



# McHenry County Natural Hazards Mitigation Plan

Completed for McHenry County and participating communities



July 2023

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# EXECUTIVE SUMMARY

## Overview

The 2023 *McHenry County Natural Hazards Mitigation Plan* (Plan, or 2023 Plan Update) identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by natural hazards. The Plan focuses on seven natural hazards facing McHenry County and its jurisdictions. The identified major natural hazards facing McHenry County include floods, severe summer storms (including hail, lightning, and wind), severe winter storms, tornadoes, extreme heat events, drought, and dam failure. The County has received one Presidential Disaster Declaration since the 2017 plan update for the Covid-19 pandemic. Nevertheless, McHenry County EMA officials have responded to at least 40 different incidents involving natural hazards since 2004, some of those incidents lasting several days, and each one impacting people, property owners, and businesses in the County.

The development and adoption of a hazard mitigation plan allows communities to be eligible to apply for Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) grants, including the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program. The 2023 Plan Update was developed in accordance with the FEMA Local Mitigation Planning Policy Guide made effective April 19, 2023, and is eligible for credit under FEMA’s National Flood Insurance Program (NFIP) Community Rating System (CRS). The updated planning guidance places an emphasis on planning for climate change and equitable outcomes. For this reason, McHenry County heavily invested in community and stakeholder engagement, and focused on identifying regional mitigation activities that increase the benefits gained by hazard mitigation.



## The 2023 Plan Update

McHenry County is the sixth most populous county in Illinois, with a 2020 population of 310,229 people. McHenry County’s population growth has slowed over the past few years due to the Covid-19 pandemic; nevertheless, the Chicago Metropolitan Transit Agency (CTA) projects a significant population increase of approximately 20 percent by 2030 and 54 percent by 2050. Growth of this magnitude implies a notable need for change in land use and development. While the County’s 2050 Comprehensive Plan is being updated during the 2023 Plan Update process, McHenry County is presented with a pivotal opportunity to grow and manage development in a manner that reduces the risk of natural hazards.

The 2023 Plan update is the third iteration of McHenry County’s Natural Hazards Mitigation Plan, which was initially prepared by the Mitigation Committee in 2008. The Mitigation Committee’s members include representatives of County offices, participating municipalities and townships, state and federal agency partners, and local not-for-profit organizations with a role in hazard mitigation and community resilience (shown below in Table ES-1).

The Plan is organized and designed to mirror FEMA’s hazard mitigation planning process (see Figure ES-1). Chapters 1 and 2 describe the planning process and resources reviewed; Chapter 2 assesses risk and capabilities; Chapters 3 through 9 set goals and guidelines and establish six mitigation strategies and recommended actions; and Chapter 10 sets forth an Action Plan to support adoption and implementation. The six mitigation strategies and recommended actions are centered on **Preventive Measures, Property Protection, Structural Projects, Resource Protection, Emergency Services, and Public Information.**

McHenry County and its jurisdictions have made significant progress since the 2017 planning process, including improving data collection for critical facilities, developing and implementing stormwater management and water resource regulations and best management practices, collaborating with federal partners to execute flood modeling efforts, and applying for federal grants to implement acquisition/demolition projects. The 2023 Plan Update considers this progress, as well as community and development needs, to establish the 5-year action plan to continue improving resilience to natural hazards.

### 2023 Participating Jurisdictions

Twenty-eight jurisdictions have committed to participating and adopting the 2023 Plan, as noted in Table ES-1. These jurisdictions identified natural hazard risks, shared critical infrastructure data and mitigation actions for their respective communities, and participated in the Mitigation Committee.

**Figure ES-1. FEMA Hazard Mitigation Planning Process**



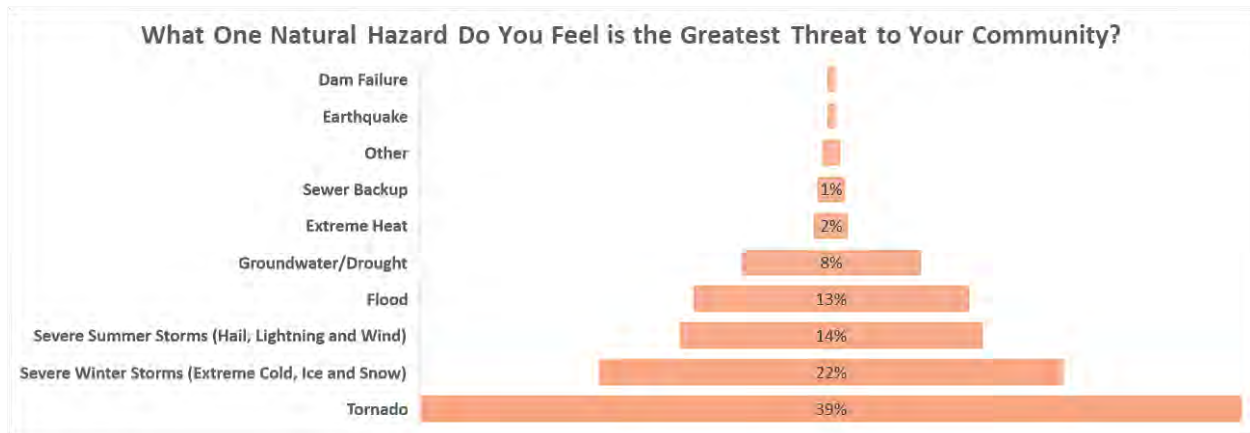
**Table ES-1 McHenry County 2023 Plan Participating Jurisdictions**

Jurisdiction	Status	Jurisdiction	Status
Alden, Township of	Participating	Lake in the Hills, Village of	Participating
Algonquin, Village of	Participating	Lakewood, Village of	Participating
Barrington Hills, Village of	Participating	Marengo, City of	Participating
Port Barrington, Village of	Participating	McHenry, City of	Participating
Bull Valley, Village of	Participating	McHenry Township Fire Protection District	Participating
Cary, Village of	Participating	McHenry Township Road District	Participating
Chemung, Township of	Participating	Richmond, Village of	Participating
Crystal Lake, City of	Participating	Ringwood, Village of	Participating
Dorr, Township of	Participating	Spring Grove, Village of	Participating
Fox River Grove, Village of	Participating	Wonder Lake, Village of	Participating
Harvard, City of	Participating	Woodstock, City of	Participating
Hebron, Township of	Participating	Unincorporated McHenry County	Participating
Huntley, Village of	Participating	Environmental Defenders of McHenry County	Participating
Johnsburg, Village of	Participating	McHenry County Conservation District	Participating

**Stakeholder and Public Engagement**

The Mitigation Committee engaged with stakeholders and the public through a series of in-person and virtual workshops, an online survey tool, and through individual interviews conducted by the University of Chicago. This approach allowed the County’s hazard mitigation message to be accessed and understood multiple ways and through a variety of platforms. The survey tool and individual interviews proved most effective in gathering and sharing data and information. The public survey was shared through social media platforms from January 31 to March 31, 2023, and received over 600 responses from residents representing all jurisdictions. Figure ES-2 demonstrates the type of data gathered through the public survey instrument. Additionally, individual interviews conducted with local officials highlighted additional coordination needs between jurisdictions. McHenry County will continue to prioritize individual engagement with jurisdictions in future updates.

**Figure ES-2. Example Feedback from the 2023 Public Survey**



Risk Assessment

The risk assessment examines eight natural hazards that could impact McHenry County; no hazards were added to the planning effort. According to the FEMA National Risk Index, the County’s national hazard risk is relatively moderate when compared to the rest of the U.S. Additionally, 91 percent of counties in Illinois have a lower risk index than McHenry County. While FEMA’s data indicates that the County’s social vulnerability is very low and that community resilience is very high, expected annual losses associated with natural hazards is relatively moderate and thus drives the County’s risk index score.

McHenry County supplemented National Risk Index data with historical losses, local subject matter expertise, climate change data, and community feedback to validate risk. The findings of the hazard analysis and risk scoring are presented in Table ES-2 and Table ES-3.

**Table ES-2 Summary of Hazard Profiles and Analysis, National Risk Index 2023**

Hazard	Value of Exposed Property	Expected Annual Loss	Annualized Frequency	NRI Risk Score
Flood	\$101 billion	\$1.4 million	1.1 events per year	72.5
Severe Summer Storms (Wind, Lightning, Hail)	\$3.67 trillion	\$2.9 million	55.9 events per year	92.4
Severe Winter Storms and Extreme Cold	\$3.67 trillion	\$2.7 million	1.2 events per year	97.4
Tornadoes	\$3.67 trillion	\$21 million	0.4 events per year	97.1
Extreme Heat	\$3.67 trillion	\$1.3 million	0.7 events per year	90.8
Drought	\$117 million	\$14,503	9.9 events per year	43.7
Earthquakes	\$3.67 trillion	\$774,437	0.34% chance per year	75.5

**Table ES-3 Summary of McHenry County Natural Hazards Final Ranking**

Hazard	Category/Degree of Risk						Risk Score
	Spatial Extent	Probability	Vulnerability	Public Health Consequences	Consequences to Property	Warning Time	
Flood	3	5	3	2	5	4	3.9
Severe Summer Storm	5	5	3	3	3	4	4.1
Severe Winter Storm	5	5	2	2	2	2	3.5
Tornado	2	4	4	3	3	5	3.4
Extreme Heat	5	4	3	3	2	1	3.4
Drought/ Groundwater	5	4	4	3	2	1	3.5
Earthquake	2	2	2	2	2	5	2.3
Dam Failure	2	1	2	3	3	3	2.1

The 2023 Plan Update’s risk scores have all increased from the previous plan update due to a variance in scoring criteria, which specifically addresses public health consequences and impacts to property. The new top 3 hazards presenting risk include severe summer storms, floods, and severe winter storms. These rankings are similar to the top three hazards identified in the last plan update.

### Goals and Guidelines

The Mitigation Committee evaluated hazard mitigation goals and guidelines to understand potential changes in priorities and needs highlighted from the risk assessment update. The goals and guidelines were deemed appropriate, and no changes were made. The Mitigation Committee established the following hazard mitigation goals for the planning process:

Goal 1. Protect the lives, health, and safety of the people of McHenry County from the impact and effects of natural hazards.

Goal 2. Protect public services, utilities, and critical facilities from potential damage from natural hazard events.

Goal 3. Protect historic, cultural, and natural resources from the effects of natural hazards.

Goal 4. Ensure that new developments do not create new exposures to damage from natural hazards.

Goal 5. Mitigate to protect against economic and transportation losses due to natural hazards.

Goal 6. Identify specific projects to protect lives and mitigate damage where cost- effective and affordable.

The following guidelines were developed by the Mitigation Committee for purpose of achieving the goals and to facilitate the development of hazard mitigation action items:

Guideline 1. Focus natural hazards mitigation efforts on floods, severe summer and winter storms, tornadoes, extreme cold and heat events, and drought.

Guideline 2. Make people aware of the hazards they face and focus mitigation efforts on measures that allow property owners and service providers to help themselves.

Guideline 3. Seek state and federal support for mitigation efforts.

Guideline 4. Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural hazards.

Guideline 5. Examine equitable approaches for the local cost of mitigation, such as user fees.

Guideline 6. Create and foster public-private partnerships to accomplish mitigation activities.

Guideline 7. Strive to improve and expand business, transportation, and education opportunities in McHenry County in conjunction with planned mitigation efforts.

Hazard Mitigation Strategies

During the initial development of this plan, the Mitigation Committee put substantial effort into reviewing each of the six mitigation strategies to understand the needs of the county. This previous work was refreshed during the 2017 update of this Plan and again during the 2023 update. Table ES-4 outlines each mitigation strategy, County capabilities, and recommendations from the Mitigation Committee.

**Table ES-4 Summary of McHenry County Mitigation Strategies**

Strategy Name	Strategy Summary	Capabilities	Primary Recommendations (Not Comprehensive)
Preventive Measures	Preventive measures include building codes, manufacturing home standards, planning and zoning regulations, and comprehensive stormwater management.	McHenry County and its jurisdictions have strong capabilities to implement further preventive measures.	Continue with county-wide ISC building code outreach and adoption; Enforce all provisions of the NFIP and County Stormwater Management Ordinance; Examine requirements to strengthen mobile homes.
Property Protection	Property protection measures modify a building or property that is subject to natural hazards to reduce potential damage. This includes structure barriers, elevation, relocation, and acquisition.	McHenry County and its jurisdictions have the capacity to implement property protection measures.	Investigate and mitigate repetitive loss properties; Mitigate critical facilities in the floodplain; Pursue funding to protect public and private property at risk.
Structural Projects	Engineering solutions that are constructed to protect people, buildings, and infrastructure from damage to natural hazards. This includes large structural flood control projects.	McHenry County and its jurisdictions may be challenged to implement structural projects from a financial perspective.	Continue developing watershed studies and plans; Evaluate opportunities to incorporate nature-based solutions; Seek funding for engineering solutions that provide regional benefit.
Resource Protection	Resource protection activities are aimed at preserving or restoring natural areas. This includes stormwater management, green infrastructure, and habitat protection and creation.	McHenry County and its jurisdictions have the capacity and the community's support to implement resource protection measures that support hazard mitigation and sustainability.	Incorporate open space provisions to preserve wetlands and farmland; Direct resources towards stream restoration and erosion protection; implement water quality and groundwater protection measures recommended by the Water Resources Action Plan.
Emergency Services	Emergency service functions include broad categories of preparedness, warning, response, and recovery.	McHenry County and its jurisdictions have strong capabilities to implement pro-active emergency management to support hazard mitigation.	Improve warning systems; Provide training and conduct exercises; Continue to evaluate critical facility vulnerabilities.
Public Information	Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property.	McHenry County's strong relationships between jurisdictions and with the community indicate the capability and capacity to implement an effective public information plan related to hazard mitigation.	Key topics to cover in future PI efforts include safety and emergency protection measures from severe storms, tornadoes, and floods; and increasing public understanding of flood risk.



## Mitigation Action Plan Summary

The Mitigation Committee meets annually to review Action Plan items from the current natural hazard mitigation plan. For the 2023 Plan Update, 24 actions were included in the Action Plan as part of a 5-year roadmap to increase community resilience and reduce natural hazard risk. The Mitigation Committee evaluated and prioritized the mitigation actions into a consolidated risk to support future annual plan reviews. A few top priority mitigation actions from the 2023 Plan Update include:

- Mitigate public infrastructure and design critical facilities with natural hazards protection measures.
- Investigate critical facilities, including validating locations and vulnerabilities, for compilation in a GIS database.
- Mitigate floodplain properties and repetitive loss structures using FEMA HMA program dollars and other federal and local grants available.

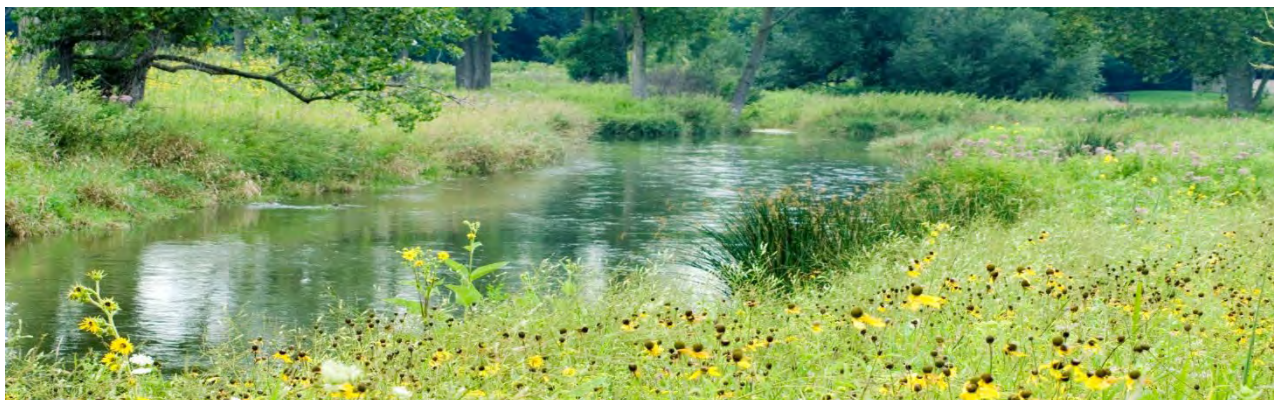
The Mitigation Committee identified several multi-jurisdictional projects for funding pursuits, including installing stream gages, building a county-wide salt storage facility to enhance severe winter storm preparedness, and execute a structure-specific vulnerability assessment for the lower 10 miles of Nippersink Creek.

## Plan Adoption

Jurisdiction adoption of the 2023 *McHenry County Natural Hazards Mitigation Plan* will be completed by resolution of the County Board, the city and village councils, and boards of trustees of each participating municipality, township, and agency. The County's resolution will include the continuation of the Mitigation Committee. The municipal resolutions will adopt each action item that is pertinent to the community (see Chapter 10) and identify a person responsible for implementation. With adoption, the County and each municipality, township or agency are individually eligible to apply for FEMA mitigation grant funding.

## Summary

This Plan was developed and updated by the McHenry County Natural Hazards Mitigation Committee as a multi-jurisdictional plan to meet federal mitigation planning requirements. Upon state and federal plan approval and formal adoption, this Plan will be implemented and maintained through both countywide and individual initiatives, as funding and resources become available. The Mitigation Committee will continue to meet annually, and the public will be invited to participate and provide comments. This Plan will be updated again in five years, as required by FEMA.



## CHAPTER 1 - INTRODUCTION

This chapter outlines the purpose of the McHenry County’s Multijurisdictional Hazard Mitigation Plan, the planning process engaged in the 2023 plan update (including public involvement), and an overview of the County and the assets within.

McHenry County is subject to natural hazards. Floods, severe winter and summer storms, and tornadoes have threatened life and health, and have caused extensive property damage. Floods have caused flooding of streets, structures, basements, and farm fields. Blizzards and snowstorms have impacted the County with the most severe winter storms occurring in 1967, 1979, 1981, 1982, 1999, 2000, 2006, 2014, and 2015, and 2019. Twenty-one tornadoes were verified between 1950 and 2023, resulting in about \$32.8 million in property damages.

McHenry County has taken several steps to address natural hazards and protect natural resources. For example, recognizing the impact of flood damage on existing and future development, the County implements a countywide stormwater management program. To protect the groundwater aquifers, the County developed the Water Resources Action Plan. To further address the potential impact of all natural hazards and to identify mitigation opportunities, McHenry County, the participating municipalities, agencies, and institutions have developed this *McHenry County Natural Hazards Mitigation Plan* (hereafter, the Plan).

**Figure 1-1 2023 Mitigation Committee Meeting**



**Figure 1-2 Hazard Mitigation**



“Hazard mitigation” does not suggest complete elimination of the damage or disruption caused by natural hazards. Natural forces are powerful and most natural hazards are well beyond our ability to control. Natural hazards can be compounded by man-made hazards and vice versa. Hazard mitigation means a long-term approach to reduce hazard vulnerability. Hazard mitigation also means a comprehensive approach to minimizing the impact of hazards.

### 1.1 Purpose of This Plan

Natural hazard events threaten every community in the nation. Every community has different resources and needs relating to natural hazards based on the types of hazards that may impact them, the frequency of events, and the potential damages. There are many ways to address potential impacts and a hazard mitigation plan outlines a blueprint to reduce the impacts of natural hazards within each community.

Hazard mitigation planning is for the purpose of assessing hazards and resources to produce a program of activities that will best mitigate the impact of hazards. Well-prepared hazard mitigation plans ensure that all possible mitigation activities are reviewed and moved towards implementation so that the natural

hazard-related problems are managed by the most appropriate and efficient solutions. Mitigation plans should also ensure that activities are coordinated, complement other community planning efforts, and foster other community objectives, where possible.

The development and adoption of a natural hazard mitigation plan is a requirement for federal mitigation funds for hazard mitigation projects. Section 104 of the Disaster Mitigation Act of 2000 (42 USC 5165) states that local governments applying for *pre*-disaster mitigation funds must have an approved local mitigation plan. Also, a plan is needed for *post*-disaster mitigation funds under the Hazard Mitigation Grant Program. These requirements are contained in 44 CFR (Code of Federal Regulations) Part 201. Hazard mitigation grant funds are made available by the Federal Emergency Management Agency (FEMA) through the Illinois Emergency Management Agency (IEMA).

This Plan identifies activities that can be undertaken by both the public and private sectors to reduce safety hazards, health hazards, and property damage caused by natural hazards. The Plan focuses on the major natural hazards facing McHenry County including floods, severe summer storms, winter storms, tornadoes, extreme heat and cold, and droughts.

Hazard mitigation plans are also recognized as “floodplain management plans” in the National Flood Insurance Program’s Community Rating System (CRS) in which McHenry County and several of its jurisdictions participate. CRS is a program that reduces flood insurance premiums in participating communities. This Plan fulfills the federal mitigation planning requirements for mitigation funding, and it provides the county, participating municipalities, townships, and agencies with an action plan for reducing the impacts of these natural hazards on people and property.

## 1.2 Authority

This updated Plan complies with all requirements set forth by IEMA and the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation of 2000. In addition, it complies with all of FEMA’s Final Rule 44 CFR Part 201, which outlines criteria for approval of hazard mitigation plans. The McHenry County 2023 Plan Update was completed in accordance with FEMA’s Local Mitigation Planning Policy Guide (FP206-21-0002), effective April 19, 2023.

## 1.3 Organization of This Plan

This Plan is organized into 10 chapters as outlined in Table 1-1:

**Table 1-1 McHenry County Hazard Mitigation Plan Chapters**

<b>Chapter 1: Introduction</b>
Purpose of the Plan
Authority
Organization of the Plan
Planning Process Approach
Summary of Meetings
Public Participation Summary
County and Jurisdiction Overview
<b>Chapter 2: Risk Assessment</b>
Hazard Profiles
Vulnerability Assessment
Summary of Risk

<b>Chapter 3: Plan Goals</b>
Plan Goals and Guidelines
Alignment to Other Planning Efforts
<b>Chapter 4: Preventative Measures</b>
Preventative Measures
Conclusions
Recommendations
<b>Chapter 5: Property Protection Measures</b>
Property Protection Measures
Conclusions
Recommendations
<b>Chapter 6: Structural Measures</b>
Structural Measures
Conclusions
Recommendations
<b>Chapter 7: Resources Measures</b>
Resources Measures
Conclusions
Recommendations
<b>Chapter 8 Emergency Management Measures</b>
Emergency Management Measures
Conclusions
Recommendations
<b>Chapter 9: Public Information Measures</b>
Public Information Measures
Conclusions
Recommendations
<b>Chapter 10: Mitigation Action Plan</b>
Mitigation Actions

## 1.4 Planning Process Approach

*Requirement 44 CFR Section 201.6(c)(1). The Plan documents the planning process, including how it was prepared and who was involved in the process for each jurisdiction.*

This multi-jurisdictional plan studies the potential damage from natural hazards in McHenry County and reviews a range of mitigation alternatives. It selects those mitigation alternatives that will work best for McHenry County and ensures that public funds are well spent. It also considers the current directions to the County government and the participating municipalities and agencies.

This planning effort was initiated and coordinated by the McHenry County Emergency Management Agency. The effort was funded by a grant from IEMA. In addition, the McHenry County Hazard Mitigation Planning Committee was consulted through each step of the planning process and includes representatives from each of the participating jurisdictions. The County followed a general 10-step planning process, based on FEMA guidance and requirements (see Figure 1-3). This was the generalized process used in the previous plan updates as well.

**Figure 1-3 Planning Process Approach**



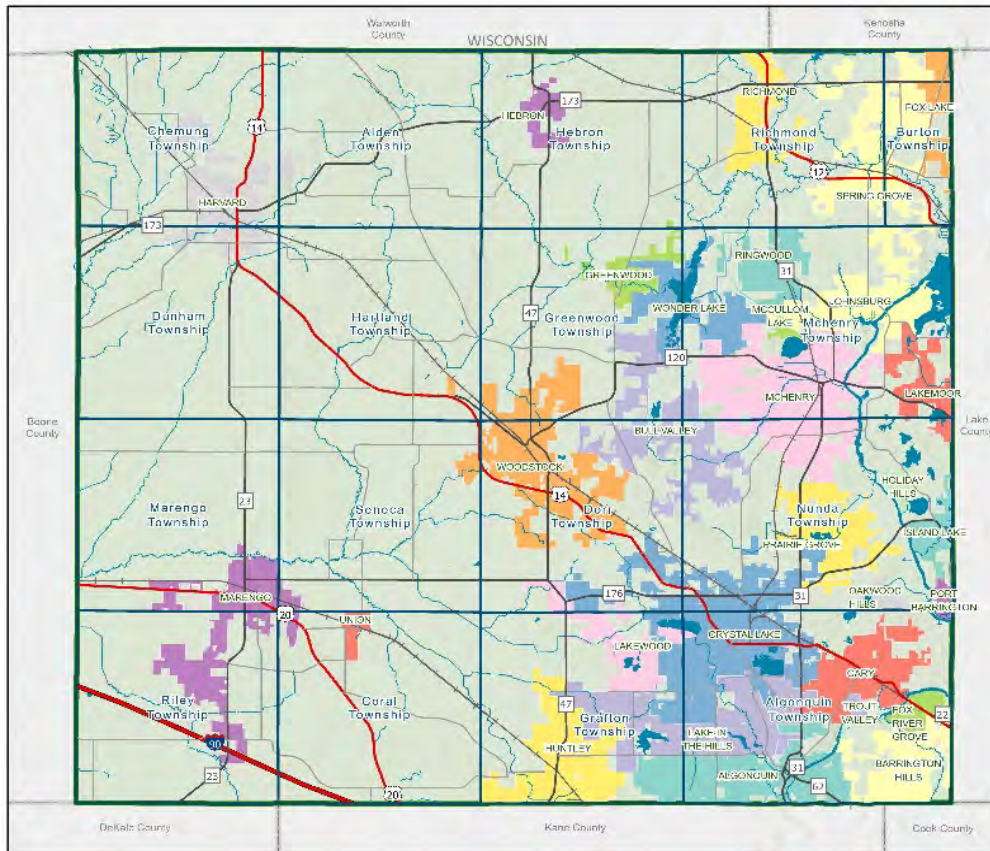
**1.4.1 Participating Jurisdictions:** Participating jurisdictions were part of the planning committee (described below in Table 1-2). Figure 1 - 4 provides a base map of the county and its jurisdiction for reference. The 28 participating jurisdictions were asked to identify natural hazards risks, shared critical infrastructure and mitigation actions for their respective communities, and adopt the Plan following FEMA approval. During the plan’s finalization, McHenry County reached out to jurisdictions lacking plan participation and input to gather natural hazard data, input on the mitigation strategy, and assess capabilities and capacity for plan implementation. The documentation of those conversations was added to the plan’s tables in subsequent chapters and in Appendix D. Commitments to participate in the planning process are in Appendix A.

**Table 1-2 McHenry County Participating Jurisdictions**

Jurisdiction	Status	Jurisdiction	Status
Alden, Township of	Participating	Lake in the Hills, Village of	Participating
Algonquin, Village of	Participating	Lakewood, Village of	Participating
Barrington Hills, Village of	Participating	Marengo, City of	Participating
Port Barrington, Village of	Participating	McHenry, City of	Participating
Bull Valley, Village of	Participating	McHenry Township Fire Protection District	Participating
Cary, Village of	Participating	McHenry Township Road District	Participating
Chemung, Township of	Participating	Richmond, Village of	Participating

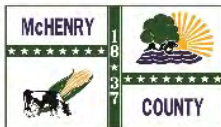
Jurisdiction	Status	Jurisdiction	Status
Crystal Lake, City of	Participating	Ringwood, Village of	Participating
Dorr, Township of	Participating	Spring Grove, Village of	Participating
Fox River Grove, Village of	Participating	Wonder Lake, Village of	Participating
Harvard, City of	Participating	Woodstock, City of	Participating
Hebron, Township of	Participating	Unincorporated McHenry County	Participating
Huntley, Village of	Participating	Environmental Defenders of McHenry County	Participating
Johnsburg, Village of	Participating	McHenry County Conservation District	Participating

Figure 1-4 McHenry County Base Map



## McHenry County, IL

### Base Map



Map Produced by McHenry County GIS Department  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Political Township
- Interstate
- US Highways
- State Roads
- Other Roads
- Railways
- Rivers & Streams
- Lakes

### Municipal Boundaries

- ALGONQUIN
- BARRINGTON HILLS
- BULL VALLEY
- CARY
- CRYSTAL LAKE
- FOX LAKE
- FOX RIVER GROVE
- GREENWOOD
- HARVARD
- HEBRON
- HOLIDAY HILLS
- HUNTLEY
- ISLAND LAKE
- JOHNSBURG
- LAKE IN THE HILLS
- LAKEMOOR
- LAKEWOOD
- MARENGO
- MCCULLOM LAKE
- MCHENRY
- OAKWOOD HILLS
- PORT BARRINGTON
- PRAIRIE GROVE
- RICHMOND
- RINGWOOD
- SPRING GROVE
- TROUT VALLEY
- UNION
- WONDER LAKE
- WOODSTOCK

**1.4.2 McHenry County Natural Hazards Mitigation Committee:** This Plan was developed under the guidance of a McHenry County Natural Hazards Mitigation Committee (Mitigation Committee), created by resolution of the McHenry County Board on November 18, 2008. It was reconvened for the 2023 plan update. Responsibilities of the Mitigation Committee included:

- Participate in McHenry County Hazard Mitigation Plan meetings and workshops,
- Provide best available data as required for the risk assessment portion of the Plan,
- Help complete the local Community Questionnaire to determine capabilities,
- Provide copies of any mitigation or hazard-related documents for review and incorporation into the Plan,
- Support the development of the Mitigation Strategy, including the design and adoption of community goal statements,
- Help design and propose appropriate mitigation actions for their department/agency for incorporation into the Mitigation Action Plan,
- Review and provide timely comments on all study findings and draft plan deliverables, and
- Support the adoption of the 2023 McHenry County Natural Hazards Mitigation Plan.

The Natural Hazards Mitigation Committee members are presented in Table 1-3.

**Table 1-3 2023 McHenry County Hazard Mitigation Planning Participants**

Jurisdiction/ Affiliation	Representative	Department
Alden, Township of	Bart Schnulle	Highway Commissioner
Algonquin, Village of	Vince Kilcullen, Debby Sosine, Matthew Bajor, Derek Lee, Danijela Sandberg	Public Works Township Road District
Barrington Hills, Village of	Anna Paul	Director of Administration
Bull Valley, Village of	Al Antoni; Mark Newton	Administration
Cary, Village of	Patrick Finlon	Police Chief
Chemung, Township of	Samuel Finrock	Supervisor
Crystal Lake, City of	Abby Wilgreen, Paul DeRaedt	Fire Rescue
Harvard, City of	Lou Leone	Administration
Hebron, Township of	Nancy Lech	Supervisor
Huntley, Village of	Patrick Ullrich; Peter D’Agostino	Public Works
Johnsburg, Village of	Vincenzo Lamontagna	Assistant Administrator
Lake in the Hills, Village of	Pat Boulden	Police
Lakewood, Village of	Jean Heckman, Mike Roth	Administration
McHenry, Township of	Karen Bush	Fire
Port Barrington, Village of	Jodi McCarthy	Stormwater
Richmond, Village of	Jon Schmitt	Administration
Spring Grove, Village of	Kelly Popelka, Sandi Rusher	Administration
Wonder Lake, Village of	Kyle Mandernack	EMA Coordinator
Woodstock, City of	Brant Aymond	Public Works Director
McHenry County Conservation District	Ben O’Dea	Conservation
McHenry County	Carolyn Campbell	Council
McHenry County	Scott Hartman	Administrator’s Office
McHenry County	Chalen Daigle, Alicia Schueller	Communications
McHenry County	Joe Korpalski (Director), Samantha Dittrich, Ed Markison, Ernest Varga, Beth Skowronski	Division of Transportation

Jurisdiction/ Affiliation	Representative	Department
McHenry County	David Christensen (Director), Robert Ellsworth (Assistant Director), Robin Gibbs, Robert Leracz, Tom Smith	Emergency Management
McHenry County	Nicole Gattuso (Director), Edward Amoo, Steven Gilbert	GIS
McHenry County	Bridget Hoffman	Department of Health
McHenry County	Joanna Colletti, Adam Wallen	Water Resources; Planning & Development
Environmental Defenders of McHenry County	Cindy Skrukud	-
Northwestern Medicine	Robby Williams	Emergency Management
United Way	Jamie Maravich	-
McHenry County College	Tim Kretschner	-
McHenry 2050 Comprehensive Plan	Mary T McCann	Plan Commissioner
Illinois Emergency Management Agency	Zachary Krug, Sam Al-Basha	Mitigation
USACE	Michelle Kozak	-
University of Chicago	Olga Brezden	-

Additional participants were invited to be part of the Mitigation Committee, including neighboring communities, agencies involved in hazard mitigation activities, and agencies that regulate development. Specifically, Jon Mensching from Kane County Office of Emergency Management (OEM) regularly attended meetings.

**1.4.3 Public Involvement:** The Mitigation Committee obtained public input in a variety of ways, including:

- Information presented on the McHenry County website and municipal websites,
- Contact with Committee members and their organizations,
- Public survey, active January 31 to March 31, 2023, with over 600 respondents representing all jurisdictions,
- April and May 2023 Committee meetings open to the public and participation of members of the public at the meetings, and
- In-person public engagement about natural hazards mitigation during the McHenry County Earth Day event on April 22, 2023.

Documentation of public engagement efforts is provided in Appendix B and detailed in Section 1.6 below.

**1.4.4 Coordination & Review of Plans, Studies, and Resources:** During the planning process, contacts were made with regional, state, and federal agencies and organizations to determine the programs, projects or data that could assist or support the County’s mitigation efforts, including:

- Illinois Office of Emergency Management
- Illinois Department of Natural Resources, Office of Water Resources
- Illinois Department of Natural Resources, State Water Survey
- Federal Emergency Management Agency
- Chicago Metropolitan Agency for Planning (CMAP)



- International Association of Emergency Managers
- Building Codes Effectiveness Grading Schedule Program
- Association of State Floodplain Managers

Existing plans and programs were reviewed during the planning process: including ongoing data analysis for the McHenry County 2050 Comprehensive Plan; the McHenry County 2040 Long Range Transportation Plan; the McHenry County Stormwater Management Plan and Ordinance; the McHenry County Water Resources Action Plan; the CMAP On to 2050 Plan; and the McHenry County 2022-2025 Strategic Plan. Alignment with the Natural Hazards Mitigation Plan is further discussed in Chapter 3. Additional planning documents reviewed include McHenry County’s 2021 Threats and Hazard Identification and Risk Assessment (THIRA), Fox River Corridor Plan, the 2018 Illinois Natural Hazard Mitigation Plan, and local studies and reports covering comprehensive and strategic planning efforts.

It should be underscored that this Plan does not replace other county or municipal planning efforts, such as the County’s stormwater management plan, comprehensive plans, watershed management plans, or local emergency management plans. This Plan is intended to complement those efforts.

**1.4.5 Risk Assessment (Hazard Assessment and Problem Evaluation):** The Committee updated the County’s risk assessment from January 2023 to February 2023. The natural hazards that could potentially impact McHenry County were reviewed by the Mitigation Committee at the February 2023 meeting. No changes were made to the hazard list, but climate change was added as an overall consideration and, ultimately, new risk scores were applied to each.

Updated hazard profiles, including the vulnerability assessment and hazard rankings, were presented to the Mitigation Committee at the February 2023 meeting. The hazard data and the Committee’s findings and conclusions are covered in Chapter 2 of this Plan. Chapter 2 examines the hazards, including a hazard assessment – what causes the hazard and the likelihood of occurrence, and a vulnerability assessment – the impact of the hazard on life, health, and property.

**1.4.6 Goals:** Mitigation planning goals and guidelines were updated based on the results of the risk assessment and reviewed and confirmed by the Mitigation Committee during the March 2023 meeting. No changes were made as all goals and guidelines were found to be in alignment with the County’s overall planning goals and needs to reduce the impacts of hazards. These are found in Chapter 3 of this Plan.

**1.4.7 Mitigation Strategies:** The Mitigation Committee considered a range of project and policy alternatives for each hazard identified. The Committee examined current mitigation efforts and then considered a variety of measures that could affect the impact of the hazards. The mitigation strategies have been organized under six categories: preventive measures, property protection, structural alternatives, resource protection, emergency management and public information. All mitigation measures were reviewed in relationship to the developed mitigation goals. The mitigation strategies are the subject of Chapters 4 – 9 in this Plan, which were reviewed and updated as part of the 2023 plan update process. Information regarding each jurisdiction’s perceptions of risk, capabilities and mitigation priorities were collected during monthly Committee meetings, 1-on-1 interviews and via email.

**1.4.8 Action Plan:** After the review of mitigation alternatives and mitigation recommendations in Chapters 4-9, the Mitigation Committee updated the “Action Plan” that specifies recommended efforts

and projects. The Action Plan describes a prioritization framework for implementation, who is responsible for implementing the mitigation measure, when the measures are to be complete, and an estimate of cost and potential funding sources. The Action Plan was developed with the consideration of the goals and guidelines presented in Chapter 3. During the 2023 plan update process, each action was reviewed to determine the status. A status for each jurisdiction was provided. In addition, each jurisdiction and township provided a status to reflect local risk and needs. Mitigation Committee members were encouraged to provide new jurisdiction-specific actions during the 2023 update of this Plan. The Action Plan is presented in Chapter 10 of this Plan.

It should be noted that this Plan serves only to recommend mitigation measures. Implementation of these recommendations depends on adoption of this Plan by the McHenry County Board and the City Council or Board of Trustees of each participating municipality and township. It also depends on the cooperation and support of the offices designated as responsible for each action item.

**1.4.9 Chapter Development and Plan Review:** The risk assessment and mitigation strategy were presented to the public in two separate meetings in April and May 2023. Comments on the plan were collected during this time; comments and questions are summarized in Appendix C as documentation of public plan review.

## 1.5 Summary of Meetings

A total of six Committee meetings, two in-person and two hybrids (i.e., mix of in-person and virtual), and two virtual-only meetings were held during the plan update process. Each is described briefly below. All agendas were posted online and open to the public. Complete meeting minutes can be found in Appendix C.

### Meeting 1: Mitigation Committee Kick-off

*Date Held: December 14, 2022*

*Meeting Objectives and Outcomes:*

- Refresh McHenry County’s understanding of the hazard mitigation planning process, including new planning requirements for 2023,
- Introduce the Core Planning Team and discuss individual roles and responsibilities, and
- Review timelines and next steps.

### Meeting 2: First Committee Meeting

*Date Held: January 26, 2023*

*Meeting Objectives and Outcomes:*

- Introduce FEMA’s hazard mitigation planning process and criteria, including how we intend to satisfy those requirements,
- Present a local hazard mitigation project and start identifying other projects to capture within the updated Plan, and
- Review our timeline and next steps so that you have clear visibility around upcoming meetings and information requests.

### Meeting 3: Risk Assessment Workshop

*Date Held: February 23, 2023*

*Meeting Objectives and Outcomes:*

- Validate our refreshed understanding of the County’s natural hazards risks since 2017,

- Identify shared critical infrastructure between County jurisdictions (and with neighboring counties) and the potential impacts of a natural disaster, and
- Start identifying potential mitigation actions to reduce those risks.

#### **Meeting 4: Mitigation Goals & Objectives Workshop**

*Date Held: March 30, 2023*

*Meeting Objectives and Outcomes:*

- Review and revise the status of the County’s current list of Action Items from the 2017 Plan,
- Identify any barriers to progress across the Action Items that the County may be able to unlock,
- Identify a set of County-wide mitigation actions to prioritize for near-term funding opportunities, and
- Reach consensus around the County’s shared mitigation goals and guidelines.

#### **Meeting 5: April Committee & Public Meeting**

*Date Held: April 27, 2023*

*Meeting Objectives and Outcomes:*

- Introduce FEMA’s hazard mitigation planning process and criteria, including how we intend to satisfy those requirements,
- Review the County’s progress to-date, including results of the latest natural hazards risk assessment and key insights from the public survey, and
- Receive feedback and address any questions from Committee Members and the public to ensure a comprehensive understanding of the County’s risk.

#### **Meeting 6: May Committee & Public Meeting**

*Date Held: May 25, 2023*

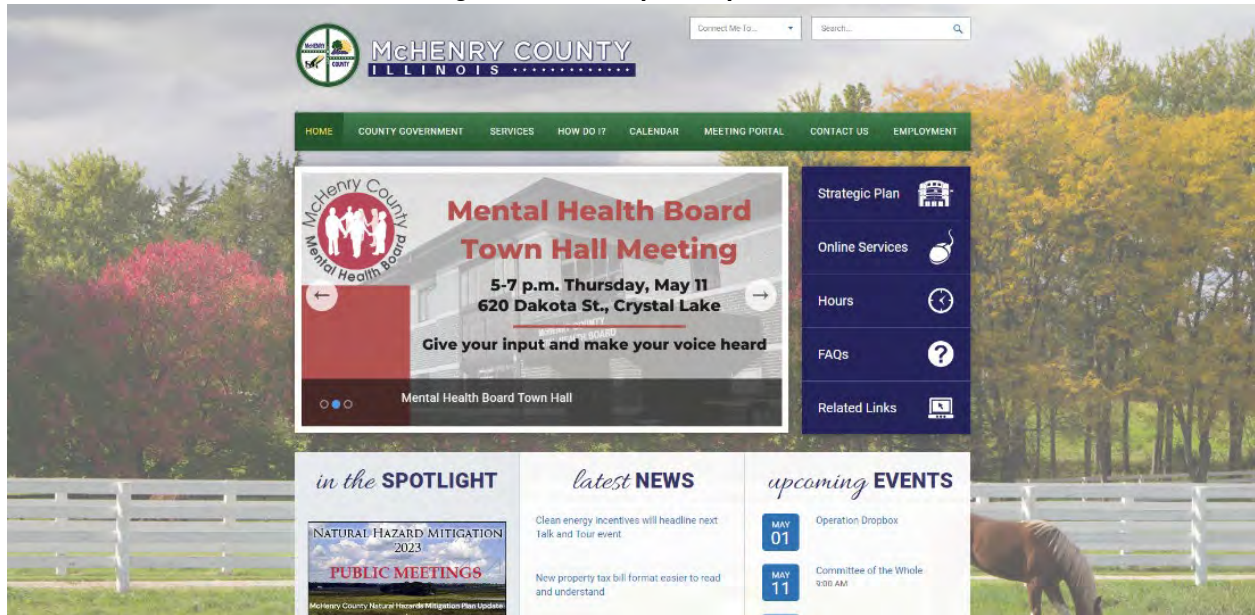
*Meeting Objectives and Outcomes:*

- Review of FEMA’s hazard mitigation planning process and criteria, including how we intend to satisfy those requirements,
- Present the Goals, Objectives, and Action Plan updated for McHenry County’s hazard mitigation plan, and
- Receive feedback and address any questions from Committee Members and the public to ensure a comprehensive understanding of the County’s natural hazard mitigation strategy and action plan.

## **1.6 Public Participation Summary**

As noted above, the public was kept informed throughout the planning process via the McHenry County website, [www.mchenrycountyil.gov](http://www.mchenrycountyil.gov) (Figure 1-5), jurisdiction websites, communication through Mitigation Committee members, and press releases. All meetings were open to the public, but the final meeting was advertised much more broadly to gain additional public input.

Figure 1-5 McHenry County Website



The most successful effort appeared to be the online Public Survey. A summary of the process and results follows:

**1.6.1 Public Survey:** From February 1 to March 31, 2023, McHenry County solicited broad input via an online survey to understand public perceptions of natural hazards risk, resilience priorities and preferred means of communication. The survey garnered 642 total responses, an increase of approximately 450 respondents since the 2017 Plan update (and 201 in 2015)!

The survey was distributed via the McHenry County website, social media channels (e.g., Facebook, Twitter, Nextdoor, etc.), and electronic newsletters. Some municipalities also publicized the survey on their websites and newsletters. Figure 1-6 and Figure 1-7 provide documentation of postings to publicize the survey and obtain community input.

Figure 1-6 Natural Hazards Survey QR Code



**Figure 1-7 Publicized Public Survey**



The complete survey and survey responses can be found in Appendix B. Key results from the survey are as follows:

- 54 percent of respondents (348) have experienced a natural disaster event in McHenry County. Of those, an overwhelming majority experienced Severe Winter and Summer Storms.
- Tornadoes were perceived as the number one threat to the community (40 percent of respondents), despite only 12 percent of respondents having experienced one in McHenry County. The next closest perceived threats were Severe Winter Storms, Flooding, and Severe Summer Storms.
- 70 percent of respondents (445) feel their community is doing a Good or Fair job at making them aware of their natural hazard risk, however:
- 54 percent of respondents only feel somewhat prepared for natural hazards,
- 77 percent of respondents do not know who to contact to learn more about natural hazard risks, and
- 77 percent of respondents do not have flood insurance because of not living in a floodplain and/or their homes were elevated to mitigate flooding impacts.

Nevertheless, 72 percent of survey respondents confirmed they are interested in making their homes more resistant to the impacts of natural hazards. Survey respondents also provided key insights for the risk assessment and mitigation strategy:

- More than 80 percent of respondents feel it’s very important for the County to prioritize protecting lives, critical facilities, utilities, and emergency services when planning for natural hazards, and
- Overwhelmingly, email (40 percent) and texts (25 percent) are the preferred method for receiving information about natural hazards.

The most popular ideas for mitigation projects included: conduct scenario-based exercises to test emergency response procedures; establish a volunteer network to support post-disaster recovery efforts; improve digital communication to enhance accessibility and speed of receiving information; and increase investment in water and land-based conservation efforts.

Lastly, the most common piece of feedback received was from residents requesting more information on natural hazards preparedness and emergency operations procedures, so they are better equipped when disaster strikes.

**1.6.2 Public Meetings:** Two monthly Committee meetings, April 27, 2023, and May 25, 2023, were advertised and opened to members of the public to increase awareness and understanding of the Plan update and collect additional input. Appendix C contains detailed meeting notes and documentation of the public meetings.

## 1.7 McHenry County Overview

If driving, McHenry County is located 61 miles northwest of downtown Chicago in northeastern Illinois. When looking from a “bird’s eye view”, McHenry County is located 35 miles from Chicago. The county seat is Woodstock, Illinois. Political jurisdictions include 17 townships and 30 municipalities. McHenry County has a land area of between 603 and 604 square miles which makes it the 34<sup>th</sup> largest county in Illinois. McHenry County is bordered by Lake County to the east, Cook, Kane and DeKalb Counties to the south, Boone County to the west, and Kenosha and Walworth Counties in the State of Wisconsin to the north. McHenry County is approximately 26 miles from east to west, and 23.5 miles from north to south. A statewide reference is included in Figure 1-8.

**1.7.1 Climate:** According to NOAA’s National Centers for Environmental Information, the average high temperature in McHenry County is approximately 31 degrees Fahrenheit in the winter (December – February) and 79 degrees Fahrenheit in the summer (June – August). The record high temperature recorded by the National

**Figure 1-8. Illinois and McHenry County Location**



Weather Service is 103 degrees Fahrenheit (July 4, 1974), while the record low experienced in McHenry County is -32 degrees Fahrenheit (January 31, 2019). Maximum temperatures have exceeded 100 degrees Fahrenheit in 2022, 2012, and 1995. Minimum temperatures have dipped below -20 degrees a handful of times: in 2019, 2014, 2009, 1999, 1996, and 1994.

The total annual precipitation is approximately 37 inches. More than half of the county's annual precipitation usually falls in April through October. The average seasonal snowfall is 35 inches. The greatest snow depth at one time recorded between 1961 and 1990 was 38 inches on January 17, 1979. The heaviest one-day snowfall was 12 inches on January 1, 1979. The 2023 Plan considers potential future climate change impacts as described further in Chapter 2.

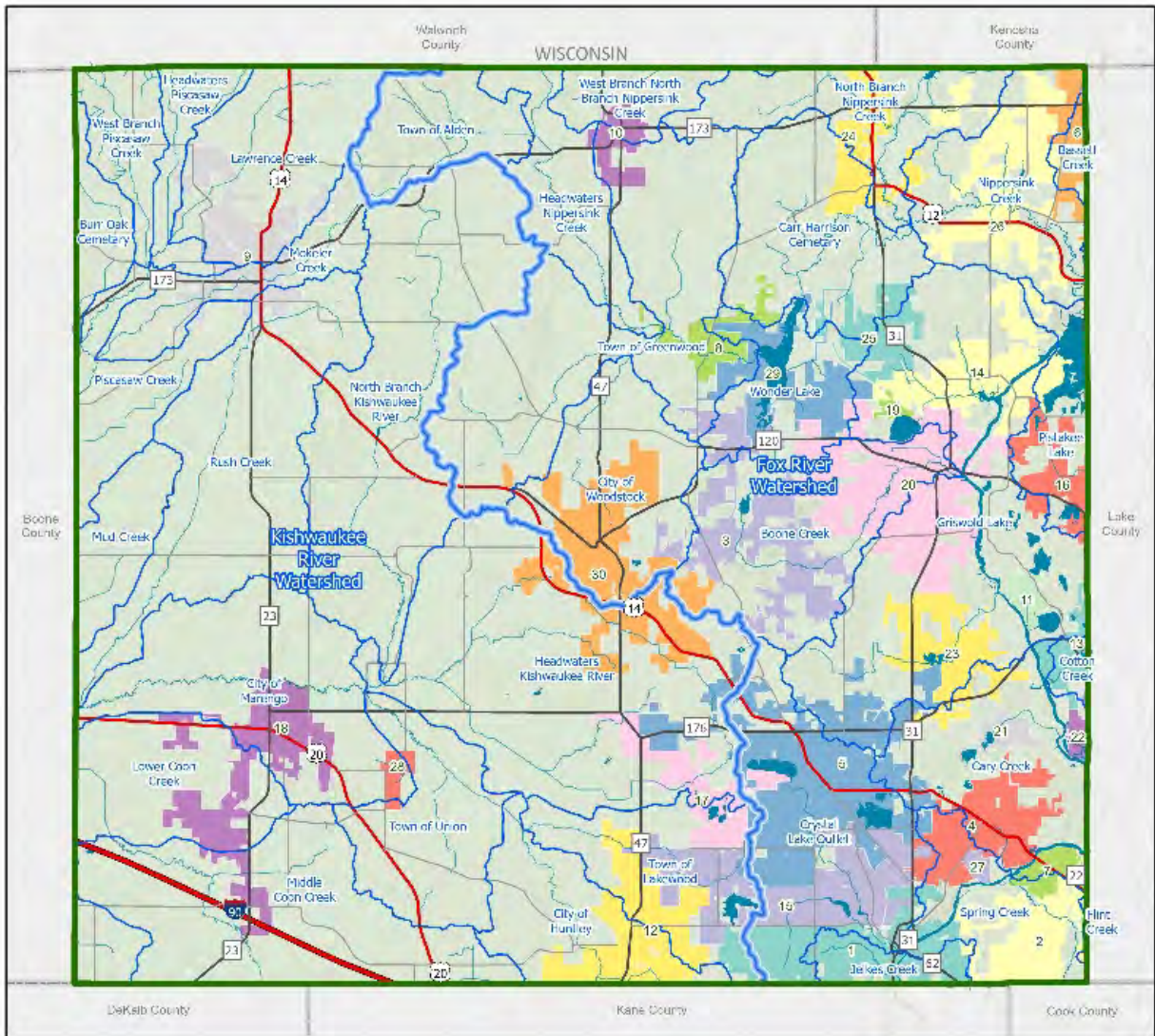
**1.7.2 Watersheds, Topography and Soils:** A watershed is the entire land area that drains into a particular lake or river. McHenry County has two major watershed areas: the Fox River watershed, and the Kishwaukee River watershed. The eastern half of the County is drained by the Fox River, which flows to the south. Boone Creek, Nippersink Creek, and Thunderbird Lake Drain (also known as Sleepy Hollow Creek) are the main tributaries of the Fox River. The western half of the county is drained by the Kishwaukee River, which flows generally towards the west. Piscasaw, Coon, and Rush Creeks are tributaries to the Kishwaukee River. Figure 1-9 presents the McHenry County Watersheds.

Glacial activity provided the County's varied terrain of rolling hills, moraines, floodplains, kames, eskers, and bogs. Combined with the many ponds, wetlands, fens and lakes, these features provide diverse recreational opportunities and wildlife habitat. The Marengo Ridge is a prominent moraine in the Harvard and Marengo area. This moraine and the entire county to the east are in the Wheaton Morainal Country of the Great Lakes Section of the Central Lowland Province. The remaining portion of the County west of the Marengo Ridge is in the Rock River Hill Country of the Till Plains Section of the Central Lowland Province. The highest elevation in the County is about 1,190 feet above sea level about five miles northeast of Harvard. The lowest elevation is about 730 feet at the point where the Fox River leaves the County south of Algonquin.

Loams and silt loams are the predominant soils in McHenry County which contribute to the healthy role that agricultural activities have on the economy and quality of life. Prime soil comprises approximately 57percent of the County's landmass. McHenry County is also a major producer of sand and gravel in Illinois. The McHenry County 2030 Comprehensive Plan presents additional information on most production soils (2030 Plan, Figure 1) and primary aggregate areas (sand and gravel) (2030 Plan, Figure 12).

In addition to contributing to the local economy, these resources provide an abundant source of groundwater found in shallow and deep aquifers. All of McHenry County obtains drinking water from groundwater sources.

**Exhibit 1-2 McHenry County Watersheds**



**McHenry County, IL**

**Watersheds**



Map Produced by McHenry County  
GIS Department  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Interstate
- US Highways
- State Roads
- Other Roads
- Rivers & Streams
- Lakes
- Fox River/Kishwaukee Watershed Boundary Line
- Watersheds

**Municipal Boundaries**

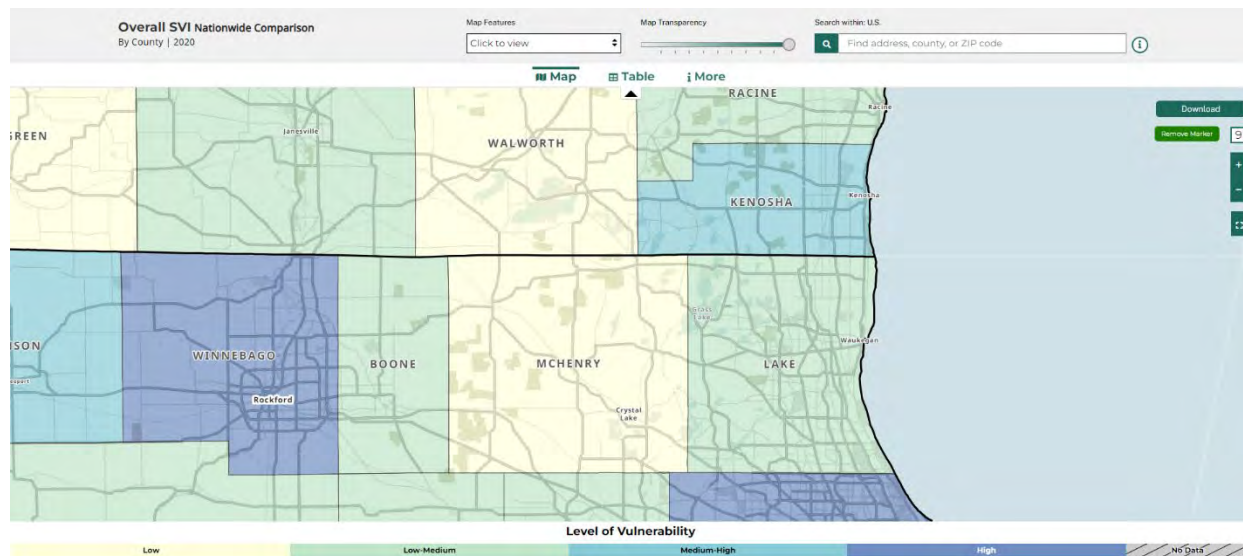
- |                   |                 |
|-------------------|-----------------|
| ALGONQUIN         | LAKEMOOR        |
| BARRINGTON HILLS  | LAKEWOOD        |
| BULL VALLEY       | MARENGO         |
| CARY              | MCCULLOM LAKE   |
| CRYSTAL LAKE      | MCHENRY         |
| FOX LAKE          | OAKWOOD HILLS   |
| FOX RIVER GROVE   | PORT BARRINGTON |
| GREENWOOD         | PRAIRIE GROVE   |
| HARVARD           | RICHMOND        |
| HEBRON            | RINGWOOD        |
| HOLIDAY HILLS     | SPRING GROVE    |
| HUNTLEY           | TROUT VALLEY    |
| ISLAND LAKE       | UNION           |
| JOHNSBURG         | WONDER LAKE     |
| LAKE IN THE HILLS | WOODSTOCK       |



**1.7.3: Population and Housing:** The 2020 U.S. Census documents McHenry County’s total population as 310,229, an increase of over 1,400 people since the 2010 census and 0.9 percent increase since the 2017 Plan. McHenry County’s population growth has slowed over the past few years due to the Covid-19 pandemic; nevertheless, the County is Illinois’ sixth most populous county and CMAP projects a significant population increase to 374,989 by 2030 and 478,639 by 2050. The County has added approximately 2,357 housing units since 2015. This equates to an addition of 470 housing units per year between 2015 and 2020 and is nearly double the residential development rate from the 2010 – 2015 comparison, which had shown an increase of about 250 units per year. Approximately 4,000 total housing units have been built since 2010. The housing stock is primarily owner-occupied, single-family homes.

Population and relevant socio-economic information for McHenry County, based on 2020 U.S. Census Data, is presented in Table 1-4 (townships) and Table 1-5 (municipalities). Regarding poverty and disadvantaged communities, 6.55 percent of the population (19.9k out of 305k people) live below the poverty line, a number that is lower than the national average of 12.8 percent. The most common racial or ethnic group living below the poverty line in McHenry County, IL is White, followed by Hispanic and Asian. The largest demographic living in poverty are Females 6 - 11, followed by Females 25 - 34 and then Females 35 - 44. According to the Center for Disease Control Social Vulnerability Index, McHenry County has a low level of social vulnerability (Figure 1-9).

**Figure 1-9 CDC SVI Nationwide Comparison – McHenry County**



**Table 1-4 2020 McHenry County Population Data by Township**

Township	Population (2020)	Housing Units (2020)
Alden	1,275	620
Algonquin	87,633	33,960
Burton	4,820	1,858
Chemung	9,095	3,294
Coral	3,638	1,380
Dorr	21,572	8,929
Dunham	2,823	1,016

Township	Population (2020)	Housing Units (2020)
Grafton	56,446	19,256
Greenwood	14,176	5,260
Hartland	1,861	784
Hebron	2,327	976
Marengo	7,202	3,065
McHenry	46,276	19,214
Nunda	38,334	15,090
Richmond	6,813	2,834
Riley	3,035	1,070
Seneca	2,893	1,102
<b>Total:</b>	<b>310,229</b>	<b>119,708</b>

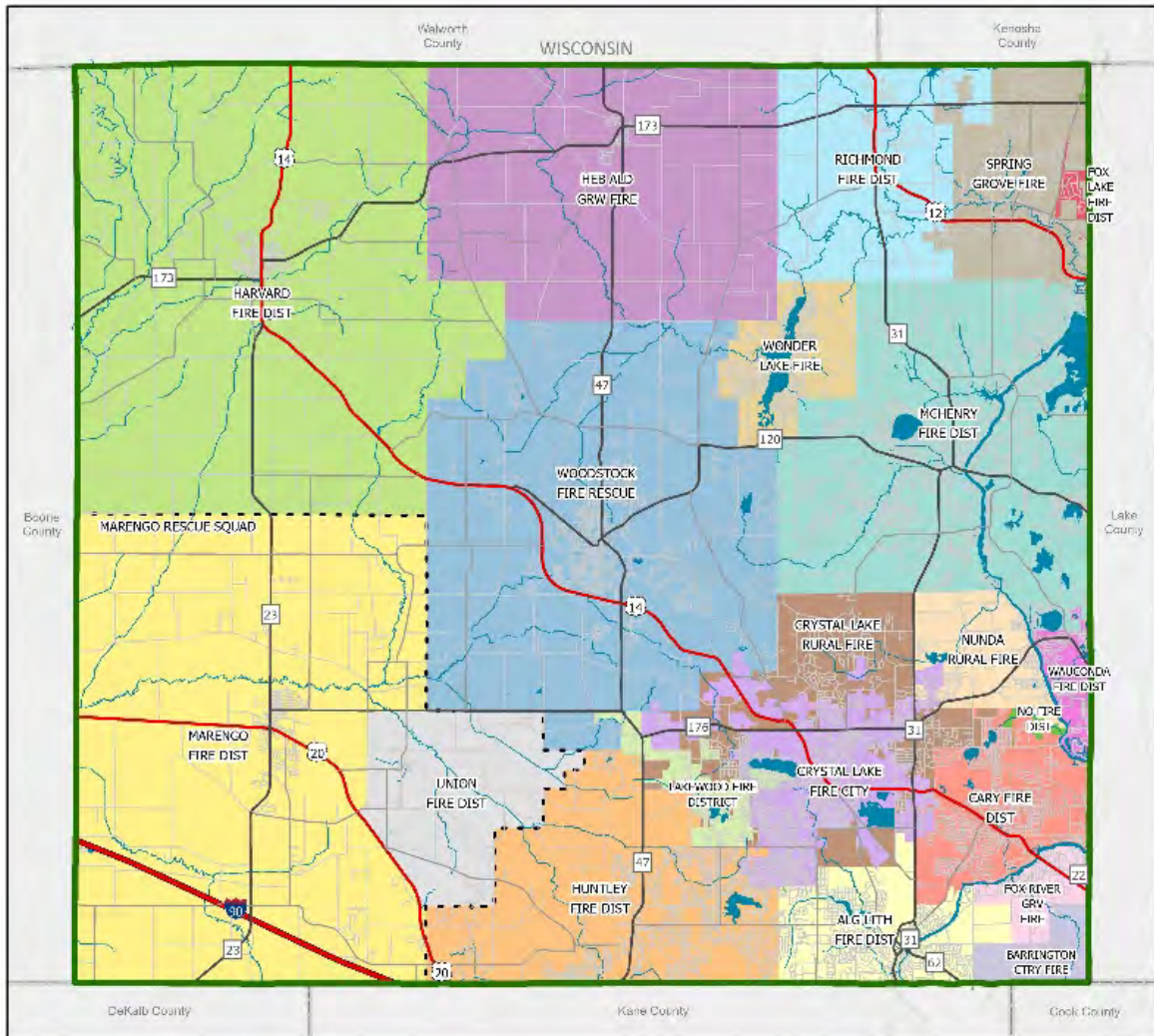
Source: U.S. 2020 Decennial Census P.L. 94-171 Redistricting Data Summary Files

**Table 1-5 2020 McHenry County Population Data by Municipality**

Community	2020 Population	Housing Units	Median Household Income*
Village of Algonquin (Part)	21,632	8,093	\$115,346
Village of Barrington Hills (Part)	1,098	510	\$126,250
Village of Bull Valley	1,128	478	\$157,875
Village of Cary	17,826	6,521	\$106,940
City of Crystal Lake	40,269	15,371	\$96,274
Village of Fox Lake (Part)	639	251	\$64,221
Village of Fox River Grove (Part)	4,253	1,698	\$65,625
Village of Greenwood	324	121	\$101,116
City of Harvard	9,469	3,306	\$63,044
Village of Hebron	1,368	550	\$93,801
Village of Holiday Hills	618	257	\$72,957
Village of Huntley (Part)	21,877	7,758	\$76,612
Village of Island Lake (Part)	4,700	1,911	\$84,940
Village of Johnsburg	6,355	2,484	\$120,500
Village of Lake in the Hills	28,982	10,121	\$102,106
Village of Lakemoor (Part)	2,452	941	\$90,000
Village of Lakewood	4,283	1,567	\$144,240
Village of McCullom Lake	988	439	\$67,083
City of McHenry	27,135	11,154	\$76,858
City of Marengo	7,568	3,091	\$65,136
Village of Oakwood Hills	2,076	808	\$111,528
Village of Port Barrington (Part)	1,052	405	\$140,500
Village of Prairie Grove	1,963	736	\$153,546
Village of Richmond	2,089	1,097	\$55,964
Village of Ringwood	844	307	\$115,836
Village of Spring Grove	5,487	1,935	\$131,735
Village of Trout Valley	515	195	\$200,240
Village of Union	551	234	\$101,250



**Figure 1-11 McHenry County Fire Districts**



## McHenry County, IL

### Fire Districts



Map Produced by McHenry County  
GIS Department  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Interstate
- US Highways
- State Roads
- Other Roads
- Rivers & Streams
- Lakes

### Fire Districts

- |                         |                       |
|-------------------------|-----------------------|
| ALG LITH FIRE DIST      | MARENGO FIRE DIST     |
| BARRINGTON CTRY FIRE    | MCHENRY FIRE DIST     |
| CARY FIRE DIST          | NUNDA RURAL FIRE      |
| CRYSTAL LAKE FIRE CITY  | RICHMOND FIRE DIST    |
| CRYSTAL LAKE RURAL FIRE | SPRING GROVE FIRE     |
| FOX LAKE FIRE DIST      | UNION FIRE DIST       |
| FOX RIVER GRV FIRE      | WAUCONDA FIRE DIST    |
| HARVARD FIRE DIST       | WONDER LAKE FIRE      |
| HEB ALD GRW FIRE        | WOODSTOCK FIRE RESCUE |
| HUNTLEY FIRE DIST       | NO FIRE DISTRICT      |
| LAKEWOOD FIRE DISTRICT  | MARENGO RESCUE SQUAD  |

**1.7.4 Employment:** The number of jobs in McHenry County decreased from 2016 to 2021 by 2.3 percent, according to the 2022 McHenry County Labor Report. This change fell short of the national growth rate of 1.8 percent by 4.1 percent. As the number of jobs declined, the labor force participation rate decreased from 82.2 percent to 79.2 percent between 2016 and 2021. According to the McHenry County Existing Conditions report from 2022, approximately 70 percent of employed residents in McHenry County work outside the County, which represents a 13 percent increase from 2013.

The top three industries in 2020 are Education and Hospitals, Restaurants, and Local Government. Of approximately 60 major employers in McHenry County, Northwestern Medicine is the largest employer (5,000+ employees), followed by Crystal Lake Elementary School District 47 (1,500+ employees), Consolidated School District 158 (1,500+) and McHenry County Government (1,400 employees). Table 1-6 presents the major employers, by community, in McHenry County.

**Table 1-6 McHenry County Major Employers**

Community	Top 15 Largest Employers
City of McHenry, Village of Huntley, Village of Woodstock	Northwestern Medicine
City of Crystal Lake	Crystal Lake Elementary School District 47
Village of Huntley	Consolidated School District 158
McHenry County	County Government
City of McHenry	Follett Library Resources, Inc.
City of McHenry	Follett Software Co.
Village of Algonquin, Village of Barrington, City of Crystal Lake, City of Harvard, Village of Lake in the Hills, City of McHenry, Village of Richmond, City of Woodstock	Mercy Health System
City of Crystal Lake	Snap-On Tools Co.
Village of Cary	Stryker
City of McHenry	Medela
City of Crystal Lake	McHenry County College
City of Crystal Lake	Knaack Manufacturing Co.
Village of Union	Intren
City of McHenry	Aptar Group, Inc.
City of Marengo	Unicarriers Americas
City of Woodstock	Charter Dura-Bar

## 1.8 McHenry County Land Use & Development

McHenry County covers 611 square miles of land area. Table 1-7 shows the estimate of existing land use in McHenry County, as well as the projected land use by 2030. At the time of this report, McHenry County’s 2050 Comprehensive Plan and future land uses were in development.

**Table 1-7 McHenry County Existing and Future Land Use**

Existing Land Use	Total Existing Land Use (Incorporated and Unincorporated)	Total Future Land Use (2030)
Vacant	5.5%	-
Agricultural	61.2%	42.4%

Existing Land Use	Total Existing Land Use (Incorporated and Unincorporated)	Total Future Land Use (2030)
Estate	9.7%	12.2%
Single-Family Residential	6.3%	11.3%
Multi-Family Residential	0.4%	
Mixed Use	0.0%	0.4%
Retail	1.2%	1.1%
Office/Research/Industrial	1.0%	2.5%
Mining	1.3%	-
Open Space	11.3%	11.9%
Government/Institutions	2.2%	1.0%

Over 60 percent of the County is currently in agricultural land use. That figure is expected to drop to around 42 percent by 2040. Primary crops are corn and soybeans. Though residential, commercial, and other development areas are expected to expand, much of the agricultural land conversion is expected to go towards environmentally sensitive areas and open space (17.2 percent of future county land will be labelled as environmentally sensitive). The McHenry County 2030 Plan provides maps of existing and future land use (2030 Plan, Figures 17 and 22).

The McHenry County population is expected to increase to 374,989 by 2030 and to 478,639 by 2050 according to CMAP and the County’s 2050 Comprehensive Plan Update preliminary data gathering efforts. This growth means that more and more people will be vulnerable to natural hazards in McHenry County. Both the consideration of the expected change in land use and population were considered throughout the development of the Plan.

### 1.9 McHenry County Critical Facilities

Critical facilities are buildings and infrastructure whose exposure or damage can affect the wellbeing of a large group. For example, the impact of a flood or tornado on a hospital is greater than on a home or most businesses. Critical facilities are generally placed into two categories:

- Buildings or locations vital to public safety and the disaster response and recovery effort, such as police and fire stations and telephone exchanges; and
- Buildings or locations that, if damaged, would create secondary disasters. Examples of such buildings or locations are hazardous materials facilities and nursing homes.

Critical facilities are not strictly defined by any agency. For this mitigation planning effort, several categories of critical facilities were used, including County, municipal and township facilities, police and fire stations, public, educational/school facilities, places of assembly, medical and health care, facilities for special needs populations, transportation, and infrastructure.

Critical facilities were identified by the County and each municipality and township participating in this Plan. McHenry County Information Management Office (GIS Department) developed a database and GIS layers for critical facilities submitted by communities and with data already available in County GIS layers. Over 1,900 facilities are included in the data. The facilities are categorized and tallied for the County, in Table 1-8. Figure 1-12 shows that location/distribution of all identified critical facilities. Some facilities, such as parks were left out of the tally in Table 1-8, and not all communities reported their numbers or

locations. All reported critical facilities locations, as reported by communities, are included in Exhibit 1-5. Further investigation into critical facility locations, use of critical facility mapping, and protection of critical facilities is discussed in Chapter 2 of this Plan.

**Table 1-8 McHenry County Summary of Critical Facilities**

<b>Critical Facility Category and Type</b>	<b>Total</b>
<b>Government</b>	<b>369</b>
City Hall	30
Emergency Operations Center	13
Evacuation Shelter	26
Fire Station	41
Highway/Road Maintenance Center	36
Jail/Prison & Juvenile Detention Center	7
Library	15
Other	1
Police Station	28
Post Office	18
School	143
County Campus	11
<b>Infrastructure</b>	<b>874</b>
Airport	3
Ambulance Service	18
Communication Tower	237
Culvert	42
Drinking Water Facility	133
Other	5
Power Plant	20
Railway	6
Dam	20
Power Substation	17
Roadway (Bridge)	190
Railway (Train Station)	8
Wastewater Treatment Facility	181
<b>Medical Facility</b>	<b>53</b>
Blood Bank	2
Diabetes	1
Dialysis	9
Family Medicine	6
Home Health	1
Imaging	1
Hospital	5
Immediate Care	4
Internal Medicine	3
OB/GYN, Pediatrics	3

<b>Critical Facility Category and Type</b>	<b>Total</b>
Occupational Health	2
Other	6
Primary Care	5
Rehabilitation	5
<b>Other</b>	<b>210</b>
Agricultural Chemical Facility	5
Grain Elevator	10
Industrial Hazardous Substance	36
National Guard Armory	1
Petroleum Storage & Distribution	103
Social Service Agency	55
<b>Residential</b>	<b>149</b>
Assisted Living/Care Facility	14
Day Care Facility	95
Nursing/Retirement Home	15
Nursing/Retirement Homes & Assisted Living Facility	5
Residential Group Home	18
Supportive Living	2
<b>Gathering Place</b>	<b>296</b>
Church	144
Civic Center	8
Other	2
Park	142
<b>Grand Total</b>	<b>1,951</b>





## 1.10 References

1. Center for Disease Control Social Vulnerability Index. Accessed 2023: <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>.
2. Chicago Metropolitan Agency for Planning. *Industry Cluster Analysis*.
3. FEMA Community Rating System. 2013. *Example Plans*.
4. FEMA. 2002. *Getting Started – Building Support for Mitigation Planning*, FEMA-386-1.
5. FEMA. 2002. *State and Local Plan Interim Criteria Under the Disaster Mitigation Act of 2000*.
6. FEMA. 2006. *McHenry County Flood Insurance Study*.
7. Illinois Department of Agriculture. 2000. *Land Cover of Illinois Statistical Summary*
8. McHenry County. 2010. *2030 Comprehensive Plan*. Accessed 2022: <https://www.mchenrycountyil.gov/county-government/departments-j-z/planning-development/planning-zoning-and-land-use/plans-and-planning-documents/2030-comprehensive-plan>.
9. McHenry County. 2022. *Tax Assessment Records*.
10. McHenry County Economic Development Corporation ([www.mchenrycountyedc.com/](http://www.mchenrycountyedc.com/))
11. McHenry County Workforce Board. 2022. *By the Numbers, McHenry County Labor Report, Fall 2022*.
12. National Oceanic and Atmospheric Administration, National Weather Service. 2022. *NOWData Online Weather Data*.
13. Survey of municipalities, townships, and County offices, 2023. Critical facilities data.
14. U.S. Census Bureau (2020). *Decennial Census P.L. 94-171 Redistricting Data Summary Files*.

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## CHAPTER 2 - RISK ASSESSMENT

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*Requirement 44 CFR Section 201.6(c)(2)(i)). The risk assessment must include a description of the jurisdiction’s vulnerability to hazards...in terms of the numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; an estimate of potential dollar losses to vulnerable structures and a general description of land uses and development trends in the community.*

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This chapter provides a risk assessment of natural hazards that could impact McHenry County. A list of potential hazards was reviewed and prioritized by the McHenry County Natural Hazards Mitigation Committee (Mitigation Committee). Understanding that not all natural hazards require a detailed analysis, priority natural hazards were selected for analysis based on historical occurrences and potential impacts. The risk assessment of natural hazards includes an analysis of each hazard and a hazard score quantifying the threat each hazard poses in McHenry County.

The hazard profile includes a description of the hazard, location each hazard might occur, extent of the hazard, past occurrences of the hazard, likelihood or probability of the hazard occurring in the future, the County’s vulnerability to the hazard, and the impact the hazard could have on the County. McHenry County analyzed its built environment to estimate the potential vulnerability, public health consequences, and property damage impacts attributable to these natural hazards for use in the risk assessment. In addition to the updates made to each hazard, the 2023 update of the Plan includes climate change considerations for each hazard. The risk assessment compares the probability of the hazard occurring against the possible impact to the County (including potential dollar losses where data is available).

A summary of the risk assessment for McHenry County follows the hazard profiles. This includes a table summarizing impacts and events and hazard ranking based on the Enhanced Priority Risk Index (EPRI). The EPRI is a tool used to measure the degree of risk for identified hazards in a particular planning area.

### 2.1 Natural Hazard Identification

McHenry County is subject to a variety of natural hazards. According to the FEMA National Risk Index (NRI), in comparison to the rest of the United States, the risk index for McHenry County is “relatively moderate”, with a score of 85.71 percent out of 100 percent. The expected annual loss for the county is also “relatively moderate”, at 87.56 percent, and the County’s community resilience score is “very high.” The highest ranked hazards in the Index include cold and heat waves, ice storms, lightning, strong wind, and tornadoes. The highest ranked hazards from the NRI reflect the most frequently occurring natural hazard events in McHenry County, including severe summer storms that bring strong wind, lightning, and tornadoes; as well as severe winter storms that cause ice storms and extreme cold weather. The county and its jurisdictions have also experienced substantial flood losses.

Appendix F contains the NRI report for McHenry County.

As part of the update process, the Mitigation Committee reviewed hazards from the existing plan and compared the updates with the County’s recent THIRA analysis, as detailed in *Chapter 1: Introduction*. The Mitigation Committee did not include any additional hazards in the 2023 update and confirmed that the Multi-Jurisdictional Mitigation Plan should remain focused on natural hazards. Note that the FEMA NRI identifies landslides as having a relatively moderate average annual loss potential in McHenry County. Landslide data was very recently updated in FEMA’s NRI methodology during the plan development process. However, since McHenry County has relatively flat topography and has not experienced landslide incidents to date, the hazard was not included in the risk assessment. McHenry County will monitor conditions and evaluate including landslides in future updates.

The natural hazards listed in Table 2-1 are discussed in detail in this chapter, and mitigation activities for each hazard are identified in Chapters 4 through 9. Lightning, thunderstorms, and hailstorms are combined under the category of severe summer storms; and snow events, ice storms, and extreme cold are combined under the category of severe winter storms. A summary of hazards can be found at the end of this chapter.

**Table 2-1 McHenry County Identified Natural Hazards**

McHenry County Identified Natural Hazards
Flood
Severe Summer Storm (Hail, Lightning, Wind)
Severe Winter Storm and Extreme Cold
Tornado
Extreme Heat
Drought/Groundwater
Earthquake
Dam Failure

### 2.1.1 Presidential Disaster Declarations

According to FEMA records, which go back 58 years, there have been 16 presidentially declared disasters in McHenry County, IL. This averages to one presidential disaster declaration every 3 ½ years. However, in the past 20 years, the average is one presidential disaster declaration approximately every 2 ½ years. Since the last update, the County has received one Presidential Disaster Declaration for the COVID-19 Pandemic.

Notwithstanding disaster declarations, McHenry County EMA officials have responded to at least 40 different incidents involving natural hazards since 2004; some of those incidents lasting several days. This is an average of 2-3 incidents involving natural hazards each year. The most common natural hazards that have required County response include severe storms (16) and winter weather incidents (9). Table 2-2 lists all Presidential or federal Disaster Declarations for the County since 1965. This table illustrates

that most disasters have occurred in spring or winter.

**Table 2-2 Federal Disaster Declarations for McHenry County (1965 – 2023)**

Hazard	Description	Incident Begin Date	Declaration Date	Disaster Number
Tornado	Tornadoes, Severe Storms & Flooding	4/25/1965	4/25/1965	194
Tornado	Tornadoes	4/25/1967	4/25/1967	227
Flood	Severe Storms & Flooding	4/26/1973	4/27/1973	373
Flood	Severe Storms & Flooding	6/10/1974	6/10/1974	438
Snow	Blizzards & Snowstorms	1/16/1979	1/16/1979	3068
Flood	Severe Storms & Flooding	9/21/1986	10/7/1986	776
Flood	Severe Storms & Flooding	4/13/1993	7/9/1993	997
Snow	Winter Storm	1/1/1999	1/28/1999	3134
Snow	Illinois Winter Snowstorms	12/11/2000	1/18/2001	3161
Hurricane	Hurricane Katrina Evacuation	8/29/2005	9/7/2005	3230
Snow	Snow	11/30/2006	12/9/2006	3269
Snow	Record Snow and Near Record Snow	2/5/2008	2/5/2008	1960
Snow	Severe Winter Storm And Snowstorm	1/31/2011	3/17/2011	3283
Flood	Severe Storms, Straight-Line Winds, & Flooding	4/16/2013	5/10/2013	4116
Pandemic	COVID-19	1/20/2020	3/13/2020	3435
			3/26/2020	4489

McHenry County has recorded several natural hazard events since 2016 that caused community disruption but were not severe enough to warrant a presidential declaration. This includes:

- The 2017 Fox River flood affected approximately 800 homes. The Fox River reached record levels of nearly 3 feet above the river’s flood stage.
- Seven hail incidents have been reported by NOAA in McHenry County since 2017. Some reports were of rather large hail – quarter to golf ball size, 2.5” in diameter.
- Lightning strikes in 2018 damaged 3 homes. Two structures burned in Coral and Huntley.
- Twenty-three severe storms and winds have also been recorded by NOAA. These events cause trees to fall, debris causes damage, and power lines are typically affected. Four events in 2021 affected nearly all areas of McHenry County.

And lastly, Northern Illinois has experienced a historic drought between 2021 and 2022. Although the drought is now over, longer-term concerns for aquifer recharge and groundwater availability remain.

## 2.2 Hazard Profile Descriptions and Risk Scoring

Each natural hazard is profiled separately to describe the hazard and potential exposure, consequences, and vulnerability conditions for the County and jurisdictions. Where data exists, specific information on location, such as jurisdiction or unincorporated area, will also be included. The profile for each hazard includes:

- Description: A scientific explanation of the hazard including potential magnitude (or severity) and impacts,

- Location: Geographical extent of the hazard,
- Extent (or magnitude): The severity of the hazard in the past and potential severity in the future. Measures may include wind speed or wave height, for example,
- Previous occurrences: The number of previous impacts from the hazard in McHenry County in the past, and
- Probability of Occurrence: The likelihood of future events impacting the county. Given that an exact probability is often difficult to quantify, this characteristic is categorized into ranges to be used in hazard profiles. Ranges are shown in Table 2-3.
- Vulnerability Assessment: The vulnerability assessment investigates the potential number of and type of structures at risk, potential dollar loss, and potential consequences resulting from each hazard based on available data and information. Scoring related to public health and physical damage consequences are shown in Table 2-3. Climate change consequences are also discussed in the Vulnerability Assessment sections to account for potential future conditions and how they may affect each hazard’s impact on McHenry County. Awareness of climate change impacts is critical, as changes in weather and climate patterns can put lives at risk. Climate change information has been gathered from NOAA, the Environmental Protection Agency (EPA), and the National Climate Data Center (NCDC).

Considering the results from the hazard profiles, the risk assessment uses a scoring methodology to compare relative risk and threats across hazards that are present in McHenry County. The County uses a modified version of the EPRI Index to assign scores for each hazard based on the spatial extent, probability of occurrence, vulnerability, consequences, and warning time. These scores are then weighted and aggregated for a total risk index that can then rank natural hazards in order of the threats they present to the County and jurisdictions. Table 2-3 presents the EPRI scoring categories, criteria, index, and weighting factors used in the 2023 Plan Update. EPRI category scores are described in the hazard profiles for each hazard, summarized in Section 2.12.

**Table 2-3 Summary of EPRI Index Descriptions**

EPRI CATEGORY	DEGREE OF RISK			ASSIGNED WEIGHTING FACTOR
	LEVEL	CRITERIA	INDEX VALUE	
Spatial Extent	Negligible	Limited to one specific area	1	20%
	Small	Between 10 and 50 square miles	2	
	Moderate	Between 50 and 100 square miles	3	
	Large	Between 100 and 250 square miles	4	
	Countywide	Greater than 250 square miles	5	
Probability	Unlikely	Unknown but rare occurrence	1	30%
	Possible	Unknown but anticipate an occurrence	2	
	Likely	100 years or fewer occurrence	3	
	Highly Likely	25 years or fewer occurrence	4	
	Frequent	Once a year or more occurrence	5	
Impact: Public Health	Minor	No risk to public health	1	15%
	Limited	Few injuries/illnesses are expected	2	
	Moderate	Few fatalities or many injuries/illnesses are	3	

EPRI CATEGORY	DEGREE OF RISK			ASSIGNED WEIGHTING FACTOR
	LEVEL	CRITERIA	INDEX VALUE	
Consequences		expected		
	Critical	Many fatalities should be expected	4	
	Catastrophic	Widespread fatalities throughout the impact area	5	
Impact: Consequences to Property	Minor	No property damage	1	15%
	Limited	Few properties destroyed or damaged	2	
	Moderate	Few destroyed - many damaged	3	
	Critical	Many destroyed - few damaged	4	
	Catastrophic	Many properties damaged and destroyed	5	
Vulnerability	Minor	Little to no vulnerability	1	10%
	Limited	Existing mitigation measures and features prevent most impacts	2	
	Moderate	Existing mitigation measures and features prevent few impacts	3	
	Critical	Existing mitigation measures and features prevent little to no impacts	4	
	Catastrophic	No mitigation measures or features that prevent any impacts from hazards	5	
Warning Time	More than 24 hours	Self-explanatory	1	10%
	12 – 24 hours	Self-explanatory	2	
	6 – 12 hours	Self-explanatory	3	
	1 and 6 hours	Self-explanatory	4	
	Less than 1 hour	Self-explanatory	5	

### 2.2.1 Data Used

The risk assessment relies on a range of data sources to provide hazard impact data for the county and participating jurisdictions. Information and data were collected from county, municipal, regional, state, and federal agencies. In addition, anecdotal information was collected from the public via meetings and public surveys. Other data was developed from McHenry County records and the County’s GIS Department.

An important source of information on recorded events was the NCEM Storm Events Database from the U.S. National Oceanic and Atmospheric Administration (NOAA). The County data, including GIS data and mapping, was used for vulnerability analysis to examine McHenry County’s exposure priority natural hazards. In addition, FEMA’s National Risk Map was used as supplemental research to provide relevant data regarding McHenry County hazards. The FEMA digital flood insurance rate map (DFIRM), which provides a (regulatory) floodplain boundary, was obtained from the FEMA Map Service Center. The McHenry County DFIRMs are effective as of November 16, 2006.

A reference list can be found at the end of this chapter in the References subsection.

## 2.3 McHenry County Assets and Property Value

McHenry County’s assets include people, buildings, infrastructure, businesses and institutions, land, and

natural resources.

**People:** There are several population groups in McHenry County: Residents, residents who work in McHenry County, residents who commute to McHenry County to work, and the college student population. While these groups are described below, for purposes of this Plan’s vulnerability analysis, calculations focus on McHenry County residents.

**Total Population:** According to 2020 U.S. Census data, the total McHenry County population is 310,229. The average density of people in the State of Illinois in 2023 is 230 persons per square mile. McHenry County is approximately 603 square miles, making the average density in the County around 514 persons per square mile, an increase from 505 persons per square mile in 2010. A list of populations by municipality is provided in Table 2-4 and by township in Table 2-5. These tables include populations for McHenry County only. Several municipalities cross county borders, and residents in those communities outside of the County are not included in the tables below. For this reason, population totals between the municipality and township tables may differ slightly.

**Table 2-4 Total Population by Municipalities (2020 US Census)**

Municipality	Total Population	Municipality	Total Population
Algonquin (Part)	21,632	Lakemoor (Part)	2,452
Barrington Hills (Part)	1,098	Lakewood	4,283
Bull Valley	1,128	McCullom Lake	988
Cary	17,826	McHenry	27,135
Crystal Lake	40,269	Marengo	7,568
Fox Lake (Part)	639	Oakwood Hills	2,076
Fox River Grove (Part)	4,253	Port Barrington (Part)	1,052
Greenwood	324	Prairie Grove	1,963
Harvard	9,469	Richmond	2,089
Hebron	1,368	Ringwood	844
Holiday Hills	618	Spring Grove	5,487
Huntley (Part)	21,877	Trout Valley	515
Island Lake (Part)	4,700	Union	551
Johnsburg	6,355	Wonder Lake	3,973
Lake In The Hills	28,982	Woodstock	25,630
Unincorporated McHenry County	62,944		
<b>TOTAL</b>			<b>310,088</b>

Source: U.S. 2020 Decennial Census P.L. 94-171 Redistricting Data Summary Files

**Table 2-5 Total Population by Township (2020 US Census)**

Township	Total Population	Township	Total Population
Alden Township	1,275	Hartland Township	1,861
Algonquin Township	87,633	Hebron Township	2,327
Burton Township	4,820	Marengo Township	7,202
Chemung Township	9,095	McHenry Township	46,276
Coral Township	3,638	Nunda Township	38,344
Dorr Township	21,572	Richmond Township	6,813
Dunham Township	2,823	Riley Township	3,035
Grafton Township	56,446	Seneca Township	2,893



Greenwood Township	14,176	
<b>TOTAL</b>		<b>310,229</b>

Source: U.S. 2020 Decennial Census P.L. 94-171 Redistricting Data Summary Files

**Work Force:** 69.5 percent of McHenry County residents commute outside the County for employment. This is a 13 percent increase from 2013. According to 2020 Census data, most McHenry County workers travel 32 minutes to reach their place of employment. However, it is notable that 16 percent of the population travels over an hour to work. Chicago, the northwestern suburbs, and Rockford provide more employment opportunities than those available in McHenry County. The Jane Addams Memorial Tollway (I-90), US Route 20, Illinois Route 47, Illinois Route 31, and Randall Road form the basis of a regional roadway system to allow McHenry County residents to reach these employment centers. (Refer to Chapter 1, Exhibit 1-1 Base Map.) Commuter rail and bus service is also available.

**Land Parcels and Buildings:** McHenry County and its jurisdictions comprise approximately \$11 billion in assessed value of land and parcel improvements, including buildings, according to 2022 McHenry County Assessment Records. The estimate of McHenry County 2020 Tax Parcels is summarized in Table 2-6, Table 2-7, and Table 2-8. The 2020 data is reflective of any new development from the previous plan update. It should be noted that the parcel data provided did not separate land and building value and includes farm homesite dwellings. Nevertheless, the assessed value for property is the best available data consistently reported across jurisdictions and is used throughout the risk assessment (where data permits) to estimate the potential value of property at risk within the county.

While 60.6 percent of McHenry County’s land is agricultural, the County’s improved land is primarily residential and comprises over 87 percent of the County’s taxable property value. The highest assessed value of parcels and buildings are sourced from the unincorporated county, with \$1.98 billion valued for over 22,000 parcels, and Crystal Lake, with \$1.57 billion valued for over 15,000 parcels. Note that parcel distribution by jurisdiction and township in Tables 2-7 and 2-8 are duplicative. Table 2-9 provides a breakdown of parcels by type (residential, commercial, industrial, and government-owned/tax-exempt) for incorporated, participating municipalities.

**Table 2-6 McHenry County Improved Parcel Summary**

Parcel Type	Total Improved Parcels	Total Improved Parcel Value (estimated value at risk)	Average Value of Improved Parcels
Residential*	111,570	\$9,680,118,901	\$86,763
Commercial	5,505	\$972,729,287	\$176,699
Industrial	1,748	\$383,123,594	\$219,178
<b>Total:</b>	<b>118,823</b>	<b>\$11,035,971,728</b>	<b>\$92,877</b>

\*Improved parcel data includes building and land values; residential data also includes farm homesite dwellings

**Table 2-7 Distribution of Parcels by Jurisdiction**

Jurisdictions	Total Parcels	Total Improved Parcels	Total Value of Improved Parcels
Algonquin	9,269	8,186	\$885,115,797
Barrington Hills	752	585	\$141,588,914
Bull Valley	1,258	827	\$117,460,756

Jurisdictions	Total Parcels	Total Improved Parcels	Total Value of Improved Parcels
Cary	7013	6,558	\$642,688,073
Crystal Lake	17,268	15,596	\$1,574,715,753
Fox Lake	606	347	\$34,379,728
Fox River Grove	2,079	1,799	\$163,962,016
Greenwood	370	193	\$17,935,874
Harvard	4,165	2,937	\$180,092,916
Hebron	921	620	\$36,827,830
Holiday Hills	664	293	\$16,184,252
Huntley	8,741	8,055	\$809,191,208
Island Lake	2,397	2,019	\$137,975,687
Johnsburg	3,952	2,891	\$316,552,255
Lake in the Hills	10,814	10,176	\$909,090,126
Lakemoor	2,235	1,286	\$94,190,646
Lakewood	2,328	1,757	\$237,432,141
Marengo	3,538	2,777	\$195,048,679
McCullum Lake	677	505	\$25,629,645
McHenry, City of	12,463	11,136	\$962,103,605
Oakwood Hills	1,184	865	\$74,366,743
Port Barrington	664	438	\$37,447,180
Prairie Grove	1,218	953	\$114,112,218
Richmond	1,357	1,048	\$81,993,139
Ringwood	788	454	\$53,929,081
Spring Grove	2,941	2,251	\$258,991,165
Trout Valley	282	229	\$31,438,492
Union	430	287	\$25,295,275
Wonder Lake	3,741	2,246	\$156,226,763
Woodstock	10,462	8,971	\$721,306,885
Unincorporated McHenry County	34,784	22,538	\$1,982,698,940
<b>Grand Total</b>	<b>149,361</b>	<b>118,823</b>	<b>\$11,035,971,782</b>

**Table 2-8 Distribution of Parcels by Township**

Township	Total Parcels	Total Improved Parcels	Total Value of Improved Parcels
Alden	1,533	691	\$59,954,958
Algonquin	3,6952	33442	\$3,337,258,188
Burton	3,218	1,902	\$180,529,407
Chemung	4,058	2,855	\$170,132,576
Coral	2,664	1,529	\$168,923,191
Dorr	9,513	7,656	\$682,688,296
Dunham	1,758	1,078	\$85,555,575
Grafton	22,137	19,648	\$2,033,163,339
Greenwood	6,485	5,060	\$380,731,450
Hartland	1,493	899	\$94,084,920
Hebron	1,858	1,062	\$75,766,407

Township	Total Parcels	Total Improved Parcels	Total Value of Improved Parcels
Marengo	3,622	2,704	\$190,059,234
McHenry	25,385	19,385	\$1,592,991,129
Nunda	20,819	15,790	\$1,476,403,816
Richmond	4,145	2,858	\$285,745,642
Riley	1,864	1,088	\$101,689,706
Seneca	1,857	1,176	\$120,293,948

**Table 2-9 Improved Parcel Data by Jurisdiction**

Jurisdiction and Parcel Type	Total Parcels	Total Improved Parcels	Assessed Value of Improved Parcels
<b>Algonquin</b>			
Residential	8,556	7,769	\$754,166,624.00
Commercial	388	377	\$124,347,827.00
Industrial	40	40	\$6,601,346.00
Government-Owned/Tax-Exempt	231	0	\$0
<b>Barrington Hills</b>			
Residential	772	639	\$146,491,660.00
Commercial	2	2	\$1,987,580.00
Industrial	2	2	\$128,201.00
Government-Owned/Tax-Exempt	9	0	0
<b>Bull Valley</b>			
Residential	988	809	\$116,075,531.00
Commercial	9	9	\$393,420.00
Industrial	-	-	\$0
Government-Owned/Tax-Exempt	47	0	-
<b>Cary</b>			
Residential	6,612	6,404	\$586,864,910.00
Commercial	188	182	\$40,566,950.00
Industrial	195	195	\$52,288,464.00
Government-Owned/Tax-Exempt	245	-	-
<b>Crystal Lake</b>			
Residential	14,766	13,741	\$1,185,651,964.00
Commercial	1,048	1,043	\$246,410,887.00
Industrial	333	333	\$77,137,172.00
Government-Owned/Tax-Exempt	405	0	-
<b>Fox Lake</b>			
Residential	396	330	\$31,649,824.00
Commercial	15	15	\$2,315,407.00
Industrial	2	2	\$414,497.00
Government-Owned/Tax-Exempt	15	0	0
<b>Fox River Grove</b>			
Residential	1,809	1,613	\$138,722,150.00
Commercial	126	126	\$17,834,436.00
Industrial	3	3	\$386,903.00
Government-Owned/Tax-Exempt	65	0	-



Jurisdiction and Parcel Type	Total Parcels	Total Improved Parcels	Assessed Value of Improved Parcels
<b>Greenwood</b>			
Residential	249	189	\$17,274,735.00
Commercial	4	4	\$661,139.00
Industrial	-	-	\$0
Government-Owned/Tax-Exempt	65	0	-
<b>Harvard</b>			
Residential	3,040	2,529	\$134,254,234.00
Commercial	319	295	\$24,926,940.00
Industrial	113	113	\$20,911,742.00
Government-Owned/Tax-Exempt	113	0	-
<b>Hebron</b>			
Residential	728	518	\$28,169,709.00
Commercial	69	69	\$4,863,830.00
Industrial	35	33	\$3,794,291.00
Government-Owned/Tax-Exempt	37	0	-
<b>Holiday Hills</b>			
Residential	619	287	\$15,481,501.00
Commercial	6	6	\$702,751.00
Industrial	-	-	\$0
Government-Owned/Tax-Exempt	31	0	0
<b>Huntley</b>			
Residential	8,206	7,761	\$750,537,797.00
Commercial	170	165	\$34,745,251.00
Industrial	143	129	\$23,908,160.00
Government-Owned/Tax-Exempt	144	0	-
<b>Island Lake</b>			
Residential	2,258	1,974	\$131,113,230.00
Commercial	44	44	\$6,633,077.00
Industrial	1	1	\$229,380.00
Government-Owned/Tax-Exempt	89	-	-
<b>Johnsburg</b>			
Residential	3,542	2,723	\$273,007,534.00
Commercial	146	142	\$39,598,355.00
Industrial	1	1	\$168,643.00
Government-Owned/Tax-Exempt	136	-	-
<b>Lake In The Hills</b>			
Residential	10,448	10,034	\$841,749,651.00
Commercial	264	258	\$66,386,396.00
Industrial	92	92	\$21,488,588.00
Government-Owned/Tax-Exempt	217	0	-
<b>Lakemoor</b>			
Residential	1,927	1,164	\$86,488,467.00
Commercial	75	75	\$6,166,579.00
Industrial	72	72	\$5,313,323.00
Government-Owned/Tax-Exempt	163	0	-

Jurisdiction and Parcel Type	Total Parcels	Total Improved Parcels	Assessed Value of Improved Parcels
<b>Lakewood</b>			
Residential	2,183	1,725	\$233,415,857.00
Commercial	205	205	\$22,734,622.00
Industrial	2	2	\$207,114.00
Government-Owned/Tax-Exempt	58	0	-
<b>Marengo</b>			
Residential	2,948	2,533	\$164,551,612.00
Commercial	205	205	\$22,734,622.00
Industrial	45	39	\$7,762,445.00
Government-Owned/Tax-Exempt	130	0	0
<b>McCullom Lake</b>			
Residential	634	490	\$23,799,388.00
Commercial	15	15	\$1,830,257.00
Industrial	-	-	\$0
Government-Owned/Tax-Exempt	21	0	-
<b>McHenry</b>			
Residential	10,698	9,992	\$753,922,006.00
Commercial	1,034	971	\$151,735,779.00
Industrial	176	173	\$56,445,820.00
Government-Owned/Tax-Exempt	275	0	0
<b>McHenry Unincorporated</b>			
Residential	28,388	22,022	\$1,936,656,259.00
Commercial	412	412	\$29,476,702.00
Industrial	108	104	\$16,565,979.00
Government-Owned/Tax-Exempt	1,419	0	0
<b>Oakwood Hills</b>			
Residential	1,136	853	\$73,659,902.00
Commercial	10	10	\$661,271.00
Industrial	2	2	\$45,570.00
Government-Owned/Tax-Exempt	30	0	-
<b>Port Barrington</b>			
Residential	6019	436	\$37,128,159.00
Commercial	2	2	\$319,021.00
Industrial	-	-	-
Government-Owned/Tax-Exempt	36	0	-
<b>Prairie Grove</b>			
Residential	1,039	885	\$101,717,634.00
Commercial	107	107	\$12,684,001.00
Industrial	9	9	\$7,659,553.00
Government-Owned/Tax-Exempt	41	0	0
<b>Richmond</b>			
Residential	984	855	\$57,361,248.00
Commercial	148	148	\$13,979,518.00
Industrial	45	45	\$10,652,373.00

Jurisdiction and Parcel Type	Total Parcels	Total Improved Parcels	Assessed Value of Improved Parcels
Government-Owned/Tax-Exempt	92	0	0
<b>Ringwood</b>			
Residential	463	377	\$39,637,560.00
Commercial	68	60	\$9,557,186.00
Industrial	17	17	\$4,734,335.00
Government-Owned/Tax-Exempt	54	0	0
<b>Spring Grove</b>			
Residential	2,553	2,092	\$230,754,641.00
Commercial	77	77	\$10,243,049.00
Industrial	82	82	\$17,993,475.00
Government-Owned/Tax-Exempt	56	0	-
<b>Trout Valley</b>			
Residential	278	226	\$30,452,993.00
Commercial	3	3	\$985,499.00
Industrial	0	-	\$0
Government-Owned/Tax-Exempt	1	0	\$0
<b>Union</b>			
Residential	312	235	\$14,844,743.00
Commercial	23	23	\$1,383,002.00
Industrial	29	29	\$9,067,530.00
Government-Owned/Tax-Exempt	32	0	0
<b>Wonder Lake</b>			
Residential	3,310	2,202	\$153,869,299.00
Commercial	43	43	\$2,296,112.00
Industrial	-	-	\$0
Government-Owned/Tax-Exempt	64	0	\$0
<b>Woodstock</b>			
Residential	8,987	8,164	\$590,648,079.00
Commercial	602	587	\$92,493,273.00
Industrial	246	229	\$39,157,338.00
Government-Owned/Tax-Exempt	339	0	0

**Residential/Housing Units:** The 2020 Decennial Census provides a current count of residential buildings in McHenry County. The current residential building (housing unit) count of 119,708 is used in the estimation of assets for the vulnerability assessment. In addition, the residential counts above include farm residences.

**Housing Density:** The average density of housing in McHenry County is approximately 197 housing units per square mile using the 2020 Census data. The average housing unit density for the State of Illinois is 94 housing units per square mile. The McHenry County average housing density varies, but generally decreases from east to west as the western portion of the county is more rural and agricultural in nature.

**Non-residential, or Non-housing Buildings:** McHenry County assets (total employer establishments) include 8,016 non-residential buildings in McHenry County (businesses, hospitals,

churches, schools, etc.).

**Government-Owned Buildings:** Government-owned buildings are considered a subset of critical facilities (presented below).

**Manufactured Housing (Mobile Homes):** The Chicago Metropolitan Agency for Planning (CMAP) 2022 Community Data Snapshot for McHenry County indicates that less than 1 percent of the County’s housing stock is comprised of manufactured homes and recreational vehicles. This is approximately 850 units. According to the American Community Survey provided by the U.S. Census, there is an estimated 821 mobile homes with a median value of approximately \$49,400 (2020 ACS 5-year estimates) within the county. There are at least five manufactured home sites located in the county: Indian Trails in Marengo, Royal Oaks Nunda Township, Oakbrook Estates in Crystal Lake, Harbor Lites in unincorporated McHenry County, and Prairie Club in Richmond Township. These types of homes are particularly vulnerable to damage from wind-related hazards. Communities like Fox River Grove and Huntley have ordinances in place that address manufactured home safety and protection. Several jurisdictions in the county, including Algonquin, Bull Valley, Spring Grove, Wonder Lake, and Woodstock have building codes that do not allow manufactured homes.

**Critical Facilities:** Critical facilities are buildings and infrastructure whose exposure or damage can affect the wellbeing of a large group. For example, the impact of a flood or tornado on a hospital is greater than on a home or most businesses due to its large service area population. Critical facilities are generally placed into two categories:

1. Buildings, locations, or infrastructure vital to public safety and the disaster response and recovery effort, such as police and fire stations and telephone exchanges; and
2. Buildings, locations, or infrastructure that, if damaged, would create secondary disasters. Examples of such buildings or locations are hazardous materials facilities and dams.

Critical facilities are not strictly defined by any agency. For this mitigation planning effort, the critical facilities were provided by the county and include several categories including County, municipal and township facilities, police and fire stations, public, educational/school facilities, places of assembly, medical and health care, facilities for special needs populations, transportation, and infrastructure.

For the 2023 plan update, workshops were facilitated to validate current critical facilities within the county. Over 1,951 critical facilities across jurisdictions are considered in the risk assessment. The facilities are categorized and tallied for the County, in Table 2-10. Figure 2-1 shows the location/distribution of all identified critical facilities reported by communities. As expected, critical facilities are concentrated in areas with higher population counts.

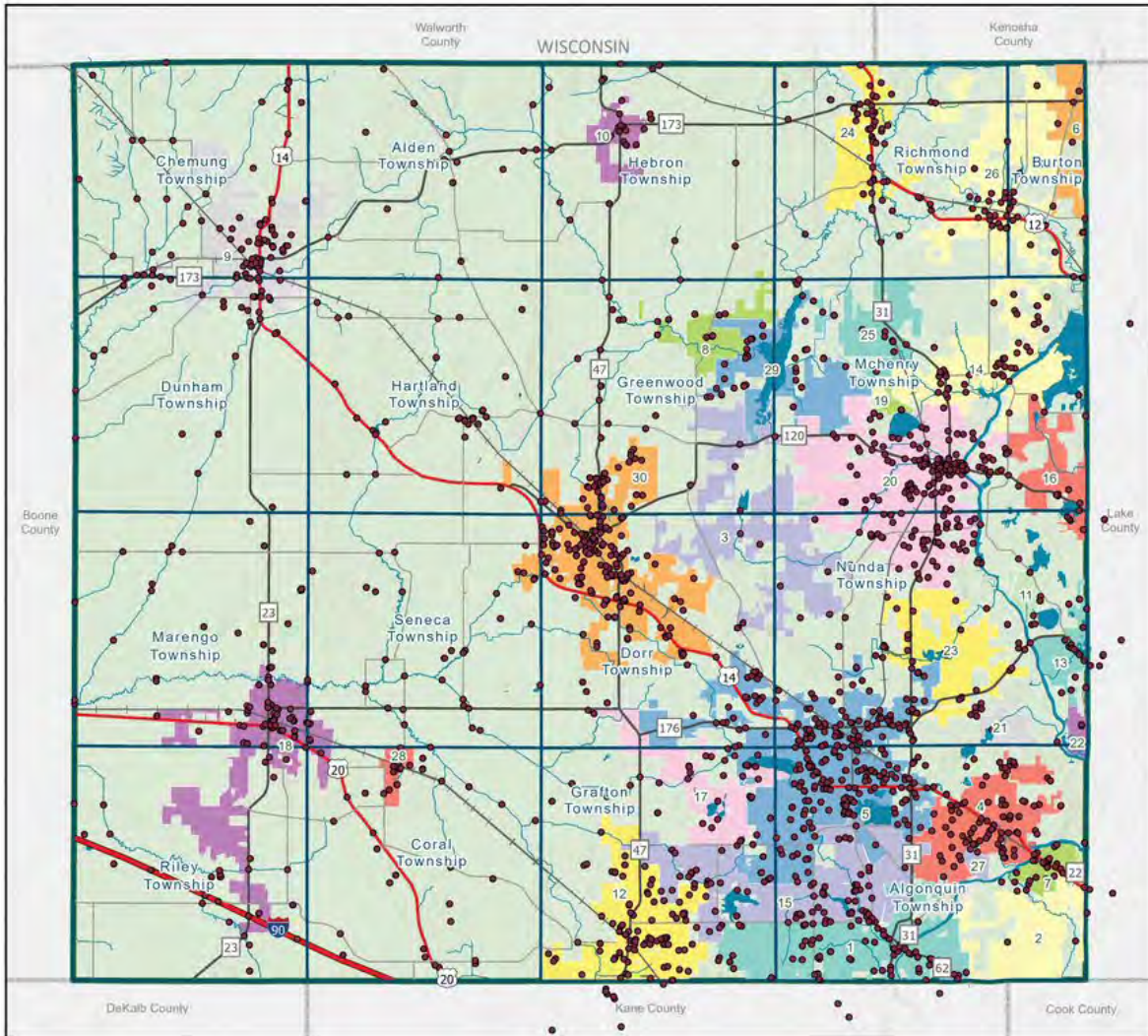
**Table 2-10 McHenry County Summary of Critical Facilities**

Critical Facility Category and Type	Total
<b>Government</b>	<b>369</b>
City Halls	30
County Campus	11
Emergency Operations Center	12
Emergency Operations Center	1
Evacuation Shelter	26
Fire Station	41
Highway/Road Maintenance Center	36

Jail/Prison & Juvenile Detention Center	7
Library	15
Other	1
Police Station	28
Post Office	18
Schools	143
<b>Infrastructure</b>	<b>874</b>
Airport	3
Ambulance Service	18
Communication Tower	237
Culvert	42
Dam	20
Drinking Water Facility	133
Other	5
Power Plant (Utility Substation)	20
Power Substation	17
Railway (Train Station)	8
Roadway (Bridge)	190
Wastewater Treatment Facility	181
<b>Medical Facility</b>	<b>53</b>
Blood Bank	2
Hospital	5
Medical Clinic	40
Other	6
<b>Other</b>	<b>210</b>
Agricultural Chemical Facility	5
Grain Elevator	10
Industrial Hazardous Substance	36
National Guard Armory	1
Petroleum Storage & Distribution	103
Social Service Agency	55
<b>Residential</b>	<b>149</b>
Assisted Living/Care Facility	14
Day Care Facility	95
Nursing/Retirement Home	15
Nursing/Retirement Homes & Assisted Living Facility	5
Residential Group Home and Supportive Living	20
<b>Gathering Place</b>	<b>296</b>
Church	144
Civic Center	8
Other	2
Park	142
<b>Grand Total</b>	<b>1,951</b>



**Figure 2-1 McHenry County Critical Facilities Locations**



## McHenry County, IL

### Critical Facilities



Map Produced by McHenry County  
GIS Department  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Interstate
- US Highways
- State Roads
- Other Roads
- Railways
- Rivers & Streams
- Lakes
- Critical Facilities

### Municipal Boundaries

- |                      |                    |
|----------------------|--------------------|
| 1 ALGONQUIN          | 16 LAKEMOOR        |
| 2 BARRINGTON HILLS   | 17 LAKEWOOD        |
| 3 BULL VALLEY        | 18 MARENGO         |
| 4 CARY               | 19 MCCULLOM LAKE   |
| 5 CRYSTAL LAKE       | 20 MCHENRY         |
| 6 FOX LAKE           | 21 OAKWOOD HILLS   |
| 7 FOX RIVER GROVE    | 22 PORT BARRINGTON |
| 8 GREENWOOD          | 23 PRAIRIE GROVE   |
| 9 HARVARD            | 24 RICHMOND        |
| 10 HEBRON            | 25 RINGWOOD        |
| 11 HOLIDAY HILLS     | 26 SPRING GROVE    |
| 12 HUNTLEY           | 27 TROUT VALLEY    |
| 13 ISLAND LAKE       | 28 UNION           |
| 14 JOHNSBURG         | 29 WONDER LAKE     |
| 15 LAKE IN THE HILLS | 30 WOODSTOCK       |

## 2.4 Flood

### 2.4.1 Flood Hazard Description

Flood events are usually the product of a sudden, heavy downpour of rain and can present as sheet flooding, urban flooding, or riverine flooding. In the event of a flood, people, property, and buildings that lie in the path of the flood waters are likely to incur some degree of damage. Flooding is a very frequent, dangerous, and costly hazard. According to NOAA and the NFIP, 90 percent of all natural disasters in the United States involve flooding. Every year, flooding results in an average of over 5,916 deaths worldwide and 114 in the United States. Nearly 75 percent of all presidential disaster declarations result from natural events where flooding was a major component.

**Figure 2-2 Flood Watches and Warnings**

**FLOOD WATCHES AND WARNINGS**

The National Weather Service Weather Forecast Office in Chicago, Illinois is responsible for issuing flood watches or warnings for McHenry County depending on the weather conditions. The following provides a brief description of each type of alert.

- ❏ **Flash Flood / Flood Watch:** A flash flood or flood watch is issued when current or developing hydrologic conditions are favorable for flash flooding or flooding to develop in or close to the watch area. It does not mean that flooding is imminent, just that individuals need to be alert and prepared.
- ❏ **Flash Flood / Flood Warning:** A flash flood or flood warning is issued when flooding is in progress, imminent or highly likely. Warnings indicate imminent danger to life and property for those who are in the warning area.

Figure 2-2 defines the difference between a flood watch and a flood warning. There are several types of flooding, which are presented below.

**Flash Flooding:** Flash floods occur within a few minutes or hours of heavy amounts of rainfall and can destroy buildings, uproot trees, and scour out new drainage channels. Heavy rains that produce flash floods can also trigger mudslides and landslides. In McHenry County, most flash flooding is caused by slow-moving thunderstorms or repeated thunderstorms in a local area. Although flash flooding often occurs in mountainous areas, it is also common in urban centers where much of the ground is covered by impervious surfaces.

**Sheet Flooding:** Sheet flooding is a condition where storm water runoff forms a sheet of water to a depth of six inches or more. Sheet flooding and ponding are often found in areas where there are no clearly defined channels, and the path of flooding is unpredictable. It is also more common in flat areas. Most floodplains are adjacent to streams or oceans; although almost any area can flood under the right conditions where water may accumulate.

**Urban Flooding:** Urban flooding is usually caused by heavy rain over a short period of time. As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Since sidewalks and roads are non-absorbent, rivers of water flow down streets and into sewers. Roads and buildings generate more runoff than forestland. Fixed drainage channels in urban areas may be unable to contain the runoff that is generated by relatively small, but intense, rainfall events. Urbanization increases runoff two to six times over what would occur on natural terrain. This high volume of water can turn parking lots into lakes, flood basements and businesses, and cause lakes to form in roads where drainage is poor or overwhelmed.

Urban flooding, which can include flash flooding and sheet flooding, can also occur where there has been development within stream floodplains. This is partly a result of the use of waterways for

transportation purposes in earlier times. Sites adjacent to rivers and coastal inlets provided convenient places to ship and receive commodities. The price of this accessibility has increased flooding in the ensuing urban areas. Urbanization intensifies the magnitude and frequency of floods by increasing impermeable surfaces, amplifying the speed of drainage collection, reducing the carrying capacity of the land and, occasionally, overwhelming sewer systems.

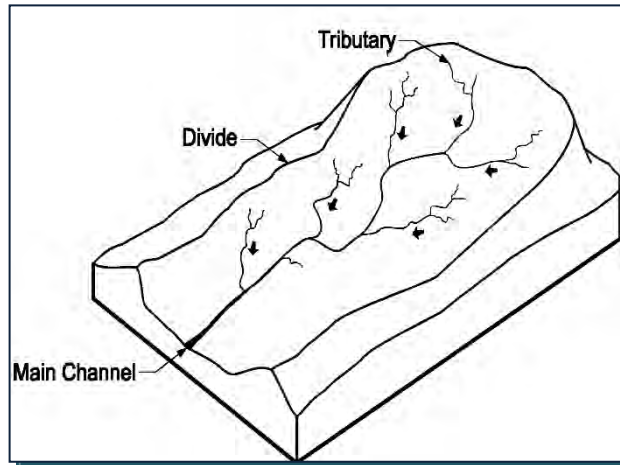
**Riverine Flooding:** Periodic flooding of lands adjacent to non-tidal rivers and streams (known as the floodplain) is a natural and inevitable occurrence. When stream flow exceeds the capacity of the normal watercourse, some of the above-normal stream flows onto adjacent lands within the floodplain. Riverine flooding is a function of precipitation levels and water runoff volumes within the watershed of a stream or river. According to USGS, the recurrence interval of a flood is defined as probability of an event in any given year (e.g., 1 percent annual chance). Flood magnitude increases with increasing recurrence interval.

**Floodplains and Watersheds:** A floodplain is generally the land area susceptible to being inundated or flooded by water from any source (i.e., river, stream, lake, estuary, etc.). Floodplains are natural features of any river or stream. Streams that drain more than one square mile have their estimated floodplain areas mapped in most areas. The mapped floodplain areas are called the regulatory floodplain. The regulatory floodplain mapping is a result of the hydrologic (rainfall) and hydraulic (runoff) analysis of the watershed and stream.

The floodway is a portion of the floodplain required to convey the flood event. The flood fringe provides flood water storage. The floodway is a high velocity area and structures or obstructions in the floodway can increase flood heights. The floodway is regulated by the Illinois Department of Natural Resources, Office of Water Resources (IDNR-OWR). The IDNR-OWR floodway requirements are incorporated into the McHenry County Stormwater Management Ordinance. Floodplain and floodway regulations will be discussed further in Chapter 4.

Flooding can occur any time of year. The severity of flooding is determined by a combination of topography and physiography, ground cover, precipitation and weather patterns and recent soil moisture conditions. Flooding is also governed by the size and the nature of the stream’s watershed. A watershed is the geographic area of land where all runoff drains to a common point, as demonstrated in Figure 2-3. McHenry County watersheds are shown in Figure 1-2 (Chapter 1). McHenry County has two major watersheds: the Fox River watershed and the Kishwaukee River watershed. Table 2-11 and Table 2-12 show the major watersheds and tributary watersheds of the County, and available drainage areas.

**Figure 2-3 Watershed Model**



**A watershed includes all land that drains to a common channel.**

**Table 2-11 McHenry County Fox River Watershed Streams and Tributaries**

<b>Stream Name and Tributaries</b>	<b>Approximate Drainage Area In All Counties (Sq Miles):</b>
Fox River at Algonquin Dam	1,403.0
Nippersink Creek	202.0
Silver Creek/Slough Creek — (Trib. Of Nippersink Creek)	34.1
Vander Karr Creek — (Trib. Of Nippersink Creek)	16.4
North Branch Nippersink Creek — (Trib. Of Nippersink Creek)	68.7
Hebron Creek — (Trib. Of Nippersink Creek)	---
Alden Creek — (Trib. Of Nippersink Creek)	---
Dutch Creek	12.6
Boone Creek	23.2
Thunderbird Lake Drain (Sleepy Hollow Creek)	11.1
Cotton Creek	13.0
Silver Creek	12
Cary Creek	3.3
Spring Creek	26.9
Crystal Creek	26.5
Woods Creek — (Trib. Of Crystal Creek)	8/90

**Table 2-12 McHenry County Kishwaukee River Watershed Streams and Tributaries**

<b>Stream Name and Tributaries</b>	<b>Approximate Drainage Area In All Counties (Square Miles):</b>
Kishwaukee River at Garden Prairie	221.0
Laughing Creek	---
Franklinville Creek	11.0
North Branch Kishwaukee River	40.3
South Branch Kishwaukee River	56
Eakin Creek — (Trib. Of South Branch Kishwaukee River)	34.1
Kishwaukee Creek — (Trib. Of South Branch Kishwaukee River)	16.4
Union Creek — (Trib. Of South Branch Kishwaukee River)	68.7
Rush Creek	3.2
Mud Creek	---
Coon Creek near Garden Prairie	15.1
Picasaw Creek at Chemung	52.2
Lawrence Creek— (Trib. Of Picasaw Creek)	21.5
Mokeler Creek at Picasaw Creek— (Trib. Of Picasaw Creek)	9.3
Geryune Creek near Capron — (Trib. Of Picasaw Creek)	12.2

The condition of the land in a watershed affects what happens to the precipitation. For example, more rain will run off the land and into the streams if the terrain is steep, if the ground is already saturated from previous rains, if the watershed is significantly covered with impervious pavement and parking lots, or if depressional storage areas have been filled in.<sup>v</sup>

On average, flooding causes more than \$4 billion in property damage each year in the United States. Floods can cause utility damage and outages, infrastructure damage (both to transportation and communication systems), structural damage to buildings, crop loss, and impede accessibility.

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## 2.4.2 Flood Hazard Location

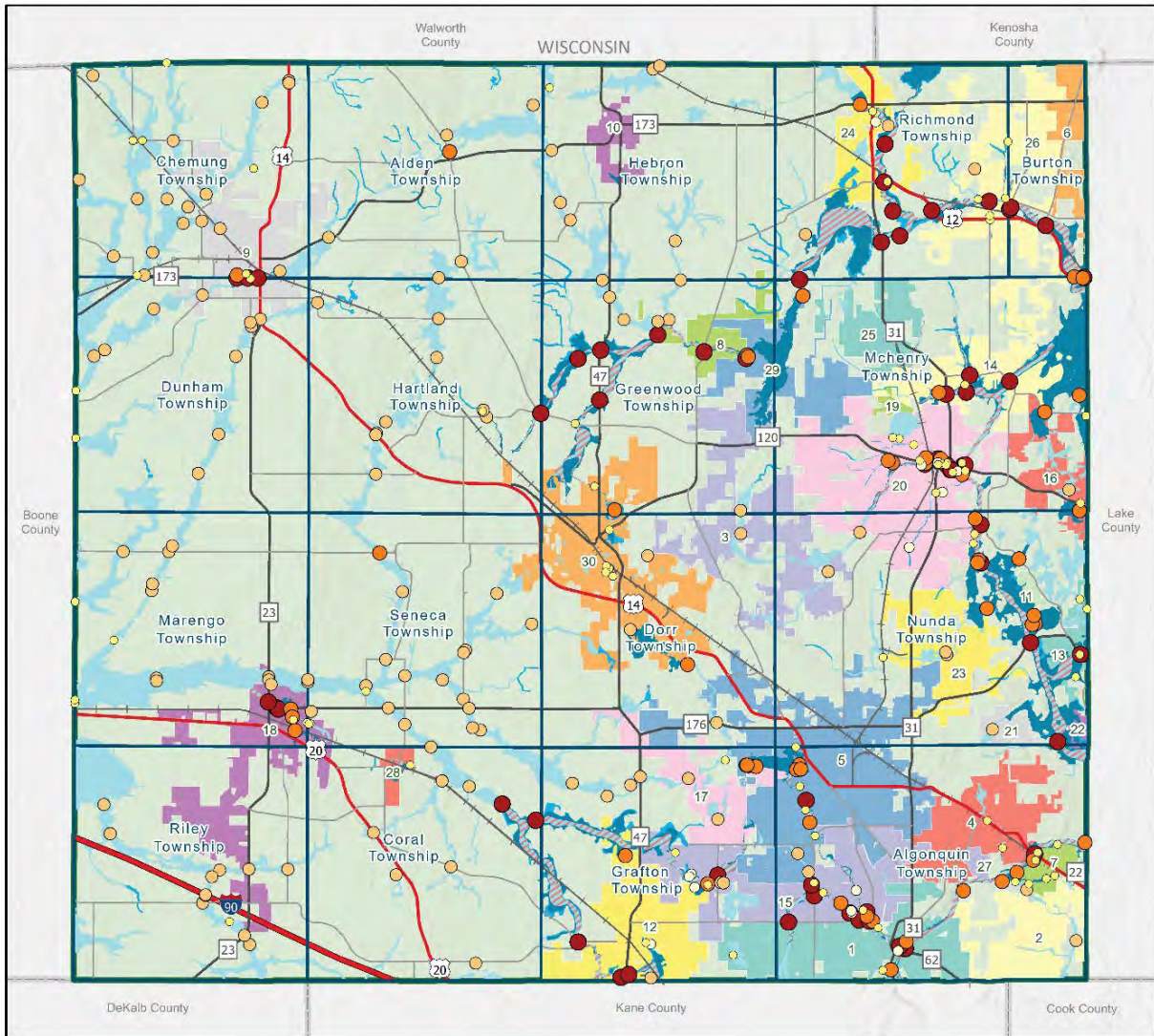
FEMA produces Flood Insurance Rate Maps (FIRMs) to define the regulatory floodplain, or the Special Flood Hazard Area (SFHA). The regulatory floodplain is also known as the 100-year floodplain, base flood elevation, or the 1 percent annual chance floodplain. The 100-year floodplain is the land area that is subject to a 1 percent or greater chance of flooding in any given year. Structures located in the SFHA are highly susceptible to flooding. Structures located in the SFHA A-Zones are required by lenders to purchase flood insurance. Anyone in a community that participates in the NFIP may voluntarily purchase flood insurance. The County and municipalities (all jurisdictions besides Oakwood Hills participate in the NFIP) administer floodplain regulations as part of FEMA's National Flood Insurance Program (NFIP) and through the McHenry County Stormwater Management Ordinance. Activities in floodplains, including grading, construction, and changes to existing structures must meet the floodplain requirements.

While the 100-year (or base flood) is the standard 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 percent) chance of occurring in any given year. It is generally deeper than a 100-year flood and covers a greater amount of area; however, it is statistically less likely to occur.

The McHenry County digital FIRMs (DFIRM) indicate both the 1.0 percent annual chance floodplain and 0.2 percent annual chance (500-year) floodplain areas in the county as shown in Figure 2-4. These DFIRMs became effective on November 16, 2006. In addition, Table 2-15 shows the amount of floodplain (in acres) in each participating jurisdiction, indicating varying risk throughout the county. However, it should be noted that flooding outside of the FEMA designated flood areas is possible. A more severe event could easily exceed the 0.2 percent annual chance (500-year) floodplain boundaries shown. In addition, urban flooding and sheet flooding are possible throughout the planning area. Basement flooding caused through water rising from a high groundwater table (i.e., seepage or groundwater flooding) is common in McHenry County.

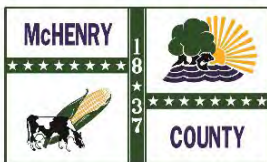
Notably, 95.4 percent of all 1.0 percent annual chance (100-year) floodplains are in the eastern half of the county due to the location of the Fox River, portions of the Kishwaukee River, and Nippersink Creek. This is of particular concern because 27 of the 30 municipalities, as well as most of the population, are in the eastern half of the county.

**Figure 2-4 McHenry County Special Flood Hazard Areas**



## McHenry County, IL

**Critical Facilities**  
Located in Effective Floodplain



Map Produced by McHenry County  
GIS Department  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Political Township
- Interstate
- US Highways
- State Roads
- Other Roads
- Railways
- Critical Facilities in Floodplain
- Floodway
- 1% chance annual flooding (Zone AE)
- 1% chance annual flooding (Zone A)
- 0.2% chance annual flooding
- Within 100-feet of floodplain

### Municipal Boundaries

- |                      |                    |
|----------------------|--------------------|
| 1 ALGONQUIN          | 16 LAKEMOOR        |
| 2 BARRINGTON HILLS   | 17 LAKEWOOD        |
| 3 BULL VALLEY        | 18 MARENGO         |
| 4 CARY               | 19 MCCULLOM LAKE   |
| 5 CRYSTAL LAKE       | 20 MCHENRY         |
| 6 FOX LAKE           | 21 OAKWOOD HILLS   |
| 7 FOX RIVER GROVE    | 22 PORT BARRINGTON |
| 8 GREENWOOD          | 23 PRAIRIE GROVE   |
| 9 HARVARD            | 24 RICHMOND        |
| 10 HEBRON            | 25 RINGWOOD        |
| 11 HOLIDAY HILLS     | 26 SPRING GROVE    |
| 12 HUNTLEY           | 27 TROUT VALLEY    |
| 13 ISLAND LAKE       | 28 UNION           |
| 14 JOHNSBURG         | 29 WONDER LAKE     |
| 15 LAKE IN THE HILLS | 30 WOODSTOCK       |

**Table 2-13 Total Floodplain Area by Jurisdiction (in Acres)**

Municipality	Acres of 1.0 percent annual chance floodplain (100-year)	Acres of 0.2 percent annual chance floodplain (500-year)	Total Floodplain Acres	% of Total Acres
Algonquin	79.3	29.1	108.4	1.8%
Barrington Hills	35.8	0	35.8	1.1%
Bull Valley	45.4	0	45.4	0.8%
Cary	32.6	1.0	33.6	0.8%
Crystal Lake	67.3	14.9	82.2	0.7%
Fox Lake	0.1	0	0.1	0.0%
Fox River Grove	37.9	6.8	44.7	4.6%
Greenwood	56.4	18.4	74.7	4.4%
Harvard	82.3	30.4	112.7	2.1%
Hebron	1.9		1.9	0.2%
Holiday Hills	25.8	11.1	36.8	6.0%
Huntley	109.7	55.5	165.2	3.1%
Island Lake	40.9	7.9	48.8	3.9%
Johnsburg	154.0	81.1	235.0	4.9%
Lake In The Hills	160.2	71.2	231.3	3.5%
Lakemoor	49.6		49.6	2.5%
Lakewood	74.6	6.1	80.7	2.6%
McCullom Lake	87.6	0	87.6	1.7%
McHenry	1.2	0	1.2	0.5%
Marengo	65.3	75.5	140.8	1.5%
Oakwood Hills	12.1		12.1	1.6%
Port Barrington	15.0	3.7	18.7	4.9%
Prairie Grove	20.6	17.6	38.2	1.1%
Richmond	81.0	15.7	96.7	3.6%
Ringwood	18.1		18.1	0.7%
Spring Grove	80.8	14.5	95.2	1.6%
Trout Valley	2.7		2.7	1.0%
Union	12.2	1.5	13.7	2.5%
Wonder Lake	16.3		16.3	0.4%
Woodstock	141.9	21.9	163.8	2.0%
Unincorporated McHenry County	216.8	307.7	524.5	0.2%
<b>McHenry County Total</b>	<b>1,825.1</b>	<b>791.5</b>	<b>2,616.6</b>	<b>1.8%</b>

**Additional Areas of Known Flood Occurrence:** In addition to the FEMA designated flood areas, several areas were noted by the planning team and the public as likely to flood or prone to flood impacts. These include:

- In the past, flooding appeared to be significant from the Fox River main stem only, but as the County has developed over the last decades, the Kishwaukee River and the Nippersink Creek watersheds have experienced several growing flood problems. FEMA recently completed a study on the Nippersink Creek and will begin a study on the Kishwaukee River in the near-term. Study results were not available at the time

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of the 2023 Plan Update but should be added to future updates.

