illinois counties were designated as agricultural disaster areas due to drought
2011	July 2011 thru September 2011	X					44 Illinois counties were designated as agricultural disaster areas due to drought
2012	June 2012 thru November 2012	X	X	X			66 Illinois counties were designated as primary natural disaster areas due to damage and losses caused by drought and extreme heat
2013	August 2013 thru March 2014	X	X				

[1] An "X" in a Drought Intensity Category column indicates that level of drought was reached by at least a portion of the County during the event.

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.

Acronyms:

US Drought Monitor – Drought Intensity Categories

D0	abnormally dry	D3	extreme drought
D1	moderate drought	D4	exceptional drought
D2	severe drought		

Table 11
Tornadoes Reported in Watseka
1950 - 2019

Map No.	Date(s)	Start Time	Magnitude (Fujita Scale)	Length[1] (Miles)	Width (Yards)	Injuries	Fatalities	Property Damage	Description
1	10/3/1990	5:55 p.m.	F1	0.5	100	n/a	n/a	$2,500,000	- a tornado touched down on the southeastern edge of the city and tore up trees and cornfields - it then moved northeast, downed 3 newly-planted utility poles - crossed U.S. Rte. 24 into the Eastside Mall, damaging 70,000 square feet of roof with attached heating and air condition units - caused much flying glass and debris at stores and EZ Pickins Market
2	4/26/1994	8:45 p.m.	F1	1.0	20	n/a	n/a	$50,000	- an abandoned cinder block car wash building was moved from its foundation and the roof was damaged - several metal storage buildings were damaged, with one landing on a car - tree limbs and power lines were also blown down
GRAND TOTAL:						**0**	**0**	**$2,550,000**	

[1] The length provided is only for the portion(s) of the tornado that occurred in The City of Watseka

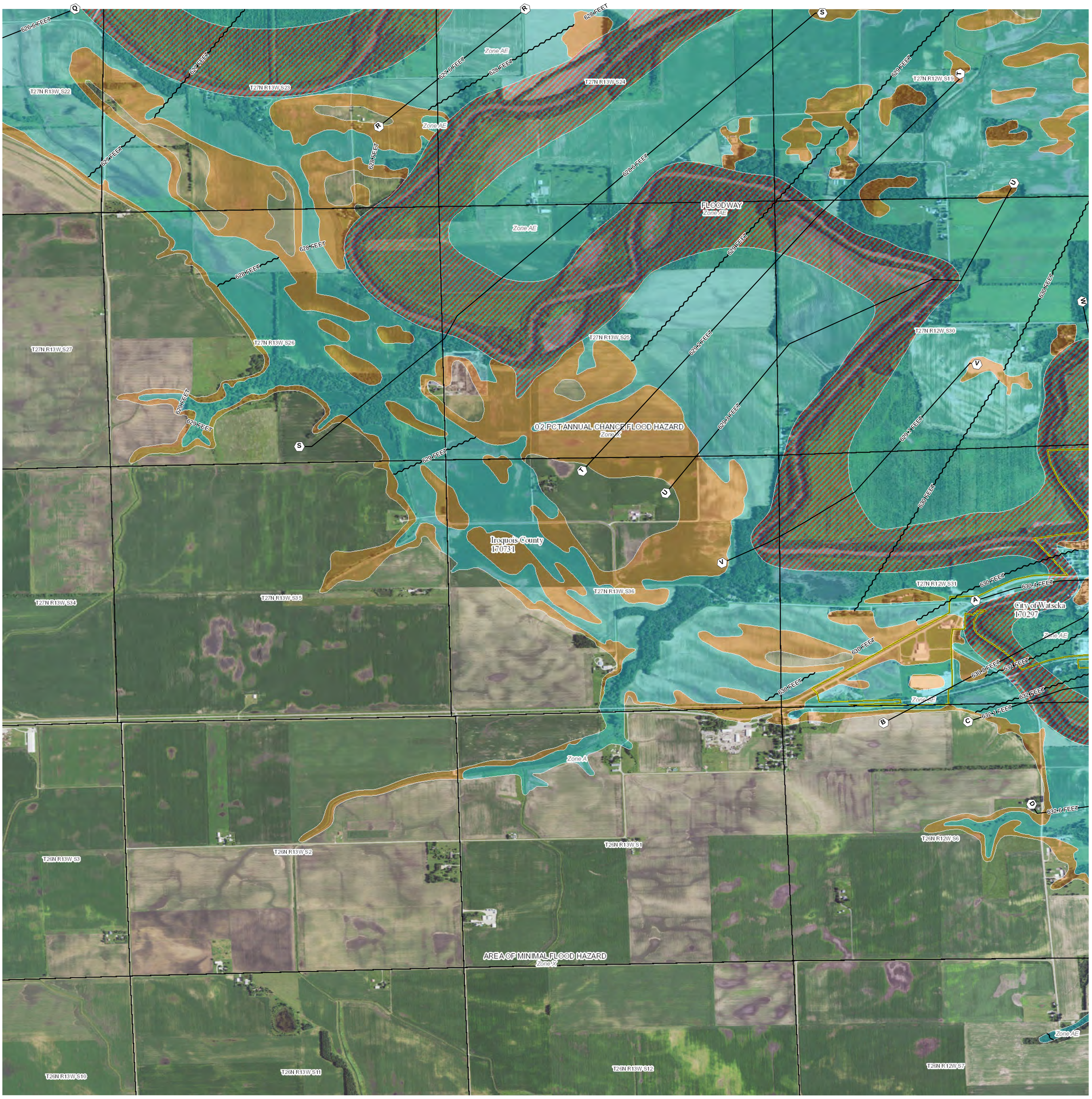
Sources: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

DFIRMS FOR THE CITY

APPENDIX K

40°48'58.38"N

87°48'46.00"W



87°44'59.04"W

USGS The National Map: Orthoimagery. Data refreshed April, 2019.