- *Reported Sources of Flood Problems - 1997:* In 1997, the McHenry County Department of Planning and Development collected flood problem reports from around the County and produced a map showing the problem area locations. Problems included overbank flooding, local drainage-related flooding, basement flooding, erosion and sedimentation problem areas, and surface water quality problems. From a review of the County mapping, almost 40 areas of overbank flooding occurred in both the Fox River and Kishwaukee River watersheds. Overbank flooding was prevalent along the Fox River, but also occurred along Nippersink Creek. Notable flooding occurred in headwater areas in Lakewood, Huntley, and Woodstock.
- *Roadway Flooding:* Flash flooding and overbank flooding can cause flood problems on roads. As part of this Plan development, communities were asked to report bridges or culverts that impede flood flow (shown in Chapter 6). As part of this effort, the McHenry County Division of Transportation, at a meeting of all staff members, identified any roadway that has had a flood problem. See Figure 2-3 for areas determined to be affected by flooding. Again, the problems could be a result of flash flooding or overbank flooding. The map of these locations is provided in Chapter 6 (Exhibit 6- 1). Details reported by the communities are described below.
- *Algonquin – Woods Creek Lane*
- *Bull Valley –* The “S-curve” on Queen Anne Road, north of Bull Valley Road has flooded a couple times in the past several years. It is a marshy area, and the road is level with the low-lying ground. In addition, Ladd Court, located south of Crystal Springs Road and west of Cherry Valley Road, has flooded from large amounts of rain. The road shoulder, consisting of gravel and vegetation, has washed down and blocked the drainage/wash out areas.
- *Hebron Township –* The township identified multiple roads with structural issues during flood events; these roads include State Line Road, Hebron Road, Johnson Road, Thayer Road, Kemman Road, and Oksen Road. These roads can overtop with just two inches of rain during the spring. Many culverts along these roads are half full of sediment build-up, and the township stated the need for barriers. In addition, IL State Highway 173 floods west of the Village of Hebron.
- *Johnsburg –* The village stated that there are several roadways in the village located in the floodway that flood entirely during heavy flood events. They also identified sediment accumulation in the Dutch Creek Bay and its adjacent channels that contributes to flooding issues.
- *McHenry City –* The city noted during flood events, the intersection of Ramble Road and Home Avenue floods frequently and limits access. In addition, Meadow Lane Bridge obstructs the flow of water over Lakeland Park Drainage Ditch. They also indicated several locations of sediment accumulation that causes channel capacity reduction and/or potential flooding, including Lakeland Park Drainage Ditch from Illinois Route 120 (Elm Street) to the Fox River, Boone Lagoon ponds along Watersedge Drive, and Boone Creek starting west of Oakwood Drive Bridge to the Fox River.



- *Oakwood Hills* – The village identified erosion and sediment issues along the channel inflow at the south end of Silver Lake from Lake Killarney. In addition, an overflow culvert under North Shore Drive obstructs water flow and increases flooding issues in the area.
- *Prairie Grove* – The village indicated that Wright Road overtops with approximately six inches of water during the spring thaw.
- *Spring Grove and Burton Township* – There are several repetitive loss areas along Nippersink Creek with previous flood impacts. McHenry County purchased seven structures on 34 parcels in repetitively flooded areas off Nippersink Creek. All structures have been removed and the properties will stay as open space in perpetuity.

### 2.4.3 Flood Hazard Extent

Flood extent, or magnitude, can be defined in several ways including flow or discharge rate (cubic feet per second), height of flood waters, and damages. The USGS drainage areas, discharge rates, and available flood stage data for McHenry County are shown in Table 2-14. Maximum discharge and maximum mean gage height are used to indicate extent.

**Table 2-14 USGS Stream Gage Data for Locations in McHenry County**

Water Feature	Gage Location	Median Discharge (cubic feet/second)	Max Discharge (cubic feet/second) (year)	Drainage Area (sq miles)	Max Mean Gage Height (feet/year)
Boone Creek	near McHenry	0.97	773 (2013)	15.5	1.4 / 2019
Elizabeth Lake Drain	near Twin Lakes	794.3 **	794.3 **	13.1	- - -
Fox River	at Johnsburg	1,047 **	4,780 (1999)	1,205	4.3 / 2019
Fox River	near McHenry	- - -	- - -	1,250	3.8 / 2003
Fox River	at Algonquin	896.7	6,720 (2007)	1,403	2.1 / 1993
Fox River (Tailwater)	near McHenry	- - -	- - -	1,250	3.4 / 2019
Fox River (Tailwater)	at Algonquin	1,411.5	7,900 (2017)	1,429	8.0 / 2019
Fox River At Miller Bridge	near McHenry	1,315 **	2,670 (2021)	1,250	12.0 / 2022
Kishwaukee River	at Marengo	161.4	7,350 (1972)	170	9.0 / 2019
Nippersink Creek	above Wonder Lake	78.3	3,690 (1999)	84.5	5.7 / 2019
Nippersink Creek	near Spring Grove	147.8	2,910 (1986)	192	5.7 / 2019

\*Using all available complete years

\*\*Only 1 recorded complete year

Data source: Station Pages from USGS National Water Information System

The drainage area for McHenry County’s water features is large, and GIS analysis determined that the FEMA mapped floodplain (FIRM A and AE Zones) covers approximately 72 square miles of the County. **Therefore, the spatial extent of flooding is considered Moderate, with a score of 3.**

### 2.4.4 Flood Hazard Previous Occurrences

Two sources of data were used to assess past flood events in McHenry County: The NOAA National Climatic Data Center (NCDC) Storm Events Database and flood insurance claims data provided by FEMA. Table 2-15 summarizes the previous flooding occurrences reported in McHenry County between 2000 and December 2022. No injuries were reported because of flooding though one fatality did occur. Nearly all events took place between May and September.

The National Flood Insurance Program (NFIP) data shows at least 44 flood events from 1978 to 2022.

Note that not all flood events have an associated Presidential Disaster Declaration. Several claim dates were aggregated into one flood event for purposes of data presentation. Flood events captured by the flood insurance data range from basement flooding only throughout the County, to long duration overbank flooding on the Fox River. Table 2-16 provides a summary of flood insurance claims paid for each flood event. The table does not show events where only one property owner made a flood insurance claim.

Since 1978, 678 flood insurance claims have been paid in McHenry County for a total of \$6.8 million, resulting in an average claim of \$8,221. For the County and all municipalities that are wholly or partially in McHenry County, there are 993 flood insurance policies in place according to 2021 data from FEMA. The total flood insurance coverage for the County is \$1,405,846 million based on a review of NFIP claims data. Additionally, Table 2-16 summarizes NFIP claims data across the county since the beginning of the NFIP in 1978. As of 2021, there are 119 repetitive loss properties in McHenry County. All are assumed to be single family residences. In 2021, the McHenry County Conservation District, in contract with the County, was awarded \$1,459,656 to implement a buyout program that allowed them to acquire 7.13 acres of repetitively flooded property on Nippersink Creek. Mitigation of repetitive flood loss structures is further discussed further in Chapter 5.

**Table 2-15 Reported Flood Events in McHenry County**

Flood Event:	Flood Type	Area Impacted	Rainfall Estimate	Damage* (event-year dollars)	NFIP Claims Paid:	Claims Amount Paid:	Deaths/Injuries*
<b>Prior to 2000</b>	All	countywide	-	-	329	\$1,700,960	Unknown
<b>June 12-17, 2000</b>	Flash Flood & Riverine	Harvard, Richmond, and countywide	3" to 5" plus earlier runoff	Unknown	15	\$103,738	0/0
<b>Feb-March 2001</b>	-	-	-	Unknown	4	\$14,433	0/0
<b>June 4, 2002</b>	Riverine Flooding	countywide	3.5"	Unknown	0	0	0/0
<b>Aug 22, 2002</b>	Flash Flood & Riverine	countywide	5"	Unknown	0	0	0/0
<b>Sept 19, 2002</b>	Riverine Flooding	Harvard	2.4"	Unknown	0	0	0/0
<b>July 2003</b>	-	-	-	Unknown	2	\$4,349	0/0
<b>May-June 2004</b>	Flash Flood & Riverine	Crystal Lake	1.5"	Unknown	12	\$121,631	0/0
<b>May 19, 2005</b>	Riverine Flood	countywide	-	Unknown	-	0	0/0
<b>July 20, 2006</b>	Riverine Flood	Huntley	-	Unknown	0	0	0/0
<b>July 9, 2007</b>	Riverine Flood	Crystal Lake	-	Unknown	0	0	0/0
<b>Aug-Sept 2007</b>	3 Flash Floods & 1 Riverine	Woodstock, Marengo, Union, Algonquin, Huntley, Lakewood	4.4" – 5.1"	\$996,980	77	\$789,385	0/0
<b>April 2008</b>	-	countywide	-	Unknown	4	\$9,873	0/0
<b>June 13-25, 2008</b>	Riverine Flood	Spring Grove	6.6"	\$289,820	10	\$64,067	0/0
<b>Sept 13, 2008</b>	Flash Flood	Crystal Lake, Lake In The Hills, Algonquin	-	Unknown	2	\$5,670	0/0
<b>Dec 1, 2008</b>	-	countywide	-	Unknown	2	\$9,453	0/0

Flood Event:	Flood Type	Area Impacted	Rainfall Estimate	Damage* (event-year dollars)	NFIP Claims Paid:	Claims Amount Paid:	Deaths/Injuries*
<b>Feb-March 2009</b>	-	countywide	-	Unknown	2	\$10,098	0/0
<b>June 2009</b>	-	countywide	-	Unknown	6	\$130,469	0/0
<b>May 12 - 14 2010</b>	-	countywide	-	Unknown	5	\$18,380	0/0
<b>July 24, 2010</b>	-	countywide	-	Unknown	1	\$4,852	0/0
<b>May 2011</b>	Riverine	Crystal Lake and Richmond	8" to 12"	Unknown	1	\$7,791	0/0
<b>March 2012</b>	Riverine	Bull Valley, Woodstock, McCullom Lake & Hartland (Uninc. Place)	-	Unknown	No data	No data	0/0
<b>April 2013**</b>	Riverine	countywide	-	Unknown	117	\$2,160,359	0/0
<b>June 2013</b>	2 Flash Floods	Cary, McHenry, & Terre Cotta (Uninc. Place)	3" to 4"	Unknown	20	\$259,794	0/0
<b>May 2014</b>	-	Crystal Lake	-	Unknown	1	\$1,085	0/0
<b>July 2015</b>	-	Marengo	-	Unknown	2	\$6,360	0/0
<b>July 2017</b>	Flash and river flooding	Crystal Lake, McCullom Lake, Union	-	\$3.9 million	68	\$1,326,578	0/0
<b>September 2018</b>	Flash flooding and overflow of retention ponds	Union, Highland SHRS, Woodstock	4.4"	Unknown	5	\$40,918	0/0
<b>2019</b>	-	Countywide	-	-	4	\$68,212	0/0
<b>May 2020</b>	Localized flooding and a foot of standing water	Huntley	1.93"	Unknown	7	\$147,292	0/0
<b>July 2022</b>	Flash flooding and ponding	Chemung	5.35"	Unknown	No data	No data	0/0
<b>County Totals</b>				<b>\$5,186,800</b>	<b>696</b>	<b>\$7,005,747</b>	<b>1/0</b>

\*\*Presidential Disaster Declaration  
 Source: NOAA; FEMA Claims Data

**Notable Flood Events:** There have been several significant flood events in the county. Details related to the more recent events are presented below.

- **July 1982:** There was only one recorded report of death associated with a flood event, which was provided by the Village of Algonquin. On July 21, 1982, an Algonquin police officer drowned in Crystal Lake Outlet Creek while searching for a man reported to have fallen into the creek.
- **1986 and 1993 Floods:** The two next largest floods in McHenry County were the September 1986 and the June 1993 floods. Both floods received disaster declarations. Neither flood event is shown in the NOAA’s Storm Events Database for McHenry County, nor are details of the floods available. Both floods were the results of extended periods of rainfall across Wisconsin and Illinois. Flood insurance claims totaled \$521,000 for the 1986 flood and \$754,000 for the 1993 event.
- **June 2000 Riverine and Flash Flood:** In McHenry County there was flooding of streets

and basements in Harvard and Richmond. It was the worst flood in 20 years in Richmond. Nine residents had to be rescued. The Fox River and Chain of Lakes were closed to all motorized boat traffic. Some communities affected along the Fox River included Holiday Hills, and Spring Grove. Some residents in Holiday Hills sandbagged to protect their homes from flooding. Floodwater from Nippersink Creek forced the evacuation of 3 homes in Spring Grove. \$118,000 in flood insurance claims was paid for this event.

- **August 2007 Flood Event:** From the Storm Event Database and the flood insurance claims data, the August 2007 flood caused the second highest recorded damages, (\$996,980 (2015 dollars) was recorded by the NWS and \$736,000 was paid in flood insurance claims. A federal disaster declaration was not granted by FEMA in McHenry County for the August 2007 flood.
  - In Woodstock, the intersection of Route 47 and 120 closed due to two feet of standing water. Willow and Clay Streets closed due to waist deep water. Police conducted rescues from stranded vehicles. Basement flooding was reported throughout Woodstock, and as many as 10 properties were flooded.
  - In Union, Boot Creek overflowed at Hemmingson Road. Water flowed over the railway station platform and many Union streets were closed. On August 19, flash flooding caused an evacuation of the Railway Museum, a mobile home park, and local campground.
- **June 2008 Floods:** The McHenry Lock and Dam crested at 6.8 feet, and downstream from the dam, about 100 homes were affected by flood water in the Orchard Heights and Colby Point areas, with 50 sustaining some damage. \$254,000 in flood insurance claims was paid for this event.
- **April 2013:** On April 17 & 18, 2013, storms cut across the Chicago area of Illinois, resulting in heavy rains of 5 to 10 inches<sup>viii</sup> on top of another two inches of rain received earlier in the week. The Fox River reached a record level of 7.44 feet at McHenry Dam on April 22, a “major flood level”. This event was considered the record river flooding for the Illinois River Valley. A federal disaster declaration was made in 35 counties across the state. Over 58,000 homes and contents were damaged or destroyed through the impacted area; as a result, over \$190 million in federal grants and loans were made available. Over \$3.7 million in flood insurance claims were paid for this event. It was declared a State and Federal Disaster in the county.
- **July 2017:** Thunderstorms produced torrential rainfall, resulting in flash flooding and major river flooding. The river gage at the Algonquin Tailwater measured a record crest of 13.15 feet. 557 homes were affected by the river flooding.
- **May 2020:** Thunderstorms produced localized flooding and several tornadoes. A foot of water was reported on Route 47 near Huntley. Rainfall of 1.93 inches was measured in 45 minutes.
- **July 2022:** Scattered thunderstorms produced wind damage and flooding. Significant ponding and standing water were reported in many areas throughout the County. Rainfall between 4 and 7 inches was reported.

**Table 2-16 Summary of McHenry County Flood Insurance Claims Data for Communities Participating in the NFIP**

Community	Number of Claims Paid	Total Paid	Average Paid	Number of Active Policies	CRS Class
Village of Algonquin	41	\$310,270	\$7,568	69	--
Village of Barrington Hills	6	\$69,216	\$12,693	2	--
Village of Bull Valley	--	--	--	--	--
Village of Cary	8	\$19,326	\$2,417	11	--
City of Crystal Lake	25	\$311,787	\$12,471	40	7
Village of Fox Lake	2	\$7,977	\$3,989	--	--
Village of Fox River Grove	21	\$214,337	\$10,207	25	--
Village of Greenwood	--	--	--	--	--
City of Harvard	7	\$50,352.01	\$3,873	15	--
Village of Hebron	--	--	--	--	--
Village of Holiday Hills	34	\$311,888	\$9,173	41	--
Village of Huntley	2	\$713	\$357	9	7
Village of Johnsburg	24	\$496,704	\$20,696	85	--
Village of Lake In The Hills	31	\$173,365	\$5,592	37	5
Village of Lakemoor	5	\$43,062	\$8,612	14	--
Village of Lakewood	3	\$39,536	\$13,179	6	--
City of Marengo	12	\$30,426	\$2,536	78	--
City of McHenry	43	\$310,394	\$7,218	36	--
Village of Port Barrington	45	\$525,775	\$11,684	27	7
Village of Spring Grove	20	\$174,469	\$8,723	3	--
Village of Union	8	\$31,482	\$3,935	12	--
Village of Wonderlake	1	\$3,791	\$3,791	15	--
City of Woodstock	14	\$182,324	\$13,023	17	10
Unincorporated McHenry County	326	\$3,555,224	\$10,906	451	6
<b>Totals</b>	<b>678</b>	<b>\$7,862,418</b>	<b>\$8,221</b>	<b>993</b>	<b>-</b>

Source: CIS and FEMA Region V Flood Claim Data

Table 2-17 summarizes McHenry County flood insurance claims by decade dating back to the 1970s. Claims paid have increased steadily since the 90s, and more than doubled between 2000-2009 to 2010 – 2019. Total claims paid includes some payments to jurisdictions that overlap McHenry County boundaries; however, the trend of claims payments remains accurate for the County.

**Table 2-17 McHenry County Flood Insurance Claims Summary**

Years	Total Claims Paid	Total Claims Paid (\$)
1978-1979	108	\$215,341
1980- 1989	90	\$422,178
1990-1999	131	\$1,063,441
2000-2009	136	\$1,263,166
2010 – 2019	225	\$3,901,959
2020 – 2021	7	\$147,292

Source: FEMA NFIP Data, September 2021

**NFIP Repetitive Flood Loss Structures:** FEMA defines a “repetitive loss structure” as an NFIP-insured structure that has had at least 2 paid flood losses of more than \$1,000 each within any 10-

year period since 1978. FEMA Region V provides the County with repetitive loss data when requested; as of 2021, FEMA reports 119 repetitive loss structures in McHenry County and its municipalities. Most properties identified are in unincorporated McHenry County; however, repetitive loss structures can be found in ten additional jurisdictions as presented in Table 2-18.

**Table 2-18 McHenry County Repetitive Loss Structures**

Community	Repetitive Flood Loss Properties	Total Repetitive Losses Paid
Village of Algonquin	8	\$269,942
City of Crystal Lake	2	\$26,739
Village of Fox River Grove	3	\$89,813
Village of Holiday Hills	11	\$295,692
Village of Johnsburg	5	\$163,581
Village of Lake-In-The-Hills	4	\$58,325
Village of Lakemoor	1	\$43,935
City of Marengo	1	\$9,508
Village of Port Barrington	11	\$445,495
City of Woodstock	2	\$44,282
McHenry County Unincorporated	71	\$2,809,517
<b>Total:</b>	<b>119</b>	<b>\$4,256,829</b>

Source: FEMA Region V, verified by McHenry County Water Resources

### 2.4.5 Flood Hazard Probability of Future Occurrences

The term “100-year flood” is often misinterpreted. The 100-year flood does not mean that it will occur once every 100 years. A 100-year flood has a 1/100 (1 percent) chance of occurring in any given year. A 100-year flood could occur two times in the same year or two years in a row. It is also possible not to have a 100-year flood event over the course of 100 years.

In the last 20 years, there have been 25 total flood occurrences (Riverine and Flash Flood) according to NOAA (likely under-reported). **This indicates a high probability of flooding of some kind occurring once a year or more on the EPRI index, earning a score of 5.** While flooding is a frequently occurring hazard within McHenry County, it is possible to have years with no flood events and years with multiple flood events.

### 2.4.6 Flood Hazard Vulnerability Assessment

With a growing population and increasing development, McHenry County is susceptible to increased flooding. Being aware of this fact, McHenry County has taken steps through the McHenry County Stormwater Management Ordinance and comprehensive planning efforts to protect against new flood damages. These efforts will be discussed in Chapter 4. Despite these steps, McHenry County’s existing developments are still vulnerable to significant flooding. GIS analysis was used to determine that the FEMA mapped floodplain (FIRM A and AE Zones) covers approximately 72 square miles of the County. Based on data provided by the County GIS team, there are 348 critical facilities within the floodplain.

McHenry County’s evaluation and scoring of vulnerability and consequences is provided below.

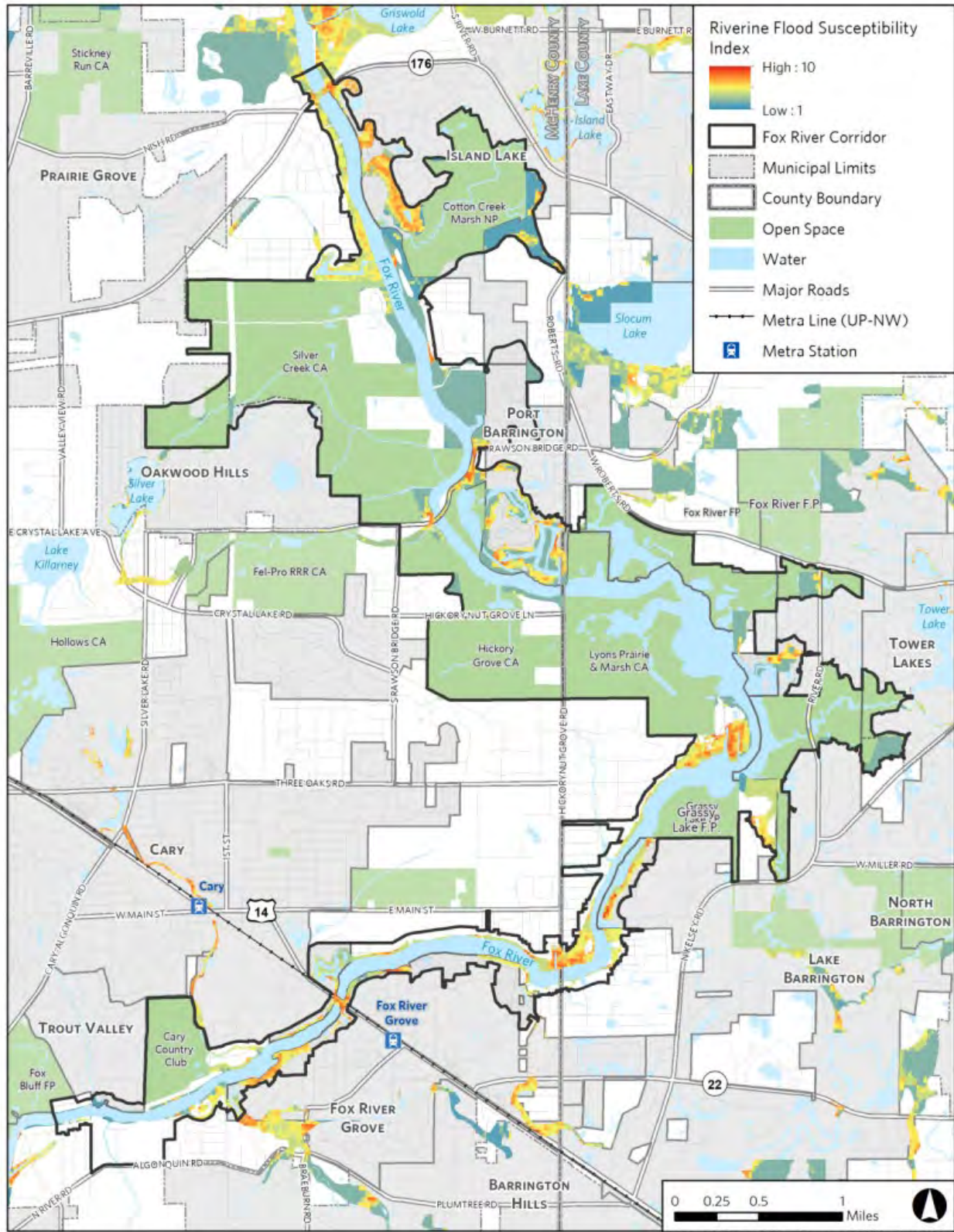
**Vulnerability Score – 3.** The vulnerability score reflects built environment or policies in place that affect susceptibility to flood hazards. A score of 3 indicates that existing mitigation measures and features prevent few impacts. McHenry County has ordinances in place to manage stormwater and development in the SFHA. Nearly all municipalities participate in the NFIP. As noted in Table 2-18, six communities participate in the CRS and encourage higher development standards in the SFHA. Nevertheless, many homeowners do not have flood insurance and there are approximately 119 repetitive loss structures in the County.

CMAP created a vulnerability assessment for the Fox River Corridor Plan. According to the study, communities within the Fox River Corridor (including those in McHenry County) are highly vulnerable to overbank flooding. The study produced a riverine flood susceptibility index, shown in Figure 2-5, which shows that the flood susceptibility of the Fox River’s developed areas is lower than in others throughout the region. This lower risk is due to open space that buffers the river. Nevertheless, areas with high riverine flood susceptibility in McHenry County include areas near Cotton Marsh, Hickory Grove, and Holiday Hills.

**Public Health Consequences Score – 2.** Safety during a flood, whether from overbank flooding or flooding caused by a high-water table (basements), is a concern. Furthermore, riverine and stormwater flooding may take hours to days to recede, preventing ingress and egress from buildings. If clean-up after a flood is not properly done, then health problems can develop due to mold. Flooding roads and viaducts are dangerous. People continue to be at risk when driving through floodwaters; fast moving waters are a hazard to people in and out of cars. The highest flood depths are at the Fox River, but stormwater flooding away from the floodplain in McHenry County can also threaten lives, as emphasized in the death during the 1982 flood event. Regarding health and safety, few fatalities and injuries are expected due to flooding.

**Consequences to Property - 5:** GIS analysis indicates there are approximately 4,416 improved parcels located in the 1 percent chance floodplain. The value of these parcels is \$279,667,132. There are an additional 543 improved parcels in the 0.2 percent chance floodplain, valued at \$37,775,561. These homes are subject to physical damage, particularly those that are not raised above the base flood elevation. The FEMA NRI indicates that McHenry County has a relatively moderate annual expected loss due to riverine flooding at \$1,406,968. Flood damage to businesses is difficult to estimate, but also expected and accounted for in the improved parcel and NRI annual expected loss estimates.

**Figure 2-5 Riverine Flood Susceptibility in the Fox River Corridor, CMAP**





Critical facilities data has improved since the last plan update, with the addition of approximately 500 more critical facilities in the County’s geodatabase. There are approximately 149 critical facilities located in the SFHA (not including dams), with 34 located within the FEMA floodway and are at higher risk of damage due to high velocity floodwaters. Most critical facilities in the floodway are roadway and stormwater infrastructure; however, some wastewater assets are located in the high velocity floodway and should be evaluated for flood protection. Table 2-19 lists the facilities in the 1 percent annual chance floodplain and the 0.2 percent annual chance floodplain. Figure 2-4 above illustrates the locations of these facilities.

**Table 2-19 Critical Facilities Located in the Floodplain**

1.0 percent ANNUAL CHANCE (100 Year) FLOODPLAIN				
Critical Facility Name	Facility Type	Category	Community or Township	Floodway
St Elizabeth Ann Seton Catholic Church	Gathering Place	Church	Crystal Lake	
Victory Rock Fellowship	Gathering Place	Church	Marengo	
Talamore Park	Gathering Place	Park	Huntley	
West Park	Gathering Place	Park	Lakewood	
Oak Valley Park	Gathering Place	Park	Spring Grove	
Miller Riverfront Park	Gathering Place	Park	McHenry	
Jacobson Park	Gathering Place	Park	Wonder Lake	
Cress Creek Property	Gathering Place	Park	Crystal Lake	Floodway
Lake Park/Main Beach	Gathering Place	Park	Crystal Lake	
Naoki Kamijima Park	Gathering Place	Park	Crystal Lake	
Brookside Trail	Gathering Place	Park	McHenry	
Pheasant Valley Park	Gathering Place	Park	McHenry	
Lions Park	Gathering Place	Park	Fox River Grove	
Silver Creek (Conservation)	Gathering Place	Park	Woodstock	
Village of Richmond	Gathering Place	Park	Richmond	
Lyle C. Thomas Park and Nippersink Canoe Base	Gathering Place	Park	Spring Grove	Floodway
Winding Creek Park & Bike Path	Gathering Place	Park	Crystal Lake	
Walsh Park	Gathering Place	Park	McHenry	Floodway
Millstream Subdivision Beaches	Gathering Place	Park	McHenry	
Carpenter Park	Gathering Place	Park	Lake in the Hills	Floodway
Indian Trail Beach	Gathering Place	Park	Lake in the Hills	
Lakewood City Hall	Government	City Halls	Lakewood	
LAKWOOD POLICE	Government	Police Station	Lakewood	
Public Works Department	Government	Highway/Road Maintenance Center	Wonder Lake	
Randall Road (between Acorn Ln. & Miller Rd.)	Infrastructure	Culvert	Lake in the Hills	Floodway
Algonquin Road Bridge (Woods Creek)	Infrastructure	Roadway	Lake in the Hills	Floodway
Alden Bridge	Infrastructure	Roadway	Alden	
Collier Bridge	Infrastructure	Culvert	Alden	
Murphy Bridge	Infrastructure	Roadway	Hartland	Floodway

1.0 percent ANNUAL CHANCE (100 Year) FLOODPLAIN				
Critical Facility Name	Facility Type	Category	Community or Township	Floodway
Gilis Bridge	Infrastructure	Roadway	Chemung	
Cash Bridge	Infrastructure	Roadway	Chemung	
Bridge No 200	Infrastructure	Roadway	Hebron	
Kishwaukee Valley Rd (Mud Creek)	Infrastructure	Culvert	Marengo	
Mc Auliffe Bridge	Infrastructure	Roadway	Seneca	
Torrance Bridge	Infrastructure	Roadway	Seneca	
Beilke Bridge	Infrastructure	Roadway	Seneca	
Paul Bridge	Infrastructure	Roadway	Chemung	
Bridge No 253	Infrastructure	Roadway	Riley	
Union North Bridge	Infrastructure	Roadway	Seneca	
Bridge No 85	Infrastructure	Roadway	Hebron	
Desmond Bridge	Infrastructure	Roadway	Hartland	
Sinding Bridge	Infrastructure	Culvert	Hartland	
Sandhill Bridge	Infrastructure	Roadway	Seneca	
Bridge No 180	Infrastructure	Culvert	Hebron	
Koltz Bridge	Infrastructure	Roadway	Chemung	
King Bridge	Infrastructure	Culvert	Alden	
Walters Bridge	Infrastructure	Roadway	Chemung	
Bridge No 224	Infrastructure	Roadway	Dunham	
Hill Bridge (15)	Infrastructure	Roadway	Richmond	Floodway
Bridge No 104	Infrastructure	Roadway	Chemung	
Bridge No 105	Infrastructure	Roadway	Chemung	
Thorne Bridge	Infrastructure	Culvert	Marengo	
Root Bridge	Infrastructure	Roadway	Marengo	
Bridge No 194	Infrastructure	Roadway	Alden	
Gustafson Bridge	Infrastructure	Culvert	Riley	
Bridge No 192	Infrastructure	Roadway	Hebron	
Cittadella Bridge	Infrastructure	Roadway	Hebron	
Bridge No 223	Infrastructure	Roadway	Riley	
Bridge No 212	Infrastructure	Roadway	Greenwood	
Knuth Bridge	Infrastructure	Roadway	Dunham	
Bridge No 286	Infrastructure	Roadway	Dunahm	
McCauley Bridge	Infrastructure	Roadway	Hartland	
Bridge No 193	Infrastructure	Roadway	Greenwood	Floodway
Book Bridge	Infrastructure	Roadway	Dunham	
Paulsen Bridge	Infrastructure	Roadway	Hartland	
Bridge No 155	Infrastructure	Roadway	Dunham	
Sackett Bridge	Infrastructure	Roadway	Alden	
Bridge No 114	Infrastructure	Culvert	Bull Valley	
Bridge No 178	Infrastructure	Roadway	Seneca	
Bridge No 182	Infrastructure	Roadway	Coral	Floodway
Bridge No 227	Infrastructure	Roadway	Seneca	
Bridge No 285	Infrastructure	Roadway	Grafton	
Bridge No 284	Infrastructure	Roadway	Seneca	

1.0 percent ANNUAL CHANCE (100 Year) FLOODPLAIN				
Critical Facility Name	Facility Type	Category	Community or Township	Floodway
Bridge No 213	Infrastructure	Roadway	Seneca	
Armsby Bridge	Infrastructure	Roadway	Hebron	
IL-173	Infrastructure	Culvert	Alden	
Hwy 47 (South Branch Kishwaukee River)	Infrastructure	Culvert	Huntley	Floodway
IL-120 (Boone Creek)	Infrastructure	Culvert	McHenry	Floodway
Burtens Bridge	Infrastructure	Roadway	Nunda	Floodway
Dutch Creek	Infrastructure	Roadway	Johnsburg	Floodway
County Hwy 20	Infrastructure	Culvert	Coral	
IL-176	Infrastructure	Culvert	Marengo	Floodway
Hereley Bridge	Infrastructure	Roadway	Dunham	
Brand Bridge	Infrastructure	Roadway	Greenwood	
Colby Bridge (177)	Infrastructure	Roadway	Nunda	
James Bridge	Infrastructure	Roadway	Grafton	
Bridge No 234	Infrastructure	Roadway	Riley	
Bridge No 225	Infrastructure	Roadway	Riley	
Bridge No 211	Infrastructure	Roadway	Coral	Floodway
Bridge No 226	Infrastructure	Roadway	Riley	
Wallace Bridge	Infrastructure	Roadway	Algonquin	
Bridge No 290	Infrastructure	Roadway	Algonquin	
S River Road	Infrastructure	Culvert	Nunda	
Johnsburg Bridge	Infrastructure	Roadway	Johnsburg	Floodway
Kattner Bridge	Infrastructure	Roadway	Burton	Floodway
Bay Bridge	Infrastructure	Roadway	Lakemoore	
Rawson Bridge	Infrastructure	Roadway	Nunda	Floodway
Bridge No 279	Infrastructure	Roadway	McHenry	Floodway
Bridge No 214	Infrastructure	Roadway	Algonquin	Floodway
Hemmer Bridge	Infrastructure	Roadway	Grafton	Floodway
Mitchell Bridge	Infrastructure	Roadway	Chemung	
Barnards Mill Bridge	Infrastructure	Roadway	McHenry	Floodway
Rawson Bridge	Infrastructure	Culvert	Richmond	
Island Road (Mokeler Creek)	Infrastructure	Culvert	Dunham	
Warren Bridge	Infrastructure	Roadway	Hartland	
Murray Road (Slough Creek)	Infrastructure	Culvert	Hartland	
Stieg Road (Franklinville Creek)	Infrastructure	Culvert	Seneca	
Hemmingsen Road (Union Creek)	Infrastructure	Culvert	Coral	
Gehl Bridge	Infrastructure	Roadway	Lake in the Hills	Floodway
Austin Bridge	Infrastructure	Culvert	Riley	
N Greenwood Bridge	Infrastructure	Roadway	Greenwood	
S Greenwood Bridge	Infrastructure	Roadway	Greenwood	Floodway
Bridge No 271	Infrastructure	Roadway	Seneca	
Pearl Street Bridge	Infrastructure	Roadway	McHenry	Floodway
Green Street Bridge	Infrastructure	Roadway	McHenry	Floodway
Millstream Bridge	Infrastructure	Roadway	McHenry	Floodway



1.0 percent ANNUAL CHANCE (100 Year) FLOODPLAIN				
Critical Facility Name	Facility Type	Category	Community or Township	Floodway
Schaffer Bridge	Infrastructure	Roadway	Johnsburg	Floodway
Spring Grove Bridge	Infrastructure	Roadway	Spring Grove	Floodway
Bull Valley Bridge	Infrastructure	Roadway	Bull Valley	
Bull Valley Bridge	Infrastructure	Roadway	McHenry	
Haligus Road (Kishwaukee River)	Infrastructure	Culvert	Lakewood	
Adams Dam Bridge	Infrastructure	Roadway	Wonder Lake	Floodway
Mitchell Bridge	Infrastructure	Culvert	Algonquin	
North Noe Bridge	Infrastructure	Roadway	Marengo	
Torrance Bridge	Infrastructure	Roadway	Seneca	
Mitchell Bridge	Infrastructure	Roadway	Chemung	
McComb Bridge	Infrastructure	Roadway	Chemung	
Schutt Bridge	Infrastructure	Roadway	Harvard	
Smith Drive	Infrastructure	Wastewater Treatment Facility	Huntley	
Lift Station #23	Infrastructure	Wastewater Treatment Facility	Crystal Lake	
Well # 8	Infrastructure	Drinking Water Facility	Marengo	
Well # 6	Infrastructure	Drinking Water Facility	Marengo	
McHenry Wellhouse #2	Infrastructure	Drinking Water Facility	McHenry	
Holiday Hills Wells No. 4 & 5	Infrastructure	Drinking Water Facility	Holiday Hills	
Wastewater Treatment Plant	Infrastructure	Wastewater Treatment Facility	Marengo	
West Beach Lift Station	Infrastructure	Wastewater Treatment Facility	Lakewood	
Lift Station #8	Infrastructure	Wastewater Treatment Facility	Crystal Lake	
Lift Station #16	Infrastructure	Wastewater Treatment Facility	Crystal Lake	
Central Plant	Infrastructure	Wastewater Treatment Facility	McHenry	
Stevenson Street Lift Station	Infrastructure	Wastewater Treatment Facility	Marengo	Floodway
North State Lift Station	Infrastructure	Wastewater Treatment Facility	Marengo	Floodway
Kishwaukee	Infrastructure	Wastewater Treatment Facility	Huntley	Floodway
Jessie Road Bridge	Infrastructure	Roadway	Lake in the Hills	
Lakewood Road (N of Miller Rd)	Infrastructure	Culvert	Lake in the Hills	Floodway
Miller Road (between Heron Dr. & Greenfield Ln.)	Infrastructure	Culvert	Lake in the Hills	
Crystal Lake Park District	Other	Industrial Hazardous Substance	Crystal Lake	
MCMS	Other	Petroleum Storage & Distribution	Marengo	

1.0 percent ANNUAL CHANCE (100 Year) FLOODPLAIN				
Critical Facility Name	Facility Type	Category	Community or Township	Floodway
Mobil	Other	Petroleum Storage & Distribution	Lake in the Hills	
THE Learning Tree of Algonquin	Residential	Day Care Facility	Algonquin	

0.2 percent ANNUAL CHANCE (500 Year) FLOODPLAIN				
Critical Facility Name	Critical Facility Name	Category	Community or Township	
Congregational Church of Algonquin	Gathering Place	Church	Algonquin	
Fort McHenry	Gathering Place	Park	McHenry	
La Buy Park	Gathering Place	Park	Lake in the Hills	
LITH Public Works	Government	Highway/Road Maintenance Center	Lake in the Hills	
Oak Street Bridge	Infrastructure	Roadway	Lake in the Hills	
SBC McHenry Garage	Infrastructure	Other	McHenry	
East Plant	Infrastructure	Wastewater Treatment Facility	Grafton	
N/A	Infrastructure	Wastewater Treatment Facility	McHenry	
N/A	Infrastructure	Wastewater Treatment Facility	McHenry	
N/A	Infrastructure	Power Plant	Lake in the Hills	
N/A	Infrastructure	Wastewater Treatment Facility	Lake in the Hills	
N/A	Infrastructure	Wastewater Treatment Facility	Richmond	
N/A	Infrastructure	Wastewater Treatment Facility	Richmond	
Hilltop Drive Bridge	Infrastructure	Roadway	Lake in the Hills	
Pioneer Center group home	Residential	Residential Group Home	McHenry	
Guyer Dawn M	Residential	Day Care Facility	Huntley	
Algonquin Preschool	Residential	Day Care Facility	Algonquin	

**Climate Change Impact (Flood):** While flooding is a natural process, development and changing precipitation patterns have increased the amount of water and flow through the landscape. Climate change could exacerbate future flooding in McHenry County, especially as precipitation increases. Illinois precipitation has increased by 10 percent in the last century, particularly in the spring and summer. The Illinois average number of storm events exceeding 4 inches of rain per city (Chicago, Rockford, Moline, Peoria, Springfield, Bloomington- Normal, Champaign-Urbana, Edwardsville, and Carbondale) has increased steadily over the last century with an average of 60 storms per year in the northeast and 80 storms in the southwest. As a result, a 2- to 3-inch storm at the end of a wet week or month may do more damage than the same storm falling during a dry week or month. Overall, precipitation in Illinois has increased by about 5 inches over the last 120 years. In McHenry County, there are an average of 7 days per year where precipitation is greater than one inch. This is projected to increase to 8 to 10 days per year by the end of the century.

Due to its location within a much larger river system, precipitation can cause significant flooding in the Fox River area and the County’s creeks, particularly when multiple rainfall events occur within a 10-day period. As the frequency and severity of rain events increase, flooding issues will increase as well. Climate models also suggest the increase in precipitation will be concentrated in a small number of storms, rather than

evenly distributed throughout the year, leading to heavy rainfall that will strain the capacity of stormwater systems and natural stormwater drainage.

Climate change is expected to result in more winter precipitation falling in the form of rain rather than snow. When snowfall does occur, it is projected to be more intense, with more snowfall accumulation per event and denser, heavier snow. Snowfall can result in flooding if large amounts of it melt in a short amount of time. The risk of flooding increases when the ground is frozen, drainage systems are blocked by snow or ice, and rainfall occurs on top of packed snow. Similarly, heavy rains that occur during drought conditions can exacerbate erosion and flooding, as dry soils are typically less stable and have a lower capacity to absorb stormwater runoff.

Without the proper planning, increasing impervious surfaces and an increase in extreme precipitation can impact McHenry County through increased stormwater management costs, flooding, and property damage. Because the probability of future occurrence of flood hazards is already scored high, McHenry County did not further adjust the probability of occurrence score given.

## 2.5 Severe Summer Storms Hazard (Wind, Lightning, Hail)

### 2.5.1 Severe Summer Storms Hazard Description

Severe summer storms are distinctive from severe winter storms in the Midwest. Severe storms may be associated with a range of hazards such as flooding, tornadoes and hail, for example. For the purposes of this Plan, wind, hail, and lightning are included in this hazard, while tornadoes and flooding are discussed as separate hazards.

Thunderstorms are very dangerous because of their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and damaging lightning. Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the “engine” of the storm).

Third, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun’s heat. When these conditions occur simultaneously, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Further, they can move through an area very quickly or linger for several hours.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as “severe.” A severe thunderstorm occurs when the storm produces one of three elements: 1) Hail of three-quarters of an inch; 2) Tornado; 3) Winds of at least 58 miles per hour.

Risk scores for vulnerability, public health consequences, and property damages have been determined after considering the threat to the County. Scores and justifications are provided in the respective

**Figure 2-6 Thunderstorm Watches and Warnings**

**THUNDERSTORM WATCHES AND WARNINGS**

The National Weather Service Weather Forecast Office in Chicago, Illinois is responsible for issuing severe thunderstorm watches or warnings for McHenry County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Severe Thunderstorm Watch:** A severe thunderstorm watch is issued when conditions are favorable for a storm to develop. The watch will tell individuals when and where a severe thunderstorm is likely to occur.
- **Severe Thunderstorm Warning:** A severe thunderstorm warning is issued when severe weather has been reported by spotters or indicated by radar. Warnings indicate imminent danger to life and property for those who are in the path of the storm.

sections.

**Wind:** Aside from tornadoes, severe thunderstorms can produce high or straight-line winds. A straight-line wind is a term used to define any wind produced by a thunderstorm that is not associated with rotation. Straight-line winds are responsible for most thunderstorm wind damage. There are several types of straight-line winds including downdrafts, downbursts and microbursts. Straight-line wind speeds can exceed 100 miles per hour (MPH) and can cause damage equivalent to a strong tornado. These winds can also be extremely dangerous to aviation.

Strong winds have a relatively high annual loss rating of \$1,945,266 in McHenry County, according to FEMA’s National Risk Index. Approximately 6.2 events occur per year, with 211 events on record between 1986 and 2021.

**Hail:** Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop to a sufficient weight and fall as precipitation. Hail typically takes the form of spheres or irregularly shaped masses greater than 0.75 inch in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth’s surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size.

Hailstone size can range a great deal in size from 5 millimeters (mm) (approximately pea-sized) to greater than 100 mm (approximately melon-sized). Hailstones are typically categorized using the TORRO Hailstorm Intensity Scale (Table 2-24). Hailstone size descriptions are in Table 2-25.

**Table 2-20 TORRO Hailstorm Intensity Scale (in millimeters)**

	Intensity Category	Typical Hail Diameter	Probable Kinetic Energy, J-m <sup>2</sup>	Typical Damage Impacts	Size Code
H0	Hard Hail	5	0-20	No damage	1
H1	Potentially Damaging	5-15	>20	Slight general damage to plants, crops	1-3
H2	Significant	10-20	>100	Significant damage to fruit, crops, vegetation	1-4
H3	Severe	20-30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored	2-5
H4	Severe	25-40	>500	Widespread glass damage, vehicle bodywork damage	3-6
H5	Destructive	30-50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries	4-7
H6	Destructive	40-60		Bodywork of grounded aircraft dented, brick walls pitted	5-8
H7	Destructive	50-75		Severe roof damage, risk of serious injuries	6-9
H8	Destructive	60-90		Severe damage to multiple roof types (including sheet and metal); damage aircraft bodywork	7-10
H9	Super Hailstorms	75-100		Extensive structural damage (including concrete and wooden walls). Risk of severe or even fatal injuries to persons caught in the open	8-10
H10	Super Hailstorms	>100		Extensive structural damage (including destruction of wooden houses and damage to brick-built homes). Risk of severe or even fatal injuries to persons caught in the open	9-10

**Table 2-21 TORRO Hailstorm Size Code Descriptions**

Size Codes	Diameter	Relational Size
0	5-9	Pea
1	9-15	Mothball
2	16-20	Marble, grape
3	21-30	Walnut
4	31-40	Pigeon's egg > squash ball
5	41-50	Golf ball > Pullet's egg
6	51-60	Hen's egg
7	61-75	Tennis ball > cricket ball
8	76-90	Large orange > Soft ball
9	91-100	Grapefruit
10	>100	Melon

In McHenry County, hail has a relatively low annual loss rating of \$74,696 per year, including damage to property and crops. Hail occurs in the County approximately 4.9 times per year, with 166 events on record between 1986 and 2021.

**Lightning:** Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning may also strike outside of heavy rain and might occur as far as 10 miles away from any rainfall.

According to FEMA, lightning injures an average of 300 people and kills 80 people each year in the United States. NOAA’s National Weather Service reported 22 deaths and hundreds injured from lightning for the ten-year average between 2013 and 2022. Direct lightning strikes can cause significant damage to buildings, critical facilities, infrastructure, and inventory largely by igniting a fire. Lightning is also responsible for igniting wildfires that can result in widespread damage to property. In McHenry County, lightning has a relatively high annual loss rating of \$901,067. Lightning has 55.9 reported occurrences per year, with approximately 1,230 events on record from 1991-2021 according to the NRI.

### 2.5.2 Severe Summer Storms Hazard Location

Thunderstorms, including the associated hazards of wind, lightning and hail, are atmospheric hazards; thus, they have the potential to occur anywhere in McHenry County.

**Wind:** Wind can tear roofs from buildings; rip siding from walls; and throw debris through windows. They can happen anywhere in the county and occur during multiple types of storms. The following map in Figure 2-7 from the Federal Emergency Management Agency illustrates wind zones in the United States. McHenry County is in Wind Zone IV, where velocities can reach up to 250 mph.

**Hail:** McHenry County is in an area of the United States that receives an average of 6-8 days per year with hail events. This information is provided by the National Weather Service displayed in Figure 2-8.

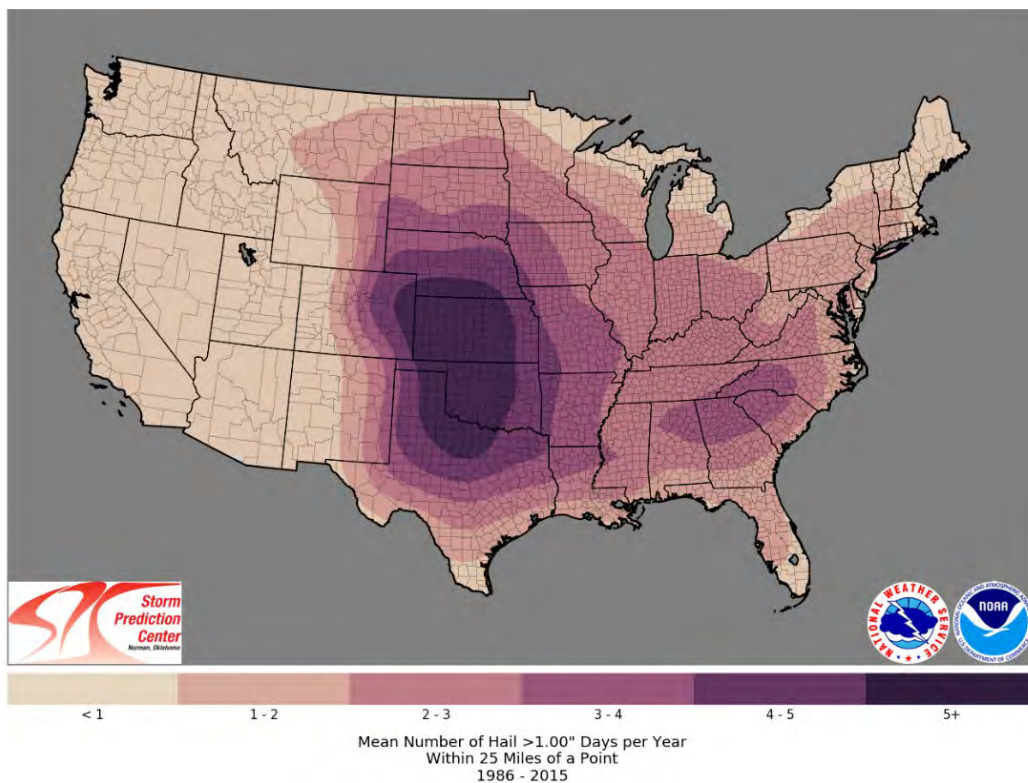


**Lightning:** Lightning flash data compiled by Vaisala, Inc. with data from 1986-2019 shows the frequency of lightning flashes per square kilometer per year; see Figure 2-9. Most areas in McHenry County have an average of 4 - 8 flashes per square kilometer per year (about average compared to national levels).

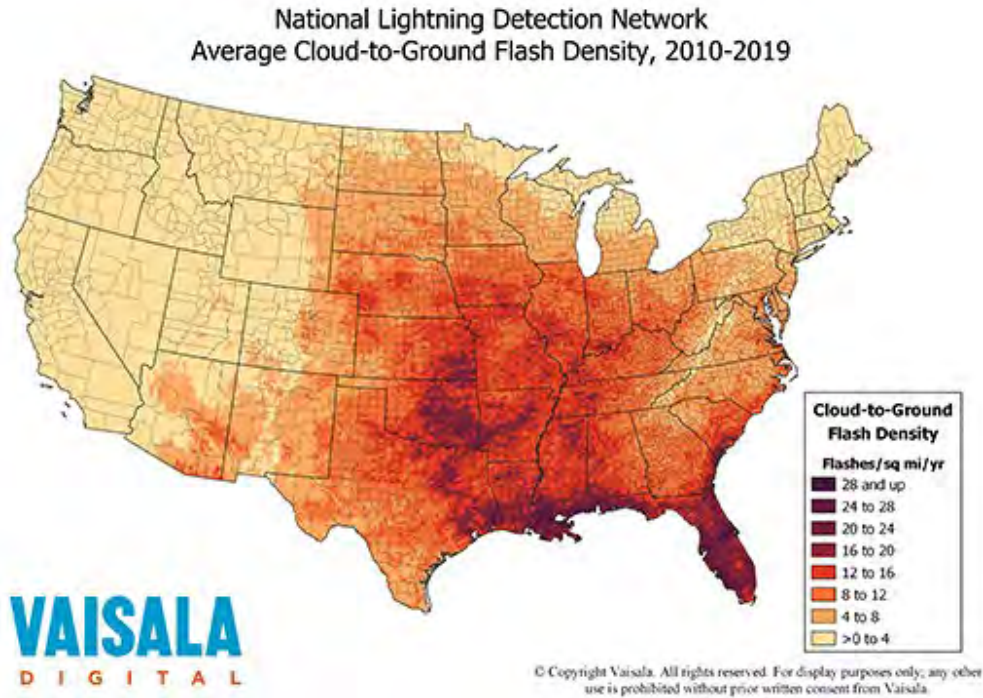
**Figure 2-7 United States Wind Zone Map**



**Figure 2-8 United States Average Number of Days per Year with Severe Hail Events**



**Figure 2-9 Average Lightning Flash per Square Kilometer per Year (2010-2019)**



### 2.5.3 Severe Summer Storms Hazard Extent

**Wind:** Thunderstorm wind extent is measured in terms of wind speed. Over 85 percent of wind events in McHenry County had gusts exceeding 50 mph. The greatest sustained wind reported in McHenry County was 76 knots. However, stronger gusts are possible. Extent can also be measured in terms of damage. The greatest amount of damage reported from a single thunderstorm wind event was \$200,000.

**Hail:** According to the TORRO scale, hailstones can exceed 100 mm (3.9 inches) in diameter, known as super hail. The largest hailstone recorded in McHenry County since 1955 was 2.75 inches in diameter occurring in both 2013 and 2018. Hailstones of this size are considered destructive and can damage vehicle bodywork, dent aircraft, and pit holes in bricks. Extent can also be measured in terms of damage and human impacts (including loss of life and injuries). The greatest amount of damage reported from a single hail event was almost \$90,000 (2015 dollars).

**Lightning:** According to Figure 2-9 above, most of McHenry County receives 4 – 8 flashes of lightning per square mile per year. Not all flashes result in lightning strikes, however. Lightning can also be measured in terms of damage caused. All events but one had recorded damage loss; the greatest amount of damage reported from a single lightning event was \$200,000 in 1996.

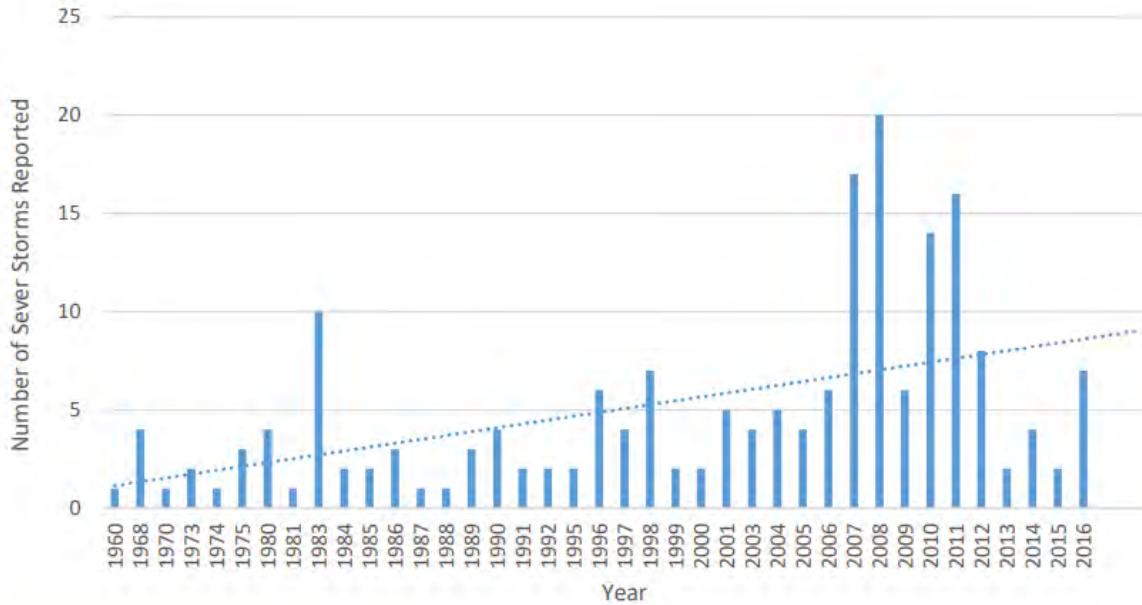
Given the capacity and frequency for large thunderstorm events, McHenry County will need to consider the possibility that much of the land area is experiencing a thunderstorm at any given time. **Because severe summer storms can occur anywhere in McHenry County, the county assigned a spatial extent score is 5.**

### 2.5.4 Severe Summer Storms Hazard Previous Occurrences

Atmospheric conditions within the Midwest, particularly during the summer months, are ideal for

generating severe storms that bring one or more of these weather elements. Figure 2-10 shows the increasing trend in the occurrence of severe storms between 1960 and 2016; spikes in occurrence are seen between 2007 and 2011.

**Figure 2-10 Severe Summer Storms Report in McHenry County (1960-2016)**



Source: Centers for Environmental Information, Storm Events Database, McHenry County, IL, 1960-2016  
<https://www.ncdc.noaa.gov/stormevents/>

**Wind:** The NOAA NCDc Storm Events Database lists 267 recorded occurrences of thunderstorm wind events in McHenry County between 1960 and October 12, 2022. This represents an increase of 84 events since the last plan update. Of the 267 recorded occurrences, 241 had wind speeds of 50 knots or greater. The highest wind speed recorded in the data was 76 knots (1981 and 1983). For 26 of the recorded occurrences of thunderstorms (wind) events, the wind speed was unavailable. Of the 267 events recorded, 161 of them occurred between April and August. Eighty-eight of the 143 events took place between 12:00 p.m. and 8:00 p.m., reflecting the favorable thunderstorm development environment (cooling of the atmosphere) during the afternoon and evening hours.

The data provided by the NCDc Storm Events Database indicates that between 1960 and October 12, 2022, 35 thunderstorms and high wind events caused approximately \$580,500 in property damage. It should be noted, however, that the property damage total includes a single event costing \$200,000, which represents a large portion of the total cost across the available data. Damage information was either unavailable or none was recorded for 232 of the recorded occurrences throughout the county. See list of occurrences in Appendix E.

The Storm Events Database has three recorded reports of injury and one recorded report of death from two separate thunderstorm and high wind events. On July 13, 1992, two injuries were recorded in Marengo due to a severe thunderstorm event. On April 7, 2001, a high wind event killed a woman in Algonquin when a 10-inch diameter tree limb fell on her car as she was driving, and a little girl was injured when the trampoline she was jumping on was blown 25 feet across the yard.

**Hail:** The Storm Events Database records show 176 recorded occurrences of hail in McHenry

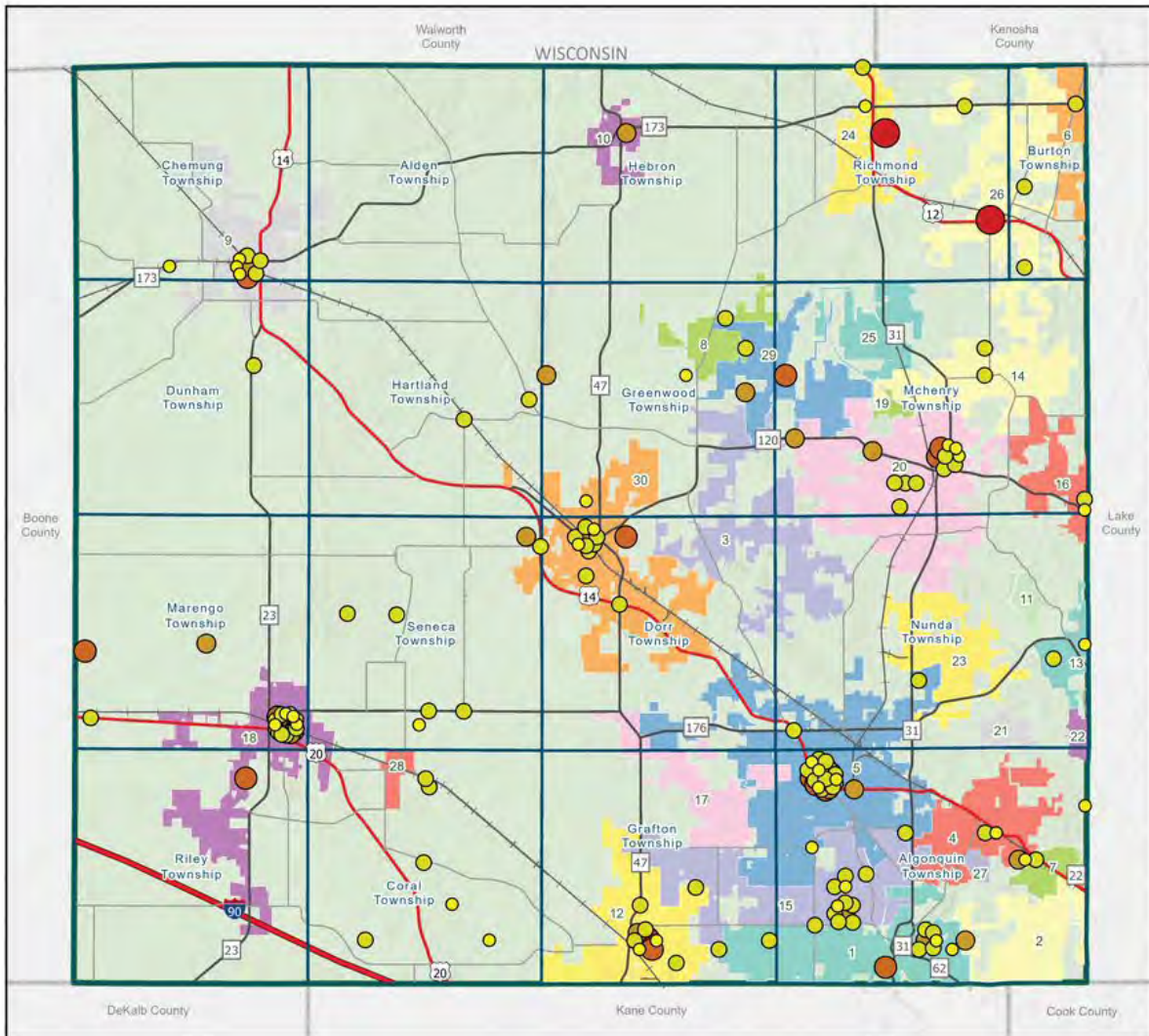
County between 1972 and July 22, 2022. Since the previous plan there have been 18 recorded occurrences by the NCDC, and all produced hailstones three quarters of an inch or larger. Ninety-one of the 176 events took place between May and July. The location and size of the hail events that cause are presented in Figure 2-11. These events did not result in any reported deaths or injuries.

The data provided by the Storm Events Database indicates that hail caused approximately \$35,000 in property damage between 1972 and July 22, 2022. Of the 176 recorded occurrences, damage was recorded for four events: details shown in Table 2-22. See Appendix E for all hail occurrences.

**Table 2-22 Hail Events with Recorded Damages**

Event Date	Area Impacted	Hail Size	Reported Damage (2015 dollars)	Event Details
April 13, 2006	Marengo	1.00 inch	\$5,970	Quarter size hail dented siding on a house and a vehicle.
October 2, 2006	Marengo	1.5 inch	\$89,550	Walnut size hail dented houses and cars in Marengo.
July 2, 2008	Algonquin	1.00 inch	\$59,700	Extensive siding damage to homes were reported from windblown hail.
May 11, 2011	Crystal Lake	1.5 inch	\$5,630	Walnut size hail was reported at the intersection of Main Street and Route 14 causing damage to cars.
<b>Total</b>			<b>\$160,850</b>	

**Figure 2-11 Hail Events in McHenry County (1955-2022)**



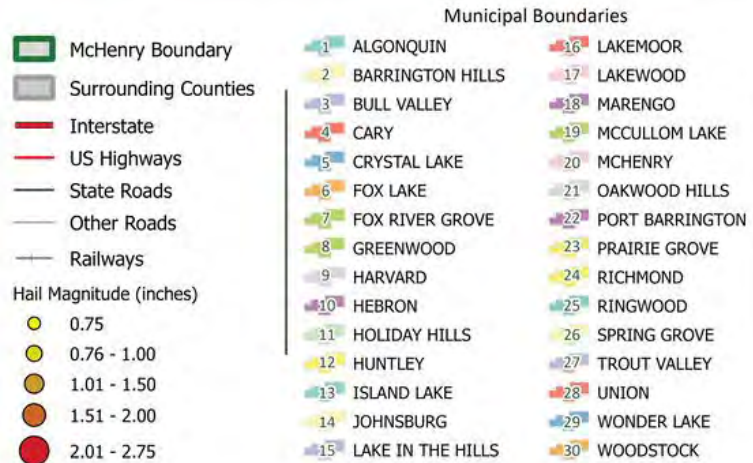
## McHenry County, IL

### Hail Events (1972 - 2022)



Map Produced by McHenry County  
GIS Department

Date: Feb 2023



**Lightning:** The Storm Events Database records show 22 recorded occurrences of lightning strikes in McHenry County between 1996 and September 2, 2018 (Table 2-23). These 22 recorded occurrences were produced by 15 weather events. There was one weather event that produced two recorded lightning strikes.

The data provided by the Storm Events Database indicates that lightning strikes caused approximately \$1,012,000 in property damage between 1996 and September 2, 2018. Five of the occurrences totaled \$100,000 or more in property damages. There was only one occurrence where the amount of the property damage was unknown. No injuries or deaths were reported for any of the occurrences.

**Table 2-23 Lightning Events Reported in McHenry County 1996 through 2015**

Date	Location	Deaths/ Injuries	Property Damage (2015 dollars)	Crop Damage	Event Details
8/5/1996	Woodstock	0/0	\$200,000	\$0	Lightning strikes knocked out power at the Woodstock swimming pool and struck power lines and equipment in 25 different places throughout McHenry County. The roof of an apartment building caught fire after being struck by lightning, with damages estimated at \$200,000.00.
5/10/2001	Woodstock	0/0	\$1,000	\$0	Lightning ignited the wooden roof of an historic old home causing one thousand dollars' damage. The house was built in 1852.
9/3/2001	Marengo	0/0	\$10,000	\$0	A line of thunderstorms moved into extreme northern Illinois during the late afternoon and early evening of Sept. 3, 2001. Trees were blown down in Fox Lake in Lake County and trees and power lines were blown down in Spring Grove and Crystal Lake in McHenry County. Dime size hail fell in Marengo in McHenry County. A house was struck by lightning and the roof caught fire in Marengo.
9/7/2001	Harvard	0/0	\$0	\$0	Lightning struck a radio tower knocking out a transmitter which had to be replaced.
10/2/2005	Lakewood	0/0	\$10,600	\$0	--
5/30/2006	Woodstock	0/0	\$1,000	\$0	Lightning strike at IL 47 and Donovan Road brought down power lines
7/17/2006	Crystal Lake	0/0	\$20,000	\$0	A home on Saddle Ridge Road was struck by lightning, which started a fire in the attic.
7/9/2007	Marengo	0/0	\$100,000	\$0	Lightning struck a two-story house starting a fire which caused significant damage.
7/9/2007	Lake In The Hills	0/0	\$50,000	\$0	Lightning struck a house causing a fire in the attic, which sustained extensive damage. The rest of the house was uninhabitable.
6/8/2008	Lake In The Hills	0/0	\$5,000	\$0	A house was struck by lightning on Heaven's Gate Street.
8/8/2008	McCullom Lake	0/0	\$110,000	\$0	--
6/19/2009	Crystal Lake	0/0	\$50,000	\$0	Lightning struck a house along Canterbury Drive and started a fire in the bathroom. The house was declared uninhabitable.
6/21/2011	Wonder Lake	0/0	\$11,255	\$0	Lightning struck a house in the 5300 block of East Wonder Lake Road and started a fire in the attic.

Date	Location	Deaths/ Injuries	Property Damage (2015 dollars)	Crop Damage	Event Details
7/11/2011	Richmond and Ringwood	0/0	\$11,255	\$0	Lightning struck a 40-foot oak tree which then fell onto a car, blowing out the rear window and heavily damaging the trunk and vinyl roof of the convertible. The tree also caused some damage to the roof and gutter of a garage.
7/11/2011	Richmond and Ringwood	0/0	\$11,255	\$0	A lightning strike ignited a fire in the steeple of a former church on Hill Road. There was slight damage to the roof and some water damage.
7/11/2011	Richmond and Ringwood	0/0	\$11,255	\$0	Lightning struck a village pump house on Valley Drive melting wiring and destroying the water pump.
7/27/2011	Fox River Grove	0/0	\$196,964	\$0	Lightning started a fire which destroyed the roof of a 2200 square foot home on Glenhurst Court.
7/27/2011	Woodstock	0/0	\$11,255	\$0	Lightning knocked ornamental stonework from the bell tower of the Woodstock Opera House.
3/17/2012	Woodstock	0/0	\$5,464	\$0	Lightning struck a satellite dish on the roof of a building of condos, which started a fire in the attic. Only minor damage was reported and the condo remained habitable.
6/30/2014	Silver Lakes (Unincorporated)	0/0	\$66,950	\$0	Lightning struck a house and caused a fire in the attic on Ned Drive.
9/2/2018	Coral, Huntley, Highland	0/0	\$105,000	\$0	A barn, house, and duplex were all struck, causing fires.
<b>Totals</b>		<b>0/0</b>	<b>\$998,253</b>	<b>\$0</b>	

### 2.5.5 Severe Summer Storms Hazard Probability of Future Occurrences

Overall, the thunderstorm hazard has a highly likely estimated annual chance of occurrence. These events are most common in the summer months and occur at least once per year, although damage is not recorded as often. **For this reason, the probability of future occurrence score is 5 for severe summer storms.**

**Wind:** A total of 267 events were reported over 55 years (1960-2022), with events recorded in each year. This is well over 100 percent annual probability of occurrence.

**Hail:** A total of 176 events were reported over 50 years (1972-2022), with events recorded in each year, and 11 events in the last five years. This is well over 100 percent annual probability of occurrence.

**Lightning:** A total of 22 events were reported over 22 years. This results in an approximate annual probability of 100 percent. It is also likely the data is not inclusive of all events in the area. Lightning flashes and strikes are an annual occurrence, though all events may not result in damage.

### 2.5.6 Severe Summer Storms Hazard Vulnerability

**Vulnerability Score – 3.** All property, critical assets, and infrastructure are exposed to severe

storms due to the topography and movement of weather through the area. New structures built to code will provide protection against the bulk of summer storms that McHenry County experiences; however, areas with above ground utility poles and lines are at risk of damage due to wind-driven debris.

During a thunderstorm, it is not uncommon for wind, hail, and lightning to pose a threat to both life and property in McHenry County. Since Covid-19, an increasing number of large events have been planned and held outdoors. The swift onset of strong winds and lightning, coupled with limited shelter available for outdoor events, make the county and its municipalities more susceptible to health and safety impacts. This is the primary reason that severe summer storms hazards were assigned a vulnerability score of 3.

**Public Health Consequences Score - 3:** Three injuries and one death have been attributed to severe storms in McHenry County, but there have not been any associated injuries or deaths since the previous version of this Plan (between 2015 and December 2022). However, there is always a threat to life and safety during severe summer storms. The National Weather Service reported that between 2010 and December 31, 2022, 12 people in Illinois were killed by flash floods, wind, and lightning brought by thunderstorms. Since 2006, there have been an average of 28 deaths per year in the United States caused by lightning. Hail rarely causes loss of life, but more commonly results in injuries and property damage.

**Consequences to Property - 3:** FEMA's NRI indicates a relatively high annual property loss rating for strong winds and lightning (\$1.9 million and \$901,067, respectively), and a low annual loss rating of \$74,696 for hail. Injuries, crop damage, and building damage have been reported in McHenry County for each thunderstorm event type. Many properties and buildings damaged during thunderstorm events are likely to require repairs, however, in most cases, the damage will be minimal.

Nevertheless, wind and lightning are the most disruptive, particularly for power and communications infrastructure. Severe winds, lightning, and falling branches/trees can damage substations, transformers, poles, and power lines, resulting in power outages. Communications can be disrupted by lightning. Signal disruptions due to lightning are common. In addition, communication lines, antennas, and towers can suffer damage from wind, lightning, and downed branches/trees. However, utility and communications companies typically quickly recover any loss in service due to summer storms.

**Climate Change Impact:** As temperatures rise due to climate change, severe storms can increase in intensity and potentially frequency. The Midwest has warmed two degrees since 2000, and the amount of precipitation falling during very heavy storm events has increased by 37 percent between 1958 and 2012. While the link between climate change, thunderstorms, and tornadoes is less well defined than some hazards, McHenry County is expected to see modest increases in frequency and severity of these severe storms as the century progresses. Because the probability of future occurrence of severe summer storms is already scored high, McHenry County did not further adjust the probability of occurrence score given this expectation.



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## 2.6 Severe Winter Storms and Extreme Cold Hazard

### 2.6.1 Severe Winter Storms and Extreme Cold Hazard Description

A winter storm is an event in which varieties of precipitation are formed that only occur at low temperatures, such as snow, sleet, freezing rain, or ice. Snowstorms generally occur with the clash of different types of air masses, with differences in temperature, moisture, and pressure; specifically, when warm moist air interacts with cold dry air. Snowstorms that produce a lot of snow require an outside source of moisture, such as the Gulf of Mexico or the Atlantic Ocean.

**Heavy Snow:** A heavy snowstorm is any winter storm that produces six inches or more of snow within a 24-hour period or less.

**Blizzard:** A blizzard is a severe snowstorm with winds of more than 35 mph and visibility of less than a 1/4 mile for more than 3 hours.

**Ice Storm, Sleet, and Freezing Rain:** An ice storm is defined as a storm with significant amounts of freezing rain and is a result of warm air in between two layers of cold air. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes.

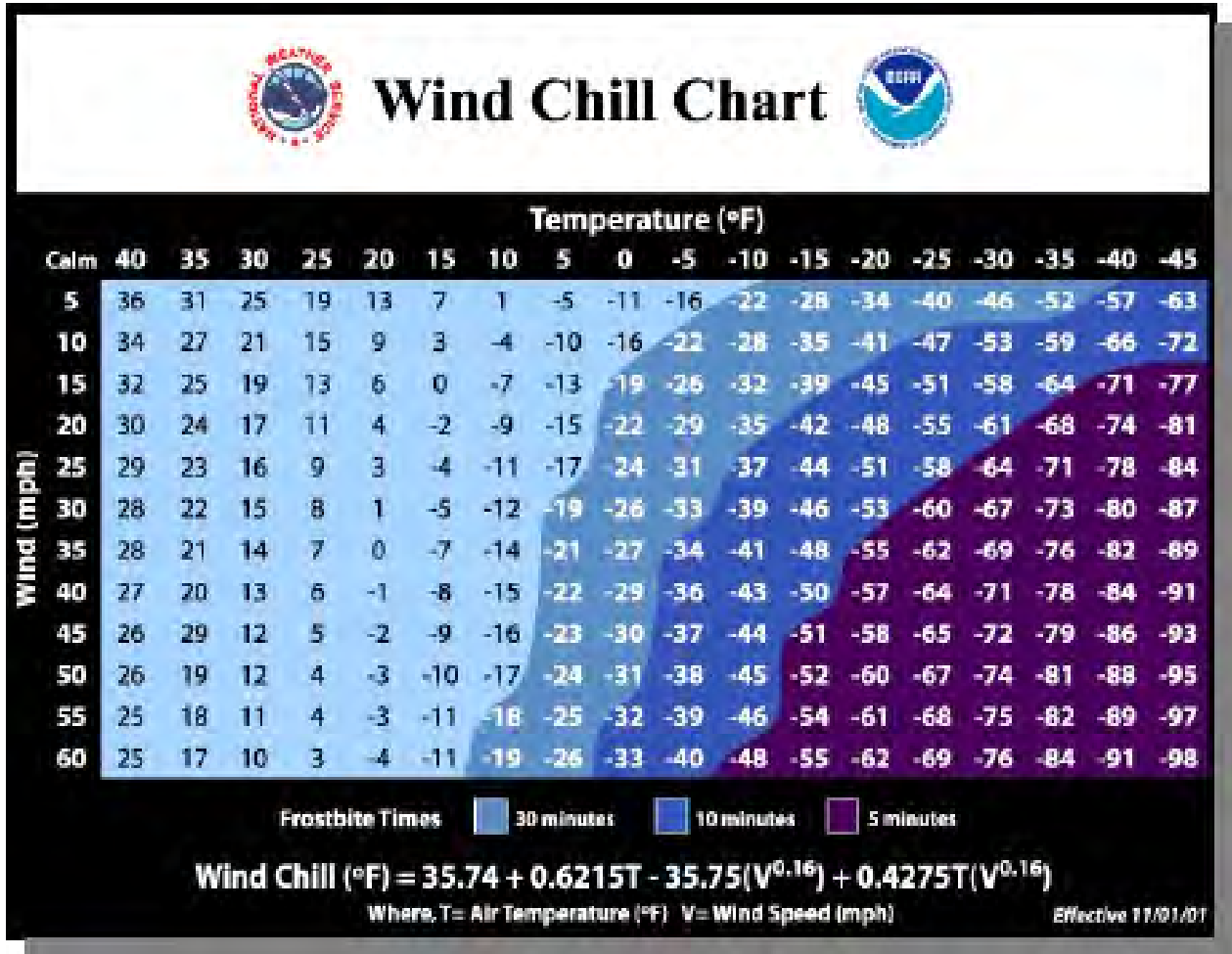
In the former case, super-cooled droplets can freeze on impact (freezing rain), while in the latter case, the re-frozen water particles are ice pellets (or sleet). Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces. Generally, in Illinois, an ice storm is considered severe if there is an accumulation of ¼ inch or more of freezing rain or ½ inch or more of sleet. Winter storms are defined differently in various parts of the country relevant to their standard weather. Two inches of snow may create serious disruptions to traffic in areas where snowfall is not expected; however, this may be considered a light dusting in regions where snowfall is typical. Therefore, there are multiple ways in which to measure a winter storm, based on snowfall, temperatures, wind speeds, societal impact, etc.

**Extreme Cold:** The term “extreme cold” can have varying definitions in hazard identification. It may or may not be associated with a winter storm. Generally, extreme cold events refer to a prolonged period (days) with extremely cold temperatures. An extreme cold event to the National Weather Service can refer to a single day of extreme or record-breaking day of sub-zero temperatures. Extended or single day extreme cold events can be hazardous to people and animals, and cause problems with buildings and transportation.

The Wind Chill Index (see Figure 2-12) is a measure of the rate of heat loss from exposed skin caused by the combined effects of wind and cold. 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. Exposure to extreme wind chills can be life threatening. The NOAA’s chart above shows the Wind Chill Index as it corresponds to various temperatures and wind speeds. As an example, if the air temperature is 5°F and the wind speed is 10 miles per hour, then the wind chill would be -

10°F. As wind chills edge toward -19°F and below, there is an increased likelihood that continued exposure will lead to individuals developing cold-related health impacts.

Figure 2-12 NOAA Wind Chill Index



Frostbite and hypothermia are both extreme cold-related impacts that result when individuals are exposed to extreme temperatures and wind chills. During exposure to extremely cold weather, the body reduces circulation to the extremities (e.g., feet, hands, nose, cheeks, ears, etc.) 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 occurs when the body begins to lose heat faster than it can produce it. As a result, the body’s temperature begins to fall. 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.

The severity of the winter storm or blizzard can be measured in terms of amount of snow or ice accumulation, loss of human life and animal life, or by economic costs imposed by property and infrastructure loss. Figure 2-13 explains the difference between various winter storm watches, advisories, and warnings. According to FEMA’s National Risk Index, cold waves have a very high expected annual loss rating of \$2,396,547, with ice storms and winter weather having relatively moderate annual loss ratings in the range of \$139,961 - \$153,621. Cold waves have an annual occurrence of 1.2 events per year, with 19 on record from 2005 to 2021. Ice storms have an average annual occurrence of 0.6 events per year, with winter weather having an average annual occurrence of 4.2 events per year.

**Figure 2-13 Winter Storm Warnings**

**WINTER STORM WATCHES, ADVISORIES AND WARNINGS**

The National Weather Service Weather Forecast Office in Chicago, Illinois is responsible for issuing winter storm watches and warnings for McHenry County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Winter Storm Watch:** A winter storm watch is issued when severe winter conditions, such as heavy snow, blizzard conditions or significant accumulations of ice, may affect an area within the next 12 to 36 hours.
- **Advisories:** Winter advisories are issued for lesser winter weather events that while presenting an inconvenience, do not pose an immediate threat of death, injury or significant property damage. The following advisories will be issued when an event is occurring, is imminent or has a high probability of occurring.
  - Snow Advisory: A snow advisory is issued for an average snow fall of 3 to 5 inches.
  - Freezing Rain Advisory: A freezing rain advisory is issued when light freezing rain or freezing drizzle will produce less than ¼ inch of ice accumulation.
  - Sleet Advisory. A sleet advisory is issued when sleet accumulation is expected to be less than ½ inch.
  - Blowing Snow Advisory: A blowing snow advisory is issued when sustained winds or frequent gust of 25 to 35 mph are accompanied by falling and blowing snow, occasionally reducing visibility to ¼ mile or less.
  - Winter Weather Advisory: A winter weather advisory is issued when a combination of two or more of the following events are occurring, imminent or likely: snow, freezing rain or drizzle, sleet or blowing snow.
  - Wind Chill Advisory: A wind chill advisory is issued when the wind chill values are expected to be between -20°F and -30°F.
- **Warnings:** Winter weather warnings are issued for events that pose a threat to life and/or property. The following warnings will be issued when an event is occurring, is imminent, or has a high probability of occurring.
  - **Blizzard Warning:** A blizzard warning is issued when sustained winds or frequent gusts greater than or equal to 35 mph are accompanied by considerable falling and/or blowing snow that frequently reduces visibility to less than ¼ mile for three hours or more. There is no temperature criterion, however, freezing temperatures and 35 mph winds will create sub-zero wind chills.
  - **Heavy Snow Warning:** A heavy snow warning is issued when six inches or more of snow is expected to fall within 12 hours or less or when eight inches or more is expected to fall within 24 hours or less.
  - **Ice Storm Warning:** An ice storm warning is issued when freezing rain is expected to produce ¼ inch or more of ice accumulation.
  - **Heavy Sleet Warning:** A heavy sleet warning is issued when sleet accumulations are expected to be ½ inches or more.
  - **Winter Storm Warning:** A winter storm warning is issued when a combination of two or more of the following events are occurring, imminent or likely: heavy snow, freezing rain, sleet and/or strong winds.
  - **Wind Chill Warning:** A wind chill warning is issued when wind chill values are expected to be -30°F or below.

If an event is expected to produce only one type of precipitation, say snow, then the warning or advisory will be specific: Heavy Snow Warning or Snow Advisory.

### 2.6.2 Severe Winter Storms and Extreme Cold Hazard Location

The entirety of McHenry County is exposed and potentially susceptible to winter storms and extreme cold.

### 2.6.3 Severe Winter Storms and Extreme Cold Hazard Extent

The severity of the winter storm or blizzard can be measured in terms of the duration of event, snow or ice accumulation, loss of life and property, and disruption of critical services. Table 2-24 displays generalized loss information expected for McHenry County winter storms from the FEMA National Risk Index.

Table 2-25 below demonstrates the previous occurrences of winter storms. While no specific property damage estimates are available for McHenry County, four severe winter storms that have occurred since 2016 have caused loss of life, damage to houses and cars, lost power, ingress and egress issues, and extreme cold coupled with wind gusts that produce frostbite conditions. **Because winter storms and extreme cold can occur anywhere in McHenry County, the county assigned a spatial extent score of 5.**

**Table 2-24 McHenry County Winter Storm Loss Estimates, National Risk Index**

Winter Storm Hazard	Average Annual Loss Value	Expected Annual Loss Rating	Annualized Frequency
Cold Wave	\$2,396,547	Very High	1.2 events per year
Ice Storm	\$153,621	Relatively Moderate	0.6 events per year
Winter Weather	\$139,961	Relatively Moderate	4.2 events per year

### 2.6.4 Severe Winter Storms and Extreme Cold Hazard Previous Occurrences

Various sources were used to understand the previous occurrences for the Severe Winter Storms and Extreme Cold Hazard. The Storm Events Database records lists 33 recorded occurrences of severe winter storms, 9 extreme cold events, and 19 winter weather events in McHenry County between 1995 and December 22, 2022 (Table 2-25). Previous occurrences are totaled by type in the table as well. There have been three reported deaths that occurred due to exposure. Certainly, numerous other injuries for McHenry County residents can be associated with severe winter storms and extreme cold events, but nearly all go unreported.

**Table 2-25 Winter Storm Previous Occurrences (1996 – 2022)**

Jurisdiction	Type of Winter Storm Event	Date	Damages (2015 Dollars)	Injuries/Deaths*	Event Details
McHenry County; Barrington	Heavy Snow	2/18/2000	\$0	0/0	The City of Barrington recorded a max of 10 inches; an estimated 600 flights were cancelled in the area. There were also numerous accidents in the region due to poor visibility and slick road conditions.
McHenry County	Blizzard	12/11/2000	\$0	0/0	This event was declared both a federal and state disaster for the county. Winds reached 40 mph, wind chill averaged 35-40 below zero, and nearly 14 inches of snow was recorded in some areas. Some homeless shelters could not open due to inaccessibility for staff, essentially all air travel was canceled, and one Boeing 727 slid off the runway during landing. There were 19 deaths due to heart failure and/or hypothermia.
McHenry County	Winter Storm	1/31/2002	\$0	0/0	Areas received one quarter inch of ice from freezing rain during the early morning hours of January 31st. Many utility poles, power lines, trees and tree limbs were knocked down by the ice causing several power outages.

Jurisdiction	Type of Winter Storm Event	Date	Damages (2015 Dollars)	Injuries/Deaths*	Event Details
McHenry County	Winter Storm	3/2/2002	\$0	0/0	Snowfall was measured at 10 inches near O'Hare airport.
McHenry County	Extreme Cold/Cold/Wind Chill	1/23/2003	\$0	0/0	One death resulted from cold exposure (not in McHenry County).
McHenry County; Cary	Winter Storm	3/4/2003	\$0	0/0	Snowfall was reported at 7.3 inches in Cary.
McHenry County	Extreme Cold/Cold/Wind Chill	1/29/2004	\$0	0/0	Wind chills between -20°F and 34°F
McHenry County	Frost/Freeze	5/3/2004	\$0	0/0	Temperatures were below freezing.
McHenry County, Harvard, Spring Grove, and Woodstock	Heavy Snow	1/4/2005	\$0	0/0	Snowfall was recorded as follows: 8.3 inches in Spring Grove; 8.1 inches in Woodstock; 6.0 inches in Harvard.
McHenry County	Heavy Snow	1/21/2005	\$0	0/0	McHenry reported 11.5 inches of snow accumulation.
McHenry County, Barrington, and Spring Grove	Winter Storm	1/20/2006	\$0	0/0	In Barrington, 11 inches of snow was reported, and in Spring Grove 6.7 inches was reported.
McHenry County	Extreme Cold/Cold/Wind Chill	2/18/2006	\$0	0/0	One man died due to exposure (north of Chicago).
McHenry County, Harvard, and Woodstock	Winter Storm	11/30/2006 – 12/1/2006	\$0	0/0	Snowfall was recorded as follows: 14.8 inches in Harvard; 12.1 inches in Woodstock
McHenry County; Crystal Lake	Extreme Cold/Cold/Wind Chill	2/3/2007	\$0	0/0	Temperatures ranged from -9°F to -14°F from the 4 <sup>th</sup> -6 <sup>th</sup> .
McHenry County, Island Lake, and Spring Grove	Blizzard	2/13/2007	\$0	0/0	Snowfall was recorded as follows: 7.0 inches in Island Lake and 6.3 inches in Spring Grove.
McHenry County	Blizzard	2/25/2007	\$0	0/0	Snowfall of 5 inches was recorded in both Harvard and Woodstock. There were numerous vehicle accidents and downed powerlines throughout the region.
McHenry County	Ice Storm	12/1/2007	\$0	0/0	South of the City of McHenry, one-quarter inch of ice accumulation was reported.
McHenry County; City of McHenry	Winter Storm	12/4/2007	\$0	0/0	Snowfall was measured at 6.5 inches in McHenry.
McHenry County	Heavy Snow	12/15/2007	\$0	0/0	Snowfall ranged from 6 to 8 inches throughout the region.
McHenry County	Winter Storm	1/31/2008 – 2/1/2008	\$0	0/0	Snowfall ranged from 6 to 10 inches throughout the region.
McHenry County; Cary and Woodstock	Winter Storm	2/5/2008	\$0	0/0	Snowfall was recorded as follows: ranges of 9-14 inches in Woodstock and 12.5 inches in Cary.
McHenry County	Extreme Cold/Cold/Wind Chill	2/10/2008	\$0	0/0	Temperatures ranged from -5°F to -10°F with wind chills of -25°F to -35°F.
McHenry County; Woodstock	Winter Storm	2/25/2008	\$0	0/0	Snowfall was measured at 6.6 inches in Woodstock.
McHenry County; Spring Grove	Winter Storm	3/21/2008	\$0	0/0	Snowfall was measured at 7 inches in Spring Grove.

Jurisdiction	Type of Winter Storm Event	Date	Damages (2015 Dollars)	Injuries/Deaths*	Event Details
McHenry County	Winter Storm	12/19/2008	\$0	0/0	Heavy snow fell across the region measuring between 6-9 inches in McHenry County. Snow, ice, and sleet cause multiple car accidents.
McHenry County	Blizzard	12/21/2008	\$0	0/0	One to two inches of snow fell atop the layer of snow from 12/19. Blizzard conditions resulted in wind gusts of 40 mph and visibility dropped to zero in some locations.
McHenry County	Extreme Cold/Cold/Wind Chill	12/21/2008	\$0	0/0	A combination of temperatures between -5°F to -10°F and wind speeds of 20- 30 mph caused wind chill to drop to -35°F.
McHenry County; Fox Lake	Winter Storm	1/9/2009	\$0	0/0	Snowfall was measured at 8.7 inches in Fox Lake.
McHenry County	Extreme Cold/Cold/Wind Chill	1/15/2009	\$0	0/0	Temperatures fell between -15°F to -20°F and wind chill to dropped between -30°F and -45°F.
McHenry County	Extreme Cold/Cold/Wind Chill	1/24/2009	\$0	0/1	Temperatures ranged between -5°F and 0°F. In Chicago a 74-year-old man died due to cold exposure, and in Johnsburg, McHenry County, a 17-year-old passed from hypothermia.
McHenry County, Algonquin, and Bull Valley	Winter Storm	3/28/2009	\$0	0/0	Snowfall was recorded as follows: 6.5 inches in Algonquin and 7.0 inches near Bull Valley.
McHenry County, Bull Valley, Hebron, and Wonder Lake	Winter Storm	12/8/2009	\$0	0/0	Snowfall was recorded as follows: 7.8 inches near Bull Valley, 8.6 inches near Hebron, and 6.7 inches near Wonder Lake.
McHenry County	Ice Storm	12/23/2009	\$0	0/0	A mixture of sleet and freezing rain fell across the area. Some areas received a quarter to a half inch of ice accumulation. Trees, tree limbs, and powerlines fell throughout the region due to the weight of the ice.
McHenry County, Barrington, Island Lake, and Woodstock	Winter Storm	12/26/2009	\$0	0/0	Snowfall was recorded as follows: 9.2 inches near Barrington, 7.5 inches in Island Lake, and 10 inches in Woodstock.
McHenry County, Barrington, and Spring Grove	Winter Storm	1/7/2010	0	0/0	Snowfall was recorded as follows: 8.0 inches near Barrington and 8.3 inches near Spring Grove.
McHenry County and McHenry	Winter Storm	2/8/2010	0	0/0	Snowfall ranged from 7-14 inches across the region, with 8.3 inches recorded in McHenry.
McHenry County	Winter Storm	12/11/2010	0	3/0	Snowfall ranged between 1 and 3 inches, with wind gusts between 45 and 55 mph creating near whiteouts/blizzard-like conditions. A 19-year-old was killed in Ogle County, a 14-car pile-up sent injured 5 people, and a flipped car in Woodstock injured 3 people.

Jurisdiction	Type of Winter Storm Event	Date	Damages (2015 Dollars)	Injuries/Deaths*	Event Details
McHenry County, McHenry, Barrington, and Hebron	Blizzard	2/1/2011	\$0	0/0	The highest snowfall totaled 21.1 inches near McHenry, 17.0 inches in Barrington, and 15.3 inches in Hebron. Blizzard conditions reduced visibility, and thousands of motorists were left stranded throughout the region.
McHenry County	Winter Storm	1/12/2012	\$0	0/0	Snowfall was recorded as follows: 6.0 inches near Algonquin and 6.0 inches in Harvard. A 77-year-old woman died shoveling snow in Des Plaines.
McHenry County	Winter Storm	1/20/2012	\$0	0/0	Snowfall ranged between 1 and 8 inches.
McHenry County, Bull Valley, Cary, and Woodstock	Winter Storm	2/23/2012	\$0	0/0	Snowfall was recorded as follows: 9.3 inches near Bull Valley, 8.5 inches near Cary, and 7.8 inches near Woodstock. An 80-year-old man died clearing snow in Buffalo Grove (about 20 miles east of McHenry County's southeastern border).
McHenry County, Fox Lake, Hebron, Lakemoor, Spring Grove, Wonder Lake, and Woodstock	Heavy Snow	2/7/2013	\$0	0/0	Snowfall ranged between 6-8 inches across McHenry County, including 8.2 inches near Fox Lake, 6.7 inches in Hebron, 6.2 inches near Lakemoor, 8.1 inches near Spring Grove, 6.7 inches near Wonder Lake, and 8.0 inches near Woodstock.
McHenry County, Fox Lake, Lakemoor, McHenry, Richmond, Wonder Lake	Heavy Snow	2/26/2013	\$0	0/0	Snowfall was recorded as follows: 9.1 inches near Fox Lake, 8.0 inches near Lakemoor, 8.2 inches in McHenry, 10.1 inches in Richmond, and 9.8 inches near Wonder Lake.
McHenry County; Woodstock	Winter Storm	3/5/2013	\$0	0/0	Snowfall ranged between 6-10 inches across the region, including 7.5 inches in Woodstock.
McHenry County; Harvard	Heavy Snow	12/21/2013	\$0	0/0	Snowfall ranged between 6-8 inches across the region, including 7.0 inches in Harvard.
McHenry County	Extreme Cold/Cold/Wind Chill	1/6/2014	\$0	0/0	Wind chills in the region fell between -40°F and -50°F. There were 4 deaths reported in Cook County due to hypothermia/cold exposure.
McHenry County; Harvard	Heavy Snow	2/1/2015	\$0	0/0	Event produced blizzard conditions with wind gusts >35 mph and low visibilities. One of the highest snowfall reports was in Harvard at 18 inches. Whiteout conditions stranded some vehicles in McHenry County.
McHenry County	Heavy Snow	3/23/2015	\$0	0/0	Snowfall ranged between 5-7 inches across the region, including 6.3 inches in Bull Valley.
McHenry County	Extreme cold/wind chill	1/11/2016	\$1	1	Morning lows dipped into the range of 5 to 10 degrees below zero. A 70-year-old female died due to being outside in cold conditions.
McHenry County	Winter Storm	11/25-11/26/2018	\$0	0/0	A winter storm moved across Central Illinois, resulting in heavy snowfall and strong winds. Trees fell onto houses and cars and over 361,000 lost power.

Jurisdiction	Type of Winter Storm Event	Date	Damages (2015 Dollars)	Injuries/Deaths*	Event Details
McHenry County	Winter Storm	1/30-31/2021	\$0	0/0	Heavy snow developed over two days. Snowfall measured between 10-13 inches.
McHenry County	Winter Storm	12/22/2022	\$0	0/0	An arctic cold front moved through, dropping temperatures down into single digits. Total snowfall ranged from 1-5 inches with wind gusts up to 55 MPH.

\*NCDC Totals 3 injuries and 3 deaths in McHenry County due to winter weather; it is possible more have occurred but were unreported.

### 2.6.5 Severe Winter Storms and Extreme Cold Hazard Probability of Future Occurrence

There is an average of 3 severe winter storm events per year based on the Storm Events Database records since 1996, and there was only one year without a recorded event. Events prior to those in the NCDC Storm Events Database are assumed to have a similar frequency as to those recorded occurrences, and winter storm events are considered an annual occurrence in the county. The Illinois State Hazard Mitigation Plan states that there have only been 5 years since 1900 where temperatures did not reach below zero, and there is an average of five severe winter storms in the state each year. **Therefore, the probability of future occurrence score is 5 for severe winter storms and extreme cold.**

### 2.6.6 Severe Winter Storms and Extreme Cold Hazard Vulnerability

**Vulnerability Score – 2.** All property, critical assets, and infrastructure are exposed to severe winter storms and extreme cold in McHenry County. The County assigned a vulnerability score of 2, indicating that existing mitigation measures and features prevent most impacts. Illinois building codes require insulation for structures to be more resistant to extreme cold temperatures and allow for people to take shelter during extreme cold weather. While the local power grid is likely to experience additional stress during extreme cold events, many residents have generators and natural gas to supply heat.

**Public Health Consequences Score - 2:** Health hazards related to walking and snow removal are frequent and life-threatening. Falls, particularly to the elderly, can result in serious injury including fractures, broken bones, and shattered hips. Middle-aged and older adults are susceptible to heart attacks from shoveling snow. According to the National Weather Service’s Weather Fatality Statistics, an average of nine deaths per year are attributable to winter storms and extreme cold in Illinois (based on data from 1996-2014).

Most injuries during severe winter storms are automobile related. However, about 25 percent of winter storm injuries occur to people who are stranded outside in a storm due to frostbite and hypothermia. As McHenry County rarely sees injuries and deaths from severe winter storms, few illnesses, injuries, or deaths are expected in the future.

**Consequences to Property - 2:** Severe winter storms and extreme cold can cause damage to property and infrastructure in certain instances. For example, high volumes of snow can collect on buildings and potentially collapse them under the additional weight, and frozen pipes can rupture underground, and buildings can lose water service. This damage rarely occurs in present day conditions. Additionally, McHenry County and its jurisdictions must salt the roads, check the fuel supply, and perform other emergency protective measures prior to a winter storm to prevent dangerous driving conditions. After a storm, the County and its jurisdictions typically have to remove snow from highways to allow travel to resume. An average snowstorm requires two twelve-hour



workdays, 40 tons of road salt, and 600 gallons of fuel to maintain County roads. Additionally, winter storms that have ice and wind components can damage power lines and cause widespread outages in the County. However, the County and its jurisdictions also regularly maintain vegetation near utility right of ways to mitigate these impacts.

**Climate Change Impact:** Climate change impact could have mixed impacts on winter weather in the county. According to the National Climatic Assessment, waves of extreme cold temperatures have reached their lowest levels on record since 1895. Increasing temperatures in the winter pose a threat to the glacial ice coverage on the Great Lakes, which has the potential to increase the impacts of other hazards.

Additionally, climate models suggest that northeastern Illinois will see an increase in winter precipitation. Warmer temperatures may mean that some winter precipitation will fall as rain rather than snow, but the overall increase will likely present significant drainage and water management challenges in McHenry County during the years to come. Heavy snowfall events may increase due to warmer temperatures, as snow crystal size increases as the temperature approaches the freezing point. Because the probability of future occurrence of severe winter storms is already scored high, McHenry County did not further adjust the probability of occurrence score given this expectation.

## 2.7 Tornado

### 2.7.1 Tornado Hazard Description

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 miles per hour to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more, can cause extreme destruction, and can turn normally harmless objects into deadly missiles. Figure 2-14 explains the difference between a tornado watch and a tornado warning, when they are issued.

Each year, an average of over 800 tornadoes are reported nationwide, resulting in an average of 80 deaths and 1,500 injuries. According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas and Florida, respectively. Figure 2-15 shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

In McHenry County, tornadoes are most likely to form in the late afternoon and early evening. Most are a few dozen yards wide and touchdown briefly but can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

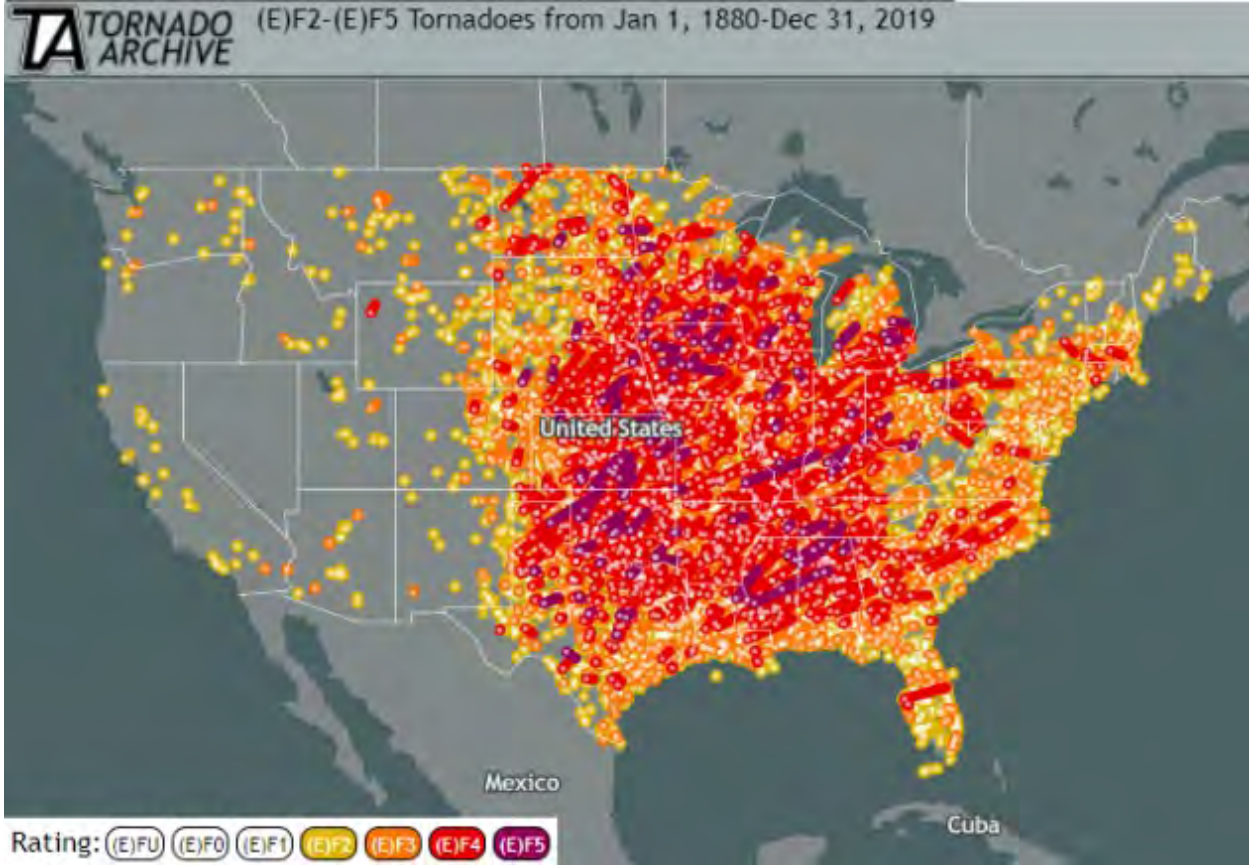
**Figure 2-14 Tornado Watches and Warnings**

**TORNADO ALERTS**

The National Weather Service Weather Forecast Office in Chicago, Illinois is responsible for issuing tornado watches or warnings for McHenry County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Tornado Watch:** A tornado watch is issued when conditions are favorable for a tornado and other kinds of severe weather to develop in the next several hours. It does not mean that a tornado is imminent, just that individuals need to be alert and prepared.
- **Tornado Warning:** A tornado warning is issued when a tornado has been spotted or indicated by radar. Warnings indicate imminent danger to life and property for those who are in the path of the tornado. Individuals should seek shelter immediately.

**Figure 2-15 United States Tornado Activity**



The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size and duration of the storm. Tornado damage may include crop and property damage, power outages, environmental degradation, injury and death. Tornadoes are known to blow off roofs, move cars and tractor trailers, and demolish homes. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings and particularly mobile homes. Tornadoic magnitude is reported according to Fujita and Enhanced Fujita Scales. The Enhanced Fujita Scale, see Table 2-26, identifies six different categories of tornadoes, EF0 through EF5. Prior to 2005, the NWS used the Fujita Scale. Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale. Tornado magnitudes were determined in 2005 and later were determined using the Enhanced Fujita Scale. Most of the historical data available on McHenry County tornadoes is based on the original Fujita Scale.

According to Figure 2-15, McHenry County tornado ratings tend to average in the EF3 to EF4 range.

**Table 2-26 The Enhanced Fujita Scale (Effective 2005 and later)**

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST	TYPE OF DAMAGE DONE
EF0	GALE	65–85 MPH	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST	TYPE OF DAMAGE DONE
EF2	SIGNIFICANT	111–135 MPH	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165 MPH	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200 MPH	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200 MPH	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

In 1999, FEMA conducted an extensive damage survey of residential and non-residential buildings in Oklahoma and Kansas following an outbreak of tornadoes on May 3, 1999, which killed 49 people. The assessment found:

- The failure for many residential structures occurred when the framing wasn’t secured to the foundation, or when nails were used as the primary connectors between the roof structure and the walls. A home in Kansas, for example, was lifted from its foundation. The addition of nuts to the foundation anchor bolts (connected to the wood framing) may have been all that was needed to prevent this.
- Roof geometry also played a significant role in a building’s performance.
- Failure of garage doors, commercial overhead doors, residential entry doors or large windows caused a significant number of catastrophic building failures.
- Manufactured homes on permanent foundations were found to perform better than those that were not on solid foundation walls.

Illinois has an average of 54 tornadoes annually: McHenry County averages 0.4 tornadoes per year. Although tornados can occur any time of the year, the greatest frequency in Illinois is between April and June with 50 percent occurring between 3 PM and 7 PM.

### 2.7.2 Tornado Hazard Location

Illinois is in the northwest portion of “Tornado Alley,” the area of the United States most prone to tornado activity. All of McHenry County is subject to a tornado event.

### 2.7.3 Tornado Hazard Extent

The two most severe tornadoes on record are an F4 in 1967 (wind speeds between 207–260 mph) and an EF3 (wind speeds between 136–165 mph) in 2008. However, it is possible for stronger events to occur in the planning area, specifically due to its location in “Tornado Alley.” **While a tornado can occur anywhere in McHenry County, a spatial extent score of 2 was assigned due to limited tornado paths when they touch down.**

## 2.7.4 Tornado Hazard Previous Occurrences

Table 2-27 summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in McHenry County. The NOAA Storm Events Database records show 26 recorded occurrences of tornadoes in McHenry County between 1958 and March 2023: FEMA’s National Risk Index reports 24 tornadoes from 1950-2021. The paths of the recorded tornadoes are shown in Figure 2-16.

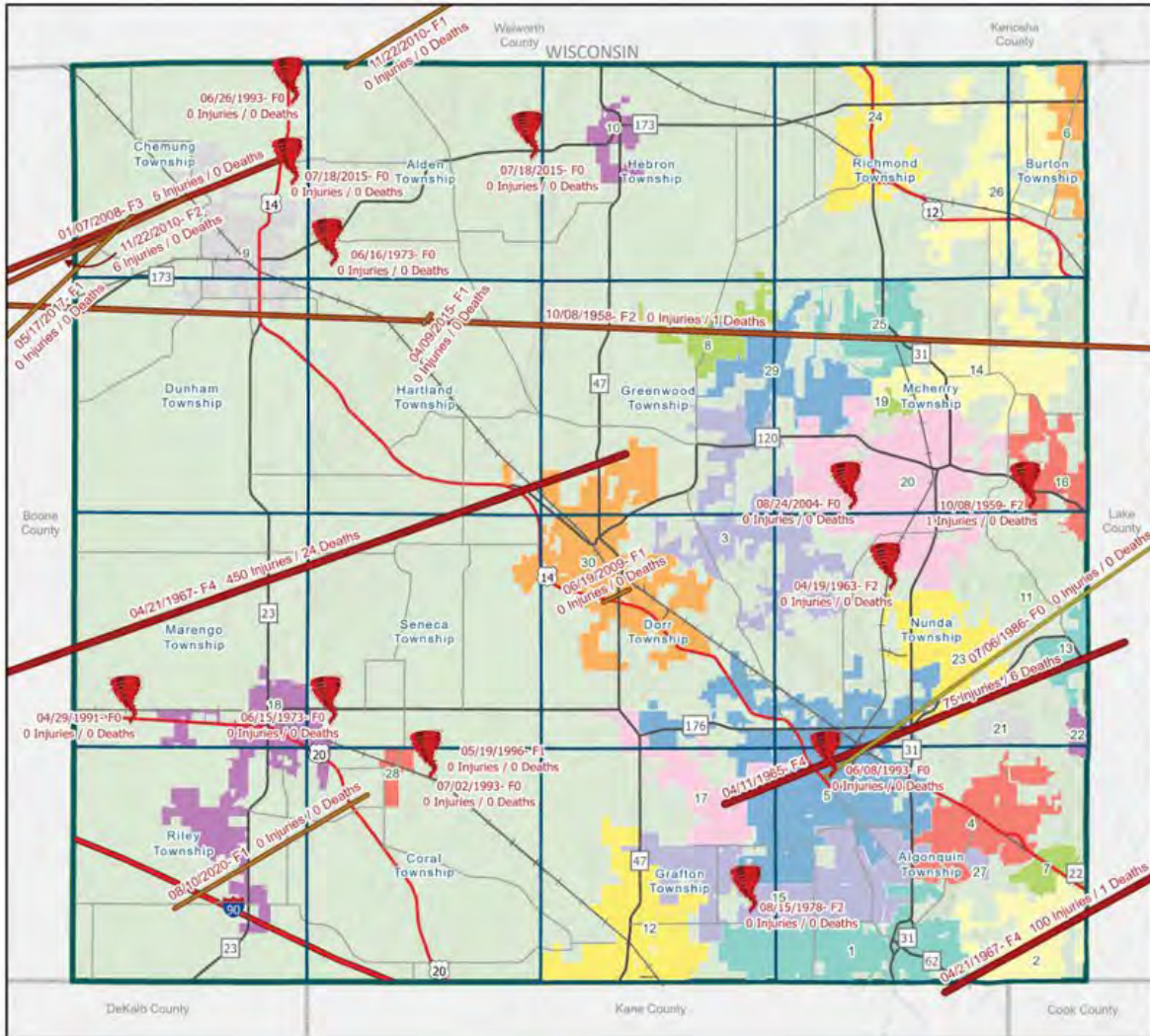
The data provided by the Storm Events Database and Storm Prediction Center indicates tornadoes caused approximately \$272 million in McHenry County property damage between 1958 and August 2021. Those events showing no property damage may have resulted in losses; however, such data is not reported. One hundred twenty-six injuries and seven deaths were reported because of seven separate incidents.

**Table 2-27 Historically Reported Tornadoes in McHenry County (1958-2022)**

Date	Location	Magnitude	Injuries	Deaths	Property Damage (2015 Dollars)
10/9/1958	Pistakee Highlands	F2	0	1	\$23,194,360
10/8/1959	Lakemoor	F2	1	0	\$2,306,899
4/19/1963	Prairie Grove	F2	0	0	\$2,188,596
4/11/1965	Lakewood/Crystal Lake	F4	75	6	\$12,739,589
4/21/1967	Woodstock	F4	40	0	\$200,364,427
4/21/1967	Algonquin/Fox River Grove	F4	3	0	\$20,036,443
6/15/1973	Marengo	F0	0	0	\$0
6/16/1973	Harvard	F0	0	0	\$0
8/15/1978	Lake In The Hills	F2	0	0	\$1,028,376
7/6/1986	Crystal Lake/Lakemoor	F0	0	0	\$0
4/29/1991	Marengo	F0	0	0	\$0
6/8/1993	Crystal Lake	F0	0	0	-
6/26/1993*	McHenry County	F0	0	0	\$9,278-\$92,777*
7/2/1993	McHenry County	F0	0	0	
5/19/1996	Union/ Marengo	F1	0	0	\$0
8/24/2004	Near City of McHenry	F0	0	0	\$415,270*
1/7/2008	Chemung (CDP), Harvard, and Lawrence (Unincorporated Place)	EF3	1	0	\$2,459,748
6/19/2009	Woodstock	EF1	0	0	\$89,554
11/22/2010*	Big Foot Prairie (Unincorporated Place)	EF2	6	0	\$6,921,169*
11/22/2010*	McHenry County	EF1	0	0	\$1,384,234*
4/9/2015	Hartland	EF1	0	0	\$0
7/18/2015	Lawrence (Unincorporated Place)	EF0	0	0	\$0
7/18/2015	Alden (Unincorporated Place)	EF0	0	0	\$0
5/17/2017	Chemung	EF1	0	0	\$0
8/10/2020	Coral	EF1	0	0	\$0
8/9/2021	McCullom Lake	EF1	0	0	\$0
<b>Totals: 26 Previous Occurrences</b>			<b>126</b>	<b>7</b>	<b>\$272,806,172</b>

\*These tornado event damages are estimates from NOAA’s Storm Prediction Center. Prior to 1996, this data was recorded in ranges, therefore the June 26, 1993 event damages are not included in the total.

Figure 2-16 McHenry County Tornado Tracks



## McHenry County, IL

Tornado Locations (1950 - 2020)



Map Produced by McHenry County GIS Department  
Date: Feb 2023

<ul style="list-style-type: none"> <li> McHenry Boundary</li> <li> Surrounding Counties</li> <li> Political Township</li> <li> Interstate</li> <li> US Highways</li> <li> State Roads</li> <li> Other Roads</li> </ul>	<p><b>Tornado Data</b></p> <ul style="list-style-type: none"> <li> Tracks F4</li> <li> F3</li> <li> F2</li> <li> F1</li> <li> F0</li> </ul> <p><b>Touchdowns</b></p> <ul style="list-style-type: none"> <li> (Magnitude measured in EF Scale starting in Feb. 2007)</li> </ul>	<p><b>Municipal Boundaries</b></p> <table border="0"> <tr> <td>1 ALGONQUIN</td> <td>16 LAKEMOOR</td> </tr> <tr> <td>2 BARRINGTON HILLS</td> <td>17 LAKEWOOD</td> </tr> <tr> <td>3 BULL VALLEY</td> <td>18 MARENGO</td> </tr> <tr> <td>4 CARY</td> <td>19 MCCULLOM LAKE</td> </tr> <tr> <td>5 CRYSTAL LAKE</td> <td>20 MCHENRY</td> </tr> <tr> <td>6 FOX LAKE</td> <td>21 OAKWOOD HILLS</td> </tr> <tr> <td>7 FOX RIVER GROVE</td> <td>22 PORT BARRINGTON</td> </tr> <tr> <td>8 GREENWOOD</td> <td>23 PRAIRIE GROVE</td> </tr> <tr> <td>9 HARVARD</td> <td>24 RICHMOND</td> </tr> <tr> <td>10 HEBRON</td> <td>25 RINGWOOD</td> </tr> <tr> <td>11 HOLIDAY HILLS</td> <td>26 SPRING GROVE</td> </tr> <tr> <td>12 HUNTLEY</td> <td>27 TROUT VALLEY</td> </tr> <tr> <td>13 ISLAND LAKE</td> <td>28 UNION</td> </tr> <tr> <td>14 JOHNSBURG</td> <td>29 WONDER LAKE</td> </tr> <tr> <td>15 LAKE IN THE HILLS</td> <td>30 WOODSTOCK</td> </tr> </table>	1 ALGONQUIN	16 LAKEMOOR	2 BARRINGTON HILLS	17 LAKEWOOD	3 BULL VALLEY	18 MARENGO	4 CARY	19 MCCULLOM LAKE	5 CRYSTAL LAKE	20 MCHENRY	6 FOX LAKE	21 OAKWOOD HILLS	7 FOX RIVER GROVE	22 PORT BARRINGTON	8 GREENWOOD	23 PRAIRIE GROVE	9 HARVARD	24 RICHMOND	10 HEBRON	25 RINGWOOD	11 HOLIDAY HILLS	26 SPRING GROVE	12 HUNTLEY	27 TROUT VALLEY	13 ISLAND LAKE	28 UNION	14 JOHNSBURG	29 WONDER LAKE	15 LAKE IN THE HILLS	30 WOODSTOCK
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14 JOHNSBURG	29 WONDER LAKE																															
15 LAKE IN THE HILLS	30 WOODSTOCK																															



### 2.7.5 Tornado Hazard Probability of Future Occurrence

Based on 26 tornadoes recorded in the last 65 years, there is an annual probability of approximately 40 percent. This data is corroborated by the 0.4 events per year reported by the National Risk Index. **Therefore, the probability of future occurrence score is 4 for tornadoes, representing an approximate 25-year return period.**

### 2.7.6 Tornado Vulnerability Assessment

**Vulnerability Score – 4.** Few mitigation measures exist to protect against tornadoes, save safe rooms and tornado warning systems to provide time to seek shelter. While safe rooms and tornado warning systems exist in McHenry County, existing measures and features are focused on protecting human lives. Property is still very susceptible to damage from tornadoes. The potential for loss of life and significant property damage increases as McHenry County’s population grows and the number of buildings increases.

**Public Health Consequences Score - 3:** Tornadoes have resulted in seven deaths and 126 injuries in McHenry County. On average, Illinois experiences two tornado-related deaths each year (NOAA Storm Events Database 1996-2023). While this is significant, due to the relatively limited spatial extent of tornadoes in McHenry County, the county expects few fatalities, but many injuries associated with this natural hazard.

Residents living in mobile homes are more vulnerable than people in permanent homes. Other health and safety issues from tornadoes include water contamination and driving hazards, as well as the potential for fire and gas leaks. Based on tornado history in Illinois, advanced warning and taking appropriate shelter is a significant mitigation method for preventing death and injury.

**Consequences to Property - 3:** Buildings, critical facilities, and infrastructure located above-ground in the path of a tornado can suffer extensive damage and/or complete destruction. Although some buildings adjacent to a tornado’s path can stand with little or no damage, debris hurled by the wind makes all buildings vulnerable to damage. According to FEMA’s National Risk Index, the expected annual loss for tornadoes is relatively high in McHenry County: \$21,579,079. This includes buildings, people, and agricultural assets susceptible to tornadoes and is the highest annual loss expected for McHenry County.

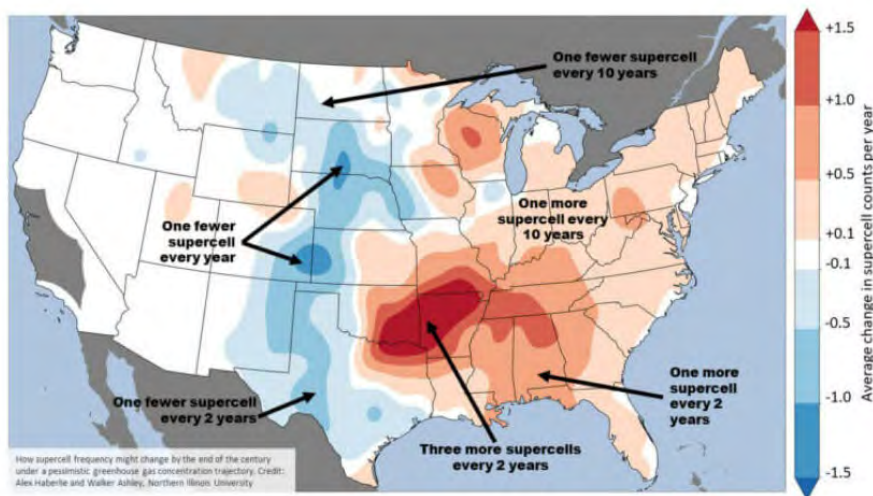
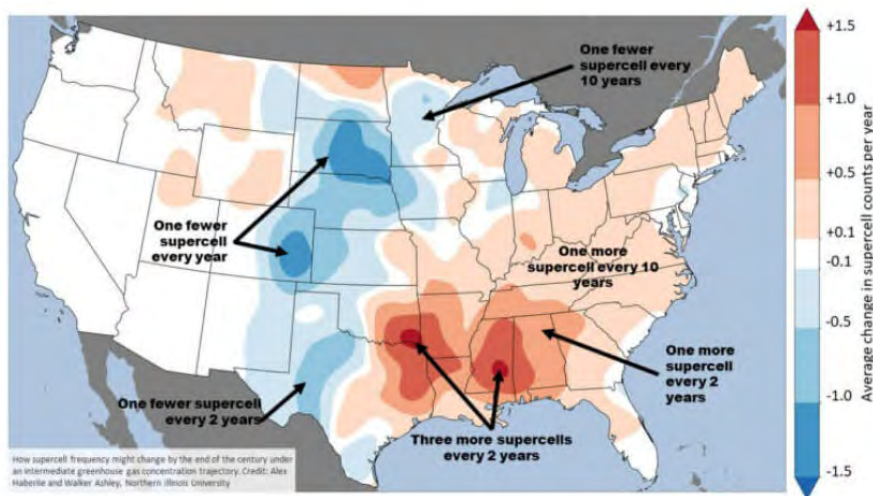
Although all buildings are vulnerable to tornadoes, mobile homes, homes on crawlspace, and large warehouse-type buildings are most likely to be destroyed after a tornado. Schools are also a particular concern because they have structures with large open areas with high ceilings and have large numbers of people present, either during school or as storm shelters. The 1990 Plainfield tornado, about 45 miles south of McHenry County, was an unfortunate example of tornado damage to educational facilities. It struck the Plainfield High School, Grand Prairie Elementary School, St. Mary Immaculate Church, and the gymnasium to the Church’s elementary school. Repair costs were approximately estimated at up to \$47 million. Large span buildings were also affected in 1990. In addition to the schools and their gyms, hangers at the Aurora airport and Joliet’s Essington Road Fire Station were damaged.

Infrastructure damage is usually limited to above ground utilities, such as power lines, roads, railroads, and water and wastewater facilities. While damage would be localized to the tornado’s path, significant

work may be required to restore service in the near-term. McHenry County is concerned with clean-up and debris removal, as well as public expenditures such as search and rescue, shelter mobilization, and other emergency protective measures.

**Climate Change Impact:** There is still some uncertainty as to the specific link between tornadoes and changing climatic conditions, and more research is needed to understand the full impact of climate change on tornadic activity. Due to the small scale of tornado events, observation and modeling can be challenging. However, a recent study by Northern Illinois University has simulated future supercell storms under two greenhouse gas concentration trajectories, one considered intermediate and the other considered pessimistic. Under both future trajectories, the number of annual supercell storms becomes more frequent and intense, with mean national activity increasing by 7 percent for the intermediate scenario and 15 percent for the pessimistic scenario. Tornado Alley is also projected to shift under both scenarios. As shown in Figure 2-17, northern Illinois is expected to potentially see an average decrease in supercell counts per year. This study is considered preliminary, and McHenry County should still plan for and mitigate the potential impacts of tornadoes in the community.

**Figure 2-17 Northern Illinois University Supercell Projections, Intermediate and Pessimistic**



## 2.8 Extreme Heat

### 2.8.1 Extreme Heat Hazard Description

Extreme heat is characterized by temperatures that hover 10 degrees or more above the average high temperature of a region for several days to several weeks. In comparison, a heat wave is generally defined as a period of at least three consecutive days above 90°F.

Extreme 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.

The National Weather Service (NWS) Weather Fatalities Database has records of heat-related fatalities beginning in 1986. Since 1950, there have been zero heat-related deaths in McHenry County. However, there have been 260 in the State of Illinois. To raise the public's awareness of the hazards of extreme heat, the National Weather Service has created excessive heat advisories and devised the "Heat Index." Figure 2-18 and Figure 2-19 display the NWS heat alert criteria and heat index chart, respectively.

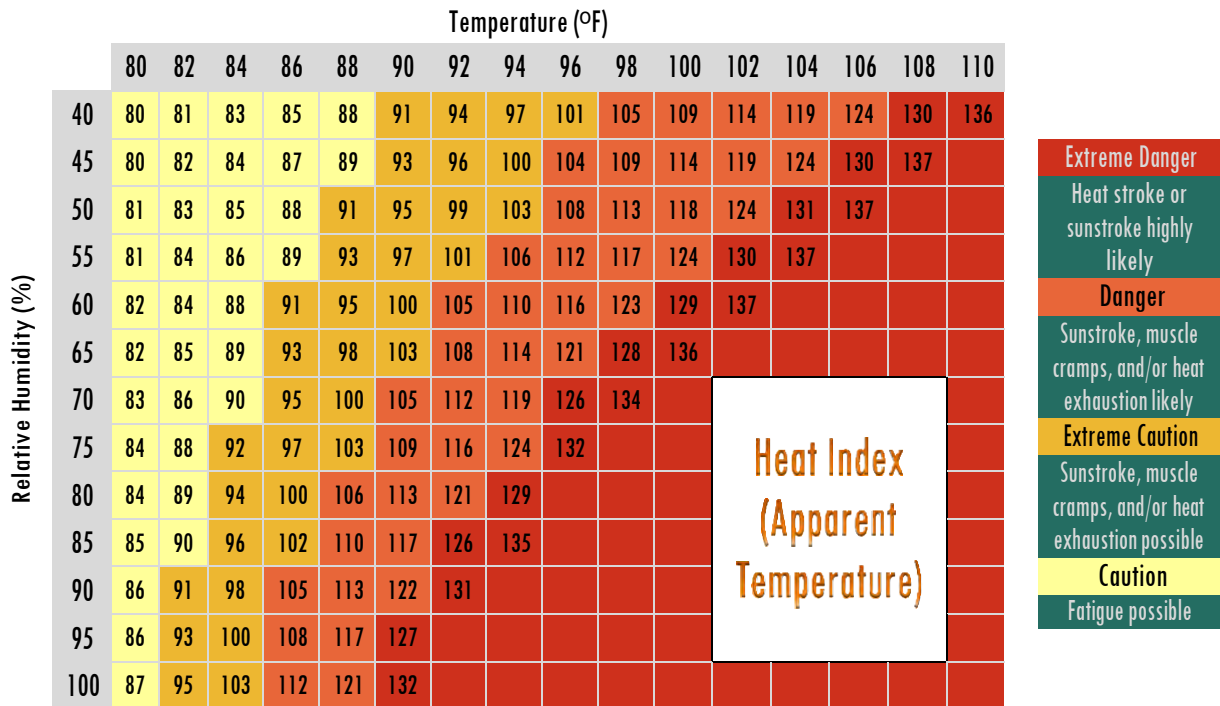
**Figure 2-18 Heat Alerts**

An excessive heat alert is an advisory or warning issued by the National Weather Service 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 National Weather Service Weather Forecast Office in Chicago, Illinois. The St. Louis office is responsible for issuing alerts for McHenry County.

- **Excessive Heat Outlook:** An excessive heat outlook is issued when the potential exists for an excessive heat event to occur within the next three to seven days.
- **Excessive Heat Watch:** An excessive heat watch is issued when conditions are favorable for an excessive heat event to occur within the next 12 to 48 hours.
- **Excessive Heat Advisory (northern Illinois):** An excessive heat advisory is issued when the heat index is expected to be between 105°F and 110°F, with a minimum temperature of 75°F or higher for two or more consecutive days.
- **Excessive Heat Warning (northern Illinois):** An excessive heat warning is issued when the heat index is expected to equal or exceed 110°F and the minimum temperature is 75°F for two or more consecutive days.



**Figure 2-19 NOAA's Heat Index Chart**



**Heat Index:** NOAA's National Weather Service (NWS) devised the Heat Index as a mechanism to better inform the public of heat dangers. The Heat Index Chart, shown in Figure 2-19, uses air temperature and humidity to determine the heat index or apparent temperature. In addition, information regarding the health dangers by temperature range is presented. As noted above, some populations, such as the elderly and young, are more susceptible to heat danger than other segments of the population.

**Heat Disorders:** Heat disorders are 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.

**Sunburn:** Sunburn is characterized by redness and pain of skin exposed too long to the sun without proper protection. In severe cases it can cause swelling, blisters, fever and headaches. It can significantly prevent the skin's ability to shed excess heat.

**Heat Cramps:** Heat cramps are characterized by heavy sweating and painful spasms, usually in the muscles of the legs and possibly the abdomen. The loss of fluid through perspiration leaves the body dehydrated resulting in muscle cramps. This is usually the first sign that the body is experiencing trouble dealing with heat.

**Heat Exhaustion:** Heat exhaustion is characterized by heavy sweating, weakness, nausea,



exhaustion, dizziness, and faintness. Breathing may become rapid and shallow and the pulse weak. The skin may appear cool, moist, and pale. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a mild form of shock. If not treated, the victim’s condition will worsen.

**Heat Stroke (Sunstroke):** Heat stroke is a life-threatening condition characterized by a high body temperature (106°F or higher). The skin appears to be dry and flushed with very little perspiration present. The individual may become mentally confused and aggressive. The pulse is rapid and strong. There is a possibility that the individual will faint or slip unconscious. 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 tends 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 people, small children, those on certain medications, and people with weight or alcohol problems are particularly susceptible to heat reactions.

### 2.8.2 Extreme Heat Hazard Location

Extreme heat events affect the entire County.

### 2.8.3 Extreme Heat Hazard Extent

As stated in Section 2.8.2, extreme heat events affect the entire County. Extent can be defined with record highs and the NWS Heat Index. Record highs throughout multiple communities in the County have reached upwards of 110 degrees during spring and summer months, although average temperatures generally remain in the low to mid 80s. All communities in McHenry County are exposed to the dangers presented during an extreme heat event. **Because extreme heat can occur anywhere in McHenry County, the county assigned a spatial extent score of 5.**

### 2.8.4 Extreme Heat Hazard Previous Occurrences

Table 2-28 summarizes the previous extreme heat occurrences as well as the extent or severity of extreme heat events in McHenry County. The Storm Events Database records show five extreme heat events in McHenry County between 1995 and March 2023. All the extreme heat events recorded occurred in June or July and lasted between three to five days. Deaths were reported in four out of five extreme heat events. However, none of the heat-related deaths reported occurred in McHenry County.

**Table 2-28 Extreme Heat Events Reported in McHenry County (1995 – 2015)**

Date	Temperature (°F)	Heat Index (°F)	Regional Impact*
July 12-16, 1995	Middle to upper 90s	High of 125°F	583 heat-related deaths; roads buckling and power outages
July 21-25, 1999	Lower to middle 90s	103°F – 111°F	13 heat-related deaths
July 28-31, 1999	Upper 90s to 100°F	105°F – 120°F	99 heat-related deaths
July 4-7, 2012	Upper 90s to 105°F	105°F – 115°F	23 heat-related deaths; 2 deaths – heat caused railroad lines on a bridge to expand, derailing a train. The incident caused a 28-car pile-up and collapsed a bridge. Two people died in a car under the bridge.

\*Deaths occurred in other counties; no reported deaths in McHenry County



Source: NOAA

No excessive heat events were reported to NOAA between 2012 and 2023. However, FEMA's National Risk Index reports a total of 12 heat waves occurring between 2005 and 2021, and news articles in McHenry County indicate that extreme heat was expected in 2016 and June 2022. Cooling centers opened throughout the county to provide shelter from the heat.

### 2.8.5 Extreme Heat Hazard Probability of Future Occurrence

McHenry County assumes that FEMA's National Risk Index data is correct and that 16 heat waves have occurred since 1995, resulting in approximately 0.5-0.6 events per year. Given the expected increase in heat waves in northwest Illinois (see Section 2.8.6), **McHenry county assigned a probability of occurrence score of 4 for heat waves.**

### 2.8.6 Extreme Heat Hazard Vulnerability Assessment

**Vulnerability Score – 3.** McHenry County assumes that existing mitigation measures and features will prevent a few impacts related to extreme heat. In most cases, the impacts of extreme heat can be mitigated by taking shelter. However, there are concerns for disproportionate vulnerabilities related to underserved populations, the homeless, and those who cannot afford or access air conditioning. Furthermore, while cooling centers have been available in past heat waves, the County does not have designated cooling centers to mobilize in a future event. The power grid is also a potential concern, as brown-outs and black-outs are typical during heat waves due to surges of grid demand. The true vulnerability of the power grid is unknown.

**Public Health Consequences Score - 3:** Few fatalities but many illnesses or injuries are expected from an extreme heat event in McHenry County. Vulnerable populations, such as the elderly, young children, mentally ill, disabled, low income or homeless persons are at greatest risk to the impacts of extreme heat. People are at risk for heat stroke or sun stroke, heat exhaustion, fatigue, and dehydration. Preparedness reduces the risks associated with this hazard. In cases of extreme heat:

- Stay indoors as much as possible to limit exposure (consider public buildings such as libraries, schools, movie theaters, or cooling centers if you do not have air conditioning),
- Limit alcoholic intake,
- Drink plenty of water, even if you do not feel thirsty,
- Do not leave children or pets in vehicles,
- Check on vulnerable populations,
- Arrange your day to avoid strenuous work during the warmest part of the day, if possible,
- Use an electric fan to vent hot air out or bring cool air in; and
- Wear loose-fitting clothing.

**Consequences to Property - 2:** Extreme heat events generally have little or no impact on structures. However, in some rare cases extreme heat can stress infrastructure assets and reduce the useful life of the systems, potentially even causing materials to warp. In July 2012, heat caused the



railroad lines on a bridge in Cook County (bordering McHenry County to the southeast) to expand. This is referred to as a heat kink in the rail line. A train derailed at the location of the heat kink, causing a 28-car pile-up, and led to the collapse of the bridge. The National Risk Index indicates that \$1,320,394 can be expected in annual losses due to heat waves in McHenry County, mostly due to population impacts.

**Climate Change Impact:** Climate change is expected to cause both an increase in average temperatures and an increase in the number of very hot days in McHenry County. According to NOAA’s Climate Explorer, McHenry County’s has traditionally experienced 10 average days with maximum temperatures above 90 degrees Fahrenheit. By 2090, this may increase to 49 – 83 days, depending on emission scenarios. Average low temperatures during the summer are expected to increase as well, meaning that evenings and nighttime will provide less relief from high temperatures. Humidity is expected to similarly increase, which may intensify the impact of warm periods and heat waves.

Importantly, the average winter temperatures are 3.3 degrees warmer today than the 1970s. Between the last Plan update in 2017 and today (2023), summer temperatures in Illinois have increased by 1.3 degrees Fahrenheit. The warming has been more rapid at night and during winter months. Extreme heat can have impacts not only on people but livestock creating a decline in meat, milk, and egg production.

Heat waves are projected to be more frequent, more intense, and last longer with climate models projecting that the entire contiguous U.S. will likely experience a significant increase in the number of extreme heat events in the coming decades. This could increase the number of heat-related deaths and illnesses.

## 2.9 Drought/Groundwater

### 2.9.1 Drought/Groundwater Hazard Description

Drought is conceptually defined by the National Drought Mitigation Center as “a protracted period of deficient precipitation resulting in extensive damage to crops, resulting in loss of yield.” Although sometimes considered a rare and random event, drought is a normal, recurrent feature of climate. Climatic factors such as high temperatures, high wind, and low relative humidity are often associated with drought. Drought occurs in virtually all climatic zones, varying significantly from one region to another, and can be defined according to meteorological, hydrological, agricultural, or socioeconomic criteria. Drought is typically categorized into four types as shown in Table 2-29. Drought is differentiated based on the use and need for water.

**Table 2-29 Drought Types and their Descriptions**

Drought Type	Description
Meteorological Drought	Meteorological drought is based on long-term precipitation departures from normal, but there is no consensus regarding the threshold of the deficit or the minimum duration of the lack of precipitation that makes a dry spell an official drought.
Hydrological Drought	Hydrological drought refers to deficiencies in surface and subsurface water supplies. It is measured as stream flow, and as lake, reservoir, and groundwater levels.
Agricultural Drought	Agricultural drought occurs when there is insufficient soil moisture to meet the needs of a particular crop at a particular time. A deficit of rainfall over cropped areas during critical periods of the growth cycle can result in destroyed or underdeveloped crops with greatly depleted yields. Agricultural drought is typically evident after meteorological drought but before a hydrological drought.



Drought Type	Description
Socioeconomic Drought:	Socioeconomic drought is a period when water shortages begin to affect people when there is not enough water to meet human and environmental needs.
Ecological Drought	Ecological drought is a prolonged and widespread deficit in naturally available water supplies – including changes in natural and managed hydrology – that create multiple stresses across ecosystems.

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. It is generally difficult to pinpoint the beginning and the end of a drought. Because the impacts of a drought accumulate slowly at first, a drought may not be recognized until it has become well established. Even during a drought there may be one or two months with above average precipitation totals. These wet months do not necessarily signal the end of a drought and generally do not have a major impact on moisture deficits. Droughts can be short, lasting just a few months. Conversely, they can persist for several years before regional climate conditions return to normal. While drought conditions can occur at any time throughout the year, the most apparent time is during the summer months. Nationally, drought ranks second in terms of national weather-related economic impacts, totaling almost \$9 billion per year.

Human activities often exacerbate the impact of drought. For example, excessive water use can deplete groundwater supply. Groundwater depletion is also a concern given aquifers in the county and drinking and agricultural water supply needs. Of note, the county recognizes this as a concern and maintains a Water Resources Action Plan. Crystal Lake also has an ordinance to manage water in drought conditions. Information on these plans can be found in Chapter 4.

**Measuring Droughts:** There are several quantitative methods for measuring drought in the United States. How these indices measure drought depends on the discipline affected (e.g., agriculture, hydrology, meteorology, etc.) and the region being considered. Two main methods are the Palmer Drought Severity Index (PDSI) and the U.S. Drought Monitor. The PDSI was the first comprehensive drought index developed in the United States. The U.S. Drought Monitor is a relatively new index that combines quantitative measures with input from experts in the field and is used in this Plan to assess drought in McHenry County.

The U.S. Drought Monitor is designed to provide the public, media, government officials, and others with an easily understandable overview of weekly drought conditions across a county throughout the United States. The U.S. Drought Monitor is unique because it assesses multiple numeric measures of drought, including the PDSI and three other indices, as well as the interpretations of experts to create a weekly map depicting drought conditions across the United States. There are five drought intensity categories, D0 through D4, to identify areas of drought; they are shown in Table 2-30.

**Table 2-30 U.S. Drought Monitor - Drought Severity Classifications**

Category	Category Name	Category Description
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

Category	Category Name	Category Description
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

### 2.9.2 Drought/Groundwater Hazard Location

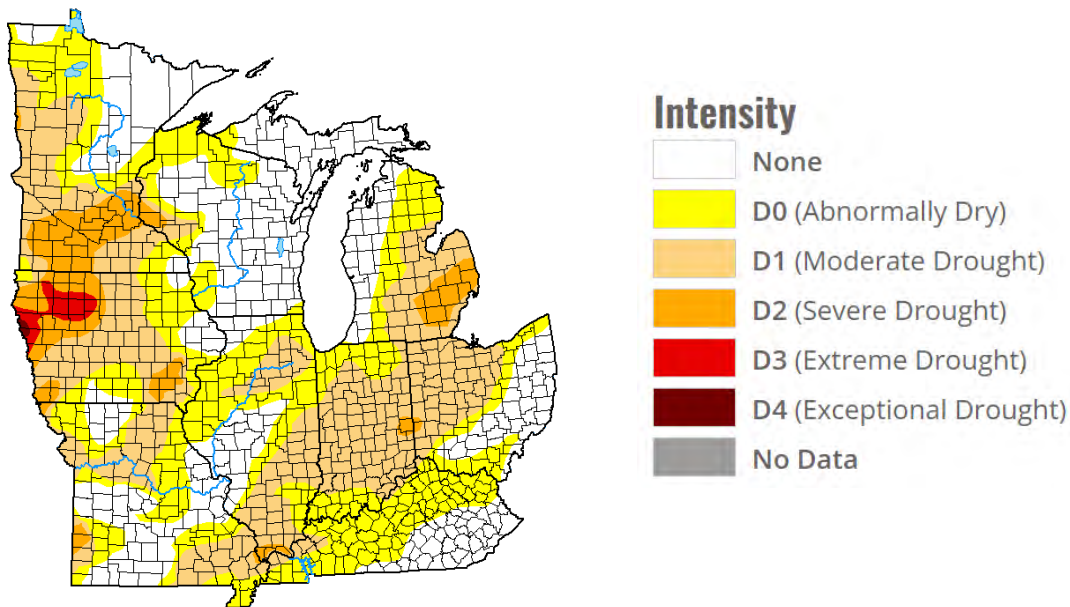
A drought is a regional event that is not confined to geographic or political boundaries; it can affect several areas at once. It can also range in severity across those areas. The entirety of McHenry County is at risk of experiencing drought occurrences and impacts.

### 2.9.3 Drought/Groundwater Hazard Extent

Drought events can affect the entire County in any one of the five drought categories discussed above. According to the U.S. Drought Monitor data, McHenry County has not experienced any exceptional droughts (D4). There have been 48 total weeks of drought at the second-most severe drought level of D3 (Extreme Drought) and 79 total weeks of drought at the Severe Drought level since 2000. Nonetheless, it is still possible for a D4 event to occur in the County or surrounding region.

Figure 2-20 shows the U.S. Drought Monitor Midwest Drought Summary map, as of September 2022. This map reflects that McHenry County was experiencing abnormally dry conditions while other portions of Illinois were experiencing moderate drought conditions. **Because drought can occur anywhere in McHenry County, the county assigned a spatial extent score of 5.**

Figure 2-20 U.S. Drought Monitor Midwest Drought Summary Map, as of September 2022



### 2.9.4 Drought/Groundwater Hazard Previous Occurrences

To understand the conditions of past droughts, it is helpful to understand the normal precipitation received each year. Official precipitation averages from the Illinois State Water Survey at the McHenry-WG Stratton monitoring station are shown in Figure 2-21. Precipitation (including rain and

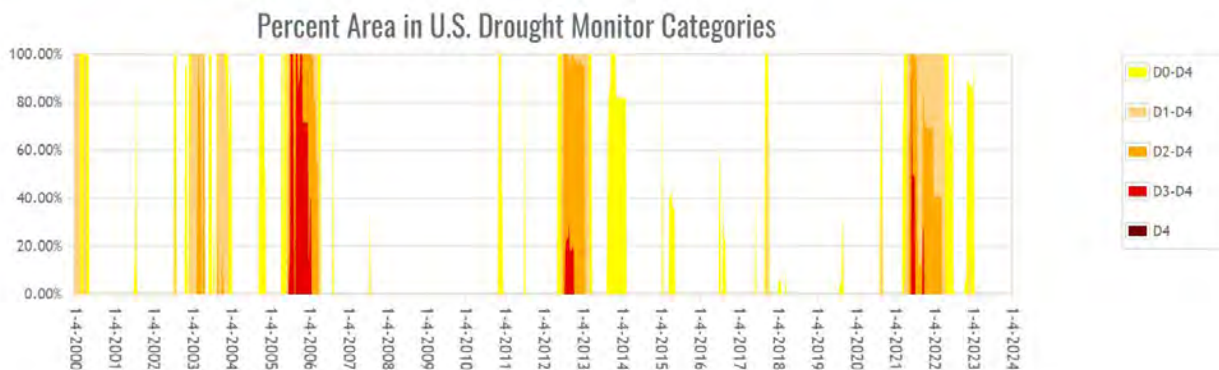
snow) is highest in late spring, summer, and early fall. Peaks are expected in June.

**Figure 2-21 Average Precipitation by Month**



The following summarizes the previous occurrences as well as the extent or severity of the drought events in McHenry County. Information obtained from the NCDC Storm Events Database, U.S. Drought Monitor, Illinois State Hazard Mitigation Plan and the Illinois Emergency Management Agency show 20 reported drought events in McHenry County between 2005 and April 1, 2023. Figure 2-22 illustrates the relative magnitude of the drought occurrences. Drought events in 2005-2006, 2012 – 2013, and from 2021-2022 appear to have met extreme drought requirements.

**Figure 2-22 Percent Area in U.S. Drought Monitor Categories, McHenry County Illinois**



- 2005-2006:** Drought conditions impacted much of the state, including McHenry County. Dry conditions reached a historic level of severity in some parts of Illinois and ranked as one of the three most severe droughts in Illinois based on 112 years of data. Thirty-one weeks from July 2005 through January 2006 were categorized as “Extreme Drought,” except for two weeks at the end of August 2005 which were “Severe Drought.” There were eight weeks of “Severe Drought” from February 2006 through the end of March, totaling to a 39 week stretch of drought.
- 2012-2013:** There was a 27 week stretch of drought. Beginning at the end of July 2012 through mid-October 2012 there were 12 weeks of “Extreme Drought.” From the third week of October 2012 through January 2013, there were 15 weeks of “Severe Drought.” During



this event, hay for hooved animals became very expensive. McHenry County has the largest horse population of all counties in Illinois. Due to the increase price of hay, a food bank for hooved animals was set up in the county. The food bank was not funded by the county.

- **2021-2022:** Drought in northern Illinois caused impacts to agriculture, ecology, and water resources. Following the third driest spring on record in 2021, McHenry County experienced 45 consecutive weeks of extreme to severe drought conditions. Many municipalities issued water conservation orders, and the USDA’s Emergency Relief Program was made available to producers with losses of crops, trees, bushes, and vines due to the drought.

Table 2-31 contains the history of droughts in McHenry County since 2000, based on U.S. Drought Monitor Data. The number of weeks recorded were noted based on the highest level of drought recorded that week. Categories are typically reported as percentages so the highest drought condition reported in each week may not have been experienced by the entire county or most of the county.

**Table 2-31 Drought Monitor Data in McHenry County, 2000 to April 2023**

Category	Category Name	Weeks at Drought Level
None	None	868
D0	Abnormally Dry	151
D1	Moderate Drought	71
D2	Severe Drought	79
D3	Extreme Drought	48
D4	Exceptional Drought	0

### 2.9.5 Drought/Groundwater Hazard Probability of Future Occurrence

McHenry County experiences some level of drought each year. According to FEMA’s National Risk Index, there are 10 drought events each year in the County, though expected annual loss is low. Given the expected increase in heat waves and drought in northwest Illinois, **McHenry county assigned a probability of occurrence score of 4.**

### 2.9.6 Drought Hazard/Groundwater Vulnerability Assessment

**Vulnerability Score – 4.** McHenry County can be significantly impacted by a drought. According to the County’s Water Resources Action Plan (WRAP), surface water levels in lakes, impoundments, and reservoirs can drop dramatically during drought. Drought will also stress aquifer supply levels in McHenry County, which represent the only potable water supply source. Excessive water use can deplete groundwater supply, and some water wells are already not deep enough in certain parts of the county. McHenry County assigned a vulnerability score of 4 for drought conditions, because drought mitigation options are limited to water conservation or seeking alternative water sources. While McHenry County and its municipalities have water conservation policies, they are not consistently implemented across all jurisdictions.

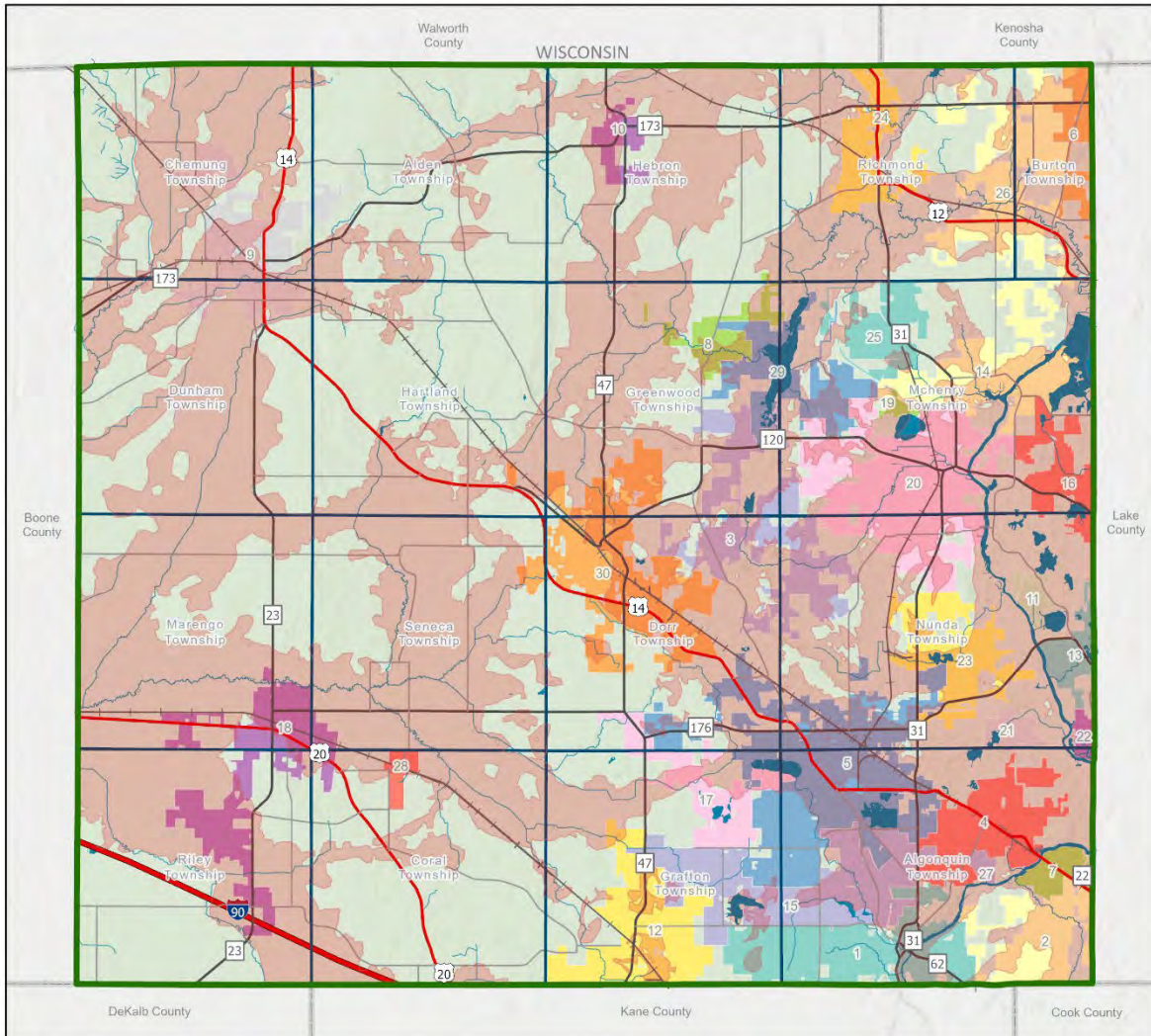
McHenry County has developed sensitive aquifer recharge area districts to protect this sensitive natural resource. The intent of these districts is to provide development standards that protect, preserve, and maintain the most sensitive recharge areas within the unincorporated county. The districts are





intermittently re-evaluated and re-mapped; Figure 2-23 includes the latest overlay districts as of 2018.

**Figure 2-23 McHenry County Sensitive Aquifer Recharge Areas Overlay District**



## McHenry County, IL

### Sensitive Aquifer Recharge



Map Produced by McHenry County  
GIS Department  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Political Township
- Interstate
- US Highways
- State Roads
- Other Roads
- Railways
- Rivers & Streams
- Lakes
- Sensitive Aquifer Recharge Area

#### Municipal Boundaries

- |                      |                    |
|----------------------|--------------------|
| 1 ALGONQUIN          | 16 LAKEMOOR        |
| 2 BARRINGTON HILLS   | 17 LAKEWOOD        |
| 3 BULL VALLEY        | 18 MARENGO         |
| 4 CARY               | 19 MCCULLOM LAKE   |
| 5 CRYSTAL LAKE       | 20 MCHENRY         |
| 6 FOX LAKE           | 21 OAKWOOD HILLS   |
| 7 FOX RIVER GROVE    | 22 PORT BARRINGTON |
| 8 GREENWOOD          | 23 PRAIRIE GROVE   |
| 9 HARVARD            | 24 RICHMOND        |
| 10 HEBRON            | 25 RINGWOOD        |
| 11 HOLIDAY HILLS     | 26 SPRING GROVE    |
| 12 HUNTLEY           | 27 TROUT VALLEY    |
| 13 ISLAND LAKE       | 28 UNION           |
| 14 JOHNSBURG         | 29 WONDER LAKE     |
| 15 LAKE IN THE HILLS | 30 WOODSTOCK       |



**Public Health Consequences Score - 3:** Water availability is imperative to health ranging from daily life to medical operations. There are concerns about the limitations of groundwater supply in McHenry County. According to NOAA and McHenry County experts, the challenges for McHenry County's groundwater resources have to do with continued population growth projections, as well as differences in underground geology and hydrology between municipalities. Some aquifers in McHenry County may recharge quicker than others due to soil type and the depth of the aquifer. For example, Huntley and Harvard's water comes from a deep-water aquifer and could take longer to recover. Both Huntley and Crystal Lake are planning to drill new deepwater wells in the near term.

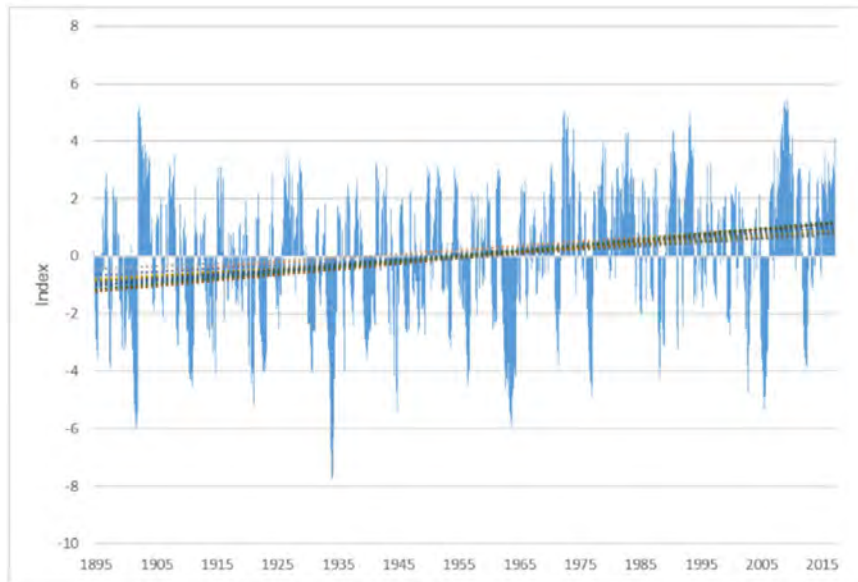
One study conducted by the Illinois State Water Survey (ISWS) in 2014 stated the County's groundwater resources may be strained within 30 – 40 years. The study has not been updated with recent data for the 2023 Plan Update. However, such a strain could cause local water shortages, thus water wars, and severe effects on the ecology of streams in the area. Additionally, large portions of McHenry County are highly susceptible to groundwater contamination due to the County's geology and land uses. This could worsen if aquifer recharge continues to be limited due to drought conditions and excessive groundwater use. **McHenry County assigned a public health consequence score of 3 as many illnesses could occur due to the potential reduced availability of potable water.** Additionally, the 4<sup>th</sup> National Climate Assessment identifies drought as a slow-moving stressor that contributes to acute and chronic mental health impacts such as anxiety and depression.

**Consequences to Property - 2:** Drought has minimal structural impacts on buildings and critical facilities, although it could have impacts on the functionality of the building if water supply is disrupted. Further, depleted water supply could impede the capability to effectively fight fires.

Drought has had economic impacts on McHenry County including agricultural, recreation and business. One of the most pronounced economic impacts is that on agricultural holdings. Given the agricultural nature of the county, water supply is imperative for crops, livestock and equestrian businesses. Drought can also destroy crops. Drought resulting in water shortage can also impact businesses (ranging from restaurants to manufacturing) which cannot operate without water. Lastly, in the case of a water shortage, the cost of water may increase (or the county may be forced to buy water from a water- rich area), which would have ripple effects in terms of a reduction in the local economic multiplier as money leaves the county. FEMA's National Risk Index assumes annual expected loss associated with drought is \$14,503 per year; all losses are assumed to be agricultural.

**Climate Change Impact:** Drought conditions have become a growing concern for northeastern Illinois. Figure 2-24 shows that droughts have become more frequent and more severe. As the climate continues to change, McHenry County is expected to see longer and more frequent droughts, periodically interrupted by large rainstorms. When heavy rains or snowmelt occurs during dry conditions, erosion and flooding become major concerns, as dry soils are typically less stable and have a lower capacity to absorb stormwater. The summer months are expected to see the largest increase in drought conditions. According to the National Climatic Assessment, the number of days without precipitation is projected to increase in the future. This indicates that even in the absence of a warmer climate, droughts could be longer and more pronounced.

**Figure 2-24 Monthly Palmer-Modified Drought Index for Northeastern Illinois**



## 2.10 Earthquake

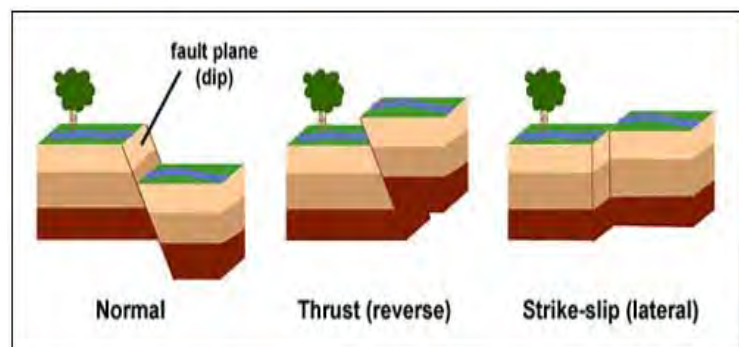
### 2.10.1 Earthquake Hazard Description

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. An abrupt shift releases 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.

A fault is a fracture or zone of fractures in the earth’s crust between two blocks of rock. Faults are classified based on the direction of slip or movement along the fault. There are three main groups of faults: normal, thrust (reverse) and strike-slip (lateral) as shown in Figure 2-25.

The severity of an earthquake is measured in terms of its magnitude and intensity. The magnitude describes the size of the earthquake, and the intensity depicts the associated damage.

**Figure 2-25 Earthquake Faults**



**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. 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 using 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.

The earthquake magnitude categorization is based on an event’s Richter Scale value. Earthquakes with a magnitude of 3.5 or less are not commonly felt by individuals as shown in Table 2-32. The largest earthquake to occur in the United States since 1900 took place off the coast of Alaska on March 28, 1964, and registered a 9.2 on the Richter Scale.

**Table 2-32 Richter Scale**

Richter Magnitudes	Earthquake Effects
< 3.5	Generally not felt but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: FEMA

Beginning in 2002, the USGS began using Moment Magnitude as the preferred measure of magnitude for all USGS earthquakes greater than magnitude 3.5. This was primarily due to the fact the Richter Scale has an upper bound, so large earthquakes were difficult to measure. Moment Magnitude also has a scale, but no instrument is used to measure it. Instead, factors such as the distance the earthquake travels, the area of the fault, and land that was displaced (also known as “slip”) are used to measure Moment Magnitude. Table 2-33 shows the Moment Magnitude scale.

**Table 2-33 Moment Magnitude Scale (appears that this scale is the same as the Richter Scale)**

Scale Value	Effect
Less than 3.5	Very weak; unlikely to be felt
3.5 – 5.4	Generally felt; rarely causes damage
5.4-6.0	Minor property damage
6.1-6.9	Will not cause damage to well-designed buildings; will damage poorly designed ones
7.0-7.9	Considered a “major earthquake” that causes a lot of damage
8 or greater	Large and destructive earthquake that can destroy large cities

**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, and intensity generally diminishes with distance.

In the United States, the Modified Mercalli Intensity Scale is used to measure earthquake intensity. This scale, shown in Table 2-34, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (e.g., felt only by a few people at rest, felt quite noticeably

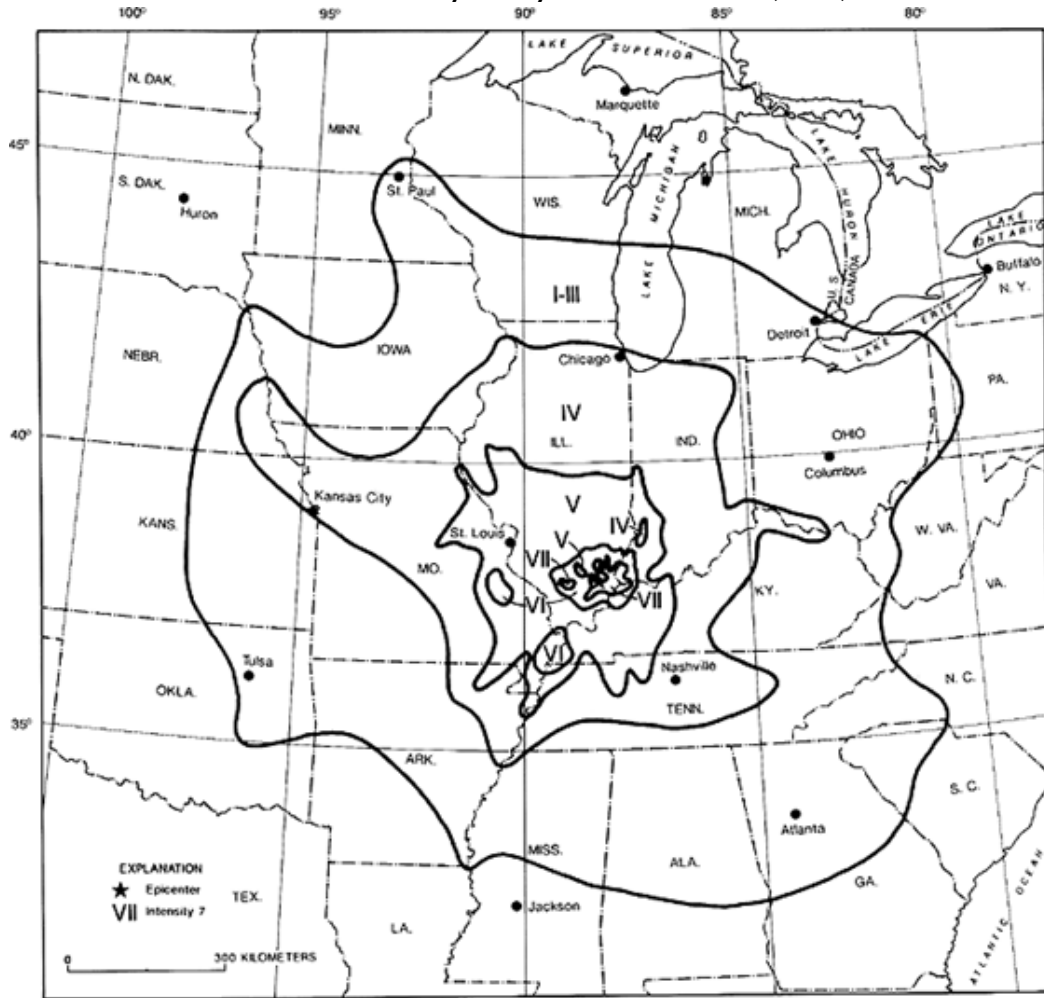


by persons indoors, etc.) The higher numbers of the scale are based on observed structural damage (e.g., broken windows, general damage to foundations, etc.). Figure 2-26 shows the intensity and magnitude of an earthquake in 1978 felt in McHenry County.

**Table 2-34 Modified Mercalli Intensity Scale**

Scale	Intensity	Description Of Effects	Corresponding Richter Scale Magnitude
I	<b>INSTRUMENTAL</b>	Detected only on seismographs.	
II	<b>FEEBLE</b>	Some people feel it.	< 4.2
III	<b>SLIGHT</b>	Felt by people resting; like a truck rumbling by.	
IV	<b>MODERATE</b>	Felt by people walking.	
V	<b>SLIGHTLY STRONG</b>	Sleepers awake; church bells ring.	< 4.8
VI	<b>STRONG</b>	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	<b>VERY STRONG</b>	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	<b>DESTRUCTIVE</b>	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	<b>RUINOUS</b>	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	<b>DISASTROUS</b>	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	<b>VERY DISASTROUS</b>	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	<b>CATASTROPHIC</b>	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

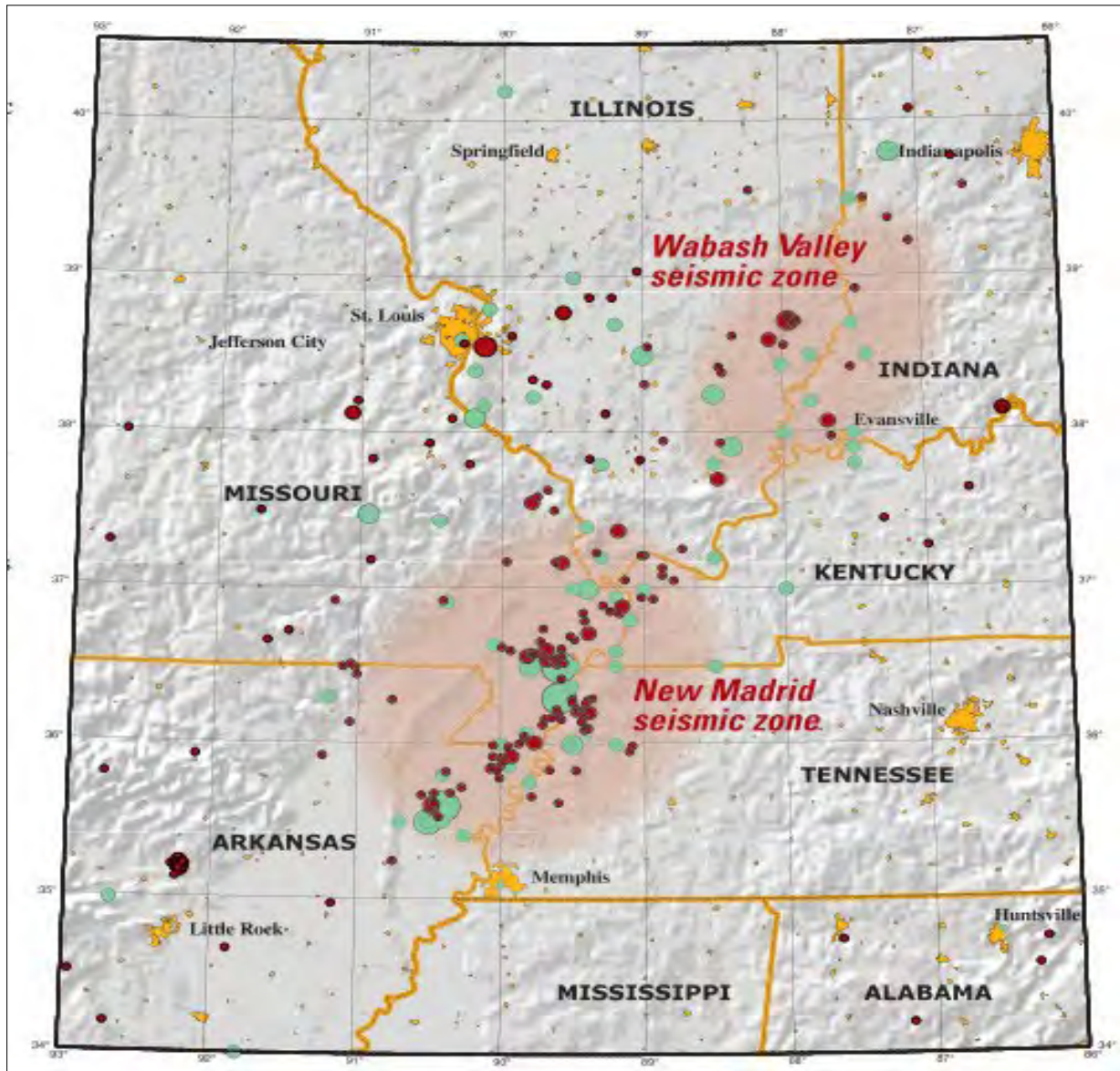
**Figure 2-26 November 9, 1968, Earthquake of magnitude 5.3 and an intensity of VII. Intensity felt in McHenry County estimated to be IV. (USGS)**



### 2.10.2 Earthquake Hazard Location

There are no known active earthquake faults in McHenry County. Figure 2-27 is a USGS map of the New Madrid and Wabash Valley seismic zones and shows earthquakes as circles. While McHenry County is not shown here, these are the nearest seismic zones to the county. Red circles indicate earthquakes that occurred from 1974 to 2002 with magnitudes larger than 2.5 located using modern instruments (University of Memphis). Green circles denote earthquakes that occurred prior to 1974 (USGS Professional Paper 1527). Larger earthquakes are represented by larger circles.

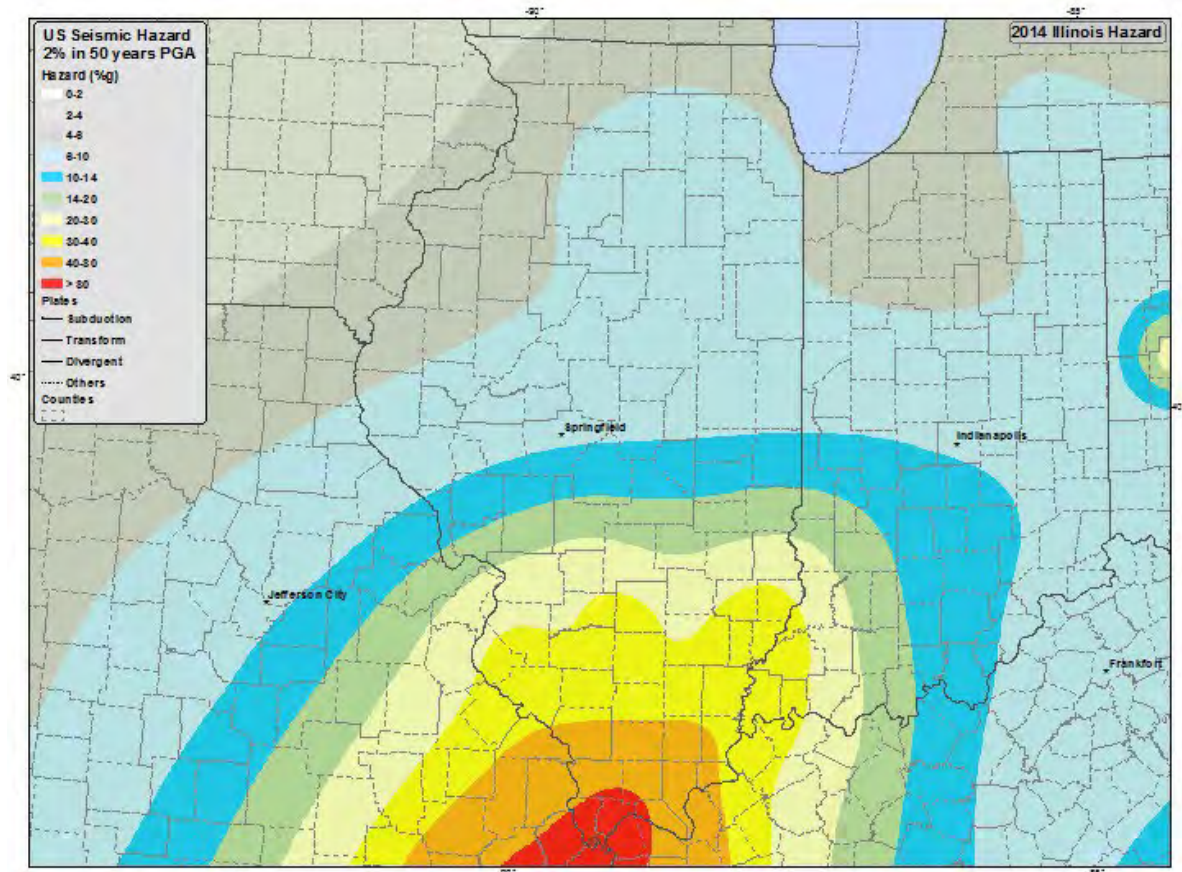
Figure 2-27 USGS Earthquake potential for ground shaking indicating McHenry County as low hazard.



### 2.10.3 Earthquake Hazard Extent

There are several ways to measure the extent of an earthquake including magnitude and intensity experienced. The most recent earthquake to impact McHenry County was in 2015, and the strongest earthquake to impact the county was a 4.2 magnitude event in 1909. In general, earthquakes greater than 5.0, which typically result in damage, are not common (or likely) in the area.

Another way to measure extent is by using percent-g, where g is a unit of ground shaking and acceleration. This is used as a way of estimating locational risk. Figure 2-28 illustrates this risk for McHenry County, displaying a 4-8 percent-g. **A spatial extent score of 3 was assigned due to the limited seismic activity measured in McHenry County.**

**Figure 2-28 USGS Seismic Map for Illinois (Measured in Percent-G)**


#### 2.10.4 Earthquake Hazard Previous Occurrences

May 26, 1909, marked the largest earthquake to take place in northern Illinois in the past several hundred years. 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. Damage to chimneys and household items was reported in McHenry County.

Other than a few events occurring between 2008 and 2015, earthquake history in McHenry County is limited:

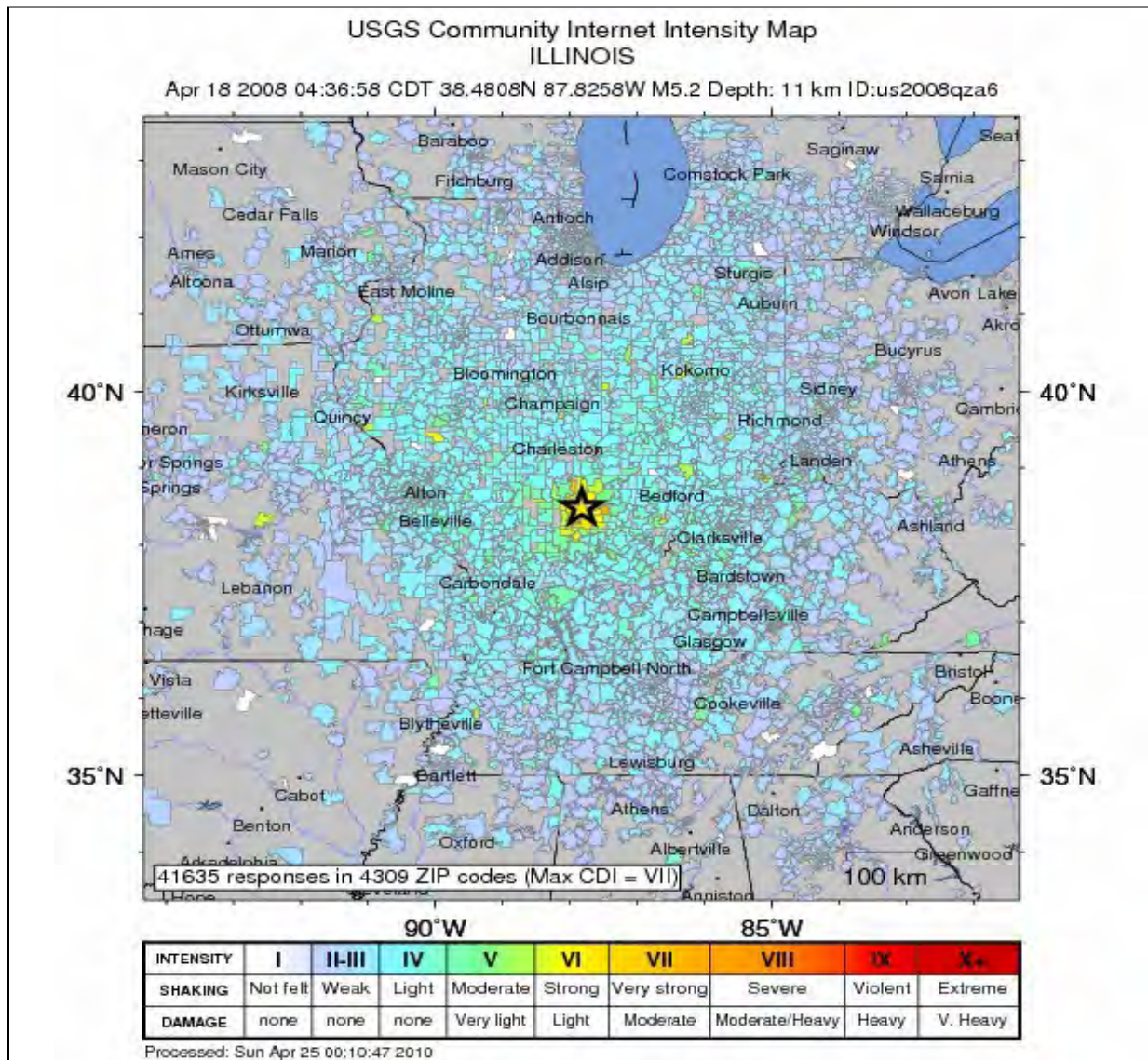
- **April 18, 2008:** A 5.2 magnitude earthquake was felt in McHenry County. The epicenter of this earthquake was in Wabash County, Illinois. As shown in Figure 2-29, people in McHenry County reported feeling the earthquake. People can report to USGS through their "Did You Feel It" website. USGS classified the McHenry reports from the April 2008 earthquake as "II" or weak and "III" or light. 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. No damage was reported in McHenry County.
- **February 10, 2010:** An earthquake occurred in northern Illinois at around 4:00 a.m.



USGS recorded the earthquake as 3.8 in magnitude with the epicenter at Pingree Grove in Kane County (just south of McHenry County).

- **January 31, 2012:** The City of McHenry was the epicenter of a 2.4 magnitude earthquake, but there were no damages or injuries recorded.
- **March 25, 2015:** A 2.9 magnitude earthquake was reported in Lake In The Hills. The impact was felt in Algonquin, Crystal Lake, Huntley, Lake In The Hills, and other jurisdictions. The event was very minor with weak to light shaking. There was no recorded damage associated with the event, but it did disrupt communication (Verizon).

**Figure 2-29 “Did You Feel It” Reports for April 18, 2008 Earthquake in Wabash County, Illinois**



In October 2021, several hundred residents in McHenry County and Lake County reported hearing and feeling a loud boom or rumble. However, USGS did not record any earthquakes in Illinois or Wisconsin. USGS attributed the event to a sonic boom, an exploded transformer, storms in the area, or a quarry blast.



### 2.10.5 Earthquake Hazard Probability of Future Occurrences

Earthquakes occur about once every year in Illinois and are occasionally felt in McHenry County. According to FEMA’s National Risk Index, there is a .034 percent chance for an earthquake every year in McHenry County, thus the probability of occurrence is low. **McHenry County assigned a probability score of 2 for earthquakes.**

Earthquakes could still potentially impact McHenry County. Table 2-35 shows earthquake probability for the New Madrid Seismic Zone from 2000 and into 2035 as reported by the Illinois State Geological Survey. Such an event is not expected to cause widespread damage in the county due to building codes and distance from the epicenter.

**Table 2-35 Probability of Earthquake Events in The New Madrid Seismic Zone**

Richter	Year 2000	Year 2035
6.3	40% - 63%	86% - 97%
7.6	5.4% - 8.7%	19% - 29%
8.3	0.3% - 1.0%	2.7% - 4.0%

Source: Illinois State Geological Survey

### 2.10.6 Earthquake Hazard Vulnerability Assessment

Since earthquakes are currently considered a lower priority hazard for McHenry County, a preliminary vulnerability analysis was conducted using research and data from the National Risk Index and the Illinois State Hazard Mitigation Plan.

**Vulnerability Score – 2.** Earthquake impacts felt in McHenry County have been limited to ground shaking. Vulnerability may be limited to historic structures in McHenry County; it is expected that building codes will continue to prevent most earthquake impacts.

**Public Health Consequences Score - 2:** Earthquakes present numerous risks to people. In more intensely felt events, earthquakes can cause buildings and their contents to fall and can result in severe injuries. Experts caution that in an earthquake, staying inside, ducking under furniture, and covering the back of your head can help reduce the possibility of serious injury. Due to the proximity of McHenry County’s jurisdictions to the active Wabash Valley and New Madrid Seismic Zones, McHenry County assigned a score of 2 for public health consequences to earthquakes. Few injuries or illnesses are expected.

**Consequences to Property - 2:** FEMA’s National Risk Index estimates \$774,437 in estimated annual loss associated with earthquakes in McHenry County. This is a relatively low historic loss rating when compared to the rest of Illinois. In addition to building damage (which is expected to be low), earthquakes can also cause infrastructure damage that can lead to cascading impacts. For example, shaking from earthquakes can rupture natural gas and potable water lines. If a fire were to occur after an earthquake due to a natural gas break, fire suppression may be difficult if water pressure is affected by breaks and leaks.



**Climate Change Impact:** Earthquakes are not influenced by climate change. According to USGS, the only correlation that’s been noted between earthquakes and weather and climate is that large changes in atmospheric pressure caused by major storms (like hurricanes) can occasionally trigger “slow earthquakes,” which release energy over comparatively long periods of time and do not result in ground shaking like traditional earthquakes do.

## 2.11 Dam Failure

### 2.11.1 Dam Failure Hazard Description

A dam is an artificial barrier constructed across a stream channel or a man-made basin for the purpose of storing, controlling, or diverting water. Dams typically are constructed of earth, rock, concrete, or mine tailings. The area directly behind the dam where water is impounded or stored is referred to as a reservoir. A dam failure is the partial or total collapse, breach, or other failure of a dam that causes flooding downstream. Dam failures can result from natural events such as a flood event, earthquakes or landslides, human-induced events such as improper maintenance, or a combination of both. In the event of a dam failure, the people, property, and infrastructure downstream could be subject to devastating damage.

Dam failures can result from one or more of the following:

- Prolonged periods of rainfall and flooding (the cause of most failures, such as the 2017 Fox River Flood),
- Inadequate spillway capacity resulting in excess flow overtopping the dam,
- Internal erosion caused by embankment or foundation leakage,
- Improper maintenance (including failure to remove trees, repair internal seepage problems, maintain gates, valves and other operational components, etc.),
- Improper design (including use of improper construction materials and practices),
- Negligent operation (including failure to remove or open gates or valves during high flow periods),
- Failure of an upstream dam on the same waterway,
- Landslides into reservoirs which cause surges that result in overtopping of the dam,
- High winds which can cause significant wave action and result in substantial erosion; and
- Earthquakes can cause longitudinal cracks at the tops of embankments that can weaken entire structures.

**Dam Regulation and Classifications in Illinois:** IDNR-OWR regulates dam construction and modification and maintains an inventory of dams. Dams that have been subject to an IDNR-OWR permit or that have a height of 25 feet or more and have more than a 50-acre-foot impounding area are included in the inventory. Three classifications are used in Illinois for regulatory purposes (Class I, II and III). Table 2-36 provides a brief description of each hazard classification. The hazard classifications used in Illinois are like those used by the U.S. Army Corps of Engineers and are based on the degree of threat to life and property in the event of a dam failure.

**Table 2-36 Illinois Dam Hazard Classification System**

Class	Description
Class I	Dams located where failure has a high probability of causing loss of life or substantial economic loss downstream (i.e., a dam located where its failure may cause additional damage to such structures as a home, a hospital, a nursing home, a highly travelled roadway, a shopping center or similar type facilities where people are normally present downstream of the dam).
Class II	Dams located where failure has a moderate probability of causing loss of life or may cause substantial economic loss downstream (i.e., a dam located where its failure may cause additional damage to such structures as a water treatment facility, a sewage treatment facility, a power substation, a city park, a U.S. Route or Illinois Route highway, a railroad or similar type facilities where people are downstream of the dam for only a portion of the day or on a more sporadic basis).
Class III	Dams located where failure has a low probability of causing loss of life, where there are no permanent structures for human habitation, or minimal economic loss downstream (i.e., a dam located where its failure may cause additional damage to agricultural fields, timber areas, township roads or similar type areas where people seldom are present and where there are few structures).

Source: Illinois Administrative Code.

**Federal Dam Regulation and Classifications:** FEMA and USACE also maintain the National Inventory of Dams (NIDs), which documents all known dams in the United States and its territories that meet certain criteria. Federal dam classifications are assessed as low, significant, or high hazard potential; see Table 2-37. FEMA uses the classifications from Table 2-37 for grant programs administered by the National Dam Safety Program, including the new Rehabilitation of High Hazard Potential Dams grant.

**Table 2-37 National Inventory of Dams Hazard Potential Classification**

Hazard Potential	Loss of Human Life	Economic, Environmental, Lifeline Losses
Low	None Expected	Low and generally limited to owner
Significant	None Expected	Yes. Often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
High	Probable	Yes, but not necessary for this classification.

### 2.11.2 Dam Failure Hazard Location

McHenry County has 20 dams listed in the NID, 11 of which are classified by Illinois as well. Nearly all dams were last inspected between 2016 and 2020. Table 2-38 contains the list of dams available in the NID, along with their purpose and hazard potential. Three high hazard dams are in McHenry County: the Wonder Lake Dam and Lake Sediment Dewatering Facility in Wonder Lake, and the High Hill Farms Dam in Algonquin. The High Hill Farms dam is the only publicly owned high-risk dam used for the purposes of flood protection. Five dams meet the significant hazard potential classification, two of which are used for flood risk reduction and owned by IDNR: the Stratton Lock and Dam in Holiday Hills and the Algonquin Dam. The Stratton Lock and Dam and the Wonder Lake Sediment Dewater Facility are the only structures with controlled spillways.

Figure 2-30 displays dam locations throughout McHenry County.

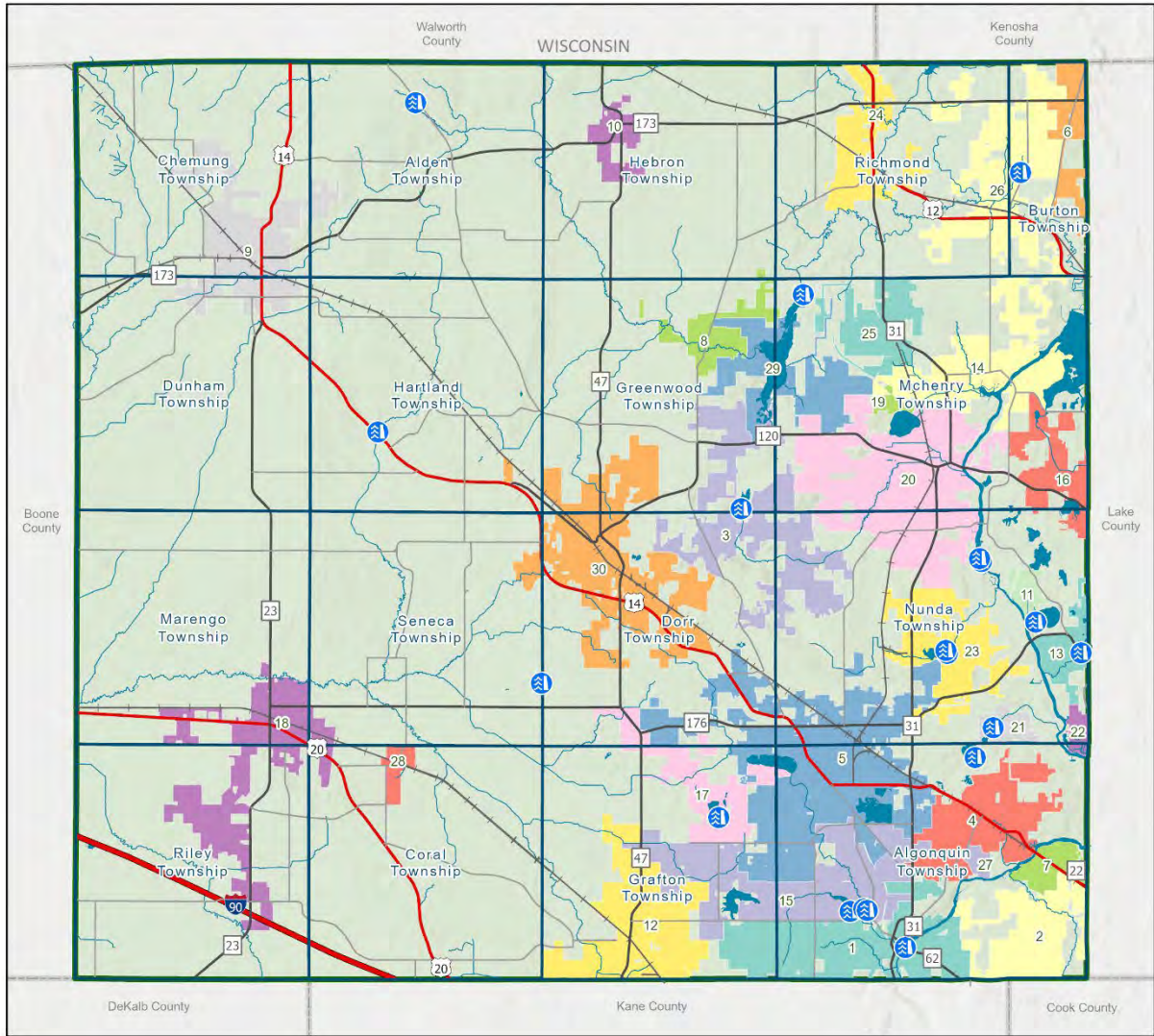


**Table 2-38 National Inventory of Dams with McHenry County**

Name	Location	Owner	Purpose	Hazard Potential
High Hill Farms Dam	Algonquin	Algonquin	Flood Risk Reduction	High
Stratton Lock & Dam (McHenry Lock & Dam)	Holiday Hills	IDNR	Flood Risk Reduction, Recreation	Significant
Wonder Lake Dam	Wonder Lake	Master Property Owners Assoc., Inc.	Recreation	High
Island Lake Dam	Island Lake	Island Lake	Recreation	Low
Lake In the Hills 2 Dam	Lake in the Hills	Lake In the Hills	Recreation, Other	Significant
Black Tern Marsh Dam (Moraine Hills Mitigation Dam)	McHenry	IDNR	Recreation	Low
Lake In the Hills 3 Dam	Lake in the Hills	Lake In the Hills	Recreation	Low
Woods creek Detention Dam	Crystal Lake	Crystal Lake	Flood Risk Reduction	Low
Brookdale Dam	Marengo	McHenry County CD	Recreation	Significant
Yellow Head Marsh Dam	Ferndale	IDNR	Other	Low
Eddy Lake Dam	Marengo	Private	Recreation	Low
Wold Lake Dam	Bull Valley	Private	Recreation	Low
Kingsley Lake Dam	Alden	Private	Recreation	Low
Kazimer Lake Dam	Spring Grove	Private	Recreation	Significant
Algonquin Dam	Algonquin	IDNR	Flood Risk Reduction, Recreation	Significant
Silver Lake Dam	Silver Lake	Oakwood Hills	Recreation	Low
South Lake Dam	Huntley	Private	Recreation	Low
Thunderbird Lake 2 Dam	Barreville	Private	Recreation	Low
Thunderbird Lake 1 Dam	Barreville	Private	Recreation	Low
Wonder Lake Sediment Dewatering Facility	Wonder Lake	Private	Other	High



Figure 2-30 McHenry County Dam Inventory



## McHenry County, IL

### Dams



Map Produced by McHenry County  
GIS Department  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Political Township
- Interstate
- US Highways
- State Roads
- Other Roads
- Railways
- Rivers & Streams
- Lakes
- Dams

### Municipal Boundaries

- 1 ALGONQUIN
- 2 BARRINGTON HILLS
- 3 BULL VALLEY
- 4 CARY
- 5 CRYSTAL LAKE
- 6 FOX LAKE
- 7 FOX RIVER GROVE
- 8 GREENWOOD
- 9 HARVARD
- 10 HEBRON
- 11 HOLIDAY HILLS
- 12 HUNTLEY
- 13 ISLAND LAKE
- 14 JOHNSBURG
- 15 LAKE IN THE HILLS
- 16 LAKEMOOR
- 17 LAKEWOOD
- 18 MARENGO
- 19 MCCULLOM LAKE
- 20 MCHENRY
- 21 OAKWOOD HILLS
- 22 PORT BARRINGTON
- 23 PRAIRIE GROVE
- 24 RICHMOND
- 25 RINGWOOD
- 26 SPRING GROVE
- 27 TROUT VALLEY
- 28 UNION
- 29 WONDER LAKE
- 30 WOODSTOCK



### 2.11.3 Dam Failure Hazard Extent

McHenry County dams collectively store over 151,000 acre-feet of water. One acre-foot equals approximately an 8-lane swimming pool. The extent of dam failure hazard is limited to areas downstream of dams, and their spillways. Four dams in McHenry County serve flood protection purposes: the Stratton Lock and Dam in Holiday Hills, the Algonquin Dam and High Hill Farms Dam in Algonquin, and the Woods Creek Detention Dam in Lake in the Hills. Specific spillway data is not available for McHenry County dams, but it is unlikely that multiple dams would fail at once. **As such, the County assigned a spatial extent score of 2 for dam failure.**

### 2.11.4 Dam Failure Hazard History

Dam failures are primarily caused by water overtopping the dam structures. The McHenry Stratton Lock and Dam has failed twice in the last decade: April 2013 and July 2017. During the April 2013 flood event, the McHenry Stratton and Lock Dam failed to hold back flood waters. The flood stage at this dam is 4 feet, and during this event, waters reached the record level of 7.44 feet. In July 2017, rainfall caused the Stratton Dam to reach its second highest crest record at 7.60 feet, above major flood stage at 7.0 feet and slightly below the record crest of 7.62 feet in 2013. The floods of July 2017 far exceeded the 10-year storm that the Stratton Dam is designed to manage and caused widespread damage to homes and businesses. The Fox Waterway Agency closed the Fox River for boating for several weeks during the height of the busy season.

### 2.11.5 Dam Failure Hazard Probability of Future Occurrences

Ideally, McHenry County dams are well maintained and have emergency operation plans developed for use when a dam failure is probable or imminent. Given the limited previous occurrences, a **probability of occurrence score of 1 was assigned, assuming that dam failure is an unknown but rare occurrence.**

### 2.11.6 Dam Failure Hazard Vulnerability

Since dam failure is considered a lower priority hazard for McHenry County, a vulnerability analysis including the mapping of potential dam breach inundation areas was not completed. These are typically completed as a separate document for individual dams. The risk assessment scores completed below are based on historical overtopping of the Stratton Dam, as well as data provided by the NID.

**Vulnerability Score – 2.** McHenry County assumes that existing dam maintenance and emergency management practices prevent most dam failure cases. For example, recent dam improvements have been made at Stratton Dam to improve operability, there are evacuation and emergency operations plans in place, and creek restoration occurring throughout the county also supports flood management benefits provided by the dams. Additionally, 8 out of 20 dams are considered significant or high hazard. Only 3 of the 8 dams with significant or high hazard classifications serve flood control purposes.

**Public Health Consequences Score - 3:** The impact of a dam failure in McHenry County



depends largely on the location of the failed dam. In most cases, the water released would not be great enough to cause significant damage to property. Public health consequences, including injuries, illness, and mental health stressors, could occur if the Stratton Lock and Dam, Algonquin Dam, or the High Hill Farms Dam were to be overtopped.

**Consequences to Property - 3:** Widespread damage to property and infrastructure is expected if dams should fail. This was demonstrated in the April 2013 and July 2017 flood events when the Stratton Dam was overtopped when precipitation exceeded a 10-year rain event. However, in 2023 IDNR conducted significant improvements of the Stratton Dam to increase the capacity, address maintenance issues, and improve the controls for spillways. The downstream lock was extended, a new upstream gate structure was implemented, berms were improved to contain water, and the dam is not remotely monitored and controlled.

**Climate Change Impact:** Increasing precipitation and riverine flooding may continue to pose challenges to dam failure as they relate to overtopping of structures. Future conditions and potential effects of climate change on the four flood risk management dams in McHenry County should continue to be evaluated in the future.

## 2.12 Summary of Natural Hazards

This risk assessment examines eight natural hazards that could impact McHenry County. According to the FEMA National Risk Index, the County’s national hazard risk is relatively moderate when compared to other Illinois counties. In fact, 91 percent of counties in Illinois have a lower risk index than McHenry County. While FEMA’s data indicates that social vulnerability is very low and that community resilience is very high, expected annual losses associated with natural hazards is relatively moderate and thus drives the County’s risk index score.

McHenry County supplemented National Risk Index data with historical losses, local subject matter expertise, and community feedback to validate risk. McHenry County has broad spatial exposure to many hazards, due to its relatively flat topography. Nevertheless, impact will likely vary by community based on population density, land use, and socioeconomics. The findings of the hazard analysis and risk scoring are presented in Table 2-39 and Table 2-40.

**Table 2-39 Summary of Hazard Profiles and Analysis, National Risk Index 2023**

Hazard	Value of Exposed Property	Expected Annual Loss	Annualized Frequency	NRI Risk Score
Flood	\$101 billion	\$1.4 million	1.1 events per year	72.5
Severe Summer Storms (Wind, Lightning, Hail)	\$3.67 trillion	\$2.9 million	55.9 events per year	92.4
Severe Winter Storms and Extreme Cold	\$3.67 trillion	\$2.7 million	1.2 events per year	97.4
Tornadoes	\$3.67 trillion	\$21 million	0.4 events per year	97.1
Extreme Heat	\$3.67 trillion	\$1.3 million	0.7 events per year	90.8
Drought	\$117 million	\$14,503	9.9 events per year	43.7
Earthquakes	\$3.67 trillion	\$774,437	0.34% chance per year	75.5





**Table 2-40 Summary of McHenry County Natural Hazards Based on EPRI Index**

Hazard	Category/Degree of Risk						
	Spatial Extent	Probability	Vulnerability	Public Health Consequences	Consequences to Property	Warning Time	EPRI Score
Flood	3	5	3	2	5	4	3.9
Severe Summer Storm	5	5	3	3	3	4	4.1
Severe Winter Storm	5	5	2	2	2	2	3.5
Tornado	2	4	4	3	3	5	3.4
Extreme Heat	5	4	3	3	2	1	3.4
Drought/ Groundwater	5	4	4	3	2	1	3.5
Earthquake	2	2	2	2	2	5	2.3
Dam Failure	2	1	2	3	3	3	2.1

The EPRI index was applied in accordance with the scoring criteria and weighting established in Section 2.2, specifically Table 2-3. The scoring criteria varied slightly from the last plan update; however, the last plan’s highest-ranking hazards included the following in order: severe winter storm, flood, tornado, severe summer storm, extreme heat, drought, earthquake, and dam failure.

The 2023 Plan Update’s EPRI scores have all increased from the previous plan update due to the variance in scoring criteria. New hazard priority rankings are included in Table 2-41. The new top 3 hazards presenting risk include severe summer storms, floods, and severe winter storms. These rankings are somewhat similar to the top three hazards identified in the last plan update. It is notable that the risk of severe summer storms has increased based on indirect impacts from the Covid-19 pandemic. Now that large events are increasingly held outside, vulnerability and public health consequences associated with severe summer storms have also progressed.

**Table 2-41 Hazard Priority Ranking**

McHenry County Identified Natural Hazards
Severe Summer Storm (Hail, Lightning, Wind) – 4.1
Flood – 3.9
Severe Winter Storm and Extreme Cold – 3.5
Drought – 3.5
Tornado – 3.4
Extreme Heat – 3.4
Earthquake – 2.3



**Dam Failure – 2.1**

**2.12.1 Comparison to State of Illinois 2018 Natural Hazard Mitigation Plan**

The 2018 Illinois Natural Hazard Mitigation Plan prepared by IEMA has five hazard rating levels: very low, low, medium, high, and severe. McHenry County’s hazard ratings for identified natural hazards as in the 2018 Plan are shown in Table 2-42. These ratings are mostly consistent with the results of the 2023 Plan Update, except for differences in assessments for droughts and tornadoes. In addition to being slightly outdated, McHenry County expects that the IEMA Plan ratings are in comparison with other Illinois counties and will maintain the results of the hazard priority ranking in Table 2-41 for updating the mitigation strategy.

**Table 2-42 IEMA Hazard Ratings for McHenry County**

<b>Hazard:</b>	<b>IEMA Rating</b>
<b>Severe Summer Storm</b>	<b>High</b>
<b>Floods</b>	<b>Medium</b>
<b>Severe Winter Storms</b>	<b>High</b>
<b>Drought</b>	<b>Low</b>
<b>Tornado</b>	<b>High</b>
<b>Extreme Heat</b>	<b>Low</b>
<b>Earthquake</b>	<b>Low</b>
<b>Dam Failure</b>	<b>N/A</b>



## 2.13 References

1. Angel, J. (2010). State Climatologist Office of Illinois [Illinois Climate Normals]. *Illinois Water Survey*. Retrieved from: <http://www.isws.illinois.edu/atmos/statecli/newnormals/normals.USC00115493.txt>
2. Changnon, S. A., Angel, J. R., Kunkel, K. E., & Lehmann, C. M. (2004). *Climate Atlas of Illinois; Illinois Water Survey*.
3. Elsner, J. B., Elsner, C. E., & Jagger, T. H. (2015). *The increasing efficiency of tornado days in the United States*. *Climate Dynamics*, 46(3), 651-659.
4. Ernest, A. (2022). *Summer Is Hotter And Longer In Illinois, Analysis Shows*. Retrieved from: <https://patch.com/illinois/across-il/summer-hotter-longer-illinois-analysis-shows>
5. FEMA National Flood Insurance Program. (2006). *McHenry County Flood Insurance Rate Maps*.
6. FEMA. 2023. *National Risk Index, McHenry County, Illinois*. Retrieved from: <https://www.fema.gov/flood-maps/products-tools/national-risk-index>
7. FEMA Mitigation Directorate. (1998). *Taking Shelter From the Storm [Wind Zone Map]*. Retrieved from: <http://www.fema.gov/pdf/library/ism2.pdf>
8. Filas, L. (2008, June 11). "Lake Co. officials anxiously watching strained Wisconsin dam." *Daily Herald*. Retrieved from <http://prev.dailyherald.com/story/print/?id=205997>
9. Holtz, M. (2013, April 13). "Area residents brace for flooding." *Chicago Tribune*. Retrieved from [http://articles.chicagotribune.com/2013-04-17/news/chi-sandbagging-begins-as-lake-county-braces-for-floods-20130417\\_1\\_sandbags-naval-station-great-lakes-flooding](http://articles.chicagotribune.com/2013-04-17/news/chi-sandbagging-begins-as-lake-county-braces-for-floods-20130417_1_sandbags-naval-station-great-lakes-flooding)
10. Illinois Department of Natural Resources. (2012). *Operation of the Stratton and Algonquin Dams, Fox River, Lake & McHenry Counties, Illinois*. Retrieved from <https://www.dnr.illinois.gov/WaterResources/Documents/StrattonAlgonquinDams.pdf>
11. Illinois Department of Natural Resources, Office of Water Resources. (2001). *Floodplain Management in Illinois: Quick Guide*.
12. Illinois Department of Transportation. (2004-2014). *Illinois Roadway Crash Data [McHenry County Crash Statistics]*. Retrieved from: <http://apps.dot.illinois.gov/fileexplorer/?search=crash\county%20summaries>
13. Illinois Office of the Governor and Emergency Management Agency. (2018). *2018 Illinois Natural Hazard Mitigation Plan*. Retrieved from [https://www.illinois.gov/iema/Mitigation/Documents/Plan\\_IllMitigationPlan.pdf](https://www.illinois.gov/iema/Mitigation/Documents/Plan_IllMitigationPlan.pdf)
14. Illinois State Geological Survey. (1995). *Earthquake Facts: Damaging Earthquakes in Illinois*. Illinois Department of Natural Resources. Retrieved from <http://www.isgs.illinois.edu/sites/isgs/files/files/qk-fct-damag.pdf>
15. Insurance Information Institute. (2015). "Hail." Retrieved from <http://www.iii.org/fact-statistic/hail>
16. McHenry County Water Resources Action Plan Task Force and Department of Planning and Development. 2020. *McHenry County Water Resources Action Plan 2020 Update*.



17. Meyer, S. (2014). *Study shows McHenry County water supplies may not suffice in future*. ISWS Press Release. Illinois State Water Survey. Retrieved from <http://www.isws.illinois.edu/hilites/press/140107mchenryco.asp>
18. National Lightning Detection Network. (2013). *Northeast U.S Lightning Data*. Vaisala.
19. National Oceanic and Atmospheric Administration. (2022). *Storm Events Database*. Retrieved from: [https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Thunderstorm+Wind&beginDate\\_mm=01&beginDate\\_dd=01&beginDate\\_yyyy=2005&endDate\\_mm=12&endDate\\_dd=31&endDate\\_yyyy=2022&county=MCHENRY%3A111&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=17%2CILLINOIS](https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Thunderstorm+Wind&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2005&endDate_mm=12&endDate_dd=31&endDate_yyyy=2022&county=MCHENRY%3A111&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=17%2CILLINOIS).
20. National Weather Service. (2001). *Heat Index Chart*. National Oceanic and Atmospheric Administration. Retrieved from [http://www.nws.noaa.gov/om/heat/heat\\_index.shtml](http://www.nws.noaa.gov/om/heat/heat_index.shtml)
21. National Weather Service. (2001). *Wind Chill Chart*. National Oceanic and Atmospheric Administration. Retrieved from: <http://www.nws.noaa.gov/om/winter/windchill-images/windchillchart3.pdf>
22. National Weather Service. (2013). *"Record River Flooding of April 2013."* National Oceanic and Atmospheric Administration. Retrieved from: <http://www.weather.gov/ilx/apr2013flooding>
23. National Weather Service. 2020. *Severe Weather Reports per Year [Severe Hail Days per Year from 2003-2020 Reports]*. National Oceanic and Atmospheric Administration. Retrieved from <http://www.spc.noaa.gov/wcm/>
24. National Weather Service; Office of Climate, Weather, and Weather Services. (2020). *Weather Fatalities*. Retrieved from <http://www.nws.noaa.gov/om/hazstats.shtml>
25. Placek, Christopher. (2016). *Budget Crisis May Leave Suburban Flood Buyout Families under Water.* Daily Herald (2016): n. page. Web. 21 Mar. 2016.
26. Pryor, S. C., & Scavia, D. (2014). *Climate Change Impacts in the United States: The Third National Climate Assessment [Ch. 18 Midwest]*. U.S. Global Change Research Program. 418-440. doi:10.7930/J0J1012N.
27. Reidmiller, D., et al. (2018). *Fourth National Climate Assessment*. U.S. Global Change Research Program.
28. State Climatologist Office for Illinois. (2016). *Rainfall Trends in Northeast Illinois*. Illinois State Water Survey. Retrieved from <http://www.isws.illinois.edu/atmos/statecli/climate-change/NE-IL-trends/rainfall.htm#Fig1>
29. Shelley, T. (2023). *A changing Central Illinois climate means more extreme rainfall, agricultural woes, and an encroachment of ticks*. Retrieved from: <https://www.wglt.org/illinois/2023-02-14/a-changing-central-illinois-climate-means-more-extreme-rainfall-agricultural-woes-and-an-encroachment-of-ticks>.
30. Stacker. (2023). *See what the average commute is in McHenry County*. Retrieved from: <https://www.shawlocal.com/northwest-herald/news/2023/01/29/see-what-the-average-commute-is-in-mchenry-county/>.



31. U.S. Census Bureau (2020). *Decennial Census P.L. 94-171 Redistricting Data Summary Files*.
32. United States Census Bureau (2022). *American FactFinder [QuickFacts Database]*. Retrieved from [http://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml#](http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml#)
33. U.S. Drought Monitor. (2022). *Tabular Data Archive [McHenry County>Traditional Percent Area]*. U.S. Department of Agriculture. Retrieved from <http://droughtmonitor.unl.edu/MapsAndData/DataTables.aspx>
34. U.S. Geological Survey Earthquake Hazards Program. (2008). *Significant Earthquakes Archive [Magnitude 5.4 – Illinois]*. Retrieved from <http://earthquake.usgs.gov/earthquakes/eqinthenews/2008/us2008qza6/#maps>
35. U.S. Geological Survey Earthquake Hazards Program. (2014). *USGS National Seismic Hazard Maps [Illinois]*. Retrieved from: <http://earthquake.usgs.gov/earthquakes/states/illinois/hazards.php>
36. U.S. Geological Survey Earthquake Hazards Program. (2015). *Earthquake Glossary [fault]*. Retrieved from <http://earthquake.usgs.gov/learn/glossary/?term=fault>
37. U.S. Geological Survey. *Earthquake Hazard in the Heart of the Homeland. (2002). Understanding Earthquake Hazards in the Central United States*. Retrieved from [http://pubs.usgs.gov/fs/2006/3125/pdf/FS06-3125\\_508.pdf](http://pubs.usgs.gov/fs/2006/3125/pdf/FS06-3125_508.pdf)
38. U.S. Geological Survey Geological Hazards Science Center. (2009). *2009 Earthquake Probability Mapping [42.312622 Lat, -88.441994 Long, 50 years, 5.0 Magnitude]*. Retrieved from <http://geohazards.usgs.gov/eqprob/2009/>
39. Winters, B. A., (2015). *Report for the Urban Flooding Awareness Act*. Office of Water Resources. Illinois Department of Natural Resources. Retrieved from [https://www.dnr.illinois.gov/WaterResources/Documents/Final\\_UFAA\\_Report.pdf](https://www.dnr.illinois.gov/WaterResources/Documents/Final_UFAA_Report.pdf)

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## CHAPTER 3 – GOALS

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*Requirement 44 CFR Section 201.6(c)(3)(i)). The Plan includes goals to reduce/avoid long-term vulnerabilities to identified hazards.*

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The goals and guidelines for the 2023 Plan Update were developed to reflect current community priorities, to accurately reflect the natural hazards that impact McHenry County, and to be consistent with other planning efforts. Both goals and guidelines were defined by the McHenry County Hazard Mitigation Committee during the 2010 planning effort and reaffirmed during subsequent 2017 and 2023 updates. Note the goals and guidelines presented in this chapter are the foundation of the Action Plan, presented in Chapter 10.

### 3.1 Goals and Guidelines

The Mitigation Committee established the goals for this *McHenry County Natural Hazards Mitigation Plan* as:

Goal 1. Protect the lives, health, and safety of the people of McHenry County from the impact and effects of natural hazards.

Goal 2. Protect public services, utilities, and critical facilities from potential damage from natural hazard events.

Goal 3. Protect historic, cultural, and natural resources from the effects of natural hazards.

Goal 4. Ensure that new developments do not create new exposures to damage from natural hazards.

Goal 5. Mitigate to protect against economic and transportation losses due to natural hazards.

Goal 6. Identify specific projects to protect lives and mitigate damage where cost- effective and affordable.

The following guidelines were developed by the Mitigation Committee for purpose of achieving the goals and to facilitate the development of hazard mitigation action items in Chapter 10:

Guideline 1. Focus natural hazards mitigation efforts on floods, severe summer and winter storms, tornadoes, extreme cold and heat events, and drought.

Guideline 2. Make people aware of the hazards they face and focus mitigation efforts on measures that allow property owners and service providers to help themselves.

Guideline 3. Seek state and federal support for mitigation efforts.

Guideline 4. Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural hazards.

Guideline 5. Examine equitable approaches for the local cost of mitigation, such as user fees.

Guideline 6. Create and foster public-private partnerships to accomplish mitigation activities.

**Guideline 7.** Strive to improve and expand business, transportation, and education opportunities in McHenry County in conjunction with planned mitigation efforts.

In summary, the goals and guidelines of this Plan focus on the life, health, and safety issues associated with natural hazards, and on the importance of people being able to protect themselves and their property from damage.

### 3.2 Consistency with Other County and Municipal Planning Goals

A review of the goals and guidelines of this Plan were compared to the goals of other County and municipal plans. The review showed that this Plan’s focus is consistent and complementary to current County and municipal initiatives included in their comprehensive and other plans.

#### 3.2.1 McHenry County 2030 Comprehensive Plan

There are numerous policy statements in the **McHenry County 2030 Comprehensive Plan**, plus a vision statement on pages 10 and 11, that support this Plan. This Plan will also foster the goals of the 2030 Comprehensive Plan. Figure 3-1 provides an excerpt from the vision statement.

**Figure 3-1 McHenry County 2030 Comprehensive Plan Excerpt**



Note that the County is currently updating the 2030 Comprehensive Plan to reflect future land use strategies through 2050. Chapter 1 and Chapter 2 community profile data are consistent with the information used to update the 2050 Comprehensive Plan.

#### 3.2.2 McHenry County 2040 Long Range Transportation Plan

**The McHenry County 2040 Long Range Transportation Plan** was prepared by the McHenry County Division of Transportation (MCDOT) and guided by the opinions and comments expressed by the public. The 2040 Transportation Plan was developed by thousands who engaged in the planning process to dream and express their ideas about how transportation can be improved in McHenry County. One of the goals of the plan is to preserve environmental quality, which directly relates to this Plan update. Figure 3-2 is an excerpt from the goals:

**Figure 3-2 McHenry County 2040 Long Range Transportation Plan Excerpt**

**MCHENRY COUNTY 2040 LONG RANGE TRANSPORTATION PLAN**  
 (Adopted by McHenry County Board in March of 2014)

Preserve Environmental Quality Goal

The goal is to promote ecological and human health. One objective of this plan is to balance the other objectives with the need to protect and enhance natural habitats and improve the quality of life in certain neighborhoods. One objective is to adopt innovative best practices in roadway design to limit or mitigate negative impacts to surface and ground water. Another objective of the plan is to identify transportation infrastructure to promote healthy and active living.

### 3.2.3 McHenry County Stormwater Management Ordinance

In 1996, McHenry County adopted the **McHenry County Comprehensive Stormwater Management Plan. The McHenry County Stormwater Management Ordinance** (the ordinance established by the Stormwater Management Plan) regulates development and substantial improvements to buildings in the floodplain throughout McHenry County, within incorporated and unincorporated areas. The purposes and goals of the Stormwater Management Plan reflect the goals of this Plan update. Figure 3-3 is an excerpt from the Purpose of the Plan:

**Figure 3-3 McHenry County Stormwater Management Ordinance Excerpt**

**MCHENRY COUNTY COMPREHENSIVE STORMWATER MANAGEMENT ORDINANCE**  
 (Amended in September of 2020)

Protect and preserve the quality and environmental values of land and water resources in McHenry County;

Encourage development in a manner that promotes the orderly, sustainable and cost-effective utilization of land and water resources;

Minimize the impact of development on flood hazards, erosion, and water quality;

Minimize the need for additional expenditure of public funds for flood control projects, repairs to flood damaged public facilities and utilities, and flood related emergency operations;

Maintain eligibility for the NFIP by equaling or exceeding Federal floodplain development regulations (the NFIP is codified as 44 CFR 59-79, as amended) thereby making federally subsidized flood insurance available to residents in participating communities.

### 3.2.4 McHenry County Water Resources Action Plan

In November 2020, the County Board adopted the **2020 Water Resources Action Plan (WRAP)**. The WRAP contains sections and chapters that address climate change, flooding, drought, and protecting ground water resources from contamination, directly reflecting the interests that drive this Plan. The WRAP describes the groundwater and surface water resources in McHenry County, identifies potential threats to those resources, and provides best management practices that can be employed to protect them. Figure 3-4 is an excerpt from the WRAP:



**Figure 3-4 McHenry County Water Resources Action Plan Excerpt**

**McHenry County Water Resources Action Plan (WRAP) 2020**  
 (Adopted by the McHenry County Board in November of 2020)

Introduction — Provides general information about McHenry County’s environment, economy, and land uses

Water Resources — Provides a general overview about water followed by detailed information about McHenry County’s water resources, water quality, and water conservation.

Significant Water Resource Issues — Covers major water resources issues such as climate change, flooding, drought, and green infrastructure that have relevance to all water related issues covered in other chapters

Land Uses — Identifies different land uses in McHenry County, explores how those land uses may impact water, and provides best management practices that can be used to mitigate those impacts.

### 3.2.5 CMAP (Chicago Metropolitan Agency for Planning) - On To 2050 Plan

CMAP spent approximately three years working with partners to conduct extensive research, issue more than two dozen reports, and engage over 100,000 residents of the seven-county region, including McHenry County. The CMAP On To 2050 Plan affirms and builds on the recommendations of its predecessor, GO TO 2040, to offer specific direction where needed and identify additional priorities. The principles in the Plan directly relate to McHenry County’s Plan priorities. Figure 3-5 is an excerpt from CMAP On To 2050 Principles:

**Figure 3-5 CMAP 2050 Plan Excerpt**

**CMAP (CHICAGO METROPOLITAN AGENCY FOR PLANNING) - ON TO 2050 PLAN**  
 (Approved by the CMAP Board and MPO Policy Committee in October 2022)

Inclusive Growth: Growing our economy through opportunity for all.

Resilience: Preparing for rapid changes, both known and unknown. To remain strong, metropolitan Chicago requires communities, infrastructure, and systems that can thrive in the face of future economic, fiscal, and environmental uncertainties.

Prioritized Investment: Carefully target resources to maximize benefit. Prioritized investment extends beyond transportation infrastructure, to the built environment, technical assistance, and other public

### 3.2.6 McHenry County 2022-2025 Strategic Plan

Adopted in 2021 and amended in 2023, the Strategic Plan outlines the County Board’s key goals and priorities to guide public policy, resource allocation and operational decisions through 2025 - and perhaps beyond. Figure 3-6 is an excerpt from the goals:

**Figure 3-6 McHenry County Strategic Plan Excerpt****MCHENRY COUNTY 2022-2025 STRATEGIC PLAN**

(Amended by the McHenry County Board in May 2023)

**Leadership & Governance Strategic Goal #5**

Explore and implement strategies to enhance regional collaboration with the County's intergovernmental partners to leverage resources, share information, and work together to identify quality solutions to current and potential challenges (e.g., control taxes, reach economies of scale, mitigate unfunded state mandates)

**Action Items: Long-Term Complex**

- Facilitate regular idea-sharing and collaboration meetings with intergovernmental partners.
- Encourage/support departments and offices to identify programs, agreements, and opportunities to share resources and efforts.
  - Publicly communicate successful partnerships and collaborative opportunities.
- Be receptive to alternative service delivery options in which the County provides common services on a contractual basis for municipalities and vice versa.
- Explore opportunities to develop intergovernmental agreements with municipalities to provide mutual aid for services to cover staff shortages and emergency situations.
- Support and assist the McHenry County Sheriff in the exploration of a joint law enforcement training center.
  - Explore partnership opportunities related to salt storage and snow removal.
    - Identify and prioritize opportunities for shared services.

### 3.3 References

1. Chicago Metropolitan Agency for Planning Board and Metropolitan Planning Organization Committee. 2022. *On to 2050*. Accessed: <https://www.cmap.illinois.gov/2050/about>.
2. McHenry County Department of Planning and Development. 2020. *Stormwater Management Ordinance*. Accessed: <https://www.mchenrycountyil.gov/home/showpublisheddocument/7922/637405331885270000>.
3. McHenry County Board of Commissioners. 2020. *The Water Resources Action Plan (WRAP) 2020 Update*. Accessed: <https://www.mchenrycountyil.gov/county-government/departments-j-z/planning-development/water-resources/water-resources-action-plan-new>.

## CHAPTER 4 - PREVENTIVE MEASURES

Preventive mitigation measures are aimed at protecting new construction from hazards and to help ensure that future development does not increase potential losses to existing development or to community assets. Building, planning, zoning, and/or code enforcement offices administer preventive measures. Preventive measures include, but are not limited to, the following:

- Building Codes
- Standards for Manufactured Homes
- Planning and Zoning
- Subdivision Regulations
- Comprehensive Stormwater Management

Comprehensive stormwater management incorporates the management of stormwater runoff, floodplain management, wetland protection, water quality protection, and soil erosion and sediment control.

### 4.1 Building Codes

The administration and enforcement of building codes is one of the most effective approaches for addressing natural hazard mitigation. Building codes protect new structures from damage by earthquakes, tornadoes, high winds, and snowstorms (see Figure 4-1). When properly designed and constructed according to code, the average building can withstand the impacts of most of these natural events. Building codes apply to all townships and unincorporated areas; however, each municipality adopts and enforces their own codes.

Additional hazard protection standards for all new, improved, or repaired buildings can be incorporated into the local building code. Provisions that should be included are:

- Making sure roofing systems will handle high winds and expected snow loads,
- Providing special standards for tying the roof, walls, and foundation together to resist the effects of wind,
- Requiring new critical facilities and public buildings to have tornado “safe rooms,”
- Including insulation standards that ensure protection from extreme heat and cold as well as energy efficiency,
- Regulating overhanging masonry elements that can fall during an earthquake,
- Ensuring that foundations are strong enough for earth movement and that all structural elements are properly connected to the foundation, and
- Mandating overhead sewers for all new basements to prevent sewer backup.

**Model codes:** The predominate model building codes being adopted by communities are the International Code series (I-Codes), including the International Residential Code (IRC) and the International Building Code (IBC). The most recent version of these codes is 2021.

**Figure 4-1. Hazards Addressed By Building Codes**

Hazards Addressed	
✓	Floods
✓	Summer Storms
✓	Winter Storms
	Extreme Cold
	Extreme Heat
✓	Tornadoes
	Drought
	Groundwater

**Flood Standards:** The I-Codes have a section on flood protection that communities must adopt separately. These standards are in addition to requirements of the National Flood Insurance Program that are adopted in a community’s floodplain ordinance.

**Protected Homes:** The Institute for Business and Home Safety (IBHS) has a set of recommendations to strengthen a building to better resist the impacts of natural hazards. The specific requirements for a protected or a “Fortified” home are available through the IBHS website at [www.disastersafety.org](http://www.disastersafety.org).

New construction should also include the construction of an underground shelter or “safe room” at the first-floor level to protect the lives of the occupants. A building code could require them in new construction. Tornado safe rooms are discussed further in Section 5.2.2.

**Code Administration:** Enforcement of code standards is very important. Adequate inspections are needed during construction to ensure that the builder understands and implements the requirements. The Building Code Effectiveness Grading Schedule (BCEGS) is a national program used by the insurance industry to determine how well new construction is protected from wind, earthquake, and other non-flood hazards. The BCEGS is like the NFIP Community Rating System and the century-old fire insurance rating scheme. With BCEGS, building permit programs are reviewed and scored, a class 1 community is the best (indicating exemplary commitment to building code enforcement), and a class 10 community has little or no program.

**Code Official Training:** Training of code officials is also very important for code enforcement. Training of code officials and inspectors is a large part of the BCEGS rating for a community. Courses are offered through the building code associations to help local officials understand standards that apply to seismic, wind and flood hazards.

**Local Implementation:** Table 4-1 below lists the building codes in use in McHenry County, along with BCEGS ratings available per jurisdiction.

**Table 4-1 Building Codes Used in McHenry County and BCEGS Ratings**

Municipalities	Building Code Residential	BCEGS Residential	Building Code Commercial	BCEGS Commercial
Unincorporated McHenry County	2021 IRC	4	2021 IBC	4
Algonquin, Village of	2018 IRC	99	2018 IBC	99
Barrington Hills, Village of	2018 IRC	10	2018 IBC	10
Bull Valley, Village of	*Adopts and enforces McHenry County’s Building Code			
Cary, Village of	*2003 IRC	10	*2003 IBC	10
Crystal Lake, City of	2018 IRC	4	2018 IBC	*4
Fox Lake, Village of	2015 IRC	4	2015 IBC	4
Fox River Grove, Village of	*BOCA	99	*2006 IBC	99
Greenwood, Village of	2018 IRC	99	2018 IBC	99
Harvard, City of	*2012 IRC	5	*2012 IBC	4
Hebron, Village of	2015 IRC	5	2015 IBC	5
Holiday Hills, Village of	*2006 IRC	99	*2006 IBC	99
Huntley, Village of	*2018 IRC	99	*2018 ICC	99
Island Lake, Village of	--	99	--	99

Municipalities	Building Code Residential	BCEGS Residential	Building Code Commercial	BCEGS Commercial
Johnsburg, Village of	*2006 IRC	99	2006 IBC	99
Lake in the Hills, Village of	2021 IRC	4	2021 IBC	3
Lakemoor, Village of	2009 IRC	6	2009 IBC	5
Lakewood, Village of	*2006 IRC	10	2018 IBC	10
Marengo, City of	2015 IRC	5	2015 IBC	4
McCullom Lake, Village of	2006 IRC	10	2006 IBC	10
McHenry, City of	2015 IRC	99	2015 IBC	99
Oakwood Hills, Village of	2021 IRC	10	2021 IBC	10
Port Barrington, Village of	2021 IRC	99	2021 IBC	99
Prairie Grove, Village of	*2006 IRC	99	*2006 IBC	99
Richmond, Village of	2015 IRC	5	2015 IBC	4
Ringwood, Village of	2015 IRC	99	2015 IBC	99
Spring Grove, Village of	*2015 IRC	3	*2015 IBC	4
Trout Valley, Village of	*Adopt and Enforce McHenry County's Building Code			
Union, Village of	--	99	--	99
Wonder Lake, Village of	*2003 IRC	99	*2003 IBC	99
Woodstock, City of	2015 IRC	5	2015 IBC	4

\*No change in building code from 2017 plan

A Classification 99 means ISO was unable to provide a BCEGS score for the community. This can happen for the following reasons: not having a building department, department declining to participate in a BCEGS survey, or not meeting the minimum requirements for a Class 1-10.

The Community Rating System (CRS) encourages strong building codes. It provides credit in two ways: points are awarded based on the community's BCEGS classification and points are awarded for adopting the International Code series. Communities can earn up to 120 points.

## 4.2 Manufactured Home Installation

Manufactured or "mobile" homes are usually not regulated by local building codes. They are built in a factory in another state and are shipped to a site. They do have to meet construction standards set by the US Department of Housing and Urban Development's National Manufactured Home Construction and Safety Standards. These standards apply uniformly across the country, and it is illegal for a local unit of government to require additional construction requirements. Local jurisdictions may regulate the location of these structures and their on-site installation.

The greatest mitigation concern with manufactured housing is protection from damage by wind. The key to local mitigation of wind damage to mobile homes is proper installation. The Illinois Mobile Home Act and Manufactured Home Tiedown Code is enforced by the Illinois Department of Public Health (IDPH). The State code includes equipment and installation standards. Installation must be done in accordance with manufacturers' specifications. There is a voluntary program for installers to be trained and certified.

**Figure 4-2. Hazards Addressed By Manufactured Home Installation Codes**

Hazards Addressed	
✓	Floods
✓	Summer Storms
	Winter Storms
	Extreme Cold
	Extreme Heat
✓	Tornadoes
	Drought
	Groundwater

However, installation requirements for mobile homes are still insufficient to address tornado-strength winds.

Following the installation of a manufactured home, installers must send the state a certification that they have complied with the State’s tiedown code. Inspections are only done if complaints are made regarding an installation. Figure 4-2 indicates that mobile home manufacturing, siting, and installation requirements address flooding, summer storms, and tornadoes.

**Local Implementation:** As discussed in Chapter 2, there are at least five manufactured home sites located in the county: Indian Trails in Marengo, Royal Oaks in Nunda Township, Oakbrook Estates in Crystal Lake, Harbor Lites in McHenry Township, and Prairie Club in Richmond Township. These types of homes are particularly vulnerable to damage from wind-related hazards. Communities like Fox River Grove and Huntley have ordinances in place that address manufactured (mobile) home safety and protection. Several jurisdictions in the county, including Algonquin, Bull Valley, Spring Grove, Wonder Lake, and Woodstock have building codes that do not allow manufactured and/or mobile homes. In addition, manufactured structures are sometimes used for temporary classrooms or sales offices at development sites. The floodplain ordinance portion of the McHenry County Stormwater Management Ordinance applies to mobile homes and manufactured buildings. Zoning ordinances have also incorporated mobile home standards.

Mobile school classrooms are regulated by the IDPH, and school districts must provide the State with an architect’s seal of compliance. Each year, there must be an inspection of the anchoring as well as a renewed evacuation plan signed by the superintendent of the school district. These provisions provide a higher level of protection than current procedures do for residential mobile homes.

### 4.3 Critical Facility Construction

Critical facilities, defined in Chapter 2 for the purposes of this Plan, are generally constructed with public funds. The exception is usually health care facilities. The source of public funds can be federal, state, or local. The state of Illinois and Federal Government executive orders require higher flood protection standards for critical facilities when funded with state or federal dollars. Both state and federal orders have consistent interpretations of “critical facilities;” Figure 4-3 indicates which hazards are addressed by codes and preventive measures that address critical facility construction specifically.

Illinois Executive Order 2006-05 requires that state agencies which plan, promote, regulate, or permit activities, as well as those which administer grants or loans in the State’s floodplain areas, must ensure that all projects meet the standards of the Illinois Floodplain Management’s regulations or the NFIP, whichever is more stringent. The State Executive Order also guarantees the State’s eligibility for certain types of federal disaster assistance. Critical facilities must be protected to the 500-year level.

The Illinois Department of Natural Resources - Office of Water Resources is required by the order to assist state agencies with flood hazard information and assistance to carry out the Executive Order. Unfortunately, no agency has the authority to enforce the Executive Order.

The Federal Executive Order 11988 has similar floodplain standards for federal agencies. Compliance with Federal Executive Order 11988 must be met for all “pass through” federal funding. These standards ensure

**Figure 4-3. Hazards Addressed By Critical Facility Codes**

Hazards Addressed	
✓	Floods
✓	Summer Storms
	Winter Storms
	Extreme Cold
	Extreme Heat
✓	Tornadoes
	Drought
	Groundwater

federal and state resources and funds are not used for inappropriate and/or dangerous floodplain development. The 500-year flood protection level is also used for critical facilities in Executive Order 11988.

**Local Implementation - Federal and/or state owned or funded critical facilities:** Federal and state agency consideration and adherence to the Executive Order 2006-05 and Executive Order 11988 for the placement of critical facilities in the floodplain is lacking. Although these agencies are required to follow state building codes, federal agencies and state agencies are *not* required to obtain local permits for construction. Local agencies are mostly unaware of the executive orders. Local government understanding of the executive orders is important, along with an understanding of the potential impact on a community when the floodplain management standards are not followed.

**Local Implementation - County, municipal or township funded critical facilities:** The Stormwater Management Ordinance requires that all buildings and additions to buildings in the 100-year floodplain (Special Flood Hazard Area) be constructed to the flood protection elevation (FPE). The McHenry County FPE is the placement of the lowest floor of a building two feet above the base flood elevation (100-year flood elevation).

#### 4.4 Planning and Zoning

Planning and zoning activities direct development away from hazardous areas, especially floodplains and wetlands. They do this by designating land uses that are more compatible with the natural conditions of the land, such as open space or recreation. They can also benefit by allowing developers more flexibility in arranging improvements on a parcel of land through the planned development approach.

**Comprehensive Plans:** These plans are the primary tools used by communities to address future development. They can reduce future flood-related damages by indicating open space or low-density development within floodplains and other hazardous areas. Natural hazards should be emphasized in specific land use recommendations.

**Zoning Regulations:** Zoning codes are the primary tool used to implement comprehensive plan guidelines for how land should be developed. Zoning ordinances usually set minimum lot sizes for each zoning district (Figure 4-5); however, a community can allow flexibility in lot sizes and location so developers can avoid hazardous areas. A zoning ordinance should designate flood prone lands for agricultural, conservation, or other uses that suffer minimal damage from a flood.

Communities can also consider cluster developments or conservation designs to allow the developer to incorporate flood hazard mitigation and resource protection measures into

**Figure 4-4. Hazards Addressed By Planning and Zoning Standards**

Hazards Addressed	
✓	Floods
	Summer Storms
	Winter Storms
	Extreme Cold
	Extreme Heat
	Tornadoes
✓	Drought
✓	Ground water

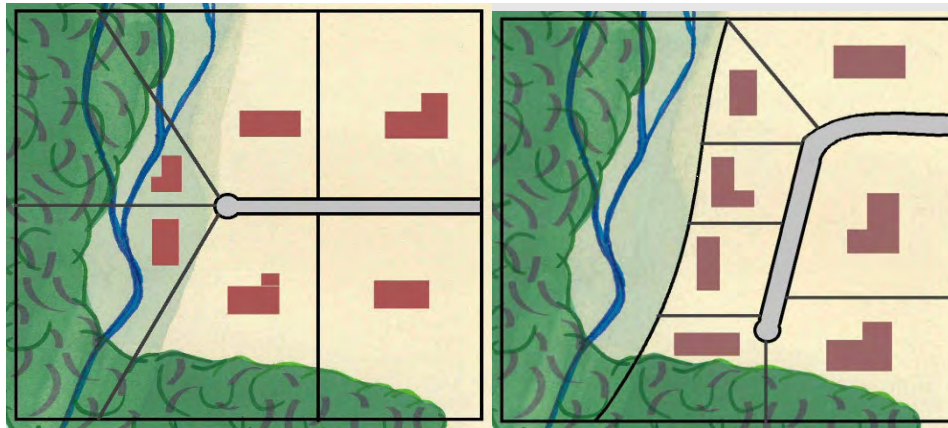
**Figure 4-5. Zoning District Example**





the project. Open space and/or floodplain preservation can be facilitated. Additionally, site design standards and land use densities can be adjusted, as in the Figure 4-6 smart zoning example below:

Figure 4-6 Smart Zoning



In the standard zoning approach (left of Figure 4-6), the developer considers siting six equally-sized lots without regard for the flood hazard. As a result, two properties are subject to flooding and the natural stream is disrupted. An alternative, flexible, approach is shown on the right. The floodplain is dedicated as public open space. There are seven smaller lots, but those abutting the floodplain have the advantage of a larger open area. Four lots have riverfront views instead of two. These amenities compensate for the smaller lot sizes, so the parcels are valued the same.

**Capital Improvement Plans:** Capital improvement plans guide a community’s major public expenditures for the next 5 to 20 years. Capital expenditures may include acquisition of open space within the hazardous areas, extension of public services into hazardous areas, or retrofitting existing public structures to withstand a hazard.

**Local Implementation:** Table 4-2 summarizes the findings of a review of comprehensive and land use plans adopted by the County and the municipalities.

Table 4-2 McHenry County Planning and Land Use Ordinances

Municipalities	Comprehensive Plan	Natural Hazards Included in Comprehensive Plan	Zoning Ordinance	Natural Hazards Included in Subdivision Ordinance	Requirement to bury utilities in Subdivision Ordinance
Algonquin, Village of	Yes	No	Yes	Yes	Yes
*Bull Valley, Village of	Yes	Yes	Yes	Yes	Yes
Barrington Hills, Village of	Yes	No	Yes	Yes	Yes
*Cary, Village of	Yes	Yes	Yes	Yes	Yes
Crystal Lake, City of	Yes	No	Yes	Yes	Yes
Fox River Grove, Village of	Yes	Yes	Yes	Yes	Yes
*Greenwood, Village of	No	No	Yes	No	No
*Harvard, City of	Yes	Yes	No	Yes	Yes
Hebron, Village of	Yes	Yes	Yes	Yes	No

*Holiday Hills, Village of	No	No	Yes	Yes	No
*Huntley, Village of	Yes	Yes	Yes	Yes	Yes
*Johnsburg, Village of	Yes	No	Yes	Yes	Yes
Lake in the Hills, Village of	Yes	No	Yes	Yes	Yes
Lakewood, Village of	Yes	Yes	Yes	Yes	Yes
*Marengo, City of	Yes	Yes	Yes	Yes	Yes
*McCullom Lake, Village of	Yes	No	Yes	Yes	Yes
*McHenry, City of	No	Yes	Yes	Yes	No
Oakwood Hills, Village of	Yes	No	Yes	Yes	Yes
*Prairie Grove, Village of	Yes	No	Yes	Yes	No
Richmond, Village of	Yes	No	Yes	Yes	No
*Ringwood, Village of	No	No	No	No	No
Spring Grove, Village of	Yes	Yes	Yes	Yes	Yes
Trout Valley, Village of	Yes	No	Yes	Yes	No
*Union, Village of	No	No	No	No	No
Wonder Lake, Village of	Yes	Yes	Yes	Yes	Yes
Woodstock, Village of	Yes	No	Yes	Yes	Yes
Unincorporated McHenry County	Yes	Yes	Yes	Yes	No

Table 4-2 Asterisk: \*Results from 2017 plan

### 4.5 Subdivision Regulations

Subdivision regulations govern how land will be subdivided and set construction standards. These standards generally address roads, sidewalks, utilities, storm sewers, and drainage ways. They can include the following hazard protection standards:

- Requiring that the final plat show all hazardous areas,
- Road standards that allow passage of firefighting equipment and snowplows,
- Requiring power or phone lines to be buried,
- Minimum water pressures adequate for firefighting,
- Requiring that each lot be provided with a building site above the flood level, and
- Requiring that all roadways be no more than one foot below the flood elevation.

Figure 4-7. Hazards Addressed By Subdivision Regulations

Hazards Addressed	
✓	Floods
✓	Summer Storms
	Winter Storms
	Extreme Cold
	Extreme Heat
✓	Tornadoes
✓	Drought
✓	Groundwater

Figure 4-7 demonstrates that subdivision regulations can address flooding, summer storms, tornadoes and wind events, drought, and groundwater concerns.

**Local Implementation:** Table 4-2 above shows the communities in McHenry County that have adopted subdivision regulations and incorporated natural hazard protection provisions.

### 4.6 Watersheds and Their Role in Natural Hazard Mitigation Planning

A watershed is the land area from which rainwater and snowmelt drain into a body of water such as a stream or lake. Watershed boundaries are defined by nature and are largely determined by the surrounding topography or “lay of the land”. Protecting our watersheds is important because what we do on the land directly affects the quality of our surface waters, drinking water supply, local economy, wildlife habitat, and recreational resources. They also play an important role in preventing flooding, mitigating the effects of droughts, and protecting our natural resources.

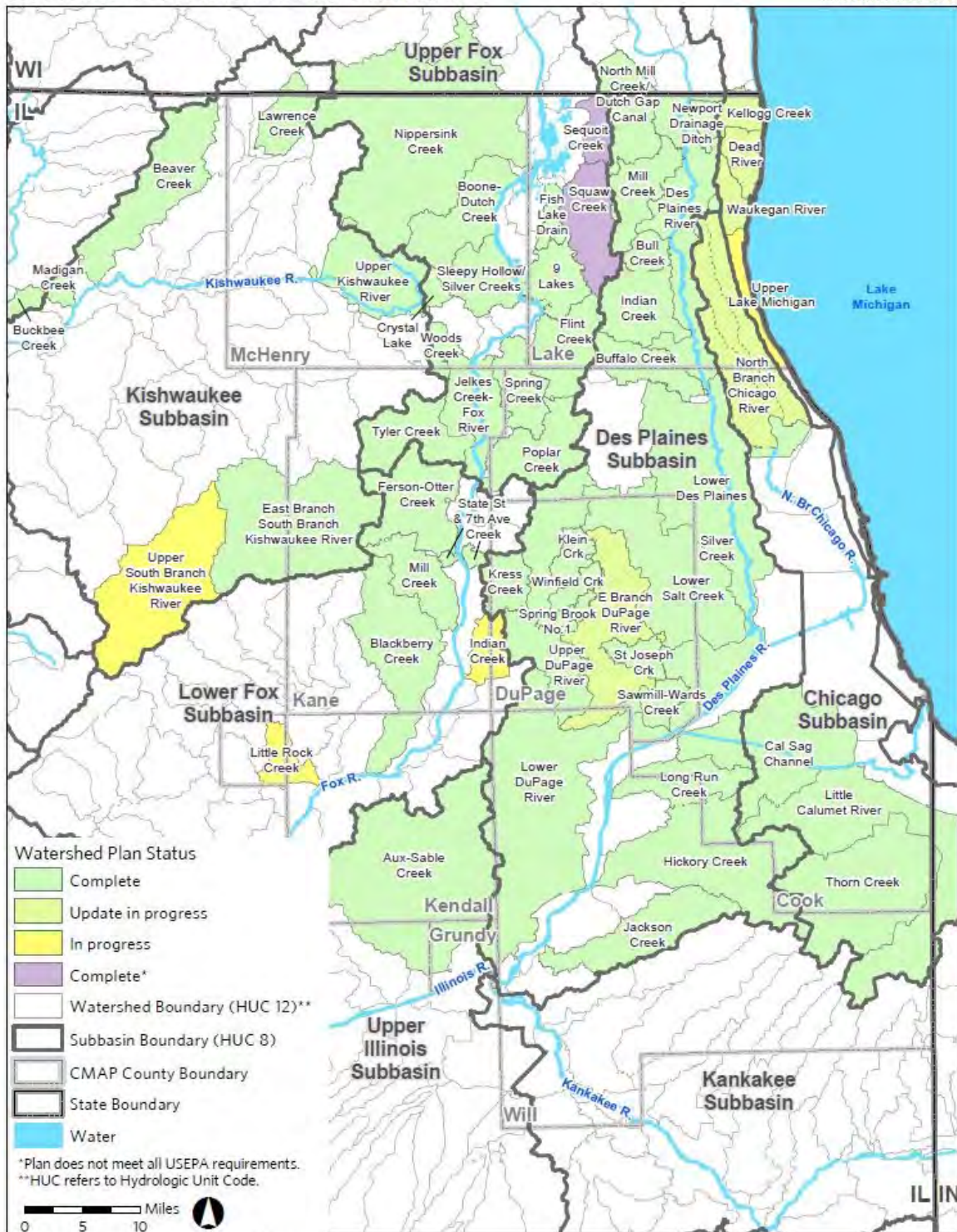
Watershed planning is a voluntary approach to protecting and improving watershed health. The written plans that result from such planning contain recommended projects that may be implemented by local governments. Such projects are aimed at protecting open space, providing floodplain protection, creating riparian buffers, controlling erosion, preventing sediment build-up, preserving and restoring wetlands, preserving habitat, retrofitting detention/retention basins, and educating the public about the importance of watershed management. Many of these projects that are part of IEPA-approved plans are eligible for grants under Section 319 of the Clean Water Act, which might aid communities as they work to implement actions to mitigate natural hazards in McHenry County. Thus, local governments are urged to include projects contained in IEPA- approved watershed plans that encompass their area in their Natural Hazard Mitigation Plans.

Figure 4-8, from CMAP, illustrates completed watershed plans and plans underway in northeast Illinois, including McHenry County. For a list of completed plans with links to plan documents and partner organizations, visit <https://www.cmap.illinois.gov/programs/water/water-quality-management/watershed-planning>.

**Figure 4-8 Watershed Based Plans**

Watershed-based Plans in Northeastern Illinois

As of November 2019



**Local Implementation:** Since the 2017 Plan update, three additional Watershed Plans were finalized for a total of eleven. Some watersheds are wholly within McHenry County, and some encompass areas within adjoining counties. The following Watershed Plans have been finalized as of January 2023:

1. Nine Lakes Watershed-Based Plan (Island Lake & Port Barrington areas),
2. Silver Creek and Sleepy Hollow Creek Watershed Plan (Crystal Lake, McHenry, Oakwood Hills & Prairie Grove areas),
3. Boone-Dutch Creek Watershed Based Plan (Bull Valley, Greenwood, Johnsburg, McCullom Lake, McHenry, Ringwood, Wonder Lake & Woodstock areas),
4. Woods Creek Watershed Plan (Algonquin, Crystal Lake & Lake in the Hills areas),
5. Jelkes Creek Watershed Plan (Algonquin & Barrington Hills areas),
6. Flint Creek Watershed-Based Plan (Barrington Hills area),
7. Spring Creek Watershed Plan (Barrington Hills & Fox River Grove areas),
8. Crystal Creek Watershed Plan (Crystal Lake, Algonquin, Lakewood & Lake-in-the-Hills areas),
9. Lawrence Creek Watershed Plan (Harvard, Alden & Chemung areas),
10. Upper Kishwaukee River Watershed Plan (Lakewood, Crystal Lake, Marengo & Woodstock areas), and
11. Nippersink Creek Watershed Plan (Woodstock, Wonder Lake, Spring Grove, Richmond, Greenwood and Ringwood areas).

Ongoing Watershed Plans include: The Crystal Creek Watershed Plan that was recently submitted to the Illinois Environmental Protection Agency (IEPA) for approval; the Fox Waterway Agency has hired consultants and is partnering with local agencies and other stakeholders to complete a Watershed-based Plan for the Upper Fox River watershed; and the County is exploring the creation of a Countywide regulatory program as prescribed within the McHenry County Comprehensive Stormwater Management Plan. This program could involve development of a Countywide watershed development ordinance that applies to both incorporated and unincorporated areas. The watershed development ordinance would be comprehensive and specify standards for stormwater drainage and detention, floodplain management, soil erosion and sedimentation control, and stream and wetland protection in a single document.

## 4.7 Comprehensive Stormwater Management

Development alters watersheds. Stormwater runoff is increased when natural ground cover is replaced by urban development. Comprehensive stormwater management, or watershed management, ordinances are adopted for the purpose of minimizing development impacts. Comprehensive stormwater management ordinances typically include:

- Site stormwater runoff requirements
- Floodplain management
- Soil erosion and sediment control
- Wetland avoidance and mitigation requirements
- Riparian environment protection
- Water quality protection

**Figure 4-9. Hazards Addressed By Stormwater Management**

Hazards Addressed	
✓	Floods
✓	Summer Storms
	Winter Storms
	Extreme Cold
	Extreme Heat
	Tornadoes
✓	Drought
✓	Groundwater

In McHenry County, stormwater is managed through site planning, floodplain management, soil erosion, wetland protection, riparian environment protection, and water quality planning. These policies address flooding, severe storms, drought, and groundwater issues (Figure 4-9).

#### 4.7.1 Site Stormwater Runoff

Site stormwater runoff management requirements involve regulating all development to ensure that the flood problems will not be created or increased. Different site requirements are developed based on the size of the development or area of disturbance.

Smaller development typically must include site features to ensure that site runoff is properly collected and discharged from the site. Larger development typically must provide site runoff storage and other requirements to protect adjacent and downstream properties from the impact of the development.

**Local Implementation:** The McHenry County Stormwater Management Ordinance establishes site stormwater management regulations for development that creates 5,000 square feet or more of disturbance and detention requirements for development that creates 20,000 square feet or more of impervious area.

#### 4.7.2 Floodplain Management

Development in floodplains is development in harm's way. New construction in the floodplain increases the amount of development exposed to damage and can aggravate flooding on neighboring properties. Floodplain management involves regulating development in the floodplain to ensure that it will be protected from flooding and that it won't divert floodwaters onto other properties. The NFIP and IDNR set minimum requirements for regulating development in the floodplain and in the floodway. All new buildings must be protected from the 100-year flood and no development can cause an increase in flood heights or velocities.

**Local Implementation:** All but one McHenry County jurisdiction (Oakwood Hills) participates in the NFIP (see Table 1-2 in Chapter 1). The McHenry County Stormwater Management Ordinance meets or exceeds all the state and NFIP floodplain regulatory requirements. These standards are enforced in all communities. Also, the McHenry County definition for "development" in the Stormwater Management Ordinance is the same as the definition required by the NFIP. This ensures all activities in the floodplain are being properly regulated. Also, compensatory storage is required at a ratio of a minimum of 1.0 to 1.0 and up to 1.5 to 1.0 in McHenry County, plus a 2-foot flood protection elevation. Municipalities that participate in the NFIP are each responsible for maintaining their "good standing" with FEMA and the NFIP. On September 8, 2021, unincorporated McHenry County received a "Community Assistance Visit" (CAV) from FEMA for the purposes of a CRS Cycle verification. The CAV allows the community to demonstrate to FEMA that the floodplain regulations are being properly administered and enforced.

**NFIP Participation:** Participation in the National Flood Insurance Program is voluntary. To successfully participate in the NFIP, the County has completed an application, adopted a resolution of intent to participate and cooperate with FEMA, and adopted and submitted a floodplain management ordinance that meets or exceeds the minimum NFIP criteria. The County, all unincorporated areas and townships, and most municipalities participate in the NFIP.

The County implements and enforces NFIP floodplain management regulations and substantial improvement/substantial damage provisions through the enforcement of the McHenry County

Stormwater Management Ordinance, for all jurisdictions that have adopted it. The County’s role in enforcing the NFIP includes:

- Adopt and enforce local floodplain ordinance and permits,
- Conduct substantial improvement and substantial damage determinations,
- Maintain copies of permit documentation and data on the cost of development and any improvements to parcels in the floodplain, and
- Inspect damaged buildings to determine if the substantial damage threshold has been met.

Table 4-3 below describes participation in the NFIP for each participant, as applicable, in accordance with NFIP regulatory requirements.

**Table 4-3 McHenry County NFIP Participation**

Municipality	Adoption of NFIP minimum floodplain management criteria via local regulation	Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHAs	Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP	Post-event Implementation of substantial improvement/substantial damage provisions
Algonquin, Village of	Kane County SMO	Yes	President Debby Sosine	Yes
Barrington Hills, Village of	Lake County WDO	No	President Brian Cecola	No
Bull Valley, Village of	McHenry County SMO	No	President Emily Berendt	No
Cary, Village of	McHenry County SMO	Yes	Mayor Mark Kownick	Yes
Crystal Lake, City of	McHenry County SMO	Yes	Mayor Haig Halebian	Yes
Fox Lake, Village of	Lake County WDO	No	Mayor Donny Schmit	No
Fox River Grove, Village of	Lake County WDO	Yes	President Marc McLaughlin	Yes
Greenwood, Village of	McHenry County SMO	No	President John Ferris	No
Harvard, City of	McHenry County SMO	Yes	Mayor Michael Kelly	Yes
Hebron, Village of	McHenry County SMO	Yes	President Robert Shelton	Yes
Holiday Hills, Village of	McHenry County SMO	Yes	Acting President Jeff Giles	Yes
Huntley, Village of	Kane County SMO	Yes	Mayor Timothy Hoeft	Yes
Island Lake, Village of	Lake County WDO	Yes	Mayor Richard McLaughlin, Jr.	Yes
Johnsburg, Village of	McHenry County SMO	Yes	President Edwin Hettermann	Yes
Lake in the Hills, Village of	McHenry County SMO	Yes	President Ray Bogdanowski	Yes
Lakemoor, Village of	McHenry County SMO & Lake County WDO	No	Mayor Colin McIntyre	No
Lakewood, Village of	McHenry County SMO	Yes	President David Stavropoulos	Yes
Marengo, City of	McHenry County SMO	Yes	Mayor John Koziol	Yes
McCullom Lake, Village of	McHenry County SMO	No	President Marilyn Shepit	No
McHenry, City of	McHenry County SMO	Yes	Mayor Wayne Jett	Yes
Oakwood Hills, Village of	McHenry County SMO	No	President Chad Rider	No

Municipality	Adoption of NFIP minimum floodplain management criteria via local regulation	Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHAs	Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP	Post-event Implementation of substantial improvement/substantial damage provisions
Port Barrington, Village of	Lake County WDO	No	President Keith Vogeler	No
Prairie Grove, Village of	McHenry County SMO	Yes	President David Underwood	Yes
Richmond, Village of	McHenry County SMO	No	President Toni Wardanian	No
Ringwood, Village of	McHenry County SMO	Yes	President Rick Mack	Yes
Spring Grove, Village of	McHenry County SMO	Yes	President Mark Eisenberg	Yes
Trout Valley, Village of	McHenry County SMO	No	President Robert Baker	No
Union, Village of	McHenry County SMO	Yes	President Robert Wagner	Yes
Wonder Lake, Village of	McHenry County SMO	Yes	President Anthony Topf	Yes
Woodstock, City of	McHenry County SMO	Yes	Mayor Michael Turner	Yes
Unincorporated McHenry County	McHenry County SMO	Yes	Chairman Michael Buehler	Yes

### 4.7.3 Soil Erosion and Sedimentation Control

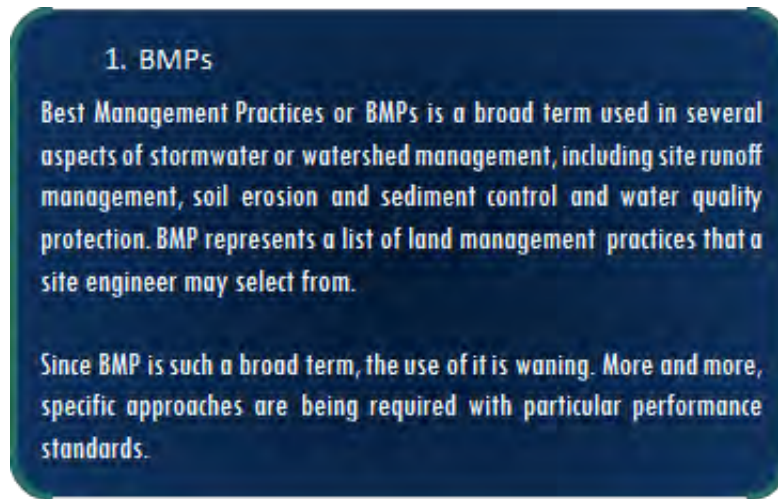
Erosion can occur when any soil is exposed to the wind or rain, but it also occurs along streambanks and shorelines as the volume and velocity of flow or wave action destabilize and wash away the soil. Suspended sediment will settle out where flowing water slows down. It can clog storm sewers, drain tiles, culverts, and ditches, and reduce the water transport and storage capacity of river and stream channels, lakes, and wetlands.

Additionally, the sediment often brings chemicals, heavy metals and other pollutants, and light and oxygen are reduced in the stream, which impairs water quality. Sediment has been identified by the U.S. EPA as the nation’s number one nonpoint source pollutant for aquatic life.

Techniques to minimize erosion include phased construction, minimal land clearing, and stabilizing bare ground as soon as possible with vegetation and other soil stabilizing practices. If erosion occurs, other measures are used to capture sediment before it leaves the site. Silt fences, sediment traps and vegetated filter strips are commonly used to control sediment transport. Runoff from the site can be slowed down by terraces, contour strip farming, no-till farm practices, constructed wetlands, and impoundments (e.g., sediment basins and farm ponds). Slowing surface water runoff on the way to a drainage channel increases infiltration into the soil and reduces the volume of topsoil eroded from the site. These practices or approaches are commonly referred to as “best management practices” or BMPs (Figure 4-10).



**Figure 4-10 Best Management Practices for Soil Erosion and Sedimentation Control**



**Local Implementation:** Standards for soil erosion and sediment control during and following project construction are components of the McHenry County Stormwater Management Ordinance and are consistent with the Illinois Environmental Protection Agency’s (IEPA) ILR10 Permit, as issued. The most recent version of the ILR10 Permit is January 2022.

**4.7.4 Wetland Protection**

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality and provide habitat for many species of fish, wildlife, and plants.

Wetlands that are determined to be part of the Waters of the United States (WOTUS) are regulated by the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (USEPA) under Section 404 of the Clean Water Act. Before a “404” Permit is issued, the plans are reviewed by several agencies, including the Corps and the U.S. Fish and Wildlife Service. Each of these agencies must sign off on individual permits. Not regulated under Section 404 are other wetlands that are not within the WOTUS, and they are referred to as “isolated wetlands.”

There are also Nationwide Permits that allow small projects that meet certain criteria to proceed without Individual Permits. If a permit is issued by the Corps (and/or by McHenry County), the impact of the development is typically required to be mitigated. Wetland mitigation can include creation, restoration, enhancement, or preservation of wetlands elsewhere. Wetland mitigation is often accomplished within the development site; however, mitigation is allowed off-site and sometimes in another watershed. The appropriate type of mitigation is addressed in each permit. Some developers and government agencies have accomplished the required mitigation by buying into a wetland bank. Wetland banks are large wetlands created for the purpose of mitigation. The banks accept money to reimburse the owner for setting the land aside for development.

**Local Implementation:** Both Corps WOTUS (jurisdictional wetlands) and isolated wetlands are regulated in the McHenry County Stormwater Management Ordinance. Wetlands must be

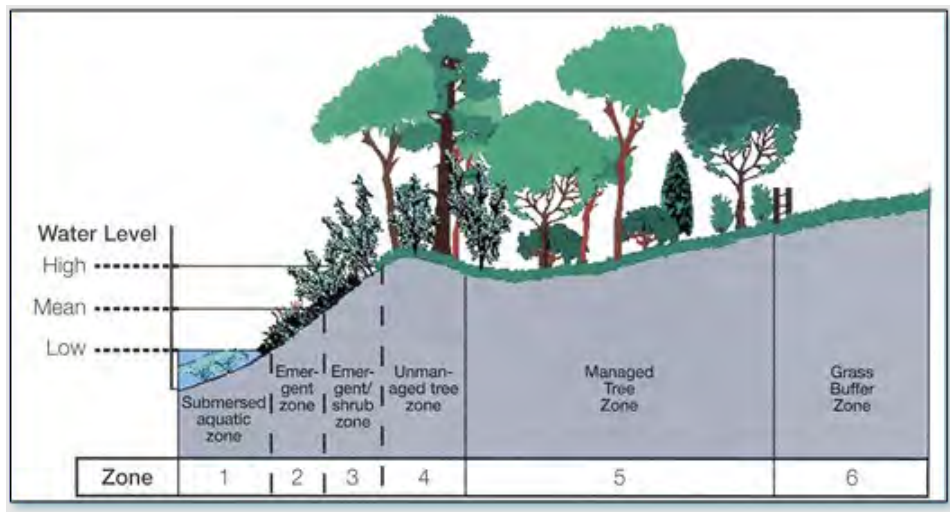
properly identified and delineated according to the standards in the Stormwater Management Ordinance, which are consistent with the Corps' standards. Disturbance of wetlands located within the WOTUS requires a permit from the Corps before a permit is issued under the McHenry County Stormwater Management Ordinance. Additional education about the importance of wetlands is needed.