40°44'46.74"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can beordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **5/2/2020 12:19:51 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

N

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at https://msc.fema.gov

1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

0 105 210 420 630 840 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

IROQUOIS COUNTY, ILLINOIS AND INCORPORATED AREAS

PANEL 370 OF 825

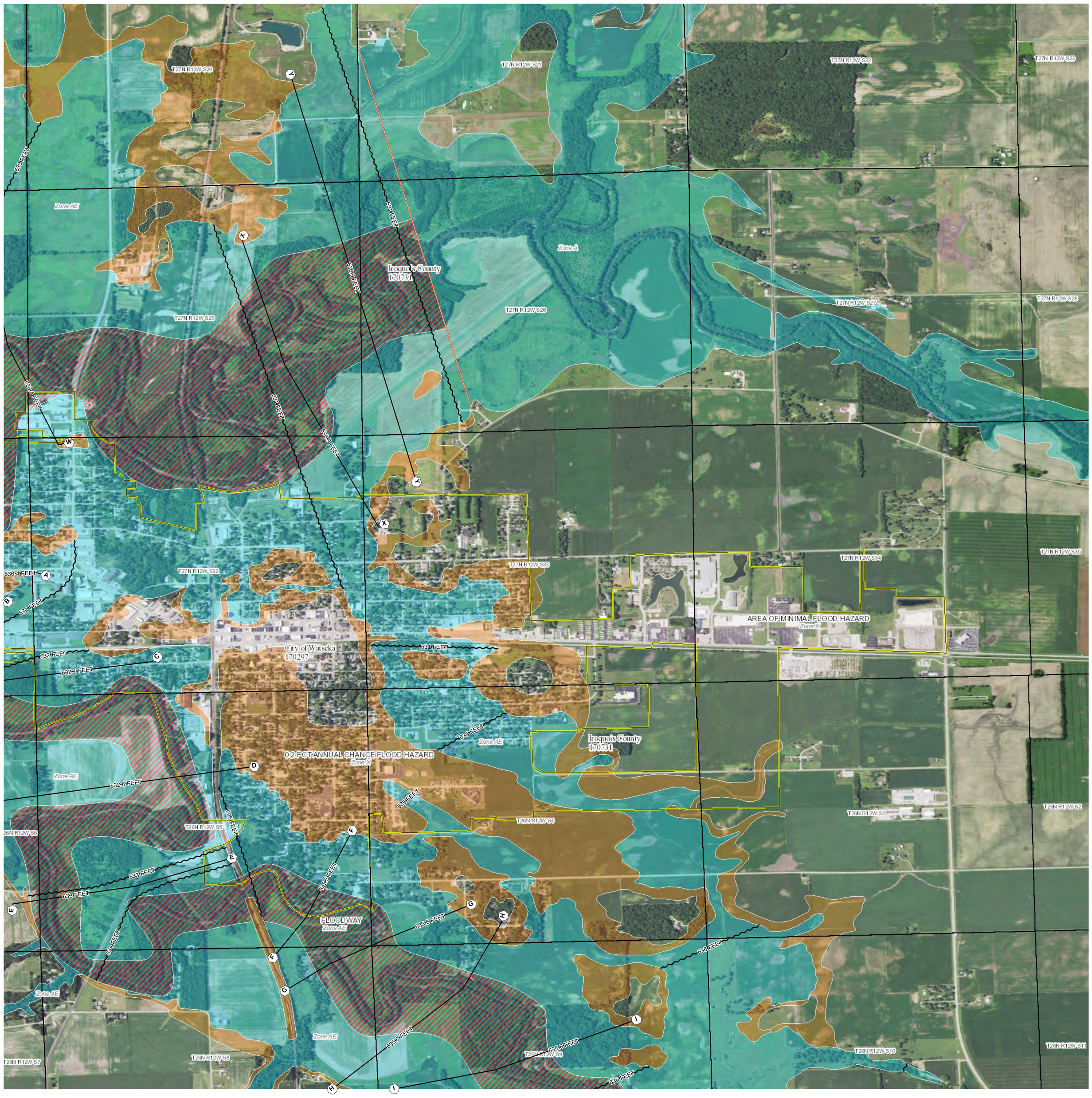
Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF WATSEKA ILLINOIS	170297	0370
IROQUOIS COUNTY ILLINOIS	170731	0370

MAP NUMBER
17075C0370E
EFFECTIVE DATE
08/16/2011

40°48'58.38"N

87°45'1.00"W



USGS The National Map: Orthoimagery. Data refreshed April, 2019.

40°44'46.74"N

87°41'14.04"W

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- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

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- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
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- Effective LOMRs
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GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 — B — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- 8 — Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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SCALE

N

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1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

0 105 210 420 630 840 Meters

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

IROQUOIS COUNTY, ILLINOIS AND INCORPORATED AREAS

PANEL 390 OF 825

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF WATSEKA ILLINOIS	170297	0390
IROQUOIS COUNTY ILLINOIS	170731	0390

MAP NUMBER
17075C0390E
EFFECTIVE DATE
08/16/2011