#### 4.7.5 Riparian Environment Protection

Riparian environments are the areas surrounding or adjacent to open bodies of water, including streams, lakes, and wetlands. Riparian environments provide a range of functions. For example, they filter runoff, enhance streambank stability, and provide a habitat for flora and fauna. Riparian areas are generally established as buffer areas, and the size depends on the nature or the quality of the water body. Figure 4-11 illustrates an example of environment protection using a riparian buffer, and Figure 4-12 provides descriptions of the zones shown in Figure 4-11.

**Local Implementation:** Buffer areas are required in the McHenry County Stormwater Management Ordinance for areas meeting the definition of WOTUS or Isolated Waters of McHenry County. The Stormwater Management Ordinance requires that all buffer areas be maintained free from development, including disturbance of the soil, dumping or filling, erection of structures and placement of impervious surfaces, with some exceptions.

**Figure 4-11 Riparian Environment Protection**



Aquatic and Riparian Buffer Plant Zones (Source: USDA, NRCS)

**Figure 4-12 Aquatic and Riparian Buffer Plant Zones**

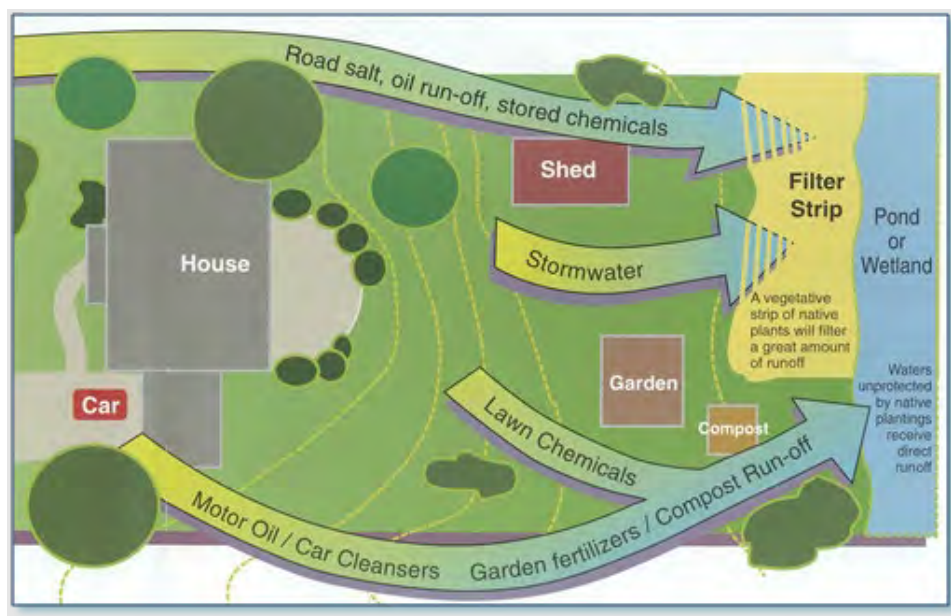
2. Different types of plants are used in different buffer zones along a channel. Zone 1 plants are normally submerged while Zone 2 plants are inundated during much of the growing season. Zone 3 plants are water tolerant, but are flooded only during highwater. By using the proper plants in each zone, they stabilize streambanks, filter polluted runoff, and provide habitat.

#### 4.7.6 Water Quality Requirements

Point source pollutants come from pipes such as the outfall of a municipal wastewater treatment plant. They are regulated by the U.S. and Illinois Environmental Protection Agencies. Nonpoint source pollutants come from non-specific locations and are harder to regulate. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining, and forestry (see Figure 4-13). These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches, and streams.

BMPs can be employed to minimize water quality degradation, preserve beneficial natural features onsite, maintain natural base flows, minimize habitat loss, and provide multiple uses of drainage and storage facilities.

**Figure 4-13 Stormwater Management**



Source: Living With Wetlands, A Handbook for Homeowners in Northeastern Illinois

**Local Implementation:** Water quality protection practices are included in the McHenry County Stormwater Management Ordinance. The Stormwater Management Ordinance requires, in general, that runoff from impervious areas be directed toward pervious areas before leaving the site.

#### 4.7.7 Implementation of the McHenry County Stormwater Management Ordinance

Figure 4-13 above shows the benefits of using BMPs in stormwater management for non-point pollution sources. The McHenry County Department of Planning and Development is responsible for administering and enforcing the Stormwater Management Ordinance. Communities, based on their regulatory resources, are granted “certified” status by the County for the review of permit applications and permit issuance. Table 4-4 shows the status of McHenry County municipalities for the implementation of the Stormwater Management Ordinance.

The Stormwater Technical Advisory Committee (TAC) meets regularly to discuss Ordinance implementation to ensure consistent interpretation and enforcement of ordinance provisions.

**Table 4-4 McHenry County Stormwater Management Ordinance Certified Community Status**

<b>Municipality:</b>	<b>Status:</b>
Village of Algonquin	Enforces Kane County stormwater regulations
Village of Barrington Hills	Lake-part
Village of Bull Valley	Non-Certified
Village of Cary	Certified
City of Crystal Lake	Certified
Village of Fox Lake	Lake-part
Village of Fox River Grove	Lake-full
Village of Greenwood	Non-Certified
City of Harvard	Certified
Village of Hebron	Certified
Village of Holiday Hills	Non-Certified
Village of Huntley	Kane County
Village of Island Lake	Lake-full
Village of Johnsburg	Certified
Village of Lake in the Hills	Certified
Village of Lakemoor	Non-Certified
Village of Lakewood	Certified
City of Marengo	Certified
Village of McCullom Lake	Non-Certified
City of McHenry	Certified
Village of Oakwood Hills	Non-Certified
Village of Port Barrington	Lake-part
Village of Prairie Grove	Certified
Village of Richmond	Non-Certified
Village of Ringwood	Certified
Village of Spring Grove	Certified
Village of Trout Valley	Non-Certified
Village of Union	Certified
Village of Wonder Lake	Certified
City of Woodstock	Certified

## 4.8 Conclusions

The following conclusions for the capacity and capabilities of McHenry County to implement prevention measures for natural hazard mitigation include:

1. Building codes are the prime preventive measure for high winds, snowstorms, and earthquakes. Rigorous enforcement of the latest available building codes, with an adequately trained staff, provides a more sustainable community.
2. The County and nearly all communities have adopted the International Code series, which provides better protection from natural hazards. However, several communities are still in the process of updating the most recent IC series. According to the Institute for Building and Home Safety, the International Residential and Building Codes do not adequately protect new construction from damage by tornadoes (wind) and hail.

3. Based on the national Building Code Effectiveness Grading Schedule (BCEGS), administration of building codes in McHenry County is generally good. Communities with a BCEGS rating of 5 or less are currently prioritized for FEMA Hazard Mitigation Assistance funding.
4. State administration of the installation of mobile or manufactured homes does not guarantee that they will be adequately tied down or protected from flooding and other hazards.
5. Critical facilities constructed in floodplains are held to higher standards than other structures built in floodplains, particularly if funded through federal dollars.
6. Most comprehensive and land use plans address floodplains and the need to preserve these hazardous areas from intensive development. However, many zoning ordinances do not designate flood prone areas for any special type of land use.
7. The McHenry County Stormwater Management Ordinance's provisions for stormwater management, floodplain development, soil erosion and sediment control, and wetland, riparian and water quality protection meet and exceed minimum national and State standards.

Given these conclusions, McHenry County and its jurisdictions have strong capabilities to implement further preventive measures as proposed by the 2023 Plan Update.

## 4.9 Recommendations

The following preventive measure recommendations are provided by the Mitigation Committee:

1. The public, developers, builders, and decision makers should be informed about the hazard mitigation benefits of building codes and the McHenry County Stormwater Management Ordinance.
2. Communities that have not adopted the latest version of the international series of codes should do so; and on a regional basis, municipal and County code enforcement staffs should work together to develop template building code language to strengthen new buildings against damage by high winds, tornadoes, and hail.
3. All communities should work to improve code administration and enforcement and should also be trained in implementing the codes that are applicable to hazard mitigation.
4. The County and municipalities that participate in the NFIP should ensure that they fully and properly administer and enforce the requirements of the NFIP, and fully enforce all provisions of the Countywide Stormwater Management Ordinance.
5. The adequacy or current requirements for manufactured home and recreational vehicle parks for protection from natural hazards should be examined, especially for concerns pertaining to placement in flood prone areas, tie downs and sheltering.
6. On a regional basis, municipal and County planning and engineering staff should develop example subdivision ordinance language that requires new infrastructure to have hazard mitigation provisions, such as secondary access to subdivisions.
7. Municipal comprehensive plans, land use plans and zoning ordinances should incorporate open space provisions that will protect properties from flooding and preserve wetlands, groundwater quality and recharge, and farmland. McHenry County should continue to enforce all aspects of the Stormwater Management Ordinance. The County should also maintain the TAC.
8. Offices responsible for design, construction or permitting critical facilities should ensure that the design accounts for natural hazards and adjacent land uses.

9. Communities (certified and non-certified) need to understand and consistently enforce the McHenry County Stormwater Management Ordinance provisions. The McHenry County Technical Advisory Committee should continue their efforts in these areas.
10. McHenry County and municipalities should consider joining the NFIP's CRS program. For the municipalities already involved in CRS, they should work to improve their CRS class.

## 4.10 References

1. American Planning Association and FEMA. 1997. *PAS Report 473 - Subdivision Design in Flood Hazard Areas*.
2. Chicago Metropolitan Agency for Planning. 2016. *EPA-Compliant Watershed-Based Plans in Northeastern Illinois*. Accessed: <http://www.cmap.illinois.gov/documents/10180/12330/Watershed-Based+Plans.jpg>
3. FEMA. 2006. *Design Guidance for Shelters and Safe Rooms – FEMA 453*.
4. FEMA. 2015. *Federal Flood Risk Management Standard*. Accessed: <https://www.fema.gov/floodplain-management/intergovernmental/federal-flood-risk-management-standard>.
5. FEMA. 2017. *National Flood Insurance Program Community Rating System Coordinator's Manual*. Accessed: [https://www.fema.gov/sites/default/files/documents/fema\\_community-rating-system\\_coordinators-manual\\_2017.pdf](https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinators-manual_2017.pdf).
6. Illinois Association for Floodplain and Stormwater Management. 2010. *The IAFSM Current, Spring 2010 Newsletter*.
7. Illinois Department of Public Health. 2000. *Guidelines for Installing Manufactured Homes in Illinois*.
8. Illinois Department of Public Health. 2000. *Regulation of Factory Built Structures in Illinois*.
9. McHenry County. 2020. *McHenry County Stormwater Management Ordinance*.
10. Northeastern Illinois Planning Commission. 1992. *Best Management Practices Guidebook for Urban Development*.
11. Northeastern Illinois Planning Commission. 1994. *Environmental Consideration in Comprehensive Planning*.
12. Northeastern Illinois Planning Commission. 1997. *Reducing the Impacts of Urban Runoff – The Advantages of Alternative Site Design Approaches*.
13. South Suburban Mayors and Managers Association. 2000. *Stormwater Management – The Benefits of Alternative Approaches*.
14. Tennessee Valley Authority. 1997. *Banks and Buffers – A Guide to Selecting Native Plants for Streambanks and Shorelines*.
15. The Wetlands Initiative. 1998. *Living With Wetlands, A Handbook for Homeowners in Northeastern Illinois*.
16. *Stream and Wetland Protection: A Natural Resource Management Priority in Northeastern Illinois*, Northeastern Illinois Planning Commission, 1991.
17. Survey of McHenry County municipalities and townships, and review of ordinances, 2023.

## CHAPTER 5 - PROPERTY PROTECTION

Property protection hazard mitigation measures are used to modify a building or a property that is subject to a hazard to reduce potential damage. Property protection measures fall under the following approaches:

- Modify the site to keep the hazard from reaching the building,
- Modify the building (retrofit the building) so it can withstand the impacts of the hazard, or
- Insure the property to provide financial relief after the damage occurs.

The word “building” can refer to residential, commercial, or industrial structures, or it can mean infrastructure facilities (treatment plants, electrical substations, roads) or other public structures. Property protection measures are normally implemented by the property owner (public or private); although in many cases technical and financial assistance can be provided by a government agency. These are discussed later in this chapter.

### 5.1 Barriers, Elevation, Relocation, and Acquisition

Most major impacts of hazards are to people and improved property. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements. A fire break is an example of this approach – brush and other fuel are cleared away from the building so a fire may not reach it. For the hazards considered in this plan, flooding has the greatest opportunity to be kept away from a building. There are four common methods to do this:

- Erect a barrier between the building and the source of flooding,
- Move the building out of the flood prone area,
- Elevate the building above the flood level, or
- Demolish the building.

**Figure 5-1. Hazards Addressed By Floodproofing**

Hazards Addressed	
✓	Floods
✓	Summer Storms
	Winter Storms
	Extreme Cold
	Extreme Heat
	Tornadoes
	Drought
✓	Groundwater

In accordance with Figure 5-1, these methods address flooding, stormwater issues caused by summer storms, and indirectly provide protection from groundwater contamination. The advantages and disadvantages to these four methods are discussed below. Table 5-1 lists various types of flood problems reported in McHenry County, as reported through a 2023 survey of municipalities and townships.

**Table 5-1 Reported Types of Existing Flood Problems in McHenry County by Municipality**

Municipality*	Stormwater Flooding	Stream Overbank Flooding	Foundation Seepage	Groundwater
Algonquin, Village of	Yes	No	No	No
Barrington Hills, Village of	Yes	No	No	No
Bull Valley, Village of	Yes	No	No	No
Cary, Village of	Yes	No	No	No
Crystal Lake, City of	Yes	No	Yes	Yes
Fox River Grove, Village of	No	Yes	No	No
Greenwood, Village of	Yes	No	Yes	No
Harvard, City of	No	No	No	No
Hebron, Village of	Yes	No	No	No
Holiday Hills, Village of	No	No	No	No

Municipality*	Stormwater Flooding	Stream Overbank Flooding	Foundation Seepage	Groundwater
Huntley, Village of	No	No	No	No
Johnsburg, Village of	Yes	Yes	Yes	Yes
Lake in the Hills, Village of	No	Yes	No	No
Lakewood, Village of	Yes	No	Yes	Yes
Marengo, City of	No	No	No	No
McCullom Lake, Village of	Yes	No	No	No
McHenry, City of	Yes	No	No	No
Oakwood Hills, Village of	Yes	No	No	No
Prairie Grove, Village of	No	No	Yes	Yes
Richmond, Village of	Yes	No	No	No
Ringwood, Village of	Yes	No	No	No
Spring Grove, Village of	No	Yes	No	No
Trout Valley, Village of	Yes	Yes	Yes	No
Union, Village of	Yes	Yes	No	No
Wonder Lake, Village of	Yes	No	Yes	Yes
Woodstock, City of	No	No	No	No
Unincorporated McHenry County	Yes	Yes	Yes	Yes

\*Island Lake, Lakemoor, Port Barrington data is not available

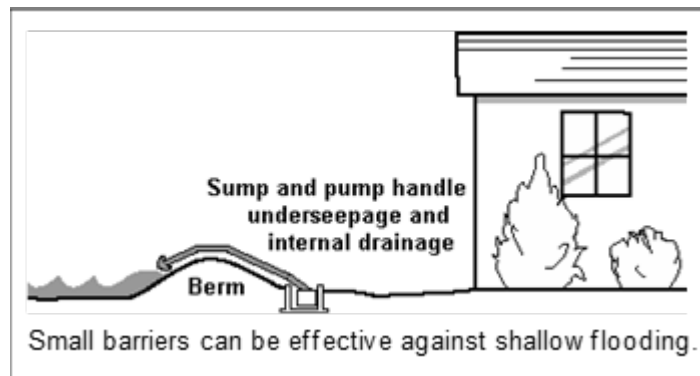
**Barriers:** A flood protection barrier can be built of dirt or soil (“berm”) or concrete or steel (“floodwall”). Berms take up more space than floodwalls, but floodwalls are more expensive than berms (Figure 5-2).

Barriers can only be built so high and still withstand hydrodynamic and hydrostatic pressure. They can be overtopped by a flood higher than expected. Barriers made of earth are susceptible to erosion from rain and floodwaters if not properly sloped, covered with grass, and maintained. A berm can settle over time, lowering its protection level. A floodwall can crack, weaken, and lose its watertight seal. Therefore, barriers need careful design and maintenance (and insurance on the building, in case of failure).

Barriers also require careful planning so as not to create flooding or drainage problems on neighboring properties. If the ground is porous and if floodwaters will stay up for more than an hour or two, the design needs to account for leaks, seepage of water underneath, and rainwater that falls inside the perimeter.

**Relocation:** Moving a building to higher ground is the surest and safest way to protect it from flooding. Relocation of a building can be to a new property outside of the floodplain or, for large lots, to a higher location (outside of the floodplain) on the existing property. Any building can be moved; however, the cost goes up for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings.

**Figure 5-2 Barriers**





**Building Elevation:** Raising a building above the flood level can be almost as effective as moving it out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents. Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. Elevation has proven to be an acceptable and reasonable means of complying with floodplain regulations that require new, substantially improved, and substantially damaged buildings to be elevated above the base flood elevation.

Elevating a building will change its appearance. If the required amount of elevation is low, the result is like putting a building on a 2- or 3-foot-high crawlspace. If the building needs to be raised more than four feet, owners are concerned that it will stick out like a sore thumb, and they may decline to implement an elevation project. Yet, many owners have successfully and attractively elevated their homes more than eight feet.

Basements present another challenge with the elevation approach. All utilities are elevated, and the basement is filled in to protect the walls from water pressure. The owner loses the use of the basement, which may deter him or her from trying this approach.

Elevation may expose the structure to greater impacts from other hazards. If not braced and anchored properly, an elevated building may have less resistance to the pressures of high winds. Careful design and construction, however, should prevent these secondary problems.

**Demolition:** If a home has been heavily damaged and susceptible to future damage, it is safest for owners to relocate. Acquisition, followed by demolition, is most appropriate for buildings that are dilapidated and are not worth protecting, but acquisition and demolition should also be considered for structures that would be difficult to move—such as larger, slab foundation, or masonry structures. Generally, demolition projects are undertaken by a government agency, so the cost is not borne by the property owner, and the land is converted to public use, such as a park.

One problem that sometimes results from an acquisition and demolition project is a “checkerboard” pattern in which nonadjacent properties are acquired. Creating such an acquisition pattern in a community adds to the maintenance costs that taxpayers must support.

**Local Implementation:** Unincorporated McHenry County, the Village of Algonquin, the City of Crystal Lake, and the City of Woodstock have acquired and demolished buildings that have experienced repetitive flood losses.

McHenry County and the Villages of Holiday Hills and Johnsburg have buildings that have been elevated according to requirements of the NFIP and the McHenry County Stormwater Management Ordinance. The countywide first floor elevation requirement is 2 feet above the FEMA-established base flood elevation for new construction, elevations, and substantial improvements.

## 5.2 Retrofitting and Building Modifications

An alternative to floodproofing, structure relocation, and acquisition/demolition is to modify or “retrofit” the site or building to minimize or even prevent damage. There are a variety of techniques to do this. This section looks at the measures that can be implemented to protect existing buildings from damage by floods, sewer backup, earthquakes, tornadoes, summer, and winter storms (see Figure 5-3).

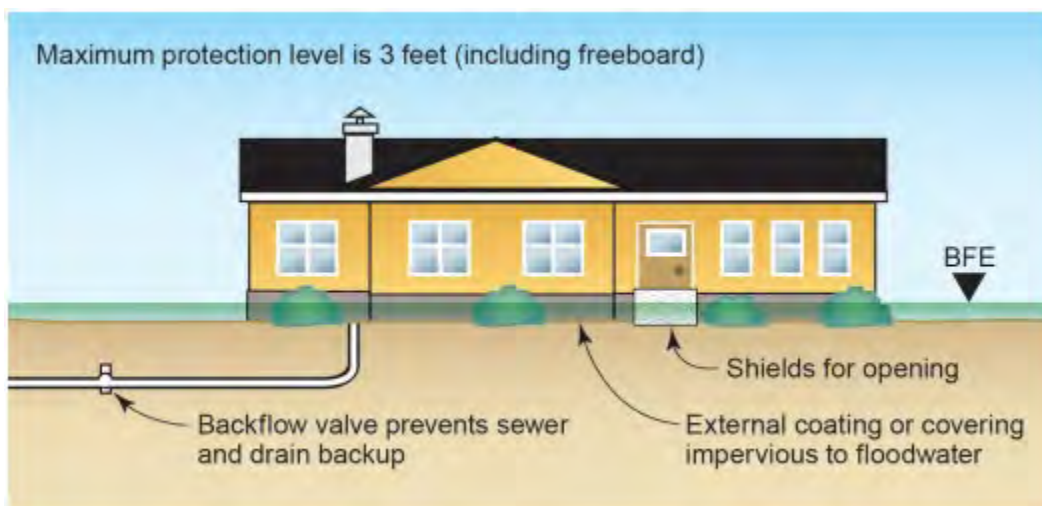
**Figure 5-3. Hazards Addressed by Retrofits**

Hazards Addressed	
✓	Floods
✓	Summer Storms
✓	Winter Storms
✓	Extreme Cold
	Extreme Heat
✓	Tornadoes
	Drought
✓	Groundwater

### 5.2.1 Flood Retrofitting

**Dry Floodproofing:** Flood retrofitting measures include dry floodproofing where all areas below the flood protection level are made watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings (doors, windows, and vents) are closed, either permanently, with removable shields, or with sandbags (Figure 5-4).

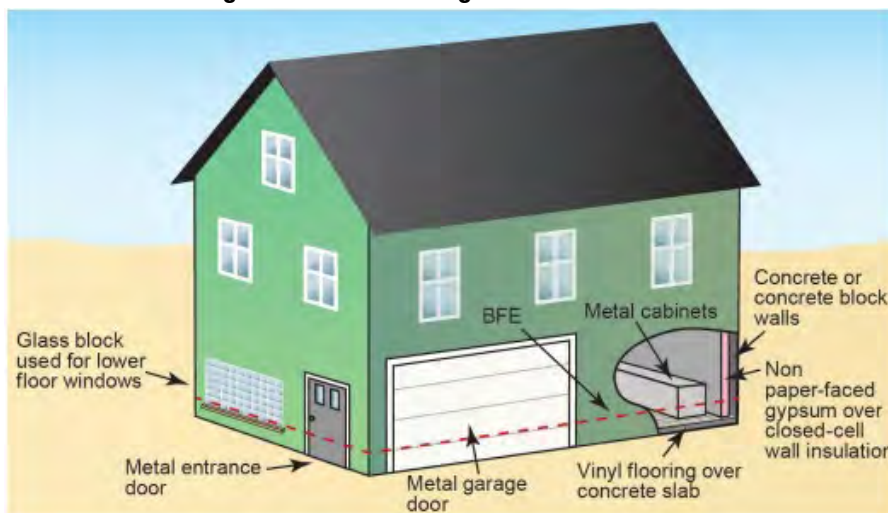
**Figure 5-4 Dry Floodproofed Building**



Dry floodproofing of new and existing nonresidential buildings in the regulatory floodplain is permitted under State, FEMA, and County regulations. Dry floodproofing of existing residential buildings in the floodplain is also permitted if the building is not substantially damaged or being substantially improved. Owners of buildings located outside the regulatory floodplain can always use dry floodproofing techniques.

**Wet floodproofing:** The alternative to dry floodproofing is wet floodproofing. Water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the flood level are replaced with materials that are not subject to water damage. For example, concrete block walls are used instead of wooden studs and gypsum wallboards. The furnace, water heater, and laundry facilities are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms. An example of a wet floodproofing using flood damage-resistant materials is shown in Figure 5-5.

**Figure 5-5 Flood Damage-Resistant Materials**



Wet floodproofing has one advantage over the other approaches that no matter how little is done, flood damage is reduced. Thousands of dollars in damage can be prevented by simply moving furniture and electrical appliances out of a basement.

**Sewer Backup:** A third flood protection modification addresses flooding caused by overloaded sanitary or combined sewers. Four approaches may be used to protect a structure against sewer backup to include floor drain plugs, floor drain standpipes, overhead sewers, and backflow protection valves.

The first two approaches keep water from flowing out of the lowest opening in the building, the floor drain and cost less than \$25. However, if water becomes deep enough in the sewer system, it can flow out of the next lowest opening, such as a toilet or tub, or it can overwhelm a drain plug by hydrostatic pressure and flow into the building through the floor drain. The other two measures, overhead sewers and backflow protection valves keep water in the sewer line during a backup. These are more secure but more expensive (\$3,000-\$4,000).

For dry floodproofing, wet floodproofing, and sewer backup prevention, it is important to consider what contents of a building are suitable for keeping in basements or crawl spaces. Valuable and invaluable items, such as photographs, should be kept elsewhere if the seepage or flooding occurs even with the retrofitting measures in place.

### 5.2.2 Tornado Retrofitting

Tornado retrofitting measures include constructing an underground shelter or “safe room” at the first-floor level to protect the lives of the occupants. Aboveground shelters are often a better choice and can function as a storage shed if outside or closet/bathroom if built into the home. Aboveground shelters are also less likely to trap people after a storm if debris is blocking the exit.

Safe rooms are built by connecting all parts of the shelter together (walls, roof, and foundation) using adequate fasteners or tie downs. These fasteners help hold the safe room together when the combination of high wind and pressure differences work to pull the walls and ceiling apart. The walls of the safe room are constructed out of plywood and metal sheeting to protect people from windborne missiles (flying debris) with the strong winds of a tornado. Figure 5-6 shows a safe room still standing in the aftermath of a tornado. More information on safe rooms can be found in [FEMA Publication 320](#).

**Figure 5-6 Safe Room example**



Another retrofitting approach for tornadoes and high winds is to secure the roof, walls and foundation with adequate fasteners or tie downs. Tiedowns help hold the building together when the combination of high wind and pressure differences work to pull the building apart. This measure also applies to manufactured homes.

A third tornado and high wind protection modification is to strengthen garage doors, windows, and other large openings. If winds break the building’s “envelope,” the pressures on the structure are greatly increased. Impact-resistant glass is also recommended for high wind or tornado protection.

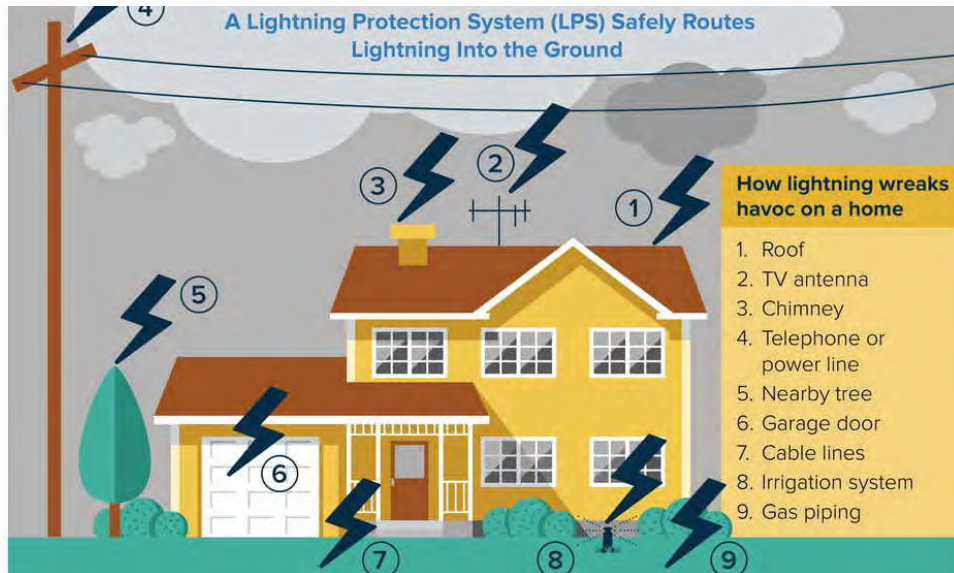
### 5.2.3 Wind, Lightning, Hail Retrofitting

Retrofitting approaches to protect private or public buildings from the effects of thunderstorms include:

- Storm shutters
- Lightning rods (see Figure 5-7)
- Strengthening connections and tie-downs (like tornado retrofitting)
- Impact-resistant glass in windowpanes
- Surge protectors at electrical outlets

Also, roofs can be replaced with materials less susceptible to damage by hail, such as modified asphalt or formed steel shingles.

**Figure 5-7 Lightning Protection**



### 5.2.4 Severe Winter Storms and Extreme Cold Hazard

Winter storm retrofitting measures include improving insulation on older buildings and relocating water lines from outside walls to interior spaces. Windows can be sealed or covered with an extra layer of glass (storm windows) or plastic sheeting. Roofs can be retrofitted to shed heavy loads of snow and prevent ice dams that form when snow melts.

### 5.2.5 Earthquake Retrofitting

Earthquakes present two hazards for buildings and people – a hazard for the structure itself and a hazard for the building’s content (non-structural hazards). Earthquake retrofitting measures for the structure include:

- Removing masonry overhangs that will fall onto the street during shaking,
- Bracing the walls of the building provides structural stability, or
- Bolting sill plates to the foundation.

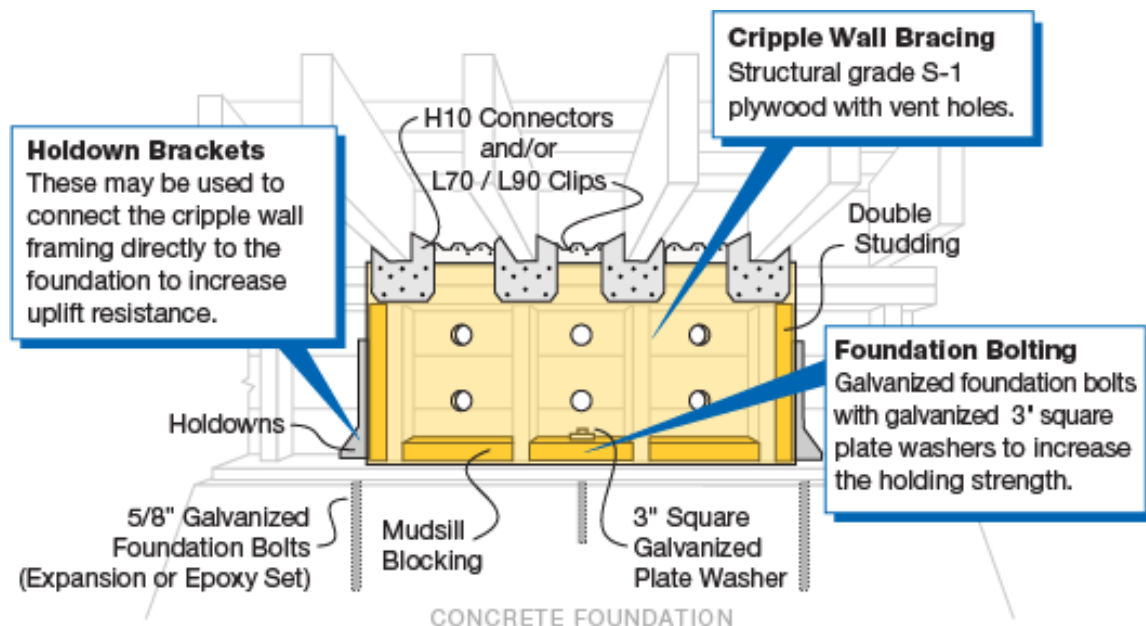
These measures can be very expensive and should be considered for buildings on a case-by-case basis. Measures that protect against non-structural seismic hazards typically involve small modifications. Retrofitting activities for non-structural hazards include:

- Tying down appliances, water heaters, bookcases, and fragile furniture so they won't fall over during a quake (Figure 5-8),
- Installing latches on drawers and cabinet doors,
- Mounting picture frames and mirrors securely,
- Installing flexible utility connections for water and gas lines, and
- Anchoring and bracing propane tanks and gas cylinders.

These approaches can be very cost effective and have little or no impact on the appearance of a building, yet they are important measures for keeping buildings safer and protecting lives during earthquake events.

While these simple and inexpensive measures may be cost effective for a home or business, they may not be sufficient for protection of critical facilities. Fire stations need to be sure that they can open their doors and hospitals must be strong enough to continue operating during the shocks and aftershocks. Again, critical facility earthquake retrofits should be evaluated on a case-by-case basis and consider the appropriate level of earthquake risk present in McHenry County.

**Figure 5-8 Earthquake Retrofitting**



**Typical Foundation Bolting & Cripple Wall Bracing**

### 5.2.6 Earthquake Retrofitting for Infrastructure and Lifelines

Infrastructure hardening, attention to lifelines and bridge strengthening are important elements of earthquake mitigation. From FEMA Publication Number 271, *Seismic Design Guidelines and Standards for Lifelines* (1996):

*Lifelines are the public works and utility systems that support most human activities: individual, family, economic, political, and cultural. The various lifelines can be classified under the following five systems: electric power, gas and liquid fuels, telecommunications, transportation, and water supply and sewers.*

The first step in protecting lifeline systems is the prioritization of critical facilities, utility systems, and other infrastructure. The involvement of state agencies, such as the Illinois Department of Transportation, is important. The involvement of private owners of utility systems is also important. FEMA, through the National Earthquake Hazard Reduction Program (NEHRP) and the Central United States Earthquake Consortium offer technical guidance on retrofitting approaches.

## 5.3 Insurance

Technically speaking, insurance does not mitigate damage caused by a natural hazard. However, it does help the owner repair, rebuild, and potentially afford to incorporate some of the other mitigation measures in the process.

Insurance has the advantage that, if the policy is in force, the property is protected and no human intervention is needed for the measure to work. A standard homeowner's insurance policy will cover a property for the hazards of tornado, wind, hail, and winter storms. Separate endorsements are usually needed for earthquake coverage.

**Flood insurance:** As homeowner's insurance policies do not cover a property for flood damage, an owner can insure a building for damage by surface flooding through the National Flood Insurance Program. Flood insurance coverage is provided for buildings and their contents damaged by a "general condition of surface flooding" in the area.

Some people have purchased flood insurance because it was required by the bank when issuing a mortgage or home improvement loan. Usually, these policies just cover the building's structure and not the contents. Renters can buy contents coverage, even if the owner does not buy structural coverage on the building. There is limited coverage for basements and the floors below grade, such as bi-levels and tri-levels.

Several insurance companies have sump pump failure or sewer backup coverage that can be added to a homeowner's insurance policy. Each company has different amounts of coverage, exclusions, deductibles, and arrangements. Most are riders that cost extra. Most exclude damage from surface flooding that would be covered by a National Flood Insurance policy.

Larger local governments can self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can be a major drain on the treasury. Communities cannot expect Federal disaster assistance to make up the difference.

**Earthquake Insurance:** Earthquakes are not covered under standard homeowners or business insurance policies, but coverage is usually available for earthquake damage in the form of an endorsement to a home or business insurance policy. Cars and other vehicles are covered for earthquake damage under

the comprehensive part of the auto insurance policy. In McHenry County, property owners can obtain earthquake insurance. Earthquake insurance provides coverage for your dwelling, for your personal property, and for any additional living expense (ALE). ALE coverage can include costs for the following:

- Temporary rental home, apartment, or hotel room
- Restaurant meals
- Telephone or utility installation in a temporary residence
- Relocation and storage
- Furniture Rental
- Laundry

Premiums for earthquake insurance are very low, but deductibles are often very high.

**Local Implementation:** Flood insurance has been available in McHenry County communities since the 1970's. For the County and all municipalities that are wholly or partially in McHenry County, there are 1,017 flood insurance policies in place.

Most communities in McHenry County are enrolled in the Illinois Municipal League Risk Management Association (IML). IML provides risk management advice and coverage for all the hazards covered in this Plan, including flood and earthquake. McHenry County has an insurance policy through the IML.

## 5.4 The Government's Role

Property protection measures are usually considered the responsibility of the property owner. However, local governments should be involved in all strategies that can reduce flood losses, especially acquisition and conversion of a site to public open space. There are various roles the County or a municipality can play in encouraging and supporting implementation of these measures.

**Government Facilities:** One of the first duties of a local government is to protect its own facilities. Fire stations, water treatment plants and other critical facilities should be a high priority for retrofitting projects and insurance coverage. Often public agencies discover after the disaster that their "all-hazard" insurance policies do not cover the property for the type of damage incurred. Flood insurance is even more important as a mitigation measure because of the Stafford Act provisions discussed above.

**Public Information:** Providing basic information to property owners is the first step in supporting property protection measures. Owners need general information on what can be done. They need to see examples, preferably from nearby. Public information activities that can promote and support property protection are covered in Chapter 9.

**Financial Assistance:** Communities can help owners by helping to pay for a retrofitting project. Financial assistance can range from full funding of a project to helping residents find money from other programs. Some communities assume responsibility for sewer backups, street flooding, and other problems that arise from an inadequate public sewer or public drainage system.

Less expensive community programs include low interest loans, forgivable low interest loans and rebates. A forgivable loan is one that does not need to be repaid if the owner does not sell the house for a specified period, such as five years. These approaches don't fully fund the project, but they cost the community treasury less and they increase the owner's commitment to the flood protection project. Often, small amounts of money act as a catalyst to pique the owner's interest to get a self-protection project moving.

For example, the City of Guthrie, Oklahoma has a rebate program for installation of tornado shelters and safe rooms. The City provides up to \$1,500 per house, which can cover most of the cost.

The more common outside funding sources are listed below. Funding under Item 3 is only available after a disaster, not before, when damage could be prevented. Following past disaster declarations, FEMA, IEMA, and the Illinois Department of Natural Resources have provided advice on how to qualify and apply for these funds.

1. Pre-disaster funding sources

- FEMA’s Building Resilient Infrastructure and Communities (BRIC) grants (administered by IEMA)
- FEMA’s Flood Mitigation Assistance (FMA) grants (administered by IEMA)
- Community Development Block Grant (administered by the Department of Commerce and Economic Opportunity)
- Illinois Department of Natural Resources
- Conservation organizations, such as the Conservation Foundation and CorLands, although generally these organizations prefer to purchase vacant land in natural areas, not properties with buildings on them.

2. Post-disaster funding sources

- Insurance claims
- The National Flood Insurance Program’s Increased Cost of Compliance provision (which increases the claim payment to cover a flood protection project required by code as a condition to rebuild the flooded building)
- U.S. Housing and Urban Development (HUD) - Community Development Block Grant-Disaster Recovery (CDBG-DR)

3. Post-disaster funding sources, Federal disaster declaration needed

- FEMA’s disaster assistance (for public properties, however, after a flood, the amount of assistance will be reduced by the amount of flood insurance that the public agency should be carrying on the property) (administered by IEMA)
- Small Business Administration disaster loans (for non-governmental properties)
- FEMA’s Hazard Mitigation Grant Program (administered by IEMA)

**Acquisition Agent:** The community can be the focal point in an acquisition project. Most funding programs require a local public agency to sponsor the project. The County or a municipality could process the funding application, work with the owners, and provide some, or all, of the local share.

**Mandates:** Mandates are considered a last resort if information and incentives aren’t enough to convince a property owner to take protective actions. An example of a retrofitting mandate is the requirement that many communities disconnect downspouts from the sanitary sewer line.

There is a mandate for improvements or repairs made to a building in the mapped floodplain. If the project equals or exceeds 50 percent of the value of the original building it is considered a “substantial improvement.” The building must then be elevated or otherwise brought up to current flood protection codes. Another possible mandate is to require less expensive hazard protection steps as a condition of a building permit. For example, many communities require upgraded electrical service as a condition of a home improvement project. If a person were to apply for a permit for electrical work, the community



could require that the service box be moved above the base flood elevation or the installation of separate ground fault interrupter circuits in the basement.

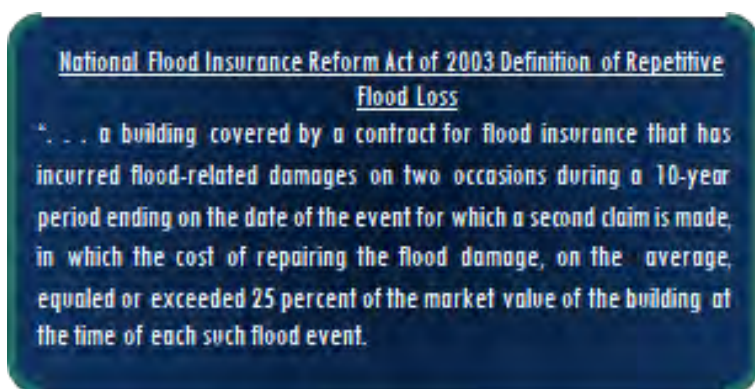
### 5.5 Repetitive Flood Loss Properties

A repetitive loss is when a home, business, or structure is in an area that has experienced two paid flood losses of \$1,000 or more each at least two times in any 10-year period.

Chapter 2 explains the criteria for designation of the County’s repetitive loss properties (Figure 5-9). These properties deserve special attention because they are more prone to damage by natural hazards than any other properties in the County. Further, protecting repetitive loss buildings is a priority with FEMA and IEMA mitigation funding programs.

When repetitive loss properties are reviewed, the key factors listed below should be used to determine appropriate property protection measures. The criteria used are based on several studies that have identified appropriate measures based on flood and building conditions. While a cost/benefit study was not conducted on each property, these guidelines show which measures are cost-effective.

**Figure 5-9 NFIP Repetitive Flood Loss Definition**



- “High hazard areas” are areas in the floodway or where the 100-year flood is two or more feet over the first floor.
- Buildings in high hazard areas or in less than good condition should be acquired and demolished.
- Buildings with basements and split-level foundations in high hazard areas should be acquired and demolished. They are too difficult to elevate and the hydrostatic pressures on the walls from deeper flooding make them too risky to protect in place.
- Buildings subject to shallow flooding from local drainage should be protected through area-wide flood control or sewer improvement projects.
- Buildings in good condition on crawlspaces should be elevated or relocated.
- Buildings in good condition on slab, basement, or split-level foundations subject to shallow flooding (less than 2 feet) can be protected by barriers and dry floodproofing.
- Recent flood claims. Some properties have not had a flood insurance claim for 20 years, indicating that some measure has probably been put in place to protect the property from repetitive flooding.

These criteria are general, and recommendations for individual structures should be made only after a site inspection. Other extenuating circumstances may also alter the recommendations.

**Local Implementation:** FEMA flood insurance data shows 119 repetitive loss structures located in the county. The communities with repetitive loss structures include Algonquin, Crystal Lake, Fox River Grove, Holiday Hills, Johnsburg, Lake in the Hills, Lakemoor, Marengo, Port Barrington, Woodstock, and McHenry County unincorporated (see Table 5-2). For purposes of investigating property protection measures for

repetitive flood loss properties, and to investigate other at-risk structures in the vicinity of the repetitive flood loss property, the properties have been grouped into areas – repetitive flood loss areas.

Figure 5-10 shows the general location of the repetitive flood loss areas throughout McHenry County. Table 5-2 shows the number of properties included in each repetitive loss area shown on Figure 5-10. Note that addresses of repetitive flood loss are not provided in this Plan, that information is confidential.

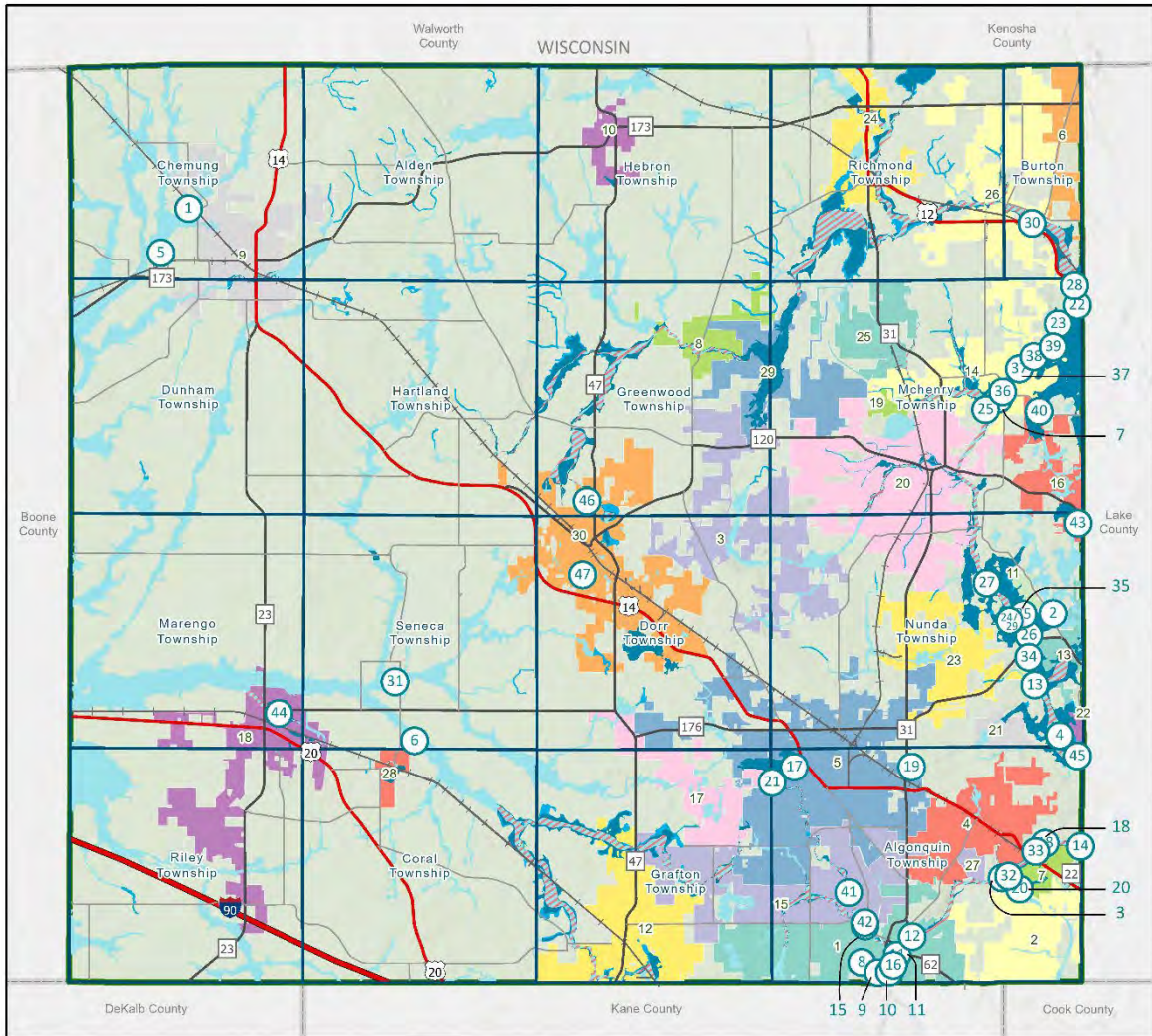
**Table 5-2 Identified McHenry County Repetitive Flood Loss Areas**

Area Number	Community	Buildings in Area	RLs in Area	RL CID	Source of Flooding	Area Number source
1	Unincorp. County	3	1	County	Unnamed Tributary off Piskasaw Creek	Created new in 2021
2	Unincorp. County	14	1	County	Griswold Lake	Created new in 2021
3	Unincorp. County	11	4	County	Fox River	Created new in 2021
4	Unincorp. County	8	1	County	Fox River	Created new in 2021
5	Unincorp. County	7	1	County	Piskasaw Creek	Created new in 2021
6	Unincorp. County	4	1	County	South Branch of Kishwaukee River	Created new in 2021
7	Unincorp. County	21	1	County	Fox River	Created new in 2021
8*	Algonquin	2	1	Algonquin	Ratt Creek	Created new in 2021
9*	Algonquin	1	1	Algonquin	Ratt Creek	Created new in 2021
10*	Algonquin	3	2	Algonquin	Ratt Creek	Created new in 2021
11*	Algonquin	2	1	Algonquin	Fox River	Created new in 2021
12*	Algonquin	15	1	Algonquin	Crystal Creek/Fox River	Created new in 2021
13	Unincorp. County	47	6	County	Fox River	Assigned in 2016
14	Unincorp. County	15	2	County	Fox River	Assigned in 2016
15	Unincorp. County	5	1	County	Crystal Creek	Assigned in 2016
16*	Algonquin	10	2	Algonquin	Fox River	Created new in 2021
17*	Crystal Lake	5	1	Crystal Lake	Crystal Lake	Created new in 2021
18	Unincorp. County	4	1	County	Fox River	Assigned in 2016
19	Unincorp. County	7	1	County	Local Drainage	Assigned in 2016
20	Unincorp. County	16	1	County	Spring Creek	Assigned in 2016
21*	Crystal Lake	1	1	Crystal Lake	Crystal Lake	Created new in 2021
22	Unincorp. County	83	8	County	Nippersink Creek	Assigned in 2016
23	Unincorp. County	34	1	County	Pistakee Lake	Assigned in 2016
24/29	Unincorp. County	40	3	County	Fox River	Assigned in 2016
25	Unincorp. County	41	3	County	Fox River	Assigned in 2016
26	Unincorp. County	86	6	County	Fox River	Assigned in 2016
27	Unincorp. County	16	6	County	Fox River	Assigned in 2016
28	Unincorp. County	108	15	County	Nippersink Creek	Assigned in 2016
30	Unincorp. County	12	4	County	Nippersink Creek	Assigned in 2016
31	Unincorp. County	5	1	County	Kishwaukee River	Assigned in 2016
32*	Fox River Grove	4	1	Fox River Grove	Fox River	Created new in 2021
33*	Fox River Grove	21	2	Fox River Grove	Fox River	Created new in 2021

Area Number	Community	Buildings in Area	RLs in Area	RL CID	Source of Flooding	Area Number source
34*	Unincorp. County	12	2	County	Fox River	Assigned in 2016
35*	Holiday Hills	163	11	Holiday Hills	Fox River, Griswold Lake	Created new in 2021
36*	Johnsburg	22	1	Johnsburg	Fox River	Created new in 2021
37*	Johnsburg	45	1	Johnsburg	Fox River	Created new in 2021
38*	Johnsburg	11	1	Johnsburg	Fox River	Created new in 2021
39*	Johnsburg	28	1	Johnsburg	Fox River	Created new in 2021
40*	Johnsburg	1	1	Johnsburg	Lily Lake Drain	Created new in 2021
41*	Lake in the Hills	2	1	Lake in the Hills	Crystal Creek	Created new in 2021
42*	Lake in the Hills	13	3	Lake in the Hills	Crystal Creek	Created new in 2021
43*	Lakemoor	1	1	Lakemoor	Lily Lake	Created new in 2021
44*	Marengo	2	1	Marengo	Stormwater	Created new in 2021
45*	Port Barrington	102	11	Port Barrington	Fox River	Created new in 2021
46*	Woodstock	2	1	Woodstock	Stormwater	Created new in 2021
47*	Woodstock	21	1	Woodstock	Stormwater	Created new in 2021

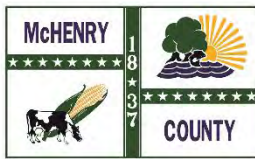
\*Buildings in the area are estimates based on 2023 aerial imagery. Detached garages are considered separate buildings.

**Figure 5-10 McHenry County Repetitive Flood Loss Areas**



## McHenry County, IL

### Repetitive Loss Areas



Map Produced by McHenry County  
GIS Department  
Date: May 2023

- McHenry Boundary
- Surrounding Counties
- Interstate
- US Highways
- State Roads
- Other Roads
- Railways
- Zone A
- Zone AE
- Floodway
- 0.2% Chance Per Year
- Repetitive Loss Areas

### Municipal Boundaries

- |                      |                    |
|----------------------|--------------------|
| 1 ALGONQUIN          | 16 LAKEMOOR        |
| 2 BARRINGTON HILLS   | 17 LAKEWOOD        |
| 3 BULL VALLEY        | 18 MARENGO         |
| 4 CARY               | 19 MCCULLOM LAKE   |
| 5 CRYSTAL LAKE       | 20 MCHENRY         |
| 6 FOX LAKE           | 21 OAKWOOD HILLS   |
| 7 FOX RIVER GROVE    | 22 PORT BARRINGTON |
| 8 GREENWOOD          | 23 PRAIRIE GROVE   |
| 9 HARVARD            | 24 RICHMOND        |
| 10 HEBRON            | 25 RINGWOOD        |
| 11 HOLIDAY HILLS     | 26 SPRING GROVE    |
| 12 HUNTLEY           | 27 TROUT VALLEY    |
| 13 ISLAND LAKE       | 28 UNION           |
| 14 JOHNSBURG         | 29 WONDER LAKE     |
| 15 LAKE IN THE HILLS | 30 WOODSTOCK       |

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## 5.6 Conclusions

The following conclusions for the capacity and capabilities of McHenry County to implement property protection measures for natural hazard mitigation include:

1. Property protection measures for natural hazards are important for McHenry County given the number of hazards and the number of buildings for which the County is at risk.
2. There are several ways to protect individual properties from damage by natural hazards. The advantages and disadvantages of each should be examined on a building-by-building basis.
3. Property owners can implement some property protection measures at little cost, especially for sites in areas of low hazards (e.g., shallow flooding, seepage, sewer backup, summer, and winter storms).
4. For other measures, such as relocation, elevation and safe rooms, the owners may need financial assistance.
5. Most property protection projects should be voluntary, but in some circumstances, projects should be required (per ordinances).
6. Government agencies can promote and support property protection measures through activities ranging from financial incentives to public information.
7. The County is unable to determine if government properties, including critical facilities, have measures to protect them from flooding, tornadoes, and other natural hazards.
8. About 1,017 of the buildings in the County's floodplains are covered by flood insurance.
9. The availability of tornado shelters or safe rooms in McHenry County manufactured home communities is unknown.
10. Addressing the repetitive flood loss problem can lead to assisting several other families on protection themselves from future floods.

Given these conclusions, McHenry County and its jurisdictions generally have the capacity to implement further property protection measures as proposed by the 2023 Plan Update.

## 5.7 Recommendations

The following property protection measures are provided by the Mitigation Committee:

1. Available property protection public education materials related to private property protection and insurance should be consolidated and tailored for McHenry County.
2. Repetitive flood loss areas should be further investigated and mitigated.
3. All property owners should be encouraged to determine if they are adequately insured for natural hazards.
4. All buildings and critical facilities in the floodplain, with priority given to buildings or facilities in the floodway, should be mitigated, to the extent that the measures are cost effective and feasible.
5. A standard checklist should be developed to evaluate a property's exposure and vulnerability to damage from the hazards most prevalent in McHenry County. The checklist should be provided to each agency participating in this planning process and made available to the public.
6. Each public entity should evaluate its own properties using the standard checklist. A priority should be placed on determining critical facilities' vulnerability to damage and whether public properties are adequately insured.
7. Each public entity should protect its own publicly owned facilities with appropriate mitigation measure(s), except where efficiencies allow for joint funding and joint projects.

8. The County and municipalities should consider the feasibility of providing information and technical advice to floodplain property owners for protecting their property.
9. Structural elevation or acquisition alternatives should be investigated for flood prone properties when a regional project is not feasible.
10. Feasible structural elevation or acquisitions should be funded through grants or through capital funding.
11. Positive incentives should be maintained and created by the County and municipalities to encourage property protection by property owners. Communities should consider cost-sharing programs, such as rebates, to encourage low-cost property protection.
12. McHenry County should seek property protection financial assistance for flood and tornado mitigation projects for properties at risk.
13. The availability of tornado shelters or safe rooms in McHenry County should be investigated.
14. Safe rooms should be constructed wherever needed in McHenry County with priority given to schools and critical facilities.

## 5.8 References

1. FEMA. 1993. *Disaster Mitigation Guide for Business and Industry, FEMA I-190*.
2. FEMA. 2012. *Engineering Principles and Practices for Retrofitting Flood Prone Residential Structures (Third Edition), FEMA P-259*.
3. FEMA. 2013. *Mitigation Ideas: A resource for Reducing Risk to Natural Hazards*.
4. FEMA. 2017. *National Flood Insurance Program Community Rating System Coordinator's Manual*. Accessed: [https://www.fema.gov/sites/default/files/documents/fema\\_community-rating-system\\_coordinators-manual\\_2017.pdf](https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinators-manual_2017.pdf).
5. FEMA. 2021. *Taking Shelter from the Storm: Building a Safe Room Inside Your House, FEMA-320*.
6. FEMA. 2022. *Flood Insurance Manual, October 2022, Risk Rating 2.0: Equity in Action*.
7. Illinois Association for Floodplain and Stormwater Management. 2006. *Guide to Flood Protection in Northeastern Illinois*.
8. Illinois Department of Natural Resources. n.d. *Guide to Floodproofing*. Accessed: <https://dnr.illinois.gov/waterresources/guidetofloodproofing.html>.
9. Illinois Emergency Management Agency. 1990. *Ice Storm Mitigation, FEMA-860-DR-Illinois*.
10. U.S. Army Corps of Engineers National Flood Proofing Workgroup. 2000. *Flood Proofing Techniques, Programs and References*.
11. Information supplied by County offices and municipalities, 2023.

## CHAPTER 6 - STRUCTURAL PROJECTS

Structural projects are the third of six overall mitigation strategies examined in this Plan. Structural projects reference engineering solutions that are constructed to protect people, buildings, and infrastructure from damage due to natural hazards. Structural projects are usually funded by public agencies.

Preventing damage due to flooding is the primary focus of structural projects (see Figure 6-1). Structural projects keep flood waters away from buildings or an area by constructing barriers, by storing floodwater elsewhere, or by redirecting flood flows. Large structural flood control projects are most often planned, funded, and implemented at a regional level by agencies, such as the Illinois Department of Natural Resources (IDNR) Office of Water Resources (IDNR-OWR), the USDA Natural resources Conservation Service, and the U.S. Army Corps of Engineers. Many projects are jointly planned and funded between these agencies in cooperation with counties and/or municipalities. Figure 6-2 provides a short description of the pros and cons of flood control projects from McHenry County’s Stormwater Management Plan.

**Figure 6-1. Hazards Addressed By Structural Projects**

Hazards Addressed	
✓	Floods
✓	Summer Storms
	Winter Storms
	Extreme Cold
	Extreme Heat
	Tornadoes
	Drought
	Groundwater

Six structural flood protection approaches are reviewed in this chapter:

- Reservoirs and detention
- Levees and barriers
- Channel improvements and diversions
- Crossings and roadways
- Drainage and storm sewer improvements
- Drainage system maintenance

Structural projects offer advantages not provided by other measures, as shown in Figure 6-2, but they also have shortcomings. The appropriateness of structural flood control measures depends on individual project area circumstances.

**Figure 6-2 Flood Control Projects**

Pros and Cons of Structural Flood Control Projects	
<u>Advantages</u>	<u>Shortcomings</u>
May provide the greatest amount of protection for land area used.	They disturb the land and disrupt natural water flows, often destroying wildlife habitat.
Because of land limitations, may be the only practical solution in some circumstances.	They require regular maintenance, which if neglected, can have disastrous consequences.
Can incorporate other benefits into structural project design such as water supply and recreational uses.	They are built to a certain flood protection level that can be exceeded by larger floods, causing extensive damage.
Regional detention may be more cost-efficient and effective than requiring numerous small detention basins.	They can create a false sense of security as people protected by a project often believe that no flood can ever reach them.
	Although it may be unintended, in many circumstances they promote more intensive land use and development in the floodplain.

The planning of structural flood control projects usually involves an alternatives assessment, and that assessment is typically part of, or a product of, a watershed plan.

## 6.1 Reservoirs and Detention

Reservoirs reduce flooding by temporarily storing flood water behind dams or in storage or detention basins. Reservoirs lower the flood height by holding back, or detaining, runoff before it can flow downstream. Flood water is detained until the flooding has subsided, then the water in the reservoir or detention basin is released or pumped out slowly at a rate that the river can accommodate downstream. Reservoirs can be dry and remain idle until a large rain event occurs. Or they may be designed so that a lake or pond is created.

Reservoirs are commonly built for one of two purposes. Large reservoirs are constructed to protect property from existing flood problems. Smaller reservoirs or detention basins are built to protect property from the impacts of new development (e.g., more runoff). Regardless of size, reservoirs protect the development that is downstream from the reservoir site. Unlike levees and channel modifications, they do not have to be built close to or disrupt the area to be protected.

There are several considerations when evaluating the use of reservoirs and detention:

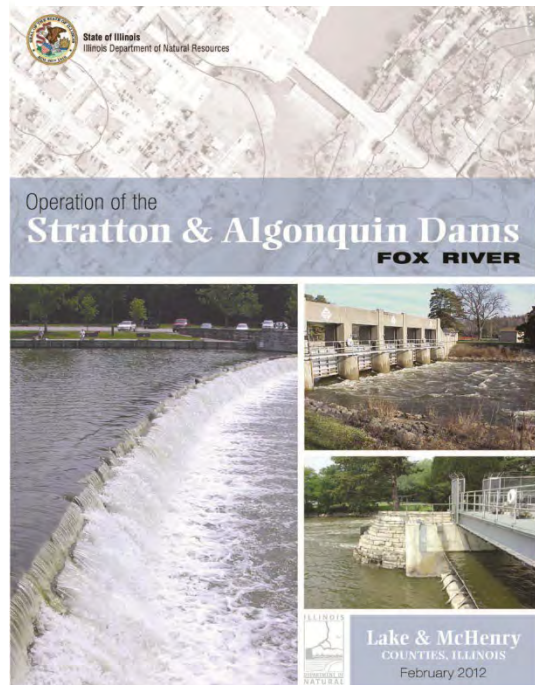
- The expense for management and maintenance of the facility.
- Flooding can still occur if their design level is exceeded.
- Sediment deposition may occur and reduce the storage capacity over time.
- They can impact water quality as they are known to affect temperature, dissolved oxygen and nitrogen, and nutrients.

**Local Implementation:** Examination of detention opportunities should be a part of watershed planning for McHenry County. Also, the McHenry County Stormwater Management Ordinance requires stormwater detention with most new developments.

Stratton and Algonquin Dams create flood storage reservoirs. As discussed in Chapter 2, Section 2.11, both dams are operated by IDNR. Stratton Dam has 5 vertical lift gates and one hinged crest gate. The gate operation is based forecasted peak flows from National Weather Service, lake stages as measured at Channel Lake, Nippersink Lake, and Fox Lake, river flows as computed for the Fox River at New Munster, Wisconsin and Nippersink Creek at Spring Grove, and river stages at Johnsbury, Algonquin and Elgin. Both dams have operational guidance; the cover of the most recent dam operations document from 2012 is shown in Figure 6-3.

River flows are primarily controlled at the Stratton Dam, especially when the Fox River is approaching or at flood stage. Operational objectives include keeping summer normal flows for recreational pools, utilizing the sluice gates at Stratton Lock and Dam to pass flood waters downstream without creating downstream flood damages, and utilizing the sluice gates during winter ice jam events to restrict flows downstream to 1100 cfs, if possible, when

**Figure 6-3. Dam Operations Cover, 2012**





there has been an accumulation of 60 degree-freezing days or very cold temperatures (daily high temperature less than 20 degrees Fahrenheit). Additional information about operation of the Stratton Lock and Dam and the Algonquin Dam can be found in the February 2012 IDNR report.

## 6.2 Levees and Barriers

This flood control measure is a barrier of earth (levee), or concrete (floodwall) erected between the watercourse and the property to be protected. Levees and floodwalls confine water to the stream channel by raising its banks. They must be well designed to account for large floods, underground seepage, pumping of internal drainage, and erosion and scour.

Key considerations when evaluating the use of a levee include:

- Removal of fill to compensate for the floodwater storage that will be displaced by the levee.
- Internal drainage of surface flow from the area inside the levee.
- Cost of construction and maintenance.
- Design limitations (while levees may reduce flood damage for smaller more frequent rain events, they may also overtop or breach in extreme flood events and subsequently create more flood damage than would have occurred without the levee).

Levees can push floodwater onto other properties upstream or downstream and need to be designed with this in mind. To reduce environmental impacts and provide multiple use benefits, a setback levee (set back from the floodway) is the best project design. The area inside a setback levee can provide open space for recreational purposes and provide access sites to the river or stream.

Floodwalls perform like levees except they are vertical-sided structures that require less surface area for construction. Floodwalls are constructed of reinforced concrete, which makes the expense of installation cost prohibitive in many circumstances. Floodwalls also degrade adjacent habitat and can displace erosive energy to unprotected areas of downstream shorelines.

Levees and floodwalls are appropriate when the cost of relocating structures out of the flood prone area exceeds that cost of the levee or floodwall construction and maintenance, and when upstream and downstream impacts can be mitigated.

## 6.3 Channel Improvements and Diversions

By improving a channel's conveyance, more water is carried away at a faster rate. Three types of channel improvements are reviewed here: projects that make the channel wider, straighter, or smoother; dredging the channel bottom; and diversion of high flows to another channel or body of water.

Straightening, deepening and/or widening a stream or river channel, commonly referred to as "channelization," is commonly used for local drainage or flooding problems. Considerations for channel improvement are:

- Channelized streams can create or worsen flooding problems downstream as larger volumes of water are transported at a faster rate.
- Channelized streams rise and fall faster. During dry periods the water level in the channel is lower than it should be, which creates water quality problems and degrades habitat.

- Channelized waterways tend to be unstable and experience more streambank erosion. The need for periodic reconstruction and silt removal becomes cyclic, making channel maintenance very expensive.

However, when properly designed, properly sloped and planted channel banks are more aesthetically and environmentally appealing and can prove to be cost-effective approaches. In McHenry County, detention projects are usually considered with channel improvements.

Dredging for the purpose of floodwater management is often viewed as a form of conveyance improvement. However, it has the following limitations:

- Dredging is often cost prohibitive because the dredged material must be disposed of somewhere else (out of the floodplain).
- Unless instream and/or tributary erosion are corrected upstream, the dredged areas usually fill back in within a few years.
- If the channel has not been disturbed for many years, dredging will destroy the habitat that has developed.
- To protect the natural values of the stream, federal law requires an U.S. Army Corps of Engineers permit before dredging can proceed. This can be a lengthy process that requires much advance planning and many safeguards to protect habitat.

A diversion is a new channel that sends floodwaters to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During flood flows, the floodwaters spill over to the diversion channel or tunnel, which carries the excess water to a receiving lake or river. Diversions are limited by topography; they will not work in some areas. Unless the receiving water body is relatively close to the flood prone stream and the land in between is low and vacant, the cost of creating a diversion can be prohibitive.

**Local Implementation:** McHenry County currently has active channel improvement projects in the North Shore Culvert and Channel Enhancement in Crystal Lake, and a weir and diversion channel just upstream of the Marengo city limits.

## 6.4 Crossings and Roadways

In some cases, buildings may be elevated above floodwaters but access to the building is lost when floodwaters overtop local roadways, driveways, and culverts or ditches. Depending on the recurrence interval between floods, the availability of alternative access, and the level of need for access, it may be economically justifiable to elevate some roadways and improve crossing points.

For example, if there is sufficient downstream channel capacity, a small culvert that constricts flow and causes localized backwater flooding may be replaced with a larger culvert to eliminate flooding at the waterway crossing point. The potential of increasing adjacent or downstream flooding should be considered before implementing any crossing or roadway drainage improvements.

**Local Implementation:** The bridges shown in Table 6-1 are those that have been identified, to date, by McHenry County communities as those which impede or obstruct flow. The roadways included in the table could be considered for elevation to provide continued access during flooding.

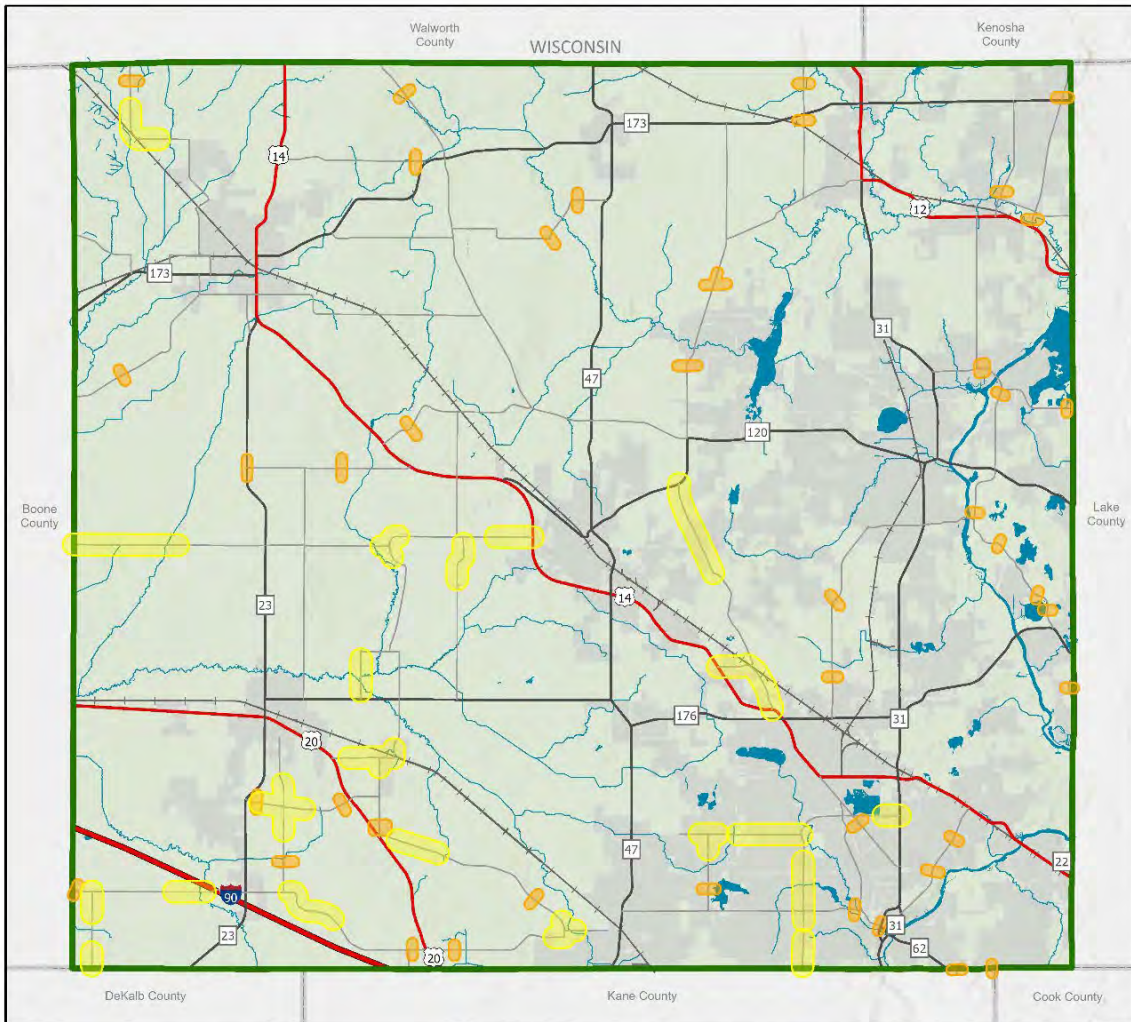
**Table 6-1 McHenry County Bridges and Roadways That Potentially Impede Flood Flows**

Community	Bridge or Roadway
Algonquin, Village of	Woods Creek Drive
Fox River Grove, Village of	Private property
Greenwood, Village of	Thayer Road
Johnsburg, Village of	Local roads and culverts flood with a 10-year event
Marengo, City of	Greenlee Street; Prospect Street; U.S. 176; Page Street; Taylor Street; Hale Street; U.S. 23
Marengo, Township of	County Line Road
Nunda, Township of	Whipporwill Drive
Oakwood Hills, Village of	Overflow culvert under North Shore Drive
Prairie Grove, Village of	Justen Road Bridge; Culverts under Ames Road and Bay Road; Bridge on Barreville Road
Woodstock, City of	Edgewood Drive

Source: 2023 survey of municipalities and townships. Municipalities and townships not listed have no roadway or bridge flooding or were unresponsive.

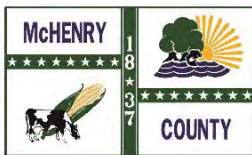
The McHenry County Division of Transportation developed the map in Figure 6-4, which shows roadways that Division staff could recall has having flooded during a flood event for a severe storm over the past 30 years. No major changes were reported from the 2017 plan.

**Figure 6-4 Past Flooding Locations on McHenry County Highways (1980 to 2022)**



## McHenry County, IL

### Observed Flooded Roadway Areas on MCDOT Roads



Map Produced by McHenry County  
GIS Department. Data from  
McHenry County DOT (03/2023)

Date: March 2023

- |                      |   |
|----------------------|---|
| McHenry Boundary     | Interstate                              |
| Surrounding Counties | US Highways                             |
| Railways             | State Roads                             |
| Rivers & Streams     | County Roads                            |
| Lakes                | Localized Areas of Flooding on Roadways |
| Municipal Boundaries | Flooding Caused by Cross Road Culvert   |

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## 6.5 Drainage and Storm Sewer Improvements

Manmade ditches and storm sewers help drain areas where the surface drainage system is inadequate, or where underground drainage ways may be safer or more practical. Storm sewer improvements include installing new sewers, enlarging small pipes, and preventing back flows. Particularly appropriate for depressions and low spots that will not drain naturally, drainage and storm sewer improvements usually are designed to carry the runoff from smaller, more frequent storms.

Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving stream or river has sufficient capacity to handle the additional volume and flow of water. To reduce the cumulative downstream flood impacts of numerous small drainage projects, additional detention or run-off reduction practices should be provided in conjunction with the drainage system improvements.

A combination of restored wetland detention, vegetated swales, infiltration trenches and other best management practices that increase infiltration (reducing runoff) and improve water quality can be implemented in conjunction with stormwater system improvements.

**Local Implementation:** Most all McHenry County communities include storm sewer and drainage improvements annually in their capital budgets.

## 6.6 Drainage System Maintenance

The drainage system may include detention ponds, stream channels, swales, ditches, and culverts. Drainage system maintenance is an ongoing program to clean out blockages caused by an accumulation of sediment or overgrowth of weedy, non-native vegetation or debris, and remediation of streambank erosion sites.

“Debris” refers to a wide range of blockage materials that may include tree limbs and branches that accumulate naturally, or large items of trash or lawn waste accidentally or intentionally dumped into channels, drainage swales or detention basins. Maintenance of detention ponds may also require revegetation or repairs of the restrictor pipe, berm, or overflow structure.

Maintenance activities normally do not alter the shape of the channel or pond, but they do affect how well the drainage system can do its job. Sometimes it is a very fine line that separates debris that should be removed from natural material that helps form habitat. Therefore, written procedures that are consistent with state laws and environmental concerns are usually needed.

Government agencies usually accept responsibility for maintaining facilities on public property. However, in Illinois, the responsibility for drainage way maintenance on private property, when no easements have been granted, is with the individual private property owner. This often results in very little maintenance being accomplished.

**Local Implementation:** Tables 6-2 and 6-3 show drainage system maintenance activity in McHenry County municipalities and townships, respectively.

**Table 6-2 McHenry County Municipal Drainage System Maintenance (not all communities are included in the table)**

Municipality	Channel Sediment Accumulation	Drain System Maintenance	Written Procedures
Algonquin, Village of	No	Yes	No
Barrington Hills, Village of	No	No	No
Bull Valley, Village of	No	Yes	No
Cary, Village of	No	Yes	No
Crystal Lake, City of	No	Yes	No
Fox River Grove, Village of	No	Yes	No
Greenwood, Village of	No	No	No
Harvard, City of	No	Yes	No
Hebron, Village of	No	Yes	No
Holiday Hills, Village of	Yes	Yes	No
Huntley, Village of	No	Yes	No
Johnsburg, Village of	Yes	Yes	Yes
Lake in the Hills, Village of	No	Yes	Yes
Lakewood, Village of	No	Yes	No
Marengo, City of	No	Yes	No
McCullom Lake, Village of	Yes	Yes	Yes
McHenry, City of	No	Yes	No
Oakwood Hills, Village of	Yes	Yes	No
Prairie Grove, Village of	Yes	Yes	No
Richmond, Village of	Yes	Yes	No
Ringwood, Village of	No	No	No
Spring Grove, Village of	No	Yes	Yes
Trout Valley, Village of	Yes	No	No
Union, Village of	No	No	No
Wonder Lake, Village of	Yes	Yes	No
Woodstock, City of	No	Yes	No

**Table 6-3 McHenry County Township Drainage System Maintenance**

Township	Sediment Accumulation	Drain System Maintenance	Written Procedures
Alden, Township of	No	No	No
Algonquin, Township of	Yes	Yes	No
Burton, Township of	No	No	No
Chemung, Township of	No	No	No
Coral, Township of	No	Yes	No
Dorr, Township of	No	No	No
Dunham, Township of	No	Yes	No
Grafton, Township of	No	No	No
Greenwood, Township of	No	No	No
Hartland, Township of	No	No	No
Hebron, Township of	No	No	No
Marengo, Township	Yes	No	No

Township	Sediment Accumulation	Drain System Maintenance	Written Procedures
McHenry, Township of	No	Yes	No
Nunda, Township of	Yes	Yes	No
Richmond, Township of	No	No	No
Riley, Township of	No	Yes	No
Seneca, Township of	Yes	No	No

## 6.7 Conclusions

The following conclusions for the capacity and capabilities of McHenry County and its jurisdictions to implement structural projects for flood protection include:

1. The McHenry County Stormwater Management Program is important to McHenry County and its municipalities.
2. Structural projects, including reservoirs, channel improvements and levees, can be effective in reducing flood damage in McHenry County, to the extent that they have been tested, though it is understood that structural projects can have adverse impacts on upstream and downstream properties and on the environment.
3. Structural projects can be effective in protecting critical facilities from natural hazards.
4. There are several locations throughout McHenry County where bridge openings or culverts are impeding flood flows and where roadways have flooded in the past.
5. Local drainage and stormwater flooding (both in and outside the floodplain) could be reduced through drainage system improvements.
6. Stream maintenance, in most areas of the County, is lacking. Both channel erosion and additional flooding may be a result of inadequate maintenance.
7. Drainage maintenance programs in communities are important throughout the County.

Given these conclusions and the standard expense of structural solutions, McHenry County and its jurisdictions may be challenged to implement these mitigation measures from a financial perspective. Grant funding should be sought to supplement local dollars for large-scale flood protection projects.

## 6.8 Recommendations

The following structural projects recommendations are provided by the Mitigation Committee:

1. Watershed plans should be developed for McHenry County as part of the countywide stormwater management program.
2. Structural flood control projects, including drainage and bridge and culvert improvements, should be pursued for McHenry County, but incorporate nature-based solutions that protect the natural functions of the stream and floodplain, in addition to flood protection. Priority areas include:
  - a. Coon Creek
  - b. Boone Creek
  - c. Nippersink Creek
  - d. Areas in Algonquin, Union, Spring Grove, and Nunda Township

3. The McHenry County Stormwater Management Program should continue to be funded through appropriate funding mechanisms.
4. Each municipality and the County should implement a formal and regular drainage system maintenance program.
5. Funding for municipal or regional structural measures in McHenry County should be sought as it is made available through FEMA hazard mitigation programs.
6. Flood problem areas in McHenry County that should be considered for structural mitigation are not limited to those identified in this Plan. Flood problems should be addressed as they are identified.

## 6.9 References

1. FEMA. 2017. *National Flood Insurance Program Community Rating System Coordinator's Manual*. Accessed: [https://www.fema.gov/sites/default/files/documents/fema\\_community-rating-system\\_coordinators-manual\\_2017.pdf](https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinators-manual_2017.pdf).
2. FEMA. 2019. *CRS Credit for Drainage System Maintenance*. Accessed: <https://crsresources.org/files/500/model-540-drainage-2019.pdf>.
3. Illinois Resource Coordination Policy Committee. 1998. *Our Community and Flooding*. Accessed: <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/waterresources/documents/ourcommunityandflooding-oct1998.pdf>.
4. Survey of municipalities, townships, and County offices, 2023.
5. Illinois Department of Natural Resources, Office of Water Resources. 2012. *Operation of Stratton and Algonquin Dams*. Accessed: <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/waterresources/documents/operation-guide-january2012.pdf>



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## CHAPTER 7- RESOURCE PROTECTION

Resource protection activities are generally aimed at preserving or restoring natural areas. Resource protection activities enable the naturally beneficial functions of the land and water areas to be better realized. Natural and beneficial functions of watersheds, floodplains and wetlands include the following:

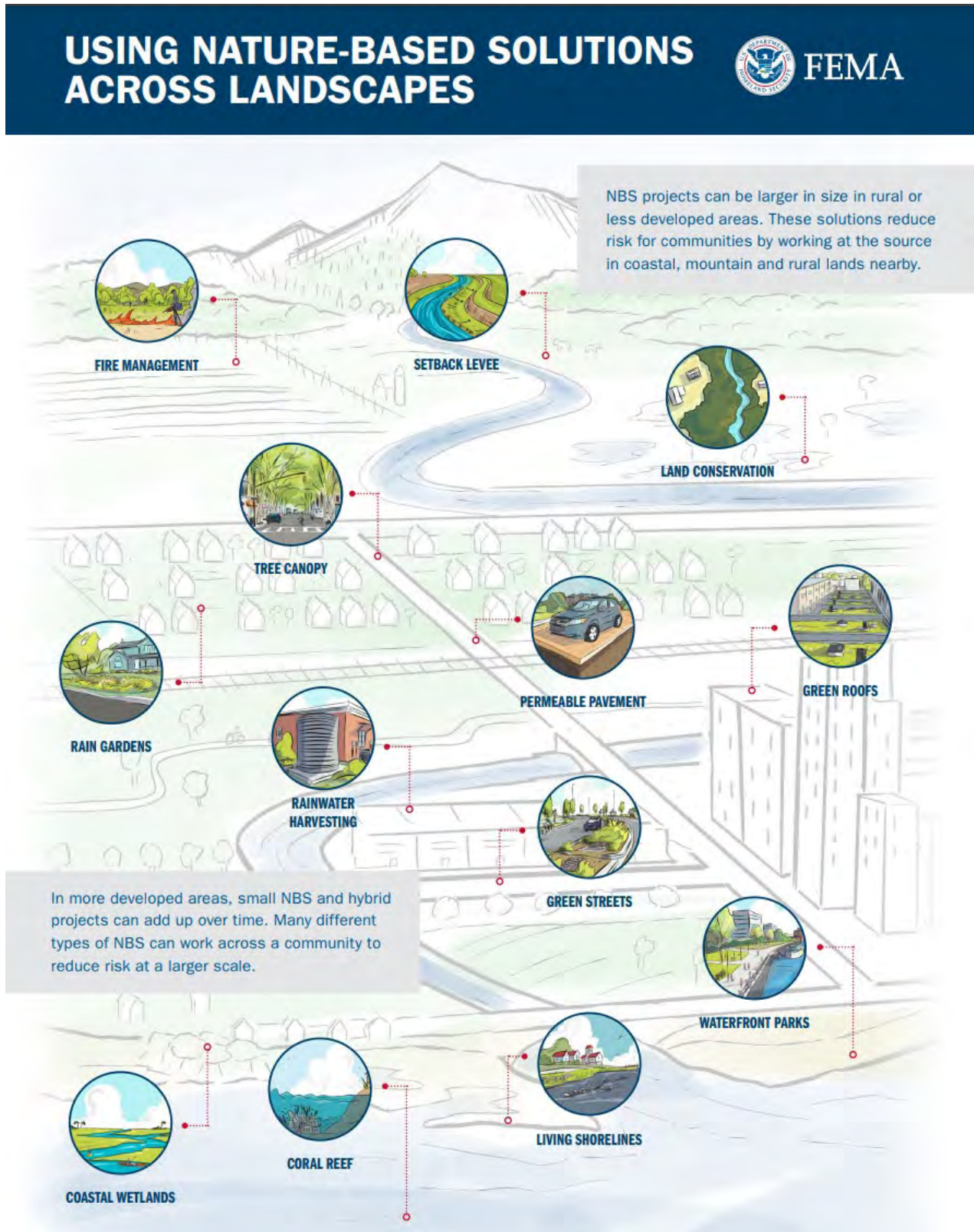
- Reduction in runoff from rainwater and snow melt in pervious areas
- Infiltration that absorbs overland flood flow
- Removal and filtering of excess nutrients, pollutants, and sediments
- Storage of floodwaters
- Absorption of flood energy and reduction in flood scour
- Water quality improvement
- Groundwater recharge
- Habitat for flora and fauna
- Recreational and aesthetic opportunities

As development occurs, many of the above benefits can be achieved through regulatory steps for protecting natural areas or natural functions. The regulatory programs are discussed in Chapter 4. This chapter covers the resource protection programs and standards that can help mitigate the impact of natural hazards, while they improve the overall environment and quality of the County. Areas reviewed include:

- Wetlands
- Groundwater
- Streambank restoration
- Dumping regulations
- Urban forestry
- Open space preservation
- Farmland protection
- Historic and natural area protection

In November 2022, the President issued Executive Order 14072, which makes a broad call for federal government agencies to accelerate deployment of nature-based solutions through their policies and programs. This Executive order recognizes the importance of forests and other nature-based solutions to strengthen communities and local economies against natural hazards and climate change. FEMA encourages hazard mitigation proposals that incorporate nature-based solutions in the Building Resilient Infrastructure and Communities (BRIC) program. Examples of different nature-based solutions for different hazards and landscapes are included in Figure 7-1 below.

Figure 7-1 FEMA Example: Using Nature-Based Solutions Across Landscapes



## 7.1 Wetlands

The regulation of wetlands is discussed in Chapter 4, but the Mitigation Committee continues to emphasize wetland function and their importance in McHenry County. Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flows. They also serve as a natural filter, which helps to improve water quality, and provide habitat for many species of fish, wildlife, and plants. Figure 7-2 provides a further description of wetlands. Approximate wetland locations in McHenry County are available on the McHenry County website ([www.mchenrycountygis.org/planning/](http://www.mchenrycountygis.org/planning/)).

**Figure 7-2 Wetlands**

“Wetlands are parts of our landscape that are either permanently or seasonally wet. As a consequence, a specific community of plants has adapted to wetland soils that are either inundated or saturated for at least part of the year. Many types of wetlands exist, each with a community of plants adapted to specific conditions that are determined by the hydrology (the source, periodicity, and quality of the water supply), and the underlying soil chemistry. Some wetlands, such as fens or sedge meadows, may be fed by subsurface or surfacing groundwater. Others, such as a floodplain forest, are periodically flooded by overflowing rivers or streams. Still others, such as bogs or vernal pools, capture rainwater in depressions or basins on the land. Marshes are areas with plants that normally grow in relatively shallow water, while a swamp is much like a marsh that is forested.

“Wetlands provide all of us with critical services. They remove pollutants and toxic substances, reduce flood and storm damages, provide important habitat for wildlife, recharge groundwater supplies, and provide valuable open space and recreational opportunities, such as fishing, hunting and bird watching. The value of wetlands is becoming ever more evident as they continue to be lost.”

*Taken from: Living with Wetlands: A Handbook for Homeowners in Northeastern Illinois, The Wetlands Initiative, Inc.*

Wetlands are of varying types and varying quality. Wetlands such as fens or sedge meadows hold much more environmental value than a wetland created by roadside ditches. McHenry County contains the largest area in the State for shallow marsh or wet meadow wetlands (11,406 acres or 8 percent of the State’s total). McHenry also holds 6 percent of the State’s deep marsh wetlands (second highest in the State).

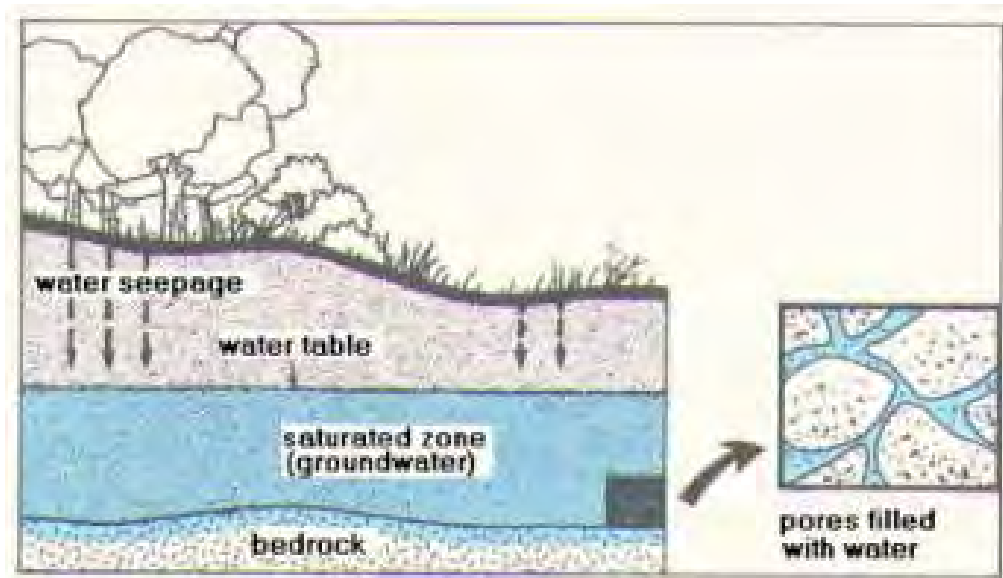
**Local implementation:** McHenry County is completely dependent on groundwater for a potable water source. Wetland protection is included in the McHenry County Stormwater Management Ordinance (also see Chapter 4 of this Plan). Wetland protection is also an area of focus in the McHenry County 2030 Comprehensive Plan and the McHenry County Water Resources Action Plan.

## 7.2 Groundwater Protection

The term “groundwater protection” refers to both the protection of groundwater quantity (or groundwater availability) and groundwater quality (Figure 7-3). All groundwater was at one time surface water. Rain and snow melt seeps or infiltrates into the ground. Water that infiltrates through the soil can eventually reach aquifers where groundwater is stored. Aquifers can be shallow, perched, deep, confined,

unconfined, etc. Aquifer types and estimates of sizes can be mapped. Often the mapping of aquifer recharge areas is similar in shape and size as surface watershed boundary maps.

**Figure 7-3 Groundwater Basics and Zones**



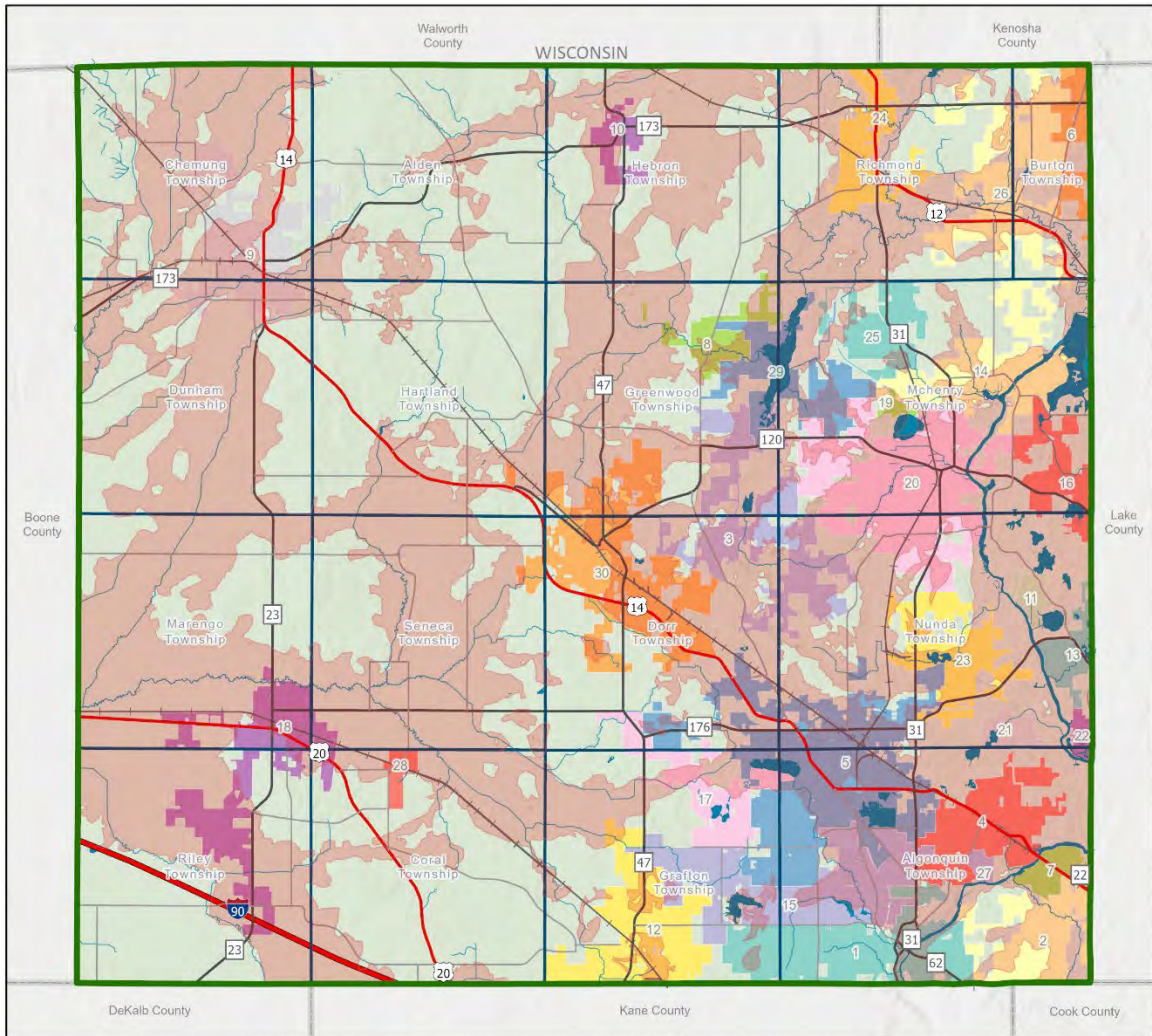
The quantity of groundwater and groundwater recharge depends on the ability of runoff to reach a pervious surface where it can become seepage. Urban runoff reaching a storm sewer, for example, which discharges into a stream, is effectively lost from the groundwater system.

The quantity and the rate that water that seeps into the ground, and becomes stored groundwater, varies based on land use, soils, season, temperature, and more. The quality of the groundwater is influenced by several factors. Different types of ground cover, soils and aggregate layers have differing abilities to filter the infiltrating waters. Because of human activity, much of the rain or snow melt runoff that becomes seepage has many opportunities to collect pollutants. Pollutants need to be filtered out either while the water is still above ground, or when it is seeping through the ground. Because soils and aggregate layers may not have the ability to fully “treat” the seepage before it becomes groundwater, it is essential to reduce the human-caused pollutants.

**Local implementation:** McHenry County is completely dependent on groundwater for a potable water source. As discussed in Chapter 1, the County’s population may increase by 20 to 54 percent by 2030 and 2050, respectively. The demand for groundwater will significantly increase as the County continues to grow. The “McHenry County Water Resources Action Plan” (WRAP) addresses the groundwater quantity and quality issues, while stressing the enhancement of surface water quality, as well. The WRAP’s goal is to ensure that the County’s water resources are protected and available in the years to come. The WRAP was last updated in 2020 and focuses on water quality, water conservation, climate change and natural hazards, and land use and zoning that can affect water resources. Each section includes a model policy for the consideration of McHenry County municipalities with supporting materials. As shown in Chapter 3 of this Plan, the Mitigation Committee places a high priority on water quality and natural resource protection.

Figure 7-4 shows the sensitive aquifers recharge areas for McHenry County identified through the WRAP. Areas in dark pink show the location of sensitive natural resources that should be protected.

**Figure 7-4 McHenry County Sensitive Aquifer Recharge Areas**



## McHenry County, IL

### Sensitive Aquifer Recharge



Map Produced by McHenry County  
GIS Department

Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Political Township
- Interstate
- US Highways
- State Roads
- Other Roads
- Railways
- Rivers & Streams
- Lakes
- Sensitive Aquifer Recharge Area

#### Municipal Boundaries

- |                      |                    |
|----------------------|--------------------|
| 1 ALGONQUIN          | 16 LAKEMOOR        |
| 2 BARRINGTON HILLS   | 17 LAKEWOOD        |
| 3 BULL VALLEY        | 18 MARENGO         |
| 4 CARY               | 19 MCCULLOM LAKE   |
| 5 CRYSTAL LAKE       | 20 MCHENRY         |
| 6 FOX LAKE           | 21 OAKWOOD HILLS   |
| 7 FOX RIVER GROVE    | 22 PORT BARRINGTON |
| 8 GREENWOOD          | 23 PRAIRIE GROVE   |
| 9 HARVARD            | 24 RICHMOND        |
| 10 HEBRON            | 25 RINGWOOD        |
| 11 HOLIDAY HILLS     | 26 SPRING GROVE    |
| 12 HUNTLEY           | 27 TROUT VALLEY    |
| 13 ISLAND LAKE       | 28 UNION           |
| 14 JOHNSBURG         | 29 WONDER LAKE     |
| 15 LAKE IN THE HILLS | 30 WOODSTOCK       |

### 7.3 Stream Restoration

Our understanding of the need for stream, streambank and riparian environment protection has grown significantly in the past decades. Eroding streambanks negatively impact our infrastructure (bridges and culvert blockages), impact property, and degrade the water quality. Terminology for “stream restoration” can differ, but the objective is to return streams, streambanks, and adjacent land to a more natural condition, including the natural meanders. Terms such as ecological restoration encourages the restoration of native indigenous plants and animals to an area.

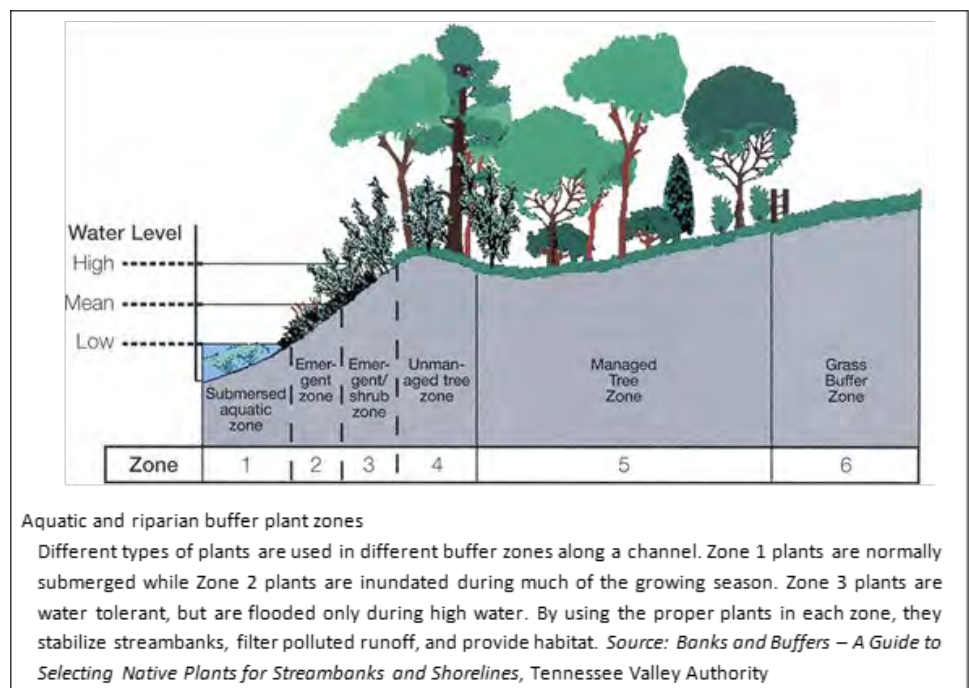
A key component of these efforts is to use appropriate native plantings along the banks that resist erosion. This may involve retrofitting the shoreline with willow cuttings, wetland plants, and/or rolls of landscape material covered with a natural fabric that decomposes after the banks are stabilized with plant roots (see Figure 7-5). In all, restoring the right vegetation to a stream has the following advantages:

- Reduces the amount of sediment and pollutants entering the water,
- Enhances aquatic habitat by cooling water temperature,
- Provides food and shelter for both aquatic and terrestrial wildlife,
- Can reduce flood damage by slowing the velocity of water,
- Increases the beauty of the land and property value,
- Prevents property loss due to erosion,
- Provides recreational opportunities, such as hunting, fishing, and bird watching, and
- Reduces long-term maintenance costs.

The last bullet deserves special attention. Studies have shown that after establishing the right vegetation, long term maintenance costs are lower than if the banks were concrete. The Natural Resources Conservation Service estimates that over a ten-year period, the combined costs of installation and maintenance of a natural landscape may be one-fifth of the cost for conventional landscape maintenance, e.g., mowing turf grass.

**Figure 7-5 Stream Restoration and Buffer Zone Example**

It is worth noting that rivers will take the most efficient or shortest path as the water flows downstream. Because of debris, scour and other factors, a stream might meander through an area. During a flood, though, the stream will attempt to straighten itself or adjust its course. This is a natural occurrence, but manmade influences on this cycle should be minimized.



## 7.4 Dumping Regulations

BMPs usually address pollutants that are liquids or suspended in water that are washed into a lake or stream. Dumping regulations address solid matter, such as shopping carts, appliances and landscape waste that can be accidentally or intentionally thrown into channels or wetlands. Such materials may not pollute the water, but they can obstruct even low flows and reduce the channels and wetland's ability to convey or clean stormwater.

Many cities have nuisance ordinances that prohibit dumping garbage or other “objectionable waste” on public or private property. Waterway dumping regulations need to also apply to “Non objectionable” materials, such as grass clippings or tree branches which can kill ground cover or cause obstructions in channels. Regular inspections to catch violations should be scheduled.

Many people do not realize the consequences of their actions. They may, for example, fill in the ditch in their front yard not realizing that it is needed to drain street runoff. They may not understand how regrading their yard, filling a wetland, or discarding leaves or branches in a watercourse can cause a problem for themselves and others. Therefore, a dumping enforcement program should include public information materials that explain the reasons for the rules as well as the penalties.

**Local Implementation:** The McHenry County Stormwater Management Ordinance prohibits dumping in regulatory floodplains, in flood prone areas, and in wetlands in McHenry County. The temporary or permanent storage of fill material, such as landscape waste in floodplains is also prohibited in the Ordinance. Most communities have ordinances that prohibit dumping regardless of the proximity to the floodplain (dumping is not allowed anywhere), as shown in Table 7-1. Communities that adopt and enforce the McHenry County Stormwater Management Ordinance meet this standard.

**Table 7-1 McHenry County Communities that Prohibit Dumping in Streams**

Municipality	Dumping Ordinance	Township	Dumping Ordinance
Algonquin, Village of	Yes	Alden, Township of	Yes
Barrington Hills, Village of	Yes	Algonquin, Township of	Yes
Bull Valley, Village of	Yes	Burton, Township of	Yes
Cary, Village of	Yes	Chemung, Township of	Yes
Crystal Lake, City of	Yes	Coral, Township of	Yes
Fox River Grove, Village of	Yes	Dorr, Township of	Yes
Greenwood, Village of	Yes	Dunham, Township of	Yes
Harvard, City of	Yes	Grafton, Township of	Yes
Hebron, Village of	Yes	Greenwood, Township of	Yes
Holiday Hills, Village of	Yes	Hartland, Township of	Yes
Huntley, Village of	Yes	Hebron, Township of	Yes
Johnsburg, Village of	Yes	Marengo, Township of	Yes
Lake in the Hills, Village of	Yes	McHenry, Township of	Yes
Lakewood, Village of	Yes	Nunda, Township of	Yes
McCullom Lake, Village of	Yes	Richmond, Township of	Yes
McHenry, City of	Yes	Riley, Township of	Yes
Oakwood Hills, Village of	Yes	Seneca, Township of	Yes
Prairie Grove, Village of	Yes		
Richmond, Village of	Yes		

Municipality	Dumping Ordinance	Township	Dumping Ordinance
Ringwood, Village of	Yes		
Spring Grove, Village of	Yes		
Trout Valley, Village of	Yes		
Union, Village of	Yes		
Wonder Lake, Village of	Yes		
Woodstock, City of	Yes		
Unincorporated McHenry County	Yes		

### 7.5 Urban Forestry

Most damage caused by wind, ice and snowstorms is to trees (Figure 7-6). Downed trees and branches break utility lines and damage buildings, parked vehicles, and anything else that was under them. A forestry program (urban or rural) can reduce the damage potential of trees. Urban foresters or arborists can select hardier trees, which can better withstand high wind and ice accumulation. Only trees that attain a height less than the utility lines should be allowed along the power and telephone line rights-of-way. Just as important as planting the right trees is correct pruning after a storm. If not done right, the damaged tree will not heal properly, decay over the next few years, and cause a hazard in the future. A trained person should review every damaged tree to determine if it should be pruned or removed.

By having stronger trees, programs of proper pruning, and on-going evaluation of the trees, communities can prevent serious damage to their tree population. A properly written and enforced urban forestry plan can reduce liability, alleviate the extent of fallen trees and limbs caused by wind and ice build-up, and provide guidance on repairs and pruning after a storm. Such a plan helps a community qualify to be a “Tree City USA.”

**Figure 7-6 Trees are the first victims of ice storms.**



**Local Implementation:** The McHenry County Division of Transportation has 2 certified arborists on staff. Table 7-2 shows the McHenry County municipalities that participate in Tree City USA.

**Table 7-2 McHenry County Tree City USA Communities**



Tree Cities	
Algonquin, Village of	Lakewood, Village of
Barrington Hills, Village of*	McHenry, City of
Cary, Village of	Port Barrington, Village of
Crystal Lake, City of	Trout Valley, Village of
Huntley, Village of	Woodstock, City of
Lake in the Hills, Village of	Unincorporated McHenry County

\*Noted as a current applicant to participate in Tree City USA.

## 7.6 Open Space Preservation

Keeping the floodplain and other hazardous areas open and free from development is the best approach to preventing damage to new developments. In urban areas, open space can serve as parks, greenway corridors and golf courses. Capital improvement plans and comprehensive land use plans can identify areas to be preserved through the following means:

- Acquisition,
- Dedication by developers,
- Dedicating or purchasing an easement to keep the land open,
- Specifying setbacks or buffer zones where development is not allowed, or
- Subdivision regulations need to ensure that streets and other public facilities can handle emergency vehicles during an emergency.

**Local Implementation:** There are two kinds of open space land in McHenry County: lands that are currently open, such as vacant parcels or remaining farmland; and lands that are preserved as open space, such as parks and fish and wildlife areas. Community interest in maintaining and creating open space is growing throughout the County.

Park Districts and the McHenry County Conservation District are working to maintain existing open land. The Conservation District currently has over 23,000 acres of woodlands, prairies, wetlands, ponds, and creeks. They maintain 29 sites for public use and 8 regional trails. There are also 17 dedicated Nature Preserves in McHenry County, according to the Conservation District.

## 7.7 Farmland Protection

Farmland protection is quickly becoming an important piece of comprehensive planning and zoning throughout the United States. The purpose of farmland protection is to provide mechanisms for prime, unique, or important agricultural land to remain as such, and to be protected from conversion to non-agricultural uses.

Frequently, farm owners sell their land to residential or commercial developers and the property is converted to non-agricultural land uses. With development comes more buildings, roads, and other infrastructure. Urban sprawl occurs, which can create additional stormwater runoff and emergency management difficulties. Farms on the edge of cities are often appraised based on the price they could be sold for to urban developers. This may drive farmers to sell to developers because their marginal farm operations cannot afford to be taxed as urban land.

The Farmland Protection Program in the United States Department of Agriculture’s 2002 Farm Bill (Part 519) allows for funds to go to state, tribal, local governments and to nonprofit organizations to help

purchase easements on agricultural land to protect against the development of the land. Eligible land includes cropland, rangeland, grassland, pastureland, and forest land that are part of an agricultural operation. Certain lands with historical or archaeological resources are also included.

The hazard mitigation benefits of farmland protection are like those of open space preservation, discussed in Chapter 4. Preventive Measures:

- Farmland is preserved for future generations,
- Farmland in the floodplain keeps damageable structures out of harm’s way,
- Farmland keeps more stormwater on site and lets less runoff downstream than developed land,
- Rural economic stability and development is sustained,
- Ecosystems are maintained, restored and/or enhanced, and
- The rural character and scenic beauty of the area is kept.

**Local implementation:** The Mitigation Committee agreed that the protection of farmland is important and should be of continued concern in McHenry County along with other land use issues. Agricultural resources are discussed in Section 3 of the McHenry County 2030 Comprehensive Plan, which is currently being updated.

### 7.8 Historic and Natural Area Protection

McHenry County is rich in historic and natural resources. Table 7-3 provides a list of McHenry County’s sites on the National Register of Historic Places. McHenry County Historic Preservation Commission has designated twenty-five local historic landmarks since the Commission's inception in 1991. All the landmarks designated since 1991 remain intact except for one – the Allendale Truss Bridge.

The historic sites are vulnerable to various hazards, mostly due to being built in accordance with outdated building codes. It is difficult to protect the structures from hazards due to their historic nature, but it is important to consider should any mitigation opportunities be presented.

**Table 7-3 National Register of Historic Places in McHenry County**

Property Name:	Location:
Charles H. Hibbard House	Marengo
Christian Geister House	Algonquin
Col. Gustavus A. Palmer House	Crystal Lake
Count's House	McHenry
George Stickney House	Nunda Township
Lucein Boneparte Covell House	Richmond
Memorial Hall	Richmond
Old McHenry County Courthouse	Woodstock
Orson Rogers House	Marengo
Terwilliger House	Dorr Township
Woodstock Opera House	Woodstock
Woodstock Square Historic District	Woodstock

There are five historic bridges in McHenry County that are listed in the “Historic Bridges of the U.S.” list including, Allendale Road Bridge over Nippersink Creek, County Line Road bridge over the Kishwaukee

River, Deep Cut Road bridge over the C&NW Railroad, Graf Road bridge over the Piscasaw Creek, and Streit Road bridge over the North Branch of the Kishwaukee River.

## 7.9 Conclusions

The following conclusions for the capacity and capabilities of McHenry County to implement resource protection measures for natural hazard mitigation include:

1. The federal government is prioritizing the use of nature-based solutions in hazard mitigation and resilience grant programs.
2. A hazard mitigation program can utilize resource protection programs to support protecting areas and natural features that can mitigate the impacts of natural hazards.
3. Preserving farmland in floodplain and other hazardous areas will help prevent damage to homes, businesses, and other development.
4. Several communities have an ordinance that prohibits dumping in wetlands or other parts of the drainage system. The degree of enforcement of these ordinances is unknown.
5. Groundwater protection is a high priority in McHenry County.
6. Community forestry programs can be effective against damage and power losses from wind and ice storms. Communities should have urban forestry programs in place that can be effective against damage and power losses from wind and ice storms.
7. McHenry County is rich in historic and natural areas, which should be protected from natural hazards.

Given these conclusions, McHenry County and its jurisdictions have the capacity and the community's support to implement resource protection measures to support hazard mitigation and sustainability.

## 7.10 Recommendations

The following resource protection measures are recommended by the Mitigation Committee:

1. Each community should ensure that it has enforceable stream and wetland dumping regulations.
2. Municipal comprehensive plans, land use plans and zoning ordinances should incorporate open space provisions that will protect properties from flooding and preserve wetlands and farmland.
3. The public and decision makers should be informed about the hazard mitigation benefits of restoring rivers, wetlands, and other natural areas.
4. The public should be informed about the need to protect streams and wetlands from dumping and inappropriate development and the relevant codes and regulations.
5. When opportunities become available, resources should be directed towards stream restoration, to protect and enhance the riparian environment, to protect against unnatural erosion, and to increase recreation benefits.
6. The County and municipalities should implement the water quality and groundwater protection measures recommended by the McHenry County WRAP.
7. McHenry County should continue to encourage conservation design approaches such as cluster development and other "low impact" approaches.
8. Communities should implement an urban forestry program that qualifies them to become a Tree City, USA.
9. Myths about mosquitoes and wetlands (and open water) should be dispelled.

## 7.11 References

1. Arbor Day Foundation. 2023. *Tree City USA Program*. Accessed: <https://www.arborday.org/programs/treecityusa/>.
2. Chicago Wilderness and Northeastern Illinois Planning Commission. 2000. *Protecting Nature in Your Community*.
3. Federal Emergency Management Agency. 2023. *Using Nature-Based Solutions Across Landscapes*. Accessed: <https://www.fema.gov/emergency-managers/risk-management/nature-based-solutions>.
4. Federal Interagency Stream Restoration Working Group. 1998. *Stream Corridor Restoration Principles, Processes and Practices*, Copies available through the USDA Natural Resource Conservation Service.
5. Illinois Emergency Management Agency. 2018. *2018 State of Illinois Natural Hazard Mitigation Plan*.
6. Northeastern Illinois Planning Commission. 1991. *Stream and Wetland Protection: A Natural Resource Management Priority in Northeastern Illinois*.
7. Northeastern Illinois Planning Commission. 1992. *Best Management Practices Guidebook for Urban Development*.
8. Northeastern Illinois Planning Commission. 1994. *Environmental Consideration in Comprehensive Planning*.
9. Northeastern Illinois Planning Commission. 1997. *Reducing the Impacts of Urban Runoff – The Advantages of Alternative Site Design Approaches*.
10. McHenry County Conservation District. 2023. *Trail Maps*. Accessed: [https://www.mccdistrict.org/visit\\_explore/places\\_to\\_go/trail\\_maps.php](https://www.mccdistrict.org/visit_explore/places_to_go/trail_maps.php).
11. McHenry County Illinois. 2023. *McHenry County Local Historic Landmarks*. Accessed: [www.mchenrycountyil.gov/HPC](http://www.mchenrycountyil.gov/HPC).
12. South Suburban Mayors and Managers Association. 2000. *Stormwater management – The Benefits of Alternative Approaches*.
13. Tennessee Valley Authority. 2017. *Banks and Buffers – A Guide to Selecting Native Plants for Streambanks and Shorelines*.
14. The White House. 2022. *Fact Sheet: Biden-Harris Administration Announces Roadmap for Nature-Based Solutions to Fight Climate Change, Strengthen Communities, and Support Local Economies*. Accessed: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/11/08/fact-sheet-biden-%E2%81%A0harris-administration-announces-roadmap-for-nature-based-solutions-to-fight-climate-change-strengthen-communities-and-support-local-economies/>.
15. The Wetlands Initiative. 1998. *Living With Wetlands, A Handbook for Homeowners in Northeastern Illinois*.
16. Survey of McHenry County municipalities and townships, 2023.

## CHAPTER 8 - EMERGENCY SERVICES

Emergency services functions are often discussed in the broad categories of preparedness, warning, response, and recovery. Each of these categories protect lives and property, and pro-active emergency management activities can be another hazard mitigation strategy to reduce losses.

A good emergency management program addresses natural hazards and involves all municipal and/or county departments. This chapter reviews emergency services measures, following their chronological order of threat recognition, emergency response, and post-disaster activities.

IEMA coordinates the state response to emergencies. The McHenry County Emergency Management Agency (EMA) coordinates emergency management services in McHenry County within incorporated and unincorporated areas. Municipalities can implement their own emergency management programs. Most municipalities have staff that serve as the emergency management director along with other municipal duties and responsibilities.

**Figure 8-1 Hazards Addressed through Emergency Preparedness and Planning**

Hazards Addressed	
✓	Floods
✓	Summer Storms
✓	Winter Storms
✓	Extreme Cold
✓	Extreme Heat
✓	Tornadoes
	Drought
	Groundwater

### 8.1 Preparedness and Planning

An emergency operations plan (EOP) ensures that all response needs are addressed and that all response activities are appropriate for the expected threat. EOPs should be reviewed annually to keep contact names and telephone numbers current and to make sure that supplies and equipment that will be needed are still available. Keeping up with changing contacts and phone numbers can be challenging. EOPs should be critiqued and revised after disasters and exercises to take advantage of the lessons learned and changing conditions. The result of such review is a coordinated effort implemented by people who have experience working together so that available resources will be used in the most efficient manner.

**Local Implementation:** McHenry County EMA has developed and adopted an EOP and is responsible for review and approval of EOPs developed by the municipalities. McHenry County EMA also facilitates emergency management exercises with the municipalities. McHenry County has a Local Emergency Planning Committee (LEPC) that meets quarterly. The LEPC has several County departments represented, several municipalities, the American Red Cross, health care, area employers, and other members.

All McHenry County municipalities have emergency management personnel, and most municipalities have either developed and adopted EOPs or are developing EOPs. All communities are working towards National Integrated Management System (NIMS) compliance. Nine communities reported having completed NIMSCAST in the 2017 update. The County has a dedicated Emergency Operations Center (EOC). Most communities have rooms that are converted into EOCs.

Mutual aid agreements are in place throughout the county for fire, police, emergency management, public health, and public works. These agreements (MABAS, ILEAS, ILWARN, IEMMAS, PHMAS, IPWMAN) can be utilized in any phase of an emergency or disaster.

### 8.2 Preparedness - Threat Recognition

Planning, resources, and personnel are all important elements of preparedness. Threat recognition is also important. The first step in responding to a flood, tornado, storm, or other natural hazard is to know when

weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

### 8.2.1 Floods

A flood threat recognition system predicts the time and height of the flood crest. This can be done by measuring rainfall, soil moisture, and stream flows upstream of the community and calculating the subsequent flood levels.

On rivers and streams, including the Fox River and the Kishwaukee River, the measuring and calculating of flood events is done by the National Weather Service (NWS) which is in the U.S. Department of Commerce’s National Oceanic and Atmospheric Administration (NOAA). Support of NOAA’s efforts is provided by the United States Geological Service (USGS), IDNR, and McHenry County.

Forecasts of expected river stages are made through the Advanced Hydrologic Prediction Service (AHPS) of the NWS. Flood threat predictions are disseminated on the NOAA Weather Wire or NOAA Weather Radio. NOAA Weather Radio is considered by the federal government to be the official source for weather information.

When weather conditions are right for potential flooding, the NWS can issue a specific *prediction* of when and how high the major rivers and streams in McHenry County will peak. NWS can also issue more general flood statements on smaller streams throughout the County. The National Weather Service may issue a “flash flood watch.” This means the amount of rain expected will cause standing water and flooding on small streams and depressional areas. However, these events can be very localized and rapid such that a “flash flood warning” may not be issued.

One of the best tools for understanding flood predictions is a flood stage forecast map. Staff can identify the number of properties flooded, which roads will be under water, which critical facilities will be affected, etc. for a given prediction. With this information, an advance plan can be prepared that shows problem sites and determines what resources will be needed to respond to the predicted flood level.

**Local Implementation:** Real-time stream gage readings for sites on the Fox River and the Kishwaukee River can be accessed on USGS’s website using the station IDs shown in Table 8-1. McHenry County cooperates with the USGS and IDNR to maintain a network of rainfall and river gages are needed for flood threat recognition. Gage locations are shown in Figure 8-2. The McHenry County website offers a link to the NWS’s website, which provides rainfall data, stream levels and flood forecasts. The IDNR website provides links to numerous sites including the NWS, USGS and the U.S. Army Corps of Engineers. According to recent stream gage data, record streamflow has been recorded for three locations since the last plan update, including increases in Fox River Tailwater in 2017, the Kishwaukee in 2018, and Nippersink Creek in 2019.

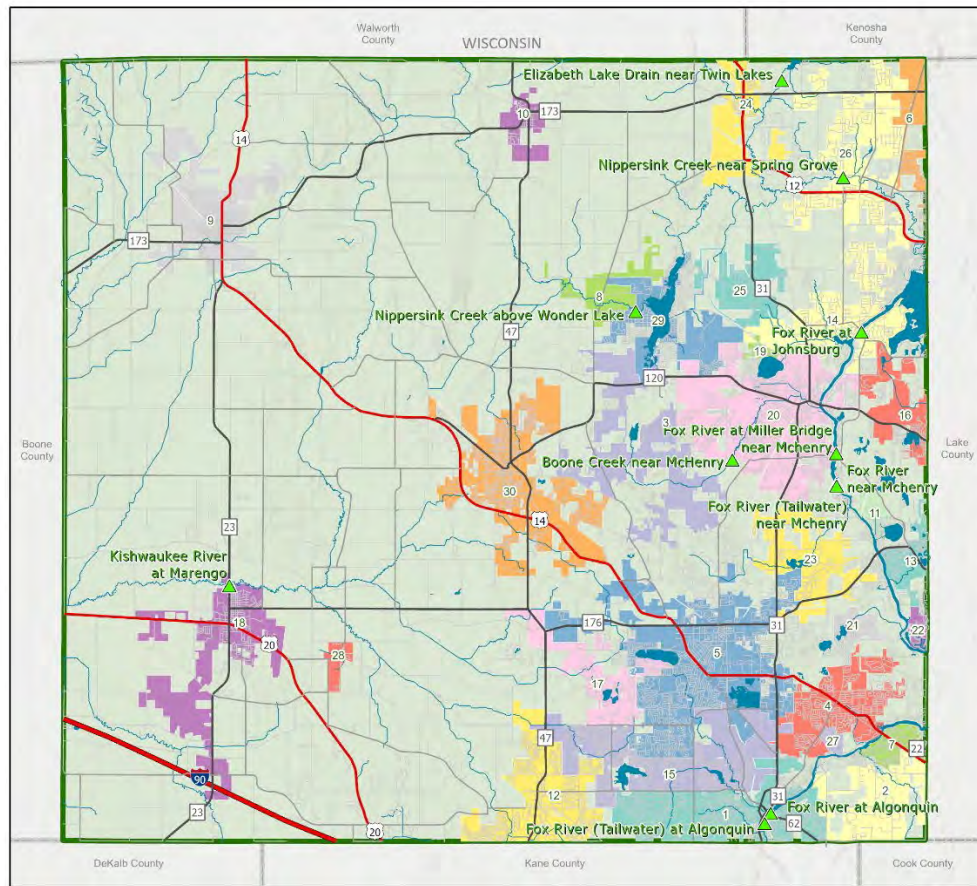
**Table 8-1 McHenry County Rain and Stream Gages**

USGS Station ID	USGS Station Name	Gage Height (ft)	Peak Streamflow	Year of Peak
05438030	Franklinville Creek at Franklinville, IL	12.43	239	2013
05438170	Kishwaukee River at Marengo, IL	13.06	3,330	2018
05548105	Nippersink Creek above Wonder Lake, IL	11.63	3,690	1999
05548280	Nippersink Creek near Spring Grove, IL	13.84	2,950	2019
05548500	Fox River at Johnsburg, IL	5.8	-	1993

USGS Station ID	USGS Station Name	Gage Height (ft)	Peak Streamflow	Year of Peak
05549000	Boone Creek near Mc Henry, IL	7.48	773	2013
05549500*	Fox River near McHenry, IL	4.8	-	1993
05549501	Fox River (Tailwater) near McHenry, IL	5.3	-	2017
05550000*	Fox River at Algonquin, IL	3.09	6,720	2004
05550001	Fox River (Tailwater) at Algonquin, IL	13.18	7,900	2017

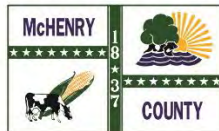
\*Peak streamflow not available from USGS.

Figure 8-2 McHenry County Rain and Stream Gage Locations



### McHenry County, IL

#### USGS Stream Gages



Map Produced by McHenry County  
GIS Department. Data: USGS (03/2023)  
Date: Feb 2023

- McHenry Boundary
- Surrounding Counties
- Interstate
- US Highways
- State Roads
- Other Roads
- Other Roads
- ~ Rivers & Streams
- ~ Lakes
- ▲ USGS Stream Gages

#### Municipal Boundaries

- 1 ALGONQUIN
- 2 BARRINGTON HILLS
- 3 BULL VALLEY
- 4 CARY
- 5 CRYSTAL LAKE
- 6 FOX LAKE
- 7 FOX RIVER GROVE
- 8 GREENWOOD
- 9 HARVARD
- 10 HEBRON
- 11 HOLIDAY HILLS
- 12 HUNTLEY
- 13 ISLAND LAKE
- 14 JOHNSBURG
- 15 LAKE IN THE HILLS
- 16 LAKEMOOR
- 17 LAKEWOOD
- 18 MARENGO
- 19 MCCULLOM LAKE
- 20 MCHENRY
- 21 OAKWOOD HILLS
- 22 PORT BARRINGTON
- 23 PRAIRIE GROVE
- 24 RICHMOND
- 25 RINGWOOD
- 26 SPRING GROVE
- 27 TROUT VALLEY
- 28 UNION
- 29 WONDER LAKE
- 30 WOODSTOCK

### *8.2.2 Tornadoes and Thunderstorms*

The NWS is the prime agency for detecting meteorological threats, such as tornadoes and thunderstorms. Severe weather warnings are transmitted through the Illinois State Police’s Law Enforcement Agencies Data System (LEADS) and through the NOAA Weather Radio System. As with floods, the NWS can only look at the large-scale weather picture, which is appropriate for the formation of a tornado.

For tornadoes and thunderstorms, local emergency managers can provide more site-specific and timely recognition by sending out NWS-trained spotters to watch the skies when the NWS issues a watch or warning.

### *8.2.3 Winter Storms*

The NWS is again the prime agency for predicting winter storms. Severe snowstorms can often be forecasted days in advance of the expected event, which allows time for warning and preparation. Though more difficult, the National Weather Service can also forecast ice storms.

### *8.2.4 Other Weather Hazards*

McHenry County dispatch centers receive other severe weather alerts from the LEADS system. These alerts are issued by the Illinois State Police who monitor the NOAA Weather Wire, or through their monitoring of NOAA weather radios. Police and fire stations, schools, county and municipal buildings, townships, libraries, and some private facilities have been issued Weather Radios, or they are notified over the EAS from the McHenry County EMA.

## **8.3 Warning**

After the threat recognition system tells the County and municipalities that a flood, tornado, thunderstorm, winter storm or other hazard is coming, the next step is to notify the public and staff of other agencies and critical facilities. Earlier-timed warnings or warnings with specific details can increase the number of people who can implement protection measures.

The NWS issues notices to the public using watches and warnings. Watch notices are issued when conditions are right for flooding, severe storms, and tornadoes. A warning is issued when a flood, severe storm, or tornado has been observed. A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- Outdoor warning sirens
- Sirens on public safety vehicles
- Commercial or public radio or TV stations
- The Weather Channel
- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone-activated receivers in key facilities
- Door-to-door contact
- Mobile public address systems
- Cellular phone text messages
- E-mail notifications
- Social media posts

Multiple or redundant systems are most effective – if people do not hear one warning, they may still get the message from another part of the system. Each has advantages and disadvantages:

- Radio and television provide pertinent information, but people must know when to turn them on.



- NOAA Weather Radio can provide short messages of any impending weather hazard or emergency and advise people to turn on their radios or televisions. While nearly all critical facilities (including schools) have Weather Radios, many or most property owners do not.
- Outdoor warning sirens can reach many people quickly if people are outdoors. They do not reach people in tightly insulated buildings or those around loud noise, such as in a factory, during a thunderstorm, or in air-conditioned homes. They do not explain what hazard is coming, but people should know to turn on a radio or television.
- Automated telephone notification services are also fast but can be expensive and do not work when phone lines are down. Nor do they work for unlisted numbers and calling screener services, although individuals can sign up for notifications.

Where a threat has a longer lead time, going door-to-door and manual telephone trees can be effective.

Just as important as issuing a warning is telling people what to do. A warning program should have a public information aspect. People need to know the difference between a tornado warning (when they should seek shelter in a basement) and a flood warning (when they should stay out of basements).

**StormReady:** The National Weather Service established the StormReady program to help local governments improve the timeliness and effectiveness of hazardous weather-related warnings for the public. To be officially StormReady, a community must:

- Establish a 24-hour warning point and EOC,
- Have more than one way to receive severe weather warnings and forecasts and to alert the public,
- Create a system that monitors weather conditions locally,
- Promote the importance of public readiness through community seminars, and
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

Being designated as a StormReady community by the Weather Service is a good measure of a community's emergency warning program for weather hazards.

**Local Implementation:** McHenry County and several municipalities are part of the StormReady program, including the Village of Huntley and the Village of Lake in the Hills. The Village of Algonquin has submitted its StormReady program application and is awaiting response for this Plan Update. McHenry County and municipal emergency services, including fire protection districts, are responsible for disseminating warning information to the public and notifying response personnel during an emergency. The EMA departments communicate with each other through radio. Once a threat is perceived, the County's 911 dispatch center then transmits the warnings to all first responders, and, in conjunction with the McHenry County emergency management, the warnings are transmitted to schools, hospitals, government offices, business, and the public through the following systems:

- The Emergency Alert Radio System (EARS) is a tone alert system designed to provide weather watch and warning information to schools, hospitals, government offices, businesses, and the public.
- The Illinois Emergency Alert System (ILEAS) is a national warning system that utilizes broadcast radio, television stations, and local cable television systems.

- Nixle is a system that provides real-time communication between public safety, municipalities, businesses, and their communities through text, email, voicemail, social media, and the Nixle Mobile App.

Communities are responsible for notification to their citizens and activation of their warning systems. Fire chiefs, police chiefs, and mayors may be authorized to activate the warning system according to their emergency plans. The hospitals, nursing homes, and special needs homes in the county have weather radios to monitor weather conditions.

## 8.4 Response

The protection of life and property is the foremost important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries. Typical actions and responding parties include the following:

- Activating the EOC
- Closing streets or bridges (police, Sheriff, MCDOT, township or public works)
- Shutting off power to threatened areas (utility company)
- Passing out sand and sandbags (MCDOT, township or public works)
- Ordering an evacuation (chief elected official)
- Holding children at school/releasing children from school (school district)
- Opening evacuation shelters (EMA)
- Monitoring water levels (engineering)
- Security and other protection measures (police or Sheriff)

**Local Implementation:** Municipalities are responsible for warnings in their incorporated areas, and fire protection districts for their areas of service, until all their resources are exhausted. If the severity or extent of an emergency were to exceed any municipality’s capability, the County emergency management will be able to provide additional resources and assistance. Table 8-2 shows which communities have EOPs with specific flood response procedures.

Algonquin utilized their GIS system to identify critical facilities and other properties that will be impacted by a flood. Maps are delivered to owners/occupants with an evacuation notice. As discussed in Section 8.1, mutual aid agreements have been developed and will be utilized to the extent needed.

## 8.5 Critical Facilities Protection

Critical facilities are discussed in Chapter 1. Protecting critical facilities during a disaster is the responsibility of the facility owner or operator. However, if they are not prepared for an emergency, the rest of the community could be impacted. If a critical facility is damaged, workers and resources may be unnecessarily drawn away from other disaster response efforts. If such a facility is adequately prepared by the owner or operator, it will be better able to support the community’s emergency response efforts.

Many critical facilities have full-time professional managers or staff who are responsible for the facility during a disaster. Some have their own emergency response plans. Illinois state law requires hospitals, nursing homes, and other public health facilities to develop such plans. Many facilities would benefit from early warning, response planning, and coordination with community response efforts.

**Local Implementation:** This Plan identifies all local government-owned buildings, schools, hospitals, nursing homes, and other public and private health facilities, including their location in the 100-year or

500-year floodplain. Table 8-2 shows communities that have procedures in their EOPs for critical facilities. Chapter 5 discusses the importance of protecting critical facilities from damage.

## 8.6 Recovery and Mitigation

After a disaster, communities should undertake activities to protect public health and safety, facilitate recovery, and help prepare people and property for the next disaster. Appropriate pro-active emergency services that can support natural hazard mitigation and the reduction of risk to life and property include:

- Conducting a public information effort to advise residents about mitigation measures they can incorporate into their reconstruction work.
- Evaluating damaged public facilities to identify mitigation measures that can be included during repairs.
- Acquiring substantially or repeatedly damaged properties from willing sellers.
- Planning for long-term mitigation activities.
- Applying for post-disaster mitigation funds.

**Table 8-2 Community Emergency Flood Procedures (not all communities are shown in table)**

Municipality	Flood Response Procedures	Critical Facilities Protection Procedures	Personnel Trained for Damage Assessment
Algonquin, Village of	Yes	Yes	Yes
Barrington Hills, Village of	Yes	No	No
Bull Valley, Village of	No	No	No
Cary, Village of	No	No	Yes
Crystal Lake, City of	Yes	No	Yes
Fox River Grove, Village of	No	No	No
Greenwood, Village of	No	No	No
Harvard, City of	No	No	No
Hebron, Village of	No	No	No
Holiday Hills, Village of	No	Yes	No
Huntley, Village of	No	No	No
Johnsburg, Village of	Yes	No	No
Lake in the Hills, Village of	Yes	No	Yes
Lakewood, Village of	Yes	Yes	Yes
Marengo, City of	Yes	No	No
McCullom Lake, Village of	No	No	No
McHenry, City of	Yes	Yes	No
Oakwood Hills, Village of	No	No	No
Prairie Grove, Village of	No	No	No
Richmond, Village of	No	No	No
Ringwood, Village of	No	No	No
Spring Grove, Village of	Yes	No	Yes
Trout Valley, Village of	No	No	No
Union, Village of	No	No	No
Wonder Lake, Village of	No	No	Yes
Woodstock, City of	No	Yes	No
Unincorporated McHenry County	Yes	Yes	Yes

**Local Implementation:** Special requirements apply to buildings in the floodplain and the floodway, regardless of the type of disaster or cause of damage. The National Flood Insurance Program (and the McHenry County Stormwater Management Ordinance) requires that local officials enforce the substantial damage regulations. These rules require that if the cost to repair a building in a flood hazard area equals or exceeds 50% of the building's market value, the building must be retrofitted to meet the standards of a new building in the floodplain. In most cases, this means that a substantially damaged building in the floodplain must be elevated above the base flood elevation. Floodway rules established by IDNR are included in the County's Stormwater Management Ordinance.

These requirements can be very difficult for understaffed and overworked offices after a disaster. If these activities are not carried out properly, the community can miss an opportunity to address a hazardous area, but it may be violating its obligations under the NFIP.

The McHenry County Department of Planning & Development's Water Resources Division is responsible for the implementation of the floodplain regulations in the countywide Stormwater Management Ordinance. Municipalities that participate in the NFIP are responsible for floodplain regulations as a condition of their good standing in the NFIP.

Also, forms for conducting damage assessments, following a hazard event are posted on the McHenry County EMA website.

## 8.7 Conclusions

The following conclusions for the capacity and capabilities of McHenry County and its jurisdictions to implement pro-active emergency management measures for natural hazard mitigation include:

1. Emergency management planning in the County is ongoing and municipalities continue to develop and maintain their own EOPs.
2. Numerous mutual aid agreements are in place throughout the County.
3. The threat recognition system for severe weather hazards (tornadoes, summer storms, floods, and winter storms) for the County is relatively good.
4. The procedures and media that the County and municipalities use to disseminate warnings are generally comprehensive.
5. Schools, hospitals, nursing homes, and government buildings have NOAA weather radios.
6. Outdoor warning systems in several areas of the County may be inadequate.
7. Mobile home parks (discussed in Chapter 5) are without warning systems. Despite the threat, tornado shelters or safe rooms are rare for mobile home parks.
8. Some emergency response plans do not cover critical facilities that will be affected by various types of hazards.

Given these conclusions, McHenry County and its jurisdictions have good capacity and capabilities to implement pro-active emergency management to support hazard mitigation.

## 8.8 Recommendations

The following emergency management measures are recommended by the Mitigation Committee:

1. The flood threat recognition system should be improved through additional funding and research of additional riverine gages in tributary watersheds to the Fox River and Kishwaukee River.

2. Continue updating emergency operations plans for the County and continue developing municipal emergency operations plans with a NIMS-compliant template.
3. All identified critical facilities in the County should be mapped using the County's GIS mapping for planning, warning, and response purposes. The County should continue their efforts to work with municipalities and determine critical facilities located in flood prone areas.
4. Provide training on NIMS and ICS for all first responders and other identified personnel for compliance.
5. Emergency operations centers in the County and in municipalities should be evaluated for effectiveness and functionality and modified appropriately. The County and all municipalities should have a fully operational EOC and a secondary location.
6. Conduct annual emergency response training exercises. Look for multi-jurisdiction training opportunities.
7. All parcels, structures, and critical facilities in the floodplain should be identified using the County's GIS mapping for planning, warning, and response purposes.
8. Investigate adequacy and research funding opportunities for emergency warning and response equipment, including outdoor weather warning sirens, generators for critical facilities, and other warning systems.
9. Response procedures for floods and other hazards should be incorporated in all emergency operations planning and response where appropriate. For example, public works departments, MCDOT and township highway departments should pre-identify sandbag staging locations for residents.
10. All communities should strive to obtain a StormReady designation.
11. Develop flood stage maps for the County's major streams to make use of gaging networks, warning systems and GIS mapping capabilities.
12. Develop emergency transportation plans that allow for emergency coordination and evacuation routes.

## 8.9 References

1. FEMA. 2017. *National Flood Insurance Program Community Rating System Coordinator's Manual*. Accessed: [https://www.fema.gov/sites/default/files/documents/fema\\_community-rating-system\\_coordinators-manual\\_2017.pdf](https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinators-manual_2017.pdf).
2. Illinois Department of Natural Resources. 2023. *Water Resources*. Accessed: <https://dnr.illinois.gov/waterresources.html>.
3. National Weather Service. 2023. *NSW StormReady Program*. Accessed: [www.nws.noaa.gov/stormready/](http://www.nws.noaa.gov/stormready/).
4. U.S. Geological Survey. 2023. *Current Water Data for the Nation*. Accessed: <https://waterdata.usgs.gov/nwis/rt>.
5. Survey of McHenry County, municipalities, and townships, 2023.

## CHAPTER 9 - PUBLIC INFORMATION

The effects of all natural hazards can be reduced through effective public information activities. This is also true for addressing health issues and pandemics. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property. These activities can motivate people to take the steps necessary to protect themselves and others. A successful hazard mitigation program involves a public information strategy and involves both the public and private sectors.

**Figure 9-1 Hazards Addressed through Public Information Methods**

Hazards Addressed	
✓	Floods
✓	Summer
✓	Winter Storms
✓	Extreme Cold
✓	Extreme Heat
✓	Tornadoes
✓	Drought
✓	Groundwater

### 9.1 Outreach Projects

Outreach projects provide property owners with information to assist them in taking appropriate steps or designing and implementing a project. Outreach projects should encourage people to seek out more information to take the most appropriate steps to protect themselves and their properties. Sending notices to property owners can help introduce the idea of property protection and identify sources of assistance.

Numerous government agencies and non-profit organizations publish public information regarding hazards and hazard mitigation. These can be used for outreach purposes. Providing technical assistance and library resources are other forms of outreach. The challenge is to have these efforts effectively reach their intended audience.

**Community newsletters/direct mailings:** One of the most effective types of outreach projects are materials mailed or distributed to everyone in the community or, in the case of floods, to floodplain property owners. Newsletters and direct mailing materials should include information on safety, health, and property protection measures. These mailings should be locally designed and tailored to meet local conditions.

**News media:** Local newspapers can be strong allies in efforts to inform the public. Press releases and story ideas may be all that is needed to garner the interest of a local reporter. And, for example, after a tornado in another community, people and the media become interested in their own tornado vulnerability and how to protect themselves and their property. Local radio stations and cable TV channels can also help. These media offer interview formats and cable may be willing to broadcast videos on the hazards.

**Figure 9-2 McHenry County EMA Application**



**Social Media:** Social media platforms like LinkedIn and Nixle are important for local government officials to connect with the public on topics like public safety, general interests, and concerns from citizens, and disseminating information during incidents. Currently, the County utilizes LinkedIn and Nixle. McHenry County EMA also has a phone application to share EMA warnings, notifications, maps, documents, links to key resources, and a platform to report damage or service outages (see Figure 9-2).

**Other approaches:** Examples of other outreach project approaches include:

- School programs,
- Presentations at meetings of neighborhood, civic or business groups,
- Displays in public buildings or shopping malls,
- Signs in parks, along trails and on waterfronts that explain the natural features (such as the river) and their relation to hazards (such as floods),
- Brochures available in municipal buildings and libraries, and
- Special meetings such as floodproofing open houses.

**Local implementation:** McHenry County and all municipalities provide community newsletters and/or community news on their websites. Algonquin, McHenry, and Nunda Townships as well as Woodstock Fire Rescue District also prepare community newsletters.

**National publications:** The American Red Cross has a variety of brochures and publications on safety measures to take for fires, floods, winter storms, heat, etc. Their publications are tailored for different age groups. The American Red Cross also conducts specialized programs on topics such as “home alone safety,” first aid and CPR, and what to do during a disaster. American Red Cross publications can be obtained at [www.redcross.org/pubs/](http://www.redcross.org/pubs/) or [www.chicagoredcross.org](http://www.chicagoredcross.org).

FEMA and IEMA provide numerous publications that can be obtained via their websites: [www.fema.gov/help/publications.shtm](http://www.fema.gov/help/publications.shtm) and [www.state.il.us/iema/](http://www.state.il.us/iema/). A number of the FEMA preparedness guides are also available on the McHenry County website.

## 9.2 Library and Websites

The community library and local websites provide great opportunities for residents to seek information on hazards, hazard protection, and protecting natural resources. Books and pamphlets on hazard mitigation can be given to libraries, many of them obtained free from state and federal agencies. Libraries also have their own public information campaigns with displays, lectures, and other projects, which can augment the activities of the local government.

Today, websites are becoming more popular as research tools. They provide quick access to a wealth of public and private sites and sources of information. Through links to other websites, there is almost no limit to the amount of up-to-date information that can be accessed by the user.

In addition to on-line floodplain maps, websites can link to information for homeowners on how to retrofit for tornadoes, earthquakes, and floods and a “FEMA for Kids” site. This website (<https://www.fema.gov/blog/fema-kids>) teaches children how to protect their home and what to have in a family disaster kit.

**Figure 9-3 Example FEMA Resources**



The McHenry County Emergency Management Agency (EMA) website offers a plethora of resources, from current events to severe weather safety and information about the McHenry County EMA App. The EMA app is a tool used to assist residents in becoming more aware of potential hazards. App features include information on how to prepare before, during, and after certain types of disasters. The app also has Social Media Integration, customizable preparedness checklists, and the ability to notify County EMA of personal property damage. The app also provides the option to send emergency notifications and information to your phone. (See Figure 9-2).

Figure 9-4 Severe Weather Preparedness



**Local implementation:** Table 9-1 lists community libraries that offer resources and information on hazards and hazard mitigation.

Table 9-1. Community libraries that offer hazard and hazard mitigation resources

Library Name	Library Name
Algonquin Area Public Library	Johnsburg Public Library
Cary Area Public Library (District)	Marengo Public Library
Crystal Lake Public Library	McHenry Public Library (District)
Fox River Grove Public Library	Nippersink Public Library
Harvard Diggins Library	Woodstock Public Library
Huntley Area Public Library	

The State of Illinois has created a website called “Ready Illinois” that provides information for before, during and after an emergency (Figure 9-5). Numerous other agency website links are provided at this site.

Figure 9-5 “Ready Illinois” website





### 9.3 Technical Assistance

**Hazard information:** Providing map information to inquirers is an important public information activity. Mapping capabilities improve each year, both on paper and via the internet. While a map may be readily available, understanding what the map shows and measures may still, in many circumstances, require technical assistance.

Communities can easily provide map information from FEMA's FIRMs and Flood Insurance Studies. They may also assist residents in submitting requests for map amendments and revisions when they are needed to show that a building is outside the mapped floodplain.

Communities often supplement what is shown on the FIRM with maps that complement the FIRM and provide information on additional hazards, flooding outside mapped areas and zoning. When the map information is provided, community staff can explain insurance, property protection measures and mitigation options that are available to property owners. Communities should also remind inquirers that being outside the mapped floodplain is no guarantee that a property will never get wet, and that flood insurance is available.

**Property protection assistance:** While general information provided by outreach projects or the library helps, most property owners do not feel ready to retrofit their buildings without more specific guidance or funding support. Local building department staff are typically experts in construction. They can provide free advice, not necessarily to design a protection measure, but to steer the owner onto the right track. Building or public works department staff can provide the following types of assistance:

- Visit properties and offer protection suggestions,
- Recommend or identify qualified or licensed contractors,
- Inspect homes for anchoring of roofing and the home to the foundation,
- Provide advice on protecting windows and garage doors from high winds, and
- Explain when building permits are needed for home improvements.

**Local implementation:** McHenry County provides technical assistance to unincorporated areas and its jurisdictions to read FIRMS and provide hazard mitigation advice to property owners.

### 9.4 Real Estate Disclosure

Historically, requirements to disclose flood damage to new property owners were limited. Federally regulated lending institutions must advise applicants for a mortgage that properties are in the SFHA and therefore require flood insurance. Nevertheless, flood losses commonly occur outside the SFHA. Currently, the Illinois Residential Real Property Disclosure Act requires a seller to disclose the following to potential buyers:

- If the seller is aware of any flooding or basement leakage problem
- If the property is in a floodplain or if the seller has flood insurance
- If the seller is aware of a radon problem
- If the seller is aware of any mine subsidence or earth stability defects on the premises
- If the seller is aware of any structural defects

This State law is not wholly reliable. Due to the sporadic occurrence of flood events, a property owner may legitimately not be aware of potential flooding problems with a property being sold or purchased. Practices by local real estate boards can overcome the deficiencies of these laws and advise newcomers

about the hazard earlier. They may also encourage disclosure of past flooding or sewer problems, regardless of whether the property is in a mapped floodplain.

## 9.5 Public Information Program Strategy

The development of a public information program strategy is an approach to improve the effectiveness of the community's public information efforts. A public information program strategy involves the review of local conditions, local public information needs, and a recommended action plan of activities. A strategy should consist of the following parts, which are incorporated into this Plan.

- The local hazards – discussed in Chapter 2 of the Plan.
- The property protection measures appropriate for a specific hazard – discussed in Chapter 5.
- Hazard safety measures appropriate for the local situation.
- The public information activities currently being implemented within the communities, including those by non-government agencies – discussed in Sections 9.1 through 9.4.
- Goals for the community public information programs are covered in Chapter 3.
- The outreach projects that will be done in each year to reach the goals of Chapter 10's Action Plan, and the recommendations made in this Chapter.
- The process that will be followed to monitor and evaluate the projects is in Chapter 10's Action Plan.

Much of the above items are taken from FEMA's Community Rating System for the National Flood Insurance Program, but the strategy is useful and applicable for any hazard or mitigation outreach effort.

## 9.6 Conclusions

Through iterations of the Natural Hazard Mitigation Plan, the Mitigation Committee has established a list of public information topics for focus, as well as methods to distribute public information messages and materials. The following conclusions related to use for natural hazard mitigation purposes include:

1. Public information programs are important so that people and businesses are more aware of the hazards they face and how they can protect themselves. Public information efforts are currently being implemented by McHenry County, McHenry County municipalities and townships, FEMA, IEMA, and the American Red Cross.
2. Community outreach projects, libraries and websites can reach a lot of people, but only a moderate amount of information is being provided on natural hazards.
3. Mitigation efforts are being implemented by communities (e.g., building codes and the countywide Stormwater Management Ordinance), but little information is being provided to property owners to describe these current mitigation activities and actions.

McHenry County's strong relationships between jurisdictions and with the community indicate the capability and capacity to implement an effective public information plan related to hazard mitigation.

## 9.7 Recommendations

The Mitigation Committee assessed a variety of topics and determined that for McHenry County the most important topics to cover in public information activities are:

1. Safety and emergency protection measures during severe storms, tornadoes, and floods.

2. Protecting your property from flood damage, including sharing educational materials about floodproofing, local drainage issues, and sources of assistance.
3. Increasing public understanding of floods, including why there are floods, why the floodplain is regulated, and flood insurance.
4. Outreach to protect McHenry County's watersheds, water quality, and water conservation activities.

By making a few changes and formalizing the activities, a community can earn nearly 500 points under the Community Rating System. The Mitigation Committee summarizes that the most effective way to share information are multi-faceted, and include engagement of social media, community newsletters, newspaper articles, and sharing material at public gatherings. All communities in McHenry County implement public information activities. In addition, the Mitigation Committee submits the following recommended actions to implement public information activities in support of natural hazard mitigation:

1. Each County office, municipality and township should review their current public information activities and incorporate the above messages in them, where appropriate.
2. Public information for hazard mitigation should be coordinated with the McHenry County Department of Health to combine resources and messages for natural hazards and health concerns related to pandemic or disasters.
3. Publications developed by other agencies should be reviewed, consolidated, and tailored for distribution to McHenry County property owners. A set of countywide publications should be developed that can be used by communities as is, but developed in a format that allows communities to customize the material.
4. Sample articles, with illustrations, on these topics should be prepared and distributed to all interested parties, such as public information offices, webmasters, permit offices, reception desks, and neighborhood organizations.
5. The County should provide an order form for local libraries to order free state and federal hazard mitigation publications.
6. Community websites should include information and links to other sites to cover as many topics as possible.
7. Communities in the National Flood Insurance Program should provide floodplain information for property owners.

## 9.8 References

1. FEMA. 2014. *Homeowner's Guide to Retrofitting FEMA P-312*. Accessed: [https://www.fema.gov/sites/default/files/2020-08/FEMA\\_P-312.pdf](https://www.fema.gov/sites/default/files/2020-08/FEMA_P-312.pdf)
2. FEMA. 2017. *National Flood Insurance Program Community Rating System Coordinator's Manual*. Accessed: [https://www.fema.gov/sites/default/files/documents/fema\\_community-rating-system\\_coordinators-manual\\_2017.pdf](https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_coordinators-manual_2017.pdf).
3. FEMA. 2021. *Mitigation Resource Guide*. Accessed: [https://www.fema.gov/sites/default/files/documents/fema\\_mitigation-resource-guide.pdf](https://www.fema.gov/sites/default/files/documents/fema_mitigation-resource-guide.pdf).
4. Illinois Emergency Management Agency. 2023. Accessed: <https://www.mchenrycountyil.gov/departments/emergency-management>.
5. Survey of McHenry County, municipalities, and townships, 2023.

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## CHAPTER 10 - ACTION PLAN

### 10.1 Action Plan Overview

The findings, conclusions and recommendations presented in Chapters 1 through 9 of the *McHenry County Natural Hazards Mitigation Plan* comprise the basis of this Action Plan. This Action Plan establishes the priority direction of the McHenry County natural hazards mitigation program. Specific mitigation activities of the Action Plan are presented in detail in Sections 10.2. The County’s process for evaluating and prioritizing mitigation activities are presented in detail in Section 10.3. Tables summarizing the responsible agencies and estimated timelines, hazards addressed, implementation priorities, and alignment to Plan goal and guidelines are provided in Sections 10.4. Sections 10.5 and 10.6 address Plan maintenance, implementation, and integration and updates since 2017, respectively.

**Plan Recommendations:** Recommendations for this McHenry County Natural Hazards Mitigation Plan are provided at the end of Chapters 4 through 9 for each of the six mitigation strategies (preventive measures, property protection, structural projects, resource protection, emergency services, and public information). Recommendations presented in the Plan may be selected for implementation as resources become available (e.g., federal, state and/or local funding). Some recommendations function as “building blocks” to other recommendations, but most recommendations call for mitigation actions and projects. This chapter presents selected recommendations for implementation as priority action items. Recommendations not included in this Action Plan are no less important. As resources become available, all recommendations may be implemented.

**Selection of Action Items:** Recommendations selected as priority action items were deemed as being both necessary and feasible over the course of the next years by the Mitigation Committee. Feasibility was based on current County and municipal resources and currently available grant funding from state and federal agencies.

The action items included in this Action Plan support the goals and guidelines for this McHenry County Natural Hazards Mitigation Plan (Chapter 3). The action items call for both the continuation of current mitigation efforts throughout the County, and the initiation of new mitigation activities. Continued compliance with the NFIP is called for in Action Item 10 – see Table 4-3 in Chapter 4 for details regarding County and community-specific NFIP participation – and improved understanding of the County’s floodplain and flood problem areas is also incorporated into several other action items.

During the 2017 Plan update, it was recommended that action status be provided at the municipal and township levels to begin moving toward jurisdiction-specific actions. The 2017 actions were reviewed annually and in-person at the March 2023 meeting. In addition, several follow-up communications were made to specific jurisdictions to obtain an action status update. In some cases, a jurisdiction-specific action status was not applicable or was not obtained. The Mitigation Committee will continue to build on these efforts in future updates of this Plan.

**Organization, Prioritization and Assignment of Action Items:** The action items in Section 10.2 are grouped into administrative items that include maintenance activities and mitigation program activities. Action items assign recommended projects and estimated timelines to the appropriate agencies. Each action item contains a brief description and a section for the responsible agency, the estimated timeline for accomplishing the action item, the costs, and the benefits. Action items were prioritized for implementation using an evaluation and scoring process detailed in Section 10.3. The full

list of action items is summarized in Table 10-27, and the relationship between the action items, Plan goals and guidelines, and chapter recommendations are summarized in Tables 10-28, 10-29, and 10-30.

## 10.2 Mitigation Action Items

### 10.2.1 Administrative Action Items

#### Action Item 1: Plan Adoption

Adopt this 2023 McHenry County Natural Hazards Mitigation Plan by resolution of the County Board, City Councils, Boards of Trustees, and other governing boards, as appropriate. Each agency resolution should adopt the action items pertinent to the community and assign a person responsible.

*Responsible Agency:* The McHenry County Board, City Councils, Village Boards, Boards of Trustees, and other agencies.

*Estimated Timeline:* 3 months post-approval of the final plan by FEMA.

*Cost:* Staff time.

*Benefits:* Adoption of the Plan ensures that the County, municipalities, townships, and other agencies are authorized to implement the action items with available resources. Adoption is also a requirement for recognition of the Plan by FEMA to be eligible for assistance via Hazard Mitigation Assistance funding programs such as the FEMA Building Resilient Infrastructure and Communities (BRIC) program, Flood Mitigation Assistance (FMA) program, and the Hazard Mitigation Grant Program (HMGP).

*Plan Reference:* Chapters 1 and 9.

**Table 10- 1 Action 1 Status**

Stakeholder	Action Item #1 Status (2023)
<b>County</b>	
McHenry County	Ongoing — The 2023 McHenry County Natural Hazards Mitigation Plan will be adopted by the county and incorporated jurisdictions once the plan receives “approved pending adoption” status from IEMA.
<b>Municipalities</b>	
Algonquin, Village of	Ongoing — The 2023 McHenry County Natural Hazards Mitigation Plan will be adopted by the county and incorporated jurisdictions once the plan receives “approved pending adoption” status from IEMA.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	

Stakeholder	Action Item #1 Status (2023)
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	Ongoing — The 2023 McHenry County Natural Hazards Mitigation Plan will be adopted by the county and incorporated jurisdictions once the plan receives “approved pending adoption” status from IEMA.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

**Action Item 2: Continuation of Mitigation Committee**

The County’s resolution to adopt this Plan should convert the McHenry County Hazards Mitigation Committee to a permanent advisory body. It should:

1. Function as a forum for hazard mitigation issues,
2. Disseminate hazard mitigation ideas and activities to all participants,
3. Allow for continued public participation in the Plan implementation and future revisions,
4. Ensure incorporation of this Plan’s goals and guidelines into other planning documents,
5. Monitor implementation of this Action Plan, and
6. Report on progress and recommended changes to the County Board and each municipality and township.

*Responsible Agency:* The McHenry County Board and local representatives part of the Mitigation Committee.

*Estimated Timeline:* Ongoing.

*Cost:* Staff time.

*Benefits:* The benefit is better implementation of this Plan, plus a more comprehensive mitigation program in McHenry County. This approach also provides a mechanism for continued public involvement (e.g., Mitigation Committee activities posted on the County website, etc.).

*Plan Reference:* Chapters 1 and 9.

**Table 10- 2 Action 2 Status**

Stakeholder	Action Item #2 Status (2023)
<b>County</b>	
McHenry County	Ongoing – The McHenry County Mitigation Committee formally convened in 2010 and will continue to guide the planning process. The County Board adoption resolution of December 2010 states that the “McHenry County Hazard Mitigation Committee is hereby established as a permanent advisory body.” All participating jurisdictions have representation, and the Mitigation Committee is reviewed for new members during each 5-year Plan update.
<b>Municipalities</b>	
Algonquin, Village of	Ongoing – The McHenry County Mitigation Committee was formally adopted in 2010 and will continue to guide the planning process. The County Board adoption resolution of December 2010 states that the “McHenry County Hazard Mitigation Committee is hereby established as a permanent advisory body.” All participating jurisdictions have representation, and the Mitigation Committee is reviewed for new members during each 5-year Plan update.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	

Stakeholder	Action Item #2 Status (2023)	
Spring Grove, Village of	Ongoing – The McHenry County Mitigation Committee formally convened in 2010 and will continue to guide the planning process. The County Board adoption resolution of December 2010 states that the “McHenry County Hazard Mitigation Committee is hereby established as a permanent advisory body.” All participating jurisdictions have representation, and the Mitigation Committee is reviewed for new members during each 5-year Plan update.	
Trout Valley, Village of		
Union, Village of		
Wonder Lake, Village of		
Woodstock, City of		
<b>Townships</b>		
Alden, Township of		
Algonquin, Township of		
Burton, Township of		
Chemung, Township of		
Coral, Township of		
Dorr, Township of		
Dunham, Township of		
Grafton, Township of		
Greenwood, Township of		
Hartland, Township of		
Hebron, Township of		
Marengo, Township of		
McHenry, Township of		
Nunda, Township of		
Richmond, Township of		
Riley, Township of		
Seneca, Township of		

**Action Item 3: Plan Monitoring and Maintenance**

McHenry County holds a formal Committee Meeting at least once a year to evaluate and monitor progress on implementation. This meeting will be advertised in print and on the County and community websites, and the public will be welcome to attend and/or comment. The chair of the Mitigation Committee will submit an annual evaluation report to the County Board.

At the annual meeting, along with an assessment of the implementation efforts, the Mitigation Committee will determine if other mitigation issues or efforts, based on any natural hazard occurrences or input from communities or the public, should be added to the Plan.

FEMA requires the Natural Hazard Mitigation Plan to be updated every five years. Every five years, or if any substantial revisions to the Plan are recommended to the Action Plan in any year, the County Board and the participating communities must adopt the Plan.

*Responsible Agency:* The McHenry County Hazard Mitigation Committee and McHenry County Emergency Management Agency (EMA).

*Estimated Timeline:* Mitigation Committee meetings are to occur annually. Evaluation reports are to be prepared annually. A five-year update is required to receive assistance for FEMA’s mitigation funding programs.

*Cost:* Staff time.



*Benefits:* A monitoring system helps ensure that responsible agencies continue to be aware of their assignments. The Plan should be evaluated considering progress, changed conditions, and new opportunities.

*Plan Reference:* Chapters 1 and 9.

**Table 10- 3 Action 3 Status**

Stakeholder	Action Item #3 Status (2023)
<b>County</b>	
McHenry County	Ongoing – The County holds an annual meeting (at a minimum) for plan participants to review the status of Action Items. The meeting is usually held in November and an annual report is prepared (in compliance with the FEMA CRS Program).
<b>Municipalities</b>	
Algonquin, Village of	Ongoing – The County holds an annual meeting (at a minimum) for plan participants to review the status of Action Items. The meeting is typically held in November and an annual report is prepared (in compliance with the FEMA CRS Program).
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	

Stakeholder	Action Item #3 Status (2023)
Burton, Township of	Ongoing — The County holds an annual meeting (at a minimum) for plan participants to review the status of Action Items. The meeting is typically held in November and an annual report is prepared (in compliance with the FEMA CRS Program).
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

**Action Item 4: Include the McHenry County Natural Hazards Mitigation Plan into Other Plans**

As the county and municipalities develop or revise comprehensive or land use plans, emergency operations plans, and ordinances, the goals and guidelines of this Plan should be incorporated into those efforts.

*Jurisdiction/Community:* McHenry County, municipalities, and Mitigation Committee members including the Environmental Defenders of McHenry County and the McHenry County Conservation District.

*Responsible Agency:* McHenry County, municipalities, and Mitigation Committee members including the Environmental Defenders of McHenry County and the McHenry County Conservation District.

*Estimated Timeline:* Ongoing.

*Cost:* Staff time.

*Benefits:* A comprehensive approach for McHenry County and municipalities to take a consistent approach to natural hazard mitigation, and develop other plans with the protection of life, health, safety, business, and property protection in mind.

*Plan Reference:* Chapters 1 and 9.

**Table 10- 4 Action 4 Status**

Stakeholder	Action Item #4 Status (2023)
<b>County</b>	Completed — The County has incorporated relevant sections and excerpts from this Plan into the following:
McHenry County	
	<ul style="list-style-type: none"> <li>• McHenry County Water Resources Action Plan (WRAP) 2020 update</li> <li>• McHenry County 2040 Long Range Transportation Plan</li> </ul>

Stakeholder	Action Item #4 Status (2023)
	<p>Ongoing — The County will incorporate relevant sections and excerpts from this Plan into the upcoming McHenry County 2022-2025 Strategic Plan, 2050 Comprehensive Plan and 2050 Long Range Transportation Plan. The County will also consider incorporating relevant sections in the Emergency Operations Plan (EOP).</p> <p>Not Started — The County will explore developing guidance for ordinance updates and plan integration.</p>
<b>Municipalities</b>	
Algonquin, Village of	⌛
Barrington Hills, Village of	⌛
Bull Valley, Village of	⌛
Cary, Village of	Completed — The Village references this Plan within its Emergency Operations Plan (EOP).
Crystal Lake, City of	⌛
Fox Lake, Village of	⌛
Fox River Grove, Village of	⌛
Greenwood, Village of	⌛
Harvard, City of	⌛
Hebron, Village of	⌛
Holiday Hills, Village of	⌛
Huntley, Village of	⌛
Island Lake, Village of	⌛
Johnsburg, Village of	⌛
Lake-In-The-Hills, Village of	⌛
Lakemoor, Village of	⌛
Lakewood, Village of	Ongoing — The Village is updating its current EOP to reference this Plan.
Marengo, City of	⌛
McCullom Lake, Village of	⌛
McHenry, City of	⌛
Oakwood Hills, Village of	⌛
Port Barrington, Village of	⌛
Prairie Grove, Village of	⌛
Richmond, Village of	⌛
Ringwood, Village of	⌛
Spring Grove, Village of	⌛
Trout Valley, Village of	⌛
Union, Village of	⌛
Wonder Lake, Village of	⌛
Woodstock, City of	⌛
<b>Townships</b>	
Alden, Township of	⌛
Algonquin, Township of	⌛
Burton, Township of	⌛
Chemung, Township of	⌛
Coral, Township of	⌛
Dorr, Township of	⌛

Stakeholder	Action Item #4 Status (2023)
Dunham, Township of	⌚
Grafton, Township of	⌚
Greenwood, Township of	⌚
Hartland, Township of	⌚
Hebron, Township of	⌚
Marengo, Township of	⌚
McHenry, Township of	⌚
Nunda, Township of	⌚
Richmond, Township of	⌚
Riley, Township of	⌚
Seneca, Township of	⌚

⌚ = No Update. The community has not integrated information from the previous plan into other planning mechanisms. The community will incorporate relevant sections and excerpts from this Plan into future ordinances and other related plans as identified.

### 10.2.2 Mitigation Program Action Items

#### Action Item 5: Watershed Studies

McHenry County should pursue comprehensive watershed studies. This effort will foster the understanding of the impact of development on existing flood problems and identify ways to reduce future flood problems. Watershed studies should also evaluate wetlands and water quality impacts of development and other activities in McHenry County, and foster implementation beyond what is recommended here.

*Responsible Agency:* McHenry County, including municipalities and watershed stakeholder groups.

*Estimated Timeline:* Ongoing.

*Cost:* \$500,000 estimate.

*Benefits:* All residents will benefit from understanding the County’s watersheds, and this effort will allow for a cost-effective approach to addressing existing and future flood problems. Efforts will provide for the protection of property, reduced transportation disruption, and improved health and safety during minor and major flood events.

*Plan Reference:* Chapter 6 discussion and Recommendation 1 in Section 6.8.

**Table 10-5 Action 5 Status**

Stakeholder	Action Item #5 Status (2023)
County	
McHenry County	<p>Complete — Since the 2017 Plan update, three additional Watershed Plans were finalized for a total of eleven. Some watersheds are within McHenry County, and some encompass areas within adjoining counties. The following Watershed Plans have been finalized as of January 2023:</p> <ul style="list-style-type: none"> <li>• Nine Lakes Watershed-Based Plan (Island Lake &amp; Port Barrington areas),</li> <li>• Silver Creek and Sleepy Hollow Creek Watershed Plan (Crystal Lake, McHenry, Oakwood Hills &amp; Prairie Grove areas),</li> </ul>

Stakeholder	Action Item #5 Status (2023)
	<ul style="list-style-type: none"> <li>• Boone-Dutch Creek Watershed Based Plan (Bull Valley, Greenwood, Johnsburg, McCullom Lake, McHenry, Ringwood, Wonder Lake &amp; Woodstock areas),</li> <li>• Woods Creek Watershed Plan (Algonquin, Crystal Lake &amp; Lake in the Hills areas),</li> <li>• Jelks Creek Watershed Plan (Algonquin &amp; Barrington Hills areas),</li> <li>• Flint Creek Watershed-Based Plan (Barrington Hills area),</li> <li>• Spring Creek Watershed Plan (Barrington Hills &amp; Fox River Grove areas),</li> <li>• Crystal Creek Watershed Plan (Crystal Lake, Algonquin, Lakewood &amp; Lake-in-the-Hills areas),</li> <li>• Lawrence Creek Watershed Plan (Harvard, Alden &amp; Chemung areas),</li> <li>• Upper Kishwaukee River Watershed Plan (Lakewood, Crystal Lake, Marengo &amp; Woodstock areas), and</li> <li>• Nippersink Creek Watershed Plan (Woodstock, Wonder Lake, Spring Grove, Richmond, Greenwood, and Ringwood areas).</li> </ul> <p>Ongoing – The Crystal Creek Watershed Plan was recently submitted to the Illinois Environmental Protection Agency (IEPA) for approval.</p> <p>Ongoing – The Fox Waterway Agency has hired consultants and is partnering with local agencies and other stakeholders to complete a Watershed-based Plan for the Upper Fox River watershed.</p> <p>Ongoing – The County is exploring the creation of a Countywide regulatory program as prescribed within the McHenry County Comprehensive Stormwater Management Program Plan. This program could involve development of a Countywide watershed development ordinance that applies to both incorporated and unincorporated areas. The watershed development ordinance would be comprehensive and specify standards for stormwater drainage and detention, floodplain management, soil erosion and sedimentation control, and stream and wetland protection in a single document.</p>
<b>Municipalities</b>	
Algonquin, Village of	<p>Ongoing – The Village submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval.</p> <p>Complete – The Village has watershed overlay district in zoning ordinance.</p> <p>Complete – The Village adopted the IEPA approved Woods Creek Watershed Plan in September 2013.</p> <p>Complete – The Village was included in the Jelkes Creek, Crystal Creek, and Spring Creek Watershed Plans.</p>
Barrington Hills, Village of	<p>Complete – The Village was included in the Flint Creek, Spring Creek, and Jelkes Watershed Plans.</p>
Bull Valley, Village of	<p>Complete – The Village was included in the Boone-Dutch Creek IEPA-compliant Watershed Plan.</p>
Cary, Village of	<p>Complete – The Village was included in the Silver Creek and Sleep Hollow Creek IEPA-compliant Watershed Plan.</p>
Crystal Lake, City of	<p>Ongoing – The City submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval.</p> <p>Complete – The City adopted the IEPA approved Woods Creek Watershed Plan in September 2013.</p>

Stakeholder	Action Item #5 Status (2023)
	Complete — The City participated in the Upper Kishwaukee Creek, Silver Creek & Sleepy Hollow Creek and Woods Creek Watershed Plans
Fox Lake, Village of	Complete — The Village was included in the Spring Creek IEPA-compliant Watershed Plan.
Fox River Grove, Village of	Complete — The Village was included in the Spring Creek and Flint Creek IEPA-compliant Watershed Plan.
Greenwood, Village of	Complete — The Village was included in the Boone-Dutch Creek and the Nippersink Creek IEPA-compliant Watershed Plans.
Harvard, City of	Complete — The City was included in the Lawrence Creek IEPA-compliant Watershed Plan.
Hebron, Village of	Complete — The Village was included in the Nippersink Creek IEPA-compliant Watershed Plan.
Holiday Hills, Village of	⌚
Huntley, Village of	Completed — The Village performed a study of the Watershed around the Wing Pointe Townhomes subdivision in 2015.
Island Lake, Village of	Complete — The Village was included in the Nine Lakes IEPA-compliant Watershed Plan.
Johnsburg, Village of	Complete — The Village was included in the Boone-Dutch Creek IEPA-compliant Watershed Plan.
Lake-In-The-Hills, Village of	Ongoing — The Village submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval. Complete — The Village was a participant in the Woods Creek Watershed Action Plan.
Lakemoor, Village of	⌚
Lakewood, Village of	Ongoing — The Village submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval. Complete — The Village was included in the Upper Kishwaukee Creek IEPA-compliant Watershed Plan.
Marengo, City of	Complete — The City was included in the Upper Kishwaukee Creek IEPA-compliant Watershed Plan.
McCullom Lake, Village of	Complete — The Village was included in the Boone-Dutch Creek IEPA-compliant Watershed Plan.
McHenry, City of	Complete — The City was included in the Boone-Dutch Creek, Nippersink Creek and Silver and Sleepy Hollow Creeks IEPA-compliant Watershed Plans.
Oakwood Hills, Village of	Complete — The Village was included in the Silver and Sleepy Hollow Creeks IEPA-compliant Watershed Plan.
Port Barrington, Village of	Complete — The Village was included in the Silver and Sleepy Hollow Creeks and Nike Lakes IEPA-compliant Watershed Plan.
Prairie Grove, Village of	Complete — The Village was included in the Silver and Sleepy Hollow Creeks IEPA-compliant Watershed Plan.
Richmond, Village of	Complete — The Village was included in the Nippersink Creek IEPA-compliant Watershed Plan.
Ringwood, Village of	Complete — The Village was included in the Boone-Dutch Creek and Nippersink Creek IEPA-compliant Watershed Plans
Spring Grove, Village of	Complete — The Village was included in the Spring Creek and Nippersink Creek IEPA-compliant Watershed Plans.
Trout Valley, Village of	⌚

Stakeholder	Action Item #5 Status (2023)
Union, Village of	⌚
Wonder Lake, Village of	Complete — The Village was included in the Boone-Dutch Creek and Nippersink Creek IEPA-compliant Watershed Plans.
Woodstock, City of	Complete — The City was included in the Boone and Dutch Creeks, Nippersink Creek, and Upper Kishwaukee IEPA-compliant Watershed Plans.
<b>Townships</b>	
Alden, Township of	Complete — The Township was Included in the Lawrence Watershed Plan.
Algonquin, Township of	⌚
Burton, Township of	⌚
Chemung, Township of	⌚
Coral, Township of	⌚
Dorr, Township of	⌚
Dunham, Township of	⌚
Grafton, Township of	⌚
Greenwood, Township of	⌚
Hartland, Township of	⌚
Hebron, Township of	⌚
Marengo, Township of	⌚
McHenry, Township of	⌚
Nunda, Township of	⌚
Richmond, Township of	⌚
Riley, Township of	⌚
Seneca, Township of	⌚

⌚ = No update. The community has no recent or upcoming watershed study activities to report.

### Action Item 6: Expand Stream Gaging Network

McHenry County should pursue the installation and maintenance of additional stream gages throughout the county. Additional funding and technical assistance should be sought from the Illinois Department of Natural Resources and the U.S. Geological Survey.

*Responsible Agency:* McHenry County.













*Estimated Timeline:* 12 months.

*Cost:* \$50,000 estimate.




























*Benefits:* The availability of more extensive river stage data will benefit the County in a number of ways. These benefits include better calibration data for the development of watershed models (studies), improved flood forecasting, and additional data for operation of Stratton Dam.

*Plan Reference:* Chapter 6 discussion, Chapter 8 discussion, and Recommendation 1 in Section 8.8.

**Table 10- 5 Action 6 Status**

Stakeholder	Action Item #6 Status (2023)
<b>County</b>	
McHenry County	Ongoing — Funding is not available at the local, state, or federal level to install additional gages throughout the County. Since adoption of the McHenry County Hazard Mitigation Plan in 2017, the County has started cost sharing with the Wonder Lake Homeowners Association for the Nippersink Creek Stream Gage at Thompson Road. Previous efforts to secure FEMA mitigation funds for gages were not successful. Additional opportunities for stream gage installation will be explored as funding becomes available.
<b>Municipalities</b>	
Algonquin, Village of	Not Started — The Village plans to install new gages on Crystal Creek (near Towne Park) and on the Fox River when funding is available.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	Ongoing — The City performs weekly checks on water levels.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Not Started — The Village plans to install stream gages on Woods Creek and Crystal Lake at the Lake-In-The-Hills Dam when funding is available.
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	



Stakeholder	Action Item #6 Status (2023)
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	

Stakeholder	Action Item #6 Status (2023)
Seneca, Township of	

 = **Ongoing – Refer to County action status. The Community is supportive of the county’s ongoing efforts to install and maintain gages as funding becomes available.**

### Action Item 7: Stream Maintenance Programs

The County, municipalities, and townships should develop and implement formal and regular drainage system maintenance programs in accordance with the County’s stormwater ordinance. This effort should include the inspection of privately maintained drainage facilities. It is understood that each municipality and township will make these considerations based on available staffing and financial resources. Both urban and rural streams need maintenance. Also, bridges and culverts (active or abandoned) that restrict flood flows should be evaluated. The removal or enlargement of stream crossings, in cases where a modification will not cause an increase in downstream flooding, should be considered and funded.

*Responsible Agency:* McHenry County, municipalities, and townships. This can include public works departments, township road districts, McHenry County Division of Transportation, or other appropriate departments or offices (e.g., drainage districts).

*Estimated Timeline:* 36 months.

*Cost:* Staff time and equipment.

*Benefits:* Development and agriculture have led to a reduction of stream capacity, and as a result, upstream flooding may be increasing. A restoration of stream capacity may mitigate upstream damage, enhance stream, and water quality. Regular maintenance can protect both structures and property. Regular maintenance can also be more cost effective than major maintenance efforts that are done on an as-needed basis.

*Plan Reference:* Chapter 6 discussion and Recommendation 3 and 4 in Section 6.8.

**Table 10- 6 Action 7 Status**

Stakeholder	Action Item #7 Status (2023)
<b>County</b>	
McHenry County	<p>Ongoing – The County has approximately fourteen (14) bridges and/or culverts that are currently undergoing some level of design or waiting for authorization from the Illinois Department of Transportation (IDOT) to proceed to design. Among other design elements, the design process will review the hydraulics and roadside safety.</p> <p>Ongoing – McHenry County Department of Transportation (MCDOT) is collaborating with the Village of Lake in the Hills to provide compensatory storage for the Randall Road project as part of their stream bank and compensatory storage project that they are leading along Woods Creek west of Randall Road. They are replacing existing Woods Creek and Woods Creek Tributary culverts with hydraulic adequate structures.</p> <p>Improving closed and open drainage systems to improve existing conditions and to manage the additional proposed pavement runoff. Raising the roadway above the flood plain. Stabilizing the Woods Creek Tributary along the east side of Randall Road. Placing bio swale treatments at key locations in the corridor.</p>

Stakeholder	Action Item #7 Status (2023)
	<p>Ongoing — Interested communities are actively researching how to re-activate local drainage districts that have become inactive over the past years. Currently, the County has three active drainage districts and numerous that are inactive.</p> <p>Ongoing — The Stream Sign Project is a collaborative effort between the McHenry County Division of Transportation, McHenry County Department of Planning &amp; Development, and the Environmental Defenders of McHenry County to place informational signage at stream crossings throughout McHenry County. Each sign identifies the name of the stream, as designated by the US Geological Survey, as well as the name of the watershed the stream flows through. All McHenry County streams are part of either the Fox River Watershed or the Kishwaukee River Watershed. A total of 90 signs were installed. Additional grant funding has been acquired to continue this project for select crossings in municipalities and townships.</p> <p>Ongoing - As required by the IEPA MS4 Permit, MCDOT completes annual inspections of all ponds, detention/retention facilities, stream channel outfalls, and storm drainage outfalls which fall under the jurisdiction of the MCDOT (road rights-of-way) and County facilities. Each municipality that is part of the MS4 program also should be completing these inspections. Inspections on private property are not being completed currently and no short-term plan is in place to institute this program.</p> <p>Not Started — The County is considering a countywide assessment of all stormwater and green infrastructure to identify stormwater management best practices and the facilities requiring retrofit.</p>
<b>Municipalities</b>	
Algonquin, Village of	<p>Ongoing — The Village is undertaking the Dixie Creek Reach Restoration Project to correct the deficiencies called out in the Jelkes Creek watershed plan and will repair two areas flagged as “Critical Areas”: Dixie Creek Reach 3 and White Chapel Detention Basin. The reach 3 project site is 9.2 acres and contains a high-quality fen on the south side of the creek that will be protected and preserved as part of this restoration.</p> <p>Ongoing — The Village is participating in the Randall Road Wetland Rehabilitation Project.</p> <p>Ongoing — Steam maintenance occurs after storms and stream gauges are checked on a weekly basis.</p>
Barrington Hills, Village of	⌚
Bull Valley, Village of	Ongoing — The Village is addressing culvert issues on Cold Springs at Boone Creek headwaters including drainage at Thompson Road Farm.
Cary, Village of	⌚
Crystal Lake, City of	<p>Ongoing — The City’s Public Works Department provides drainage system maintenance which includes specific areas of scheduled inspection, cleaning, and rebuilding of its storm sewer system. Repairs and maintenance are also completed upon request or as needed throughout the entire system. Public Works utilizes a map that identifies specific private and public drainage locations which are periodically inspected. The City has started updating its storm system maps into our geographic information systems (GIS) mapping system to improve the accuracy of our entire storm system.</p> <p>Ongoing — The City maintains an active drainage system inspection and maintenance program meeting the requirements of the CRS.</p>
Fox Lake, Village of	⌚

Stakeholder	Action Item #7 Status (2023)
Fox River Grove, Village of	Ongoing — Stream maintenance is part of the Village Public Works Department’s regular operations. When action needs to be undertaken there are organizations that generate revenue specifically for those projects (e.g., debris clearing, etc.).
Greenwood, Village of	⌛
Harvard, City of	⌛
Hebron, Village of	⌛
Holiday Hills, Village of	⌛
Huntley, Village of	Ongoing — Each Spring, the Village’s Public Works Department cleans out catch basins, looks for signs in storms sewers and check them as necessary. Cleaning up the watershed is a persistent issue, including periodically catching beavers and removing dams along Eakin Creek. The Village checks outfalls at least once a year and inspects the dam in town annually and when there is a half-inch of rainfall. Ongoing — The Village maintains an active drainage system inspection and maintenance program meeting the requirements of the CRS.
Island Lake, Village of	⌛
Johnsburg, Village of	⌛
Lake-In-The-Hills, Village of	Ongoing — The Village is collaborating with McHenry DOT to provide compensatory storage for the Randall Road project as part of their stream bank and compensatory storage project that they are leading along Woods Creek west of Randall Road. They are replacing existing Woods Creek and Woods Creek Tributary culverts with hydraulic adequate structures. Improving closed and open drainage systems to improve existing conditions and to manage the additional proposed pavement runoff. Raising the roadway above the flood plain. Stabilizing the Woods Creek Tributary along the east side of Randall Road. Placing bio swale treatments at key locations in the corridor. Ongoing — The Village maintains an active drainage system inspection and maintenance program meeting the requirements of the CRS.
Lakemoor, Village of	⌛
Lakewood, Village of	Complete — In 2022, the Village completed the Turnberry Trunk Sewer Study evaluating whether to increase the capacity of the pump station to improve basement backup protection to properties in The Gates. Ongoing — Stream maintenance is ongoing through Public Works.
Marengo, City of	⌛
McCullom Lake, Village of	⌛
McHenry, City of	⌛
Oakwood Hills, Village of	⌛
Port Barrington, Village of	Ongoing — The Village maintains an active drainage system inspection and maintenance program meeting the requirements of the CRS.
Prairie Grove, Village of	⌛
Richmond, Village of	Not Started — The Richmond Public Works Department is planning to assess storm sewers/drainage system maintenance requirements for the Village.
Ringwood, Village of	⌛
Spring Grove, Village of	⌛
Trout Valley, Village of	⌛
Union, Village of	⌛
Wonder Lake, Village of	⌛

Stakeholder	Action Item #7 Status (2023)
Woodstock, City of	⌚
<b>Townships</b>	
Alden, Township of	⌚
Algonquin, Township of	⌚
Burton, Township of	⌚
Chemung, Township of	⌚
Coral, Township of	⌚
Dorr, Township of	⌚
Dunham, Township of	⌚
Grafton, Township of	⌚
Greenwood, Township of	⌚
Hartland, Township of	⌚
Hebron, Township of	Ongoing – Drainage District #1 maintains the Townships ditches and waterways.
Marengo, Township of	⌚
McHenry, Township of	⌚
Nunda, Township of	⌚
Richmond, Township of	⌚
Riley, Township of	⌚
Seneca, Township of	⌚

⌚ = **No Update. The community has no formal program in place and funding is required for implementation.**

### Action Item 8: Prohibited Waterway Dumping Ordinances

Each community should ensure that they have enforceable stream and wetland dumping ordinances. Regulations should apply to both “objectionable waste” and “non-objectionable” materials such as grass clippings and tree branches. Communities they do not have stream and wetland dumping ordinances should adopt appropriate regulations.

*Responsible Agency:* McHenry County and municipalities.

*Estimated Timeline:* 36 months.

*Cost:* Community specific.

*Benefits:* Keeping streams, including drainage ditches, free of debris and dumped material benefits the stream’s ability to convey water, reduced erosion and sedimentation, protects the riparian environment, protects water quality, and can reduce flood damage.

*Plan Reference:* Chapter 7 discussion and Recommendation 1 in Section 7.10.

**Table 10- 7 Action 8 Status**

Stakeholder	Action Item #8 Status (2023)
<b>County</b>	
McHenry County	Ongoing – The County Stormwater Management Ordinance prohibits filling of flood hazard areas. Impacts to wetlands (dumping of materials) would also require a permit. The ordinance does not specifically prohibit the dumping of landscape waste, but the result of the dumping is what the ordinance regulates (filling of flood hazard area or wetland).

Stakeholder	Action Item #8 Status (2023)
<b>Municipalities</b>	
Algonquin, Village of	Ongoing – The Village has its own dumping ordinance in place (i.e., Municipal Code 6C.04) in addition to enforcing the dumping restrictions adopted via the Kane County Stormwater Management Ordinance.
Barrington Hills, Village of	Ongoing – The Village has adopted and enforces the Lake County Watershed Development Ordinance that prohibits dumping.
Bull Valley, Village of	Ongoing – The Village has adopted Zoning Code Section 14.4-2 prohibiting dumping or fill in flood plain in addition to enforcing the dumping restrictions adopted via the McHenry County Stormwater Management Ordinance.
Cary, Village of	Ongoing – The Village has its own ordinance prohibiting illegal discharge in addition to enforcing the dumping restrictions adopted via the McHenry County Stormwater Management Ordinance.
Crystal Lake, City of	Ongoing – The City’s Illicit Discharge Ordinance (Chapter 595 of the City Code) addresses the requirements of this item in addition to enforcing the dumping restrictions adopted via the McHenry County Stormwater Management Ordinance.
Fox Lake, Village of	Ongoing – The Village has adopted and enforces the Lake County Watershed Development Ordinance that prohibits dumping.
Fox River Grove, Village of	Ongoing – The Village maintains enforceable dumping ordinances through its Municipal Code in addition to enforcing the dumping restrictions adopted via the Lake County Watershed Development Ordinance.
Greenwood, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Harvard, City of	Ongoing – The City has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Hebron, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Holiday Hills, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Huntley, Village of	Ongoing – The Village has adopted and enforces the Kane County Stormwater Management Ordinance that prohibits dumping.
Island Lake, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Johnsburg, Village of	Ongoing – The Village maintains enforceable dumping ordinances through its Municipal Code in addition to enforcing the dumping restrictions adopted via the McHenry County Stormwater Management Ordinance. Additionally, the Village prohibits dumping discharge into culverts via the National Pollutant Discharge Elimination System (NPDES) permit program.
Lake-In-The-Hills, Village of	Ongoing – The Village maintains enforceable dumping ordinances through its Municipal Code in addition to enforcing the dumping restrictions adopted via the McHenry County Stormwater Management Ordinance. .
Lakemoor, Village of	Ongoing – The Village has adopted and enforces the Lake County Watershed Development Ordinance and McHenry County Stormwater Management Ordinance that prohibit dumping.

Stakeholder	Action Item #8 Status (2023)
Lakewood, Village of	Ongoing – The Village has a dumping ordinance enforced by the police department in addition to enforcing the dumping restrictions adopted via the McHenry County Stormwater Management Ordinance.
Marengo, City of	Ongoing – The City has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
McCullom Lake, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
McHenry, City of	Ongoing – The City has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Oakwood Hills, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Port Barrington, Village of	Ongoing – The Village has adopted and enforces the Lake County Watershed Development Ordinance that prohibits dumping.
Prairie Grove, Village of	Ongoing – The Village has an ordinance in place and plans to update to prohibit specific dumping actions.
Richmond, Village of	Ongoing – The Village has an ordinance in place and will maintain and update in addition to enforcing the dumping restrictions adopted via the McHenry County Stormwater Management Ordinance.
Ringwood, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Spring Grove, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Trout Valley, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Union, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Wonder Lake, Village of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
Woodstock, City of	Ongoing – The Village has adopted and enforces the McHenry County Stormwater Management Ordinance that prohibits dumping.
<b>Townships</b>	
Alden, Township of	Ongoing – Unincorporated areas and townships adhere to the McHenry County Stormwater Management Ordinance that prohibits dumping.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	

Stakeholder	Action Item #8 Status (2023)
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

**Action Item 9: Mitigation of Public Infrastructure**

Mitigation of public infrastructure, including roadways, bridges and culverts, and treatment facilities, for protection from natural hazards should be investigated as the facility or asset is being considered for repair, replacement, or expansion. When possible, improvements should incorporate protecting the natural functions of the streams and floodplains, if located in a floodplain.

*Responsible Agency:* McHenry County, municipalities, and townships.

*Estimated Timeline:* As funding becomes available.

*Cost:* Project specific.







*Benefits:* Regional solutions to flood problems are often more cost beneficial than the mitigation of individual buildings. Also, when flooding on streets and the overtopping of bridges is reduced, then the entire community benefits. Transportation damages are reduced and safety is improved.























*Plan Reference:* Chapter 6 discussion and Recommendation 2 under Section 6.8. Chapter 5 discussion and Recommendation 4 under Section 5.7.

**Table 10- 8 Action 9 Status**

Stakeholder	Action Item #9 Status (2023)
<b>County</b>	
McHenry County	<p>Ongoing — All MCDOT structures are inspected following a natural disaster event.</p> <p>Ongoing — The County is completing repair projects on West Solon and Harmony Road bridges in 2020. Both bridges will improve safety for motorists. Additional to these repair projects, the County has completed maintenance and repairs to the Randall at Miller box culvert and double pipe culverts on Bull Valley Road. Both culvert projects addressed the storage capacities back to their original designed specifications and improved safety and hydraulic capabilities.</p> <p>Not Started — MCDOT is planning to develop a County-wide, remote/regional salt storage capability to enhance severe winter storm preparedness by ensuring the safety of County transportation roadways.</p> <p>Not Started — The County is working to identify funding for a living snow fence.</p> <p>Complete — The Kishwaukee Valley Road culvert west of IL-23 was replaced in late 2021 with a slab bridge. (The new structure has a larger water way opening to accommodate offsite flows from adjacent field tiles and roadway runoff. Additional new features also include bioswales, open cell articulated block, multi-outlet drain tile headwall for the adjacent farmer, wide shoulders, and roadside drop-off protection on the bridge. The open cell articulated block is a pervious replacement option for conventional riprap that, in addition to providing erosion protection, allows vegetation to grow through and does not accumulate trash).</p>



Stakeholder	Action Item #9 Status (2023)
	<p>Complete — In 2023, the McHenry County Historical Society (MCHS) completed a facility expansion assessment for their museum located in the Village of Union and found that the underground pipe that conveys water is insufficient to manage a 100-year flood.</p> <p>Complete — In 2022, MCDOT maintenance staff performed 17 culvert replacements in the County, cleaned 600 catch basins and performed 19 bridge projects.</p>
<b>Municipalities</b>	
Algonquin, Village of	<p>Ongoing — Woods Creek box culverts will be expanded/replaced.</p> <p>Ongoing — The Village will continue open space/wetland restoration and maintenance.</p> <p>Ongoing — The Village is currently working on a streetscape program for Crystal Creek bridge area a (3-5 yrs.) bridge will be replaced.</p> <p>Ongoing — The Harper Drive/Multi-Use Trail Project is in-progress. This work includes tree removal, grading, retaining walls, storm sewer installation, asphalt path, wood boardwalk, and landscape restoration. Completion scheduled mid-2016.</p> <p>Ongoing —The Copper Oaks Subdivision and Drainage Improvements project in-progress.</p> <p>Ongoing — There are multiple other road improvements planned for the next 10 years.</p> <p>Ongoing — The Village will continue identification of public infrastructure that requires mitigation. In the event of a disaster declaration, several structures/infrastructure may have sustained damage that require repair and mitigation through public assistance funds.</p> <p>Ongoing — The Village is collaborating with the County to procure power generators for all water and sewer facilities in the Village of Algonquin to diminish the impacts of power outages to critical facilities.</p> <p>Completed — Crystal Creek bridge on Main Street needs to be replaced.</p> <p>Completed — Highland Avenue Project, including replacement of existing roadway, installation of curb and gutter, storm sewer and detention area, spot sidewalk removal and replacements, resurfacing of Presidential Park parking lot, and construction of a new trail (late 2016).</p>
Barrington Hills, Village of	
Bull Valley, Village of	<p>Ongoing — The Village is completing its 2023 Road Plan and updating Pacer scoring. The Village has also identified \$15 million in public road improvements, culvert upgrades, comprising 30 miles and 150,000 feet of centerline roadways.</p>
Cary, Village of	
Crystal Lake, City of	<p>Ongoing — The City continually evaluates the need for mitigation improvements to protect from natural hazards and is in the process of updating the 2007 Flooding Study which identifies and prioritizes areas in need of mitigation improvements.</p>
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	<p>Ongoing — The City is currently collaborating with the Illinois Department of Transportation, on preliminary engineering and environmental study of the intersection at U.S. Route 14 at Harland/Hughes Road. The purpose of the study is to evaluate alternatives to find the most appropriate solution to improve safety and operations at the intersection.</p>
Hebron, Village of	

Stakeholder	Action Item #9 Status (2023)
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Ongoing – The Village has no critical facilities located in the floodplain. Other hazards are considered during planning for major improvements. In the event of a disaster declaration, several structures/infrastructure may have sustained damage that require repair and mitigation through public assistance funds.
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	Not Started – During the MCHS facility expansion assessment, it was found the underground pipe conveying water to the museum is insufficient to manage a 100-year flood. The Village may pursue funds to mitigate this.
Wonder Lake, Village of	<p>Ongoing – The Village has a list of ongoing and planned infrastructure projects, including:</p> <ul style="list-style-type: none"> <li>• Diversions and channel Improvements planned, including lake dredging and swale projects</li> <li>• Thompson Road Bridge Replacement</li> <li>• East Wonder Lake Road Resurface</li> <li>• Thompson Road Watermain Extension</li> <li>• Wonderview Resurfacing</li> <li>• Memory Trail Watermain Extension</li> <li>• Highland Shores Water Tower Removal</li> </ul>
Woodstock, City of	Ongoing – The City currently collaborating with IDOT on a preliminary engineering and environmental study of the intersection at U.S. Route 14 at Harland/Hughes Road. The purpose of the study is to evaluate alternatives to find the most appropriate solution to improve safety and operations at the intersection.
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	

Stakeholder	Action Item #9 Status (2023)
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	Ongoing – The Township currently collaborating with IDOT on a preliminary engineering and environmental study of the intersection at U.S. Route 14 at Harland/Hughes Road. The purpose of the study is to evaluate alternatives to find the most appropriate solution to improve safety and operations at the intersection.
Hebron, Township of	Not Started – The Township and Draining District are planning to replace old drain tile lines across the Township’s 7,000 acres. Note taxes are only enough to cover annual repairs with replacements estimated to cost between \$2-5 Million.
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

= Ongoing. The community will continue identifying public infrastructure for mitigation. In the event of a disaster declaration, public structures may sustain damage and require repair and mitigation through public assistance funds.

### Action Item 10: Continue NFIP Compliance

Municipalities that participate in the National Flood Insurance Program (NFIP) should ensure that they are in full compliance with the NFIP administration and enforcement requirements. While the McHenry County Planning and Development Department administers the McHenry County Stormwater Management Ordinance for non-certified municipalities, all NFIP municipalities are still ultimately responsible for ensuring that development within the regulatory floodplain meets the NFIP minimum standards.

*Responsible Agency:* McHenry County Department of Planning and Development and municipal NFIP Administrators.

*Estimated Timeline:* Ongoing.

*Cost:* Staff time.

*Benefits:* Community compliance with the NFIP is essential.

*Plan Reference:* Chapter 4 discussion and recommendations in Section 4.9. See Table 4-3 for more information on each jurisdiction’s adoption and enforcement of NFIP requirements.

**Table 10- 9 Action 10 Status**

Stakeholder	Action Item #10 Status (2023)
<b>County</b>	
McHenry County	Ongoing - The County Department of Planning and Development continues to ensure the county is meeting all NFIP requirements. The County is a Class 6 FEMA Community Rating System (CRS) community and maintains compliance with higher floodplain management standards than the NFIP minimum requirements.
<b>Municipalities</b>	

Stakeholder	Action Item #10 Status (2023)
Algonquin, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the Kane County Stormwater Management Ordinance.
Barrington Hills, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the Lake County Watershed Development Ordinance.
Bull Valley, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Cary, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Crystal Lake, City of	Ongoing – The City is a Class 7 CRS community and maintains compliance with higher floodplain management standards than the NFIP minimum requirements.
Fox Lake, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the Lake County Watershed Development Ordinance.
Fox River Grove, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the Lake County Watershed Development Ordinance.
Greenwood, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Harvard, City of	Ongoing – The City complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Hebron, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Holiday Hills, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Huntley, Village of	Ongoing – The Village is a Class 7 CRS community and maintains compliance with higher floodplain management standards than the NFIP minimum requirements.
Island Lake, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the Lake County Watershed Development Ordinance.
Johnsburg, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Lake-In-The-Hills, Village of	Ongoing – The Village is a Class 5 CRS community and maintains compliance with higher floodplain management standards than the NFIP minimum requirements.
Lakemoor, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance and Lake County Watershed Development Ordinance.
Lakewood, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Marengo, City of	Ongoing – The City complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
McCullom Lake, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
McHenry, City of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Oakwood Hills, Village of	Ongoing – As of April 2023, the community has not joined the NFIP; however, the Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.

Stakeholder	Action Item #10 Status (2023)
Port Barrington, Village of	Ongoing – The Village is a Class 7 CRS community and maintains compliance with higher floodplain management standards than the NFIP minimum requirements.
Prairie Grove, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Richmond, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Ringwood, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Spring Grove, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Trout Valley, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Union, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Wonder Lake, Village of	Ongoing – The Village complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
Woodstock, City of	Ongoing – The City complies with and enforces the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance.
<b>Townships</b>	
Alden, Township of	Ongoing – All unincorporated areas and townships enforce the minimum standards of the NFIP through adherence to the McHenry County Stormwater Management Ordinance. Additionally, these communities maintain compliance with higher floodplain management standards than the NFIP minimum requirements through McHenry County’s participation in CRS.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

**Action Item 11: Repetitive Loss Areas Study**

Repetitive flood loss areas (identified as part of this Plan) should be studied and mitigation alternatives, such as acquisition, elevation or floodproofing, identified and investigated for the structures. The County or municipalities should seek a mitigation planning grant as needed for preparing the repetitive loss areas studies.

*Responsible Agency:* The McHenry County Department of Planning and Development with the cooperation of municipalities with properties included in the repetitive loss areas.














*Estimated Timeline:* 24 months.

*Cost:* \$100,000.

*Benefits:* Property owners subject to repetitive flood losses will directly benefit from this action as they learn of ways that they can protect themselves from future flood damage. This effort will also lead to the request for FEMA funding for mitigation measures within the repetitive flood loss areas, and the removal or protection of repetitive flood loss structures will benefit all levels of government and the National Flood Insurance Fund.

*Plan Reference:* Chapter 2, Section 2.4.4; and Chapter 5 discussion and Recommendations 2 and 4 in Section 5.7.

**Table 10- 10 Action 11 Status**

Stakeholder	Action Item #11 Status (2023)
<b>County</b>	
McHenry County	Ongoing – In 2021, the County Department of Planning and Development updated the list of repetitive loss properties for all unincorporated areas as part of FEMA CRS requirements. The County’s 5-year CRS assessment visit was in 2021 and updated Repetitive Loss data was acquired from FEMA. Additional properties were added to the list and therefore new Repetitive Loss areas were created. Planning and Development is exploring the feasibility and time/resource commitment of creating a Study based on the new data.
<b>Municipalities</b>	
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	Ongoing - The City of Crystal Lake continues to educate the homeowners of repetitive loss properties regarding how to protect themselves and their neighborhood from flood damage. Crystal Lake is a CRS community and has repetitive loss properties and is exploring additional CRS credit through a repetitive loss area study done locally or by the county.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Ongoing – The Village’s repetitive loss properties have been identified and residents are reminded annually of the threat to their property. The Village is a CRS community and has repetitive loss properties and is exploring additional CRS credit through a repetitive loss area study done locally or by the county.
Lakemoor, Village of	

Stakeholder	Action Item #11 Status (2023)
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	Ongoing – In 2021, the County Department of Planning and Development updated the list of repetitive loss properties for all unincorporated areas as part of FEMA CRS requirements. The County will maintain its inventory of repetitive loss properties.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

= **No Update. The community has repetitive loss properties and will take future action if resources become available as part of a County-wide study.**

= **Ongoing. The community has no known repetitive loss properties and will continue coordination with the County to monitor and address as needed.**

### Action Item 12: Identification of Floodplain Structures

In addition to examining repetitive flood loss areas, a comprehensive list of structures located in the County’s floodplains should be developed. Through GIS and examining building footprints, the numbers and types of structures in the floodplain can be determined. The list should include critical facilities that potentially need flood protection.

*Responsible Agency:* McHenry County Department of Planning and Development and GIS Division.









*Estimated Timeline:* 36 months.

Cost: \$100,000.

*Benefits:* The countywide stormwater management program and hazard mitigation effort would benefit from a full picture of the number of McHenry County floodplain properties. Appropriate property protection measures could be better identified through this information. Also, having this information would allow municipalities to provide public information materials directly to these property owners.

*Plan Reference:* Chapters 4, 5 and 8 discussions, and Recommendation 3 and 7 in Section 8.8.

**Table 10- 11 Action 12 Status**

Stakeholder	Action Item #12 Status (2023)
<b>County</b>	
McHenry County	<p>Ongoing – The Department of Planning and Development, in partnership with the Illinois State Water Survey, applied for a FY2022 FEMA Hazard Mitigation Assistance Program (HMGP) grant to complete a structure-specific risk assessment on the lower 10 miles of the Nippersink Creek. The goal of the project is to acquire 1st floor elevations on over 190 structures within the watershed. The data will provide information which can assist in preparing benefit cost analyses and creating a strategic plan for buyouts and mitigation actions.</p> <p>Ongoing – The County updates flood inundation maps on an annual basis.</p> <p>Ongoing – As a CRS community, the County maintains a list of all floodplain structures within unincorporated McHenry County.</p>
<b>Municipalities</b>	
Algonquin, Village of	<p>Not Started – The Village is planning to evaluate properties and consider acquiring a few homes along the Fox River.</p> <p>Ongoing – The Village has done some work to alleviate shoreline issues, specifically cosmetic and structure work on rock retaining walls near Cornish/River Front park.</p> <p>Complete – The Village used GIS to identify previously flooded structures and developed an inventory of building footprints.</p>
Barrington Hills, Village of	
Bull Valley, Village of	Ongoing – The Village has recently completed a review of floodplain structures and plans to maintain the list.
Cary, Village of	
Crystal Lake, City of	Ongoing – As a CRS community, the City maintains a list of all floodplain structures within its borders.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	<p>Complete – in 2016, the Village completed a watershed study that remapped the floodplain showing structures in the floodplain. The community hired a consultant to measure elevation and acquired Elevation Certificates from the property owners. Submitted a LOMA and it was approved (Wing Pointe Townhomes - 2015).</p> <p>Ongoing – As a CRS community, the Village maintains a list of all floodplain structures within its borders.</p>



Stakeholder	Action Item #12 Status (2023)
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Ongoing — As a CRS community, the Village maintains a list of all floodplain structures within its borders.
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	Ongoing — As a CRS community, the Village maintains a list of all floodplain structures within its borders.
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

= Ongoing. Refer to County action status. This work is being completed at the County level.

### Action Item 13: Investigation of Critical Facilities

An investigation/analysis of the critical facilities mapped in the County’s GIS as part of this Plan should be conducted to determine if buildings or facilities are in hazardous locations (floodplains or otherwise). Additional critical facility data should be collected and added to the GIS layers. Emergency managers should provide input on mapping and data formats that would enhance emergency preparedness,

response, and recovery in the county. The investigation should also identify critical facilities that should be protected from identified natural hazards.

*Responsible Agency:* McHenry County GIS Team

*Estimated Timeline:* Ongoing

*Cost:* \$100,000.

*Benefits:* This review of critical facilities and any mitigation efforts will benefit McHenry County through preparedness, response and recovery.

*Plan Reference:* Chapter 8 and Recommendation 3 in Section 8.8.

**Table 10- 12 Action 13 Status**

Stakeholder	Action Item #13 Status (2023)
<b>County</b>	
McHenry County	Ongoing – The County uses GIS (building points and floodplain) to identify and analyze critical facilities County-wide. Analysis includes all identified critical facilities but does not include elevations of the structures. EMA reviews and updates information on critical facilities within McHenry County. This information is then utilized by GIS to input a map layer. Ongoing – As part of the FY2022 FEMA HMGP grant application, critical facilities in the Nippersink Creek watershed project scope area are to be surveyed and elevations determined for future risk analyses.
<b>Municipalities</b>	
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	Ongoing – The Village has initiated work to identify pipelines located in wetlands and floodplains. Also, the Village has identified natural hazards risks to the Stickney Village Hall, Bull Valley Police Department and the Shepherd Assisted Living facility.
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	

Stakeholder	Action Item #13 Status (2023)
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

= Ongoing. Refer to County action status. This work is completed at the County level. The community will coordinate with the County GIS Team to solicit this data.

### Action Item 14: Critical Facilities Design with Natural Hazards Protection

Offices responsible for design, construction or permitting critical facilities, including federal, state, county and municipal agencies, and institutions should ensure that the design or modification of critical facilities accounts for all natural hazards and adjacent land uses. Critical facilities in the floodplain should be protected to the 500-year flood event.

*Responsible Agency:* County, municipal, townships, and federal and state agencies responsible for critical facilities.

*Estimated Timeline:* Ongoing.

























*Cost:* Staff time.

*Benefits:* This Plan expanded the list of critical facilities to include school, places of assembly, and other assets that are significant in the County during times of natural disasters. These may be shelters, or places

of concentrated populations. If these facilities are better protected, then the risk for life, health and safety is reduced.

*Plan Reference:* Chapter 4 and 5 discussion and Recommendation 4 in Section 5.7, Chapter 8 discussion, and Recommendation 3 in Section 8.8.

**Table 10- 13 Action 14 Status**

Stakeholder	Action Item #14 Status (2023)
<b>County</b>	
McHenry County	Ongoing – The McHenry County Stormwater Management Ordinance requires all new structures’ first floor elevations be built to two feet above the base flood elevation; however, it does not regulate protection levels for specific types of development (e.g., critical facilities).
<b>Municipalities</b>	
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	Ongoing – The Village has identified the Village Hall and Police Department require relocation to a storm safe facility and currently represent a significant public safety issue.
Cary, Village of	
Crystal Lake, City of	Ongoing – The City has identified many critical facilities and incorporated this data into the Com Ed Joint Operations Center plans for the Crystal Lake service area to restore power as a priority.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	Ongoing – The Village Hall will undergo renovations to improve safety.
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	Ongoing – The Village is constructing a new sewer plant designed with the consideration of natural hazards. It is not, however, located within a floodplain.
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	

Stakeholder	Action Item #14 Status (2023)
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

= Ongoing. Refer to County action status. No further mitigation efforts are required for critical facilities at this time and future facility development will comply with the McHenry County Stormwater Management Ordinance.

### Action Item 15: Mitigation of Floodplain Properties - Property Protection Projects

Properties that are exposed to flood damage throughout McHenry County should be protected through property protection measures where regional structural projects are not feasible. Property protection measures should include, but not be limited to, acquisition, elevation, or floodproofing. Priority should be given to repetitive loss properties, but all floodplain properties including critical facilities should be included.

*Responsible Agency:* McHenry County Department of Planning and Development – Water Resources Division, municipal stormwater administrators and NFIP coordinators.




















*Estimated Timeline:* Ongoing.

*Cost:* Identified per project.

*Benefits:* Properties will be protected from future flooding. Additionally, the exposure of the National Flood Insurance Fund will be reduced. There will also be a reduction in emergency response as structures are protected or removed from flood prone areas.

*Plan Reference:* Chapter 5 discussion and Recommendations 4, 9, and 10 in Section 5.7.

**Table 10- 14 Action 15 Status**

Stakeholder	Action Item #15 Status (2023)
<b>County</b>	
McHenry County	<p>Ongoing — County Water Resources Division is progressing with the 2020 Illinois Department of Natural Resources (IDNR) Hazard Mitigation Program Grant. The grant will allow the County to purchase seven structures on 20 parcels utilizing \$1,459,656 from IDNR with no local match required. Structures are near the project area of the FEMA HMGP grant and near the Orchard Heights subdivision, off the Fox River, in Nunda Township. Following the demolition of all structures and site stabilization, the properties will be transferred to the McHenry County Conservation District (MCCD) and Nunda Township for long term maintenance as open space. To date, four structures have been demolished, two are scheduled for future acquisition, and one structure has declined to proceed.</p> <p>Complete — The Stormwater Division has completed the 2018 Hazard Mitigation Program Grant project, which allowed the County to purchase seven structures on 34 parcels in repetitively flooded areas of Burton Township off the Nippersink Creek. All structures have been removed and the properties will stay as open space in perpetuity. Once approved by FEMA and IDNR, the properties will be transferred to MCCD for long term maintenance as open space.</p>
<b>Municipalities</b>	
Algonquin, Village of	Ongoing — The Village is currently mitigating floodplain properties as part of the Dixie and Woods Creeks restoration project, the Randall Road project and engineering work on North River Road.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	Ongoing — Initiated in 2021, the City’s Stormwater Solutions Initiative — funded by an IDNR state reimbursement grant — is an ongoing effort to alleviate flooding impacting structures/homes and roadway flooding, including acquisition . As of January 2023, 18 projects have been implemented.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	

Stakeholder	Action Item #15 Status (2023)
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	Ongoing – The Village is exploring floodplain mitigation as part of the Nippersink erosion control effort.
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	Ongoing – The Village is currently implementing a project leveling on home using back taxes.
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	
Burton, Township of	Ongoing – The Township is working with the County to finalize a buyout grant with IDNR to demolish up to 10 homes in the Township.
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	Ongoing – The Township is working with the County to finalize a buyout grant with IDNR to demolish up to 3 homes in the Township.
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

= Ongoing. The community will work with the County to identify property mitigation needs, solutions, and pre- and post- disaster funding to implement projects.

### Action Item 16: Safe Rooms

The need for additional safe rooms throughout the county should be considered, including safe rooms and sheltering in residences, businesses, critical facilities, health care facilities, and schools. As needs are identified, grant funding should be pursued for the construction of safe rooms.

*Responsible Agency:* McHenry County, municipalities, and townships.

*Estimated Timeline:* 36 months.

*Cost:* Staff time.

*Benefits:* McHenry County is vulnerable to tornado events. With the construction of safe rooms, life and safety can be protected.

Plan Reference: Chapter 5 discussion and Recommendations 13 and 14 in Section 5.7.

**Table 10- 15 Action 15 Status**

Stakeholder	Action Item #16 Status (2023)
<b>County</b>	
McHenry County	<p>Ongoing - McHenry County will continue applying for federal assistance to fund a safe room project for the County DOT facility.</p> <p>Ongoing – The County Department of Planning and Development reviews all permit applications for safe room developments in unincorporated areas of McHenry County.</p> <p>Not Started – The County and Hartland Township are planning to construct a large underground storm shelter for the Township.</p>
<b>Municipalities</b>	
Algonquin, Village of	Ongoing – The Village performs emergency medical distribution as needed. Several high schools are used for shelters and have set ups for emergency situations. The Village is considering safe rooms for future senior housing developments as funding becomes available.
Barrington Hills, Village of	⌚
Bull Valley, Village of	Ongoing – The Village is completing a rebuild of the Stickney Barn to safeguard critical Village operations.
Cary, Village of	⌚
Crystal Lake, City of	Ongoing – The City’s Community Development Department provides informational flyers available at the front desk regarding safe rooms. Additionally, safe room information will be included in a community newsletter sent to all residents.
Fox Lake, Village of	⌚
Fox River Grove, Village of	⌚
Greenwood, Village of	⌚
Harvard, City of	⌚
Hebron, Village of	⌚
Holiday Hills, Village of	⌚
Huntley, Village of	⌚
Island Lake, Village of	⌚
Johnsburg, Village of	⌚
Lake-In-The-Hills, Village of	⌚
Lakemoor, Village of	⌚
Lakewood, Village of	⌚
Marengo, City of	⌚
McCullom Lake, Village of	⌚
McHenry, City of	⌚
Oakwood Hills, Village of	⌚
Port Barrington, Village of	⌚
Prairie Grove, Village of	⌚
Richmond, Village of	⌚
Ringwood, Village of	⌚
Spring Grove, Village of	⌚
Trout Valley, Village of	⌚
Union, Village of	⌚



Stakeholder	Action Item #16 Status (2023)
Wonder Lake, Village of	⌚
Woodstock, City of	⌚
<b>Townships</b>	
Alden, Township of	Ongoing – The County Department of Planning are Development reviews all permit applications for safe room developments in all unincorporated areas and townships of McHenry County.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

⌚= **No Update. As funding becomes available or vulnerabilities are identified, the retrofit or development of safe rooms will be explored.**

### Action Item 17: Consider Community Rating System Participation

McHenry County and the municipalities that participate in the NFIP should consider participating in the Community Rating System (CRS). The County, the Villages of Huntley, Lake in the Hills, and Port Barrington, and the City of Crystal Lake already participate in CRS, and should continue their participation.

*Responsible Agency:* McHenry County Department of Planning and Development and municipal NFIP administrators.

*Estimated Timeline:* Ongoing.

*Cost:* Staff time.

*Benefits:* The CRS program saves property owners money on flood insurance premiums, and it has been shown to be effective for the implementation of stormwater and floodplain management. McHenry County and the municipalities enforce higher regulatory standards than FEMA and participate in many creditable CRS activities.

*Plan Reference:* Chapter 1, and throughout the Plan (see CRS icons and comments). Also see Chapter 4 Recommendation 11 in Section 4.9.

**Table 10- 16 Action 17 Status**

Stakeholder	Action Item #17 Status (2023)
<b>County</b>	
McHenry County	Ongoing — As of April 2023, the County has a CRS Class 6 rating.
<b>Municipalities</b>	
Algonquin, Village of	⌛
Barrington Hills, Village of	⌛
Bull Valley, Village of	⌛
Cary, Village of	⌛
Crystal Lake, City of	Ongoing — As of April 2023, the City has a CRS Class 7 rating.
Fox Lake, Village of	⌛
Fox River Grove, Village of	⌛
Greenwood, Village of	⌛
Harvard, City of	⌛
Hebron, Village of	⌛
Holiday Hills, Village of	⌛
Huntley, Village of	Ongoing — As of April 2023, the Village has a CRS Class 7 rating.
Island Lake, Village of	⌛
Johnsburg, Village of	⌛
Lake-In-The-Hills, Village of	Ongoing — As of April 2023, the Village has a CRS class 5 rating.
Lakemoor, Village of	⌛
Lakewood, Village of	⌛
Marengo, City of	⌛
McCullom Lake, Village of	⌛
McHenry, City of	⌛
Oakwood Hills, Village of	⌛
Port Barrington, Village of	Ongoing — As of April 2023, the Village has a CRS Class 7 rating.
Prairie Grove, Village of	⌛
Richmond, Village of	⌛
Ringwood, Village of	⌛
Spring Grove, Village of	⌛
Trout Valley, Village of	⌛
Union, Village of	⌛
Wonder Lake, Village of	⌛
Woodstock, City of	⌛
<b>Townships</b>	
Alden, Township of	Ongoing — As of April 2023, all unincorporated areas and townships are participating via McHenry County and have a Class 6 rating.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	

Stakeholder	Action Item #17 Status (2023)
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

 = **No update. The community is not participating at this time and may consider joining later. Further research is needed to determine cost effectiveness.**

### Action Item 18: Urban Forestry – Consider Participating in Tree City USA

McHenry County municipalities that are Tree City USA communities will maintain their status in the nationwide program, and communities that are not in the program should consider joining the program. It is understood that each municipality will make these considerations based on available staffing and financial resources.

*Responsible Agency:* Public works department or other appropriate municipal department.





*Estimated Timeline:* Ongoing.

*Cost:* \$2 per capita, staff time.

*Benefits:* Urban forestry programs provide mitigation against severe winter and summer storms, and high wind events. The loss of trees is prevented along with the protection of power, telephone, and cable services. Damage to vehicles and buildings from falling limbs is also prevented.

*Plan Reference:* Chapter 7 discussion and Recommendations 8 in Section 7.10.

**Table 10- 17 Action 18 Status**

Stakeholder	Action Item #18 Status (2023)
<b>County</b>	
McHenry County	Ongoing – Current participant in Tree City USA. Ongoing – The County is exploring an education campaign, in collaboration with the County Conservation District (MCCD) and the Chicago Region Trees Initiative, to include a tree program template for municipalities and identifying a shared arborist to lead program coordination. Ongoing – The County is exploring opportunities to underground transmission lines in heavily wooded areas.
<b>Municipalities</b>	
Algonquin, Village of	Ongoing – Current participant in Tree City USA.
Barrington Hills, Village of	Ongoing – Currently applying to participate in Tree City USA.
Bull Valley, Village of	
Cary, Village of	Ongoing – Current participant in Tree City USA.
Crystal Lake, City of	Ongoing – Current participant in Tree City USA.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	

Stakeholder	Action Item #18 Status (2023)
Harvard, City of	⌚
Hebron, Village of	⌚
Holiday Hills, Village of	⌚
Huntley, Village of	Ongoing – Current participant in Tree City USA. In 2021, was awarded the Tree City USA “Growth Award” for their projects.
Island Lake, Village of	⌚
Johnsburg, Village of	⌚
Lake In The Hills, Village of	Ongoing – Current participant in Tree City USA.
Lakemoor, Village of	⌚
Lakewood, Village of	Ongoing – Current participant in Tree City USA.
Marengo, City of	⌚
McCullom Lake, Village of	⌚
McHenry, City of	Ongoing – Current participant in Tree City USA
Oakwood Hills, Village of	⌚
Port Barrington, Village of	Ongoing – Current participant in Tree City USA
Prairie Grove, Village of	⌚
Richmond, Village of	⌚
Ringwood, Village of	⌚
Spring Grove, Village of	⌚
Trout Valley, Village of	Ongoing – Current participant in Tree City USA.
Union, Village of	⌚
Wonder Lake, Village of	⌚
Woodstock, City of	Ongoing – Currently applying to participate in Tree City USA.
<b>Townships</b>	
Alden, Township of	⌚
Algonquin, Township of	⌚
Burton, Township of	⌚
Chemung, Township of	⌚
Coral, Township of	⌚
Dorr, Township of	⌚
Dunham, Township of	⌚
Grafton, Township of	⌚
Greenwood, Township of	⌚
Hartland, Township of	⌚
Hebron, Township of	⌚
Marengo, Township of	⌚
McHenry, Township of	⌚
Nunda, Township of	⌚
Richmond, Township of	⌚
Riley, Township of	⌚
Seneca, Township of	⌚

⌚= No Update. The community is not participating at this time and may consider joining later. Further research is needed to determine cost effectiveness.

### Action Item 19: Consider Participation in Storm Ready

McHenry County, communities and other agencies should consider joining the National Weather Service’s (NWS) StormReady program. The StormReady program has been developed to provide communities guidelines to improve the timeliness and effectiveness of hazardous weather-related warnings for the public.

*Responsible Agency:* County, municipal, other agency, and institutional emergency managers.

*Estimated Timeline:* Ongoing.

*Cost:* \$2 per capita, staff time.

*Benefits:* By meeting StormReady requirements, the County, communities, and institutions will be better able to detect impending weather hazards and disseminate warnings as quickly as possible. All efforts to prevent injury, save lives, and protect property are of high value.

*Plan Reference:* Chapter 8 discussion and Recommendation 10 in Section 8.8.

**Table 10-18 Action 19 Status**

Stakeholder	Action Item #19 Status (2023)
<b>County</b>	
McHenry County	Ongoing – The County has participated since 2018 and will continue to participate in the future. The County will be up for renewal in 2024. Most of the paperwork is ready for the 2024 submission to continue in this program. Completed – The County has trained approximately 200 volunteers and installed 15 Storm Ready signs at key entry ways to the County-on-County roadways.
<b>Municipalities</b>	
Algonquin, Village of	Ongoing - The Village have submitted their application and are awaiting approval.
Barrington Hills, Village of	⌚
Bull Valley, Village of	⌚
Cary, Village of	⌚
Crystal Lake, City of	⌚
Fox Lake, Village of	⌚
Fox River Grove, Village of	⌚
Greenwood, Village of	⌚
Harvard, City of	⌚
Hebron, Village of	⌚
Holiday Hills, Village of	⌚
Huntley, Village of	Ongoing - The Village has participated since 2023 and will continue their participation.
Island Lake, Village of	⌚
Johnsburg, Village of	⌚
Lake-In-The-Hills, Village of	Ongoing – The Village has participated since 2018 and will continue their participation.
Lakemoor, Village of	⌚
Lakewood, Village of	⌚
Marengo, City of	⌚
McCullom Lake, Village of	⌚
McHenry, City of	⌚
Oakwood Hills, Village of	⌚

Stakeholder	Action Item #19 Status (2023)
Port Barrington, Village of	⌚
Prairie Grove, Village of	⌚
Richmond, Village of	⌚
Ringwood, Village of	⌚
Spring Grove, Village of	⌚
Trout Valley, Village of	⌚
Union, Village of	⌚
Wonder Lake, Village of	⌚
Woodstock, City of	⌚
<b>Townships</b>	
Alden, Township of	⌚
Algonquin, Township of	⌚
Burton, Township of	⌚
Chemung, Township of	⌚
Coral, Township of	⌚
Dorr, Township of	⌚
Dunham, Township of	⌚
Grafton, Township of	⌚
Greenwood, Township of	⌚
Hartland, Township of	⌚
Hebron, Township of	⌚
Marengo, Township of	⌚
McHenry, Township of	⌚
Nunda, Township of	⌚
Richmond, Township of	⌚
Riley, Township of	⌚
Seneca, Township of	⌚

⌚= **No Update. The community is not participating at this time and may consider joining later. Further research is needed to determine cost effectiveness.**

### Action Item 20: Strengthen Building Codes and Code Enforcement Training

Communities that have not adopted the International Code Council series of building codes should do so, and for all communities, future code revisions should be pursued to strengthen new buildings against damage by high winds, tornadoes, hail, and earthquakes. Requiring tornado “safe rooms” in certain structures should be considered. Any code revisions should be consistent with the efforts undertaken by multi-community organizations of building department staff.

Training should be developed and conducted for building department staff on building code administration, enforcement, the natural hazards aspects of the International Codes, regulation of mobile home installation, Stormwater Management Ordinance, and provisions applicable to hazard mitigation.

*Responsible Agency:* McHenry County and building departments.

*Estimated Timeline:* 24 months.

*Cost:* Staff time.

*Benefits:* Building codes cannot be effective unless they are administered and enforced properly. Training will ensure that county and municipal staff understand the codes and procedures. This is a benefit that property owners will also benefit from as they understand the importance of the building standards for new construction. It also allows them to protect their investment in the property. Implementation of this Action Item will improve the hazard protection standards for new construction and will ensure a consistent set of building standards across the County.

*Plan Reference:* Chapter 4 discussion and Recommendations 2 and 3 in Section 4.9. Refer to Table 4-1 for a list of residential and commercial codes adopted and enforced by each community.

**Table 10- 19 Action 20 Status**

Stakeholder	Action Item #20 Status (2023)
<b>County</b>	
McHenry County	Ongoing – The County has adopted and enforces the current 2021 International Code Council (ICC) series. The County will continue to investigate and adopt the latest ICC codes in the future. Not Started – The County will explore delivery of quarterly trainings to increase community awareness of the benefits of codes.
<b>Municipalities</b>	
Algonquin, Village of	⌚
Barrington Hills, Village of	⌚
Bull Valley, Village of	⌚
Cary, Village of	⌚
Crystal Lake, City of	⌚
Fox Lake, Village of	⌚
Fox River Grove, Village of	⌚
Greenwood, Village of	⌚
Harvard, City of	⌚
Hebron, Village of	⌚
Holiday Hills, Village of	⌚
Huntley, Village of	⌚
Island Lake, Village of	⌚
Johnsburg, Village of	⌚
Lake-In-The-Hills, Village of	Ongoing – The Village has adopted and enforces the current 2021 International Code Council (ICC) series. The Village will continue to investigate and adopt the latest ICC codes in the future.
Lakemoor, Village of	⌚
Lakewood, Village of	⌚
Marengo, City of	⌚
McCullom Lake, Village of	⌚
McHenry, City of	⌚
Oakwood Hills, Village of	Ongoing – The Village has adopted and enforces the current 2021 International Code Council (ICC) series. The Village will continue to investigate and adopt the latest ICC codes in the future.

Stakeholder	Action Item #20 Status (2023)
Port Barrington, Village of	Ongoing – The Village has adopted and enforces the current 2021 International Code Council (ICC) series. The Village will continue to investigate and adopt the latest ICC codes in the future.
Prairie Grove, Village of	⌚
Richmond, Village of	⌚
Ringwood, Village of	⌚
Spring Grove, Village of	⌚
Trout Valley, Village of	⌚
Union, Village of	⌚
Wonder Lake, Village of	⌚
Woodstock, City of	⌚
<b>Townships</b>	
Alden, Township of	Ongoing – Unincorporated areas and townships refer to the current 2021 International Code Council (ICC) series adopted and enforced by the County.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

⌚ = **No Updates.** The community has not adopted the latest 2021 ICC series and will consider doing so in the future.

### Action Item 21: Seek Mitigation Grant Funding for Additional Mitigation Planning and Cost Beneficial Projects

The County, municipalities, townships, other agencies, and institutions should apply for mitigation grant funding through available IEMA and FEMA programs for mitigation planning and mitigation projects. As required by IEMA and FEMA programs, projects must be cost beneficial. FEMA hazard mitigation funding including BRIC, HMGP, FMA and Section 406 of the Stafford Act (for facilities and infrastructure damaged due to a presidentially declared disaster) should be considered.

*Responsible Agency:* McHenry County, municipalities, other agencies, and institutions.

*Estimated Timeline:* As needed.


*Cost:* 25 percent of plan or project cost (non-federal share).

































*Benefits:* The County, municipalities, townships, other agencies, and institutions, along with residents and property owners, would benefit from the available grant funding. The request for grant funding also allows the Mitigation Committee to benefit from the mitigation planning effort.

*Plan Reference:* Chapters 1 and 4 through 9.

**Table 10- 20 Action 21 Status**

Stakeholder	Action Item #21 Status (2023)
<b>County</b>	
<p>McHenry County</p>	<p>Ongoing – The County is evaluating state and federal funding opportunities to support planning, design and implementation of the following, multi-jurisdictional projects:</p> <ul style="list-style-type: none"> <li>• Installing stream gages in Woods Creek, Crystal Creek, and elsewhere as needed (see Action Item 5: Expand Stream Gaging Network)</li> <li>• Assessing and inventorying County-wide stormwater and green infrastructure and stormwater management practices (see Action Item 7: Stream Maintenance Programs)</li> <li>• Building a County-wide, remote/regional salt storage capability to enhance severe winter storm preparedness (see Action Item 9: Mitigation of Public Infrastructure)</li> <li>• Constructing a living snow fence (see Action Item 9: Mitigation of Public Infrastructure)</li> <li>• Executing a structure-specific risk assessment on the lower 10 miles of the Nippersink Creek (see Action Item 11: Identification of Floodplain Structures)</li> <li>• Continuing to target and purchase additional flood-prone properties (see Action Item 14: Mitigation of Floodplain Properties)</li> <li>• Creating a Tree City USA education program and exploring transmission line undergrounding in heavily wooded areas (see Action Item 18: Urban Forestry)</li> <li>• Increasing County-wide capacity and capability to perform code enforcement (see Action Item 20: Strengthen Building Codes &amp; Code Enforcement Training)</li> </ul> <p>Ongoing – The County is working to finalize a buyout grant with IDNR to demolish up to 13 homes in Nunda and Burton Townships.</p> <p>Not Started – The County will explore available funding to hire a grant writer and grant manager for County-wide use.</p>
<b>Municipalities</b>	
<p>Algonquin, Village of</p>	<p>Ongoing – The Village is collaborating with the County to procure power generators for all water and sewer facilities in the Village of Algonquin to diminish the impacts of power outages to critical facilities (see Action Item 9: Mitigation of Public Infrastructure).</p> <p>Not Started – The Village may pursue funding to install new gauges on Crystal Creek (near Towne Park) and on the Fox River.</p> <p>Not Started – The Village may pursue funding to replace the Crystal Creek bridge on Main Street.</p>
<p>Barrington Hills, Village of</p>	<p></p>
<p>Bull Valley, Village of</p>	<p>Ongoing – The Village is seeking funding for stormwater projects and culvert upgrades (see Action Item 7: Stream Maintenance Programs and 9: Mitigation of Public Infrastructure).</p>

Stakeholder	Action Item #21 Status (2023)
Cary, Village of	Not Started — The Village may pursue funding for a Flood Mitigation Buyout Program (Sunset and Crest intersection).
Crystal Lake, City of	Ongoing — The City identified funding needs for the Re-Establish Crystal Creek project to re-establish where the old creek was to match upstream and downstream. Construction is anticipated for 2024/2025.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	Ongoing — The Village has requested funding for its shoreline stabilization project at Wing Pointe.
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Ongoing — The Village will continue to pursue funding for installing stream gages on Woods Creek and Crystal Lake at the Lake-In-The-Hills Dam.
Lakemoor, Village of	
Lakewood, Village of	Ongoing — Following 2017 flooding, the Village is pursuing funds to expand its sewer system to connect with U.S. Route 14. Ongoing — The Village is pursuing funds to increase the capacity of a pump station to improve basement backup protection to properties in The Gates. An engineering study was completed in December 2022.
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	
<b>Townships</b>	
Alden, Township of	
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	

Stakeholder	Action Item #21 Status (2023)
Greenwood, Township of	
Hartland, Township of	Not Started — The Township may collaborate with the County to apply for funds to construct a large underground storm shelter in Hartland Township (see Action Item 16: Safe Rooms).
Hebron, Township of	Not Started — The Township may collaborate with the County to apply for funds to replace 100-year-old drain tile lines in Hebron Township (see Action Item 9: Mitigation of Public Infrastructure).
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	Ongoing — The Township is working with the County to finalize a buyout grant with IDNR to demolish up to 7 homes in Nunda and Burton Townships.
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

= Ongoing. As mitigation needs arise, the community will work with the County to investigate state and federal funding sources and solicit County sponsorship as needed.

### Action Item 22: Implementation of the Water Resources Action Plan

The County, municipalities and townships should implement the water quality and groundwater protection measures recommended by the McHenry County Water Resources Action Plan (2020).

*Responsible Agency:* McHenry County, municipalities, and townships.

*Estimated Timeline:* Ongoing.











*Cost:* Staff time.

*Benefits:* McHenry County will benefit in the years to come by the protection of surface water and groundwater quality, and groundwater quantity for drinking water supply purposes.

*Plan Reference:* Chapter 7 discussion and Recommendation 6 in Section 7.10.

**Table 10- 21 Action 22 Status**

Stakeholder	Action Item #22 Status (2023)
County	
McHenry County	<p>Complete — The County Board adopted the updated 2020 Water Resources Action Plan November 17, 2020. This was a major accomplishment concluding a two-year project that began in the spring of 2019. During the first year of the project, monthly stakeholder meetings were conducted with over 160 persons participating including elected officials, municipal staff, engineers, land use planners, environmental organizations, and representatives of the aggregate industry and others. The Plan will be professionally designed and primarily distributed on-line with a limited number of printed hard copies available.</p> <p>Ongoing — Since the adoption of the revised WRAP, the County continues to work with municipalities to review and adopt the Plan or those portions of the Plan that are appropriate to their communities. Outreach is ongoing with stakeholders across the county. With respect to All Hazards Mitigation, the Plan contains sections and chapters</p>

Stakeholder	Action Item #22 Status (2023)
that address climate change, flooding, drought, and protecting ground water resources from contamination.	
<b>Municipalities</b>	
Algonquin, Village of	Ongoing – The Village contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force.
Barrington Hills, Village of	Ongoing – The Village contributed to developing the 2020 WRAP through participation in the WRAP Task Force.
Bull Valley, Village of	Ongoing – The Village contributed to developing the 2020 WRAP through its participation in the WRAP Task Force.
Cary, Village of	Ongoing – Village is assessing pipeline-specific vulnerabilities to natural disasters.
Crystal Lake, City of	Ongoing – The Village contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force.
Crystal Lake, City of	Ongoing – The City contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force. Ongoing – The City continues to participate and improve the Municipal Separate Storm Sewer System MS4 program, and this information has been placed on the City’s website for public information. The Crystal Lake Public Works Staff regularly participates on the Northwest Water Planning Alliance (NWPA) technical advisory committee. The goal of this organization is to collaboratively plan for and steward water resources to ensure sustainable water supply through education and outreach and utilize best policies and practices to protect drinking water supplies.
Fox Lake, Village of	Ongoing – The Village contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force.
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	Ongoing – The City contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force.
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	Ongoing – The Village contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force.
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Ongoing – The Village contributed to developing the 2020 WRAP through participation in the WRAP Task Force.
Lake-In-The-Hills, Village of	Ongoing – The Village has adopted a groundwater protection ordinance and actively manages the program.
Lakemoor, Village of	
Lakewood, Village of	Ongoing – The Village contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force.
Marengo, City of	
McCullom Lake, Village of	
McHenry, City of	Ongoing – The City contributed to developing the 2020 WRAP through participation in the WRAP Task Force.
Oakwood Hills, Village of	

Stakeholder	Action Item #22 Status (2023)
Port Barrington, Village of	⌚
Prairie Grove, Village of	⌚
Richmond, Village of	⌚
Ringwood, Village of	⌚
Spring Grove, Village of	⌚
Trout Valley, Village of	⌚
Union, Village of	⌚
Wonder Lake, Village of	Ongoing – The City contributed to developing the 2020 WRAP through participation in the WRAP Task Force.
Woodstock, City of	Ongoing – The City contributed significantly to developing the 2020 WRAP and was a regular participant in the WRAP Task Force.
<b>Townships</b>	
Alden, Township of	Ongoing – Unincorporated areas and townships are required to implement the 2020 Water Resources Action Plan adopted by the County Board.
Algonquin, Township of	
Burton, Township of	
Chemung, Township of	
Coral, Township of	
Dorr, Township of	
Dunham, Township of	
Grafton, Township of	
Greenwood, Township of	
Hartland, Township of	
Hebron, Township of	
Marengo, Township of	
McHenry, Township of	
Nunda, Township of	
Richmond, Township of	
Riley, Township of	
Seneca, Township of	

⌚ = **No update. The community did not participate in developing the 2020 WRAP update and will consider adoption and implementation in the future.**

### Action Item 23: Development of a Public Information Strategy

A countywide natural hazards public information strategy should be developed for the use of the County, municipalities, townships, and institutions. The strategy should be consistent with the recommended approach for the CRS program. The most important topics to cover are Safety and emergency protection measures; Protecting your property; Understanding Floods; Flood Insurance; and Nature-Based Solutions.

Publications developed by other agencies should be reviewed, consolidated, and tailored for distribution to McHenry County property owners. A set of countywide publications should be developed that can be used by communities as is, but developed in a format that allows communities to customize the materials.

*Responsible Agency:* McHenry County Mitigation Committee, municipalities, institutions.

*Estimated Timeline:* 12 months.

*Cost:* Staff time, publication costs.

*Benefits:* There are many benefits to having a well-informed public. For example, deaths from lightning have steadily decreased over the years because people are more aware of what they should and should not do. More self-help and self-protection measures will be implemented if people know about them and are motivated to pursue them.

By preparing a public information strategy and a master set of locally pertinent articles and materials, each interested office only must select the most appropriate media and distribute the messages. By simply inserting an article in a newsletter or putting it on the website, the local level of effort is reduced, which increases the likelihood that the messages will get out. The messages will also be technically correct and consistent throughout the County.

*Plan Reference:* Chapter 9 discussion, conclusions 1 and 2 in Section 9.6, and Recommendation 1 in Section 9.7.

**Table 10- 22 Action 23 Status**

Stakeholder	Action Item #23 Status (2023)
<b>County</b>	
McHenry County	<p>Ongoing - The County Department of Planning and Development has created pamphlets and handouts for flooding, water quality, wetlands, and water conservation available online and in County offices. The documents are also handed out at various seminars and educational events throughout the year. Additionally, the County has a public information officer (PIO) on staff.</p> <p>Ongoing – The County Board recently approved the purchase and installation of an outdoor tornado siren at Boone Creek Golf Club and the District is planning to seek a financial partnership with Nunda Township and the Village of Bull Valley.</p> <p>Not Started — The County is planning to collaborate with representatives from all municipalities, townships, and unincorporated areas to develop a public information strategy to enhance public awareness and understanding of natural hazards and emergency preparedness. The strategy will leverage best practices from within and outside the County and feedback gathered from the 2023 Public Survey.</p>
<b>Municipalities</b>	
Algonquin, Village of	Ongoing — The Village uses Nixle, posts a newsletter, and utilizes social media for education and notification during emergency events.
Barrington Hills, Village of	⌚
Bull Valley, Village of	⌚
Cary, Village of	Ongoing - The Village elected to use TextCaster as its method to contact residents with pertinent information regarding informational and emergency messaging. Additionally, subscribers can elect to receive severe weather pass-through information from the National Weather Service.
Crystal Lake, City of	<p>Ongoing - For several years, the City has produced an emergency preparedness guide. Additional publications from various agencies related to severe weather are available on the City’s website for access by the public at any time. The City also provides information related to emergency preparedness several times a year in the City’s newsletters.</p> <p>Not Started — The City is interested in establishing an Emergency Alert AM radio station, including ALERT AM broadcasts warnings for: AMBER Alerts, School Incidents, Flooding, Industrial Accidents, Terror Threats, Earthquakes, and Tornadoes, etc.</p>

Stakeholder	Action Item #23 Status (2023)
Fox Lake, Village of	⌛
Fox River Grove, Village of	⌛
Greenwood, Village of	⌛
Harvard, City of	⌛
Hebron, Village of	⌛
Holiday Hills, Village of	⌛
Huntley, Village of	Ongoing — The Village of Huntley, Policy Department and Fire Protection District maintain a Family preparedness guide to increase resident awareness of appropriate measures in the event of a natural disaster. Ongoing — The Village posts a newsletter to their main website and sends physical copies with water bills.
Island Lake, Village of	Ongoing — Distributes quarterly newsletters tailored to the season and provides safety tips. Also, invites EMA to speak about safety at public events throughout the year. The Village is planning to link EMA information to its main website.
Johnsburg, Village of	Ongoing — The Village distributes an electronic newsletter — the eBlast — the keep residents up to date on the latest Village events and stories, including disaster preparedness.
Lake-In-The-Hills, Village of	Ongoing — The Village is willing to work with other municipalities to improve the public information strategy.
Lakemoor, Village of	⌛
Lakewood, Village of	⌛
Marengo, City of	⌛
McCullom Lake, Village of	⌛
McHenry, City of	⌛
Oakwood Hills, Village of	⌛
Port Barrington, Village of	⌛
Prairie Grove, Village of	⌛
Richmond, Village of	⌛
Ringwood, Village of	⌛
Spring Grove, Village of	⌛
Trout Valley, Village of	⌛
Union, Village of	⌛
Wonder Lake, Village of	⌛
Woodstock, City of	⌛
<b>Townships</b>	
Alden, Township of	⌛
Algonquin, Township of	⌛
Burton, Township of	⌛
Chemung, Township of	⌛
Coral, Township of	⌛
Dorr, Township of	⌛
Dunham, Township of	Not Started — The Township is planning to build a warning system for areas in the southwest and southeast.
Grafton, Township of	⌛
Greenwood, Township of	⌛

Stakeholder	Action Item #23 Status (2023)
Hartland, Township of	⌚
Hebron, Township of	⌚
Marengo, Township of	⌚
McHenry, Township of	⌚
Nunda, Township of	⌚
Richmond, Township of	Not Started — The Township is planning to design and develop all-hazards outreach projects (e.g., seminars, pamphlets, etc.).
Riley, Township of	⌚
Seneca, Township of	⌚

⌚= **No Updates.** The community will investigate leveraging resources developed by the County and investigate more formal plans in the future.

### Action Item 24: Property Protection References

Provide municipal departments, libraries, and other interested offices with a list of references on property protection that can be ordered for free from state and federal offices. Include a request that they make the references available for public use. A special effort should be made to identify references on insurance, emergency preparedness and property protection.

Also, identify websites that provide property protection information and provide their addresses to the County and municipal webmasters.

*Responsible Agency:* McHenry County Mitigation Committee, then municipal offices to place in libraries and offices. The American Red Cross should provide technical advice.

*Estimated Timeline:* 12 months.

*Cost:* Staff time.

*Benefits:* As with the other public information activities, this action item helps inform the public. It provides the greatest assistance to those people who want to learn more about property protection and take the right steps to reduce their exposure to damage by natural hazards.

*Plan Reference:* Chapter 9.

**Table 10- 23 Action 24 Status**

Stakeholder	Action Item #24 Status (2023)
<b>County</b>	
McHenry County	Ongoing — The County Department of Planning and Development has targeted eleven (11) libraries throughout the County and provided them with nine (9) FEMA technical guidance manuals. Each manual is searchable in the library’s card catalog and may be accessed by the public. Ongoing — The County’s EMA & Planning and Development websites provide information on insurance, emergency preparedness and property protection. Ongoing — The County is exploring development of a property protection guide for all residents.
<b>Municipalities</b>	
Algonquin, Village of	Ongoing - There is reference information in the library and the police department lobby.
Barrington Hills, Village of	⌚



Stakeholder	Action Item #24 Status (2023)
Bull Valley, Village of	⌘
Cary, Village of	⌘
Crystal Lake, City of	Ongoing – The City has Information regarding property protection measures for flooding available on its website. The City’s Flood Study is cataloged in the Crystal Lake Public Library under two references. (REF 368.1 FLO and CRYSTAL LAKE REF 627.4 CRY) Ongoing – The City participates in the ICC Building Safety month campaign each May. A table with relevant material is set up in the main lobby. The materials are available for review or to take home and the materials are changed every week during the campaign.
Fox Lake, Village of	⌘
Fox River Grove, Village of	⌘
Greenwood, Village of	⌘
Harvard, City of	⌘
Hebron, Village of	⌘
Holiday Hills, Village of	⌘
Huntley, Village of	Ongoing – The Village Police Department distributes property protection information via its Severe Weather and Emergency Preparedness website, including the Village of Huntley Emergency Preparedness Guide.
Island Lake, Village of	⌘
Johnsburg, Village of	Ongoing – The Village distributes property protection information via the McHenry Township Fire Protection District Station 2 website.
Lake-In-The-Hills, Village of	⌘
Lakemoor, Village of	⌘
Lakewood, Village of	⌘
Marengo, City of	⌘
McCullom Lake, Village of	⌘
McHenry, City of	⌘
Oakwood Hills, Village of	⌘
Port Barrington, Village of	⌘
Prairie Grove, Village of	⌘
Richmond, Village of	⌘
Ringwood, Village of	⌘
Spring Grove, Village of	⌘
Trout Valley, Village of	⌘
Union, Village of	⌘
Wonder Lake, Village of	⌘
Woodstock, City of	⌘
<b>Townships</b>	
Alden, Township of	⌘
Algonquin, Township of	⌘
Burton, Township of	⌘
Chemung, Township of	⌘
Coral, Township of	⌘
Dorr, Township of	⌘
Dunham, Township of	⌘
Grafton, Township of	⌘

Stakeholder	Action Item #24 Status (2023)
Greenwood, Township of	⌚
Hartland, Township of	⌚
Hebron, Township of	⌚
Marengo, Township of	⌚
McHenry, Township of	⌚
Nunda, Township of	⌚
Richmond, Township of	⌚
Riley, Township of	⌚
Seneca, Township of	⌚

⌚= **No Updates.** The community will investigate leveraging resources developed by the County and investigate more formal plans in the future.

### 10.3 Action Plan Items Prioritization Criteria

The actions in the mitigation strategy are prioritized to assist with implementation. Equity has been added as a crucial factor for consideration in this process. An action’s equity score was determined by looking at a variety of factors including, but not limited to:

- Does the action reduce risk to a geographic area with greater exposure to the hazard (ex: areas in a FEMA designated flood zone or areas experiencing higher heat due to the urban heat island effect)?
- Does the action reduce risk to a population more susceptible to negative impacts from the hazard due to intrinsic characteristics (ex: Individuals with disabilities, access and functional needs, or older adults)?
- Does the action reduce risk to a population or geographic location placed at greater risk to the hazard due to historic inequities or underinvestment?
- Does the action inadvertently increase risk to any of these populations or geographic locations?
- Has the principle of ‘no adverse impact’ been considered to ensure that a project that builds resiliency in one neighborhood does not increase risk for up or downstream neighbors?

After mitigation actions were developed, they were compared with one another to determine a ranking or priority using the Mitigation Action Prioritization Criteria listed below (Table 10-25). For each action, scores of 0, 1, 2, or 3 were assigned for each of the criteria listed below with 0 indicating that the project did not meet the criteria and 3 indicating that the project overwhelmingly met the criteria. Values were given to each project based on the information provided by the lead agency. Members of the Planning Team validated the scores assigned to each action.

**Table 10- 24 Action Item Ranking Criteria**

Action Item Ranking Criteria	Criteria Description
Effectiveness	The extent to which an action reduces risks to people and properties
Efficiency	The extent to which time, effort, and cost is well used as a means of reducing vulnerability both short and long-term. Agency has demonstrated expertise and capacity to manage implementation of the action.
Multi-Hazard Mitigation	The action reduces risk to more than one hazard.
Address High Risk Hazard	This action reduces risk to people and properties from a hazard(s) identified as high risk.

Address Critical Communications / Critical Facilities	The action pertains to the maintenance of critical functions and structures such as transportation, supply chain management, data circuits, etc.
Equity	The action reduces risk to one of more populations more susceptible to the negative impacts of natural disasters due to environmental exposure, social vulnerability, or other factors (factors impacting exposures and vulnerability are described in more detail in Chapter 2: Community Profile and throughout Hazard Profiles)

Each project was given a priority (i.e., high priority, medium priority, or low priority) based on the average score earned:

- High priority: 2.5-3.0
- Medium priority: 1.9-2.4
- Low Priority: 0-1.8

The prioritization of each mitigation action is included below in Table 10-26. This table was reviewed by the Planning Team, the Mitigation Committee, and the public at the May 2023 Public Meeting. Stakeholders were encouraged to review and comment on draft prioritization.

**Table 10- 25 Action Item Prioritization**

Action Items	Priority	Effective	Efficient	Multi-Hazard	High Risk Hazard	Critical Facility	Equity	Score
1. Plan Adoption	Low	1	2	3	1	0	0	1.16
2. Continuation of Mitigation Committee	Low	1	2	3	1	0	0	1.16
3. Plan Monitoring and Maintenance	Low	1	2	3	1	0	0	1.16
4. Include the McHenry County Natural Hazards Mitigation Plan into Other Plans	Low	1	2	3	1	0	0	1.16
5. Watershed Studies	Medium	2	2	2	3	1	1	1.83
6. Expand Stream Gaging Network	Medium	2	2	2	3	1	1	1.83
7. Stream Maintenance Programs	Medium	2	2	2	3	1	1	1.83
8. Prohibited Waterway Dumping Ordinances	Medium	2	2	2	3	1	2	2.00
9. Mitigation of Public Infrastructure	High	3	3	3	3	3	2	2.83
10. Continued NFIP Compliance	Low	2	2	2	3	1	1	1.66
11. Repetitive Loss Areas Study	Medium	2	2	2	3	2	2	2.16
12. Identification of Floodplain Structures:	Medium	2	2	2	3	2	2	2.16

Action Items	Priority	Effective	Efficient	Multi-Hazard	High Risk Hazard	Critical Facility	Equity	Score
13. Investigation of Critical Facilities	High	2	2	3	3	3	2	2.50
14. Critical Facilities Design with Natural Hazards Protection	High	3	3	3	3	3	2	2.83
15. Mitigation of Floodplain Properties - Property Protection Projects	High	3	3	2	3	2	2	2.50
16. Safe Rooms	High	3	2	3	3	2	2	2.50
17. Consider Community Rating System Participation	Low	1	1	2	2	1	1	1.33
18. Urban Forestry – Consider Participation in Tree City USA	Low	1	1	3	2	1	1	1.50
19. Consider Participation in StormReady	Low	1	1	2	2	1	1	1.33
20. Strengthen Building Codes and Code Enforcement Training	High	3	2	3	3	3	1	2.50
21. Seek Mitigation Grant Funding	High	3	2	3	3	3	3	2.83
22. Implementation of the Water Resources Protection Action Plan	Medium	2	2	2	3	3	2	2.33
23. Development of a Public Information Strategy	High	3	3	3	2	1	3	2.50
24. Property Protection References	Medium	1	3	3	3	1	3	2.33

## 10.4 Summary of Action Plan Items

Table 10-27 summarizes all Action Items, including the responsible agencies and estimated timelines, hazards mitigated and prioritization for implementation. The Action Items are categorized as administrative items and mitigation program items. Administrative items include tasks needed to administer and support plan implementation. The relationship between the goals and guidelines (from Chapter 3) and chapter recommendations are shown in Tables 10-27, 10-28, 10-29, and 10-30.

**Table 10- 26 Summary of Action Items**

Action Items	Lead / Supporting Agencies	Hazards Addressed	Est. Project Cost	Priority	Potential Funding Source(s)	Est. Implement. Timeline
1. Plan Adoption	McHenry County Board, City Councils, Village Boards, Boards of Trustees, and municipalities	All	Staff Time	Low	Staff time, Agency operating budget, FEMA HMA programs	3 months
2. Continuation of Mitigation Committee	McHenry County Board and municipalities	All	Staff Time	Low	Staff time, Agency operating budget, FEMA HMA programs	Ongoing
3. Plan Monitoring and Maintenance	McHenry County Hazard Mitigation Committee and McHenry County EMA	All	Staff Time	Low	Staff time, Agency operating budget, FEMA HMA programs	2028 (next 5-year cycle)
4. Include the McHenry County Natural Hazards Mitigation Plan into Other Plans	McHenry County and municipalities	All	Staff Time	Low	Staff time, Agency and municipal operating budgets	Ongoing
5. Watershed Studies	McHenry County	Flood, Drought/Groundwater	\$500,000	Medium	FEMA HMA programs, IEMA grants, IDNR grants	Ongoing
6. Expand Stream Gaging Network	McHenry County	Flood, Drought/Groundwater	\$50,000	Medium	FEMA HMA programs, IEMA grants, IDNR grants	12 months
7. Stream Maintenance Programs	McHenry County, municipalities, and townships	Flood, Drought/Groundwater	Staff time and equipment	Medium	FEMA HMA programs, IEMA grants, IDNR grants	36 months
8. Prohibited Waterway Dumping Ordinances	McHenry County and municipalities	Flood, Drought/Groundwater	Community-specific	Medium	Staff time, Agency and municipal operating budgets	36 months
9. Mitigation of Public Infrastructure	McHenry County, municipalities, and townships	All	Project-specific	High	FEMA HMA programs, HUD CDMG-DR & MIT programs, DOT RAISE grants, IEMA grants, IDNR grants	As funding becomes available

Action Items	Lead / Supporting Agencies	Hazards Addressed	Est. Project Cost	Priority	Potential Funding Source(s)	Est. Implement. Timeline
10. Continued NFIP Compliance	McHenry County Department of Planning and Development and municipal NFIP Administrators	Flood, Drought/Groundwater	Staff time	Low	Staff time, Agency and municipal operating budgets	Ongoing
11. Repetitive Loss Areas Study	McHenry County Department of Planning and Development with the cooperation of municipalities with properties included in the repetitive loss areas	Flood, Drought/Groundwater	\$100,000	Medium	FEMA HMA programs, IEMA grants, IDNR grants	24 months
12. Identification of Floodplain Structures:	McHenry County Department of Planning and Development and GIS Division	Flood, Drought/Groundwater	\$100,000	Medium	Staff time, Agency operating budget	36 months
13. Investigation of Critical Facilities	McHenry County GIS Team	All	\$100,000	High	Staff time, Agency and municipal operating budgets, FEMA HMA programs, IEMA grants, IDNR grants	Ongoing
14. Critical Facilities Design with Natural Hazards Protection	McHenry County, municipal, townships, and federal and state agencies responsible for critical facilities	All	Staff time	High	Staff time, Agency and municipal operating budgets, FEMA HMA programs, IEMA grants, IDNR grants	Ongoing
15. Mitigation of Floodplain Properties - Property Protection Projects	McHenry County Department of Planning and Development – Water Resources Division, municipal stormwater administrators and NFIP coordinators	Flood, Drought/Groundwater	Project-specific	High	FEMA HMA programs, HUD CDMG-DR & MIT programs, USFW grant programs, DOT RAISE grants, IEMA grants, IDNR grants	Ongoing
16. Safe Rooms	McHenry County, municipalities, and townships	All	Staff time	High	FEMA HMA programs, HUD CDMG-DR & MIT programs, DOT RAISE grants, IEMA grants, IDNR grants	36 months

Action Items	Lead / Supporting Agencies	Hazards Addressed	Est. Project Cost	Priority	Potential Funding Source(s)	Est. Implement. Timeline
17. Consider Community Rating System Participation	McHenry County Department of Planning and Development and municipal NFIP administrators	Flood, Drought/Groundwater	Staff time	Low	Staff time, Agency, and municipal operating budgets	Ongoing
18. Urban Forestry – Consider Participation in Tree City USA	Municipal Public Works Departments or other appropriate municipal entity	Severe Winter Storm and Extreme Cold, Severe Summer Storm, Tornado	\$2 per capita, Staff time	Low	Staff time, Agency, and municipal operating budgets	Ongoing
19. Consider Participation in StormReady	McHenry County, municipal, other agency, and institutional emergency managers	Severe Winter Storm and Extreme Cold, Severe Summer Storm, Tornado, Flood	\$2 per capita, Staff time	Low	Staff time, Agency, and municipal operating budgets	Ongoing
20. Strengthen Building Codes and Code Enforcement Training	McHenry County and municipal building departments	Flood, Severe Summer Storm, Severe Winter Storm and Extreme Cold, Tornado, Drought/Groundwater, Earthquake	Staff time	High	FEMA HMA programs, IEMA grants, IDNR grants	24 months
21. Seek Mitigation Grant Funding	McHenry County, municipalities, other agencies, and institutions	All	25% of plan or project cost (non-federal share)	High	FEMA HMA programs, HUD CDMG-DR & MIT programs, USFW grant programs, EPA grant programs, DOT RAISE grants, DOE grant programs, IEMA grants, IDNR grants	As needed

Action Items	Lead / Supporting Agencies	Hazards Addressed	Est. Project Cost	Priority	Potential Funding Source(s)	Est. Implement. Timeline
22. Implementation of the Water Resources Protection Action Plan	McHenry County, municipalities, and townships	Flood, Drought/Groundwater	Staff time	Medium	Staff time, Agency and municipal operating budgets, FEMA HMA programs, Bureau of Reclamation WaterSMART	Ongoing
23. Development of a Public Information Strategy	McHenry County Mitigation Committee, municipalities, and institutions	All	Staff time, publication costs	High	Staff time, Agency, and municipal operating budgets	12 months
24. Property Protection References	McHenry County Mitigation Committee, then municipal offices to place in libraries and offices. The American Red Cross should provide technical advice	All	Staff time	Medium	Staff time, Agency, and municipal operating budgets	12 months



**Table 10- 27 Demonstrating Where Action Items Advance NHMP Goals**

Action Items	Goals					
	Goal 1. Protect lives, health, and safety	Goal 2. Protect public services, utilities, and critical facilities	Goal 3. Protect historic, cultural, and natural resources	Goal 4. Ensure that new developments do not create new exposures to natural hazards	Goal 5. Mitigate economic and transportation losses due to natural hazards	Goal 6. Identify specific projects to protect lives and mitigate damage where cost-effective and affordable
1. Plan Adoption	X	X	X	X	X	X
2. Continuation of Mitigation Committee	X	X	X	X	X	X
3. Plan Monitoring and Maintenance	X	X	X	X	X	X
4. Include the McHenry County Natural Hazards Mitigation Plan into Other Plans	X	X	X	X	X	X
5. Watershed Studies	X	X		X	X	
6. Expand Stream Gaging Network	X	X			X	
7. Stream Maintenance Programs		X	X		X	
8. Prohibited Waterway Dumping Ordinances		X	X		X	
9. Mitigation of Public Infrastructure		X			X	X
10. Continued NFIP Compliance	X	X				
11. Repetitive Loss Areas Study	X					X
12. Identification of Floodplain Structures:	X	X	X			
13. Investigation of Critical Facilities	X	X			X	
14. Critical Facilities Design with Natural Hazards Protection	X	X		X	X	X
15. Mitigation of Floodplain Properties - Property Protection Projects	X		X		X	X

Action Items	Goals					
	Goal 1. Protect lives, health, and safety	Goal 2. Protect public services, utilities, and critical facilities	Goal 3. Protect historic, cultural, and natural resources	Goal 4. Ensure that new developments do not create new exposures to natural hazards	Goal 5. Mitigate economic and transportation losses due to natural hazards	Goal 6. Identify specific projects to protect lives and mitigate damage where cost-effective and affordable
16. Safe Rooms	X	X			X	X
17. Consider Community Rating System Participation	X				X	
18. Urban Forestry – Consider Participation in Tree City USA	X	X	X		X	
19. Consider Participation in StormReady	X	X			X	
20. Strengthen Building Codes and Code Enforcement Training	X			X	X	
21. Seek Mitigation Grant Funding	X		X		X	X
22. Implementation of the Water Resources Protection Action Plan	X	X	X	X	X	
23. Development of a Public Information Strategy	X	X	X	X	X	
24. Property Protection References	X	X	X	X	X	

**Table 10- 28 Demonstrating Where Action Items Advance NHMP Guidelines**

Action Items	Guidelines						
	Guideline 1. Focus natural hazards mitigation efforts	Guideline 2. Make people aware of the hazards they face	Guideline 3. Seek state and federal support for mitigation efforts.	Guideline 4. Use available local funds to protect the public services, critical facilities, lives, health, and safety from natural hazards.	Guideline 5. Examine equitable approaches for the local cost of mitigation	Guideline 6. Create and foster public-private partnerships	Guideline 7. Strive to improve and expand business, transportation, and education opportunities
1. Plan Adoption		X		X			
2. Continuation of Mitigation Committee		X		X			
3. Plan Monitoring and Maintenance				X			
4. Include the McHenry County Natural Hazards Mitigation Plan into Other Plans		X	X	X		X	X
5. Watershed Studies	X		X	X			
6. Expand Stream Gaging Network	X		X	X			
7. Stream Maintenance Programs	X			X			
8. Prohibited Waterway Dumping Ordinances	X			X			
9. Mitigation of Public Infrastructure	X			X			X
10. Continued NFIP Compliance	X			X			
11. Repetitive Loss Areas Study	X		X	X			
12. Identification of Floodplain Structures:	X		X	X			
13. Investigation of Critical Facilities	X		X	X			
14. Critical Facilities Design with Natural Hazards Protection	X			X			X
15. Mitigation of Floodplain Properties - Property Protection Projects	X		X	X		X	
16. Safe Rooms	X		X	X		X	
17. Consider Community Rating System Participation	X			X			

Action Items	Guidelines						
	Guideline 1. Focus natural hazards mitigation efforts	Guideline 2. Make people aware of the hazards they face	Guideline 3. Seek state and federal support for mitigation efforts.	Guideline 4. Use available local funds to protect the public services, critical facilities, lives, health, and safety from natural hazards.	Guideline 5. Examine equitable approaches for the local cost of mitigation	Guideline 6. Create and foster public-private partnerships	Guideline 7. Strive to improve and expand business, transportation, and education opportunities
18. Urban Forestry – Consider Participation in Tree City USA	X			X			
19. Consider Participation in StormReady	X			X			
20. Strengthen Building Codes and Code Enforcement Training	X			X	X		
21. Seek Mitigation Grant Funding	X		X	X		X	X
22. Implementation of the Water Resources Protection Action Plan	X			X	X	X	X
23. Development of a Public Information Strategy	X	X		X		X	
24. Property Protection References	X	X		X		X	

**Table 10- 29 Demonstrating Where Action Items Advance NHMP Recommendations**

Action Items	Recommendations					
	Ch. 4. Preventive Measures	Ch. 5. Property Protection	Ch. 6. Structural Projects	Ch. 7. Resource Protection	Ch. 8. Emergency Services	Ch. 9. Public Information
1. Plan Adoption						X
2. Continuation of Mitigation Committee						X
3. Plan Monitoring and Maintenance						X
4. Include the McHenry County Natural Hazards Mitigation Plan into Other Plans						X
5. Watershed Studies			X			
6. Expand Stream Gaging Network			X		X	
7. Stream Maintenance Programs		X	X			
8. Prohibited Waterway Dumping Ordinances				X		
9. Mitigation of Public Infrastructure		X			X	
10. Continued NFIP Compliance	X					
11. Repetitive Loss Areas Study		X				
12. Identification of Floodplain Structures:		X			X	
13. Investigation of Critical Facilities					X	
14. Critical Facilities Design with Natural Hazards Protection	X	X			X	
15. Mitigation of Floodplain Properties - Property Protection Projects		X				
16. Safe Rooms		X			X	
17. Consider Community Rating System Participation	X					
18. Urban Forestry — Consider Participation in Tree City USA				X	X	
19. Consider Participation in StormReady					X	
20. Strengthen Building Codes and Code Enforcement Training	X					

Action Items	Recommendations					
	Ch. 4. Preventive Measures	Ch. 5. Property Protection	Ch. 6. Structural Projects	Ch. 7. Resource Protection	Ch. 8. Emergency Services	Ch. 9. Public Information
21. Seek Mitigation Grant Funding	X	X	X	X	X	X
22. Implementation of the Water Resources Protection Action Plan				X		
23. Development of a Public Information Strategy						X
24. Property Protection References						X

## 10.5 Plan Implementation, Maintenance, and Integration

The continuation of the McHenry County Mitigation Committee is necessary for implementation of the Action Plan. The establishment of the Mitigation Committee as a permanent group is proposed to monitor the implementation of the Plan, report to the County Board, municipalities, townships, and other agencies on its progress, and recommend revisions to this Plan as needed (see Action Item 2).

Maintenance and monitoring of the *McHenry County Natural Hazards Mitigation Plan* are addressed in Action Item 3. This Action Item explains how and when this Plan will be reviewed, revised, and updated. While Action Item 3 calls for the Mitigation Committee to meet at least once a year, it is anticipated that they will meet more frequently through the Stormwater Technical Advisory Committee meetings and the Local Emergency Managers Coordinators group. The purpose of the Mitigation Committee meetings will be for the development and review of countywide mitigation activities.

Hazard mitigation planning is most effective when it is integrated into existing plans, regulations, and programs. By leveraging strengths and filling gaps through plan integration, McHenry County can ensure hazard mitigation goals and actions are applied in comprehensive planning efforts to improve the County’s overall reduction of risk. Action Item 4 reinforces the importance of plan integration, including identifying where the County and municipalities have integrated information from the previous Plan into others. Additionally, the County and municipalities are committed to infusing other planning mechanisms with information from this plan going forward.

## 10.6 Plan Update

The McHenry County Mitigation Committee remains committed to reviewing the *McHenry County Natural Hazards Mitigation Plan* annually (see Action Item 3) and performing a comprehensive plan assessment and update every five years. This five-year cycle represents an opportunity for the County, municipalities, and townships to collectively assess their previous goals and action plan, evaluate progress in implementing hazard mitigation action, and adjust its actions to address the current realities. Table 10-31 below details the changes in development and priorities and progress against County and local mitigation efforts made since 2017.

**Table 10- 30 2023 McHenry County Natural Hazards Mitigation Plan Updates**

Plan Update Requirements	Plan Update Descriptions
Changes in Development	No development changes affected the jurisdiction’s overall vulnerability.
Changes to Priorities	<p>No change in participant priorities since the last approval of this plan in 2017. Goals and Guidelines were reviewed and re-validated by the McHenry County Mitigation Committee in March 2023. The following Action Items were consolidated under other, existing Action Items during the 2023 update:</p> <ul style="list-style-type: none"> <li>● Warning System from Dunham Township was consolidated under Action Item #23: Development of a Public Information Strategy</li> <li>● Power Outages for the Community of Algonquin was consolidated under Action Item #9: Mitigation of Public Infrastructure</li> <li>● Replace Main Drain Tiles in Hebron Township was consolidated under Action Item #9: Mitigation of Public Infrastructure</li> <li>● Review of Storm Sewers/Drainage System Maintenance for the Village of Richmond was consolidated under Action Item #7: Stream Maintenance Programs</li> <li>● Outreach Projects in the Village of Richmond Addressing All Hazards was consolidated under Action Item #23: Development of a Public Information Strategy</li> </ul>

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	<ul style="list-style-type: none"><li>• Develop a Reliable Means for Citizens in Crystal Lake to Receive Official Information from the City was consolidated under Action Item #23: Development of a Public Information Strategy</li><li>• Remote/Regional Salt Storage for McHenry County was consolidated under Action Item #9: Mitigation of Public Infrastructure</li></ul>
Changes to Progress of Mitigation Efforts	<p>The following Action Items were subsequently completed and removed from the Plan during the 2023 update:</p> <ul style="list-style-type: none"><li>• Tornado Siren at Public Works Facility in the Village of Richmond</li></ul> <p>Note the Mitigation Committee, comprised of representatives from the County and municipalities and townships, reviewed and revised the status of all hazard mitigation activities (as needed) within each Action Item during the 2023 update.</p>





# Appendix List

Appendix A: Local Mitigation Strategy Checklist and Letters of Intent

Appendix B: Public Survey Results

Appendix C: Stakeholder and Public Meeting Documentation

Appendix D: Analysis of McHenry County Public Survey and Interviews

Appendix E: NCDC Storms Event Database

Appendix F: National Risk Index Report



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July 2023



Appendix A: Local  
Mitigation Strategy  
→ Checklist and Letters of  
Intent



# Local Mitigation Plan Review Tool

## Cover Page

The Local Mitigation Plan Review Tool (PRT) demonstrates how the local mitigation plan meets the regulation in 44 CFR § 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the local governments, including special districts.

1. The Multi-Jurisdictional Summary Sheet is a worksheet that is used to document how each jurisdiction met the requirements of the plan elements (Planning Process; Risk Assessment; Mitigation Strategy; Plan Maintenance; Plan Update; and Plan Adoption).
2. The Plan Review Checklist summarizes FEMA’s evaluation of whether the plan has addressed all requirements.

*For greater clarification of the elements in the Plan Review Checklist, please see Section 4 of this guide. Definitions of the terms and phrases used in the PRT can be found in Appendix E of this guide.*

Plan Information	
Jurisdiction(s)	McHenry County, Illinois
Title of Plan	McHenry County Natural Hazard Mitigation Plan
New Plan or Update	Update
Single- or Multi-Jurisdiction	Multi-jurisdiction
Date of Plan	6/30/2023
Local Point of Contact	
Title	Brooke Lloyd, Chief Deputy Director of Emergency Management
Agency	McHenry County Emergency Management
Address	2200 N Seminary Ave, Woodstock, IL 60098
Phone Number	815-338-6400
Email	bxloyd@mchenrycountyil.gov

<b>Additional Point of Contact</b>	
<b>Title</b>	David Christensen, Director of Emergency Management
<b>Agency</b>	McHenry County Emergency Management
<b>Address</b>	2200 N Seminary Ave, Woodstock, IL 60098
<b>Phone Number</b>	815-338-6400
<b>Email</b>	dachristensen@mchenrycountyil.gov

<b>Review Information</b>	
<b>State Review</b>	
<b>State Reviewer(s) and Title</b>	Click or tap here to enter text.
<b>State Review Date</b>	Click or tap to enter a date.
<b>FEMA Review</b>	
<b>FEMA Reviewer(s) and Title</b>	Click or tap here to enter text.
<b>Date Received in FEMA Region</b>	Click or tap to enter a date.
<b>Plan Not Approved</b>	Click or tap to enter a date.
<b>Plan Approvable Pending Adoption</b>	Click or tap to enter a date.
<b>Plan Approved</b>	Click or tap to enter a date.

## Multi-Jurisdictional Summary Sheet

In the boxes for each element, mark if the element is met (Y) or not met (N).

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. State Requirements
1	Alden, Township of	Y	Y	Y	Y	Y	N/A	Y
2	Algonquin, Village of	Y	Y	Y	Y	Y	N/A	Y
3	Barrington Hills, Village of	Y	Y	Y	Y	Y	N/A	Y
4	Bull Valley, Village of	Y	Y	Y	Y	Y	N/A	Y
5	Cary, Village of	Y	Y	Y	Y	Y	N/A	Y
6	Chemung, Township of	Y	Y	Y	Y	Y	N/A	Y
7	Crystal Lake, City of	Y	Y	Y	Y	Y	N/A	Y
8	Dorr, Township of	Y	Y	Y	Y	Y	N/A	Y
9	Fox River Grove, Village of	Y	Y	Y	Y	Y	N/A	Y
10	Harvard, City of	Y	Y	Y	Y	Y	N/A	Y
11	Hebron, Township of	Y	Y	Y	Y	Y	N/A	Y
12	Huntley, Village of	Y	Y	Y	Y	Y	N/A	Y
13	Johnsburg, Village of	Y	Y	Y	Y	Y	N/A	Y
14	Lake in the Hills, Village of	Y	Y	Y	Y	Y	N/A	Y
15	Lakewood, Village of	Y	Y	Y	Y	Y	N/A	Y
16	Marengo, City of	Y	Y	Y	Y	Y	N/A	Y
17	McHenry, City of	Y	Y	Y	Y	Y	N/A	Y
18	McHenry, County of	Y	Y	Y	Y	Y	N/A	Y
19	McHenry Township Fire Protection District	Y	Y	Y	Y	Y	N/A	Y
20	Richmond, Village of	Y	Y	Y	Y	Y	N/A	Y
21	Ringwood, Village of	Y	Y	Y	Y	Y	N/A	Y
22	Spring Grove, Village of	Y	Y	Y	Y	Y	N/A	Y
23	Wonder Lake, Village of	Y	Y	Y	Y	Y	N/A	Y
24	Woodstock, City of	Y	Y	Y	Y	Y	N/A	Y
25	Port Barrington, Village of	Y	Y	Y	Y	Y	N/A	Y

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Local Mitigation Planning Policy Guide

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. State Requirements
25	Unincorporated McHenry County	Y	Y	Y	Y	Y	N/A	Y
26	Environmental Defenders of McHenry County	Y	Y	Y	Y	Y	N/A	Y
27	McHenry County Conservation District	Y	Y	Y	Y	Y	N/A	Y
28	McHenry Township Road District	Y	Y	Y	Y	Y	N/A	Y

## Plan Review Checklist

The Plan Review Checklist is completed by FEMA. States and local governments are encouraged, but not required, to use the PRT as a checklist to ensure all requirements have been met prior to submitting the plan for review and approval. The purpose of the checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been “met” or “not met.” FEMA completes the “required revisions” summary at the bottom of each element to clearly explain the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is “not met.” Sub-elements in each summary should be referenced using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each element and sub-element are described in detail in Section 4: Local Plan Requirements of this guide.

Plan updates must include information from the current planning process.

If some elements of the plan do not require an update, due to minimal or no changes between updates, the plan must document the reasons for that.

Multi-jurisdictional elements must cover information unique to all participating jurisdictions.

### Element A: Planning Process

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))</b>		
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan’s development, as well as who was involved?	Section 1.4 Planning Process Approach documents participating jurisdictions, Mitigation Committee members, and a summary of the planning process. The schedule is addressed in Section 1.5.	Met
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?	Section 1.4.1, Table 1-2 lists participating jurisdictions and how they participated in the planning process	Met

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process? (Requirement 44 CFR § 201.6(b)(2))</b>		
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?	Section 1.4.3, Section 1.5, and Section 1.6 summarize the results of public surveys and participation in meetings to obtain plan feedback	Met
<b>A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))</b>		
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?	Appendix C lists public comments and responses obtained during public meetings; Section 1.6.1 directly integrates results from the public survey into the plan	Met
<b>A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))</b>		
A4-a. Does the plan document what existing plans, studies, reports and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?	Section 1.4.4 documents resources, plans, and studies reviewed as part of the planning process. Section 3 lists various planning documents reviewed to support the risk assessment and alignment of the mitigation strategy with other planning efforts.	Met
<b>ELEMENT A REQUIRED REVISIONS</b>		
Required Revision: Click or tap here to enter text.		



## Element B: Risk Assessment

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))</b>		
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	Section 2.1 identifies and describes the natural hazards that can affect McHenry County and jurisdictions, including the rationale to omit natural hazards.	Met
B1-b. Does the plan include information on the location of each identified hazard?	Section 2.4.2 (Flood); 2.5.2 (Summer Storms); 2.6.2 (Winter Storms); 2.7.2 (Tornado); 2.8.2 (Extreme Heat); 2.9.2 (Drought); 2.10.2 (Earthquake); and 2.11.2 (Dam Failure) include information on the location of each hazard.	Met
B1-c. Does the plan describe the extent for each identified hazard?	Section 2.4.3 (Flood); 2.5.3 (Summer Storms); 2.6.3 (Winter Storms); 2.7.3 (Tornado); 2.8.3 (Extreme Heat); 2.9.3 (Drought); 2.10.3 (Earthquake); and 2.11.3 (Dam Failure) include information on the extent of each hazard.	Met
B1-d. Does the plan include the history of previous hazard events for each identified hazard?	Section 2.4.4 (Flood); 2.5.4 (Summer Storms); 2.6.4 (Winter Storms); 2.7.4 (Tornado); 2.8.4 (Extreme Heat); 2.9.4 (Drought); 2.10.4 (Earthquake); and 2.11.4 (Dam Failure) include the history of occurrence for each hazard.	Met

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
<p>B1-e. Does the plan include the probability of future events for each identified hazard? Does the plan describe the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature and sea levels), on the type, location and range of anticipated intensities of identified hazards?</p>	<p>Section 2.4.5 (Flood); 2.5.5 (Summer Storms); 2.6.5 (Winter Storms); 2.7.5 (Tornado); 2.8.5 (Extreme Heat); 2.9.5 (Drought); 2.10.5 (Earthquake); and 2.11.5 (Dam Failure) include the probability of future occurrence for each hazard. Section 2.4.6 (Flood); 2.5.6 (Summer Storms); 2.6.6 (Winter Storms); 2.7.6 (Tornado); 2.8.6 (Extreme Heat); 2.9.6 (Drought); 2.10.6 (Earthquake); and 2.11.6 (Dam Failure) include the effects of climate change and their effect on risk scores.</p>	<p>Met</p>
<p>B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?</p>	<p>Section 2.4 (Flood) and Section 2.11 (Dam Failure) describes the variation in flood description, location, extent, occurrence, and vulnerability across participating jurisdictions. Remaining hazards do not vary in their location or extent across jurisdictions.</p>	<p>Met</p>
<p><b>B2. Does the plan include a summary of the jurisdiction’s vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))</b></p>		
<p>B2-a. Does the plan provide an overall summary of each jurisdiction’s vulnerability to the identified hazards?</p>	<p>Section 2.4.6 (Flood); 2.5.6 (Summer Storms); 2.6.6 (Winter Storms); 2.7.6 (Tornado); 2.8.6 (Extreme Heat); 2.9.6 (Drought); 2.10.6 (Earthquake); and 2.11.6 (Dam Failure) provide a summary of vulnerability to the identified hazards.</p>	<p>Met</p>
<p>B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?</p>	<p>Section 2.4.6 (Flood); 2.5.6 (Summer Storms); 2.6.6 (Winter Storms); 2.7.6 (Tornado); 2.8.6 (Extreme Heat); 2.9.6 (Drought); 2.10.6 (Earthquake); and 2.11.6 (Dam Failure) provide a summary of consequences to the identified hazards.</p>	<p>Met</p>

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?	Section 2.4.4, Table 2-16, and Table 2-18 addresses NFIP claims, insured structures, and repetitive loss properties for each jurisdiction. NFIP participation is also discussed in Section 4.7.2. Repetitive flood loss properties and areas are specifically addressed in Section 5.5.	Met

**ELEMENT B REQUIRED REVISIONS**

Required Revision:

Click or tap here to enter text.

**Element C: Mitigation Strategy**

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>C1. Does the plan document each participant’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))</b>		
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?	Capabilities by jurisdiction are described in detail through Chapters 4-9. Existing building codes are located in Section 4.1, Table 4-1; Land use and development regulations are located in Section 4.7.2, Table 4-2 and 4-3	Met
C1-b. Does the plan describe each participant’s ability to expand and improve the identified capabilities to achieve mitigation?	The expansion and improvement of capabilities by jurisdiction are captured as activities under each Action Item in Chapter 10, Section 10.2	Met
<b>C2. Does the plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))</b>		
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?	Section 4.7.2, Table 4-3 provides detailed information for each jurisdiction’s NFIP participation	Met

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))</b>		
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?	Chapter 3 describes the goals and guidelines for reducing risk from hazards identified in the plan	Met
<b>C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))</b>		
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?	Section 10.2 identifies and describes a comprehensive range of specific mitigation actions and projects for each jurisdiction	Met
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan’s risk assessment?	Section 10.2 includes actions from each jurisdiction to address hazards from the risk assessment. Table 10-27 shows alignment between action items and hazards	Met
<b>C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))</b>		
C5-a. Does the plan describe the criteria used for prioritizing actions?	Section 10.3 describes the County’s criteria for prioritizing action items	Met
C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?	Section 10.4, Table 10-27 provides lead and supporting agencies, potential funding sources, and the expected timeframe for implementation of all action items.	Met

**ELEMENT C REQUIRED REVISIONS**

Required Revision:

Click or tap here to enter text.

## Element D: Plan Maintenance

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))</b>		
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?	Section 10.2 (Action Item #2) and Section 10.5 describe the County’s commitment to continue the Mitigation Committee comprised of representatives from all municipalities and townships	Met
<b>D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))</b>		
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?	Section 10.2 (Action Item #3) and Section 10.5 describe the role of the Mitigation Committee to review the plan annually and oversee a comprehensive update every 5 years	Met
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.	Section 10.2 (Action Item #3) and Section 10.5 describe the annual plan evaluation process for effectiveness, criteria, and responsible entities	Met
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?	Section 10.2 (Action Item #2) describes the process for updating the plan every 5 years, and the responsible entity	Met
<b>D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))</b>		
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?	Section 10.2 (Action Item #4) and Section 10.5 describes expectations for integrating the plan into other mechanisms	Met
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?	Section 10.2 (Action Item #4) describes the planning mechanisms of each participant for plan integration	Met

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?	Section 10.2 (Action Item #4) describes each participant's commitment to integrate the plan into local planning mechanisms	Met

**ELEMENT D REQUIRED REVISIONS**

Required Revision:  
Click or tap here to enter text.

**Element E: Plan Update**

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))</b>		
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?	Section 1.8 and Section 2.3 discuss McHenry County population and development changes and how it affects hazard-prone areas. Risk assessment scores were adjusted and summarized in Section 2.12 to reflect changes in risk. Section 10.6, Table 10-31 confirms that major priorities reflect updated risk.	Met
<b>E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))</b>		
E2-a. Does the plan describe how it was revised due to changes in community priorities?	Section 2.12 reflects how the plan's risk assessment was revised and incorporated community priorities; this is also confirmed in Section 10.6 and throughout Appendix C. Section 3 Also provides goals and guidelines that were updated to reflect community priorities.	Met

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?	Section 10.6, Table 10-31, provides a status update for all completed and removed action items from the 2017 plan	Met
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?	Section 10.2, Action Item #4 describes how jurisdictions have integrated the plan into other planning mechanisms	Met

**ELEMENT E REQUIRED REVISIONS**

Required Revision:  
Click or tap here to enter text.

**Element F: Plan Adoption**

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))</b>		
F1-a. Does the participant include documentation of adoption?	N/A. Adoption will occur after approval.	Choose an item.
<b>F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))</b>		
F2-a. Did each participant adopt the plan and provide documentation of that adoption?	N/A. Adoption will occur after approval.	Choose an item.

**ELEMENT F REQUIRED REVISIONS**

Required Revision:  
Click or tap here to enter text.

## Element G: High Hazard Potential Dams (Optional)

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?</b>		
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?	Section 2.11.1 describes ongoing collaboration with IDNR, who regulates dam construction and modification and maintains an inventory of dams.	Met
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?	Section 2.11.2, Table 2-38 provides details on the dam inventory as maintained by IDNR and FEMA.	Met
<b>HHPD2. Did the plan address HHPDs in the risk assessment?</b>		
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?	Section 2.11.6 describes dam failure hazard vulnerability and identifies a risk score based on HHPD classifications within the County.	Met
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?	Section 2.11.6 describes McHenry County assumptions surrounding dam safety, maintenance, and rehabilitation work recently completed by IDNR.	Met
<b>HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?</b>		
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?	Reduction of vulnerabilities is limited to routine maintenance and installation of additional stream gages and warning systems. (Section 10.2.1, Action Item 6.)	Met



HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?	Section 10.4, Table 10-27 links gage and warning system activities to long-term vulnerabilities identified in the Goals and Guidelines.	Met
<b>HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?</b>		
HHPD4-a. Does the plan describe specific actions to address HHPDs?	No specific actions identified.	Not Met
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?	No prioritization criteria identified.	Not Met
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?	No actions identified.	Not Met
<b>HHPD Required Revisions</b>		
Required Revision: Click or tap here to enter text.		

### Element H: Additional State Requirements (Optional)

Element H Requirements	Location in Plan (section and/or page number)	Met / Not Met
<b>This space is for the State to include additional requirements.</b>		
Click or tap here to enter text.	Click or tap here to enter text.	Choose an item.

## Plan Assessment

These comments can be used to help guide your annual/regularly scheduled updates and the next plan update.

### Element A. Planning Process

#### Strengths

- [insert comments]

#### Opportunities for Improvement

- [insert comments]

### Element B. Risk Assessment

#### Strengths

- [insert comments]

#### Opportunities for Improvement

- [insert comments]

### Element C. Mitigation Strategy

#### Strengths

- [insert comments]

#### Opportunities for Improvement

- [insert comments]

### Element D. Plan Maintenance

#### Strengths

- [insert comments]

#### Opportunities for Improvement

- [insert comments]

### Element E. Plan Update

#### Strengths

- [insert comments]

#### Opportunities for Improvement

- [insert comments]

## **Element G. HHPD Requirements (Optional)**

### **Strengths**

- [insert comments]

### **Opportunities for Improvement**

- [insert comments]

## **Element H. Additional State Requirements (Optional)**

### **Strengths**

- [insert comments]

### **Opportunities for Improvement**

- [insert comments]

## Statement of Intent in Natural Hazard Mitigation Planning

Village of Barrington Hills

As a potential participant in the Hazard Mitigation Assistance Program, the Village of Barrington Hills, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Barrington Hills, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

  
\_\_\_\_\_  
Signature of Authorized Representative

5/16/2023

\_\_\_\_\_  
Date

Anna Paul  
\_\_\_\_\_  
Print Name

Director of Administration  
\_\_\_\_\_  
Title of Representative

### Statement of Intent in Natural Hazard Mitigation Planning

Alden Township  
(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the Alden Township (Village / City / Township), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Alden Township (Village / City / Township), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Signature of Authorized Representative

3-30-23

Date

Dustin Rea

Print Name

Supervisor

Title of Representative



# Village of Algonquin

The Gem of the Fox River Valley

## Statement of Intent in Natural Hazard Mitigation Planning

As a potential participant in the Hazard Mitigation Assistance Program, the Village of Algonquin, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Algonquin, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

1/30/23

Signature of Authorized Representative

Date

Tim Schloneger

Print Name

Village Manager

Title of Representative

## Statement of Intent in Natural Hazard Mitigation Planning

### Village of Bull Valley

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As a potential participant in the Hazard Mitigation Assistance Program, the Village of Bull Valley Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Bull Valley, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.


  
Signature of Authorized Representative

3/1/23  
Date

Emma Kane  
Print Name

Emma Kane  
Title of Representative

Development Director

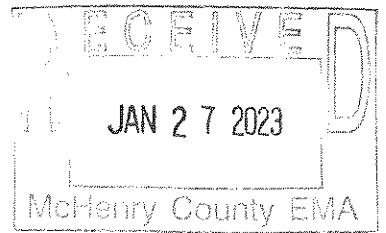
  
Signature of Authorized Representative

3-1-2023  
Date

Al Antoni  
Print Name

AL ANTONI  
Title of Representative

Police Sergeant



## Statement of Intent in Natural Hazard Mitigation Planning

Village / City / Township  
*VILLAGE OF CARL*

As a potential participant in the Hazard Mitigation Assistance Program, the **Village / City / Township**, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the **Village / City / Township**, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Signature of Authorized Representative

*JANUARY 26, 2023*

Date

*Patrick M. Finlon*

Print Name

*Chief of Police*

Title of Representative





## Statement of Intent in Natural Hazard Mitigation Planning

~~Village / City / Township~~

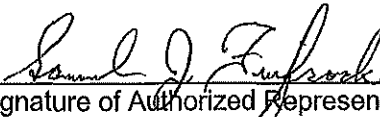
Chemung Twp

As a potential participant in the Hazard Mitigation Assistance Program, the ~~Village / City / Township~~, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the ~~Village / City / Township~~, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

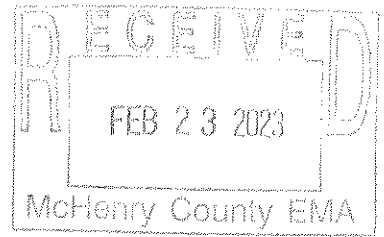
As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of Intent is nonbinding and is subject to any applicable local legal requirements.

  
Signature of Authorized Representative

3-30-2023  
Date

SAMUEL J FINFROCK  
Print Name

Chemung Township Supervisor  
Title of Representative



**Statement of Intent in Natural Hazard Mitigation Planning**

McHenry County Conservation District  
(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the McHenry County Conservation District (Village / City / Township), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the McHenry County Conservation District (Village / City / Township), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

[Signature] \_\_\_\_\_ 2/23/22  
Signature of Authorized Representative Date

Ben O'Dea \_\_\_\_\_ Public & Fleet Supervisor  
Print Name Title of Representative

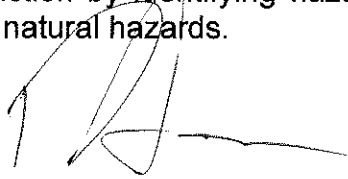
J

# Statement of Intent in Natural Hazard Mitigation Planning

## County of McHenry

The County of McHenry in compliance with the Natural Hazard Mitigation Planning has spoken with each jurisdiction listed in the 2023 McHenry County Natural Hazards Mitigation Planning Grant Application Scope of Work, in regard to their intent to participate. Each jurisdiction listed in the Scope of Work understands the roles and responsibilities expected of them, as well as the timeframe in which to complete their objectives as defined in the Scope of Work. This letter serves as verification that those jurisdictions listed in the plan as well as the County, have agreed to participate in the 2023 McHenry County Natural Hazards Mitigation planning process.

As signed, we understand this is a voluntary program and our participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of natural hazards.



1.27.23

Signature of Authorized Representative

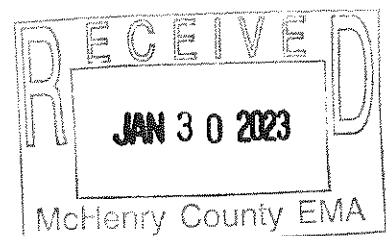
Date

Peter Austin

County Administrator

Print Name

Title of Representative



## Statement of Intent in Natural Hazard Mitigation Planning

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### City of Crystal Lake

As a potential participant in the Hazard Mitigation Assistance Program, the **City of Crystal Lake**, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the **City of Crystal Lake**, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.



Signature of Authorized Representative

Date: March 1, 2023

---

Print Name

Title of Representative

Paul DeRaedt

Fire Rescue Chief / Emergency Manager

## Statement of Intent in Natural Hazard Mitigation Planning

DORR TOWNSHIP

(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the DORR TOWNSHIP (Village / City / Township), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the DORR TOWNSHIP (Village / City / Township), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.



Signature of Authorized Representative

3/28/23

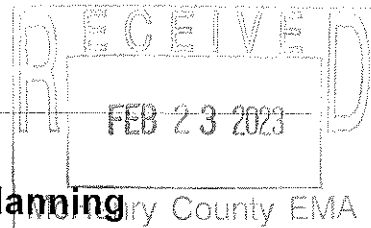
Date

JOHN FULLER

Print Name

HIGHWAY COMMISSIONER

Title of Representative



### Statement of Intent in Natural Hazard Mitigation Planning

Environmental Defenders of McHenry Co.  
~~(Village / City / Township)~~ Remove highlighted when submitting (EDMC)

As a EDMC potential participant in the Hazard Mitigation Assistance Program, the ~~(Village / City / Township)~~, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the EDMC ~~(Village / City / Township)~~, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

<u>Cynthia Skrutwald</u>	<u>2/23/23</u>
Signature of Authorized Representative	Date
<u>Cynthia Skrutwald</u>	<u>Chair, Water &amp; Nat. Resources Protection Action Team</u>
Print Name	Title of Representative
SKRUTWALD	



# Statement of Intent in Natural Hazard Mitigation Planning

## Village of Fox River Grove

As a potential participant in the Hazard Mitigation Assistance Program, the **Village of Fox River Grove** Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the **Village of Fox River Grove**, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

 2/2/23  
Signature of Authorized Representative Date

John Reese Operations Manager  
Print Name Title of Representative

## Statement of Intent in Natural Hazard Mitigation Planning

City of Harvard, IL

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As a potential participant in the Hazard Mitigation Assistance Program, the City of Harvard, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the City of Harvard, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.



02/02/2023

---

Signature of Authorized Representative

Date

Lou Leone

City Administrator

---

Print Name

Title of Representative



# Statement of Intent in Natural Hazard Mitigation Planning

Hebron Township  
(Village / City / Township) *Remove highlighted when submitting*

As a potential participant in the Hazard Mitigation Assistance Program, the Hebron Township (Village / City / Township), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Hebron Township (Village / City / Township), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Nancy Lech

Signature of Authorized Representative

3/30/23

Date

Nancy Lech

Print Name

Supervisor

Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

## Village of Huntley

(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the Village of Huntley (**Village / City / Township**), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Huntley (**Village / City / Township**), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.



Signature of Authorized Representative

2/2/23

Date

David Johnson

Village Manager

Print Name

Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

## Village of Johnsburg

(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the Village of Johnsburg (Village / City / Township), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Johnsburg (Village / City / Township), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Clarkson Spinks 1-30-23  
Signature of Authorized Representative Date

Clark H Sofiakis Administrator  
Print Name Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

## Village of Lake in the Hills

As a potential participant in the Hazard Mitigation Assistance Program, the Village of Lake in the Hills, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Lake in the Hills, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Shannon Andrews 2/22/2023  
Signature of Authorized Representative Date

Shannon Andrews Village Administrator  
Print Name Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

## VILLAGE OF LAKEWOOD

(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the VILLAGE OF LAKEWOOD (**Village / City / Township**), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the VILLAGE OF LAKEWOOD (**Village / City / Township**), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Jean Heckman  
Signature of Authorized Representative

1/31/23  
Date

JEAN HECKMAN  
Print Name

VILLAGE MANAGER  
Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

CITY OF MARENGO

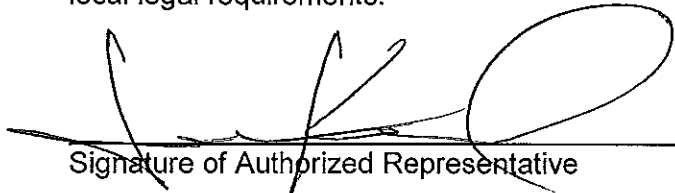
---

As a potential participant in the Hazard Mitigation Assistance Program, the CITY OF MARENGO, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the CITY OF MARENGO, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

  
Signature of Authorized Representative

2/16/23  
Date

JOHN KOZIVC  
Print Name

MAYOR  
Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

## City of McHenry

As a potential participant in the Hazard Mitigation Assistance Program, the City of McHenry, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the City of McHenry, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

  
\_\_\_\_\_  
Signature of Authorized Representative

2/17/23  
\_\_\_\_\_  
Date

Wayne Jett  
\_\_\_\_\_  
Print Name

Mayor  
\_\_\_\_\_  
Title of Representative

## Statement of Intent in Natural Hazard Mitigation Planning

### McHenry Township Fire Protection District

As a potential participant in the Hazard Mitigation Assistance Program, the McHenry Township Fire Protection District, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the McHenry Township Fire Protection District, Illinois agrees to participate in the hazard mitigation planning process.

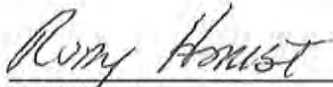
We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.



Signature of Authorized Representative

1/30/23  
Date



Print Name



Title of Representative



## Statement of Intent in Natural Hazard Mitigation Planning

### McHenry Township Road District

As a potential participant in the Hazard Mitigation Assistance Program, McHenry Township Road District, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the McHenry Township Road District, agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from our government agency.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

  
Signature of Authorized Representative

January 31, 2023  
Date

James E. Condon  
Print Name

MTRD Highway Commissioner  
Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

## Village of Richmond


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As a potential participant in the Hazard Mitigation Assistance Program, the Village of Richmond, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Richmond, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

  
Signature of Authorized Representative

2-6-2023  
Date

Jon Schmitt  
Print Name

Director of Public Works  
Title of Representative

## Statement of Intent in Natural Hazard Mitigation Planning

### VILLAGE OF RINGWOOD

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As a potential participant in the Hazard Mitigation Assistance Program, the Village of Ringwood, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the

VILLAGE OF RINGWOOD, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Richard E. Mack  
Signature of Authorized Representative

2/22/23  
Date

Richard E. Mack  
Print Name

Ringwood Village President  
Title of Representative

## Statement of Intent in Natural Hazard Mitigation Planning

Village of Spring Grove  
(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the Village of Spring Grove (Village / City / Township), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the Village of Spring Grove planning implementation update, the (Village / City / Township), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.



2/13/2023

Signature of Authorized Representative

Date

Mark R Eisenberg

Print Name

President

Title of Representative

# Statement of Intent in Natural Hazard Mitigation Planning

## Village of Wonder Lake

As a potential participant in the Hazard Mitigation Assistance Program, the Village Wonder Lake, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village Wonder Lake, Illinois agrees to participate in the hazard mitigation planning process. We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

L.T.V. Manderjack

01/26/23

Signature of Authorized Representative

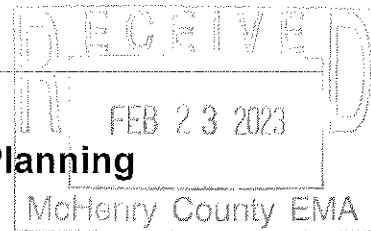
Date

KYLE MANDERJACK

LIEUTENANT - VILLAGE EMA COORDINATOR

Print Name

Title of Representative



### Statement of Intent in Natural Hazard Mitigation Planning

City of Woodstock  
(Village / City / Township) Remove highlighted when submitting

As a potential participant in the Hazard Mitigation Assistance Program, the City of Woodstock (Village / City / Township), Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the City of Woodstock (Village / City / Township), Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

[Signature]  
Signature of Authorized Representative

2/23/2023  
Date

Brent Aymond  
Print Name

Public Works Director  
Title of Representative

J



69 South Circle Avenue  
Port Barrington, IL 60010-1001

847-639-7595  
[villagehall@portbarrington.net](mailto:villagehall@portbarrington.net)

## Statement of Intent in Natural Hazard Mitigation Planning

### Village Of Port Barrington

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As a potential participant in the Hazard Mitigation Assistance Program, the Village of Port Barrington, Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the Village of Port Barrington, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As, signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

  
\_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
May 17, 2023  
Date

Keith Vogeler  
\_\_\_\_\_  
Print Name

Village President  
\_\_\_\_\_  
Title of Representative



→ Appendix B: Public  
Survey Results



July 2023



# McHenry County Natural Hazards Public Survey

643

Responses

10:38

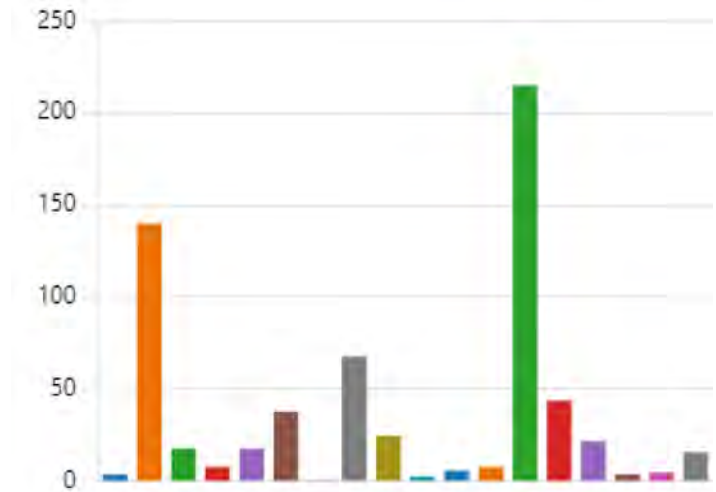
Average time to complete

Closed

Status

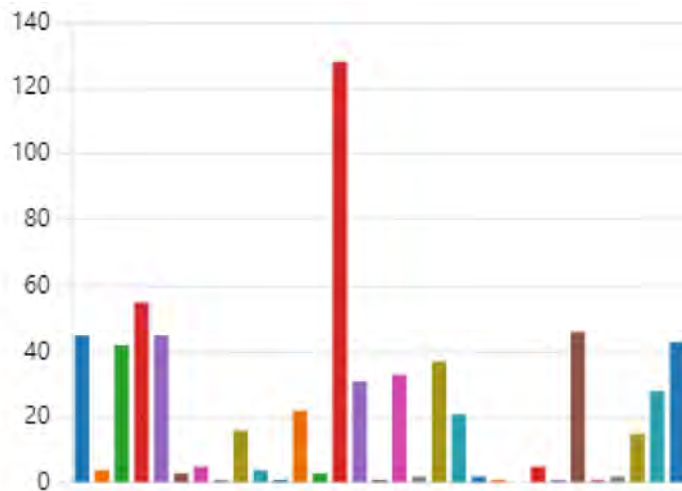
### 1. What township do you live in?

<span style="color: blue;">●</span> Alden	4
<span style="color: orange;">●</span> Algonquin	140
<span style="color: green;">●</span> Burton	18
<span style="color: red;">●</span> Chemung	8
<span style="color: purple;">●</span> Coral	18
<span style="color: brown;">●</span> Dorr	38
<span style="color: pink;">●</span> Dunham	1
<span style="color: gray;">●</span> Grafton	68
<span style="color: olive;">●</span> Greenwood	25
<span style="color: cyan;">●</span> Hartland	3
<span style="color: blue;">●</span> Hebron	6
<span style="color: orange;">●</span> Marengo	8
<span style="color: green;">●</span> McHenry	215
<span style="color: red;">●</span> Nunda	44
<span style="color: purple;">●</span> Richmond	22
<span style="color: brown;">●</span> Riley	4
<span style="color: pink;">●</span> Seneca	5
<span style="color: gray;">●</span> Other	16



## 2. What incorporated jurisdiction do you live in?

Algonquin, Village of	45
Barrington Hills, Village of	4
Bull Valley, Village of	42
Cary, Village of	55
Crystal Lake, City of	45
Fox Lake, Village of	3
Fox River Grove, Village of	5
Greenwood, Village of	1
Harvard, City of	16
Hebron, Village of	4
Holiday Hills, Village of	1
Huntley, Village of	22
Island Lake, Village of	3
Johnsburg, Village of	128
Lake-In-The-Hills, Village of	31
Lakemoor, Village of	1
Lakewood, Village of	33
McCullom Lake, Village of	2
McHenry, City of	37
Marengo, City of	21
Oakwood Hills, Village of	2
Port Barrington, Village of	1
Prairie Grove, Village of	0
Richmond, Village of	5
Ringwood, Village of	1
Spring Grove, Village of	46
Trout Valley, Village of	1
Union, Village of	2
Wonder Lake, Village of	15



<span style="color: #00A0C0;">●</span> Woodstock, City of	28
<span style="color: #0056B3;">●</span> Other	43

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3. Have you ever experienced a natural disaster in McHenry County?

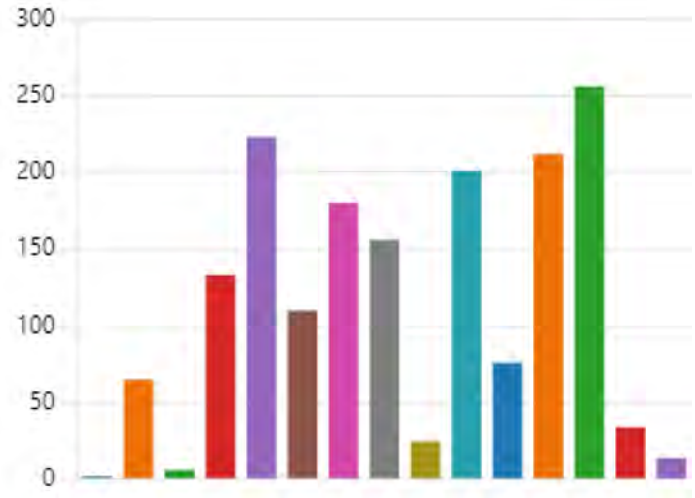
Natural disasters include all types of severe weather events (e.g., winter storm, flood, earthquake, etc.) that pose a significant threat to human health and safety, property, and critical infrastructure.

<span style="color: #0056B3;">●</span> Yes	348
<span style="color: #FF8C00;">●</span> No	295



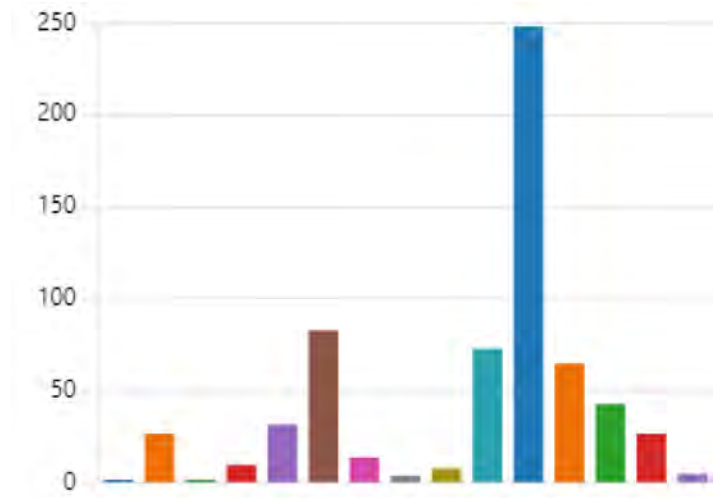
4. If "Yes", which of these natural hazards have you experienced? **(Select all that apply)**

	Dam Failure	2
	Drought	65
	Earthquake	6
	Extreme Heat	133
	Extreme Cold	223
	Flood	110
	Hail	180
	Lightning	156
	Sewer Backup	25
	Thunderstorm-Microburst	201
	Tornado	76
	Winter Storm-Ice	212
	Winter Storm-Snow	256
	Groundwater	34
	Other	14



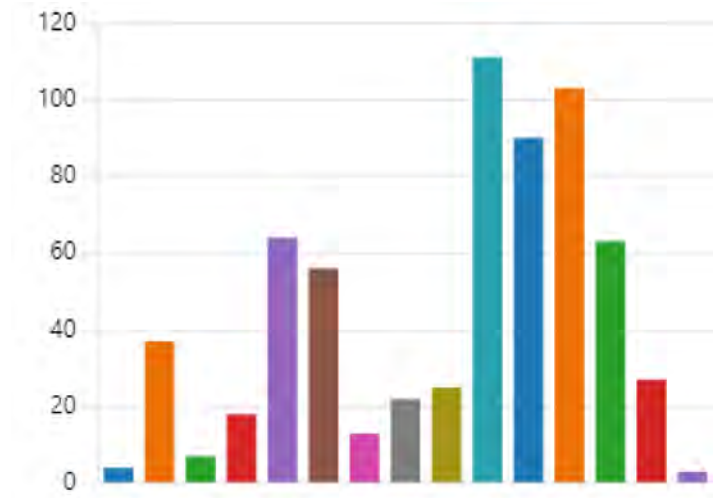
5. Which one natural hazard do you feel is the **greatest threat** to your community?

● Dam Failure	2
● Drought	27
● Earthquake	2
● Extreme Heat	10
● Extreme Cold	32
● Flood	83
● Hail	14
● Lightning	4
● Sewer Backup	8
● Thunderstorm-Microburst	73
● Tornado	248
● Winter Storm-Ice	65
● Winter Storm-Snow	43
● Groundwater	27
● Other	5



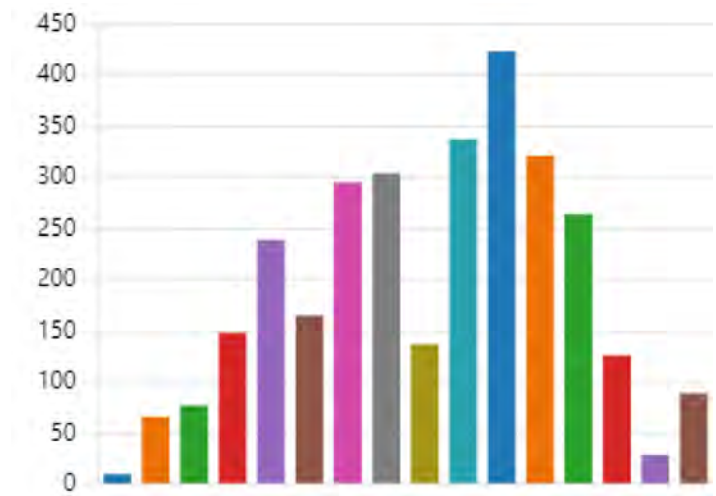
6. Which one natural hazard do you feel is the **second greatest threat** to your community?

● Dam Failure	4
● Drought	37
● Earthquake	7
● Extreme Heat	18
● Extreme Cold	64
● Flood	56
● Hail	13
● Lightning	22
● Sewer Backup	25
● Thunderstorm-Microburst	111
● Tornado	90
● Winter Storm-Ice	103
● Winter Storm-Snow	63
● Groundwater	27
● Other	3



7. Which natural hazards pose a threat to your home? **(Select all that apply)**

<span style="color: blue;">●</span> Dam Failure	10
<span style="color: orange;">●</span> Drought	66
<span style="color: green;">●</span> Earthquake	77
<span style="color: red;">●</span> Extreme Heat	148
<span style="color: purple;">●</span> Extreme Cold	239
<span style="color: brown;">●</span> Flood	165
<span style="color: magenta;">●</span> Hail	295
<span style="color: gray;">●</span> Lightning	304
<span style="color: olive;">●</span> Sewer Backup	137
<span style="color: cyan;">●</span> Thunderstorm-Microburst	337
<span style="color: blue;">●</span> Tornado	423
<span style="color: orange;">●</span> Winter Storm-Ice	321
<span style="color: green;">●</span> Winter Storm-Snow	264
<span style="color: red;">●</span> Groundwater	126
<span style="color: purple;">●</span> I Don't Know	29
<span style="color: brown;">●</span> Other	89



8. How prepared do YOU feel for natural hazards likely to occur within McHenry County?

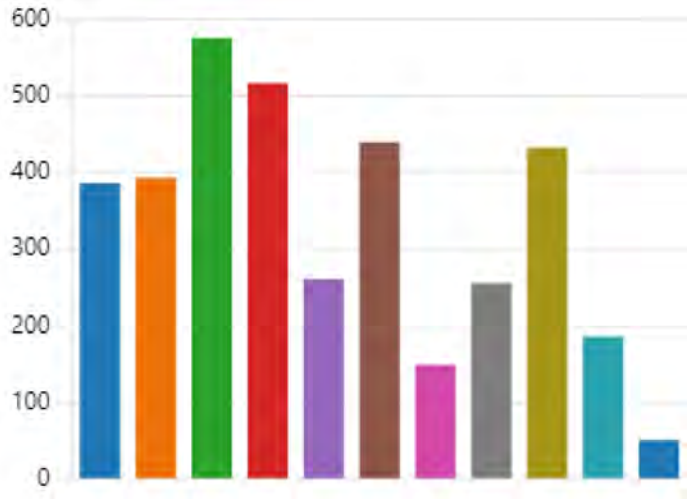
<span style="color: blue;">●</span> Not at all prepared	49
<span style="color: orange;">●</span> Somewhat prepared	346
<span style="color: green;">●</span> Adequately prepared	171
<span style="color: red;">●</span> Well prepared	55
<span style="color: purple;">●</span> Very well prepared	22





9. What steps have you or someone in your home taken to prepare for a natural disaster?  
**(Select all that apply)**

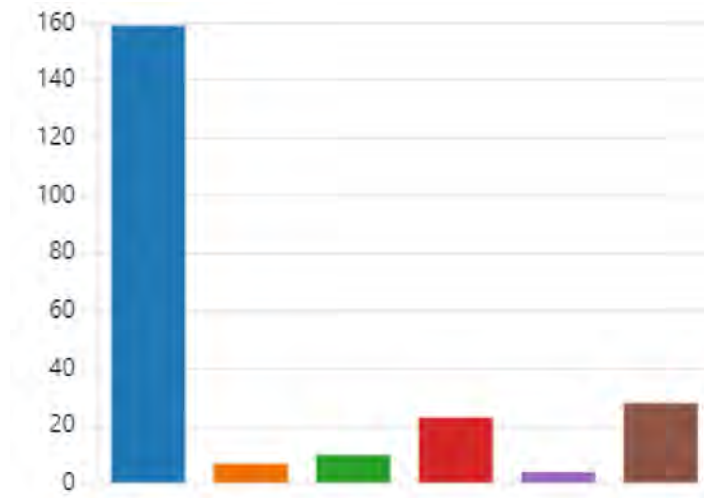
● Food	386
● Water	393
● Flashlight	575
● Batteries	516
● Battery-powered radio	261
● Medical supplies (First Aid Kit)	439
● Practiced a fire escape plan	149
● Received First Aid/CPR training	255
● Fire extinguishers	432
● Discussed utility shutoffs	186
● Other	51





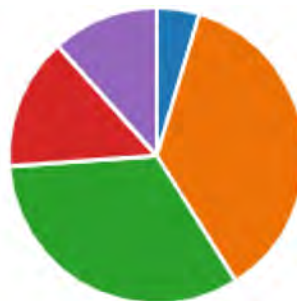
12. If "No", why not?

<span style="color: blue;">●</span> Not in a floodplain	159
<span style="color: orange;">●</span> Too expensive	7
<span style="color: green;">●</span> Never floods	10
<span style="color: red;">●</span> House is elevated	23
<span style="color: purple;">●</span> Did not know it was an option	4
<span style="color: brown;">●</span> Other	28



13. How do you feel your community is doing to make residents aware of the natural hazards that they may face?

<span style="color: blue;">●</span> Excellent	30
<span style="color: orange;">●</span> Good	234
<span style="color: green;">●</span> Fair	211
<span style="color: red;">●</span> Poor	93
<span style="color: purple;">●</span> I don't know	75

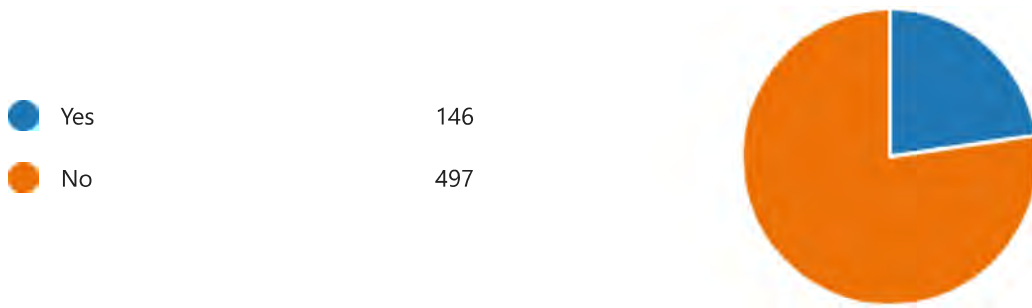


14. Are you interested in making your home more resistant to natural hazards?

<span style="color: blue;">●</span> Yes	465
<span style="color: orange;">●</span> No	178

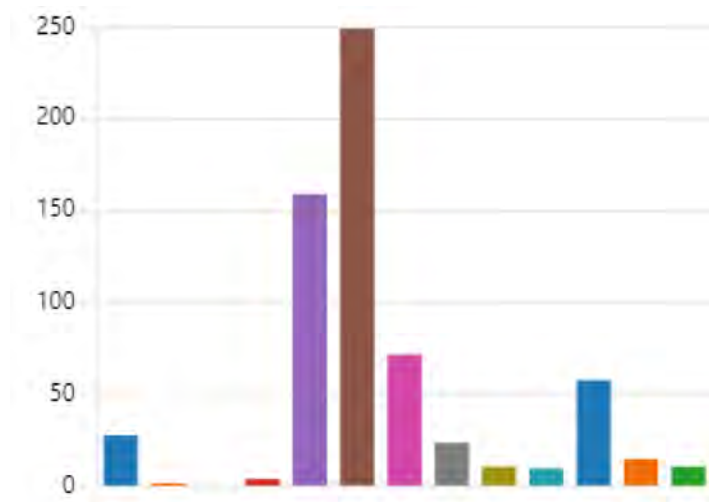


15. Do you know who to contact to learn more about natural hazard risks in your community?



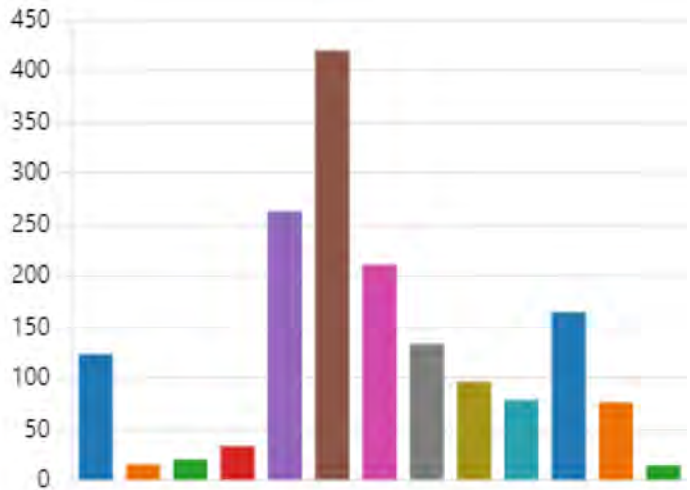
16. What is the most effective way for you to **receive information about learning about natural hazards**?

<span style="color: blue;">●</span> Facebook	28
<span style="color: orange;">●</span> Twitter	2
<span style="color: green;">●</span> Instagram	0
<span style="color: red;">●</span> YouTube	4
<span style="color: purple;">●</span> Text Message	159
<span style="color: brown;">●</span> Email	249
<span style="color: pink;">●</span> County or Community website	72
<span style="color: grey;">●</span> Television	24
<span style="color: olive;">●</span> Radio	11
<span style="color: teal;">●</span> Newspaper	10
<span style="color: blue;">●</span> Physical Mail	58
<span style="color: orange;">●</span> Public workshops/meetings	15
<span style="color: green;">●</span> Other	11



17. What are the most effective ways for you to **receive information on how to protect your household and property from damage due to natural disasters?** (Select all that apply)

<span style="color: blue;">●</span> Facebook	124
<span style="color: orange;">●</span> Twitter	16
<span style="color: green;">●</span> Instagram	21
<span style="color: red;">●</span> YouTube	34
<span style="color: purple;">●</span> Text Message	263
<span style="color: brown;">●</span> Email	420
<span style="color: pink;">●</span> County or Community website	211
<span style="color: grey;">●</span> Television	134
<span style="color: olive;">●</span> Radio	97
<span style="color: teal;">●</span> Newspaper	79
<span style="color: blue;">●</span> Physical Mail	165
<span style="color: orange;">●</span> Public workshops/meetings	77
<span style="color: green;">●</span> Other	15



18. (Optional) Do you have any programs, projects or activities in mind to reduce the impacts of natural disasters in your community?

124  
Responses

Latest Responses

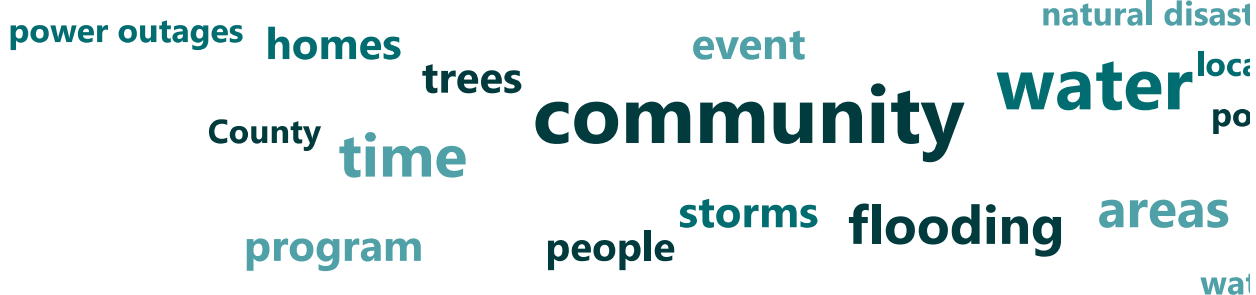
"Increase transportation options other than car for events that i...

"Use native plants in landscaping"

[Update](#)

12 respondents (10%) answered **community** for this question.

**Disaster preparedness**



19. (Optional) Are there any other comments you would like to make regarding natural hazards or risk reduction in your community?

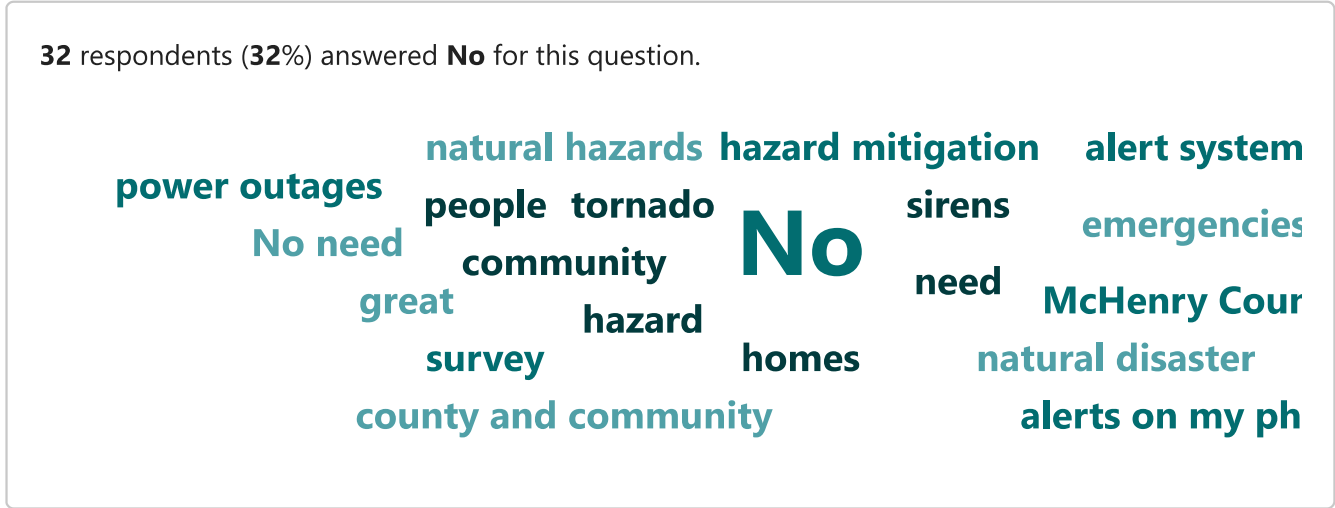
98  
Responses

Latest Responses

"Have an accepted hazard mitigation plan with FEMA. HMP is a ...

[Update](#)

32 respondents (32%) answered **No** for this question.





# Appendix C: Stakeholder and Public Meeting Documentation

**MCH**  
MCHENRY COUNTY · IL

July 2023



# Meeting Advertisements and Announcements

EMERGENCY MANAGEMENT

- ESV Calendar
- EMA Twitter Feed
- 2022 School Summit
- Staying Informed
- 30 Days 30 Ways
- Getting Help
- + Flooding
- + Volunteers
- Coordinating Council
- Local Emergency Planning Committee (LEPC)
- Hazard Mitigation Planning**
- Links
- Forms and Downloads
- Report Flood Damage
- Report Non-Flood Damage
- Training
- Current Weather Conditions
- Contact and About Us
- + FOIA Request

## EMERGENCY MANAGEMENT

David Christensen  
EMA Director



[Departments](#) - [Emergency Management](#) -

### Hazard Mitigation Planning

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#### 2023 Plan Update

The purpose of the next few virtual **public meetings** will be to discuss and provide input on the update to the McHenry County Natural Hazard Mitigation Plan. The Plan identifies hazards, vulnerabilities, assets at risk, and ways to reduce impacts through long-term, hazard mitigation projects. The primary intent of the workshop is to gather feedback on mitigation strategies to reduce identified hazard vulnerabilities, answer questions, and gather input to share with the Hazard Mitigation Planning Committee for the plan update.

May 25, 2023, the next McHenry County Natural Hazard Mitigation Plan meeting will be from 1pm-2:30pm. This meeting will be held virtually, please click on the virtual option below to attend.

[Meeting Recording](#) [Meeting Notes](#) [Meeting Slides](#)

[Virtual Access](#) [Meeting Agenda](#)

[Timekeeping Survey](#) [Letter of Intent](#) [In-Kind Hours](#)

April 27, 2023, the next McHenry County Natural Hazard Mitigation Plan meeting will be from 1-2:30pm. This meeting will be held virtually, please click on the virtual option below to attend.

[Meeting Recording](#) [Comments & Questions](#)

[Timekeeping Survey](#) [Letter of Intent](#) [In-Kind Hours](#)

March 30, 2023, from 1pm - 5pm, in-person only meeting with no virtual participation option, at the Village of Cary, 755 Georgetown Dr., Cary IL 60013. This will be the last chance for jurisdictions who have not already participated, to join the McHenry County Natural Hazard Mitigation plan. Please have someone from your jurisdiction attend, and as always, these meetings are open to the public. The purpose of this meeting is to gather your input and feedback to ensure a comprehensive understanding of the County's mitigation priorities and barriers to implementation. As a result, the County will be better equipped to define and prioritize multi-jurisdictional mitigation actions for future funding opportunities. To that end, we will use this time to:

1. Validate shared goals and objectives for mitigation based on our refreshed understanding of County-wide risk;
2. Define jurisdiction-specific mitigation priorities and barriers to include the status of Action Items from the 2017 Plan; and
3. Drive consensus around a manageable number (3-7) multi-jurisdictional hazard mitigation projects for the County.

[Agenda English](#)

[Timekeeping Survey](#) [Letter of Intent](#) [In-Kind Hours](#)

# Meeting Advertisements and Announcements



February 23, 2023, from 1pm - 5pm, in-person only meeting with no virtual participation option, at the Village of Cary, 755 Georgetown Dr., Cary IL 60013. The purpose of this meeting is to gather your input and feedback to ensure a comprehensive understanding of the County's natural hazards risks, such as vulnerabilities and impacts to critical infrastructure from tornados, winter storms and flooding. As a result, the County will be better equipped to prescribe mitigation actions that can meaningfully reduce the impacts of those risks throughout our communities.

[Agenda English](#)   [Agenda Spanish](#)

[Meeting Slides](#)

[Timekeeping Survey](#)   [Letter of Intent](#)   [In-Kind Hours](#)

January 26, 2023, from 3pm - 4:30pm for the Kick-Off Meeting to update the McHenry County Natural Hazard Mitigation Plan. Village of Cary, 755 Georgetown Dr., Cary, IL 60013. ([INVITE](#)).

[AGENDA English](#)   [AGENDA Spanish](#)

[Meeting Slides](#)   [Meeting Notes](#)   [Meeting Recording](#)

[Timekeeping Survey](#)   [Letter of Intent](#)   [In-Kind Hours](#)

[FAQ's](#)

## Current Plan

The McHenry County Natural Hazard Mitigation Plan has been updated and approved by Resolution by the County Board on September 19, 2017. A copy of the plan is below:

- [2022 Review](#)
- [2021 Review](#)
- [2020 Review](#)
- [2019 Review](#)
- [2018 Review](#)
- [2017 Review](#)
- [2017 Natural Hazard Mitigation Plan](#)

# Meeting Advertisements and Announcements



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30 Days 30 Ways

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+ Flooding

+ Volunteers

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## EMERGENCY MANAGEMENT

David Christensen

EMA Director



[Departments »](#)

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### Natural Hazard Mitigation Plan

McHenry County has completed the **public meetings** for the update to the McHenry County Natural Hazard Mitigation Plan. Currently we are working to complete the development and review of the Plan.

The Plan identifies hazards, vulnerabilities, assets at risk, and ways to reduce impacts through long-term, hazard mitigation projects.

Input direct from the public has included a 3-month survey period resulting in over 600 respondents across all jurisdictions; Open-to-the-Public Committee Meetings during April and May; engagement during McHenry County Earth Day event in April; A public meeting in March to receive comments on the draft Plan.

We want to thank all members of the public, including representatives external to McHenry County, for participating! Input to the Plan was vital and we are very proud to say that participation for the 2023 Plan exceeded that for the 2017 Plan!

#### NEWS

No news items at this time.

#### EVENTS

Local Emergency Planning Committee (LEPC) Meeting

08/17/2023 1:30 PM - 1:45 PM

Coordinating Council Meeting

08/17/2023 1:45 PM - 3:00 PM

Local Emergency Planning Committee (LEPC) Meeting

11/16/2023 1:30 PM - 1:45 PM

Coordinating Council Meeting

11/16/2023 1:45 PM - 3:00 PM

[MORE »](#)

# → McHenry County Mitigation Committee

2023 Natural Hazards Mitigation Plan Update

Wednesday, December 14, 2022, 1:30 pm – 2:30 pm CST

In-Person: McHenry County Emergency Operations Center

Virtual: [GoTo Link](#) OR Dial-In: 1-872-240-3412 + PIN: 970-269-756

## McHenry County Natural Hazards Mitigation Plan Update Kick-Off

### Purpose and Objectives:

The purpose of this meeting is to kick-off the work of updating our 2017 McHenry County Natural Hazards Mitigation Plan so that we are eligible to apply for federal hazard mitigation assistance grants in 2023 and beyond. To that end, we will use this time to:

- 1) Refresh your understanding of the hazard mitigation planning process, including new FEMA criteria for 2023, so you understand the full scope of work.
- 2) Introduce the Core Team and discuss individual roles and responsibilities so you are equipped to contribute.
- 3) Review next steps so that you are anticipating data requests from the ICF support team.

### Agenda:

Time	Topic	Speaker
1:30 pm–1:40 pm (10 Minutes)	Welcome & Team Introductions	Dave Christensen & Bob Ellsworth
1:40 pm–1:55 pm (15 Minutes)	Hazard Mitigation Planning 101 <ul style="list-style-type: none"><li>• FEMA criteria for 2023</li></ul>	ICF
1:55 pm–2:25 pm (30 Minutes)	Project Overview <ul style="list-style-type: none"><li>• Roles and Responsibilities</li><li>• Schedule</li><li>• Brief Engagements and Planning Discussion</li></ul>	ICF
2:25 pm–2:30 pm (5 Minutes)	Next steps & Wrap-up <ul style="list-style-type: none"><li>• Information request</li></ul>	Dave Christensen & Bob Ellsworth



# McHenry County Natural Hazards Mitigation Plan Update Kick-Off

Date/Time: Friday, December 14<sup>th</sup> from 1:30-2:30PM CST

## Attendees:

- Bob Ellsworth
- Dave Christensen
- Bob Leracz
- Robin Gibbs
- Joanna Colleti
- Adam Wallen
- Beth Skowronski
- Ed Markison
- Darrell Kuntz
- Ed Buikema
- Kim Alahmadi
- Olga Brezden
- Nicole Gattuso
- Edward Amoo
- Steven Gilbert
- Ned Fernandez (ICF)
- Kelli Reddick (ICF)
- Justin Strickland (ICF)
- Michael Farinella (ICF)

## Action Items:

### McHenry County

- **All** provide inputs to additional stakeholders and information via [Mural](#)
- **Bob Ellsworth** to share list of local stakeholders with ICF to support engagement planning
- **Joanna Colleti** to share CRS community data (e.g., NFIP Rep Loss/Severe Rep Loss, etc.) with ICF
- **Darrel Kuntz** to share CMAP Transportation Resilience Assessment with ICF (complete)
- **Bob Leracz** to share THIRA data with ICF (complete)

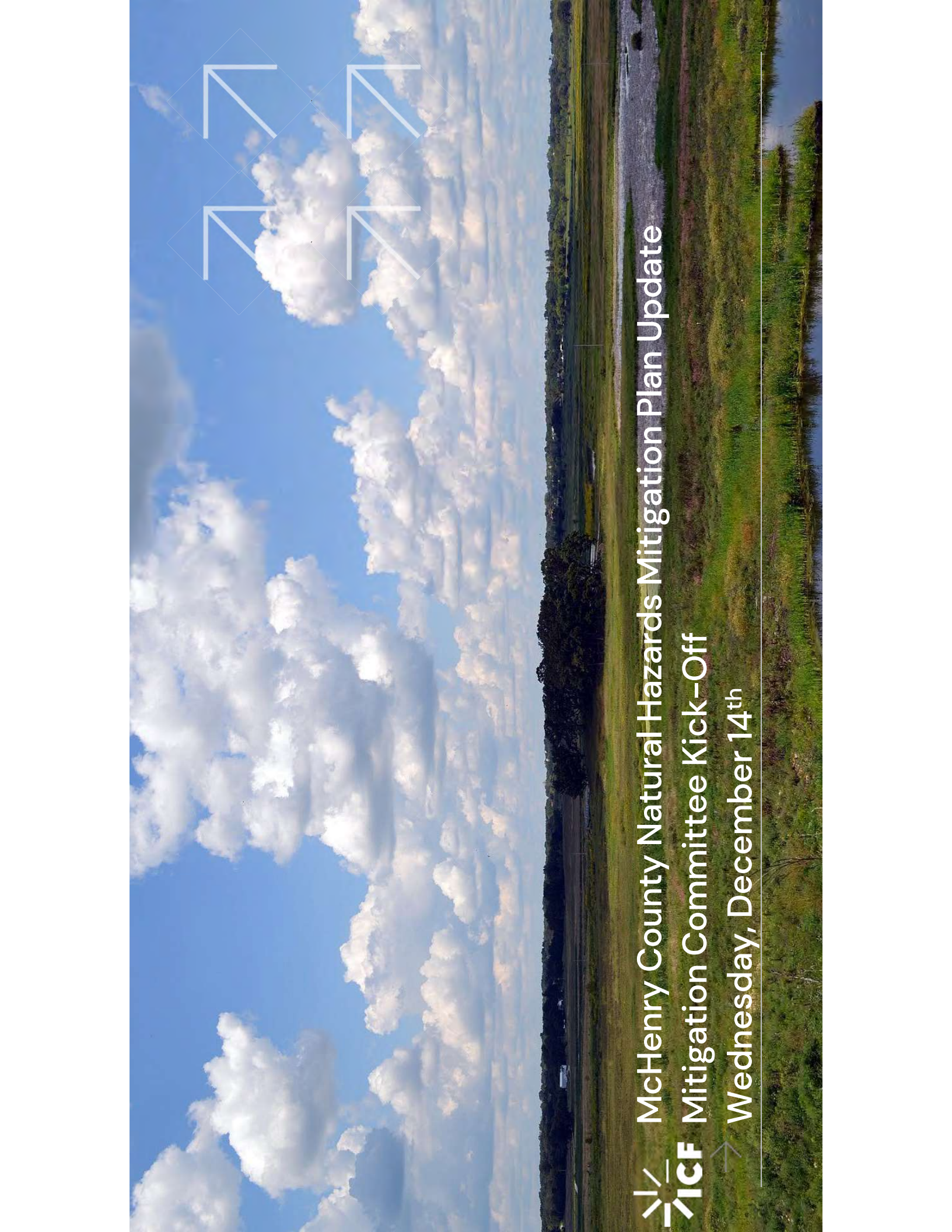
### ICF

- Remove rate request from Timekeeping survey and send to Bob, Dave and Robin for approval
- Review CRS Manual to confirm planning documentation processes are consistent between both efforts
- Distribute kick-off notes, slides and action items to Committee
- Schedule biweekly meetings for the Core Planning Team
- Schedule monthly meetings for the Committee

## Key Takeaways:

- Internal Project Coordination and Documentation:
  - Ensure processes and documentation align with FEMA CRS criteria for consistency
    - **Action: ICF to review CRS Manual to confirm planning documentation processes are consistent between both efforts**
  - Timekeeping
    - Confirmed the current timekeeping survey, minus rate request, will be satisfactory for the Committee
    - ICF should include rate request for broader stakeholder engagement
    - **Action: ICF to remove rate request from Timekeeping survey and send to Bob, Dave and Robin for approval**

- Meeting frequency:
  - Confirmed Biweekly recurrence for Core Planning Team (i.e., ICF Team, Dave Christensen, Bob Ellsworth, Joanna Colleti, Nicole Gattuso, Beth Skowronski, Ed Markison, Chalen Diagle, Kim Alahmadi and Olga Brezden)
  - Confirmed Monthly recurrence for Committee
  - All meetings should be scheduled in the afternoon, preferably after 2pm CST to accommodate other commitments
  - McHenry County posts current meeting dates and times on its website
- FEMA Hazard Mitigation Planning Process
  - McHenry County Board is currently developing its Strategic Plan, which we'll need to integrate (i.e., demonstrate alignment) within the updated Hazard Mitigation goals and objectives
  - McHenry County must wait until FEMA approves the Plan before County or local adoption can occur
    - Local jurisdictions can adopt after the County, and must submit their resolutions to IEMA before becoming eligible for FEMA Hazard Mitigation Assistance grants
    - Recommend seeking the County Board's approval prior to submission to the Illinois Emergency Management Agency (IEMA)
- Organizing Resources
  - Stakeholder Engagement:
    - The County has prepared a draft list of local municipalities and offices for engagement
      - **Action: Bob Ellsworth** to share list of local stakeholders with ICF to support engagement planning
  - Other Plans, Studies, Reports and Technical Information
    - The County has recently completed a Threat and Hazard Identification and Risk Assessment (THIRA)
      - **Action: Bob Leracz** to share THIRA data with ICF (complete)
    - Confirmed some required NFIP data (e.g., RL/SRL, etc.) can be sourced from local CRS documentation
      - **Action: Joanna Colleti** to share CRS community data (e.g., NFIP Rep Loss/Severe Rep Loss, etc.) with ICF
    - Identified the recent Chicago Metropolitan Agency for Planning (CMAP) Transportation Resilience Assessment as a data source
      - **Action: Darrel Kuntz** to share CMAP Transportation Resilience Assessment with ICF (complete)
  - **Action: All** provide inputs to additional stakeholders and information via [Mural](#)



# McHenry County Natural Hazards Mitigation Plan Update

Mitigation Committee Kick-Off

Wednesday, December 14<sup>th</sup>



Time	Topic	Speaker
1:30 pm-1:40 pm (10 Minutes)	<b>Welcome &amp; Introductions</b> <ul style="list-style-type: none"> <li>Timekeeping Discussion</li> </ul>	Dave Christensen and Bob Ellsworth
1:40 pm-1:55 pm (15 Minutes)	<b>Hazard Mitigation Planning 101</b> <ul style="list-style-type: none"> <li>FEMA Criteria for 2023</li> </ul>	ICF
1:55 pm-2:25 pm (30 Minutes)	<b>Project Overview</b> <ul style="list-style-type: none"> <li>Roles and Responsibilities</li> <li>Schedule</li> <li>Brief Engagements and Planning Discussion</li> </ul>	ICF
2:25 pm-2:30 pm (5 Minutes)	<b>Wrap-up &amp; Next Steps</b> <ul style="list-style-type: none"> <li>Information Request</li> </ul>	Dave Christensen and Bob Ellsworth



### Today's Objectives:

1. Refresh your understanding of the hazard mitigation planning process, including what's new for 2023
2. Introduce the Core Planning Team and discuss individual roles and responsibilities
3. Review timelines and next steps

## → Agenda



**State your:**

- **Name**
- **Title + Organization**
- **A favorite holiday tradition in your family**

**Welcome and Introductions**

Group Discussion: What is the easiest way to track time for in-kind match? Is the team open to an online survey that automatically compiles data?

#	Question	#	Question
1	First Name	6	Phone
2	Last Name	7	Date of work or meeting
3	Title/Role	8	Brief description of work or meeting
4	Jurisdiction	9	In-kind hourly rate (multiple choice)
5	Email	10	Time worked (multiple choice)

→ Timekeeping



# Hazard Mitigation Planning 101

**Purpose:** To develop a long-term strategy for reducing disaster damage, disruption, and repetitive loss impacts.

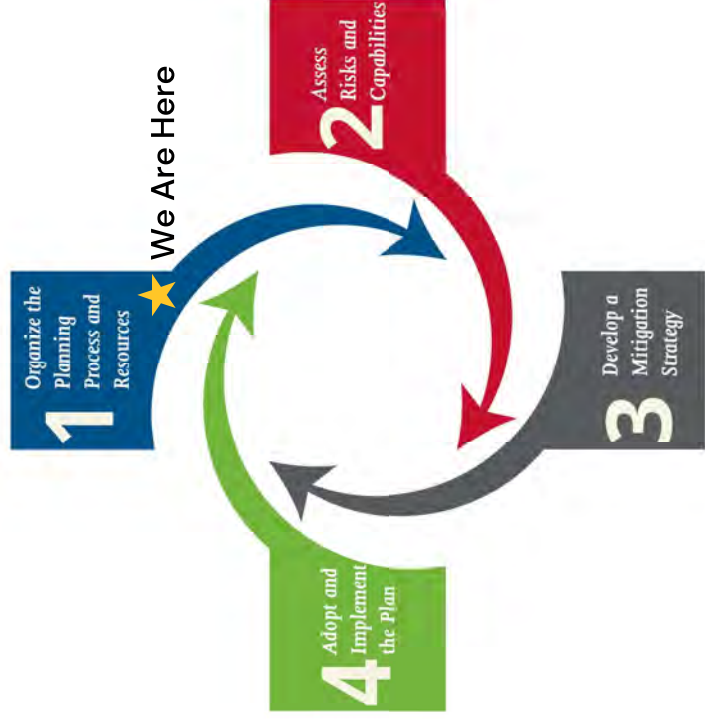
Having an updated plan....

- ✓ Enables access to FEMA Hazard Mitigation Assistance Grants (e.g., HMGP, BRIC, etc.)
- ✓ Increases readiness for subapplication development when funding becomes available
- ✓ Promotes more disaster-resilient and sustainable communities
- ✓ Increases public awareness and understanding of risk
- ✓ Fosters relationships between all levels of government, non-governmental organizations and the private sector
- ✓ Reduces costs associated with disaster response and recovery by promoting mitigation

→ **Why Hazard Mitigation Planning?**



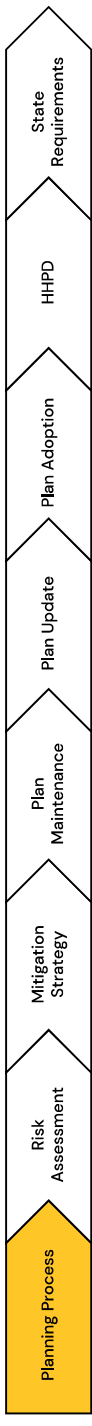
## FEMA Hazard Mitigation Planning Process



## FEMA Local Planning Sections

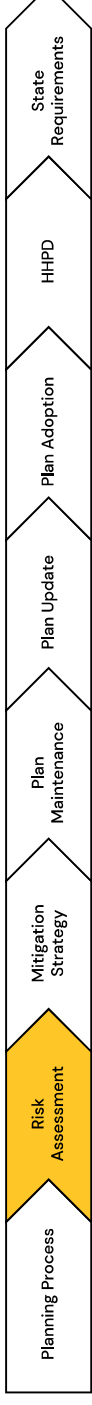
- A. Planning Process
- B. Risk Assessment
- C. Mitigation Strategy
- D. Plan Maintenance
- E. Plan Update
- F. Plan Adoption
- G. High Hazard Dams
- H. Additional State Requirements (Optional)

→ FEMA's HM Planning Process & Local Plan Requirements



- Describe the **planning process** and provide supporting documentation (e.g., meeting minutes, sign-in sheets, etc).
- Identify the **planning team** and describe their participation
  - How did we engage representatives from non-profit/community organizations (e.g., housing, healthcare, social services) that support underserved communities and socially vulnerable populations?
- Document the opportunity for **public engagement and involvement** in the planning process
  - How were underserved communities and vulnerable populations within the planning area provided an opportunity to be involved?
- Describe review and integration of **other plans, studies, reports, etc.**

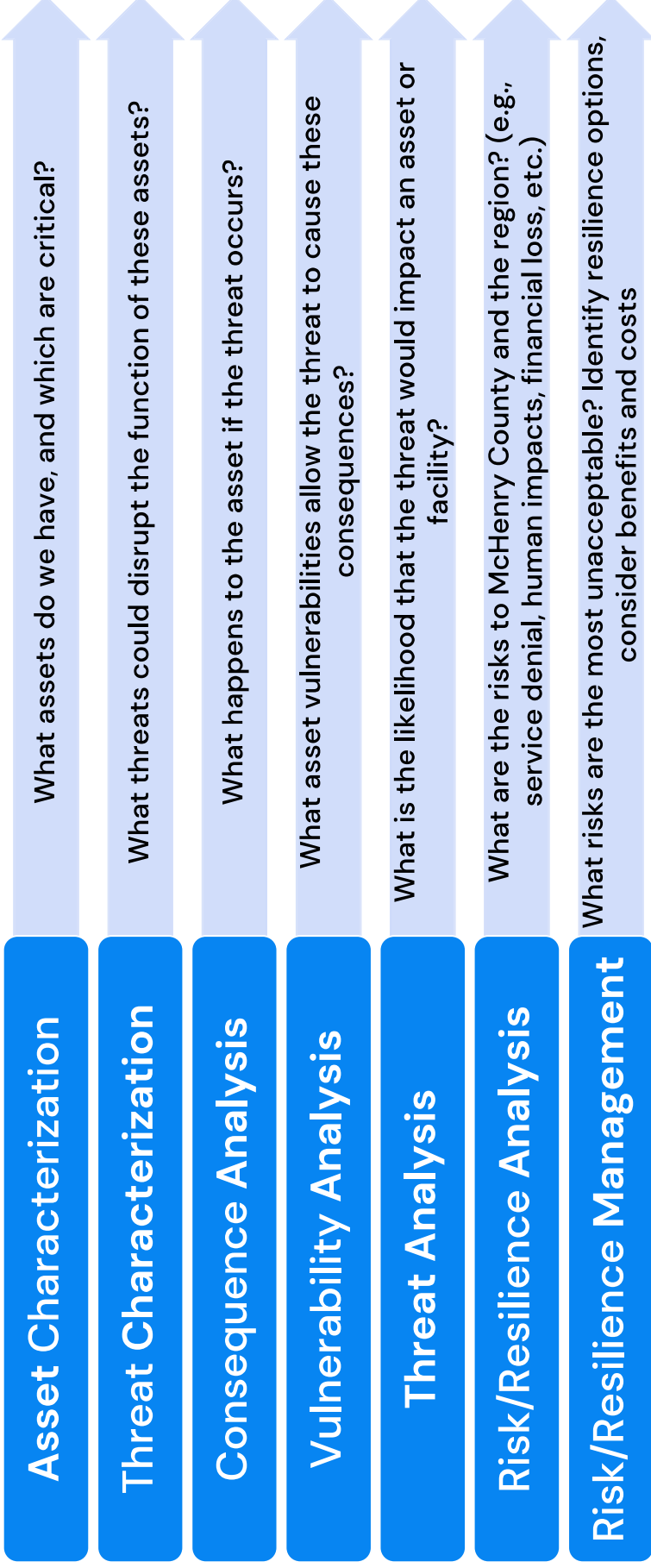
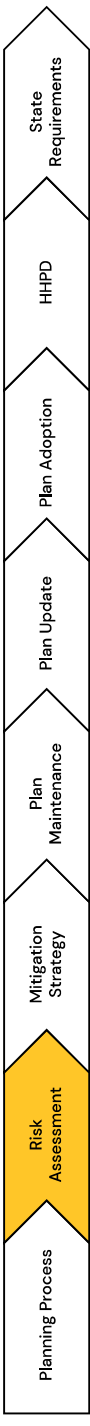
→ **Planning Process**



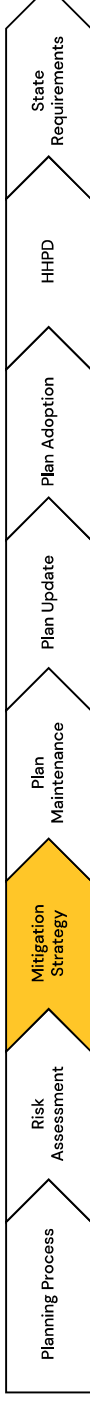
- Identify hazards, critical assets, and prior hazard events
- For each hazard, address the type, history, extent, impact, probability of future occurrences and vulnerability
  - Incorporate perceived impacts of climate change (ex. population shifts, changes in land use/development, etc.)
  - Include repetitive loss (RL)/severe repetitive loss (SRL) structures
- Note: ICF will leverage the all-hazards, Risk Analysis and Management for Critical Asset Protection (RAMCAP) Standard

→ Risk Assessment





→ **RAMCAP 7-Step Risk Assessment Process**



- Describe how existing authorities, policies, programs, funding and resources of each participant are available to support the mitigation strategy
  - Highlight NFIP participation where applicable
- Provide goals to reduce the risk of the identified hazards (i.e., broad statements focused on reducing risks from each hazard)
- Identify the mitigation actions identified to achieve those goals
  - Describe methodology used to analyze potential mitigation actions
- Describe the mitigation action plan (i.e., implementation plan)
  - Include criteria used for prioritizing implementation, with emphasis on benefits (i.e., benefit-cost analysis)
  - For each action, address who is responsible, funding sources and timelines
  - Each plan participant must identify at least one (1) action to implement

## → Mitigation Strategy



- **Plan Maintenance**
  - Describe process for continuing public engagement with the plan
  - Include updating process and schedule
  - Describe process for integration into other plans
- **Plan Update**
  - Describe any changes to land use development
  - Changes to priorities and progress in local mitigation efforts
- **Plan Adoption**
  - Include adoption documentation for all jurisdictions
  - FEMA may issue an Approved Pending Adoption (APA) notice prior to formal adoption
  - FEMA approval issued upon receipt of adoption resolution
  - Each jurisdiction must adopt individually within 1 year of approval

→ **Plan Maintenance, Update and Adoption**

## Federal Emergency Management Agency

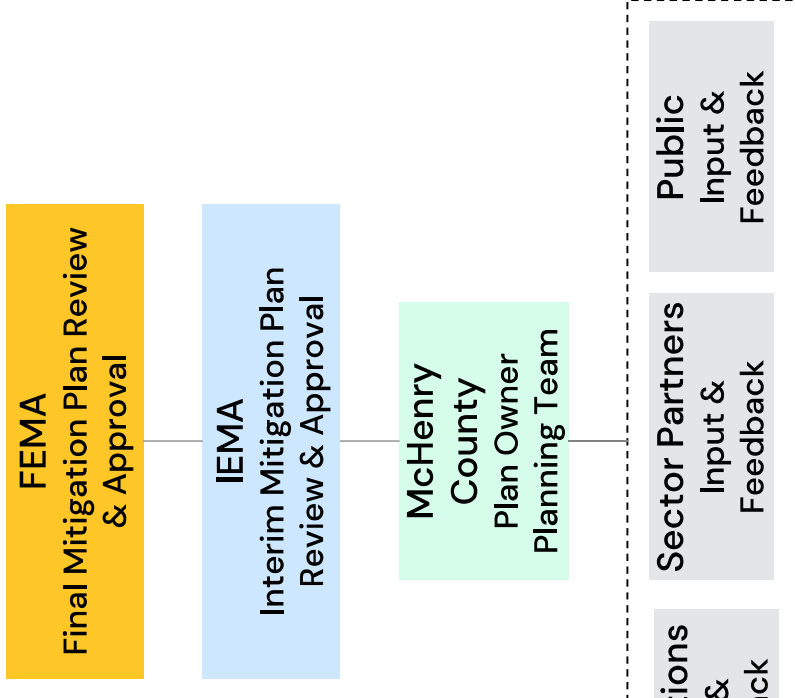
- Reviews and approves final plan

## Illinois Emergency Management Agency

- Reviews and approves final draft plan

## McHenry County

- Develops plan to meet FEMA criteria
- Coordinates submission and adoption with local jurisdictions
- Provides subject matter expertise
- Engages the public, local officials and sector partners for feedback

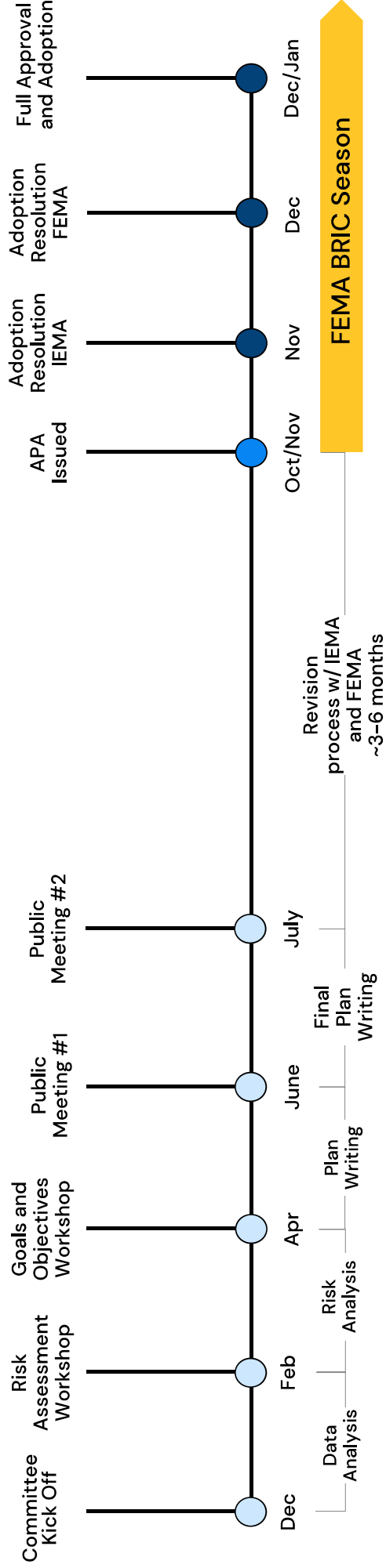


## → Organizational Roles and Responsibilities

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# Project Overview





## ➔ Overall Project Timeline

McHenry County		ICF
<b>Accountable</b> <i>Manages the work</i>	Bob Ellsworth (Primary) Dave Christensen (Back-Up)	Kelli Reddick
<b>Responsible</b> <i>Performs the work</i>	<ul style="list-style-type: none"> <li>Nicole Gattuso (GIS SME)</li> <li>Chalen Daigle (Coordination and Outreach)</li> <li>Kim Alahmadi (Research &amp; writing support)</li> <li>Olga Brezden (Research &amp; writing support)</li> </ul>	<ul style="list-style-type: none"> <li>Michael Farinella (Lead Planner)</li> <li>Justin Strickland (Coordination and Outreach)</li> </ul>
<b>Consulted</b> <i>Provides subject matter expertise</i>	Identifying Natural Hazards and Assets (including locations/maps, etc.)	<ul style="list-style-type: none"> <li>Bob Leracz</li> <li>Beth Skowronski</li> <li>Ed Markison</li> </ul>
	Defining Vulnerabilities and Potential Impacts (by jurisdiction)	<ul style="list-style-type: none"> <li>Bob Leracz</li> <li>Beth Skowronski</li> <li>Ed Markison</li> </ul>
	Determining Mitigation Strategies	<i>To be determined</i>
	Reviewing Drafts of Risk Assessment Report and Mitigation Action Plans	<ul style="list-style-type: none"> <li>Joanna Colletti</li> <li>Bob Ellsworth</li> <li>Bob Leracz</li> </ul>
	Facilitating State and Local Outreach and Engagement	<ul style="list-style-type: none"> <li>Chalen Daigle (Local and Public)</li> <li>Dave Christensen (State)</li> <li>Robin Gibbs (State)</li> </ul>
<b>Informed</b> <i>Provides strategic direction</i>	<ul style="list-style-type: none"> <li>Adam Wallen</li> <li>Scott Hartman</li> <li>Michael Buehler</li> </ul>	Ned Fernandez

→ **Committee Roles and Responsibilities**

## December 2022 Activities

- Establish and meet with the McHenry Co. Mitigation Committee (*complete*)
- Review existing Natural Hazards Mitigation Plan to identify necessary revisions and additions (*ongoing*)
- Meet with the Core Planning Team to discuss tactical approach
- Identify stakeholder groups and prepare Engagement Plan (Discussion Topic #1)
- Collect and review other plans, studies, reports and technical information (Discussion Topic #2)
- Prepare and submit Information Request and detailed schedule to the Committee

## January 2023 Activities

- Develop comprehensive asset inventory and base map
- Identify hazards and prepare hazard profiles
- Draft and deploy a stakeholder survey
- Conduct preliminary analysis for *Plan Introduction, Plan Update, and Planning and Engagement* sections

## → December & January Workplan



1. Stakeholder Ecosystem (15 mins)
2. Other Plans, Studies, Reports and Technical Information (5 mins)

<https://app.mural.co/t/icfeei4168/m/icfeei4168/1670527365503/a895ccdb321312ff6f61778e3c0df7c714bde476?sender=u13d2eb5669973667c0cc4901>

→ **Group Discussions**

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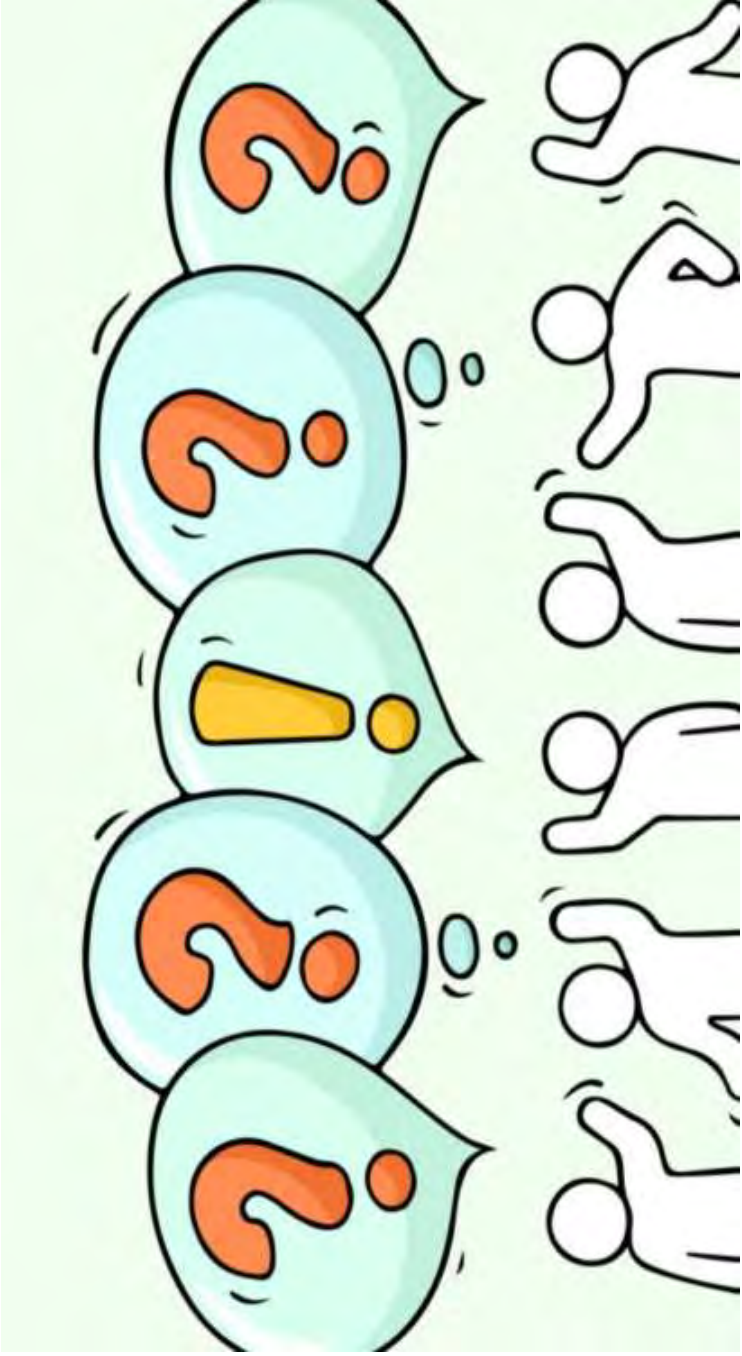


Wrap-up and Next Steps

1. (ICF) Review existing Natural Hazards Mitigation Plan to identify necessary revisions and additions
2. (ICF) Collect and review other plans, studies, reports and technical information
3. (ICF) Schedule recurring Planning Team meetings to review the detailed project plan, status progress and escalate risks and issues as needed
  - Core Planning Team = ICF, Bob, Dave, Joanna, Beth, Ed, Nicole, Chalen, Kim and Olga
  - [Group Discussion: how often should these occur \(biweekly\)?](#)
4. (ICF) Draft Stakeholder Engagement Plan
5. (ICF) Prepare and submit Information Request (RFI) and detailed schedule to the Committee
6. (Bob Ellsworth) Schedule recurring Committee meetings to solicit Plan input and feedback and gain consensus where needed to continue moving work forward
  - [Group Discussion: how often should these occur \(monthly\)?](#)

→ **Immediate Next Steps**

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→ Questions?

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Thank you!

## ICF contact info:

Name	Email	Phone
Kelli Reddick	<a href="mailto:Kelli.Reddick@icf.com">Kelli.Reddick@icf.com</a>	904-307-5163
Justin Strickland	<a href="mailto:Justin.Strickland@icf.com">Justin.Strickland@icf.com</a>	803-917-6607
Michael Farinella	<a href="mailto:Michael.Farinella@icf.com">Michael.Farinella@icf.com</a>	904-982-5664
Edward "Ned" Fernandez	<a href="mailto:Edward.Fernandez@icf.com">Edward.Fernandez@icf.com</a>	850-510-5696



# McHenry County Mitigation Committee

2023 Natural Hazards Mitigation Plan Update

Thursday, January 26, 2023, 3:00 pm – 4:30 pm CST

In-Person: Cary Village Hall (755 Georgetown Dr., Cary, IL 60013)

(Optional) Virtual: [Microsoft Teams Link](#) OR Dial-In: 1-571-348-5774 + ID: 119-560-425-5

## 2023 McHenry County Natural Hazards Mitigation Plan Update

### Purpose and Objectives:

Welcome everyone to the McHenry County Hazard Mitigation Committee! The **purpose of this meeting is to enhance your awareness and understanding of Plan update effort**, including why it's important, our overall process and timeline, and the role of the Committee. To that end, we will use this time to:

1. Introduce FEMA's hazard mitigation planning process and criteria, including how we intend to satisfy those requirements.
2. Present a local hazard mitigation project and start identifying other projects to capture within the updated Plan.
3. Review our timeline and next steps so that you have clear visibility around upcoming meetings and information requests.

### Agenda:

Time	Topic	Speaker
3:00 pm–3:20 pm (20 Minutes)	<b>Welcome &amp; Announcements</b> <ul style="list-style-type: none"> <li>• Introductions</li> <li>• Timekeeping requirements</li> </ul>	Bob Ellsworth & Dave Christensen (McHenry County Emergency Management Agency)
3:20 pm–3:40 pm (20 Minutes)	<b>Hazard Mitigation Planning 101</b> <ul style="list-style-type: none"> <li>• FEMA criteria for 2023</li> </ul>	Kelli Reddick (ICF)
3:40 pm–4:00 pm (20 Minutes)	<b>Project Overview</b> <ul style="list-style-type: none"> <li>• Schedule</li> <li>• Committee expectations</li> <li>• Upcoming activities</li> </ul>	Justin Strickland (ICF)
4:00 pm–4:20 pm (20 Minutes)	<b>Crystal Lake Mitigation Project Presentation (Stormwater Solutions Initiative)</b>	Abigail Wilgreen & Mike Magnuson (City of Crystal Lake)
4:20 pm–4:30 pm (10 Minutes)	<b>Wrap-up &amp; Adjourn</b> <ul style="list-style-type: none"> <li>• February Committee meeting</li> <li>• Information requests</li> </ul>	Justin Strickland (ICF)

# McHenry County Emergency Management

Type of Meeting: HAZARD MITIGATION 2023

Date: 1/26/2023

(Please Print)

Name	Department	Email Address	Phone
Robert Lopez	EMA	1530-arc @ McHenryCountyIL.gov	815-334-8600
R. Ellsworth	"	redksad @ McHenryCountyIL.gov	"
Tom Smith	"	PEMATON @ FMAIL.COM	847-849-3200
Patrick Finbow	CAMP POLICE DEPT	FINBOW @ CAMPILNOIS.COM	847-494-8046
Jon Meszardine	Kane Co OEM	Meschling Jonathan @ CO.KANE.IL.US	224-833-9760
Vince Kilcullen	Village of Algonquin	V.Kilcullen @ algonquin.org	847-456-5307
Abby Wilgrain	Crystal Lake	awilgrain @ crystalake.org	815-356-3605
Derek Lee	Algonquin Township Road Dept	DLee @ gta.sp.com	847-343-3892
Carolya Campbell	McHenry County	cmc.campbell @ mchenrycountyil.gov	815-345-9429
Jessica Celata	McHenry Co P&D	jscelata @ mchenrycountyil.gov	815-334-4560
George Berrill	Barrett Law Surveying	barrettlawsurvey @ att.net	347-462-8464
Chalen Daigle	McHenry Co MCG	cd Daigle @ mchenrycountyil.gov	815-988-4390
Bridget Hoffmann	MOSH	bhoffmann @ mchenrycountyil.gov	815-334-4554
GAREN BUSH	McHenry Twp Fire	bushkaren @ fire.mtfpd.org	815-307-2421
Adam Wallen	P&D	apwallen @ mchenrycountyil.gov	815-334-4568
Samie Porcari	Waukegan	jporcari @ waukegan.org	708-263-1777
AUCIA SCHULLER	McHENRY COUNTY	aschuller @ mchenrycountyil.gov	(815) 334-0309





# McHenry County Natural Hazard Mitigation Plan Committee Kickoff

Date(s)/Time(s): Thursday, January 26 from 3:00-4:30PM CST

Attendees: Total of 50 participants (in-person and virtual)

## Action Items:

1. Fill out and submit your Letter of Intent to [EMA](#) if you have not done so
  - a. Note an editable copy of the letter is attached to the post-meeting communication sent by McHenry County EMA on Friday, January 27<sup>th</sup>.
2. Please record your attendance via [this survey](#).
3. Share any natural hazard-related:
  - a. Plans, reports or technical data (see Slide 18 in the attached PDF for our current inventory)
  - b. Mitigation projects (including a brief description, location and impact if known)
4. Begin to identify communications channels for sharing the upcoming, Public Survey (formal request to come next week)

## Decisions:

- February (2/23/23) and March (3/30/23) Committee Meetings will be \*in-person only\* at the Cary Village Hall (755 Georgetown Drive, Cary, IL, 60013)

## Key Takeaways:

### Hazard Mitigation Planning:

- Highlight shared natural hazard risks and joint mitigation solutions – between McHenry County jurisdictions and between McHenry County and neighboring counties in Illinois and Wisconsin – to better pool resources and increase eligibility for future hazard mitigation grant funding opportunities
- Ensure the planning process is closely aligned with FEMA’s Community Rating System (CRS) program criteria
- Confirm if Conditional/Letters of Map Revision should be reviewed as part of the Plan Review

### Crystal Lake Stormwater Solutions Initiative: Lessons Learned

- When working with homeowners, be accommodating to their schedules and transparent about the work to avoid setting unrealistic expectations.
  - Residents who had previously refused to participate in the buyout programs eventually came around after years of flooding
- Illinois’ Department of Natural Resources (IDNR) grant programs funded both Crystal Lake projects and the recent, Nippersink Creek Study
  - For more information, visit the [IDNR Grant Opportunities site](#)
- Other anecdotes shared by participants:

- Floodproofing of basements must be certified. For example: a resident who did not properly floodproof their basement suffered a failure when pumping water out
- Floodwater can destroy a home's foundation. For example, floodwaters destroyed the foundation of a St. Louis County resident's home resulting in a basement flood fissure large enough to fit a hand inside

Welcome!

If you are in-person, please make sure to Sign-In via the Sign-In Sheet

If you are virtual, please use the Chat to enter the following information:



1. Name
2. Jurisdiction/Affiliation (ex. Crystal Lake or Huntley)
3. Department (ex. Public Works or Policy)





# McHenry County Natural Hazards Mitigation Plan Update Mitigation Committee Kick-Off

Thursday, January 26<sup>th</sup>

This meeting is being recorded  and will be made available to the public, so please:

- ✓ Keep your microphones muted  when you are not speaking
- ✓ If you are in the room, please **limit side conversations**  that could be distracting for others
- ✓ If you would like **to speak**, please use the “**raise your hand**” feature in Teams. Also, feel free to **use the Chat!**



- ✓ If you are in the room, please **raise your hand** and Bob or Dave will acknowledge you. Note, there will be **dedicated time for Q&A after each topic**
- ✓ When speaking, please **speak clearly and loudly** 
- ✓ Avoid “**deeper dive**” discussions 

## → Housekeeping: Ground Rules

### Statement of Intent in Natural Hazard Mitigation Planning

#### Village / City / Township

As a potential participant in the Hazard Mitigation Assistance Program, the **Village / City / Township** Illinois hereby states their interest in participating in the multi-jurisdictional McHenry County Natural Hazard Mitigation Plan.

During the planning implementation update, the **Village / City / Township**, Illinois agrees to participate in the hazard mitigation planning process.

We understand that the process will include a variety of meetings and/or workgroups that will require a degree of participation from a designated representative(s) from the municipality.

As signed, we further understand that this is a voluntary program and participation may benefit our jurisdiction by identifying hazards and prioritizing potential projects to mitigate the effects of these natural hazards. This statement of intent is nonbinding and is subject to any applicable local legal requirements.

Signature of Authorized Representative \_\_\_\_\_ Date \_\_\_\_\_

Print Name \_\_\_\_\_ Title of Representative \_\_\_\_\_

## McHenry County Natural Hazard Mitigation Plan Update 2023

Thank you for supporting this important effort! Please take no have an accurate record of your support. We appreciate your!

\* Required

1. First Name \*

Enter your answer

2. Last Name \*

Enter your answer

3. Title/Role \*

Enter your answer

4. Jurisdiction/Affiliation \*

Enter your answer

5. Email \*

Enter your answer

6. Phone Number \*

Enter your answer

7. Date of work or meeting \*

Please input date (MM/YYYY)

8. Brief description of work or meeting conducted \*

Enter your answer

9. Time Worked \*

- 30 minutes  
 1 hour  
 1.5 hours  
 2 hours  
 3 hours  
 4 hours  
 5 hours  
 6 hours  
 7 hours

→ Housekeeping: Letter of Intent & Timekeeping

## Today's Meeting Purpose and Objectives

Purpose: enhance your awareness and understanding of Plan update effort, including why it's important, our overall process and timeline, and the role of the Committee

Objectives:

1. Introduce FEMA's hazard mitigation planning process and criteria, including how we intend to satisfy those requirements.
2. Present a local hazard mitigation project and start identifying other projects to capture within the updated Plan.
3. Review our timeline and next steps so that you have clear visibility around upcoming meetings and information requests.

## → Agenda

Time (CST)	Topic	Speaker
3:00 pm–3:20 pm (20 Minutes)	<b>Welcome &amp; Announcements</b> <ul style="list-style-type: none"> <li>• Introductions</li> <li>• Timekeeping requirements</li> </ul>	<b>Bob Ellsworth &amp; Dave Christensen</b> (McHenry County Emergency Management Agency) <b>Justin Strickland</b> (ICF)
3:20 pm–3:40 pm (20 Minutes)	<b>Hazard Mitigation Planning 101</b> <ul style="list-style-type: none"> <li>• FEMA criteria for 2023</li> </ul>	<b>Kelli Reddick</b> (ICF)
3:40 pm–4:00 pm (20 Minutes)	<b>Project Overview</b> <ul style="list-style-type: none"> <li>• Schedule</li> <li>• Committee expectations</li> <li>• Upcoming activities</li> </ul>	<b>Justin Strickland</b> (ICF)
4:00 pm–4:20 pm (20 Minutes)	<b>Crystal Lake Mitigation Project Presentation (Stormwater Solutions Initiative)</b>	<b>Abigail Wilgreen &amp; Mike Magnuson</b> (City of Crystal Lake)
4:20 pm–4:30 pm (10 Minutes)	<b>Wrap-up &amp; Adjourn</b> <ul style="list-style-type: none"> <li>• February Committee meeting</li> <li>• Information requests</li> </ul>	<b>Justin Strickland</b> (ICF)



# Hazard Mitigation Planning 101

**Purpose:** To develop a long-term strategy for reducing disaster damage, disruption, and repetitive loss impacts.

Having an updated plan....

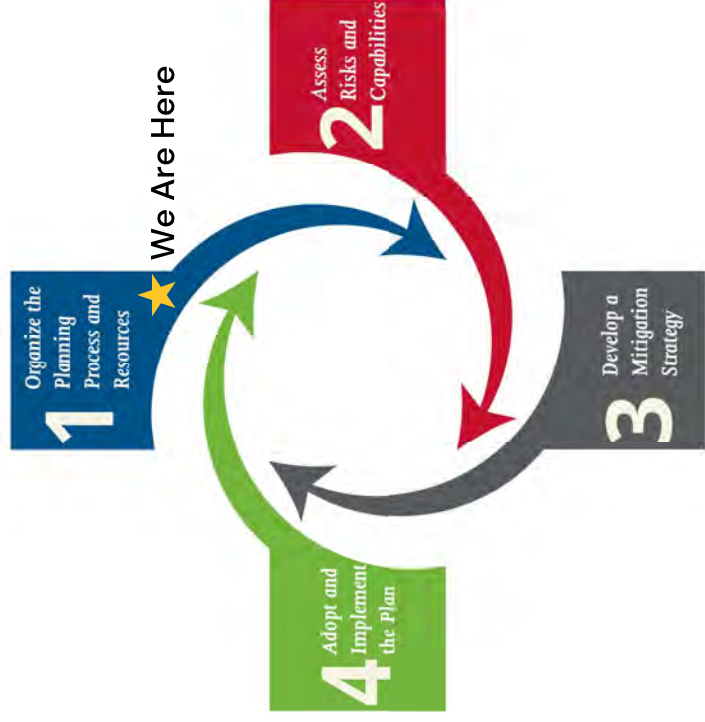
- ✓ Enables access to FEMA Hazard Mitigation Assistance Grants (e.g., HMGP, BRIC, etc.)
- ✓ Increases readiness for subapplication development when funding becomes available
- ✓ Promotes more disaster-resilient and sustainable communities
- ✓ Increases public awareness and understanding of risk
- ✓ Fosters relationships between all levels of government, non-governmental organizations and the private sector
- ✓ Reduces costs associated with disaster response and recovery by promoting mitigation

→ **Why Hazard Mitigation Planning?**





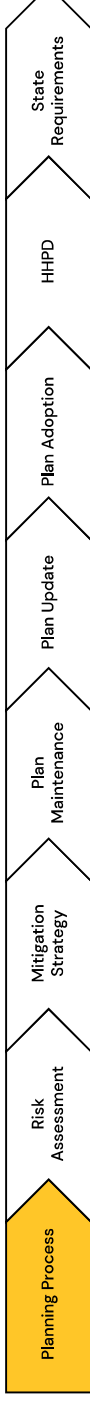
## FEMA Hazard Mitigation Planning Process



## FEMA Local Planning Sections

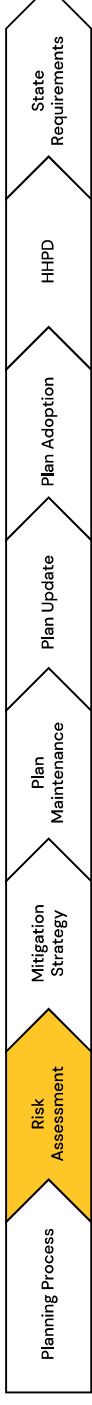
- A. Planning Process
- B. Risk Assessment
- C. Mitigation Strategy
- D. Plan Maintenance
- E. Plan Update
- F. Plan Adoption
- G. High Hazard Dams
- H. Additional State Requirements (Optional)

→ FEMA's HM Planning Process & Local Plan Requirements



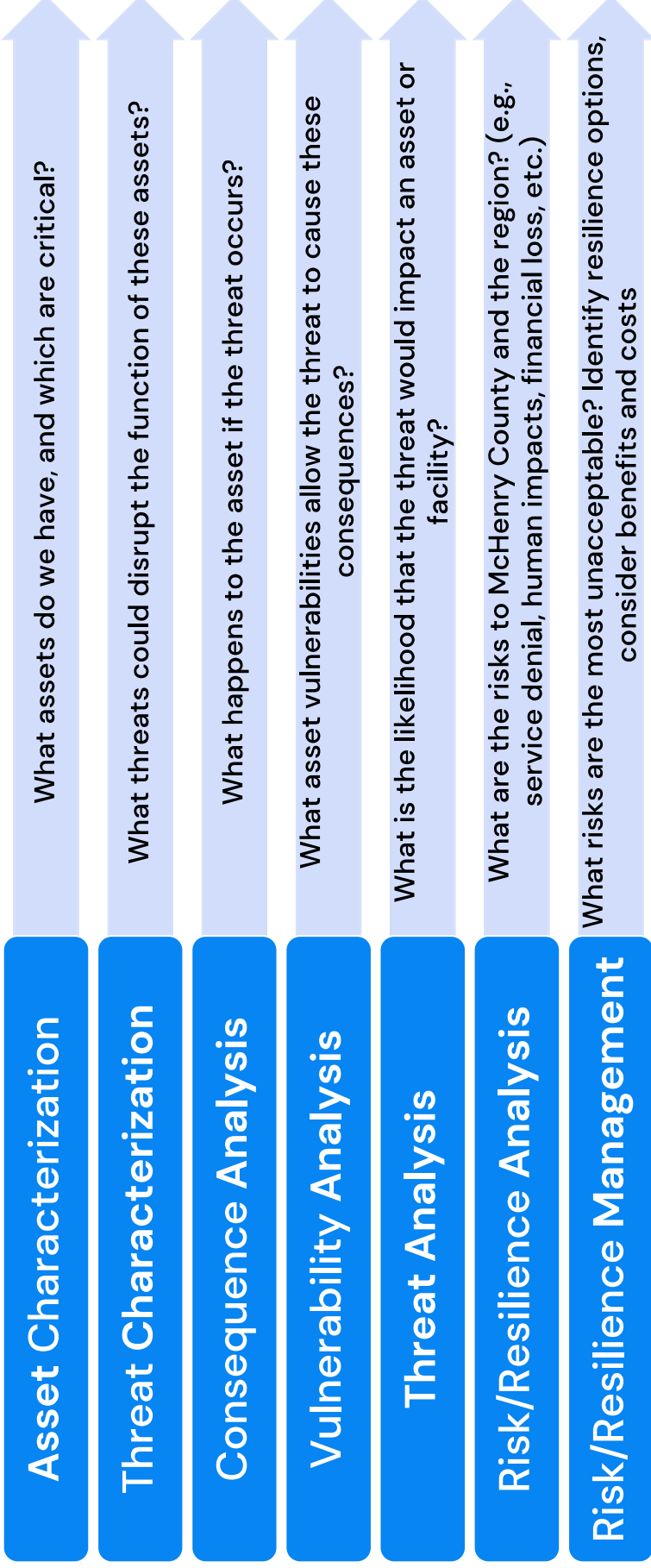
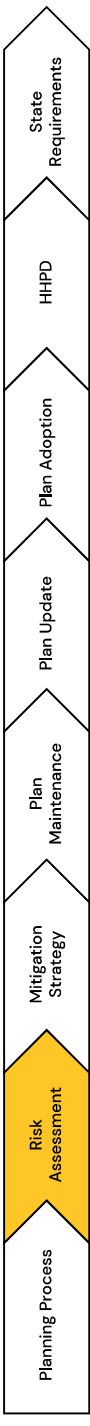
- Describe the **planning process** and provide supporting documentation (e.g., meeting minutes, sign-in sheets, etc).
- Identify the **planning team** and describe their participation
  - How did we engage representatives from non-profit/community organizations (e.g., housing, healthcare, social services) that support underserved communities and socially vulnerable populations?
- Document the opportunity for **public engagement and involvement** in the planning process
  - How were underserved communities and vulnerable populations within the planning area provided an opportunity to be involved?
- Describe review and integration of **other plans, studies, reports, etc.**

→ **Planning Process**

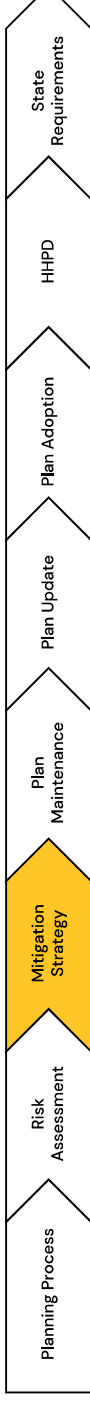


- Identify hazards, critical assets, and prior hazard events
- For each hazard, address the type, history, extent, impact, probability of future occurrences and vulnerability
  - Incorporate perceived impacts of future conditions (ex. population shifts, changes in land use/development, etc.)
  - Include repetitive loss (RL)/severe repetitive loss (SRL) structures
- Note: ICF will leverage the all-hazards, Risk Analysis and Management for Critical Asset Protection (RAMCAP) Standard

→ Risk Assessment



→ **RAMCAP 7-Step Risk Assessment Process**



- Describe how existing authorities, policies, programs, funding and resources of each participant are available to support the mitigation strategy
  - Highlight NFIP participation where applicable
- Provide goals to reduce the risk of the identified hazards (i.e., broad statements focused on reducing risks from each hazard)
- Identify the mitigation actions identified to achieve those goals
  - Describe methodology used to analyze potential mitigation actions
- Describe the mitigation action plan (i.e., implementation plan)
  - Include criteria used for prioritizing implementation, with emphasis on benefits (i.e., benefit-cost analysis)
  - For each action, address who is responsible, funding sources and timelines
  - Each plan participant must identify at least one (1) action to implement

→ Mitigation Strategy



- **Plan Maintenance**
  - Describe process for continuing public engagement with the plan
  - Include updating process and schedule
  - Describe process for integration into other plans
- **Plan Update**
  - Describe any changes to land use development
  - Changes to priorities and progress in local mitigation efforts
- **Plan Adoption**
  - Include adoption documentation for all jurisdictions
  - FEMA may issue an Approved Pending Adoption (APA) notice prior to formal adoption
  - FEMA approval issued upon receipt of adoption resolution
  - Each jurisdiction must adopt individually within 1 year of approval

→ **Plan Maintenance, Update and Adoption**

## Federal Emergency Management Agency

- Reviews and approves final plan

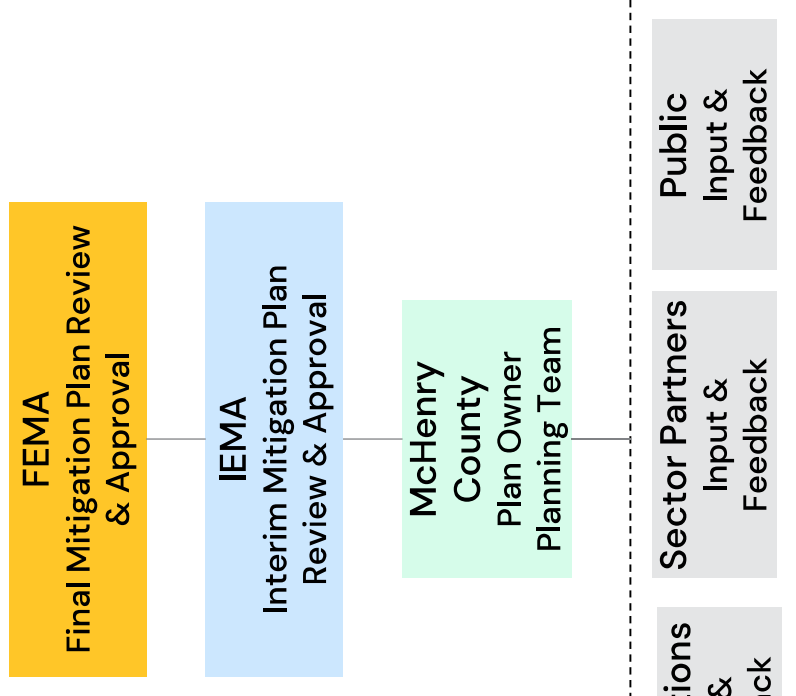
## Illinois Emergency Management Agency

- Reviews and approves final draft plan

## McHenry County

- Develops plan to meet FEMA criteria
- Coordinates submission and adoption with local jurisdictions
- Provides subject matter expertise
- Engages the public, local officials and sector partners for feedback

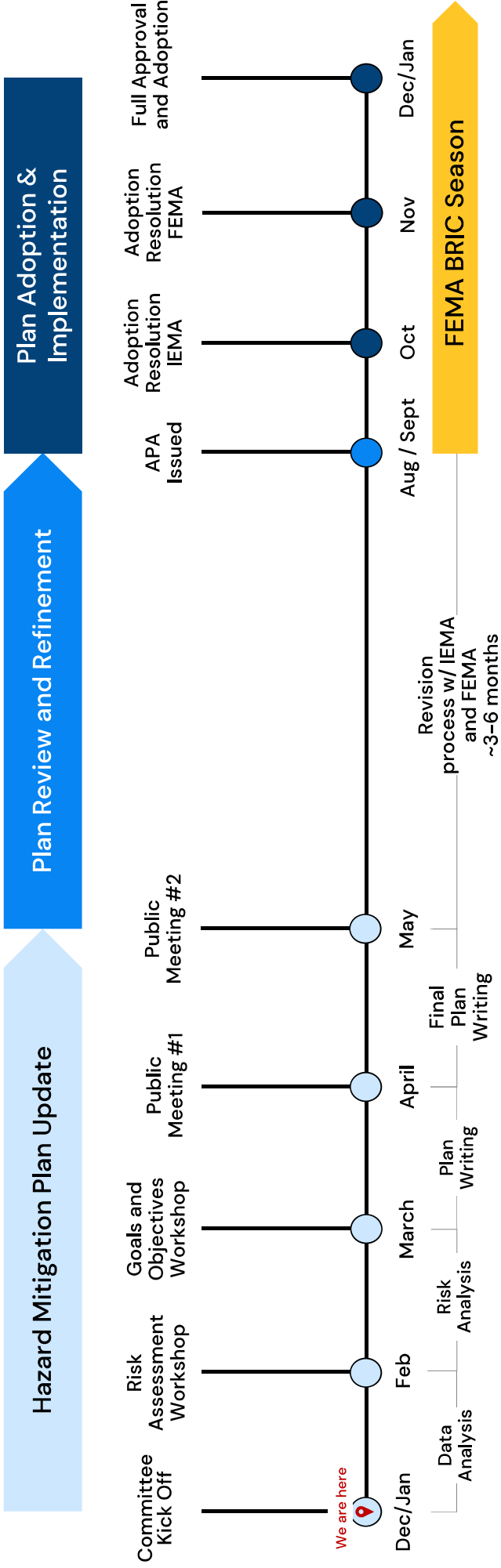
## → Organizational Roles and Responsibilities



# Project Overview







## ➔ Overall Project Timeline

1. Participate in Monthly Committee Meetings/Workshops (last Thursday of the month, 3:00–4:30pm CST)
  - Please note the Thursday, February 23<sup>rd</sup> and Thursday, March 30<sup>th</sup> Committee meetings will be 3–4 hours and in-person (location TBD) given the highly detailed and interactive nature of our agendas
2. Share any natural hazard-related [plans](#), [reports](#) and/or [technical data](#) for review and incorporation into the Plan (due next Friday, February 3<sup>rd</sup>)
3. Share information on any mitigation projects initiated since 2017, including [location](#), [description](#) and [impact](#) if known (due next Friday, February 3<sup>rd</sup>)
4. Share best available data for the Risk Assessment (upon request)
5. Help broadcast Public Survey communications in your jurisdiction (week of February 6<sup>th</sup>)
6. Complete the Community Capabilities Survey (late February/early March)
7. Support the development of the Mitigation Strategy, including proposing mitigation actions for your jurisdiction/department (Thursday, March 30<sup>th</sup>)
8. Review and provide timely comments on all study findings and draft plan deliverables (beginning in April)
9. Support adoption of the 2023 McHenry County Natural Hazards Mitigation Plan

## → NHMP Committee Role and Responsibilities

**Plans Identified (as of January 26, 2023)**

Plan Types	Plans Identified (as of January 26, 2023)	
<p>State and Local Hazard Mitigation Plans</p>	<p><b>Federal/State</b></p> <ul style="list-style-type: none"> <li>• Illinois Natural Hazard Mitigation Plan (2018)</li> <li>• State of Wisconsin Hazard Mitigation Plan (2017)</li> </ul> <p><b>County/Regional</b></p> <ul style="list-style-type: none"> <li>• McHenry Co. Natural Hazards Mitigation Plan (2017)</li> <li>• McHenry Co. Water Resources Action Plan (WRAP) Update (2020)</li> <li>• CMAP Transportation Resilience Assessment</li> <li>• CMAP Regional Flood Susceptibility Index</li> </ul>	<p><b>County/Regional (neighbors)</b></p> <ul style="list-style-type: none"> <li>• Lake County All Natural Hazards Mitigation Plan (2017)</li> <li>• Cook County Multi-Jurisdictional Hazard Mitigation Plan (2019)</li> <li>• Natural Hazards Mitigation Plan County of Kane (2015)</li> <li>• DeKalb County All Hazards Mitigation Plan (2019)</li> <li>• Boone County, Illinois Multi-Hazard Mitigation Plan (2020)</li> <li>• Kenosha County Hazard Mitigation Plan (2011-2015)</li> <li>• Walworth County Hazard Mitigation Plan</li> </ul> <p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• City of Crystal Lake Comprehensive Plan (2012)</li> <li>• City of McHenry Comprehensive Plan (2013)</li> </ul>
<p>Other Relevant Plans</p>	<p><b>Federal/State: to be determined</b></p> <p><b>County/Regional:</b></p> <ul style="list-style-type: none"> <li>• McHenry Co. Strategic Plan (2023)</li> <li>• McHenry Co. Comprehensive Plan (2010)</li> </ul>	<p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• Village of Barrington Comprehensive Plan (2021)</li> <li>• Village of Cary Capital Improvement Plan (2021-2025)</li> <li>• Fox River Corridor Plan (2022)</li> <li>• City of Harvard Comprehensive Plan (2016)</li> </ul>
<p>Studies and Reports</p>	<p><b>Federal/State:</b></p> <ul style="list-style-type: none"> <li>• Wisconsin Upper Fox Flood Risk Review Study (2016)</li> <li>• Illinois State Water Survey (ISWS) Nippersink Creek Study</li> <li>• USGS 10-year McHenry County Water Quality Report (2020)</li> </ul> <p><b>County/Regional: to be determined</b></p>	<p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• Village of Lakewood Stormwater Strategic Implementation Report (2019)</li> </ul>
<p>Technical Information</p>	<p><b>Federal/State:</b></p> <ul style="list-style-type: none"> <li>• NOAA Storm Events Database</li> <li>• National Weather Service Preliminary US Flood Fatality Statistics</li> </ul> <p><b>County/Regional:</b></p> <ul style="list-style-type: none"> <li>• McHenry Co. THIRA</li> <li>• McHenry Co. Building Codes</li> <li>• McHenry Co. Unified Development Ordinance</li> <li>• McHenry Co. Stormwater Management Ordinance</li> </ul>	<p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• CRS Program Documentation</li> </ul>

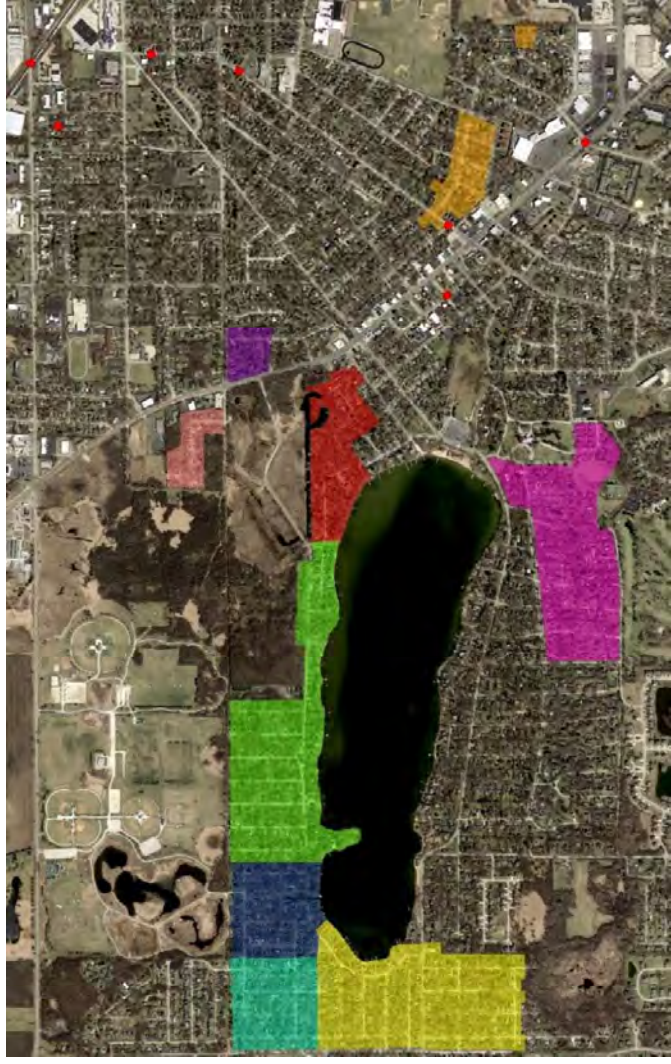
# Crystal Lake Stormwater Solutions Initiative

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City of Crystal Lake  
Public Works and Engineering

- 9 Study Areas with a large variety of impacts
- Identified Near, Mid and Long-Term projects
- 20+ Public Meetings/Workshops



→ What is the Stormwater Solutions Initiative

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## Alleviate Flooding That Impacts:

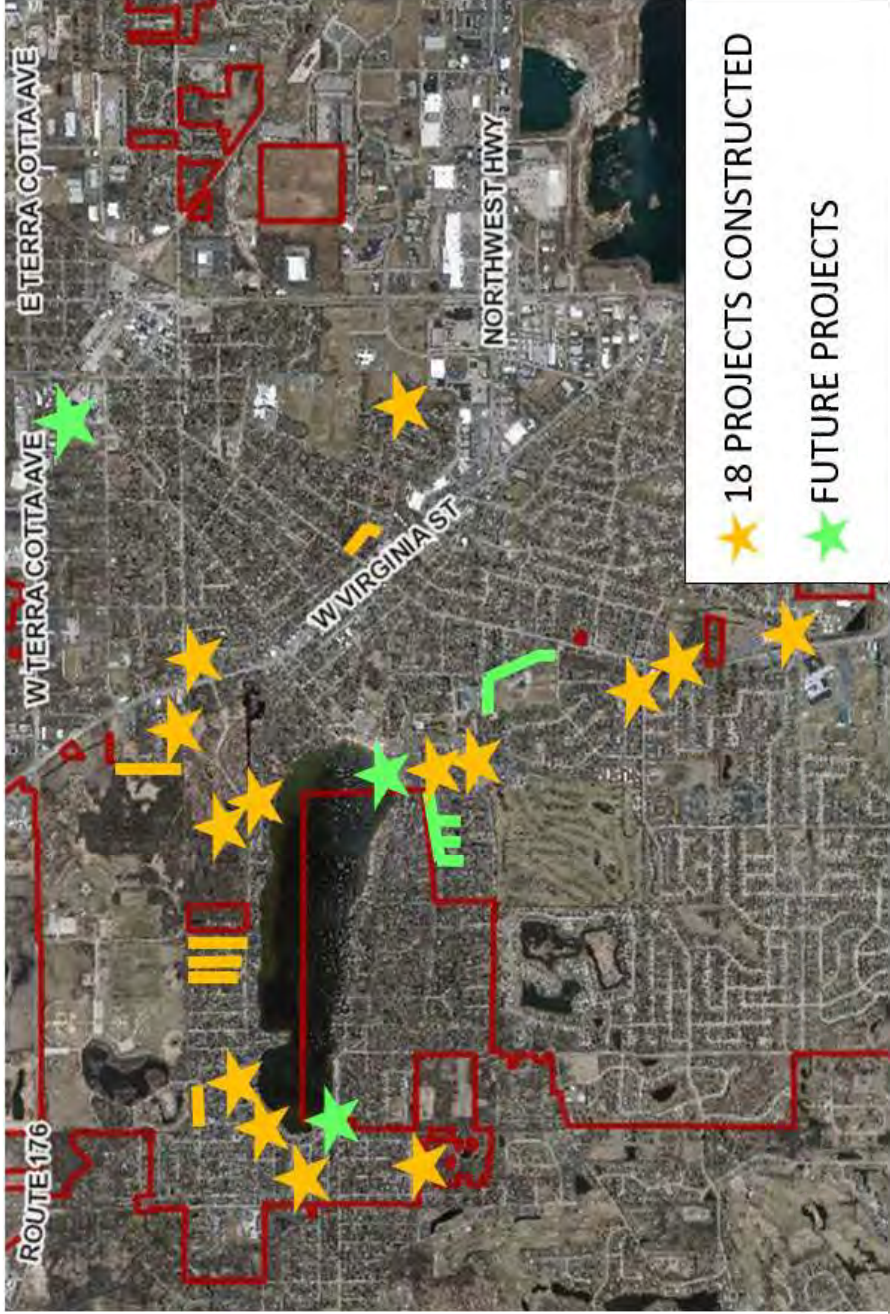
1. Structures/Homes
2. Roadway Flooding that also impacts structures and properties



Ability to provide public conveyance mechanism  
(sewer or ditches)

Program was not to assist with groundwater  
infiltration into cracks in foundation or for periodic  
yard flooding.  
→ **How Were Projects Prioritized?**

# → Proje



## Pine Street/Oriole Trail Study Area

- *Problem:* Repetitive garage, basement and significant rear yard flooding (several feet)



- Repetitive flooding of multiple homes
- Low point 1 foot above normal Lake level
- City storm sewer surcharges into low spot
- Water remained in low spot unless pumped



# Pre-Existing Conditions 2019



Time Lapse/Original Trail Photos

## Pine Street/Oriole Trail Study Area

- *Solution:* Most cost-effective solution acquire 5 of the
- ~~Reduced~~ impervious and increased storage
- *Funding:* City applied to IEMA and FEMA for grant funding in 2018, 2019 to acquire flood-impacted properties and was not successful.
- Awarded an IDNR state reimbursement grant which covered 100% of the cost



## Pine Street/Oriole Trail Study Area

- Grant covered appraisals, acquisition, demolition and restoration.
- Mandated that Voluntary acquisition (no condemnation)
- Grant mandated the City worked cooperatively with property owners to meeting their needs for closing dates.







December 21, 2021

→ Pine Street/Oriole Trail Photos

December 29, 2021





January 13, 2022

→ [Pine Street/Oriole Trail Photos](#)

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September 14, 2022



- **Area will flood during large storm events**
- **Native plantings will be managed by ecological contractor for 3-5 years**



November 14, 2022

→ **Pine Street/Oriole Trail Items to Note**

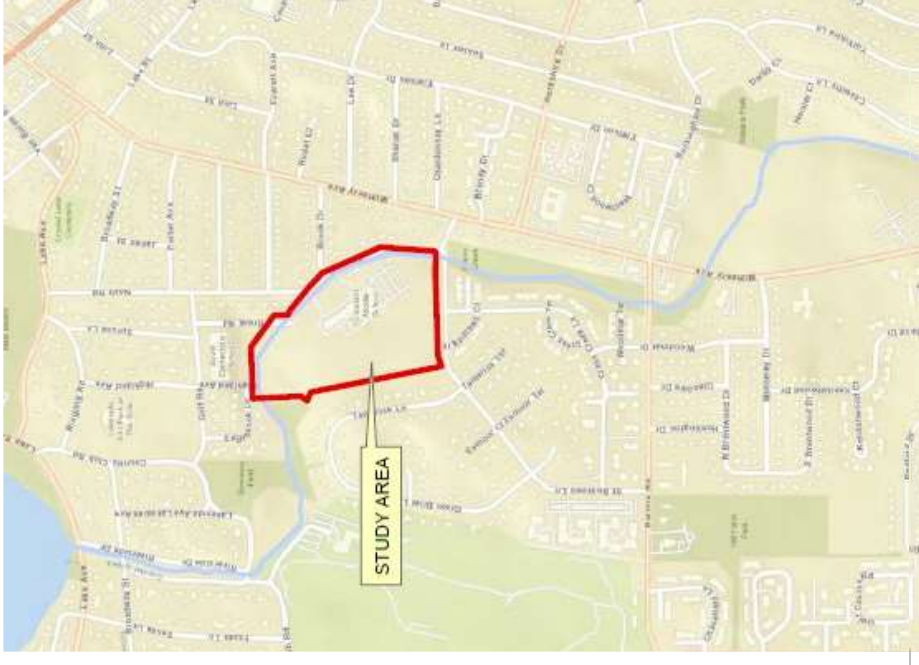
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- Portion of Crystal Creek was buried into storm sewer (1950's?)
- Causes a pinch point and flooding upstream
- Re-establish where the old creek was to match upstream and downstream



→ Future

al Creek



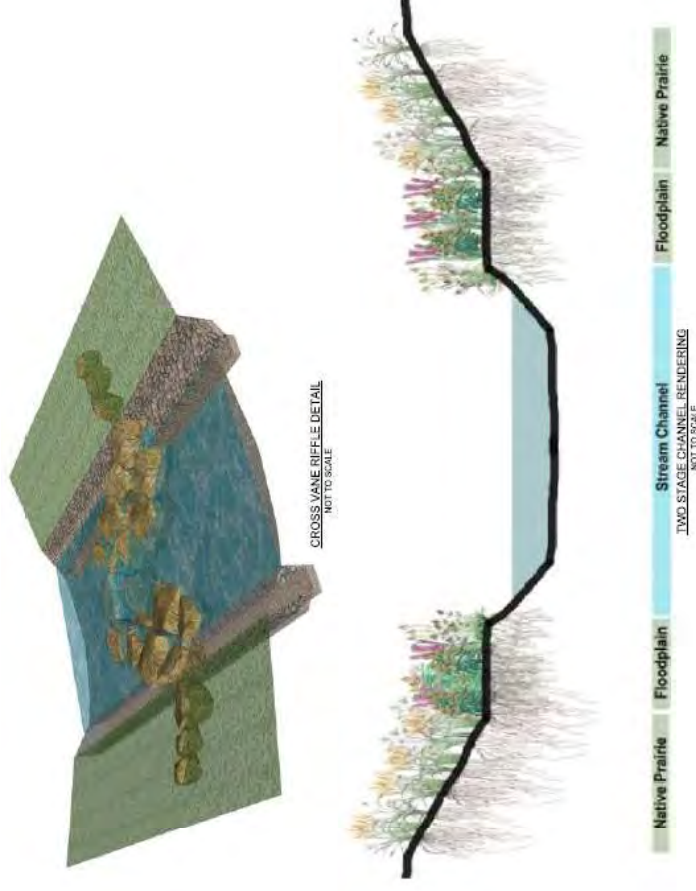


- Detailed Coordination with the school district

- Applying for grant funding through IEPA 319 funding and FEMA BRIC (Building Resilient Infrastructure and Communities)


- Construction anticipated for 2024/2025

→ Re-Establish Crystal Creek





Wrap-up and Next Steps

1. Fill out and submit your Letter of Intent to EMA (if you haven't done so)
  - (Soft copy) [ema@mchenrycountyil.gov](mailto:ema@mchenrycountyil.gov)
  - (Physical copy) McHenry County EMA, 2200 N Seminary Ave, Woodstock, IL 60098
2. Confirm your attendance via sign-in sheet (in-person) or timekeeping survey 
  - Link to survey: <https://forms.office.com/r/nrqgEDUMEX>
3. Share any natural hazard-related: 1) plans, reports and/or data (not on slide 17); and 2) mitigation project information, including location, description and impact if known
  - Send information to this email: [ema@mchenrycountyil.gov](mailto:ema@mchenrycountyil.gov)
4. Start identifying ways you can help broadcast the Public Survey announcement and link
  - Please note a formal request will be sent in the coming weeks

## Next Steps

# McHenry County Natural Hazard Mitigation Plan Update 2023 - Timekeeping Survey



Thank you!

McHenry County Natural Hazard  
Mitigation Plan Update 2023 -  
Timekeeping Survey



# → McHenry County Mitigation Committee Monthly Meeting

## 2023 Natural Hazards Mitigation Plan Update: Risk Assessment Workshop

Date/Time: Thursday, February 23, 2023, 1:00 pm – 5:00 pm CST

Location: In-Person @ Cary Village Hall (755 Georgetown Dr., Cary, IL 60013)

**\*No virtual participation option is available for this highly interactive meeting\***

### Meeting Purpose and Objectives:

The purpose of this meeting is to gather your input and feedback to ensure a comprehensive understanding of the County's natural hazards risks, such as vulnerabilities and impacts to critical infrastructure from tornados, winter storms and flooding. As a result, the County will be better equipped to prescribe mitigation actions that can meaningfully reduce the impacts of those risks throughout our communities. To that end, we will use this time to:

1. Validate our refreshed understanding of the County's natural hazards risks since 2017;
2. Define where there are shared risks between County jurisdictions and neighboring communities; and
3. Start identifying potential mitigation actions to reduce those risks.

Please note this meeting will be **in-person only** given the highly interactive nature of our agenda. We hope many of you can join us in Cary for a great afternoon of learning and collaboration!

### Agenda:

Time (CST)	Topic	Presenter(s)
1:00pm-1:40pm CT (40 mins)	<b>Welcome &amp; Introductions</b> <ul style="list-style-type: none"> <li>• Housekeeping</li> <li>• Agenda Review</li> <li>• Icebreaker Activity</li> </ul>	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)
1:40pm-2:00pm CT (20 mins)	<b>Context Setting</b> <b>Desired Outcome(s):</b> Increased awareness of how today's outputs will advance the broader hazard mitigation planning process	Kelli Reddick (ICF)
2:00pm-3:00pm CT (60 mins)	<b>Small Group Exercise 1: Validating Hazard Profiles</b> <b>Desired Outcome(s):</b> Enhanced understanding of the vulnerabilities and consequences of priority natural hazards to ensure a comprehensive view of County-wide risk	EMA & ICF Facilitators
3:00pm-3:15pm CT (15 mins)	<b>BREAK</b>	
3:15pm-4:15pm CT (60 mins)	<b>Small Group Exercise 2: Identifying Shared Infrastructure and Cascading Impacts</b> <b>Desired Outcome(s):</b> Enhanced understanding of shared, critical facilities between County jurisdictions and with neighboring	EMA & ICF Facilitators

Time (CST)	Topic	Presenter(s)
	communities/Counties, to better define where collective action is needed.	
4:15pm-4:55pm CT (40 mins)	<b>Small Group Exercise 3: Brainstorming Mitigation Actions</b> <b>Desired Outcome(s):</b> Increased awareness of local mitigation strategies to reduce risk to natural hazards	EMA & ICF Facilitators
4:55pm-5:00pm CT (5 mins)	<b>Recap &amp; Adjourn</b> <b>Desired Outcome(s):</b> Equipped participants to share today's results with their managers and colleagues	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)

# McHenry County Emergency Management

Date: February 23, 2023

Type of Meeting: Natural Hazard Mitigation Committee Meeting

(PLEASE PRINT)

Name	Address	Organization	Position	Email	Continuing Education (CEM / AEM) Y / N
Bob Allison	2200 N Seminary Ave Woodstock	EMA		reel@nd@mchenrycountyil.gov	
ROBIN GIBBS	2200 N SEMINARY AVE WD	EMA		rnjibbs@mchenrycountyil.gov	
KAREN BUSH	300 W. ELW McHENRY	WTFPD	Deputy Ch	bushkaren@fire.mt.fpd.org	
OLGA BREDEN		UNIVERSITY OF PTH CO	Student volunteer	BREEDEN@UNIVERSITY.EDU	
Vince Kulcien	110 Meyer Dr Alsonguin	Village of Alsonguin	Superintendent	vkulcien@alsonguin.org	
Jean Schmitt	5600 Huntig Dr	Village of Richmond	Director of Public Work	PublicWorks@Richmond-il.com	
Pat Boulton	1115 Crystal Lake Rd.	LITH PD	Deputy Chief	pboulton@lith.org	
Carolyn Campbell	978 Saddle Creek Lane C.L.	McHenry Co	Board Member	ccampbell@mchenrycountyil.gov	
Bridget Hoffmann	2200 N Seminary Ave Woodstock	MCST	ERC	bhoffmann@mchenrycountyil.gov	
Brent Raymond	326 Washington St. Woodstock	Woodstock	PWD	baymond@woodstockil.gov	
PATRICK FINLON	755 Georgetown Drive, Cary R	Cary P.O	Chief of Police	Finlon@comcast.net	
Abby Wilgreen	100 W. Woodstock Crystal Lake	Crystal Lake	City Engineer	awilgreen@crystalake.org	
Cindy Skrutnick	2200 W. Solon Rd. Elgin Mills	Elgin	City Engineer	cskrutnick@elgin.il.gov	
Jeanne Colletti	McHenry Co PFD		Winter Business Mgr	jcolletti@mchenrycountyil.gov	
KYLE MARSDEN	4444 THOMPSON RD WONDER LAKE IL 60097	VILLAGE OF WONDER LAKE	EMA COORDINATOR	KMARSDEN@VILLAGE.WL.IL.GOV	
ADAM WALKER	1001 WACE RD WASSERKOP IL	McHenry Co	P&D	apwalker@mchenrycountyil.gov	
Mary V Ireland	18110 Kishwaukee Hwy Rd	Ubbek	Estimator 2023	dmccorm@gmail.com	

# McHenry County Emergency Management

Date: February 23, 2023

Type of Meeting: Natural Hazard Mitigation Committee Meeting

(PLEASE PRINT)

Name	Address	Organization	Position	Email	Continuing Education (CEM / AEM) Y / N
AL ANTONI	1904 Cherry Valley	BULL VALLEY	Sofa Police	alanton@bullvalley.org	
FRANCE VANMUT	10911 MAIN ST HUNTERY	HUNTERY PD	SP3PM	france@huntery.il.us	Y
JEAN HECKMAN	1515 CHAMPLA BEACH AVE, JOHNSBURG, ILL 60151	VILLAGE OF JOHNSBURG	ASSIST. ADMINISTRATOR	JEANHECKMAN@JOHNSBURG.ILL.US	
MIKE ROTH	2500 LAKE AVE	LAKELAND	VLG MGR.	JEANHECKMAN@VILLAGE.LAKELAND.ILL.US	
TOM SMITH	2200 MCGC	"	POLICE CHIEF	tomsmith@mcg.com	Y
Peter DiAgostino	11000 Birkley Street	McHenry Co EMA	EMA	pdagostino@mcHenryCountyIL.gov	
Patrick Noonan	150 E Margaret Ter Cary	Village of Huntery	ADMIN. SERVICES MANAGER	patricknoonan@mcHenryCountyIL.gov	
Peter Anst	2000 N. Seminary, Woodstock	Cary Park District	City of Huntery Police Mgr.	panst@mcHenryCountyIL.gov	
Tom Mensching	719 Barbara Ave #26 Geneva	McHenry County	Co. Manager	tom.mensching@mcHenryCountyIL.gov	
Jodi McCarthy	Nonhord - representing Lakemoor Port Barrington	Kane Co OEM	Act. Director	mcCarthy@nonhord.com	Y
Lou Leone	201 W. Diggins, Harvard, IL	Lakemoor Port Barrington	Village Engineer	leone@cityofharvard.org	
Ben O'Dog	18410 U.S. Hwy 14 Woodstock	City of Harvard	City Admin.	benodog@mcHenryCountyIL.gov	
Robert Williams	10400 Haligus. Rd. Huntley IL 60142	MCCO	Police & Foot Supervisor	robertwilliams@mcc.org	
Paul Salbeck	100 W. Waukegan St. Ft. Carroll	Northwestern Medicine	Emergency Manager	psalbeck@northwestern.edu	
David Christensen	2200 N. Seminary Ave. Woodstock, IL 60091	City of CC	Fire Chief	dchristensen@northwestern.edu	Y
Alicia Shuster	2200 N. Seminary Ave Woodstock 16.60078	MEEMA Administration	Director	Ashuster@mcHenryCountyIL.gov	





McHenry County 2023 Natural Hazards Mitigation Plan Update: Risk Assessment Workshop Outcomes

Exercise 1: Validating Hazard Profiles

Hazard	Confirmed Scores			Key Insights (summarized from sticky notes)
	Vulnerability	Consequences – Public Health	Consequences – Property Damage	
Flooding	3	2	5	<ul style="list-style-type: none"> <li>Major McHenry Township flood in 2017 damaged waste water treatment lift stations</li> <li>SE of the County most impacted by flooding due to high population and river proximity</li> <li>Historically, groundwater flooding is the most prevalent type of flooding and often backs up County sewers</li> <li>Most of the County is reliant on ground water / well water, not city (Chicago) water</li> </ul>
Severe Summer Storms	3	3	3	<ul style="list-style-type: none"> <li>Blackouts experienced</li> <li>Data is needed to validate impact</li> <li>Newer communities are less affected</li> <li>Building codes – trees</li> <li>Prevalent in the news</li> <li>Increased outdoor events w/ no plan</li> <li>Lakewood experienced extreme flooding at Hall Dam</li> <li>Microburst examples = injuries</li> <li>Roofs need replacement</li> <li>Limited hail/light protection options</li> <li>Flash spring floods</li> <li>Limited hospital intake</li> </ul>
Tornado	4	3	3	<ul style="list-style-type: none"> <li>Low-impact improvement in warnings</li> </ul>
Severe Winter Storms	2	2	2	<ul style="list-style-type: none"> <li>COMED response to 2/23/23 storm was insufficient</li> <li>2/23/23 storm damaged several Algonquin critical facilities</li> <li>Not enough public works staff to perform preventative tree trimming around transmission lines</li> <li>Localized PD may be higher</li> <li>PD – concern about aging infrastructure</li> <li>Consequence of cascading events – refrigerated foods</li> <li>Building codes as in – great</li> </ul>
Extreme Heat	3	3	2	<ul style="list-style-type: none"> <li>Power grid is vulnerable – will worsen as time goes on</li> <li>LMI pop may be more vulnerable</li> <li>Public infrastructure can be damaged</li> <li>Life cycle asset impacts</li> <li>Cooling centers for homeless pop – none designated</li> <li>Home health is in need</li> <li>Illness, not fatality</li> </ul>

McHenry County 2023 Natural Hazards Mitigation Plan Update: Risk Assessment Workshop Outcomes

Hazard	Confirmed Scores			Key Insights (summarized from sticky notes)
	Vulnerability	Consequences – Public Health	Consequences – Property Damage	
Drought	4	3	2	<ul style="list-style-type: none"> <li>• Wells are not deep enough in some areas</li> <li>• Potential for water wars</li> <li>• Financial impacts to businesses/jobs</li> <li>• Impacts are mostly illness-related</li> <li>• Agriculture loss</li> </ul>
Dam Failure	2	3	3	<ul style="list-style-type: none"> <li>• Recent dam improvements</li> <li>• Fault line in Illinois</li> <li>• Lake in the Hills closed in 90s; Evacuated over 100 residents</li> <li>• Crystal Creek – lot of properties to the South</li> <li>• Density around dams – increased vulnerability</li> <li>• Check w/ Elgin at King CO</li> <li>• Evacuation plans in place</li> <li>• Algonquin Dam/Earth Dam- just restored the creek</li> <li>• Dam south of Mch Township</li> </ul>

Exercise 2: Identifying Shared Infrastructure – [see Excel doc](#)

Exercise 3: Brainstorming Mitigation Actions

Hazard	Prior / Existing Projects (Location, POC)	New Ideas (POC)
Flooding	<ul style="list-style-type: none"> <li>• Randall Rd. Wetland Rehab (Algonquin)</li> <li>• IEMA-funded Flood-Prone Property Acquisition (Cary, E. Morimoto)</li> <li>• Crystal Lake Stormwater Solutions Initiative (Crystal Lake, Abigail Witgreen)</li> <li>• Lake-In-The-Hills Stream Restoration Project (LITH, Darren Olson)</li> <li>• Huntley Tree City USA Growth Awards (Huntley)</li> <li>• Dixi Creek Rehab (Algonquin)</li> <li>• Woodscreek Watershed Plan (LITH)</li> <li>• Nippersink Creek (McHenry Co. Conservation District, John Peters, 815-482-5171)</li> <li>• North Glacial Park (McHenry Co. Conservation District, John Peters, 815-482-5171)</li> <li>• Fox River Erosion at Lyons Prairie Marsh (McHenry Co. Conservation District, Gabe Powers, 815-482-0631)</li> <li>• Coon Creek Restoration ((McHenry Co. Conservation District, Gabe Powers, 815-482-0631)</li> </ul>	<ul style="list-style-type: none"> <li>• Manage open space/wetlands</li> <li>• Continue LITH Stream Maintenance/Restoration project</li> <li>• Enforce codes for building in flood prone areas</li> <li>• Utilize mine pits for water collection</li> <li>• Utilize county-wide green infrastructure for new development and retrofitting (Dennis Dreher, Geosyntex)</li> <li>• County-wide floodplain buyout project</li> <li>• Kishwaukee flood study update with Illinois State Water Survey</li> </ul>

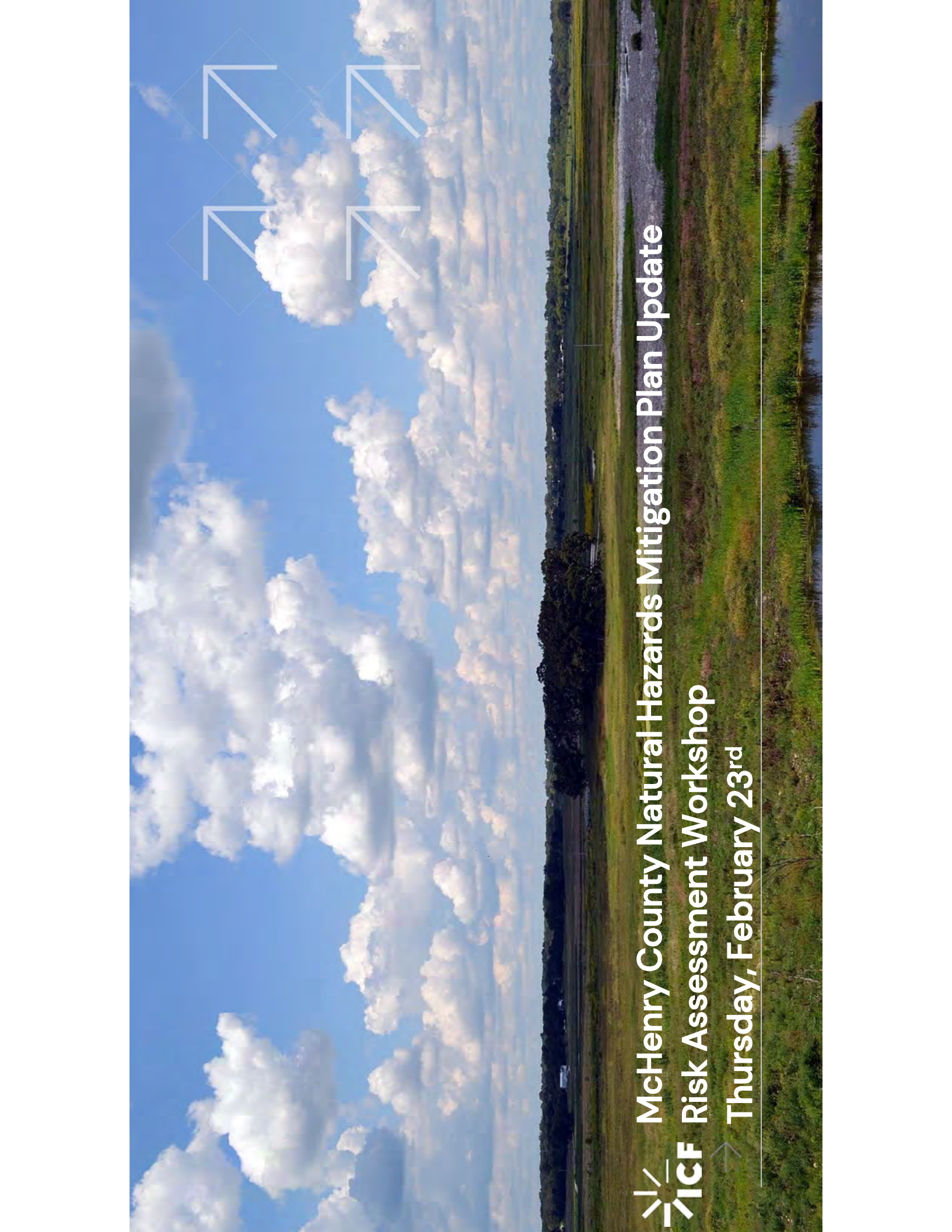
McHenry County 2023 Natural Hazards Mitigation Plan Update: Risk Assessment Workshop Outcomes

Hazard	Prior / Existing Projects (Location, POC)	New Ideas (POC)
	<ul style="list-style-type: none"> <li>Lake-In-The-Hills CRS Program (LITH)</li> <li><a href="#">Turnberry Trunk Project</a> to increase pipe capacity – engineered but needs funding (Lakewood)</li> </ul>	
Severe Summer Storms	<ul style="list-style-type: none"> <li>Family preparedness guide (Huntley)</li> <li>Education for storm-ready com. (Huntley)</li> <li>Algonquin active tree trimming</li> </ul>	<ul style="list-style-type: none"> <li>Utility Grid Modernization (GRANDS)</li> <li>Road tunnels/raising in flood areas</li> <li>Emergency alert assessment and upgrade</li> <li>Community education for different types of warning</li> <li>Countywide native tree (storm resistant) planting guide</li> <li>Increased burying utilities in new development and retrofit in most vulnerable areas</li> </ul>
Tornado	<ul style="list-style-type: none"> <li>Changed the UDO to mandate EMA sign-off on events with over 1,000 people. IAP required</li> <li>FEMA tornado VTX 4/23 Huntley</li> </ul>	<ul style="list-style-type: none"> <li>Building codes – tornado resistant homes</li> <li>Encourage a community-wide emergency alert program/system</li> </ul>
Severe Winter Storms	<ul style="list-style-type: none"> <li>Sensible salting – Mchenry County Dept of Transportation</li> <li>NOAA Weather Radio</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation awareness campaign ex: power lines</li> <li>Designate day and night warming centers across the county</li> <li>Comprehensive tree trimming around transmission lines</li> <li>McH MCDH TTX (Foodbourne outbreak in March 2023)</li> <li>Encourage community members to sign up for emergency alerts</li> </ul>
Extreme Heat	<ul style="list-style-type: none"> <li>Village Hall Expansion – Full HVAC standby generator; cooling center + food distribution</li> </ul>	<ul style="list-style-type: none"> <li>Mobile cooling vehicles(large capacity)</li> <li>Designate day and night cooling centers across the county</li> <li>Increase home grown(sp?) energy in the county – solar farms; greater power resilience</li> </ul>
Drought	<ul style="list-style-type: none"> <li>Water conservation regulations @ Cary and E. Morimoto</li> <li>Water conservation efforts @ Woodstock</li> <li>Village Water use restrictions for lawn watering</li> <li>County-wide ground water monitoring network</li> </ul>	<ul style="list-style-type: none"> <li>Explore Lake Michigan water allocation</li> <li>New water reservoir in old mining pits?</li> <li>County-wide restrictions for lawn watering</li> <li>County-wide initiative for natural landscaping (native plants do not need to be watered when established)</li> </ul>
Dam Failure	<ul style="list-style-type: none"> <li>Dam maintenance (LITH)</li> <li>Buyout programs</li> <li>LITH dam plan TTX Dec. 2022</li> <li>Alg. Dam break TTX MCDH</li> </ul>	<ul style="list-style-type: none"> <li>Update dam failure plans</li> <li>Dam removal investigation</li> <li>All dams with response plans</li> <li>CERT – community emergency response teams</li> <li>Buyouts behind dams</li> </ul>



Critical Asset Dependency Exercise

Facility Type	Facility Name	Location (jurisdiction)	Dependency 1	Dependency 2	Dependency 3	Dependency 4	Dependency 5	Dependency 6	Dependency 7	Comments
Infrastructure-Transportation	Bridge US Route 14	Cary, Village of	Fox Lake, Village of							
Infrastructure-Transportation	LTH Dam Failure	Algonquin, Village of								
Infrastructure-Transportation	Route 62 bridge	Lake-In-The-Hills, Village of								
Infrastructure-Transportation	Public Works building	Barrington Hills, Village of	McHenry, City of							
Infrastructure-Transportation	FRG Public Works	Fox River Grove, Village of								
Infrastructure-Utility	PPWC	Johnsburg, Village of	McHenry, City of							
Infrastructure-Utility	Privately owned water systems	Wonder Lake, Village of	Lakewood, Village of							
Infrastructure-Utility	Johnsburg public works (waste water treatment facility)	Johnsburg, Village of								
Infrastructure-Utility	Johnsburg 1, well Shiloh	Johnsburg, Village of								
Infrastructure-Utility	Johnsburg 2, well and water tower	Johnsburg, Village of								
Infrastructure-Utility	(maintenance)	All								
Infrastructure-Utility	Memory Trail Water Plant water/sewer									
Infrastructure-Utility	Water Production Facilities (wells #2 and #3)									
Infrastructure-Utility	Lift Station									
Infrastructure-Utility	Cell Tower (east/west)									
Infrastructure-Utility	Water Distribution Center									
Infrastructure-Utility	Sanitary Sewer Lift Stations									
Infrastructure-Utility	Sanitary Sewer Collection System									
Infrastructure-Utility	WWTD (including septic receiving station)									
Infrastructure-Utility	Wonder Lake Conservation Dam	Wonder Lake, Village of								
Infrastructure-Utility	NICOR Sub 120??									
Infrastructure-Utility	Huntley Wastewater Treatment Plants									
Infrastructure-Utility	ComEd Substation x2									
Infrastructure-Utility	Communications Starcom									
Infrastructure-Utility	MCSO Sheriff Towers									
Medical	McHenry Dialysis Center	Wonder Lake, Village of	Richmond, Village of	Spring Grove, Village of						Dependent on CO for redundant power
Medical	Northwestern McHenry Hospital	Wonder Lake, Village of	All							
Medical	McHenry County Department of Health	Wonder Lake, Village of								
Medical	Northwestern Immediate Care	Wonder Lake, Village of								
Medical	Huntley Hospital	Lakewood, Village of								
Medical	New Mercy Hospital	Crystal Lake, City of	Crystal Lake, City of	Algonquin, Village of						
Medical	CL Davita Dialysis	Crystal Lake, City of	Cary, Village of							
Medical	CL Urgent Care sites	Crystal Lake, City of								
Medical	McHenry MCH Hospital	All								
Medical	Good Shepherd	Barrington Hills, Village of								
Medical	Woodstock Hospital	Lakewood, Village of								
Medical	McHenry County Department of Health	All								
Other	Dam 1 and Dam 2	Algonquin, Village of								
Other	Whitey's Towing	Lakewood, Village of								
Other	Ormsby's Towing	Lakewood, Village of								
Other	Alden-Hebron (gathering)									
Other	Scrap yard 1 and 2									
Other	Transfer Station	Holiday Hills, Village of	Crystal Lake, City of	Cary, Village of						
Other	Lowes									
Other	Home Depot									
Other	Home Depot									
Residential / Gathering Place	St. John's Catholic Church	Algonquin, Village of	Lake-In-The-Hills, Village of							
Residential / Gathering Place	Meadowland Barn Church	Crystal Lake, City of								
Residential / Gathering Place	Lutheran Church	McHenry, City of								
Residential / Gathering Place	Willow Creek PADS Center Homeless Shelter	McHenry, City of	Johnsburg, Village of	Spring Grove, Village of	Ringwood, Village of	Richmond, Village of				
Residential / Gathering Place	Cedarhurst Assisted Living McHenry	All	Wonder Lake, Village of	Johnsburg, Village of						
Residential / Gathering Place	Riverside Residence	Fox Lake, Village of								
Residential / Gathering Place	Lost Valley Visitor Center	All	Richmond, Village of							
Residential / Gathering Place	Fox Lake Community Center	Fox Lake, Village of								
Residential / Gathering Place	Johnsburg Community Club									
Residential / Gathering Place	Whispering Hills Community Center									
Residential / Gathering Place	Coon Island									
Residential / Gathering Place	Melody Living									
Residential / Gathering Place	Alden Rose Assisted Living									
Residential / Gathering Place	Libraries	Crystal Lake, City of								
Residential / Gathering Place	Wonder Lake Community Center	Greenwood, Village of								
Residential / Gathering Place	CL Assisted living and nursing homes	Crystal Lake, City of								12 homes; no road



# McHenry County Natural Hazards Mitigation Plan Update

Risk Assessment Workshop

Thursday, February 23<sup>rd</sup>

## Housekeeping

- Please [fill-in the sign-in sheet](#) before you depart, also indicating if you would like continuing education credit for CEM or AEM certifications
- You should have received a [Workshop packet](#) with information to inform small group discussions
- If you haven't already done so, please [fill-out and sign your Letter of Commitment](#) (last page of your packet)
- [Create a nametag](#) with your first/last name and duty location (ex. *John Smith, City of Crystal Lake*)

## Ground Rules

- We cannot solve for everything today, and that's ok
- Keep conversations focused on our objectives
- Give others a chance to be heard
- Network and make new connections!

---

# → Housekeeping & Ground Rules



## Today's Meeting Purpose and Objectives

**Purpose:** collect your input and feedback to ensure a comprehensive understanding of the County's natural hazards risks, such as vulnerabilities and impacts to critical infrastructure from tornados, winter storms and flooding. As a result, the County will be better equipped to prescribe mitigation actions that can meaningfully reduce the impacts of those risks throughout our communities.

**Objectives:**

1. Validate our refreshed understanding of the County's natural hazards risks since 2017
2. Identify shared critical infrastructure between County jurisdictions (and with neighboring counties) and the potential impacts of a natural disaster
3. Start identifying potential mitigation actions to reduce those risks

## → Agenda

Time (CST)	Topic	Presenter(s)
1:00pm-1:40pm CT (40 mins)	<b>Welcome &amp; Introductions</b> <ul style="list-style-type: none"> <li>• Housekeeping</li> <li>• Agenda Review</li> <li>• Icebreaker Activity</li> </ul>	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)
1:40pm-2:00pm CT (20 mins)	<b>Context Setting</b> <b>Desired Outcome(s):</b> Increased awareness of how today's outputs will advance the broader hazard mitigation planning process	Kelli Reddick (ICF)
2:00pm-3:00pm CT (60 mins)	<b>Small Group Exercise 1: Validating Hazard Profiles</b> <b>Desired Outcome(s):</b> Enhanced understanding of the vulnerabilities and consequences of priority natural hazards to ensure a comprehensive view of County-wide risk	EMA & ICF Facilitators
3:00pm-3:15pm CT (15 mins)	<b>BREAK</b>	
3:15pm-4:15pm CT (60 mins)	<b>Small Group Exercise 2: Identifying Shared Infrastructure and Cascading Impacts</b> <b>Desired Outcome(s):</b> Enhanced understanding of shared, critical facilities between County jurisdictions and with neighboring communities/Countries, to better define where collective action is needed.	EMA & ICF Facilitators
4:15pm-4:55pm CT (40 mins)	<b>Small Group Exercise 3: Brainstorming Mitigation Actions</b> <b>Desired Outcome(s):</b> Increased awareness of local mitigation strategies to reduce risk to natural hazards	EMA & ICF Facilitators
4:55pm-5:00pm CT (5 mins)	<b>Recap &amp; Adjourn</b> <b>Desired Outcome(s):</b> Equipped participants to share today's results with their managers and colleagues	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)

- 
1. Stand Up
  2. Introduction Yourself: Name, County or Local Jurisdiction, Position
  3. What was your first ever job?

## Icebreaker Activity

Context Setting



**Purpose:** To develop a long-term strategy for reducing disaster damage, disruption, and repetitive loss impacts.

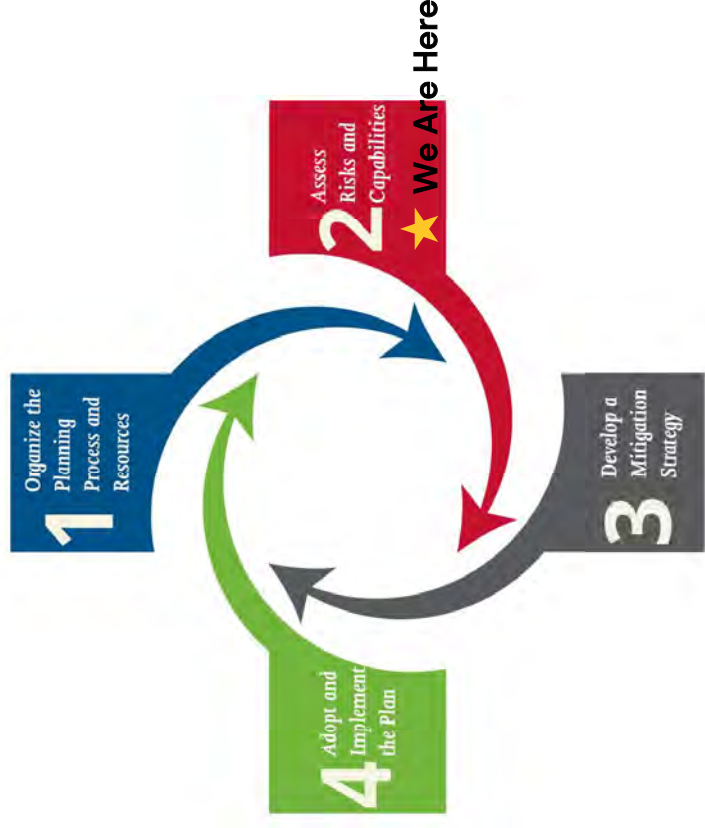
Having an updated plan....

- ✓ Enables access to FEMA Hazard Mitigation Assistance Grants (e.g., HMGP, BRIC, etc.)
- ✓ Increases readiness for subapplication development when funding becomes available
- ✓ Promotes more disaster-resilient and sustainable communities
- ✓ Increases public awareness and understanding of risk
- ✓ Fosters relationships between all levels of government, non-governmental organizations and the private sector
- ✓ Reduces costs associated with disaster response and recovery by promoting mitigation

→ **Why Hazard Mitigation Planning?**



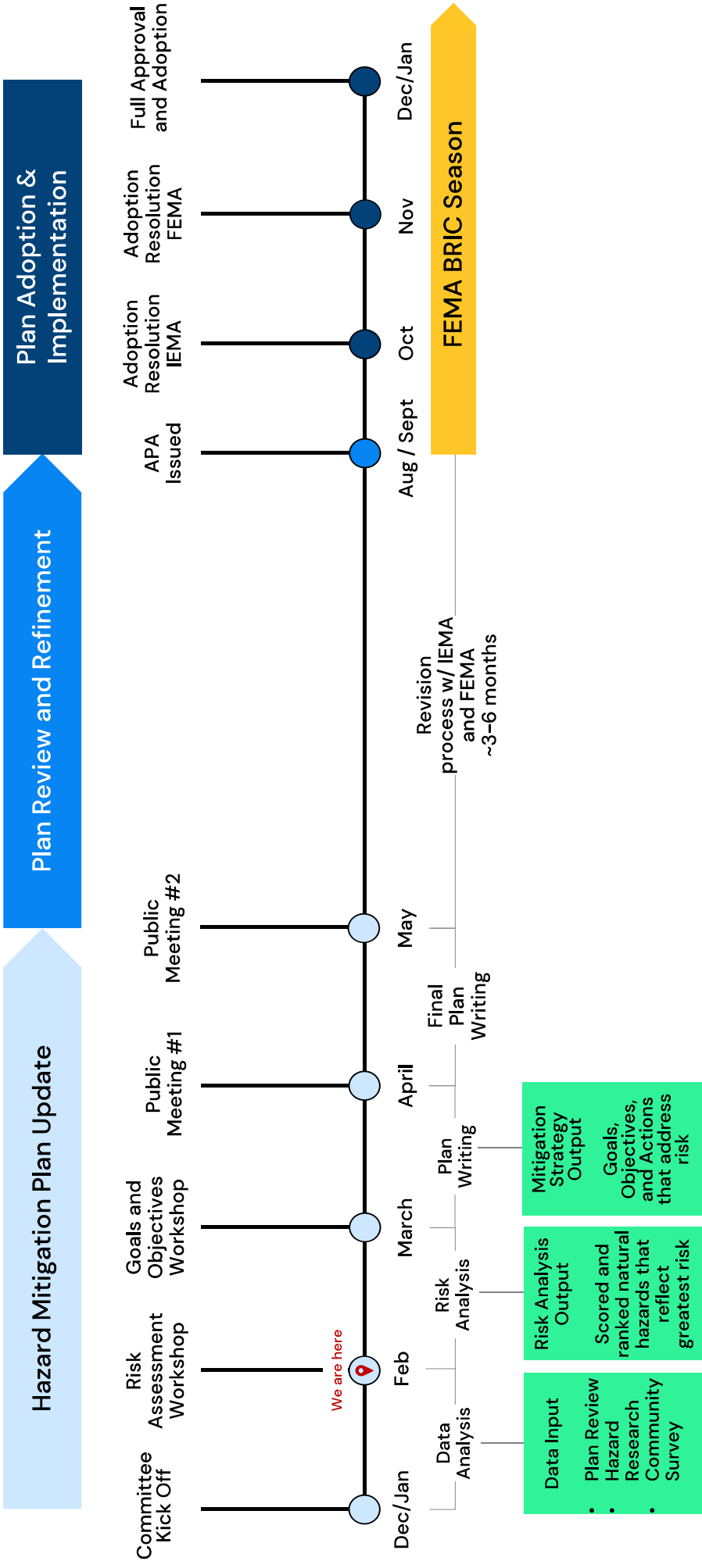
## FEMA Hazard Mitigation Planning Process



## FEMA Local Planning Sections

- A. Planning Process
- B. Risk Assessment**
- C. Mitigation Strategy
- D. Plan Maintenance
- E. Plan Update
- F. Plan Adoption
- G. High Hazard Dams
- H. Additional State Requirements (Optional)

## → FEMA's HM Planning Process & Local Plan Requirements



➔ **Overall Project Timeline**

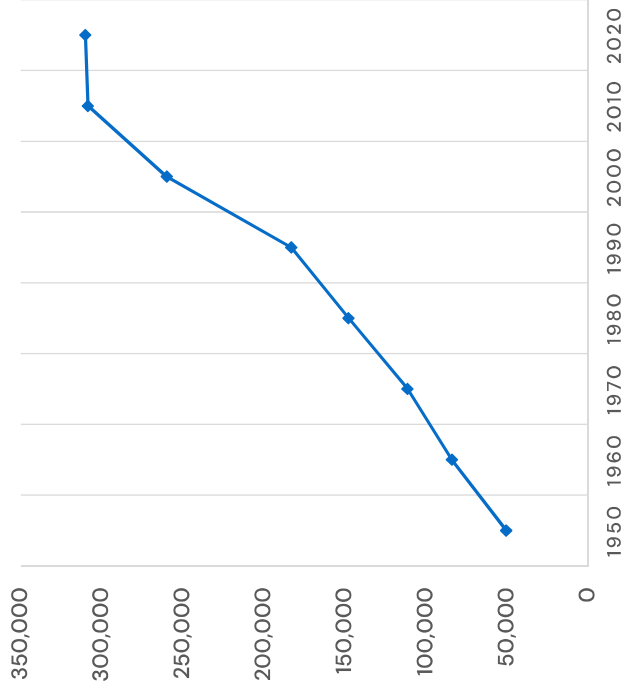
Primary data sources from the plan review process:

- McHenry County 2021 THIRA
- McHenry County 2050 Comprehensive Plan Existing Conditions Memo
- McHenry County WRAP
- Fox River Corridor Plan

→ **Progress to Date**

Plans Identified (as of January 26, 2023)	
Plan Types	
State and Local Hazard Mitigation Plans	<p><b>Federal/State</b></p> <ul style="list-style-type: none"> <li>• Illinois Natural Hazard Mitigation Plan (2018)</li> <li>• State of Wisconsin Hazard Mitigation Plan (2017)</li> </ul> <p><b>County/Regional</b></p> <ul style="list-style-type: none"> <li>• McHenry Co. Natural Hazards Mitigation Plan (2017)</li> <li>• McHenry Co. Water Resources Action Plan (WRAP) Update (2020)</li> <li>• CMAP Transportation Resilience Assessment</li> <li>• CMAP Regional Flood Susceptibility Index</li> </ul> <p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• City of Crystal Lake Comprehensive Plan (2012)</li> <li>• City of McHenry Comprehensive Plan (2013)</li> </ul> <p><b>County/Regional (neighbors)</b></p> <ul style="list-style-type: none"> <li>• Lake County All Natural Hazards Mitigation Plan (2017)</li> <li>• Cook County Multi-Jurisdictional Hazard Mitigation Plan (2019)</li> <li>• Natural Hazards Mitigation Plan County of Kane (2015)</li> <li>• DeKalb County All Hazards Mitigation Plan (2019)</li> <li>• Boone County, Illinois Multi-Hazard Mitigation Plan (2020)</li> <li>• Kenosha County Hazard Mitigation Plan (2011-2015)</li> <li>• Walworth County Hazard Mitigation Plan</li> </ul>
Other Relevant Plans	<p><b>Federal/State: to be determined</b></p> <p><b>County/Regional:</b></p> <ul style="list-style-type: none"> <li>• McHenry Co. Strategic Plan (2023)</li> <li>• McHenry Co. Comprehensive Plan (2022)</li> </ul> <p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• Village of Barrington Comprehensive Plan (2021)</li> <li>• Village of Cary Capital Improvement Plan (2021-2025)</li> <li>• Fox River Corridor Plan (2022)</li> <li>• City of Harvard Comprehensive Plan (2016)</li> </ul>
Studies and Reports	<p><b>Federal/State:</b></p> <ul style="list-style-type: none"> <li>• Wisconsin Upper Fox Flood Risk Review Study (2016)</li> <li>• Illinois State Water Survey (ISWS) Nippersink Creek Study</li> <li>• USGS 10-year McHenry County Water Quality Report (2020)</li> </ul> <p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• Village of Lakewood Stormwater Strategic Implementation Report (2019)</li> </ul>
Technical Information	<p><b>Federal/State:</b></p> <ul style="list-style-type: none"> <li>• NOAA Storm Events Database</li> <li>• National Weather Service Preliminary US Flood Fatality Statistics</li> </ul> <p><b>County/Regional:</b></p> <ul style="list-style-type: none"> <li>• McHenry Co. THIRA</li> <li>• McHenry Co. Building Codes</li> <li>• McHenry Co. Unified Development Ordinance</li> <li>• McHenry Co. Stormwater Management Ordinance</li> </ul> <p><b>Local:</b></p> <ul style="list-style-type: none"> <li>• CRS Program Documentation</li> </ul>

## MCHENRY COUNTY POPULATION OVER TIME



**310,229**

Residents in McHenry County. This is a 0.9% increase from the 2017 HMP. CMAP projects that the population may grow to 374,989 by 2030 and 478,639 by 2050.

**69.5%**

Of employed residents work outside the County. This represents a 13% increase from 2013. There are a total of 85,811 jobs available in McHenry County. Manufacturing and retail trade industries are the largest employment sectors.

**60.6%**

Of land in McHenry County is agricultural. While ag land conversion has been less than 1% since 2009, significant acreage of farmland may be developed by 2040. 18% of the County's land use is considered environmentally sensitive.

**4,000+**

Housing units have been built since 2010. The housing stock is primarily owner-occupied, single-family homes.

## McHenry County's Community Profile





Presidential disaster declarations are rare for McHenry County.

## 2017 Fox River Flood

Approximately 800 homes were affected by flooding. The Fox River reached record levels of nearly 3 feet above the river's flood stage.

**Natural Hazard**  
**Updates**



## 7 hail incidents

Have been reported by NOAA in the McHenry County region since 2017. Some reports were rather large hail – quarter to golf ball size, 2.5” diameters.

## 23 severe storms & wind

These events cause trees to fall, debris causes damage, and power lines are likely affected. Four events in 2021 affected nearly all areas of McHenry County.

## 3 homes damaged

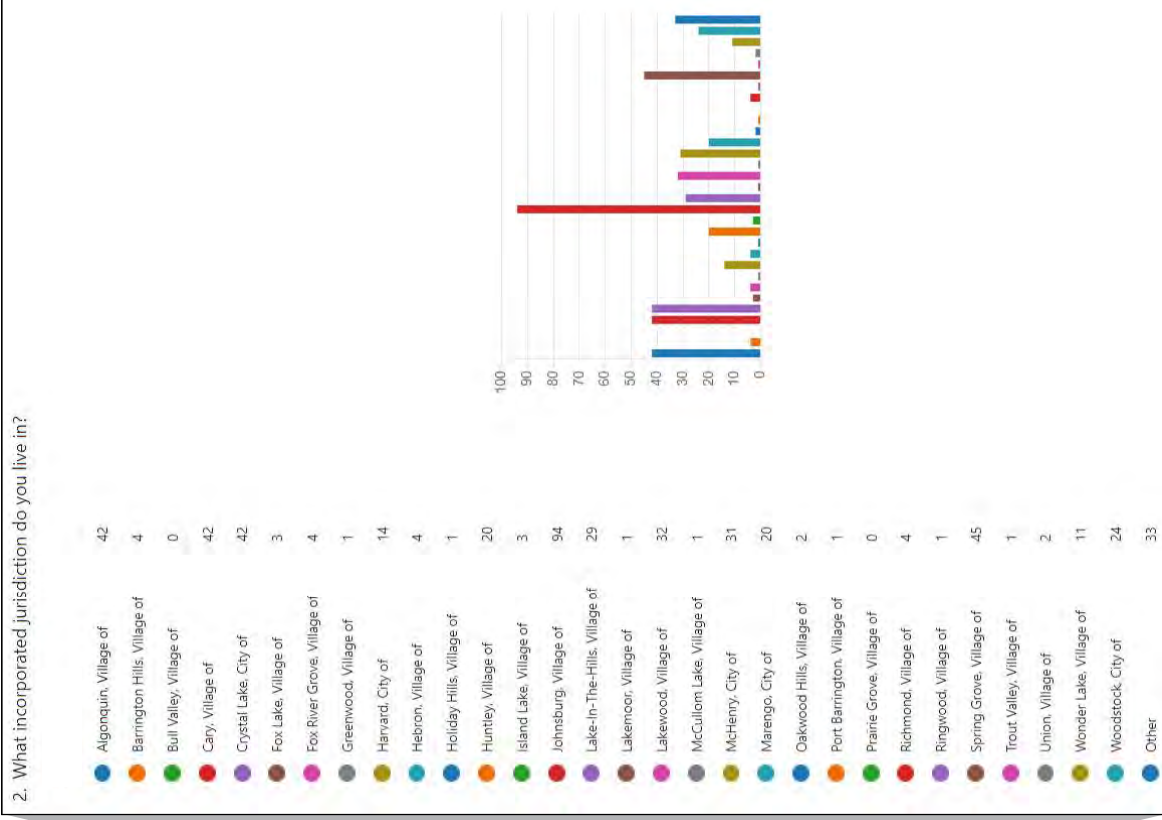
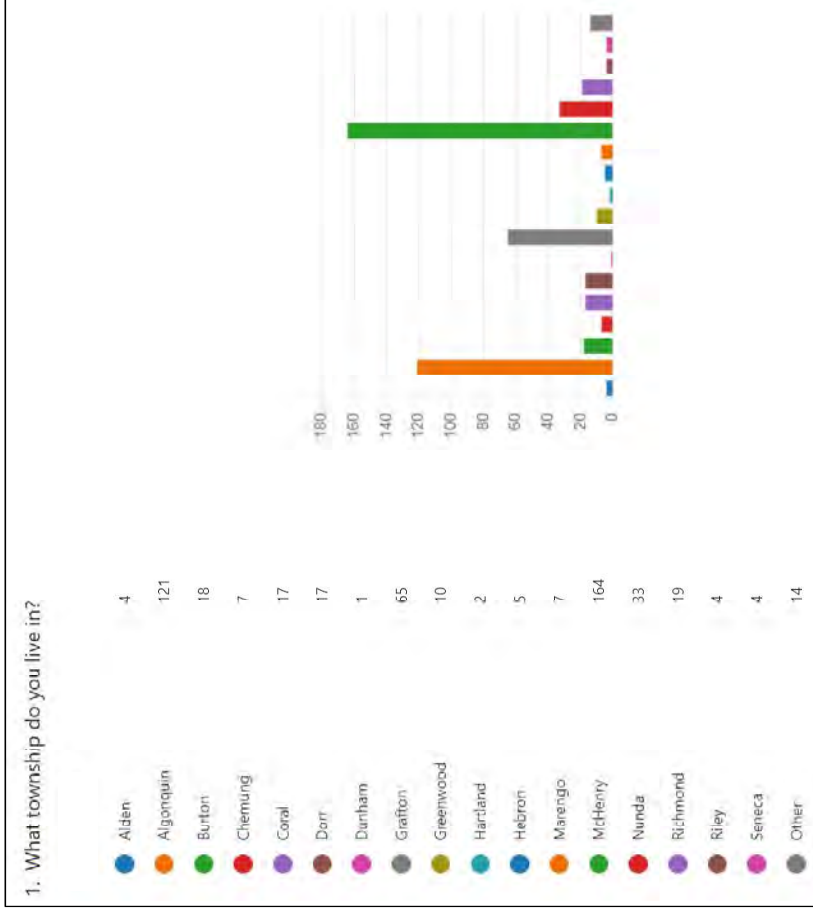
By lightning strikes in 2018. Two structures burned in Coral and Huntley.

## 2-year drought

Northern Illinois experienced historic drought between 2021 and 2022. Although the drought is over, longer-term concerns for aquifer recharge and groundwater availability remain.

## Public Engagement:

- As of today, we've received approx. 512 responses (+300 from 2017!)



## Public Survey Status Update

## Key Insights for the Risk Assessment:

### Lived Experience

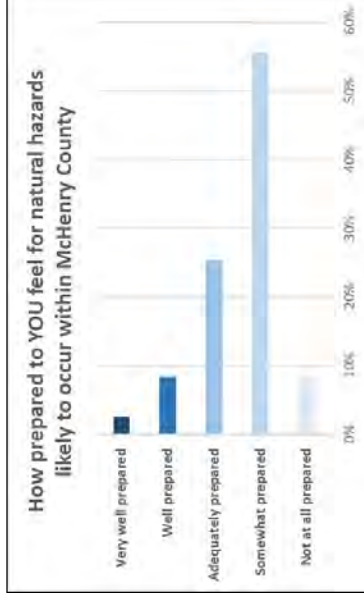
- 52% of respondents (264) have “experienced” a natural disaster event in McHenry County
- Of those, an overwhelming majority have experienced Severe Winter Storm conditions (Ice, Snow and Extreme Cold)

### Perceived Threats from Natural Hazards

- Tornadoes were perceived as the #1 threat to community (40%), despite only 12% of respondents having “experienced” one in McHenry County
- The next closest perceived threats were Flooding, Severe Summer Storms (Thunderstorms) and Severe Winter Storms (Ice)

### Community Preparedness

- 56% (285) feel only Somewhat Prepared for natural hazards likely to occur in McHenry County
- 80% (410) confirmed they do not know who to contact to learn more about natural hazards risks
- However, there is a strong desire (over 70%) that want to make their homes more resistant to natural disasters
- Many would like to see more natural disaster preparedness and awareness information distributed via email and text
- Several respondents confirmed their desire to participate in scenario-based exercises and volunteer to support response and recovery efforts



14. Are you interested in making your home more resistant to natural hazards?



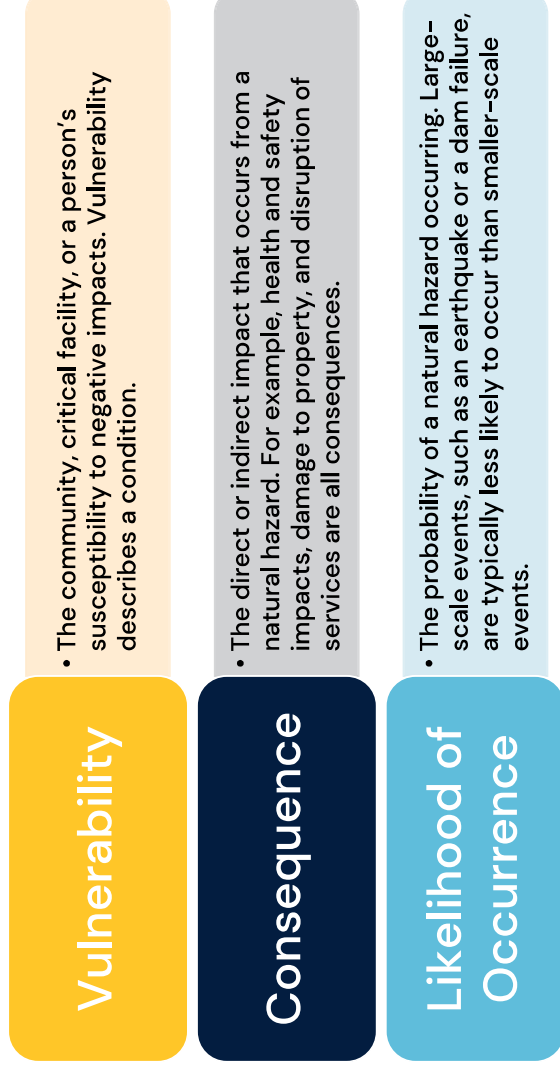
➔ **Public Survey Status Update – cont.**

Hazard	Hazard Mitigation Plan	THIRA
Flood	X	X
Severe Summer Storms	X	X
Severe Winter Storms and Extreme Cold	X	
Tornado	X	X
Extreme Heat	X	
Drought & Groundwater	X	X
Earthquake	X	
Dam Failure	X	
Cyber Attack		X
Pandemic		X
Utility Disruption		X
Armed Assault		X
Space Weather		X
Hazardous Materials Release		X
Transportation Accident		X

The Planning Team elected to maintain the Hazard Mitigation Plan as an assessment and strategy to address natural hazards in McHenry County.

→ **Validation of Natural Hazards**

1. Review existing risk assessment
2. Integrate our new knowledge of **hazards and recent events, the community context, and critical assets**
3. Update and score the following criteria:



$$R = V \times C \times T$$

Risk = Vulnerability x Consequence x Threat Likelihood

## → Risk Assessment Approach

The 2023 Plan Update will incorporate the following risk factors:

→ **McHenry County Risk Scoring**

Risk Factor	Evaluation Criterion	Assigned Value
Spatial Extent	Negligible (fewer than 10 square miles)	1
	Small (between 10 and 50 square miles)	2
	Moderate (between 50 and 100 square miles)	3
	Large (between 100 and 250 square miles)	4
	Countywide (greater than 250 square miles)	5
Probability of Occurrence (Likelihood)	Unknown but rare occurrence	1
	Unknown but anticipate an occurrence	2
	100 years or fewer occurrence	3
	25 years or fewer occurrence	4
	Once a year or more occurrence	5
Vulnerability (Community or asset characteristics that determine susceptibility to hazards)	Little to no vulnerability	1
	Existing mitigation measures and features prevent most impacts	2
	Existing mitigation measures and features prevent few impacts	3
	Existing mitigation measures and features prevent little to no impacts	4
	No mitigation measures or features that prevent any impacts from hazards	5
Public Health Consequences	No risk to public health	1
	Few injuries/illness are expected	2
	Few fatalities or many injuries/illnesses are expected	3
	Many fatalities should be expected	4
	Widespread fatalities throughout the impact area	5
Consequences to Property (Damage)	No Property damage	1
	Few properties destroyed or damaged	2
	Few destroyed - many damaged	3
	Many destroyed - few damaged	4
	Many properties damaged and destroyed	5
Impacts to Critical Facilities (Loss of service)	No disruption to government functions and services. No shutdown of critical facilities	1
	Limited loss of service (1 day or less) for government functions or critical facilities	2
	Loss of service of government functions or critical facilities for several days (7 days)	3
	Loss of service of government functions or critical facilities for several weeks (2 - 3 weeks)	4
	Significant loss of government functions or critical facilities (30 days or more)	5
Warning Time	More than 24 hours of advance notice	1
	Between 12 and 24 hours of advance notice	2
	Between 6 and 12 hours of advance notice	3
	Between 1 and 6 hours of advance notice	4
	Less than 1 hour of advance notice	5

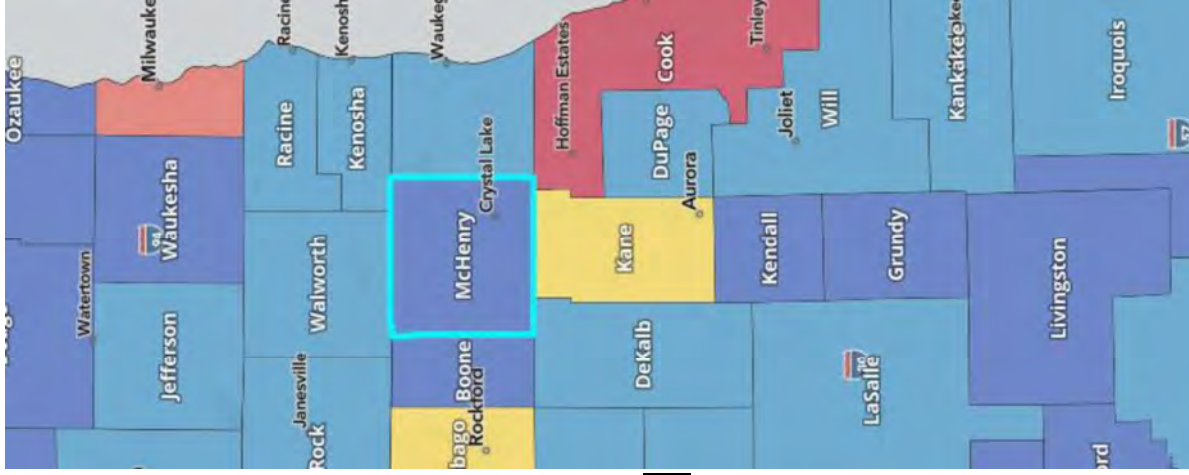
## FEMA's National Risk Index for McHenry County, IL

### Very Low Risk

McHenry County has a risk index of 6.6 according to FEMA. This is compared to an IL average of 9.87, and a National Average of 10.6. Risk is determined by loss, social vulnerability, and community resilience.

### Moderate Annual Loss

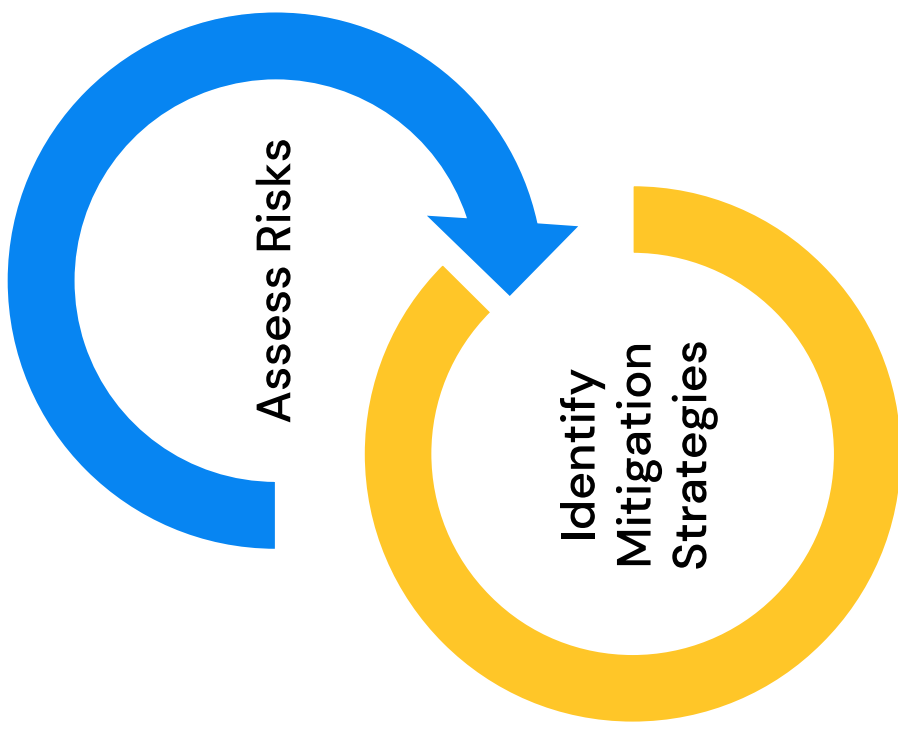
McHenry County has an annual loss score of 18.8. This is higher than the IL and National Average (13.9, 13.3). Extreme cold weather, lightning, strong winds, and tornadoes have the highest projected loss.



$$\text{FEMA's Risk Index} = (\text{Expected Annual Loss} \times \text{Social Vulnerability}) / \text{Community Resilience}$$

Hazard Type	Risk Index Rating	Risk Index Score
Avalanche	Not Applicable	--
Coastal Flooding	Not Applicable	--
Cold Wave	Relatively Moderate	21.88
Drought	Very Low	2.75
Earthquake	Very Low	2.00
Hail	Very Low	3.25
Heat Wave	Relatively Low	7.64
Hurricane	Very Low	1.99
Ice Storm	Very Low	6.15
Landslide	Very Low	4.52
Lightning	Relatively Low	11.09
Riverine Flooding	Very Low	5.55
Strong Wind	Relatively Low	9.27
Tornado	Relatively Low	14.69
Tsunami	Not Applicable	--
Volcanic Activity	Not Applicable	--
Wildfire	Very Low	1.10
Winter Weather	Very Low	8.30

- The results of today's workshop will be used to finalize the risk assessment scores and develop mitigation strategies
- **Keep the end in mind** – mitigation projects to your asset infrastructure that will have the greatest impact and address the greatest risk and vulnerability



→ **Context Setting: What's next?**



1. Validate and expand on preliminary **vulnerability and consequence assessment results** to ensure a comprehensive view of risk
2. Develop a **shared** or **interdependent understanding** of natural hazard risk based on geography and infrastructure systems
3. Brainstorm **multi-jurisdictional** mitigation actions to address shared natural hazard risk

→ **Context Setting: Purpose of Today's Risk Assessment Workshop**



# Exercise 1: Validating Hazard Profiles

**Desired Outcome(s):** Reached consensus around Vulnerability and Consequence scoring for the County's priority natural hazards, and identified additional data to refine our understanding of the hazards

**Timing:** 50 mins

**Instructions:**

1. Everyone will be randomly assigned to 1 of 3 groups
2. **Hazard Description #1 (5 mins):** The group facilitator will provide a brief description of your group's first hazard, including justification for the current draft Vulnerability and Consequences scores
  - Note: additional information about the hazards is available in your Workshop packet
3. **Discussion 1 (2.5 mins):** Do you agree with the current scores? (Voting = Yes, No-Higher, No-Lower) (5 mins)
4. **Discussion 2 (10 mins):** If you disagree, why?
  - Based on your knowledge and expertise, what considerations (e.g., consequences to assets and critical facilities, new technical data, etc.) have we missed?
5. **Discussion 3 (2.5 mins):** Reach consensus around new score(s) via another round of voting as needed (5 mins)
6. **Repeat Steps 2-5 for the second hazard (20 mins)**
7. **Report Out (~10 mins):** Where did we start? What were the key insights from the discussion? Where did we end up?

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## → Exercise 1: Instructions

Risk Factor	Evaluation Criterion	Assigned Value
Vulnerability (How safe are the areas' Critical Facilities from the impacts of the hazard?)	Little to no vulnerability	1
	Existing mitigation measures and features prevent most impacts	2
	Existing mitigation measures and features prevent few impacts	3
	Existing mitigation measures and features prevent little to no impacts	4
	No mitigation measures or features that prevent any impacts from hazards	5
Potential Consequences to Public Health	No risk to public health	1
	Few injuries/illness are expected	2
	Few fatalities or many injuries/illnesses are expected	3
	Many fatalities should be expected	4
	Widespread fatalities throughout the impact area	5
Potential Consequences to Property (Damage)	No Property damage	1
	Few properties destroyed or damaged	2
	Few destroyed - many damaged	3
	Many destroyed - few damaged	4
	Many properties damaged and destroyed	5

Critical Facilities = buildings, locations, or infrastructure vital to 1) public safety and 2) disaster response and recovery efforts (e.g., police and fire stations, hospitals, electrical substations, etc.)

→ **Exercise 1: Scoring Criteria**

Hazard	Confirmed Risk Scores			Key Insights (summarized from sticky notes)
	Vulnerability	Consequences – Public Health	Consequences – Property Damage	
Flooding	3	2	5	<ul style="list-style-type: none"> <li>Major McHenry Township flood in 2017 damaged wastewater treatment lift stations</li> <li>Southeast of the County most impacted by flooding due to high population and river proximity</li> <li>Historically, groundwater flooding is a the most prevalent type of flooding and often backs up County sewers</li> <li>Most of the County is reliant on ground water / well water, not city (Chicago) water</li> <li>Blackouts experienced</li> <li>Data is needed to validate impact</li> <li>Newer communities are less affected</li> <li>Building codes – trees</li> <li>Prevalent in the news</li> <li>Increased outdoor events w/ no plan</li> <li>Lakewood experienced extreme flooding at Hall Dam</li> <li>Microburst examples = injuries</li> <li>Roofs need replacement</li> <li>Limited hail/light protection options</li> <li>Flash spring floods</li> <li>Limited hospital intake</li> </ul>
Severe Summer Storms	3	3	3	
Tornado	4	3	3	<ul style="list-style-type: none"> <li>Low-impact improvement in warnings</li> <li>COMED response to 2/23/23 storm was insufficient</li> <li>2/23/23 storm damaged several Algonquin critical facilities</li> <li>Not enough public works staff to perform preventative tree trimming around transmission lines</li> <li>Consequence of cascading events (e.g., loss of power, etc.)</li> <li>Must enforce building codes</li> </ul>
Severe Winter Storms	2	2	2	

## → Exercise 1 Results

Hazard	Confirmed Risk Scores			Key Insights (summarized from sticky notes)
	Vulnerability	Consequences – Public Health	Consequences – Property Damage	
Extreme Heat	3	3	2	<ul style="list-style-type: none"> <li>Power grid is vulnerable and likely to worsen as time goes on</li> <li>Low-to-moderate income populations may be more vulnerable</li> <li>Public infrastructure can be damaged</li> <li>Life cycle asset impacts</li> <li>Cooling centers for homeless pop – none designated</li> <li>Home health is in need</li> <li>Expect illness, not fatalities</li> </ul>
Drought	4	3	2	<ul style="list-style-type: none"> <li>Wells are not deep enough in some areas</li> <li>Potential for water wars</li> <li>Financial impacts to businesses/jobs</li> <li>Impacts are mostly illness-related</li> <li>Expect agriculture loss</li> </ul>
Dam Failure	2	3	3	<ul style="list-style-type: none"> <li>Recent dam improvements</li> <li>Fault line in Illinois</li> <li>Lake in the Hills dam closed after disaster event in 1990s; evacuated over 100 residents</li> <li>Crystal Creek – lot of properties to the South</li> <li>Density around dams – increased vulnerability</li> <li>Evacuation plans in place</li> <li>Algonquin Dam/Earth Dam was recently restored</li> <li>Another dam located south of McHenry Township</li> </ul>

→ **Exercise 1 Results (continued)**



## Exercise 2: Identifying Shared Infrastructure & Impacts

**Desired Outcome(s):** Enhanced understanding of shared, critical facilities between County jurisdictions and with neighboring Counties to better define where collective action is needed.

**Timing:** 50 mins

**Instructions:**

1. Everyone will be assigned to a \*new\* group based on geography (see page 11 in your packet)
2. **Information Review (5 mins):** At each station, the group facilitator will briefly orient you to the critical facilities information in your Workshop packet
  - Note for this exercise we are defining critical facilities as buildings, locations, or infrastructure vital to public safety and the disaster response and recovery effort (e.g., police and fire stations, hospitals, electrical substations, etc.)

Government (EOCs, Fire and Police Stations, Schools, etc.)	Infrastructure – Transportation (Airports, Rail, Road, etc.)	Infrastructure – Utility (Power Plant, Wastewater Treatment, etc.)	Medical (Hospital, Medical Clinic, etc.)	Residential (Assisted Living Facility, Park, Civic Center, etc.)	Other (Dam, hazardous materials site, etc.)
--	--	--	--	--	---

3. **Discussion 1 (15 mins):** What critical facilities and services within your community have been disrupted or damaged within the last 5 years? Of those, which ones are other communities/counties reliant on?
4. **Discussion 2 (10 mins):** What critical facilities residing in other communities/counties is your community reliant on?
5. **Gallery Walk (20 mins):** Review the work of the other two (2) groups and identify the key critical facilities that your community is reliant on

## → Exercise 2 Directions



Group 1: Justin Strickland (ICF)	Group 2: Kelli Reddick (ICF)	Group 3: David Christensen (EMA)
<ul style="list-style-type: none"> <li>• Algonquin, Village of</li> <li>• Barrington Hills, Village of</li> <li>• Cary, Village of</li> <li>• Crystal Lake, City of</li> <li>• Fox River Grove, Village of</li> <li>• Lake-In-The-Hills, Village of</li> <li>• Lakewood, Village of</li> <li>• Oakwood Hills, Village of</li> <li>• Port Barrington, Village of</li> <li>• Trout Valley, Village of</li> </ul>	<ul style="list-style-type: none"> <li>• Bull Valley, Village of</li> <li>• Fox Lake, Village of</li> <li>• Holiday Hills, Village of</li> <li>• Island Lake, Village of</li> <li>• Johnsburg, Village of</li> <li>• Lakemoor, Village of</li> <li>• McCullom Lake, Village of</li> <li>• McHenry, City of</li> <li>• Prairie Grove, Village of</li> <li>• Ringwood, Village of</li> </ul>	<ul style="list-style-type: none"> <li>• Greenwood, Village of</li> <li>• Harvard, City of</li> <li>• Hebron, Village of</li> <li>• Huntley, Village of</li> <li>• Marengo, City of</li> <li>• Richmond, Village of</li> <li>• Spring Grove, Village of</li> <li>• Union, Village of</li> <li>• Wonder Lake, Village of</li> <li>• Woodstock, City of</li> </ul>
<p>*McHenry County and other regional participants will be evenly distributed among the 3x groups</p>		

Note: Exercise 2 Results were not shared publicly due to the sensitive nature of critical facilities location information

## → Exercise 2 Groups & Results

# Exercise 3: Brainstorming Mitigation Projects



**Desired Outcome(s):** Increased awareness of prior or existing mitigation actions that could reduce the impact of the County's priority natural hazards

**Timing:** 40 mins

**Instructions:**

1. We've posted Flip Charts on walls throughout the room for each of the County's priority natural hazards
2. Using a sticky note, write down: (20 mins)
  - The name of a previous OR existing mitigation project that could address the perceived impacts of each hazard + the leading community and a point of contact (if known); OR
  - An idea for a mitigation project that could address the potential impacts of each hazard
3. Main facilitator will ask for volunteers to share a little detail about the projects identified (20 mins)

## → Exercise 3 Directions

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Hazard	Prior/Existing Projects (Location, POC)	New Ideas (POC)
Flooding	<ul style="list-style-type: none"> <li>• Randall Rd. Wetland Rehab (Algonquin)</li> <li>• IEMA-funded Flood-Prone Property Acquisition (Cary, E. Morimoto)</li> <li>• Crystal Lake Stormwater Solutions Initiative (Crystal Lake, Abigail Witgreen)</li> <li>• Lake-In-The-Hills (LITH) Stream Restoration Project (LITH, Darren Olson)</li> <li>• Huntley Tree City USA Growth Awards (Huntley)</li> <li>• Dixi Creek Rehab (Algonquin)</li> <li>• Woods creek Watershed Plan (LITH)</li> <li>• Nippersink Creek (McHenry Co. Conservation District, John Peters)</li> <li>• North Glacial Park (McHenry Co. Conservation District, John Peters)</li> <li>• Fox River Erosion at Lyons Prairie Marsh (McHenry Co. Conservation District, Gabe Powers)</li> <li>• Coon Creek Restoration ((McHenry Co. Conservation District, Gabe Powers,)</li> <li>• Lake-In-The-Hills CRS Program (LITH)</li> <li>• <a href="#">Turnberry Trunk Project</a> to increase pipe capacity – engineered but needs funding (Lakewood)</li> </ul>	<ul style="list-style-type: none"> <li>• Manage open space/wetlands</li> <li>• Continue LITH Stream Maintenance/Restoration project</li> <li>• Enforce codes for building in flood prone areas</li> <li>• Utilize mine pits for water collection</li> <li>• Utilize county-wide green infrastructure for new development and retrofitting (Dennis Dreher, Geosyntex)</li> <li>• County-wide floodplain buyout project</li> <li>• Kishwaukee flood study update with Illinois State Water Survey</li> </ul>
Severe Summer Storms	<ul style="list-style-type: none"> <li>• Family preparedness guide (Huntley)</li> <li>• Education for storm-ready com. (Huntley)</li> <li>• Algonquin active tree trimming</li> </ul>	<ul style="list-style-type: none"> <li>• Utility Grid Modernization (GRANDS)</li> <li>• Road tunnels/raising in flood areas</li> <li>• Emergency alert assessment and upgrade</li> <li>• Community education for different types of warning</li> <li>• Countrywide native tree (storm resistant) planting guide</li> <li>• Increased burying utilities in new development and retrofit in most vulnerable areas</li> </ul>
Tornado	<ul style="list-style-type: none"> <li>• Changed the UDO to mandate EMA sign-off on events with over 1,000 people. IAP required</li> <li>• FEMA tornado VTX 4/23 Huntley</li> </ul>	<ul style="list-style-type: none"> <li>• Building codes – tornado resistant homes</li> <li>• Encourage a community-wide emergency alert program/system</li> </ul>

## → Exercise 3 Results

Hazard	Prior/Existing Projects (Location, POC)	New Ideas (POC)
Severe Winter Storms	<ul style="list-style-type: none"> <li>Sensible Salting (McHenry County Dept of Transportation)</li> <li>NOAA Weather Radio</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation awareness campaign ex: power lines</li> <li>Designate day and night warming centers across the county</li> <li>Comprehensive tree trimming around transmission lines</li> <li>Table-top exercise, like the MCDH Foodborne outbreak TTX in March 2023</li> <li>Encourage community members to sign up for emergency alerts</li> </ul>
Extreme Heat	<ul style="list-style-type: none"> <li>Village Hall Expansion – Full HVAC standby generator; cooling center + food distribution</li> </ul>	<ul style="list-style-type: none"> <li>Large capacity mobile cooling vehicles</li> <li>Designate day and night cooling centers across the county</li> <li>Increase home grown energy in the county – ex. solar farms = greater power resiliency</li> </ul>
Drought	<ul style="list-style-type: none"> <li>Water conservation regulations (Cary and E. Morimoto)</li> <li>Water conservation efforts (Woodstock)</li> <li>Village Water use restrictions for lawn watering</li> <li>County-wide ground water monitoring network</li> </ul>	<ul style="list-style-type: none"> <li>Explore Lake Michigan water allocation</li> <li>New water reservoir in old mining pits</li> <li>County-wide restrictions for lawn watering</li> <li>County-wide initiative for natural landscaping (native plants do not need to be watered when established)</li> </ul>
Dam Failure	<ul style="list-style-type: none"> <li>Dam maintenance (LITH)</li> <li>Buyout programs</li> <li>LITH dam plan table-top exercise (TTX) Dec. 2022</li> <li>Algonquin Dam break TTX MCDH</li> </ul>	<ul style="list-style-type: none"> <li>Update dam failure plans</li> <li>Dam removal investigation</li> <li>All dams with response plans</li> <li>CERT – community emergency response teams</li> <li>Buyouts behind dams</li> </ul>

→ **Exercise 3 Results (continued)**



Wrap-up and Next Steps

**Friendly Reminder to:**

- Fill-in the sign-in sheet before you depart, also indicating if you would like continuing education credit for CEM or AEM certifications
- Fill-out and sign your Letter of Commitment (if you have not already)

**Next Steps:**

- We'll be reaching out to schedule brief interviews regarding your mitigation priorities, ongoing projects and capacity/capabilities to support shared (cross-County) mitigation initiatives
- Next meeting will be Thursday, March 30<sup>th</sup> here in Cary from 1-5pm CT

→ **Wrap-Up & Adjourn**

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Thank You!





# → McHenry County Mitigation Committee Monthly Meeting

## 2023 Natural Hazards Mitigation Plan Update: Mitigation Goals & Objectives Workshop

Date/Time: Thursday, March 30, 2023, 1:00 pm – 5:00 pm CST

Location: In-Person @ Cary Village Hall (755 Georgetown Dr., Cary, IL 60013)

**\*No virtual participation option is available for this highly interactive meeting\***

### Meeting Purpose and Objectives:

The **purpose of this meeting is to gather your input and feedback to ensure a comprehensive understanding of the County's mitigation priorities and barriers to implementation.** As a result, the County will be better equipped to define and prioritize multi-jurisdictional mitigation actions for future funding opportunities. To that end, we will use this time to:

1. Increase awareness and understanding of where we are in the Planning process, including key themes and insights from what's been completed to-date;
2. Validate existing Action Items from the 2017 Plan, including barriers to progress and potential solutions; and
3. Reaffirm shared goals and guidelines for mitigation based on our refreshed understanding of County-wide risk.

Please note this meeting will be **in-person only** given the highly interactive nature of our agenda. We hope many of you can join us in Cary for a great afternoon of learning and collaboration!

### Agenda:

Time (CST)	Topic	Presenter(s)
1:00pm-1:30pm CT (30 mins)	<b>Welcome &amp; Introductions</b> <ul style="list-style-type: none"> <li>• Housekeeping</li> <li>• Agenda Review</li> <li>• Icebreaker Activity</li> </ul>	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)
1:30pm-1:50pm CT (20 mins)	<b>Context Setting</b> <b>Desired Outcome(s):</b> Increase awareness of where we are in the Planning process, including key themes and insights from what's been completed to-date.	Kelli Reddick (ICF)
1:50pm-2:50pm CT (60 mins)	<b>Small Group Exercise 1: Validate Existing Action Items</b> <b>Desired Outcome(s):</b> Reached consensus around the status of existing Action Items from the 2017 Plan.	EMA & ICF Facilitators
2:50pm-3:00pm CT (10 mins)	<b>BREAK</b>	
3:00pm-4:15pm CT (75 mins)	<b>Small Group Exercise 2: Defining Mitigation Barriers &amp; Solutions</b> <b>Desired Outcome(s):</b> Increased understanding around barriers to implementation for specific Action Items and start identifying potential solutions.	EMA & ICF Facilitators

Time (CST)	Topic	Presenter(s)
4:15pm–4:25pm CT (15 mins)	<b>BREAK</b>	
4:25pm–4:55pm CT (30 mins)	<b>Full Group Exercise 3: Validating Mitigation Goals &amp; Guidelines</b> <b>Desired Outcome(s):</b> Reached consensus around the County’s shared mitigation goals and guidelines.	Justin Strickland (ICF)
4:50pm–5:00pm CT (10 mins)	<b>Recap &amp; Adjourn</b> <b>Desired Outcome(s):</b> Equipped participants to share today’s results with their managers and colleagues	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)

# McHenry County Emergency Management

Date: March 30, 2023

Type of Meeting: Natural Hazard Mitigation Committee Meeting

( PLEASE PRINT )

Name	Address	Organization	Position	Email	Continuing Education (CEM / AEM) Y / N
David Christensen	McHenry, Woodstock	McEMA	DIR		
Bob Elksoo	"	"			
Robin Khoury	EMA	"			
Bob Ceraco	"	"	YES		
Bruce Ulrich	Number of Hurstons	Hurstons		pullrich@hurstons.il.us	
Al Antoni	Village Bull Valley				
Kelly Popelka	Village of Spring Grove	Spring Grove	Clerk	kpopelka@springgrove.il.us	
Mike Frer	Village of Spring Grove	1056	PW Supervisor	mfrer@springgrove.il.us	
John Reese	Village of Fox River Grove	F. R.G.	OPERATION MANAGER	J.Reese@foxrivergrove.org	
MARK BEATON	VILLAGE BULL VALLEY		TRUSTEE	NEWTON.TRUSTEE.BV@SMALL.COM	
JOHN FULLER	<del>DORR</del> DORR TOWNSHIP		Hwy Com	Highway@dorr-township.com	
Brent Aymond	City of Woodstock		PWD	baymond@woodstock.il.gov	
JEAN HECKMAN	LAKEWOOD		VLG MOR	JEANHECKMAN@VILLAGELAKEWOOD.IL.GOV	
Robby Williams	Northwestern Medicine Locations	Northwestern Medicine	Emergency MGR	Robert.williams@nm.org	Y
Unce Kilullen	Village of Abington	PW	Superintendent	Unce.kilullen@abington.il.us	
Mary Jo McCann	Citizen @ Sangre	(S)		dmccann@angrill.com	
Cindy Skerding	417 W John Rd	EDMC	Volunteer	cskerding@edmc.org	

Grand.com

# McHenry County Emergency Management

Date: March 30, 2023

Type of Meeting: Natural Hazard Mitigation Committee Meeting

(PLEASE PRINT)

Name	Address	Organization	Position	Email	Continuing Education (CEM / AEM) Y / N
Nancy Lech	10206 Seaman Rd, Hebron	Hebron Township	Supervisor	hebron.supervisor@gmail.com	
Mike Roth	2500 Lake Avenue, Lakeview	Lakeview	Police Chief	mroth@village.lakeview.il.us	
Jon Mersching	719 Barbara Ave #C Geneva	KCOEM	Act Dir	Mersching.Jonathan@co.kaw.IL.us	
KAREN BUSH	3610 W-Elm McHenry	MTFPD	DIC	bushkaren@fire.mtff.org	
NON LAMUNGA	1515 CHANUEL BENCH AVE, JOHNSBURG, IL 60451	Village of Johnsburg	Asst. Administrator	VLAMUNGA@JOHNSBURG.IL.GOV	Yes
Jon Schmitt	5600 Hunter Dr, Richmond, IL 60070	Village of Richmond	PW Director	Publicworks@richmond.il.gov	
Carolyn Campbell		McHenry County	RD Member	cmccampbell@mcHenryCounty.il.gov	
Bridget Hoffman	2200 N Seminary Ave, Woodstock, IL	MODH	ERC	bhoffman@mcHenryCounty.il.gov	NO
Paul Delbeck	341 Lewis Dr, Cary, IL	Cary Fire	Chief/EM	pdelbeck@cary.il.gov	
Asha Beldew	1407 E 60th St, Chicago, IL	University of Chicago	Student	BAEEDAN@UCHICAGO.EDU	Yes
Kim Alahmad		U of C	Student	ksalahmad@uChicago.edu	Yes
Petar D'Agostino	11000 Barry Street Huntley, IL	Village of Huntley	Admin. Svs. Mgr.	PdAgostino@huntley.il.us	
Chalen Daigle			County Coroner	Chalen.Daigle@mcHenryCounty.il.gov	
Scott Hartman	2200 N Seminary	McHenry County	Fire Captain	SHartman@McHenryCounty.il.gov	



## Small Group Exercise: Validating 2017 Action Items

**Desired Outcome(s):** Confirm the status of existing Action Items from the 2017 Plan, including barriers to implementation.

**Timing:** 130 mins with short, 10-minute break after 60 mins

### Instructions:

1. **Everyone will be randomly assigned to 1 of 3 groups**
2. **Action Item Review** (2 mins): Group Facilitators will introduce the first Action Item (i.e., title, description, responsible entity, presumed status and what a “blank entry” means) and give participants a minute to review their municipality’s existing information – i.e., Justification.
  - **Station #1 Action Items can be found on pages 2-24**
  - **Station #2 Action Items can be found on pages 25-39**
  - **Station #3 Action Items can be found on pages 40-44**
3. **Small Group Discussion** (4-5 mins): Group Facilitators will ask probing questions (found under each Action Item table), record the group’s inputs (i.e., additions, subtractions, and edits + barriers to implementation) on sticky notes and place them on the Flip Chart under “2023 Plan Updates” and “Barriers” respectively.  
Common questions include:
  - For the County and/or municipalities with existing inputs, is the text still valid?
  - Are there other relevant activities to report for this Action Item?
  - What are the real or perceived barriers to implementation?
4. **Group Facilitators will repeat steps 2-3 for all their Action Items** (40 mins)
5. **Rotate to the Next Station:** Participants will rotate clockwise to the next station
6. **Group Facilitators will repeat steps 2-3 for all their Action Items** (40 mins)
  - Note: we will take a short break midway through the 2<sup>nd</sup> Station
7. **Rotate to the Final Station:** Participants will rotate clockwise to their final station
8. **Group Facilitators will repeat steps #2-3 for all their Action Items** (40 mins)

## Group 1 Action Items for Discussion

### Action Item 4: Watershed Studies

Description	McHenry County should pursue comprehensive watershed studies. This effort will foster the understanding of impact of development on existing flood problems and identify ways to reduce future flood problems. Watershed studies should also evaluate wetlands and water quality impacts of development and other activities in McHenry County.
Responsible Entity(s)	McHenry County
Presumed Status	Ongoing
What "Blank" Means	Deferred – No recent or upcoming watershed study related activities to report
Justification	
McHenry County	<ul style="list-style-type: none"> <li>From 2010-2016, seven (7) additional Watershed Plans were created (i.e., Nike Lakes, Silver Creek &amp; Sleepy Hollow Creek, Boon-Dutch Creek, Woods Creek, Jelkes Creek, Flint Creek, and Spring Creek)</li> <li>Since the 2016 Plan update, three (3) additional Watershed Plans have been created (Crystal Creek, Lawrence Creek and Upper Kishwaukee River)</li> <li>Submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval</li> <li>The Fox Waterway Agency has hired consultants and is partnering with local agencies and other stakeholders to complete a Watershed-based Plan for the Upper Fox River watershed.</li> <li>Under the McHenry County Comprehensive Stormwater Management Plan, a Countywide regulatory program would involve development of a Countywide watershed development ordinance that applies to both incorporated and unincorporated areas. The watershed development ordinance should be comprehensive and specify standards for stormwater drainage and detention, floodplain management, soil erosion and sedimentation control, and stream and wetland protection in a single document (2020 WRAP)</li> </ul>
Algonquin, Village of	<ul style="list-style-type: none"> <li>Submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval</li> <li>Adopted IEPA approved Woods Creek Watershed Plan (9/17/13)</li> </ul>
Barrington Hills, Village of	
Bull Valley, Village of	Included in the Boone and Dutch Creeks IEPA-compliant Watershed Plan
Cary, Village of	Portions of Cary are included by the Silver and Sleepy Hollow Creeks IEPA-compliant Watershed Plan
Crystal Lake, City of	<ul style="list-style-type: none"> <li>Submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval</li> <li>Adopted IEPA approved Woods Creek Watershed Plan (9/17/13)</li> <li>Participant in Upper Kishwaukee Creek Watershed</li> <li>Participant in Silver Creek &amp; Sleepy Hollow Creek Watershed Action Plan</li> <li>Participant in Woods Creek Watershed Action Plan</li> </ul>
Fox Lake, Village of	Included in the Spring Creek IEPA-compliant Watershed Plan
Fox River Grove, Village of	
Greenwood, Village of	Included in the Boone and Dutch Creek and the Nippersink Creek IEPA-compliant Watershed Plans
Harvard, City of	Included in the Lawrence Creek IEPA-compliant Watershed Plan

**Action Item 4: Watershed Studies**

Hebron, Village of	Included in the Nippersink Creek IEPA-compliant Watershed Plan
Holiday Hills, Village of	Ongoing - A watershed study and plan will be completed when resources become available
Huntley, Village of	Completed - Study performed in the Watershed around the Wing Pointe Townhomes subdivision in 2015.
Island Lake, Village of	Included in the Nine Lakes IEPA-compliant Watershed Plan
Johnsburg, Village of	included in the Boone and Dutch Creeks IEPA-compliant Watershed Plan
Lake-In-The-Hills, Village of	<ul style="list-style-type: none"> <li>• Submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval</li> <li>• Participant in Woods Creek Watershed Action Plan</li> </ul>
Lakemoor, Village of	
Lakewood, Village of	<ul style="list-style-type: none"> <li>• Submitted a draft copy of the Crystal Creek Watershed Plan to the IEPA for approval</li> <li>• Included in the Upper Kishwaukee Creek IEPA-compliant Watershed Plan</li> </ul>
McCullom Lake, Village of	Included in the Boone and Dutch Creeks IEPA-compliant Watershed Plan
McHenry, City of	Included in the Boone and Dutch Creeks and Nippersink Creek IEPA-compliant Watershed Plans
Marengo, City of	Ongoing - A watershed study and plan will be completed when resources become available
Oakwood Hills, Village of	Included in the Silver and Sleepy Hollow Creeks IEPA-compliant Watershed Plan
Port Barrington, Village of	Included in the Silver and Sleepy Hollow Creeks IEPA-compliant Watershed Plan
Prairie Grove, Village of	
Richmond, Village of	Included in the Nippersink Creek IEPA-compliant Watershed Plan
Ringwood, Village of	Included in the Boone and Dutch Creeks and Nippersink Creek IEPA-compliant Watershed Plans
Spring Grove, Village of	Included in the Spring Creek and Nippersink Creek IEPA-compliant Watershed Plans
Trout Valley, Village of	Ongoing - A watershed study and plan will be completed when resources become available
Union, Village of	Ongoing - A watershed study and plan will be completed when resources become available
Wonder Lake, Village of	Included in the Boone and Dutch Creeks and Nippersink Creek IEPA-compliant Watershed Plans
Woodstock, City of	Included in the Boone and Dutch Creeks, Nippersink Creek, and Upper Kishwaukee IEPA-compliant Watershed Plans

**Probing Questions:**

- Confirming McHenry County is the Responsible Entity? If so, which department?
- For the County and/or municipalities with existing inputs, is the text still valid?
- What municipalities supported and/or are included in the Upper Fox River Watershed Plan?
- For all Watershed Plans, are we missing any municipalities that supported and/or are included?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?



**Action Item 5: Expand Stream Gaging Network**

Description	McHenry County should pursue the installation and maintenance of additional stream gages throughout the county. Additional assistance should be sought from the Illinois Department of Natural Resources and the U.S. Geological Survey for funding and technical assistance.
Responsible Entity(s)	<b>McHenry County</b>
Presumed Status	<b>To be determined</b>
What "Blank" Means	Deferred to County – community is supportive of the County's ongoing efforts to install and maintain gages as funding becomes available
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>In 2013, the Division of Transportation added a stream gauge as part of a bridge replacement to a Road Weather Information System (RWIS) over the Piscasaw Creek.</li> <li>Funding is not available on the local, state or federal level at this point to install additional gages throughout the county. Since adoption of the McHenry County Hazard Mitigation Plan in 2010, the county has started cost sharing with the Wonder Lake Homeowners Association for the Nippersink Creek Stream Gage.</li> <li>Previous efforts to secure FEMA mitigation funds for gages were not successful. Additional opportunities for stream gage installation will be explored as funding becomes available.</li> </ul>
Algonquin, Village of	<ul style="list-style-type: none"> <li>Village is interested in adding another gauge on the Fox River</li> <li>Add on in Crystal Creek (near Towne Park) if funding is available; medium priority</li> </ul>
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	Ongoing - Crystal Lake is interested in exploring this action through a partnership with the county (county maintains responsibility). Currently, Crystal Lake performs weekly checks on water levels throughout the city
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Installation of stream gages for Woods Creek at LITH Dam and Crystal Lake at LITH Dam was pursued under IEMA Mitigation Grant funding, but the project was not accepted.
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	

**Action Item 5: Expand Stream Gaging Network**

Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Question:**

- Confirming McHenry County is the Responsible Entity? If so, which department?
- For the County and/or municipalities with existing inputs, is the text still valid?
- For Algonquin, Crystal Lake and LITH, are the projects identified still priorities? If so, what are the perceived barriers?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 6: Stream Maintenance Programs**

Description	The County, municipalities, and townships should develop and implement formal and regular drainage system maintenance programs. This effort should include the inspection of privately maintained drainage facilities. It is understood that each municipality and township will make these considerations based on available staffing and financial resources. Both urban and rural streams are in need of maintenance. Also, bridges and culverts (active or abandoned) that restrict flood flows should be evaluated. The removal or enlargement of stream crossings, in cases where a modification will not cause an increase in downstream flooding, should be considered and funded.
Responsible Entity(s)	McHenry County, municipalities and townships. This can include public works departments, township road districts, McHenry County Division of Transportation, or other appropriate departments or offices.
Presumed Status	Ongoing
What "Blank" Means	Deferred to County – currently there is no formal program in place and funding would be needed for implementation
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>The County has close to fourteen (14) bridges and/or culverts that are currently undergoing some level of design or waiting for IDOT authorization to proceed to design. Among other design elements, the design process will review the hydraulics and roadside safety.</li> <li>McHenry County DOT is collaborating with the Village of Lake in the Hills to provide compensatory storage for the Randall Road project as part of their stream bank and compensatory storage project that they are leading along Woods Creek west of Randall Road. They are replacing existing Woods Creek and Woods Creek Tributary culverts with hydraulic adequate structures. Improving closed and open drainage systems to improve existing conditions and to manage the additional proposed pavement runoff. Raising the roadway above the flood plain. Stabilizing the Woods Creek Tributary along the east side of Randall Road. Placing bio swale treatments at key locations in the corridor.</li> <li>Interested stakeholders are actively researching how to re-activate local drainage districts that have become inactive over the past years. Currently, the County has two active drainage districts and numerous that are inactive.</li> <li>The <b>Stream Sign Project</b> is a collaborative effort between the McHenry County Division of Transportation, McHenry County Department of Planning &amp; Development, and the Environmental Defenders of McHenry County to place informational signage at stream crossings throughout McHenry County. Each sign identifies the name of the stream, as designated by the US Geological Survey, as well as the name of the watershed the stream flows through. All McHenry County streams are part of either the Fox River Watershed or the Kishwaukee River Watershed. A total of 90 signs were installed.</li> <li>Additional grant funding has been acquired to continue this project for select crossings in municipalities and townships.</li> <li>North Glacial Park project</li> <li>Fox River Erosion project at Lyons Prairie Marsh</li> <li>Coon Creek restoration project</li> </ul>

**Action Item 6: Stream Maintenance Programs**

	<ul style="list-style-type: none"> <li>In Progress – as required by the IEPA MS4 Permit, MCDOT completes annual inspections of all ponds, detention/retention facilities, stream channel outfalls, and storm drainage outfalls which fall under the jurisdiction of the MCDOT (road rights-of-way) and County facilities. Each municipality that is part of the MS4 program also should be completing these inspections. Inspections on private property are not being completed at this time and no short term plan is in place to institute this program.</li> </ul>
Algonquin, Village of	<ul style="list-style-type: none"> <li>Dixie Creek Reach Restoration Project to correct the deficiencies called out in the Jelkes Creek watershed plan and will repair two areas flagged as “Critical Areas”: Dixie Creek Reach 3 and White Chapel Detention Basin. The reach 3 project site is 9.2 acres and contains a high-quality fen on the south side of the creek that will be protected and preserved as part of this restoration.</li> <li>Randall Rd. Wetland rehabilitation project</li> <li>Ongoing - There is currently a program in place (maintenance occurs after storms in ordinance public works assists police dept. Weekly check of stream gauges)</li> </ul>
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	Ongoing – The Public Works Department provides drainage system maintenance which includes specific areas of scheduled inspection, cleaning, and rebuilds of its storm sewer system. Repairs and maintenance are also completed upon requests or as needed throughout the entire system. Public Works utilizes a map that identifies specific private and public drainage locations which are periodically inspected. We have started updating our storm system maps into our GIS mapping system to improve the accuracy of our entire storm system.
Fox Lake, Village of	Ongoing - This is a part of their regular operation - weekly, if not biweekly, task for the Public Works Department. When action needs to be undertaken there are organizations that generate revenue specifically for those projects (debris clearing).
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	Ongoing - Every spring the Public Works Department cleans out catch basins, looks for signs in storms sewers and check them as necessary. Clean up of the watershed (ex. Beaver dams are an issue. They have to catch beavers periodically and remove dams. Specifically along Eakin Creek) Check outfalls at least 1 time a year. Inspect the dam in town annually and when there is a half-inch of rainfall.
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	<ul style="list-style-type: none"> <li>McHenry County DOT is collaborating with the Village of Lake in the Hills to provide compensatory storage for the Randall Road project as part of their stream bank and compensatory storage project that they are leading along Woods Creek west of Randall Road. They are replacing existing Woods Creek and Woods Creek Tributary culverts with hydraulic adequate structures.</li> </ul>

**Action Item 6: Stream Maintenance Programs**

	<p>Improving closed and open drainage systems to improve existing conditions and to manage the additional proposed pavement runoff. Raising the roadway above the flood plain. Stabilizing the Woods Creek Tributary along the east side of Randall Road. Placing bio swale treatments at key locations in the corridor.</p> <ul style="list-style-type: none"> <li>• Stream restoration project</li> <li>• Complete - Village maintains an active drainage system inspection and maintenance program meeting the requirements of the CRS</li> </ul>
Lakemoor, Village of	
Lakewood, Village of	In 2022, completed the Turnberry Trunk Sewer Study evaluating whether to increase the capacity of the pump station to improve basement backup protection to properties in The Gates.
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
- Can anyone share more details about the following projects
  - North Glacial Park project (McHenry County Conservation District)
  - Fox River Erosion project at Lyons Prairie Marsh (McHenry County Conservation District)
  - Coon Creek restoration project (McHenry County Conservation District)
  - LITH stream restoration project (LITH)
  - Randall Rd. Wetland rehabilitation project (Algonquin)
- What municipalities have participated in the Stream Sign Project?
- Are there activities under "McHenry County" that were supported by municipalities?
- For McHenry EMA: Additional grant funding is being prioritized for which municipalities?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 7: Prohibited Waterway Dumping Ordinances**

Description	Each community should ensure that they have enforceable stream and wetland dumping ordinances. Regulations should apply to both “objectionable waste” and “non-objectionable” materials such as grass clippings and tree branches. Communities they do not have stream and wetland dumping ordinances should adopt appropriate regulations.
Responsible Entity(s)	McHenry County
Presumed Status	To be determined
What “Blank” Means	Ongoing – A formal ordinance is not known to be in place but community will continue exploration of ordinance development
Justification	
McHenry County	The McHenry County Stormwater Management Ordinance prohibits filling of flood hazard areas. Impacts to wetlands (dumping of materials) would also require a permit. The ordinance does not specifically prohibit the dumping of landscape waste, but the result of the dumping is what the ordinance regulates (filling of flood hazard area or wetland).
Algonquin, Village of	Ongoing - Ordinance in place (Municipal Code 6C.04)
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	Have an ordinance regarding illegal discharge
Crystal Lake, City of	Complete and ongoing - The City’s Illicit Discharge Ordinance in Chapter 595 of the City Code addresses the requirements of this item.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	A formal ordinance is not known to be in place but community will continue exploration of ordinance development. Will also explore implementation in lieu of an ordinance through the building department
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Maintains enforceable dumping ordinances through its Municipal Code.
Lakemoor, Village of	
Lakewood, Village of	Ongoing - They have a dumping ordinance (implemented by the police dept.)
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	Ongoing - An ordinance is in place but needs to be updated for specific dumping actions
Richmond, Village of	We have an ordinance and want to maintain and update
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	

**Action Item 7: Prohibited Waterway Dumping Ordinances**

Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- Confirming McHenry County is the Responsible Entity? If so, which department?
- For the County and/or municipalities with existing inputs, is the text still valid?
- What municipalities have their own ordinance in place?

**Action Item 8: Mitigation of Public Infrastructure**

Description	Mitigation of public infrastructure, including roadways, bridges and culverts, and treatment facilities, for protection from natural hazards should be investigated as the facility or asset is being considered for repair, replacement or expansion. When possible, improvements should incorporate protecting the natural functions of the streams and floodplains, if located in a floodplain
Responsible Entity(s)	McHenry County, municipalities and townships
Presumed Status	Ongoing
What "Blank" Means	Ongoing – Community will continue to identify public infrastructure that needs to be mitigated; in the event of a disaster declaration, structures/infrastructure may sustain damage that require repair and mitigation through public assistance funds.
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>All Division of Transportation structures are inspected dependent on the event.</li> <li>The County is completing repair projects on West Solon and Harmony Road bridges in 2020. Both bridges will improve safety for motorists. Additional to these repair projects, the County has completed maintenance and repairs to the Randall at Miller box culvert and double pipe culverts on Bull Valley Road. Both culvert projects addressed the storage capacities back to their original designed specifications and improved safety and hydraulic capabilities.</li> <li>The Kishwaukee Valley Road culvert west of Il 23 was replaced in late 2021 with a slab bridge. (The new structure has a larger water way opening to accommodate offsite flows from adjacent field tiles and roadway runoff. Additional new features also include bioswales, open cell articulated block, multi-outlet drain tile headwall for the adjacent farmer, wide shoulders, and roadside drop-off protection on the bridge. The open cell articulated block is a pervious replacement option for conventional riprap that, in addition to providing erosion protection, allows vegetation to grow through and doesn't accumulate trash).</li> <li>In 2022, the DOT maintenance staff performed 17 culvert replacements in the County, cleaned 600 catch basins and performed 19 bridge projects.</li> </ul>
Algonquin, Village of	<ul style="list-style-type: none"> <li>Woods Creek box culverts will be expanded/replaced</li> <li>Crystal Creek bridge on Main Street needs to be replaced;</li> <li>Continue open space/wetland restoration and maintenance;</li> <li>Currently working on streetscape program for crystal creek bridge area a (3-5 yrs.) bridge will be replaced;</li> <li>Harper Drive/Multi-Use Trail Project in-progress. Includes tree removal, grading, retaining walls, storm sewer installation, asphalt path, wood boardwalk, and landscape restoration. Completion scheduled mid-2016;</li> <li>Copper Oaks Subdivision and Drainage Improvements project in-progress;</li> <li>Highland Avenue Project - replacement of existing roadway, installation of curb and gutter, storm sewer and detention area, spot sidewalk removal and replacements, resurfacing of Presidential Park parking lot, and construction of a new trail (late 2016);</li> <li>Multiple other road improvements planned (1-10 years); continued identification of public infrastructure that needs to be mitigated; in the event of a disaster declaration, several structures/infrastructure may have sustained damage that require repair and mitigation through public assistance funds.</li> </ul>
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	The City of Crystal Lake continually evaluates the need for mitigation improvements to protect from natural hazards and is in the process of updating the 2007 Flooding Study which identifies and prioritizes areas in need of mitigation improvements



**Action Item 8: Mitigation of Public Infrastructure**

Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Complete - No critical facilities are located in the floodplain. Other hazards are considered during planning for major improvements. In the event of a disaster declaration, several structures/infrastructure may have sustained damage that require repair and mitigation through public assistance funds.
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	<ul style="list-style-type: none"> <li>• Ongoing - Diversions/Channel Improvements planned (lake being dredged 2016 and swale project in progress);</li> <li>• Thompson Road Bridge Replacement - FED;</li> <li>• East Wonder Lake Road Resurface - ARRA;</li> <li>• Thompson Road Watermain Extension - ARRA;</li> <li>• Wonderview Resurfacing - MFT;</li> <li>• Memory Trail Watermain Extension - CDBG;</li> <li>• Highland Shores Water Tower Removal - CDBG;</li> <li>• Other - In the event of a disaster declaration, several structures/infrastructure may have sustained damage that require repair and mitigation through public assistance funds.</li> </ul>
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 9: Continued NFIP Compliance**

Description	Municipalities that participate in the National Flood Insurance Program (NFIP) should ensure that they are in full compliance with the NFIP administration and enforcement requirements. While the McHenry County Planning and Development Department administers the McHenry County Comprehensive Storm water Ordinance for non-certified municipalities, all NFIP municipalities are still ultimately responsible for ensuring that development within the regulatory floodplain meets the NFIP minimum standards.
Responsible Entity(s)	McHenry County Department of Planning and Development and municipal NFIP Administrators.
Presumed Status	Ongoing
What "Blank" Means	Ongoing - Will continue to comply with the NFIP through maintenance and enforcement of the McHenry County Stormwater Management Ordinance.
Justification	
McHenry County	<ul style="list-style-type: none"> <li>As of now, Only 1 community has not joined the NFIP (Oakwood Hills). All other communities (29 total) within McHenry County and the unincorporated areas are NFIP communities.</li> <li>In Progress - The Department of Planning and Development continues to ensure the county is meeting all NFIP requirements. The County is a Class 8 CRS community. As a result, the County must maintain compliance with the NFIP (and CRS requirements).</li> </ul>
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	As of now, the community has not joined the NFIP
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	

**Action Item 9: Continued NFIP Compliance**

Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For McHenry County Planning & Development: confirming the input for McHenry County is accurate?
- Has the County experienced challenges with ensuring NFIP compliance?

**Action Item 10: Repetitive Loss Areas Study**

Description	Repetitive flood loss areas (identified as part of this Plan) should be studied and mitigation alternatives, such as acquisition, elevation or flood proofing, identified and investigated for the structures. The County or municipalities should seek a mitigation planning grant as needed for preparing the repetitive loss areas studies
Responsible Entity(s)	McHenry County Department of Planning and Development with the cooperation of municipalities with properties included in the repetitive loss areas.
Presumed Status	Ongoing
What "Blank" Means	Deferred - Not a CRS Community but does have repetitive loss properties. May be completed in the future if resources become available or part as a county study.
<b>Justification</b>	
McHenry County	In 2021, Planning and Development updated the Repetitive Loss Areas in unincorporated McHenry County as part of the FEMA Community Rating System requirements. The County's 5-year Cycle visit was in 2021 and updated Repetitive Loss data was acquired from FEMA. Additional properties were added to the list and therefore new Repetitive Loss areas were created. Planning and Development is exploring the feasibility and time/resource commitment of creating a Study based on the new data.
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	Ongoing - The City of Crystal Lake continues to educate the homeowners at the one repetitive loss property regarding how to protect themselves and their neighborhood from flood damage. Crystal Lake is a CRS community and has repetitive loss properties so could gain additional CRS credit through a repetitive loss area study done locally or by the county.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Ongoing - LITH repetitive loss properties have been identified and are reminded annually of the threat to their property. LITH is a CRS community and has repetitive loss properties so could gain additional CRS credit through a repetitive loss area study done locally or by the county.
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	

**Action Item 10: Repetitive Loss Areas Study**

Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 11: Identification of Floodplain Structures**

Description	In addition to examining repetitively flood loss areas, a comprehensive list of structures located in the County's floodplains should be developed. Through GIS and examining building footprints, the numbers and types of structures in the floodplain can be determined. The list should include critical facilities that potentially need flood protection.
Responsible Entity(s)	McHenry County Department of Planning and Development and GIS Division.
Presumed Status	Ongoing
What "Blank" Means	Deferred to County - This would likely be completed at the county level; refer to County action status.
<b>Justification</b>	
McHenry County	Planning & Development, with the collaboration of Illinois State Water Survey (ISWS) staff, applied for a FY2022 FEMA FMA grant to complete a Structure-specific Risk Assessment on the lower 10 miles of the Nippersink Creek. The goal of the project is to acquire 1st floor elevations on over 190 structures within the watershed. The data will provide information which can assist in preparing benefit cost analyses and creating a strategic plan for buyouts and mitigation actions.
Algonquin, Village of	Would like to evaluate properties and consider acquiring a couple homes along the Fox River. However, they have done some work to alleviate the issues shoreline; rock retaining walls (cosmetic & structural - Cornish/River Front park). Have identified some structures on GIS including several areas that are identified as having past flooding (complete) and developed an inventory of building footprints
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	Same status as County – Not completed as of the 2016 plan update. Wants to keep as a long term action. Not high priority.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	Completed - Last year someone completed a watershed study that remapped the floodplain showing structures in the floodplain. The community hired a consultant to measure elevation and acquired Elevation Certificates from the property owners. Submitted a LOMA and it was approved (Wing Pointe Townhomes - 2015).
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	

**Action Item 11: Identification of Floodplain Structures**

Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
  - For McHenry: what is the status of the proposed, structure-specific risk assessment on the lower 10 miles of the Nippersink Creek?
- Confirming which municipalities have identified structures in the floodplain?
- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 12: Investigation of Critical Facilities**

Description	An investigation/analysis of the critical facilities mapped in the County's GIS as part of this Plan should be conducted to determine if buildings or facilities are located in hazardous locations (floodplains or otherwise). Additional critical facility data should be collected and added to the GIS layers. Emergency managers should provide input on mapping and data formats that would enhance emergency preparedness, response and recovery in the county. The investigation should also identify critical facilities that should be protected from identified natural hazards.
Responsible Entity(s)	McHenry County, municipalities and townships
Presumed Status	Ongoing
What "Blank" Means	Deferred to County - This would likely be completed at the county level; refer to County action status.
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>As part of the FY2022 FEMA FMA grant application, critical facilities in the Nippersink Creek watershed project scope area are to be surveyed and elevations determined for future risk analyses.</li> <li>Ongoing - As part of this Plan update, a preliminary critical facility investigation was performed using GIS analysis (building points and floodplain). The analysis performed included all identified critical facilities in the county but does not include elevations of the structures. EMA will review and update information on critical facilities within McHenry County. This information will then be utilized by GIS to input a map layer. An analysis will be performed as funding permits.</li> </ul>
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	



**Action Item 12: Investigation of Critical Facilities**

Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
  - For McHenry: what is the status of the Nippersink Creek watershed study?
- Confirming which municipalities have reviewed critical facilities and/or initiated mitigation actions for those facilities?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 13: Critical Facilities Design with Natural Hazards Protection**

Description	Offices responsible for design, construction or permitting critical facilities, including federal, state, county and municipal agencies, and institutions should ensure that the design or modification of critical facilities accounts for all natural hazards and adjacent land uses. Critical facilities in the floodplain should be protected to the 500-year flood event.
Responsible Entity(s)	County, municipal, townships, and federal and state agencies responsible for critical facilities.
Presumed Status	Ongoing
What "Blank Means"	Deferred to County - This would likely be completed at the county level; refer to County action status.
<b>Justification</b>	
McHenry County	The McHenry County Stormwater Management Ordinance does not regulate protection levels for specific types of development (e.g., critical facilities). The Ordinance requires all new structures' first floor elevations be built to two feet above the base flood elevation. In the 2016 update we will look to add information relating to earthquakes and the Executive Order.
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	In Progress - Many of these critical facilities have been identified by the City and incorporated into the Com Ed Joint Operations Center plans for the Crystal Lake service area to restore power as a priority
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	Ongoing/In Progress - Village Hall will be going through renovations.
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	

**Action Item 13: Critical Facilities Design with Natural Hazards Protection**

Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 14: Mitigation of Floodplain Properties (Property Protection Projects)**

Description	Properties that are exposed to flood damage throughout McHenry County should be protected through property protection measures where regional structural projects are not feasible. Property protection measures should include, but not be limited to, acquisition, elevation, or flood proofing. Priority should be given to repetitive loss properties, but all floodplain properties including critical facilities should be included.
Responsible Entity(s)	<b>Municipalities and townships</b>
Presumed Status	Ongoing
What "Blank" Means	Ongoing - As need is determined for property mitigation, pre- and post-disaster funding sources will be explored to implement the project. Disaster funding would be routed through the County: refer to County action status.
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>McHenry Township has an area on the Nippersink Creek that they are interested in. The Stormwater Division has completed the 2018 Hazard Mitigation Program Grant project, which allowed the County to purchase seven structures on 34 parcels in repetitively flooded areas of Burton Township off the Nippersink Creek. All structures have been removed and the properties will stay as open space in perpetuity. Once approved by FEMA and IDNR, the properties will be transferred to MCCD for long term maintenance as open space.</li> <li>The Division is progressing with the 2020 IDNR Hazard Mitigation Program Grant. The grant will allow the County to purchase seven structures on 20 parcels utilizing \$1,459,656 from the Illinois Department of Natural Resources with no local match required. Structures are near the project area of the FEMA HMGP grant and near the Orchard Heights subdivision, off the Fox River, in Nunda Township. Following the demolition of all structures and site stabilization, the properties will be transferred to MCCD and Nunda Township for long term maintenance as open space. To date, four structures have been demolished, two are scheduled for future acquisition, and one structure has declined to proceed.</li> </ul>
Algonquin, Village of	Ongoing - Encourage homeowners to protect properties through education. As need is determined for property mitigation, pre- and post-disaster funding sources will be explored to implement the project
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	<ul style="list-style-type: none"> <li>IEMA-funded flood-prone property acquisition project</li> <li>In 2013, the Village of Cary applied for a grant requesting funding to purchase four flood prone houses at the intersection of Sunset and Crest in Cary. On October 14, 2014, FEMA announced the release of \$971,295 in Hazard Mitigation Grant Program (HMGP) funds to the village of Cary, Ill., for the acquisition and demolition of four residential structures in the floodplain. Following demolition, these properties will be maintained as permanent open space in the community. Through HMGP, FEMA will pay 75 percent of the \$1,295,060 eligible project cost. The remaining 25 percent of the funds, \$323,765, will be</li> </ul>
Crystal Lake, City of	Ongoing – Started in 2021, Crystal Lake initiated the Stormwater Solutions Initiative (funded by an IDNR state reimbursement grant) to alleviate flooding impacting structures/homes and roadway flooding, including acquisition . To date, 18 projects have been implemented.
Fox Lake, Village of	
Fox River Grove, Village of	

**Action Item 14: Mitigation of Floodplain Properties (Property Protection Projects)**

Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	Ongoing - Wing Point Homes are in need of mitigation action. As additional need is determined for property mitigation, pre- and post-disaster funding sources will be explored to implement the project. Disaster funding would be routed through county: refer to county action status.
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	Ongoing - Currently a project leveling on home using back taxes. As additional need is determined for property mitigation, pre- and post-disaster funding sources will be explored to implement the project. Disaster funding would be routed through county: refer to county action status.
Woodstock, City of	

**Probing Questions:**

- Confirming municipalities and townships are the Responsible Entity?
- For the County and/or municipalities with existing inputs, is the text still valid?
- For Cary: can you share more information about the IEMA-funded flood-prone property acquisition project?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

## Group 2 Action Items for Discussion

### Action Item 15: Safe Rooms

Description	The need for additional safe rooms throughout the county should be considered, including safe rooms and sheltering in residences, businesses, critical facilities, health care facilities, and schools. As needs are identified, grant funding should be pursued for the construction of safe rooms.
Responsible Entity(s)	McHenry County, municipalities, and townships
Presumed Status	<b>To be determined</b>
What "Blank" Means	Ongoing - As vulnerability or funding is identified, safe room retrofit or development will be explored: refer to County action status.
Justification	
McHenry County	Ongoing - McHenry County will apply for a Safe Room project within the 2016 updated plan for the Division of Transportation facility. The Department of Planning & Development will review permit applications for safe room developments in unincorporated areas of McHenry County. Neither the Unified Development Ordinance nor the Stormwater Management Ordinance requires the installation of safe rooms. As funding becomes available or vulnerabilities or determined, the retrofit or development of safe rooms will be explored further.
Algonquin, Village of	Ongoing - Emergency medical distribution; Several high schools used for shelters (have set ups for emergency situations); Consider safe rooms in future for senior housing developments (*low priority); as funding becomes available, safe rooms retrofit and development will be considered
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	<ul style="list-style-type: none"> <li>Ongoing/In-progress - Community Development Department has informational flyers available at the front desk regarding safe rooms. Additional information can be accessed at the following web page: <a href="http://www.fema.gov/safe-rooms">www.fema.gov/safe-rooms</a>; <a href="http://www.iccsafe.org">www.iccsafe.org</a>; <a href="http://www.fema.gov/fema-p-361-safe-rooms-tornadoes-and-hurricanes-guidance-community-and-residential-safe-rooms">www.fema.gov/fema-p-361-safe-rooms-tornadoes-and-hurricanes-guidance-community-and-residential-safe-rooms</a></li> <li>Safe room information will be included in a community newsletter sent to all residents. As vulnerability or funding is identified, safe room retrofit or development will be explored: refer to county status.</li> </ul>
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	

**Action Item 15: Safe Rooms**

Prairie Grove, Village of	Ongoing - Police Basement would be a great place for a safe room because it is structurally sound (would need generator), however, funding is needed.
Richmond, Village of	Ongoing - Silver Trees Shelter area for elderly and disabled housing is in place. As additional vulnerability or funding is identified, safe room retrofit or development will be explored: refer to county status.
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?
- Have any municipalities experienced challenges with implementing related projects?

**Action Item 16: Community Rating System Participation**

Description	The CRS recognizes measures for flood protection and flood loss reduction. The four main activity categories include Public Information, Mapping and Regulation, Flood Damage Reduction, and Flood Preparedness. In order to participate in the CRS, a community must complete and submit an application to FEMA. Subsequently, FEMA reviews the community's floodplain management efforts and assigns the appropriate CRS classification based on credit points earned for various activities. A community's classification may change depending on the level of continued floodplain management efforts. Classifications range from 1 to 10 and determine the premium discount for eligible flood insurance policies. All community assignments begin at Class 10 with no premium discount. Communities with a Class 1 designation receive the maximum 45 percent premium discount.
Responsible Entity(s)	<i>McHenry County Department of Planning and Development</i>
Presumed Status	Ongoing
What "Blank" Means	Deferred - Community is not participating at this time and may consider joining later. Further research is needed to determine cost-effectiveness.
<b>Justification</b>	
McHenry County	<a href="#">As of October 2022, unincorporated areas of McHenry County are now a Class 6 rating.</a>
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	<a href="#">As of October 2022, the City of Crystal Lake has a CRS Class 7 rating.</a>
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	<a href="#">As of October 2022, the Village of Huntley has a CRS Class 7 rating.</a>
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	<a href="#">As of October 2022, the Village of Lake in the Hills has a CRS class 7 rating.</a>
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	<a href="#">As of October 2022, the Village of Port Barrington has a CRS Class 7 rating.</a>
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	



**Action Item 16: Community Rating System Participation**

Wonder Lake, Village of	
Woodstock, City of	<a href="#">As of October 2022, The City of Woodstock has rescinded from the program.</a>

**Probing Questions:**

- Confirming the McHenry County of Planning and Development is the responsible entity? Should we also include “with the cooperation of municipalities”?
- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?
- Are other municipalities interested in membership? What are the perceived barriers to entry?

**Action Item 17: Urban Forestry (Participation in Tree City USA)**

Description	McHenry County municipalities that are Tree City USA communities will maintain their status in the nationwide program, and communities that are not in the program will consider joining the program. It is understood that each municipality will make these considerations based on available staffing and financial resources.
Responsible Entity(s)	<b>Municipalities and townships</b>
Presumed Status	Ongoing
What "Blank" Means	Deferred - Community is not participating at this time and may consider joining later. Further research is needed to determine cost-effectiveness.
<b>Justification</b>	
McHenry County	
Algonquin, Village of	Current participant in Tree City USA
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	Current participant in Tree City USA
Crystal Lake, City of	Current participant in Tree City USA
Fox Lake, Village of	
Fox River Grove, Village of	Considering - Already participates in cleanup day annually around Arbor day
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	Current participant in Tree City USA. Awarded the Tree City USA "Growth Award" in 2022 for their projects
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Current participant in Tree City USA
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	Current participant in Tree City USA
Marengo, City of	Current participant in Tree City USA
Oakwood Hills, Village of	
Port Barrington, Village of	Current participant in Tree City USA
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- Confirming the municipalities are the lead entities?
- Are there other relevant activities to report for this Action Item?
- Are other municipalities interested in membership (Fox River Grove)? What are the perceived barriers to entry?

**Action Item 18: Participation in StormReady**

Description	McHenry County, communities and other agencies should consider joining the National Weather Service's (NWS) StormReady program. The StormReady program has been developed to provide community guidelines to improve the timeliness and effectiveness of hazardous weather-related warnings for the public.
Responsible Entity(s)	<i>McHenry County, municipalities, and townships</i>
Presumed Status	Ongoing
What "Blank" Means	Deferred - Community is not participating at this time and may consider joining later. Further research is needed to determine cost-effectiveness.
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>The County, and the Village of Lake in the Hills (member since September 17, 2018) now participate in StormReady, and they should continue their participation.</li> <li>McHenry County was approved by the NWS in 2020, this is the 3rd renewal for the county. The county will be up for renewal in 2024. Most of the paperwork is ready for the 2024 submission to continue in this program.</li> <li>The Division of Transportation installed 15 Storm Ready signs at key entry ways to the County on the County roadways.</li> </ul>
Algonquin, Village of	In-progress - The Village has submitted the application and waiting approval.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	In-progress - The City was approached by McHenry County EMA to consider applying for StormReady status. As an active participant in severe weather preparedness, the City is probably close to being able to obtain this status without much additional effort. We will consider pursuing StormReady status in 2016.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	The County, and the Village of Lake in the Hills (member since September 17, 2018) now participate in StormReady, and they should continue their participation.
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	

**Action Item 18: Participation in StormReady**

Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- Confirming the municipalities and townships are the responsible entities?
- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?
- Are other municipalities interested in membership (Algonquin, Crystal Lake)? What are the perceived barriers to entry?

**Action Item 19: Strengthen Building Codes and Code Enforcement Training**

Description	Communities that have not adopted the International Code series of building codes should do so, and for all communities, future code revisions should be pursued to strengthen new buildings against damage by high winds, tornadoes, hail, and earthquakes. Any code revisions should be consistent with the efforts undertaken by multi-community organizations of building department staff.
Responsible Entity(s)	McHenry County
Presumed Status	Ongoing
What "Blank Means"	Deferred to County – Community will enforce the latest codes adopted by the County
Justification	
McHenry County	The County Board has adopted the 2021 ICC code series and will become effective on January 1, 2023. The revised County's codes reference the 2021 IBC, IRC, IMC, IFC, IFGC, IECC, ISPSC and the 2020 NEC.
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- Confirming McHenry County is the Responsible Agency? Is so, which department?
- Are there other relevant activities to report for this Action Item?

### Action Item 20: Seek Mitigation Grant Funding for Additional Mitigation Planning and Cost Beneficial Projects

Description	The County, municipalities, townships, other agencies and institutions should apply for mitigation grant funding through available IEMA and FEMA programs for mitigation planning and mitigation projects. As required by IEMA and FEMA programs, projects must be cost beneficial. FEMA hazard mitigation funding including PDM, HMGP, FMA and Section 406 of the Stafford Act (for facilities and infrastructure damaged due to a presidentially declared disaster) should be considered.
Responsible Entity(s)	McHenry County EMA
Presumed Status	Ongoing
What "Blank" Means	Ongoing - As mitigation needs arise, we will work with the County to investigate funding sources (FEMA funds would be routed through the county). Funding sources beyond FEMA may also be available including US EPA, US HUD, and US DOT which would also require County partnership.
Justification	
McHenry County	<ul style="list-style-type: none"> <li>The County is interested in continuing to target and purchase additional flood-prone properties, with the financial assistance of state and federal grants. With the use of the Repetitive Loss Area maps and a list of interested property owners, the County can target areas of concern and higher risk for future buyout projects.</li> <li>In Progress - In 2014, the County received a mitigation grant (HMGP) for \$1.1M to acquire 41 separate parcels and demolish approximately fifteen structures in the regulatory floodplain. The County has not completed the project as of the update.</li> <li>McHenry County Division of Transportation, Emergency Management, and the Soil &amp; Water Conservation District have met to discuss possible funding for a Living Snow Fence project. The project would also include the Farm Bureau of McHenry County. The County will continue to pursue future grants for mitigation projects.</li> <li>Remote/regional salt storage project</li> <li>Large underground storm shelter (Hartland)</li> <li>Structure-specific risk assessment on the lower 10 miles of the Nippersink Creek</li> <li>Installing stream gages throughout the County</li> </ul>
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	Flood Mitigation Buyout Program (Sunset and Crest intersection)
Crystal Lake, City of	<ul style="list-style-type: none"> <li>Identify funding for the proposed Re-Establish Crystal Creek project to reestablish where an old creek was to match upstream and downstream in close coordination with the school district. Construction anticipated for 2024/2025.</li> <li>Develop a Reliable Means for Citizens in Crystal Lake to Receive Official Information from the City</li> </ul>
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	

**Action Item 20: Seek Mitigation Grant Funding for Additional Mitigation Planning and Cost Beneficial Projects**

Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other priority projects to report for this Action Item?

**Action Item 21: Implementation of the Water Resources Protection Action Plan**

Description	The County, municipalities and townships should implement the water quality and groundwater protection measures recommended by the “McHenry County Water Resources Protection Action Plan.”
Responsible Entity(s)	McHenry County, municipalities, and townships
Presumed Status	Ongoing
What “Blank” Means	Ongoing – Refer to County action status
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>The County Board adopted the updated 2020 Water Resources Action Plan on Tuesday night (11/17). This was a major accomplishment concluding a two year project that began in the spring of 2019. During the first year of the project, monthly stakeholder meetings were conducted with over 160 persons participating including elected officials, municipal staff, engineers, land use planners, environmental organizations, and representatives of the aggregate industry and others. The Plan will be professionally designed and primarily distributed on-line with a limited number of printed hard copies available.</li> <li>Since the adoption of the revised WRAP, staff continues to work with municipalities to review and adopt the Plan or those portions of the Plan that are appropriate to their communities. Outreach is ongoing with stakeholders across the county. With respect to All Hazards Mitigation, the Plan contains sections and chapters that address climate change, flooding, drought, and protecting ground water resources from contamination.</li> </ul>
Algonquin, Village of	Ongoing - Algonquin has adopted the plan and implemented elements of it.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	Ongoing - Cary has adopted the plan.
Crystal Lake, City of	In Progress - The City continues to review and reference the Water Resources Action Plan (WRAP) that was created by the McHenry County Groundwater Taskforce, which the City Council passed a resolution on May 4, 2010, for that recommendation. The City continues to participate and improve the Municipal Separate Storm Sewer System MS4 program, and this information has been placed on the City’s website for public information. The Crystal Lake Public Works Staff regularly participates on the Northwest Water Planning Alliance (NWPA) technical advisory committee. The goal of this organization is to collaboratively plan for and steward water resources to ensure sustainable water supply through education and outreach and utilize best policies and practices to protect drinking water supplies.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Complete - LITH has adopted a groundwater protection ordinance and actively manages the program.
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	



**Action Item 21: Implementation of the Water Resources Protection Action Plan**

Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
- Are there other relevant activities to report for this Action Item?

**Action Item 23: Property Protection References**

Description	Provide municipal departments, libraries and other interested offices with a list of references on property protection that can be ordered for free from state and federal offices. Include a request that they make the references available for public use. A special effort should be made to identify references on insurance, emergency preparedness and property protection. Also, identify web sites that provide property protection information and provide their addresses to the County and municipal webmasters.
Responsible Entity(s)	<b>McHenry County</b>
Presumed Status	Ongoing
What "Blank" Means	Deferred - Action generally related to CRS but future action, including leveraging of existing county and municipal resources, may be considered as need arises.
<b>Justification</b>	
McHenry County	<ul style="list-style-type: none"> <li>As part of the Planning and Development Department's participation in the FEMA Community Rating System, the County targeted eleven (11) libraries throughout the county and provided them nine FEMA technical guidance manuals. Each manual is searchable in the library's card catalog and may be accessed by the general public.</li> <li>The County's EMA and Planning and Development websites provide information on insurance, emergency preparedness and property protection.</li> </ul>
Algonquin, Village of	Ongoing - There is reference information in the library and the police department lobby.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	<ul style="list-style-type: none"> <li>Ongoing/In-progress - Information is available on the City's website regarding property protection measures for flooding. The City's Flood Study is cataloged in the Crystal Lake Public Library under two references. (REF 368.1 FLO and CRYSTAL LAKE REF 627.4 CRY)</li> <li>The City participates in the ICC Building Safety month campaign in May. A table with relevant material is set up in the main lobby. The materials are available for review or to take home and the materials are changed every week during the campaign.</li> </ul>
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	Family preparedness guide
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	

**Action Item 23: Property Protection References**

Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- Confirming McHenry County is the responsible entity? If so, which department?
- For the County and/or municipalities with existing inputs, is the text still valid?
  - For Huntley: can you share more information about the “family preparedness guide”?
  - Are there other relevant activities to report for this Action Item?
- Any perceived barriers to implementation?

**Action Item 32: Include the McHenry County Natural Hazards Mitigation Plan into Other Plans**

Description	As the county and municipalities develop or revise comprehensive or land use plans, emergency operations plans, and ordinances, the goals and guidelines of this Plan should be incorporated into those efforts.
Responsible Entity(s)	McHenry County Hazard Mitigation Committee and McHenry County EMA.
Presumed Status	Ongoing
What "Blank" Means	Deferred – No recent or planned activities to report
<b>Justification</b>	
McHenry County	<a href="#">McHenry County has incorporated relevant sections and excerpts from this Plan into the recent update to the 2020 Water Resources Action Plan.</a>
Algonquin, Village of	
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	
Crystal Lake, City of	
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	
Island Lake, Village of	
Johnsburg, Village of	
Lake-In-The-Hills, Village of	
Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	

**Probing Questions:**

- Where else have the County or municipalities incorporated the goals and guidelines of this Plan into other plans?
- Who is currently developing new plans or updating existing plans (e.g., McHenry 2023 Strategic Plan, etc.)?
- Any perceived barriers to implementation?

**Group 3 Action Items for Discussion**

**Action Item 24: Warning System for Dunham Township**

Description	Build a warning system for areas in the southwest and southeast sections of Dunham Township.
Responsible Entity(s)	McHenry County, municipalities and Dunham Township
Presumed Status	<i>To be determined</i>
What "Blank" Means	Deferred – No recent or planned activities to report
Justification	
McHenry County	
Dunham, Township of	

**Probing Questions:**

- Are there any updates to report here?
- Any perceived barriers to implementation?

**Action Item 25: Power Outages for the Community of Algonquin**

Description	Need generators for all water and sewer facilities.
Responsible Entity(s)	McHenry County and Algonquin
Presumed Status	<i>To be determined</i>
What "Blank" Means	Deferred – No recent or planned activities to report
Justification	
McHenry County	
Algonquin, Village of	

**Probing Questions:**

- Are there any updates to report here?
- Any perceived barriers to implementation?

**Action Item 26: Replace Main Drain Tiles in Hebron Township**

Description	Hebron Drainage District is 101 years old and the main drain tiles are worn out and need replacement. The District collects taxes but are just enough to make repairs on an annual basis. Large rain events have necessitated many more repairs to the tile lines causing more issues with roads and culverts within the township's 7,000 acres including homes, farms, crops (row crops, veggies, bees, and vineyards).
Responsible Entity(s)	Hebron Township and Drainage District
Presumed Status	<i>To be determined</i>
What "Blank" Means	Deferred – No recent or planned activities to report
Justification	
Hebron, Township of	

**Probing Questions:**

- Are there any updates to report here?
- Any perceived barriers to implementation?

**Action Item 28: Review of Storm Sewers/Drainage System Maintenance for the Village of Richmond**

Description	None
Responsible Entity(s)	Richmond Public Works
Presumed Status	<i>To be determined</i>
What "Blank" Mean	Deferred – No recent or planned activities to report
Justification	
Richmond, Village of	

**Probing Questions:**

- Are there any updates to report here?
- Any perceived barriers to implementation?

**Action Item 29: Outreach Projects (Seminars, Pamphlets, Etc.) in the Village of Richmond Addressing All Hazards**

Description	None
Responsible Entity(s)	Richmond Policy Department
Presumed Status	<i>To be determined</i>
What "Blank" Means	Deferred – No recent or planned activities to report
Justification	
Richmond, Village of	

**Probing Questions:**

- Are there any updates to report here?
- Any perceived barriers to implementation?

**Action Item 30: Develop a Reliable Means for Citizens in Crystal Lake to Receive Official Information from the City**

Description	During severe weather events and post-event restoration, there is a need for developing a reliable means for citizens to receive official information from the City
Responsible Entity(s)	Crystal Lake
Presumed Status	Ongoing
What "Blank" Means	Deferred – No recent or planned activities to report
Justification	
Crystal Lake, City of	<ul style="list-style-type: none"> <li>• Crystal Lake is interested in establishing an Emergency Alert AM radio station to broadcast warnings for AMBER Alerts, School Incidents, Flooding, Industrial Accidents, Terror Threats, Earthquakes, and Tornadoes, etc. <ul style="list-style-type: none"> <li>◦ Still pursuing a funding grant for an AM radio station to use in place of a catastrophic loss of internet communications.</li> </ul> </li> <li>• The City has upgraded its paid service (Nixle) to alert its citizens of hazards and threats.</li> </ul>

**Probing Questions:**

- For Crystal Lake: are there any updates to report here?
- Any perceived barriers to implementation?

**Action Item 31: Remote/Regional Salt Storage for McHenry County (Winter Event Preparedness)**

Description	A study conducted by Marquette University found that, when winter storms turn roads to ice, de-icing them with salt reduces accidents by 88% and injuries by 85%. Road salt also saves money. When snow and ice make roads impassable, it can cost state economies as much as \$700 million a day — losses salt can mitigate.
Responsible Entity(s)	<i>McHenry County</i>
Presumed Status	<i>To be determined</i>
What “Blank” Means	Deferred – No recent or planned activities to report
Justification	
McHenry County	<ul style="list-style-type: none"> <li>Quote from the Salt Institute said that due to previous winter events, the lack of salt storage and/or the availability/deliverability has presented diametric opposition to which public works departments including the Division of Transportation have tried to overcome. Having the ability to immediately access salt has been and continues to be an ongoing issue in McHenry County, which hampers the safety of the transportation roadways within the County.</li> <li>Options for this project are still being evaluated by McHenry County.</li> </ul>

**Probing Questions:**

- Confirming McHenry County is the responsible entity? If so, which department?
- For McHenry Count: are there any updates to report here?
- Any perceived barriers to implementation?

**\*New\* Action Item 33: Funding the Counties Living Snow Fence Project**

Description	None
Responsible Entity(s)	<i>McHenry County</i>
Presumed Status	<i>To be determined</i>
What “Blank” Means	Deferred – No recent or planned activities to report
Justification	
McHenry County	

**Probing Questions:**

- Confirming McHenry County is the responsible entity? If so, which department?
- For McHenry: are there any updates to report here?
- Any perceived barriers to implementation?

**\*New\* Action Item 34: Large Underground Storm Shelter (Hartland)**

Description	None
Responsible Entity(s)	<i>McHenry County</i>
Presumed Status	<i>To be determined</i>
What “Blank” Means	Deferred – No recent or planned activities to report
Justification	
McHenry County	

**Probing Questions:**

- Confirming McHenry County is the responsible entity? If so, which department?
- For McHenry: are there any updates to report here?
- Any perceived barriers to implementation?

**Action Item 22: Development of a Public Information Strategy**

Description	<p>A countywide natural hazards public information strategy should be developed for the use of the County, municipalities, townships and institutions. The strategy should be consistent with the recommended approach for the CRS program. The most important topics to cover are:</p> <ul style="list-style-type: none"> <li>• Safety and emergency protection measures</li> <li>• Protecting your property</li> <li>• Understanding floods:</li> <li>• The most appropriate ways to provide information</li> </ul>
Responsible Entity(s)	McHenry County, municipalities, and townships
Presumed Status	Ongoing
What "Blank" Means	Deferred - Will investigate leveraging resources developed by the County and investigate more formal plans for the future.
Justification	
McHenry County	Ongoing - The Department of Planning and Development has created pamphlets and handouts for flooding, water quality, and water conservation. They are available in our office and online. The documents are also handed out at different seminars and educational activities throughout the county during the year. This will be a main focus in the updated 2016 Plan. The County has a public information officer (PIO) on staff.
Algonquin, Village of	Ongoing - Nixle, village newsletter, utilizes social media for education and notification during emergency.
Barrington Hills, Village of	
Bull Valley, Village of	
Cary, Village of	Ongoing - The Village of Cary elected to use TextCaster as its method to contact residents with pertinent information regarding informational and emergency messaging. Additionally, subscribers can elect to receive severe weather pass-through information from the National Weather Service.
Crystal Lake, City of	Complete/In-progress - For several years the City has produced an emergency preparedness guide. Additional publications from various agencies related to severe weather are available on the City's website for access by the public at any time. The City also provides information related to emergency preparedness several times a year in the City's newsletters.
Fox Lake, Village of	
Fox River Grove, Village of	
Greenwood, Village of	
Harvard, City of	
Hebron, Village of	
Holiday Hills, Village of	
Huntley, Village of	<ul style="list-style-type: none"> <li>• Family preparedness guide</li> <li>• Ongoing - Newsletters that go out, posted on their website and sent out with water bills.</li> </ul>
Island Lake, Village of	Ongoing - Quarterly newsletter that goes out to the citizens that is tailored to the season and provides safety tips. The EMA speaks about safety at public events throughout the year. They are planning to link emergency management information in to the village website.
Johnsburg, Village of	
Lake-In-The-Hills, Village of	Deferred - LITH is willing to work with other County partners to improve the public information strategy. Opportunity to increase CRS credit through additional public information activity.



**Action Item 22: Development of a Public Information Strategy**

Lakemoor, Village of	
Lakewood, Village of	
McCullom Lake, Village of	
McHenry, City of	
Marengo, City of	
Oakwood Hills, Village of	
Port Barrington, Village of	
Prairie Grove, Village of	Deferred - There may be public information gaps. There is no public library; however, hazard information is available at the police station. Will investigate leveraging resources developed by the County and investigate more formal plans for the future.
Richmond, Village of	
Ringwood, Village of	
Spring Grove, Village of	
Trout Valley, Village of	
Union, Village of	
Wonder Lake, Village of	
Woodstock, City of	Ongoing - Will investigate leveraging resources developed by the County and investigate more formal plans for the future. Opportunity to increase CRS credit through additional public information activities.

**Probing Questions:**

- For the County and/or municipalities with existing inputs, is the text still valid?
  - For Huntley: can you share more information about the “family preparedness guide”?
- Are there other relevant activities to report for this Action Item?
- Any perceived barriers to implementation?
- Are any municipalities interested in working with the EMA to develop a County-wide public information strategy?
- Does anyone have communications and stakeholder engagement best practices or ideas to share?

## Full Group Exercise: Validating Mitigation Goals & Guidelines

**Desired Outcome(s):** Reached consensus around the County’s shared mitigation goals and guidelines.

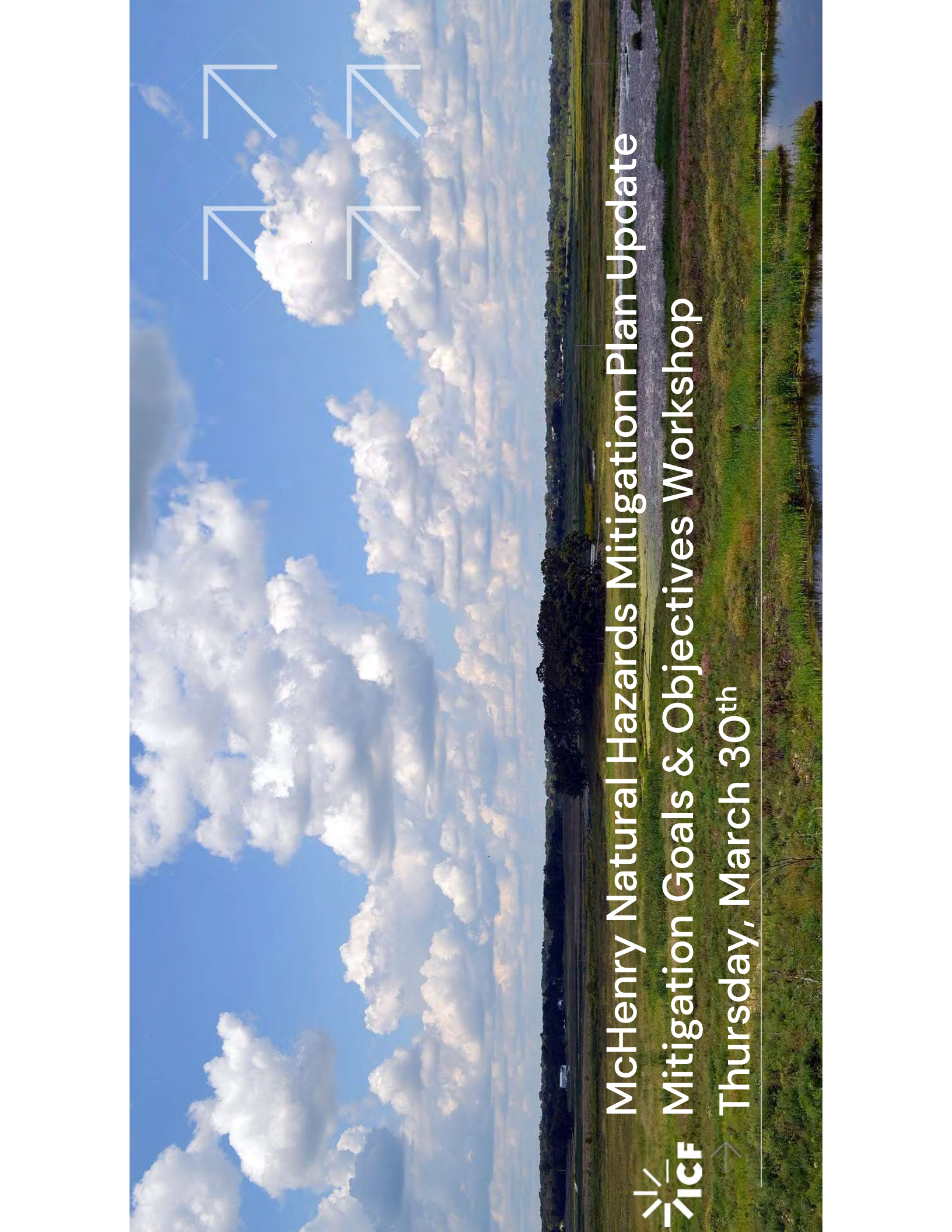
**Timing:** 40 mins

**Instructions:**

1. **Review Goals and Guidelines:** Main facilitator will review the County’s existing Goals and Guidelines from the 2017 Plan (5 mins)
2. **Discussion:** Main facilitator will ask Committee members to share any questions or concerns they have with the existing Goals and Guidelines, including suggested revisions based on the County’s updated risk profile and mitigation commitments (25 mins)
3. **Voting:** Main facilitator will ask Committee members to vote (by show of hands) on the Goals and Guidelines, to include any revisions, for the 2023 Plan update (10 mins)

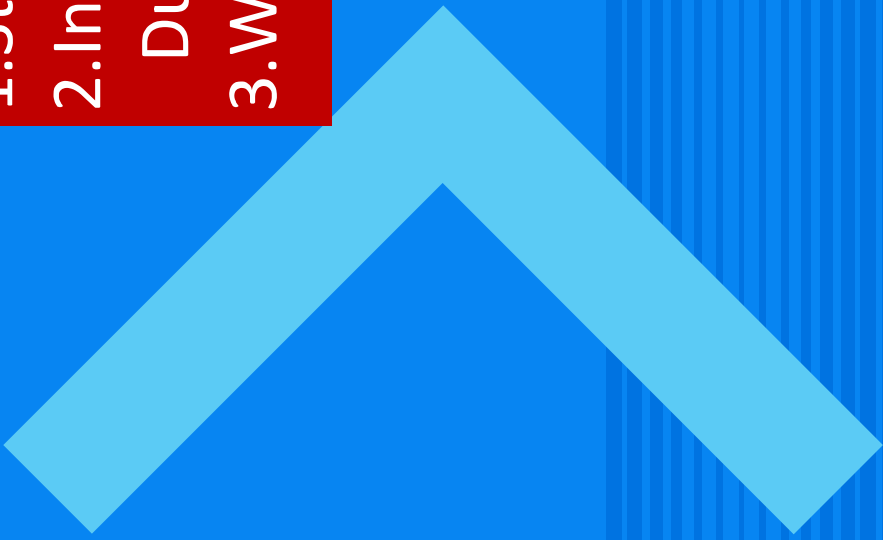
### Existing McHenry County National Hazards Mitigation Goals & Guidelines

<b>Goal 1.</b> Protect the lives, health, and safety of the people of McHenry County from the impact and effects of natural hazards.	<b>Guideline 1.</b> Focus natural hazards mitigation efforts on floods, severe summer and winter storms, tornadoes, extreme cold and heat events, and drought.
<b>Goal 2.</b> Protect public services, utilities and critical facilities from potential damage from natural hazard events.	<b>Guideline 2.</b> Make people aware of the hazards they face and focus mitigation efforts on measures that allow property owners and service providers to help themselves.
<b>Goal 3.</b> Protect historic, cultural, and natural resources from the effects of natural hazards.	<b>Guideline 3.</b> Seek state and federal support for mitigation efforts.
<b>Goal 4.</b> Ensure that new developments do not create new exposures to damage from natural hazards.	<b>Guideline 4.</b> Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural hazards.
<b>Goal 5.</b> Mitigate to protect against economic and transportation losses due to natural hazards.	<b>Guideline 5.</b> Examine equitable approaches for the local cost of mitigation, such as user fees.
<b>Goal 6.</b> Identify specific projects to protect lives and mitigate damage where cost effective and affordable.	<b>Guideline 6.</b> Create and foster public-private partnerships to accomplish mitigation activities.
	<b>Guideline 7.</b> Strive to improve and expand business, transportation and education opportunities in McHenry County in conjunction with planned mitigation efforts.



McHenry Natural Hazards Mitigation Plan Update  
Mitigation Goals & Objectives Workshop  
Thursday, March 30<sup>th</sup>



- 
1. Stand Up
  2. Introduction Yourself: Name, Role and Duty Station/Jurisdiction
  3. What was your **first concert?**

Icebreaker Activity

## Housekeeping

- Please [fill-in the sign-in sheet](#) before you depart, also indicating if you would like continuing education credit for CEM or AEM certifications
- [Create a nametag](#) with your first/last name and duty location (ex. *John Smith, City of Crystal Lake*)
- You should have received a [Workshop packet](#) with information to inform small group discussions
- If you haven't already done so, please [fill-out and sign your Letter of Commitment](#) (last page of your packet)

## Ground Rules

- We cannot solve for everything today, and that's ok
- Keep conversations focused on our objectives
- Give others a chance to be heard
- Most importantly...make new connections!

→ Housekeeping & Ground Rules

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## Today's Meeting Purpose and Objectives

Purpose: gather your input and feedback to ensure a comprehensive understanding of the County's mitigation priorities and barriers to implementation. As a result, the County will be better equipped to define and prioritize multi-jurisdictional mitigation actions for future funding opportunities.

### Objectives:

1. Review and revise the status of the County's current list of Action Items from the 2017 Plan;
2. Identify any barriers to progress across the Action Items that the County may be able to unlock;
3. Identify a set of County-wide mitigation actions to prioritize for near-term funding opportunities; and
4. Reach consensus around the County's shared mitigation goals and guidelines.

## → Agenda

Time (CST)	Topic	Presenter(s)
1:00pm-1:30pm CT (30 mins)	<b>Welcome &amp; Introductions</b> <ul style="list-style-type: none"> <li>• Housekeeping</li> <li>• Agenda Review</li> <li>• Icebreaker Activity</li> </ul>	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)
1:30pm-1:50pm CT (20 mins)	<b>Context Setting</b> <b>Desired Outcome(s):</b> Increased awareness of where we are in the Planning process, including key themes and insights from what's been completed to-date.	Kelli Reddick (ICF)
1:50pm-2:50pm CT (60 mins)	<b>Small Group Exercise: Reaffirming 2017 Action Items</b> <b>Desired Outcome(s):</b> Enhanced understanding of jurisdiction-specific mitigation priorities, projects and barriers, including the status of Action Items from the 2017 Plan.	EMA & ICF Facilitators
2:50pm-3:00pm CT (10 mins)	<b>BREAK</b>	
3:00pm-4:00pm CT (60 mins)	<b>Small Group Exercise: Reaffirming 2017 Action Items (cont.)</b> <b>Desired Outcome(s):</b> Enhanced understanding of jurisdiction-specific mitigation priorities, projects and barriers, including the status of Action Items from the 2017 Plan.	EMA & ICF Facilitators
4:00pm-4:10pm CT (10 mins)	<b>BREAK</b>	
4:10pm-4:50pm CT (40 mins)	<b>Full Group Exercise: Validating Mitigation Goals &amp; Guidelines</b> <b>Desired Outcome(s):</b> Reached consensus around the County's shared mitigation goals and guidelines.	Justin Strickland (ICF)
4:50pm-5:00pm CT (10 mins)	<b>Recap &amp; Adjourn</b> <b>Desired Outcome(s):</b> Equipped participants to share today's results with their managers and colleagues	Bob Ellsworth (EMA), David Christensen (EMA), & Justin Strickland (ICF)

Context Setting



**Purpose:** To develop a long-term strategy for reducing disaster damage, disruption, and repetitive loss impacts.

Having an updated plan....

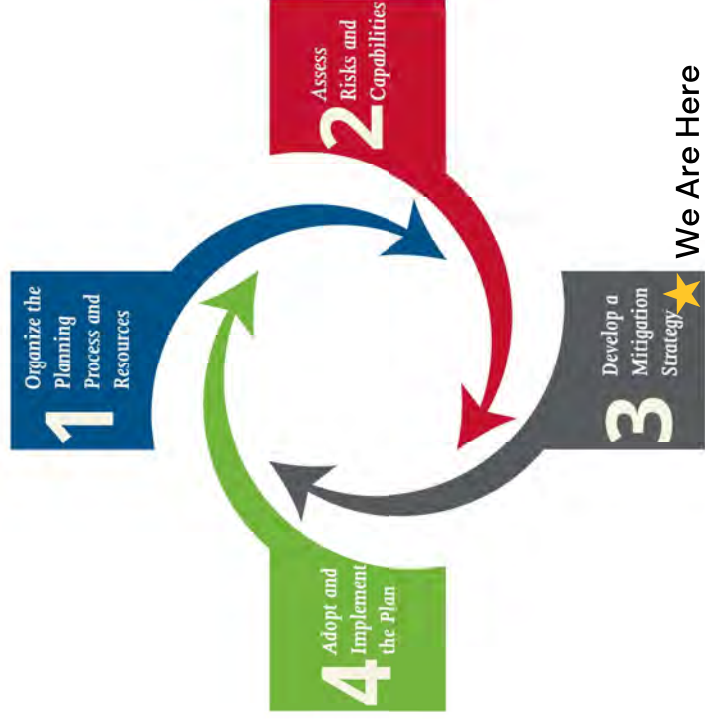
- ✓ Enables access to FEMA Hazard Mitigation Assistance Grants (e.g., HMGP, BRIC, etc.)
- ✓ Increases readiness for subapplication development when funding becomes available
- ✓ Promotes more disaster-resilient and sustainable communities
- ✓ Increases public awareness and understanding of risk
- ✓ Fosters relationships between all levels of government, non-governmental organizations and the private sector
- ✓ Reduces costs associated with disaster response and recovery by promoting mitigation

→ **Why Hazard Mitigation Planning?**





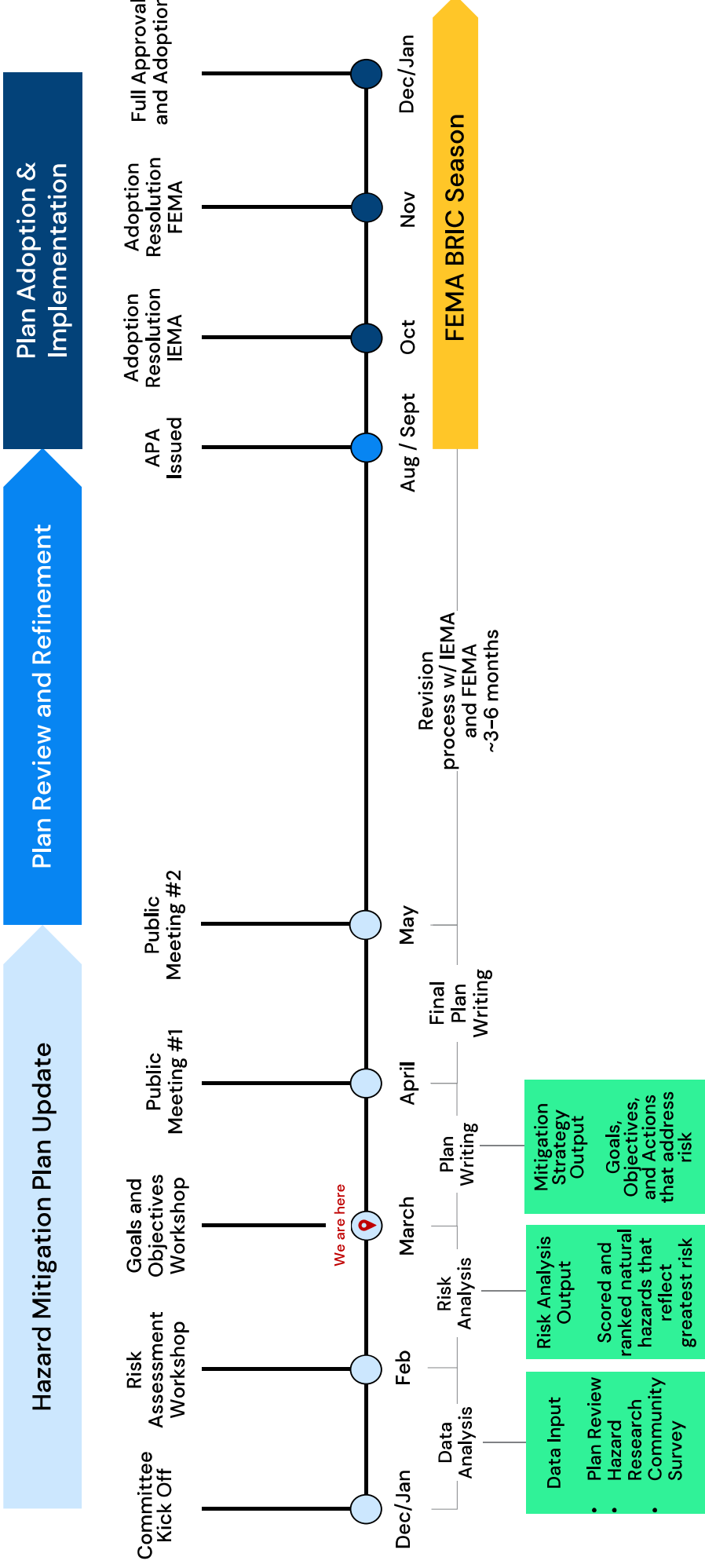
## FEMA Hazard Mitigation Planning Process



## FEMA Local Planning Sections

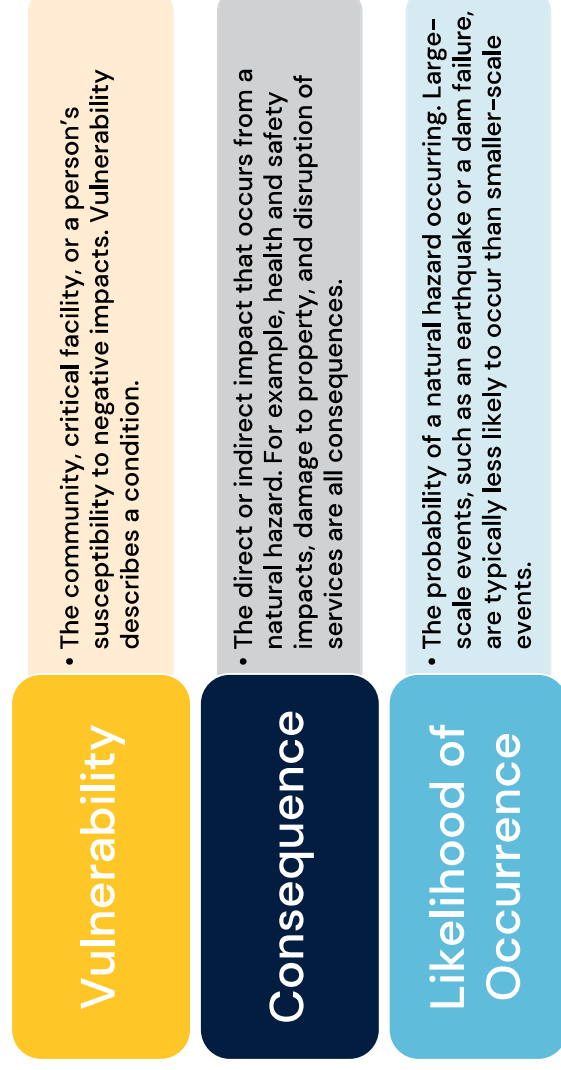
- A. Planning Process
- B. Risk Assessment
- C. Mitigation Strategy
- D. Plan Maintenance
- E. Plan Update
- F. Plan Adoption
- G. High Hazard Dams
- H. Additional State Requirements (Optional)

→ FEMA's HM Planning Process & Local Plan Requirements



➔ **Overall Project Timeline**

1. Review existing risk assessment
2. Integrate our new knowledge of hazards and recent events, the community context, and critical assets
3. Update and score the following criteria:



$$R = V \times C \times T$$

Risk = Vulnerability × Consequence × Threat Likelihood

## → Risk Assessment Approach

Risk Factor	Evaluation Criterion	Assigned Value
Vulnerability (How safe are the areas' Critical Facilities from the impacts of the hazard?)	Little to no vulnerability	1
	Existing mitigation measures and features prevent most impacts	2
	Existing mitigation measures and features prevent few impacts	3
	Existing mitigation measures and features prevent little to no impacts	4
	No mitigation measures or features that prevent any impacts from hazards	5
Potential Consequences to Public Health	No risk to public health	1
	Few injuries/illness are expected	2
	Few fatalities or many injuries/illnesses are expected	3
	Many fatalities should be expected	4
	Widespread fatalities throughout the impact area	5
Potential Consequences to Property (Damage)	No Property damage	1
	Few properties destroyed or damaged	2
	Few destroyed - many damaged	3
	Many destroyed - few damaged	4
	Many properties damaged and destroyed	5

Critical Facilities = buildings, locations, or infrastructure vital to 1) public safety and 2) disaster response and recovery efforts (e.g., police and fire stations, hospitals, electrical substations, etc.)

→ Risk Assessment Score Updates

Hazard	Final Risk Scores			Key Insights
	Vulnerability	Public Health Consequences	Property Damage	
Flooding	3	2	5	<ul style="list-style-type: none"> <li>Major 2017 flood caused widespread damage to homes and infrastructure</li> <li>Southeast of the county has the most exposure due to population's proximity to the river</li> </ul>
Severe Summer Storms	3	3	3	<ul style="list-style-type: none"> <li>Large outdoor events need to plan for evacuation</li> <li>Newer communities are less affected due to building code updates</li> </ul>
Tornado	4	3	3	<ul style="list-style-type: none"> <li>Warning system needs improvement</li> </ul>
Severe Winter Storms	2	2	2	<ul style="list-style-type: none"> <li>Power loss can be a significant impact</li> <li>Hail and debris can damage critical facilities</li> <li>Limited staff for preventative vegetative maintenance</li> </ul>
Extreme Heat	3	3	2	<ul style="list-style-type: none"> <li>Power grid is vulnerable</li> <li>No designated cooling centers</li> </ul>
Drought	4	3	2	<ul style="list-style-type: none"> <li>Wells are not deep enough in some areas</li> <li>Impacts are mostly illness-related</li> <li>Significant agricultural losses expected</li> </ul>
Dam Failure	2	3	3	<ul style="list-style-type: none"> <li>Dams have experienced recent improvements and evacuation plans are in place</li> </ul>

## → Risk Assessment Score Updates

The following hazard scores changed from the 2017 Risk Assessment. (Scores include probability, warning time, and spatial extent).

Updated Risk Scores		
Hazard	Old Score (2017 Risk Assessment)	New Score (2023)
Severe Winter Storm	3.3	3.5
Flood	3.2	3.7
Tornado	3	3.4
Severe Summer Storm	2.9	4.1
Extreme Heat	2.4	3.2
Drought/Groundwater	2.2	3.3
Earthquake	2.1	2.8
Dam Failure	1.5	2.1

Updating the County's new top hazard risks:

1. Severe Summer Storm
2. Flood
3. Severe Winter Storm
4. Tornado
5. Drought/Groundwater
6. Extreme Heat
7. Earthquake
8. Dam Failure

→ Context: New Risk Scores and Justification



- **Severe Summer Storm:** Few mitigation measures in place to prevent impacts, especially in older neighborhoods. Consequence scores increased due to more large outdoor events planned in the County.



- **Flooding:** Experience of more widespread damaging flood events increased consequence score as it relates to property damage.



- **Tornado:** According to the National Weather Service, tornado occurrence is increasing in Illinois. The County's warning system could use improvement.



- **Drought:** Experience with a prolonged drought has increased consequence score to reflect agricultural losses expected.

## → Context: Primary Reason for Increased Risk

## Government

- Fire Stations and Police Departments
- Communications Centers
- Housing Authority
- Schools

## Transportation

- Route 31
- Route 14 and bridge
- Union Prairie Railroad
- Queen Anne Road and Bull Valley road infrastructure

## Utilities

- Water wells
- Water Distribution Centers
- Privately owned water systems
- Wastewater treatment facilities
- Sanitary sewer collection and lift stations
- Communications

## Medical

- Hospitals
- Dialysis centers
- Urgent care sites

## Community Resources

- Community Centers
- Park spaces
- Assisted living and nursing homes
- Libraries
- Homeless shelter
- Churches

## Other

- Towing services
- Scrap yards
- Lowes and Home Depot
- Grocery stores and pharmacies

# → Risk Assessment Workshop Outputs: Critical Facility Dependencies



## Flooding

- Stream maintenance and restoration
- Code enforcement
- Manage open space and mine pits for water collection
- Green infrastructure
- Floodplain buyouts
- Flood study updates

## Tornado

- Safe rooms
- Community-wide emergency alert system

## Extreme Heat

- Designate cooling shelters and explore mobile cooling vehicles
- Invest in sustainable backup power resources for the community: solar farms, microgrids

## Summer Storms

- Utility grid modernization and retrofits
- Roadway elevation and drainage projects
- Emergency alert assessments and warning education for the community

## Winter Storms

- Vegetation management campaign
- Increase shelter accessibility
- Tabletop exercises

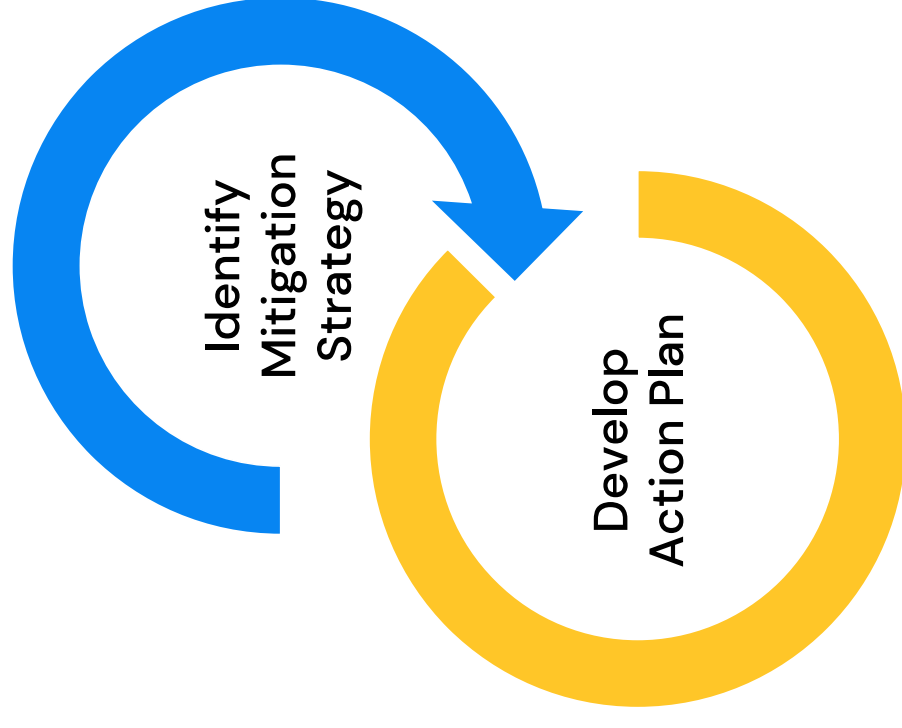
## Drought

- Explore Lake Michigan water allocation
- Explore use of new water reservoirs in old mining pits
- Consistent restrictions for water conservation
- Natural landscaping initiatives

## → Context: Mitigation Actions Brainstorm

Today, we will obtain consensus on the **County's mitigation priorities**, barriers to implementation, and new mitigation activities based on new risk information.

The results of today's workshop will be used to develop a mitigation strategy and action plan for implementation.



→ Context Setting: Purpose of Today's Workshop



# Small Group Exercise: Reaffirming Mitigation Projects, Priorities and Barriers

**Desired Outcome(s):** Enhanced understanding of jurisdiction-specific mitigation priorities, projects and barriers, including the status of Action Items from the 2017 Plan.

**Timing:** 130 mins with short, 10-minute break after 60 mins

**Instructions:**

1. **Everyone will be randomly assigned to 1 of 3 groups (5 mins)**
2. **Action Item Review (2 mins):** Group Facilitators will introduce the first Action Item and give participants a minute to review their municipality's existing information
  - Note: detailed information for each Action Item can be found in your participant packet (pages 2-45)
3. **Small Group Discussion (5 mins):** Group Facilitators will ask probing questions, record the group's inputs on sticky notes and place them on the Flip Chart. Common questions include:
  - For the County and/or municipalities with existing inputs, is the text still valid?
  - Are there other relevant activities to report for this Action Item?
  - What are the real or perceived barriers to implementation?
4. **Group Facilitators will repeat steps 2-3 for all their Action Items (40 mins)**
5. **Rotate to the Next Station:** Participants will rotate clockwise to the next station
6. **Group Facilitators will repeat steps 2-3 for all their Action Items (40 mins)**
  - Note: we will take a short break midway through the 2nd Station
7. **Rotate to the Final Station:** Participants will rotate clockwise to their final station
8. **Group Facilitators will repeat steps #2-3 for all their Action Items (40 mins)**

## → Exercise 1: Instructions

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## List of McHenry County Natural Hazards Mitigation Action Items

Status – Completed (Removed)	Status – Ongoing
<p>Action Item 27: Tornado Siren at Public Works Facility in the Village of Richmond</p>	<p>Action Item 1: Plan Adoption</p> <p>Action Item 2: Continuation of Mitigation Committee</p> <p>Action Item 3: Plan Monitoring and Maintenance</p> <p>Action Item 4: Include the McHenry County Natural Hazards Mitigation Plan into Other Plans</p> <p>Action Item 5: Watershed Studies</p> <p>Action Item 6: Expand Stream Gaging Network</p> <p>Action Item 7: Stream Maintenance Programs</p> <p>Action Item 8: Prohibited Waterway Dumping Ordinances</p> <p>Action Item 9: Mitigation of Public Infrastructure</p> <p>Action Item 10: Continued NFIP Compliance</p> <p>Action Item 11: Repetitive Loss Areas Study</p> <p>Action Item 12: Identification of Floodplain Structures</p> <p>Action Item 13: Investigation of Critical Facilities</p> <p>Action Item 14: Critical Facilities Design with Natural Hazards Protection</p> <p>Action Item 15: Mitigation of Floodplain Properties (Property Protection Projects)</p> <p>Action Item 16: Safe Rooms</p> <p>Action Item 17: Community Rating System Participation</p> <p>Action Item 18: Urban Forestry (Participation in Tree City USA)</p> <p>Action Item 19: Participation in StormReady</p> <p>Action Item 20: Strengthen Building Codes and Code Enforcement Training</p> <p>Action Item 21: Seek Mitigation Grant Funding for Additional Mitigation Planning and Cost Beneficial Projects</p> <p>Action Item 22: Implementation of the Water Resources Protection Action Plan</p> <p>Action Item 23: Development of a Public Information Strategy</p> <p>Action Item 24: Property Protection References</p> <p>Action Item 25: Warning System for Dunham Township</p>



# Exercise 3: Validating Mitigation Goals & Guidelines

Desired Outcome(s): Reached consensus around the County's shared mitigation goals and guidelines

Timing: 30 mins

Instructions:

- 1. Review Goals and Guidelines:** Main facilitator will review the County's existing Goals and Guidelines from the 2017 Plan (5 mins)
- 2. Discussion:** Main facilitator will ask Committee members to share any questions or concerns they have with the existing Goals and Guidelines, including suggested revisions based on the County's updated risk profile and mitigation commitments (15 mins)
- 3. Voting:** Main facilitator will ask Committee members to vote (by show of hands) on the Goals and Guidelines, to include any revisions, for the 2023 Plan update (10 mins)

## → Exercise 3 Directions

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### Existing McHenry County National Hazards Mitigation Goals & Guidelines

<p><b>Goal 1.</b> Protect the lives, health, and safety of the people of McHenry County from the impact and effects of natural hazards.</p> <p><b>Goal 2.</b> Protect public services, utilities and critical facilities from potential damage from natural hazard events.</p>	<p><b>Guideline 1.</b> Focus natural hazards mitigation efforts on floods, severe summer and winter storms, tornadoes, extreme cold and heat events, and drought.</p> <p><b>Guideline 2.</b> Make people aware of the hazards they face and focus mitigation efforts on measures that allow property owners and service providers to help themselves.</p>
<p><b>Goal 3.</b> Protect historic, cultural, and natural resources from the effects of natural hazards.</p> <p><b>Goal 4.</b> Ensure that new developments do not create new exposures to damage from natural hazards.</p>	<p><b>Guideline 3.</b> Seek state and federal support for mitigation efforts.</p> <p><b>Guideline 4.</b> Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural hazards.</p>
<p><b>Goal 5.</b> Mitigate to protect against economic and transportation losses due to natural hazards.</p> <p><b>Goal 6.</b> Identify specific projects to protect lives and mitigate damage where cost effective and affordable.</p>	<p><b>Guideline 5.</b> Examine equitable approaches for the local cost of mitigation, such as user fees.</p> <p><b>Guideline 6.</b> Create and foster public-private partnerships to accomplish mitigation activities.</p> <p><b>Guideline 7.</b> Strive to improve and expand business, transportation and education opportunities in McHenry County in conjunction with planned mitigation efforts.</p>

## → Current Goals & Guidelines

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Wrap-up and Next Steps

### **Friendly Reminder to:**

- Fill-in the sign-in sheet before you depart, also indicating if you would like continuing education credit for CEM or AEM certifications
- Fill-out and sign your Letter of Commitment (if you have not already)

### **Next Steps:**

- We'll be reaching out via survey to collect additional information regarding new projects we've identified today and any community-specific regulations, programs and processes we cannot locate
- Next meeting will be Thursday, April 27<sup>th</sup> (virtual and in-person participation available) to present a Draft Plan update for feedback
  - Note this meeting may be open to the public unless another venue is identified

**Any known, upcoming (April-June) venues that are relevant to this effort and open to the public?**

→ Wrap-Up & Adjourn

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Thank You!



# → McHenry County Mitigation Committee Monthly Meeting

## 2023 Natural Hazards Mitigation Plan Update: Public Meeting #1

Date/Time: Thursday, April 27, 2023, 1:00 pm – 2:30 pm CST

Location: Virtual Only - [Microsoft Teams Link](#)

**\*Note the April and May 2023 Mitigation Committee Meetings are open to the public\***

### Hazard Mitigation Planning Background:

An effort is underway to update the McHenry County [2017 Natural Hazards Mitigation Plan](#) and renew our 5-year eligibility for federal hazard mitigation funding and discounted flood insurance. **Context:** A mitigation plan is how we communicate about the natural hazards that threaten our County, including the extent and severity of those impacts to residents and critical infrastructure, and our collective plans to reduce those threats. Every 5 years our Plan will be updated considering changing circumstances and risks. **Benefits:** A current mitigation plan increases our awareness of hazards, risks and vulnerabilities; identifies actions for risk reduction; and focuses our dollars on the greatest risks while communicating our hazard mitigation priorities to state and federal officials. Financially, approved mitigation plans are a prerequisite for certain kinds of non-emergency disaster assistance, such as Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance projects, including those funded by the \$2.295 billion dollar Building Resilient Infrastructure and Communities (BRIC) program. An approved mitigation plan is also required to reduce flood insurance premiums for residents by sustaining our eligibility National Flood Insurance Program (NFIP) and Community Rating System (CRS) Program participation.

### Today's Meeting Purpose and Objectives:

The **purpose of this meeting is to enhance your awareness and understanding of the County's Natural Hazards Mitigation Plan update and progress to-date, and gather your input and feedback** on the risk assessment results. As a result, the County will be better equipped to prescribe mitigation actions that will meaningfully reduce the impacts of those risks to our communities. To that end, we will use this time to:

1. Introduce FEMA's hazard mitigation planning process and criteria, including how we intend to satisfy those requirements;
2. Review the County's progress to-date, including results of the latest natural hazards risk assessment and key insights from the public survey; and
3. Receive feedback and address any questions from Committee Members and the public to ensure a comprehensive understanding of the County's risk.

### Agenda:

Time (CST)	Topic	Presenter(s)
1:00pm-1:15pm CT (15 mins)	<b>Welcome &amp; Introductions</b> <ul style="list-style-type: none"><li>• Icebreaker Activity</li><li>• Agenda Review</li><li>• Administrative Update</li></ul>	Bob Ellsworth (EMA) & Justin Strickland (ICF)
1:15pm-1:30pm CT (15 mins)	<b>Introduction to Hazard Mitigation Planning</b> <b>Desired Outcome(s):</b> Increased awareness of the FEMA Local Hazard Mitigation Planning Process, including new criteria for 2023 and how the County is satisfying federal requirements	Kelli Reddick (ICF)

<b>Time (CST)</b>	<b>Topic</b>	<b>Presenter(s)</b>
1:30pm-1:45pm CT (15 mins)	<b>Review Public Survey Results</b> <b>Desired Outcome(s):</b> Increased awareness of key themes and insights from the 2023 Natural Hazards Public Survey.	Justin Strickland (ICF) & Olga Brezden (U of Chicago)
1:45pm-2:00pm CT (15 mins)	<b>Review Risk Assessment Results</b> <b>Desired Outcome(s):</b> Increased awareness and understanding of results from the County's latest Risk Assessment, including top hazards and risks to critical infrastructure.	Kelli Reddick (ICF)
2:00pm-2:20pm CT (20 mins)	<b>Public Meeting Q&amp;A</b> <b>Desired Outcome(s):</b> Addressed any outstanding questions or comments regarding the hazard mitigation planning process and schedule, public survey and/or risk assessment.	Justin Strickland (ICF)
2:20pm-2:30pm CT (10 mins)	<b>Recap &amp; Adjourn</b> <b>Desired Outcome(s):</b> Equipped participants to share today's results with their managers and colleagues	Bob Ellsworth (EMA) & Justin Strickland (ICF)

# McHenry County Hazard Mitigation Plan Committee Meeting

**Date/Time:** Thursday, April 27, 2023, from 1:00-2:30pm CT

**Attendees:** a total of 31 participants from the following jurisdictions and organizations:

- McHenry County Emergency Management Agency
- McHenry County Conservation District
- McHenry County Historical Society
- Environmental Defenders of McHenry County
- Kane County Illinois Emergency Management Agency
- Village of Algonquin Public Works
- Village of Bull Valley
- Village of Cary
- City of Crystal Lake
- City of Harvard
- Village of Huntley
- Village of Johnsburg
- Village of Lakewood
- Village of Richmond
- Village of Spring Grove
- City of Woodstock


## Questions & Answers:

- **Q1:** Can you clarify if the projects individual jurisdictions identified during prior Mitigation Committee meetings will be included in the Plan. How will funding be requested/approved for these projects?
  - A: Yes, we are capturing both jurisdictions-specific and County-wide projects as Action Items in the Plan. Also, FEMA requires hazard mitigation plans to identify a potential funding solution for each mitigation action.
- **Q2:** Emergency alert assessments were included as a strategy for summer storms. Are there funding opportunities available for replacing our jurisdiction's emergency alert system?
  - A: Yes, this is one of the priorities in the plan. We have documented emergency alerts as a mitigation strategy in the plan to make it easier when applying for state and federal assistance.
- **Q3:** Why are there so many hurdles regarding floodplain construction and mitigation, when it seemingly scored so low on the risk assessment?
  - A: Those standards and processes are required for the County and most municipalities to participate in the National Flood Insurance Program, which provides flood insurance discounts and mitigation assistance funding for participating jurisdictions.
- **Q4:** Is there an opportunity for villages to raise their priorities via this Plan?
  - A: Yes, participating in this process and public forums (like this meeting) are good opportunities to communicate community-specific priorities to the County. The Planning Team is documenting community capabilities and needs in this Plan to provide greater opportunity for federal and state funding. If you have not been engaged in the Natural Hazards Mitigation Plan Update process, then please contact the McHenry County Emergency Management Agency for more information: [ema@mchenrycountyil.gov](mailto:ema@mchenrycountyil.gov)

## Comments:

- **Comment 1:** There is no mention of upgrading communications in the western portion of the county. Wi-Fi, even phone services, in this area is horrible. I live south of Harvard and my only option is satellite access. Even Verizon and T-Mobile do not offer service in my area. It looks like the only option is satellite access. Even Verizon and T-Mobile do not offer service in my area.
  - **Response:** Public information as well as in enhancing the service area is something that we're prioritizing for future mitigation action, based on the survey feedback in addition to some of what we found through our plan research.
- **Comment 2:** Protection of Sensitive Aquifer Recharge Areas (per SARA map) per Cindy's comment (Cindy's comment: I think it is critical that the topic of aquifer recharge be included as a key issue under drought.)
  - **Response:** Yes, we have received the SARA map and have included this in our assessment of the County's risk.
- **Comment 3:** From the intro of what FEMA is looking for, I think a policy of resilient and sustainable communities should be the priority of the plan as they are an investment in reducing risk. We need to think holistically. For example, eligible projects such as stormwater improvements and stream restoration should not focus on better drainage. They should focus on reconnecting floodplains (where possible) and restoring wetlands that hold water and allow it to soak into the ground. This is a holistic solution that addresses both the flooding and aquifer recharge issue that is critical to our water supply.
  - **Response:** What happens at the local level is critical. Also, FEMA and other federal entities are prioritizing funding for nature-based solutions.
- **Comment 4:** Addressing issues regarding an add-on to a building in Union that is in a floodplain and ways to mitigate these flooding issues while still being able to expand the areas in the floodplain.
  - **Response:** Union has specific standards for floodplain regulations, such as the 50% threshold requirement. Check with your local officials for jurisdiction-specific regulations. We did look at facility expansion as part of our review and the effort is being included in the plan, which will create a simpler process for procuring state and federal funding.
- **Comment 6:** You have to see development and building in two scopes - 1. Site/Civil 5' and Out and 2. Building - 5' and Up. There are mitigations in place, but if development doesn't want to construct basin with hard storm sewers to mitigate, then natural lateral transfer/sheer and open ditch and culverts with slope pitch takes large scopes of land.

Please use the chat to tell us which  
municipality, township or  
unincorporated community you are  
joining us from today!

 McHenry Natural Hazards Mitigation Plan Update  
April Committee & Public Meeting  
Thursday, April 27<sup>th</sup>



This meeting is being recorded  and will be made available to the public, so please:

✓ Keep your microphones muted  at all times

✓ Use the chat box throughout to ask questions or comment on the information being shared



Please note there will be dedicated time for Q&A at the end of today's presentations

✓ During today's Q&A, if you would like to speak, please use the "raise your hand" feature in Teams



✓ When speaking, please speak clearly and loudly 

## → Housekeeping: Ground Rules

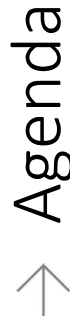
## Today's Meeting Purpose and Objectives

**Purpose:** Enhance your awareness and understanding of the County's Natural Hazards Mitigation Plan update and progress to-date and gather your input and feedback on the risk assessment results. As a result, the County will be better equipped to prescribe mitigation actions that will meaningfully reduce the impacts of those risks to your communities.

### Objectives:

1. Introduce FEMA's hazard mitigation planning process and criteria, including how we intend to satisfy those requirements;
2. Review the County's progress to-date, including results of the latest natural hazards risk assessment and key insights from the public survey; and
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Agenda

**Natural Hazards = Environmental phenomena that have the potential to impact societies and the human environment**

**Mitigation = The effort taken to reduce the loss of life and property by lessening the impact of disaster events**

**Resilience = The capacity of individuals, communities, businesses, institutions, and governments to adapt to changing conditions and prepare for, withstand, and rapidly recover from disaster events**

→ **Key Definitions**

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# Introduction to Hazard Mitigation Planning

**Purpose:** To develop a long-term strategy for reducing disaster damage, disruption, and repetitive loss impacts.

Having an updated plan....

- ✓ Enables access to FEMA Hazard Mitigation Assistance Grants (e.g., HMGP, BRIC, etc.)
- ✓ Increases readiness for subapplication development when funding becomes available
- ✓ Promotes more disaster-resilient and sustainable communities
- ✓ Increases public awareness and understanding of risk
- ✓ Fosters relationships between all levels of government, non-governmental organizations and the private sector
- ✓ Reduces costs associated with disaster response and recovery by promoting mitigation

→ **Why Hazard Mitigation Planning?**



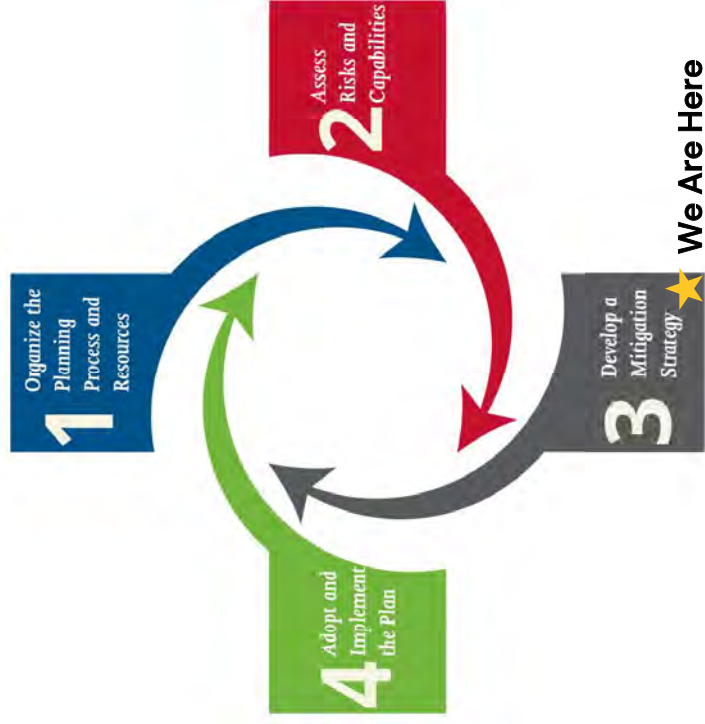


- > Flood Protection / Retrofits
- > Property Elevations
- > Stormwater Improvements
- > Stream Restoration
- > Erosion Control
- > Aquifer Storage & Recovery
- > Microgrids
- > Enhanced Building Codes
- > Emergency Power Generation
- > Winter Storm Electrical Hardening
- > Acquisition & Demolition
- > Seismic Retrofit
- > Wind Retrofit
- > Saferooms/Shelters
- > Wildfire Mitigation
- > Utility Hardening

## → Example Hazard Mitigation Projects

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## FEMA Hazard Mitigation Planning Process



## FEMA Local Planning Sections

- A. Planning Process
- B. Risk Assessment
- C. Mitigation Strategy
- D. Plan Maintenance
- E. Plan Update
- F. Plan Adoption
- G. High Hazard Dams
- H. Additional State Requirements (Optional)

## → FEMA's HM Planning Process & Local Plan Requirements

## Federal Emergency Management Agency

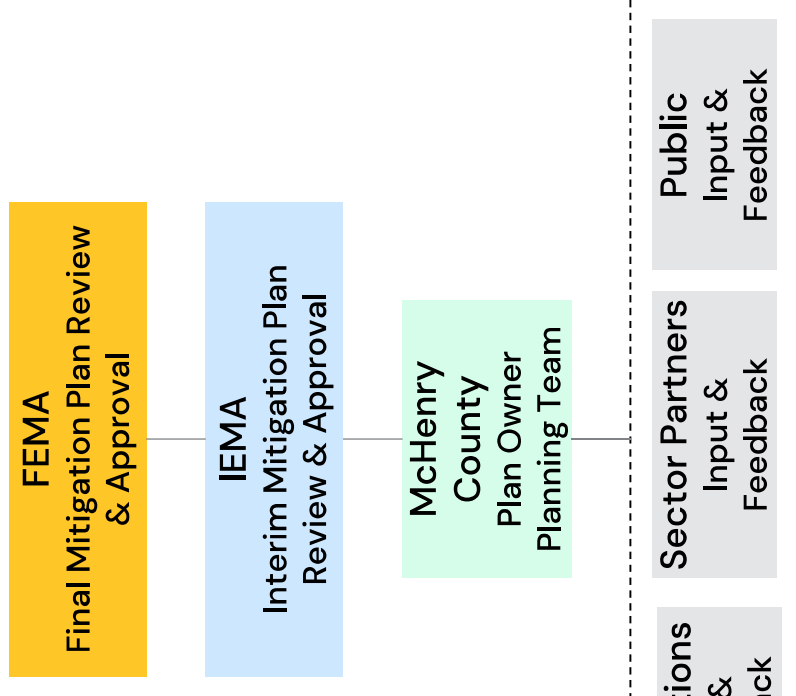
- Reviews and approves final plan

## Illinois Emergency Management Agency

- Reviews and approves final draft plan

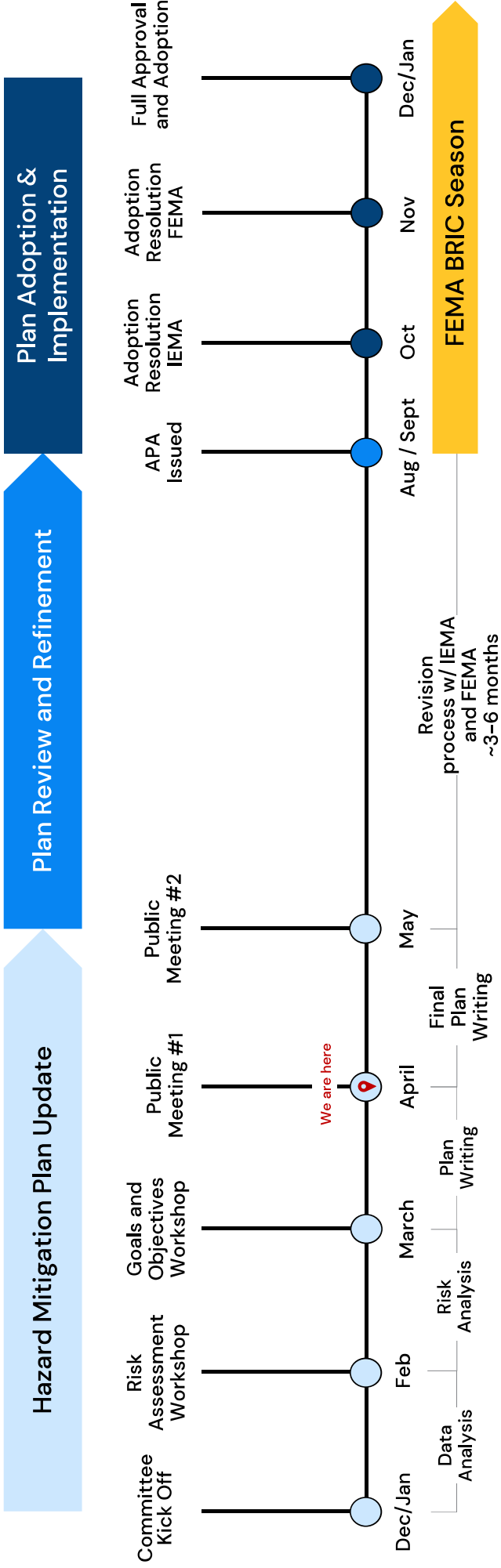
## McHenry County

- Develops plan to meet FEMA criteria
- Coordinates submission and adoption with local jurisdictions
- Provides subject matter expertise
- Engages the public, local officials and sector partners for feedback



## → Organizational Roles and Responsibilities





## ➔ Overall Project Timeline

# 2023 Natural Hazards Public Survey Results



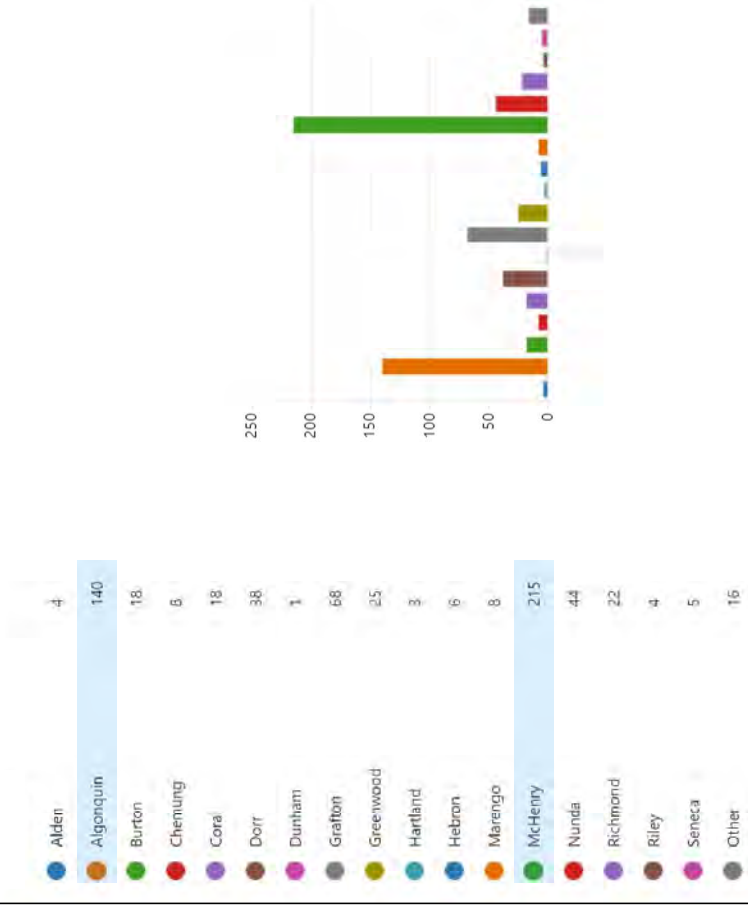
- From February 1 to March 31, 2023, McHenry County solicited broad input via an online survey to understand public perceptions of natural hazards risk, resilience priorities and preferred means of communication
- The survey was distributed via the McHenry County website, social media channels (e.g., Facebook, Twitter, Nextdoor, etc.), and electronic newsletters. Some municipalities also publicized the survey on their websites and newsletters
- The survey garnered **643 total responses**, an increase of approximately 450 respondents since the 2017 Plan update!

## → 2023 Public Survey Approach

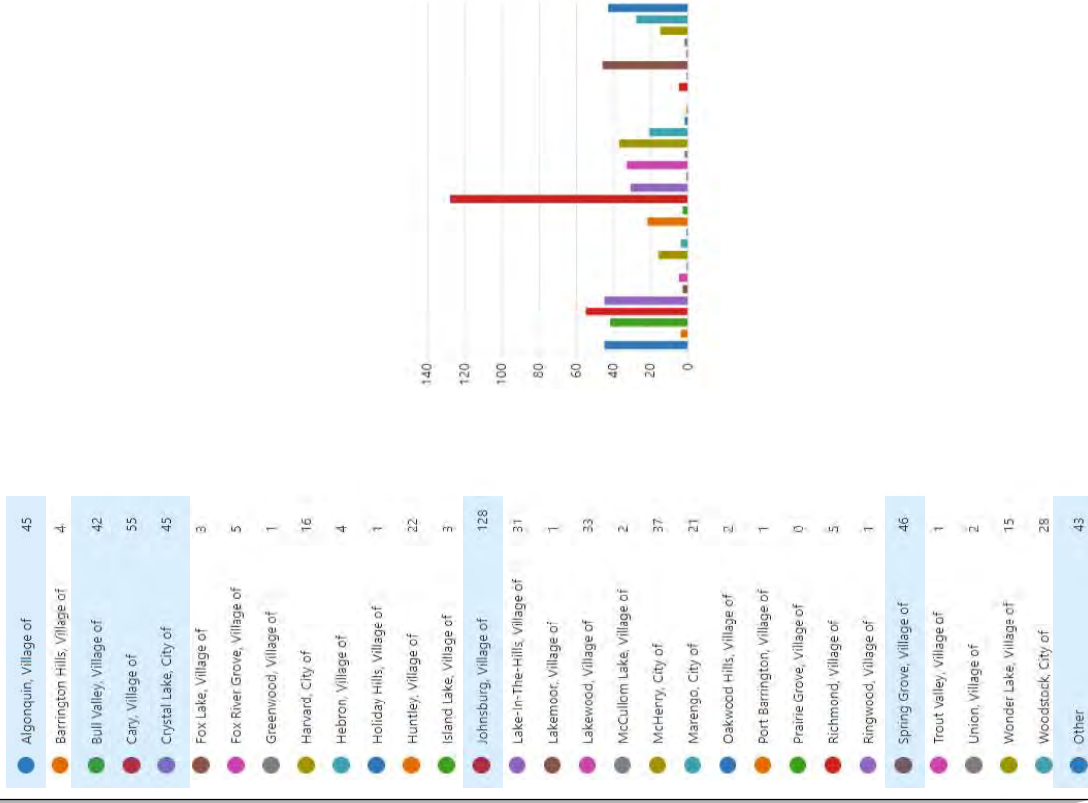


## Distribution of Respondents Across the County

1. What township do you live in?



2. What incorporated jurisdiction do you live in?



## → 2023 Public Survey Results

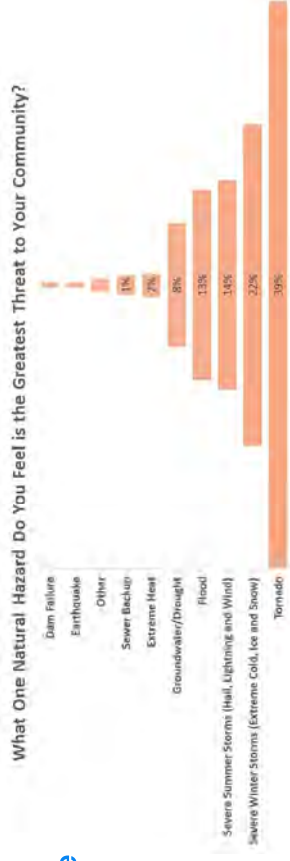
## Key Insights for the Risk Assessment

### Lived Experience

- 54% of respondents (348) have “experienced” a natural disaster event in McHenry County
- Of those, an overwhelming majority experienced Severe Winter and Summer Storms

### Perception of Risk

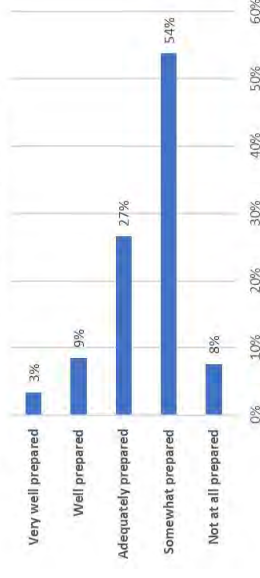
- Tornados were perceived as the #1 threat to community (40%), despite only 12% of respondents having “experienced” one in McHenry County
- The next closest perceived threats were Severe Winter Storms (Extreme Cold, Ice and Snow), Flooding and Severe Summer Storms (Hail, Lightning and Wind)



### Level of Preparedness

- 70% of respondents (445) feel their community is doing a Good or Fair job at making them aware of their natural hazards risk, however...
  - 54% of respondents (346) only feel Somewhat Prepared for natural hazards likely to occur in McHenry County
  - 77% of respondents (497) do not know who to contact to learn more about natural hazards risks in their community
  - 77% of respondents (495) do not have flood insurance as a result of not living in a floodplain and/or their homes were elevated to mitigate flooding impacts
- That said, 72% (465) of respondents confirmed they are interested in making their homes more resistant to the impacts of natural hazards

### How Prepared to You Feel for Natural Hazards Likely to Occur Within McHenry County



➔ **Public Survey Results (cont.)**

## Key Insights for the Risk Assessment

### Priorities & Preferences:

- More than 80% of respondents feel its Very Important for the to County prioritize protecting lives, critical facilities, utilities and emergency services when planning for natural hazards
- Overwhelmingly, Email (40%) and Text (25%) are the preferred method for receiving information about natural hazards, followed by information on County or Community websites (12%)

The most popular ideas for mitigation projects were:

- Conducting scenario-based exercises to test emergency response procedures in the event of a natural disaster event
- Establishing a volunteer network (i.e., community emergency response team) to support local post-disaster recovery efforts
- Improving digital communication (e.g., Nixle/text, social media, etc.) to enhance accessibility and the speed with which people receive information about natural hazards preparedness and emergency response
- Increasing investment in water and land-based conservation efforts

Finally, the most common piece of “Other” feedback received was from residents requesting more information on natural hazards preparedness and emergency operations procedures, so they’re better equipped when disaster strikes

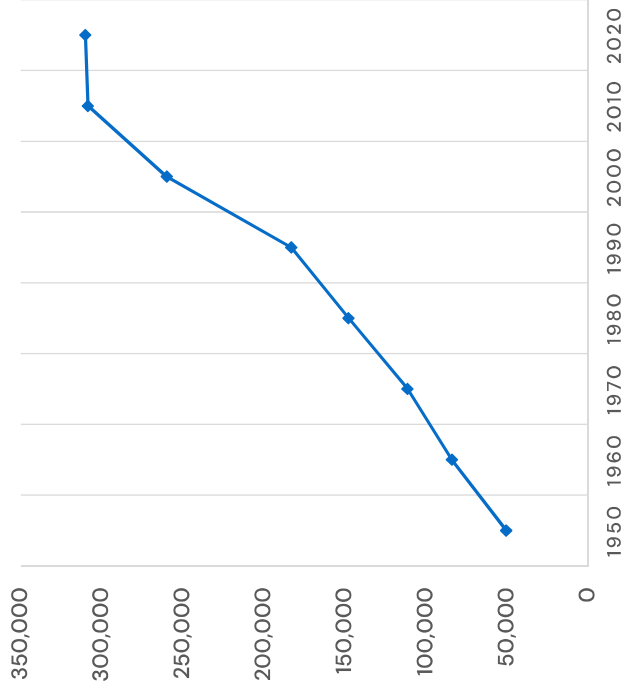
→ **Public Survey Results (cont.)**

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# 2023 Risk Assessment & Results



## MCHENRY COUNTY POPULATION OVER TIME



**310,229**

Residents in McHenry County. This is a 0.9% increase from the 2017 HMP. CMAP projects that the population may grow to 374,989 by 2030 and 478,639 by 2050.

**69.5%**

Of employed residents work outside the County. This represents a 13% increase from 2013. There are a total of 85,811 jobs available in McHenry County. Manufacturing and retail trade industries are the largest employment sectors.

**60.6%**

Of land in McHenry County is agricultural. While ag land conversion has been less than 1% since 2009, significant acreage of farmland may be developed by 2040. 18% of the County's land use is considered environmentally sensitive.

**4,000+**

Housing units have been built since 2010. The housing stock is primarily owner-occupied, single-family homes.

## McHenry County's Community Profile



Presidential disaster declarations are rare for McHenry County.

## 2017 Fox River Flood

Approximately 800 homes were affected by flooding. The Fox River reached record levels of nearly 3 feet above the river's flood stage.

**Natural Hazard**  
**Updates**



## 7 hail incidents

Have been reported by NOAA in the McHenry County region since 2017. Some reports were rather large hail – quarter to golf ball size, 2.5” diameters.

## 23 severe storms & wind

These events cause trees to fall, debris causes damage, and power lines are likely affected. Four events in 2021 affected nearly all areas of McHenry County.

## 3 homes damaged

By lightning strikes in 2018. Two structures burned in Coral and Huntley.

## 2-year drought

Northern Illinois experienced historic drought between 2021 and 2022. Although the drought is over, longer-term concerns for aquifer recharge and groundwater availability remain.

Hazard	Hazard Mitigation Plan	THIRA
Flood	X	X
Severe Summer Storms	X	X
Severe Winter Storms and Extreme Cold	X	
Tornado	X	X
Extreme Heat	X	
Drought & Groundwater	X	X
Earthquake	X	
Dam Failure	X	
Cyber Attack		X
Pandemic		X
Utility Disruption		X
Armed Assault		X
Space Weather		X
Hazardous Materials Release		X
Transportation Accident		X

The Planning Team elected to maintain the Hazard Mitigation Plan as an assessment and strategy to address natural hazards in McHenry County.

## → Validation of Natural Hazards

1. Review existing risk assessment
2. Integrate our new knowledge of **hazards and recent events, the community context, and critical assets**
3. Update and score the following criteria:



$$R = V \times C \times T$$

$$\text{Risk} = \text{Vulnerability} \times \text{Consequence} \times \text{Threat Likelihood}$$

## → Risk Assessment Approach

The 2023 Plan Update will incorporate the following risk factors:

Risk Factor	Evaluation Criterion	Assigned Value
Spatial Extent	Negligible to None (limited to one specific area)	1
	Small (between 10 and 50 square miles)	2
	Moderate (between 50 and 100 square miles)	3
	Large (between 100 and 250 square miles)	4
	Countywide (greater than 250 square miles)	5
Probability of Occurrence (Likelihood)	Unknown but rare occurrence	1
	Unknown but anticipate an occurrence	2
	100 years or fewer occurrence	3
	25 years or fewer occurrence	4
	Once a year or more occurrence	5
Vulnerability (Community or asset characteristics that determine susceptibility to hazards)	Little to no vulnerability	1
	Existing mitigation measures and features prevent most impacts	2
	Existing mitigation measures and features prevent few impacts	3
	Existing mitigation measures and features prevent little to no impacts	4
	No mitigation measures or features that prevent any impacts from hazards	5
Public Health Consequences	No risk to public health	1
	Few injuries/illness are expected	2
	Few fatalities or many injuries/illnesses are expected	3
	Many fatalities should be expected	4
	Widespread fatalities throughout the impact area	5
Consequences to Property (Damage)	No Property damage	1
	Few properties destroyed or damaged	2
	Few destroyed - many damaged	3
	Many destroyed - few damaged	4
	Many properties damaged and destroyed	5
Warning Time	More than 24 hours of advance notice	1
	Between 12 and 24 hours of advance notice	2
	Between 6 and 12 hours of advance notice	3
	Between 1 and 6 hours of advance notice	4
	Less than 1 hour of advance notice	5

→ **McHenry County Risk Scoring**

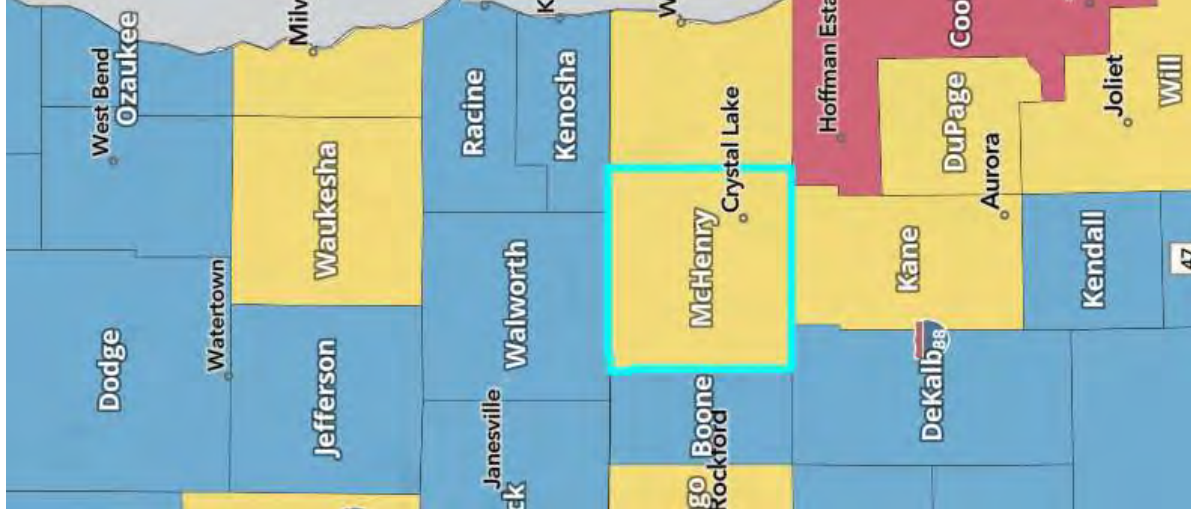
## FEMA's National Risk Index for McHenry County, IL

### Relatively Moderate Risk

McHenry County has a risk score of 85.71 according to FEMA. This is compared to an IL average of 91.20. Risk is determined by loss, social vulnerability, and community resilience.

### Moderate Annual Loss

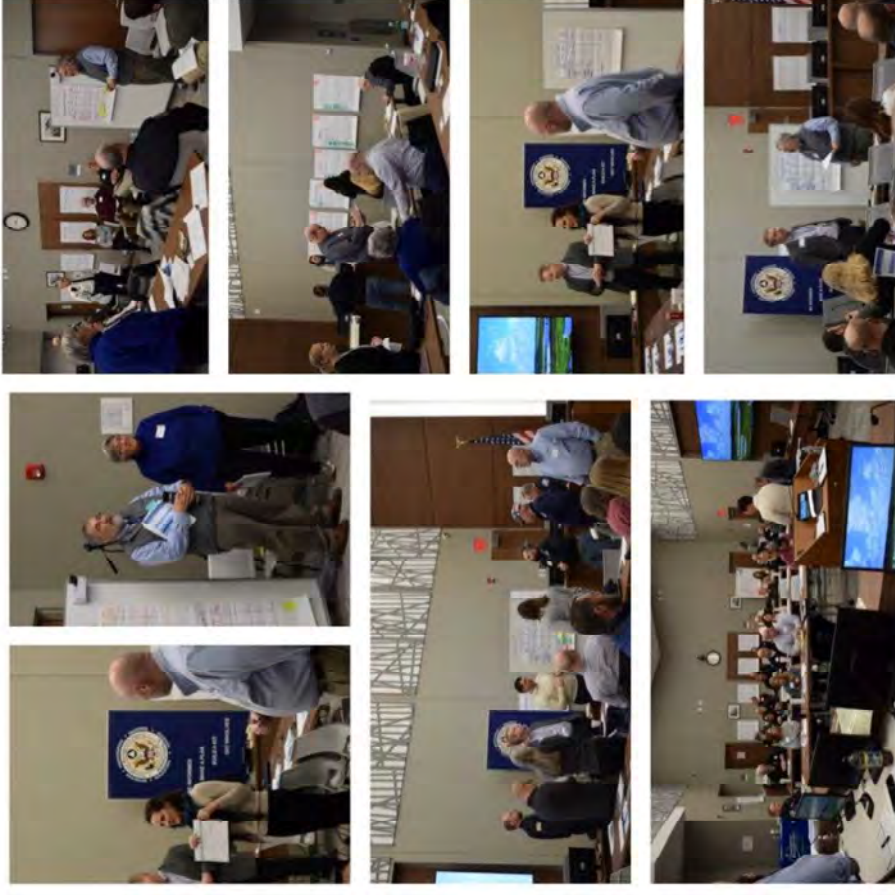
McHenry County has an annual loss score of 87.56. Cold Waves, lightning, strong winds, and tornadoes have the highest projected loss.



$$\text{FEMA's Risk Index} = (\text{Expected Annual Loss} \times \text{Social Vulnerability}) / \text{Community Resilience}$$

Hazard Type	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Score
Tornado	\$21,579,079	Very Low	Very High	0.91	\$19,490,840	97.1
Cold Wave	\$2,396,547	Very Low	Very High	0.91	\$2,188,278	97.4
Strong Wind	\$1,945,266	Very Low	Very High	0.91	\$1,767,008	90.2
Riverine Flooding	\$1,406,968	Very Low	Very High	0.91	\$1,288,893	72.5
Heat Wave	\$1,320,394	Very Low	Very High	0.91	\$1,201,103	90.8
Lightning	\$901,067	Very Low	Very High	0.91	\$815,976	92.4
Earthquake	\$774,437	Very Low	Very High	0.91	\$710,835	75.5
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Tsunami	--	Very Low	Very High	0.91	--	--
Volcanic Activity	--	Very Low	Very High	0.91	--	--

- In February 2023, the Mitigation Committee gathered in Cary Village Hall to review and discuss interim risk assessment results and identify shared risks between municipalities, townships and with neighboring counties
- Despite the severe winter storm conditions, the County Administrator and over 40 representatives from the County, municipalities and townships participated in-person (including a few junior emergency managers that were let out of school early due to the weather)



→ **2023 Risk Assessment Workshop**

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The following hazard scores changed from the 2017 Risk Assessment. (Scores include probability, warning time, and spatial extent).

Updated Risk Scores		
Hazard	Old Score (2017 Risk Assessment)	New Score (2023)
Severe Winter Storm	3.3	3.5
Flood	3.2	3.9
Tornado	3	3.4
Severe Summer Storm	2.9	4.1
Extreme Heat	2.4	3.4
Drought/Groundwater	2.2	3.3
Earthquake	2.1	2.8
Dam Failure	1.5	2.1

Updating the County's new top hazard risks:

1. Severe Summer Storm
2. Flood
3. Severe Winter Storm
4. Tornado
5. Extreme Heat
6. Drought/Groundwater
7. Earthquake
8. Dam Failure

→ **New Risk Scores and Justification**



- **Severe Summer Storm:** Few mitigation measures in place to prevent impacts, especially in older neighborhoods. Consequence scores increased due to more large outdoor events planned in the County.



- **Flooding:** Major 2017 flood caused widespread damage to homes and infrastructure. Southeast of the county has the most exposure due to population's proximity to the river



- **Tornado:** According to the National Weather Service, tornado occurrence is increasing in Illinois. The County's warning system could use improvement.



- **Drought:** Experience with a prolonged drought has increased consequence score to reflect agricultural losses expected.

## → Primary Reason for Risk Updates



## Government

- Fire Stations and Police Departments
- Communications Centers
- Housing Authority
- Schools

## Transportation

- Route 31
- Route 14 and bridge
- Union Pacific Railroad
- Queen Anne Road and Bull Valley road infrastructure

## Utilities

- Water wells
- Water Distribution Centers
- Privately owned water systems
- Wastewater treatment facilities
- Sanitary sewer collection and lift stations
- Communications

## Medical

- Hospitals
- Dialysis centers
- Urgent care sites

## Community Resources

- Community Centers
- Park spaces
- Assisted living and nursing homes
- Libraries
- Homeless shelter
- Churches

## Other

- Towing services
- Scrap yards
- Lowes and Home Depot
- Grocery stores and pharmacies



# Risk Assessment Workshop Outputs: Critical Facility Dependencies

## Flooding

- Stream maintenance and restoration
- Code enforcement
- Manage open space and mine pits for water collection
- Green infrastructure
- Floodplain buyouts
- Flood study updates

## Tornado

- Safe rooms
- Community-wide emergency alert system

## Extreme Heat

- Designate cooling shelters and explore mobile cooling vehicles
- Invest in sustainable backup power resources for the community: solar farms, microgrids

## Summer Storms

- Utility grid modernization and retrofits
- Roadway elevation and drainage projects
- Emergency alert assessments and warning education for the community

## Winter Storms


- Vegetation management campaign
- Increase shelter accessibility
- Tabletop exercises

## Drought

- Explore Lake Michigan water allocation
- Explore use of new water reservoirs in old mining pits
- Consistent restrictions for water conservation
- Natural landscaping initiatives



## Context: Mitigation Actions Brainstorm



Please use the Chat or the “Raise your Hand” feature to ask a question or provide a comment and the ICF team will answer questions and/or unmute participants in the order they are received

Public Meeting Q&A



Recap & Adjourn

## Friendly Reminders:

- If you are participating from a township or unincorporated community and want to get involved in the planning process, please let us know now via the chat or email [ema@mchenrycountyil.gov](mailto:ema@mchenrycountyil.gov) after today's meeting
- If you are a Mitigation Committee representative that has not yet filled out a Letter of Support, please drop your email in the chat now and we'll send you a blank form

## Next Steps:

- For Mitigation Committee members, the ICF team will be reaching out over the coming weeks to fill data gaps and validate that the information we have is correct
- For All, our next public meeting is scheduled tentatively for Thursday, May 25<sup>th</sup> to present and collect feedback on the County's Mitigation Strategy
- Reminder we will wrap-up the Plan Update and submit to the Illinois Emergency Management Agency for review in early June 2023
- If you have any remaining questions or comments regarding today's presentation, then please email them to [ema@mchenrycountyil.gov](mailto:ema@mchenrycountyil.gov)

→ **Wrap-Up & Adjourn**

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Thank You!



# → McHenry County Mitigation Committee Monthly Meeting

## 2023 Natural Hazards Mitigation Plan Update: Public Meeting #2

Date/Time: Thursday, May 25, 2023, 1:00 pm – 2:30 pm CST

Location: Virtual Only - [Microsoft Teams Link](#)

**\*Note the May 2023 Mitigation Committee Meeting is open to the public\***

### Hazard Mitigation Planning Background:

An effort is underway to update the McHenry County [2017 Natural Hazards Mitigation Plan](#) and renew our 5-year eligibility for federal hazard mitigation funding and discounted flood insurance. **Context:** A mitigation plan is how we communicate about the natural hazards that threaten our County, including the extent and severity of those impacts to residents and critical infrastructure, and our collective plans to reduce those threats. Every 5 years our Plan will be updated considering changing circumstances and risks. **Benefits:** A current plan increases our awareness of hazards, risks and vulnerabilities; identifies actions for risk reduction; and focuses our dollars on the greatest risks. Financially, approved mitigation plans are a prerequisite for certain kinds of non-emergency disaster assistance, such as Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance projects. An approved mitigation plan is also required to reduce flood insurance premiums for residents by sustaining our eligibility National Flood Insurance Program and Community Rating System Program participation.

### Today's Meeting Purpose and Objectives:

The **purpose of this meeting is to enhance your awareness and understanding of the County's Natural Hazards Mitigation Plan update and progress to-date and gather your input and feedback** on the mitigation strategy. As a result, the County will be better equipped to refine its mitigation priorities to ensure we meaningfully reduce the impacts of natural hazards to our communities. We will use this time to:

1. Review FEMA's hazard mitigation planning process and criteria, including progress to-date;
2. Review the County's revalidated Mitigation Goals and Guidelines, proposed Action Plan edits and additions, and discuss near-term federal funding opportunities (i.e., FEMA BRIC and FMA); and
3. Receive feedback and address any questions from Committee Members and the public to ensure a comprehensive understanding of the County's mitigation priorities.

### Agenda:

Time (CST)	Topic	Presenter(s)
1:00-1:15pm CT (15 mins)	<b>Welcome &amp; Introductions</b> <ul style="list-style-type: none"><li>• Icebreaker Activity</li><li>• Agenda Review</li><li>• Administrative Update</li></ul>	Bob Ellsworth (EMA), David Christensen, (EMA) & Justin Strickland (ICF)
1:15-1:35pm CT (20 mins)	<b>Hazard Mitigation Planning 101 &amp; Risk Assessment Recap</b> <b>Desired Outcome(s):</b> Refreshed understanding of the FEMA Local Hazard Mitigation Planning Process and the County's progress to-date, including the updated Risk Assessment.	Kelli Reddick (ICF)

Time (CST)	Topic	Presenter(s)
1:35-1:55pm CT (20 mins)	<b>Mitigation Goals &amp; Action Plan Review</b> <b>Desired Outcome(s):</b> Increased awareness and understanding of the County's revalidated hazard mitigation Goals, Guidelines and Action Plan, including how both individual and multi-jurisdictional actions were captured in the Plan Update.	Justin Strickland (ICF)
1:55-2:05pm CT (10 mins)	<b>Near-Term Federal Funding Opportunities for Mitigation Projects</b> <b>Desired Outcome(s):</b> Increase awareness and understanding of eligibility requirements, criteria and upcoming deadlines for FEMA Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) programs	Kelli Reddick (ICF)
2:05-2:25pm CT (20 mins)	<b>Public Meeting Q&amp;A</b> <b>Desired Outcome(s):</b> Addressed any outstanding questions or comments regarding the hazard mitigation planning process, public survey and/or risk assessment and mitigation strategy.	Justin Strickland (ICF)
2:25-2:30pm CT (5 mins)	<b>Recap &amp; Adjourn</b> <b>Desired Outcome(s):</b> Equipped participants to share today's results with their neighbors and colleagues.	Bob Ellsworth (EMA), David Christensen, (EMA) & Justin Strickland (ICF)



# McHenry County Hazard Mitigation Plan Committee & Public Meeting

Date/Time: Thursday, May 25, 2023, from 1:00-2:30pm CT

Attendees: a total of 34 participants from the following jurisdictions and organizations:

- McHenry County Administration
- McHenry County Emergency Management Agency
- McHenry County Department of Transportation
- McHenry County Department of Health
- McHenry County Department of Planning & Development
- McHenry County Board
- McHenry County Farm Bureau
- American Red Cross of Illinois
- Kane County
- Walworth County (WI)
- Village of Bull Valley
- Village of Cary
- City of Crystal Lake
- Village of Huntley
- Village of Johnsburg
- Village of Port Barrington
- Village of Richmond
- Village of Spring Grove
- Village of Wonder Lake

## Questions & Answers:

- **Q1:** Can new mitigation activities be added to the Plan over the next five (5) years?
  - **A:** No. Once the plan is approved and adopted, no further updates can be made to the document. However, the results of an annual review process – which the County is doing at the end of each calendar year - can be maintained and shared as a supplement to the Plan. This supplement, in addition to the Plan, can be referenced by the County or participating communities when soliciting state or federal grant funding.
- **Q2:** If a community is not part of the planning process, are they eligible for Federal Emergency Management Agency (FEMA) funding?
  - **A:** No. A community must actively participate in the hazard mitigation planning process and provide a letter of support (to be documented within the Plan update) to be eligible for FEMA hazard mitigation assistance.
- **Q3:** Is the County eligible to apply for FEMA Building Resilient Infrastructure and Communities (BRIC) Program funding this year under the current (2017) Plan (while the new plan undergoes review and adoption)?
  - **A:** Once the County submits the (Draft) Revised Plan to the Illinois Emergency Management Agency (IEMA) for review, then the County and participating communities are eligible to apply for FEMA BRIC funding under the in-review (2023) Plan. Any applications prior to this date will be linked with the current (2017) Plan.
- **Q4:** Bull Valley submitted multiple projects for inclusion into the County's Natural Hazards Mitigation Action Plan. Confirming our projects have been accepted?
  - **A:** Yes, all mitigation projects submitted by individual communities – via email, phone interview or recorded during monthly Committee meetings – have been captured as community-specific activities under each of the County's Action Items.

- **Q5:** If a community wants to request funding to update its building codes but did not include this a community-specific mitigation project, can the community reference a County-level building codes objective instead?
  - A: Yes, individual communities requesting state or federal grant funding to update their building codes may reference the County's current Action Item #19: Strengthen Building Codes and Code Enforcement Training

### Comments:

- **Comment 1:** Did find some additional 2017 flooding data as recorded at the: McHenry Dam - receiving runoff from approximately 1,250 square miles of land area - 7.62 ' cresting (passing the 2013 record); Algonquin Dam - receiving approximately 1,400 square miles of land area - 13.0 ' cresting (passing the 2013 record). Also, the largest tributary is the Nippersink Creek, which has approximately 200 square miles of land area receiving runoff area.

Please use the chat to tell us which municipality, township or unincorporated community you are joining us from today!



McHenry Natural Hazards Mitigation Plan Update  
May Committee & Public Meeting  
Thursday, May 25<sup>th</sup>

This meeting is being recorded  and will be made available to the public, so please:

✓ Keep your microphones muted  at all times

✓ Use the chat box throughout to ask questions or comment on the information being shared



Please note there will be dedicated time for Q&A at the end of today's presentations

✓ During today's Q&A, if you would like to speak, please use the "raise your hand" feature in Teams



✓ When speaking, please speak clearly and loudly 

## → Housekeeping: Ground Rules

## Today's Meeting Purpose and Objectives

**Purpose:** Enhance your awareness and understanding of the County's Natural Hazards Mitigation Plan Update and progress to-date and gather your input and feedback on the revised mitigation strategy. As a result, the County will be better equipped to refine its mitigation priorities to ensure we meaningfully reduce the impacts of natural hazards to our communities.

**Objectives:**

1. Review FEMA's hazard mitigation planning process and criteria, including progress to-date;
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- **Natural Hazards:** Environmental phenomena that have the potential to impact societies and the human environment
- **Mitigation:** The effort taken to reduce the loss of life and property by lessening the impact of disaster events
- **Resilience:** The capacity of individuals, communities, businesses, institutions, and governments to adapt to changing conditions and prepare for, withstand, and rapidly recover from disaster events



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→ **Important Terminology**



# Hazard Mitigation Planning Refresh

**Purpose:** To develop a long-term strategy for reducing disaster damage, disruption, and repetitive loss impacts.

Having an updated plan....

- ✓ Enables access to FEMA Hazard Mitigation Assistance Grants (e.g., HMGP, BRIC, etc.)
- ✓ Increases readiness for subapplication development when funding becomes available
- ✓ Promotes more disaster-resilient and sustainable communities
- ✓ Increases public awareness and understanding of risk
- ✓ Fosters relationships between all levels of government, non-governmental organizations and the private sector
- ✓ Reduces costs associated with disaster response and recovery by promoting mitigation

→ **Why Hazard Mitigation Planning?**





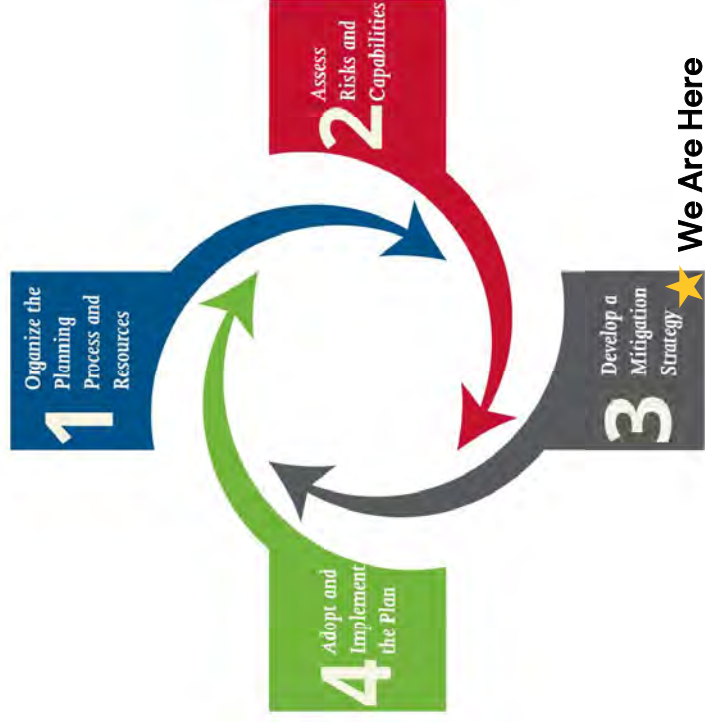


- > Flood Protection / Retrofits
- > Property Elevations
- > Stormwater Improvements
- > Stream Restoration
- > Erosion Control
- > Aquifer Storage & Recovery
- > Microgrids
- > Enhanced Building Codes
- > Emergency Power Generation
- > Winter Storm Electrical Hardening
- > Acquisition & Demolition
- > Seismic Retrofit
- > Wind Retrofit
- > Saferooms/Shelters
- > Wildfire Mitigation
- > Utility Hardening

## → Example Hazard Mitigation Projects

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## FEMA Hazard Mitigation Planning Process



## FEMA Local Planning Sections

- A. Planning Process
- B. Risk Assessment
- C. Mitigation Strategy
- D. Plan Maintenance
- E. Plan Update
- F. Plan Adoption
- G. High Hazard Dams
- H. Additional State Requirements (Optional)

## → FEMA's HM Planning Process & Local Plan Requirements

## Federal Emergency Management Agency

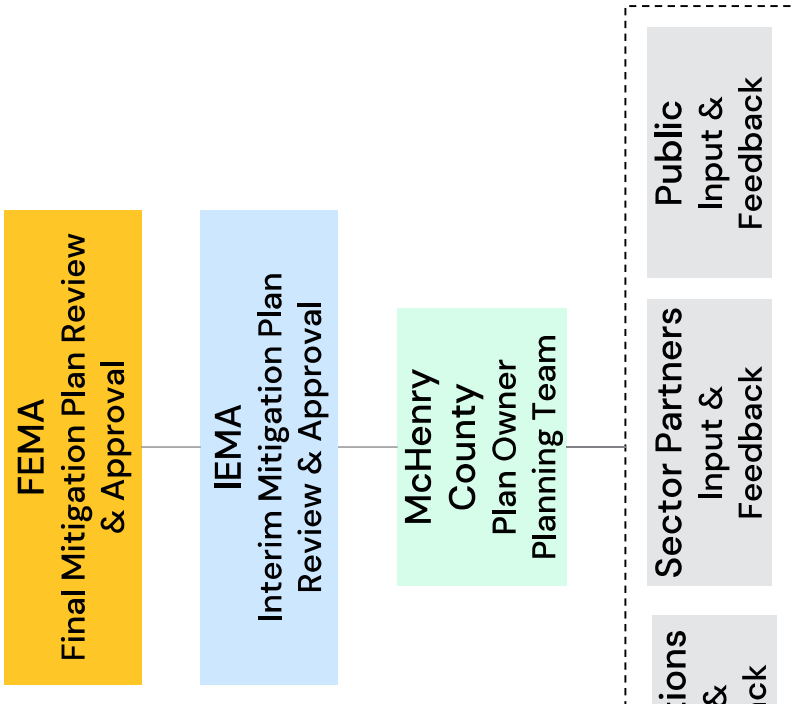
- Reviews and approves final plan

## Illinois Emergency Management Agency

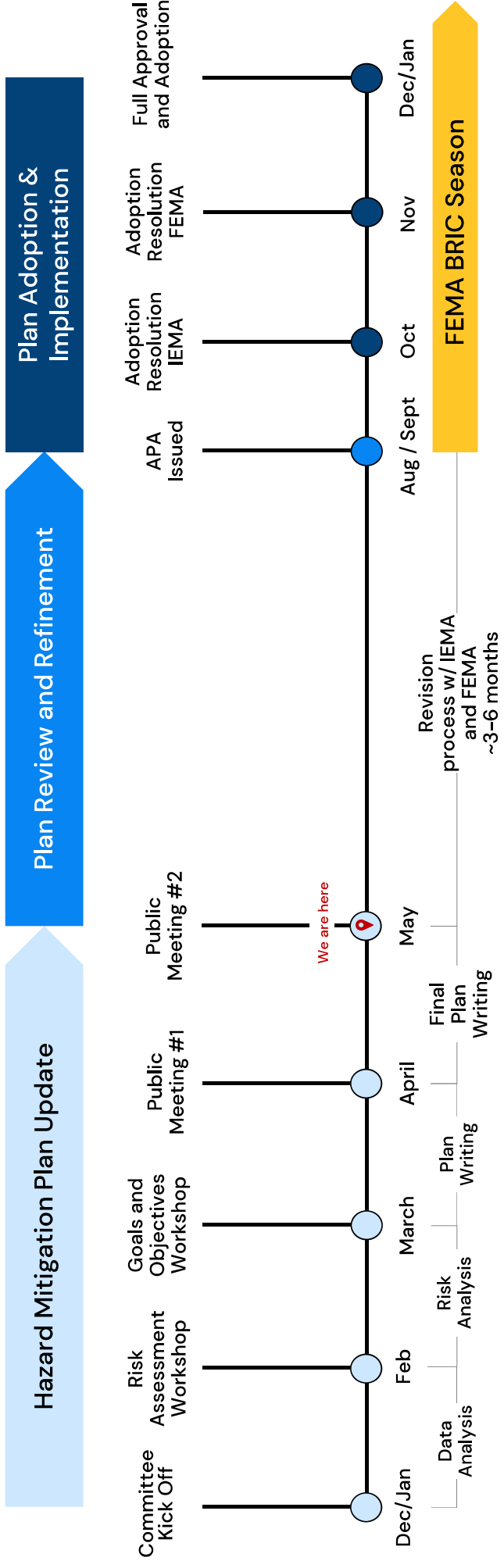
- Reviews and approves final draft plan

## McHenry County

- Develops plan to meet FEMA criteria
- Coordinates submission and adoption with local jurisdictions
- Provides subject matter expertise
- Engages the public, local officials and sector partners for feedback



## → Organizational Roles and Responsibilities



## ➔ Overall Project Timeline

Presidential disaster declarations are rare for McHenry County.

## 2017 Fox River Flood

Approximately 800 homes were affected by flooding. The Fox River reached record levels of nearly 3 feet above the river's flood stage.

**Natural Hazard**  
**Updates**



## 7 hail incidents

Have been reported by NOAA in the McHenry County region since 2017. Some reports were rather large hail – quarter to golf ball size, 2.5” diameters.

## 23 severe storms & wind

These events cause trees to fall, debris causes damage, and power lines are likely affected. Four events in 2021 affected nearly all areas of McHenry County.

## 3 homes damaged

By lightning strikes in 2018. Two structures burned in Coral and Huntley.

## 2-year drought

Northern Illinois experienced historic drought between 2021 and 2022. Although the drought is over, longer-term concerns for aquifer recharge and groundwater availability remain.

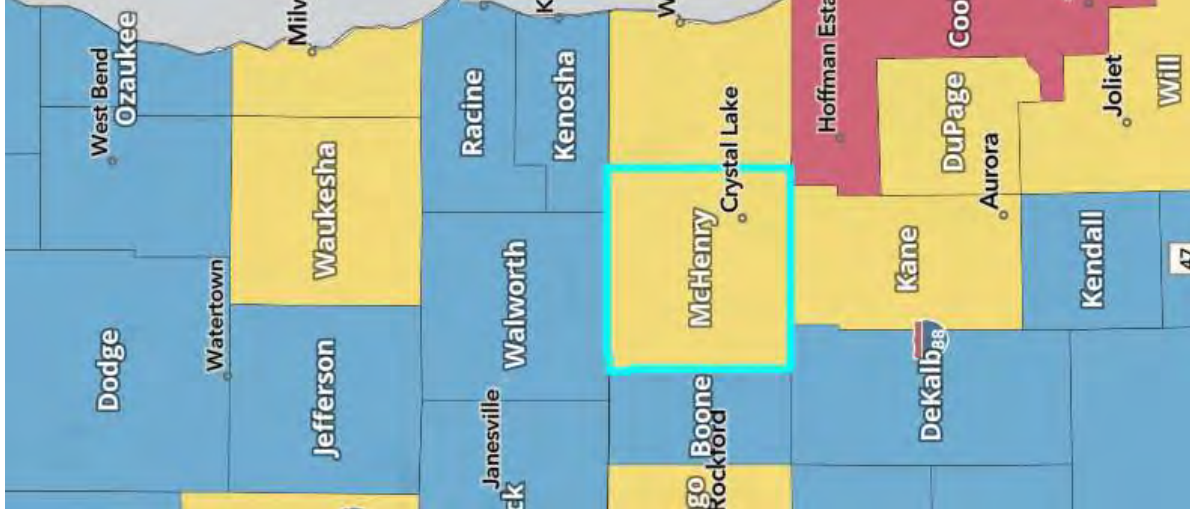
## FEMA's National Risk Index for McHenry County, IL

### Relatively Moderate Risk

McHenry County has a risk score of 85.71 according to FEMA. This is compared to an IL average of 91.20. Risk is determined by loss, social vulnerability, and community resilience.

### Moderate Annual Loss

McHenry County has an annual loss score of 87.56. Cold Waves, lightning, strong winds, and tornadoes have the highest projected loss.



$$\text{FEMA's Risk Index} = (\text{Expected Annual Loss} \times \text{Social Vulnerability}) / \text{Community Resilience}$$

Hazard Type	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Score
Tornado	\$21,579,079	Very Low	Very High	0.91	\$19,490,840	97.1
Cold Wave	\$2,396,547	Very Low	Very High	0.91	\$2,188,278	97.4
Strong Wind	\$1,945,266	Very Low	Very High	0.91	\$1,767,008	90.2
Riverine Flooding	\$1,406,968	Very Low	Very High	0.91	\$1,288,893	72.5
Heat Wave	\$1,320,394	Very Low	Very High	0.91	\$1,201,103	90.8
Lightning	\$901,067	Very Low	Very High	0.91	\$815,976	92.4
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Updating the County's new top hazard risks:

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→ **New Risk Scores and Justification**

## Flooding

- Stream maintenance and restoration
- Code enforcement
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- Green infrastructure
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## Tornado

- Safe rooms
- Community-wide emergency alert system

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## Winter Storms

- Vegetation management campaign
- Increase shelter accessibility
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## Drought

- Explore Lake Michigan water allocation
- Explore use of new water reservoirs in old mining pits
- Consistent restrictions for water conservation
- Natural landscaping initiatives

## → Context: Mitigation Actions Brainstorm



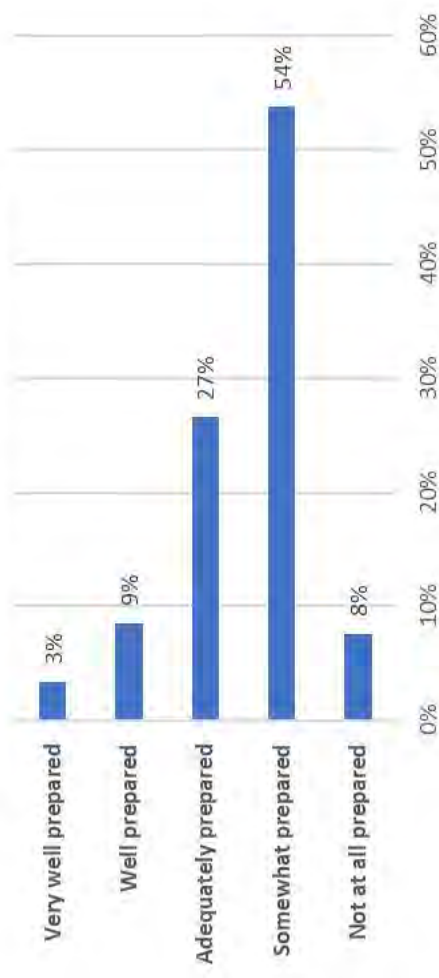
### Priorities & Preferences:

- More than 80% of respondents feel its **Very Important** to prioritize protecting lives, critical facilities, utilities and emergency services when planning for natural hazards

### The most popular ideas for mitigation projects were:

- Conducting scenario-based **exercises** to test emergency response procedures in the event of a natural disaster event
- Establishing a **volunteer network** to support local post-disaster recovery efforts
- Improving **digital communication** to enhance accessibility and the speed with which people receive information about natural hazards preparedness and emergency response
- Increasing investment in **water and land-based conservation efforts**

How Prepared to You Feel for Natural Hazards Likely to Occur Within McHenry County



## → Public Survey Results

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# Proposed Mitigation Strategy



In March 2023, the Mitigation Committee came back together in Cary Village Hall to [review and discuss the County's existing Mitigation Strategy](#), including mitigation goals and guidelines and the implementation (or action) plan



→ **2023 Mitigation Goals & Objectives Workshop**

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### McHenry County's Natural Hazards Mitigation Goals:

- **Goal 1.** Protect the lives, health, and safety of the people of McHenry County from the impact and effects of natural hazards.
- **Goal 2.** Protect public services, utilities and critical facilities from potential damage from natural hazard events.
- **Goal 3.** Protect historic, cultural, and natural resources from the effects of natural hazards.
- **Goal 4.** Ensure that new developments do not create new exposures to damage from natural hazards.
- **Goal 5.** Mitigate to protect against economic and transportation losses due to natural hazards.
- **Goal 6.** Identify specific projects to protect lives and mitigate damage where cost-effective and affordable.

### McHenry County's Guidelines (for accomplishing the Goals):

- **Guideline 1.** Focus natural hazards mitigation efforts on floods, severe summer and winter storms, tornadoes, extreme cold and heat events, and drought.
- **Guideline 2.** Make people aware of the hazards they face and focus mitigation efforts on measures that allow property owners and service providers to help themselves.
- **Guideline 3.** Seek state and federal support for mitigation efforts.
- **Guideline 4.** Use available local funds, when necessary, to protect the public services, critical facilities, lives, health, and safety from natural hazards.
- **Guideline 5.** Examine equitable approaches for the local cost of mitigation, such as user fees.
- **Guideline 6.** Create and foster public-private partnerships to accomplish mitigation activities.
- **Guideline 7.** Strive to improve and expand business, transportation and education opportunities in McHenry County in conjunction with planned mitigation efforts.

**2016 Goals & Guidelines Were Revalidated for 2023 by the NHMP  
Committee in March 2023**

2016 NHMP Action Items

2023 NMHP Action Items		Community-Specific Action Items (Remain / Consolidated Under Multi-Jurisdictional Action Items)
Completed (Removed)	Multi-Jurisdictional Action Items (Remain / Updated Status for the County & Individual Communities)	
Action Item 27: Tornado Siren at Public Works Facility in the Village of Richmond	Action Item 1: Plan Adoption Action Item 2: Continuation of Mitigation Committee Action Item 3: Plan Monitoring and Maintenance Action Item 4: Include the McHenry County Natural Hazards Mitigation Plan into Other Plans Action Item 5: Watershed Studies Action Item 6: Expand Stream Gaging Network	
	Action Item 7: Stream Maintenance Programs	Action Item 29: Review of Storm Sewers/Drainage System Maintenance for the Village of Richmond
	Action Item 8: Prohibited Waterway Dumping Ordinances	
	Action Item 9: Mitigation of Public Infrastructure	Action Item 26: Power Outages for the Community of Algonquin Action Item 28: Replace Main Drain Tiles in Hebron Township Action Item 32: Funding the Counties Living Snow Fence Project
	Action Item 10: Continued NFIP Compliance Action Item 11: Repetitive Loss Areas Study Action Item 12: Identification of Floodplain Structures Action Item 13: Investigation of Critical Facilities Action Item 14: Critical Facilities Design with Natural Hazards Protection Action Item 15: Mitigation of Floodplain Properties (Property Protection Projects)	
	Action Item 16: Safe Rooms	Action Item 33: Large Underground Storm Shelter (Hartland)
	Action Item 17: Community Rating System Participation Action Item 18: Urban Forestry (Participation in Tree City USA) Action Item 19: Participation in StormReady Action Item 20: Strengthen Building Codes and Code Enforcement Training Action Item 21: Seek Mitigation Grant Funding for Additional Mitigation Planning and Cost Beneficial Projects Action Item 22: Implementation of the Water Resources Protection Action Plan	
	Action Item 23: Development of a Public Information Strategy	Action Item 25: Warning System for Dunham Township Action Item 30: Outreach Projects (Seminars, Pamphlets, Etc.) in the Village of Richmond Addressing All Hazards Action Item 31: Develop a Reliable Means for Citizens in Crystal Lake to Receive Official Information from the City
	Action Item 24: Property Protection References	

Action Item Ranking Criteria	Criteria Description
Effectiveness	The extent to which an action reduces risks to people and properties
Efficiency	The extent to which time, effort, and cost is well used as a means of reducing vulnerability both short and long-term. Agency has demonstrated expertise and capacity to manage implementation of the action.
Multi-Hazard Mitigation	The action reduces risk to more than one hazard.
Address High Risk Hazard	This action reduces risk to people and properties from a hazard(s) identified as high risk.
Address Critical Communications / Critical Facilities	The action pertains to the maintenance of critical functions and structures such as transportation, supply chain management, data circuits, etc.
Equity	The action reduces risk to one of more populations more susceptible to the negative impacts of natural disasters due to environmental exposure, social vulnerability, or other factors (factors impacting exposures and vulnerability are described in more detail in Chapter 2: Community Profile and throughout Hazard Profiles)

**High Priority**

- 9. Mitigation of Public Infrastructure
- 13. Investigation of Critical Facilities
- 14. Critical Facilities Design with Natural Hazards Protection
- 15. Mitigation of Floodplain Properties – Property Protection Projects
- 16. Safe Rooms
- 20. Strengthen Building Codes and Code Enforcement Training
- 21. [Seek Mitigation Grant Funding for Additional Mitigation Planning and Cost Beneficial Projects](#)
- 23. Development of a Public Information Strategy

**Medium Priority**

- 5. Watershed Studies
- 6. Expand Stream Gaging Network
- 7. Stream Maintenance Programs
- 8. Prohibited Waterway Dumping Ordinances
- 11. Repetitive Loss Areas Study
- 12. Identification of Floodplain Structures:
- 22. Implementation of the Water Resources Protection Action Plan
- 24. Property Protection References

**Lower Priority**

- 1. Plan Adoption
- 2. Continuation of Mitigation Committee
- 3. Plan Monitoring and Maintenance
- 4. Include the McHenry County Natural Hazards Mitigation Plan into Other Plans
- 10. Continued NFIP Compliance
- 17. Consider Community Rating System Participation
- 18. Urban Forestry – Consider Participation in Tree City USA
- 19. Consider Participation in StormReady

- Installing stream gages in Woods Creek, Crystal Creek, and elsewhere as needed
- Building a County-wide, remote/regional salt storage capability to enhance severe winter storm preparedness
- Constructing a living snow fence
- Executing a structure-specific risk assessment on the lower 10 miles of the Nippersink Creek
- Continuing to target and purchase repetitive loss/severe repetitive loss (i.e., floodprone) properties
- Increasing County-wide capacity and capability to perform building code training & enforcement
- Creating a Tree City USA education program and exploring transmission line undergrounding in heavily wooded areas

## ➔ **Multi-Jurisdictional Projects for Action Item 21 (Seek Mitigation Grant Funding)**

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# Near-Term Federal Funding Opportunities for Mitigation Projects



The **Building Resilient Infrastructure and Communities** program funds projects that proactively invest in community resilience.

BRIC prioritizes projects that demonstrate innovative approaches to partnerships, such as shared funding mechanisms, and/or project design.

Through BRIC, FEMA invests in a variety of mitigation activities with a focus on infrastructure projects benefitting disadvantaged communities, nature-based solutions, climate resilience and adaptation, and adopting hazard resistant building codes.

## → **Building Resilient Infrastructure and Communities (BRIC)**

### **Eligibility**

- > Applicant/Subapplicant Eligibility
- > All-Hazards Mitigation Program
- > Cost Reimbursable (75% Fed / 25% Local)

### **Priorities**

- > Critical infrastructure
- > Nature-based solutions
- > Partnerships and innovation
- > Disadvantaged communities & Justice40

### **Flexibility**

- > Phased Projects
- > Increased Project Funding Caps
- > Pre-award costs allowable year-round



- > Hazard Mitigation Planning
- > Project Scoping
- > Flood Protection / Retrofits
- > Property Elevations
- > Stormwater Improvements
- > Stream Restoration
- > Erosion Control
- > Aquifer Storage & Recovery
- > Microgrids
- > Enhanced Building Codes

- > Emergency Power Generation
- > Winter Storm Electrical Hardening
- > Acquisition & Demolition
- > Seismic Retrofit
- > Wind Retrofit
- > Saferooms/Shelters
- > Wildfire Mitigation
- > Utility Hardening

→ **Eligible BRIC Activities**

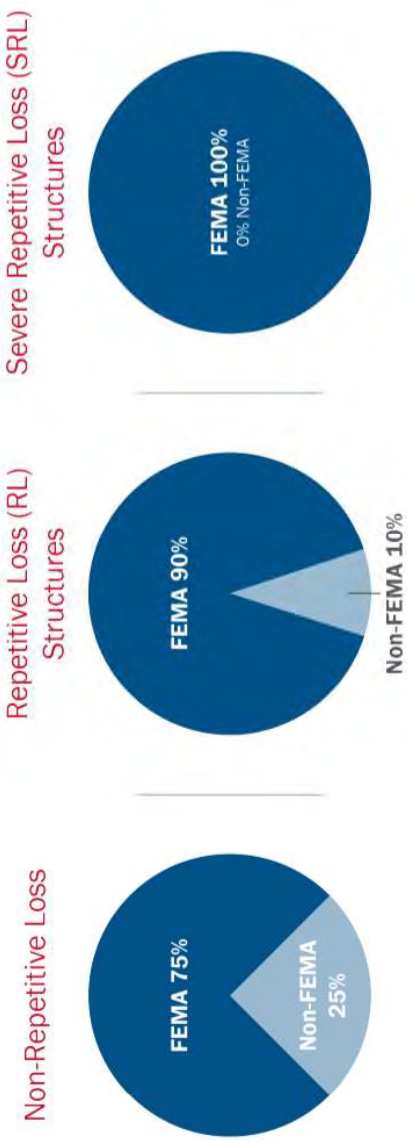
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### Eligibility Requirements:

- > Applicants must participate in the NFIP.
- > Must have a FEMA-approved local mitigation plan to apply for funding under the program.
- > All structures in the project should must be insured by the NFIP.
- > All projects must be cost-effective.
- > Program is cost-reimbursable.

The **Flood Mitigation Assistance** program funds flood mitigation measures to NFIP insured structures with the goal to reduce the number of flood claims by NFIP policy holders. In FY2022, \$800 million was available.



→ **Flooding Mitigation Assistance (FMA)**

- > Property Acquisition & Demolition/Relocation
- > Structure Elevation
- > Mitigation Reconstruction
- > Dry Flooding of Non-Residential Structures
- > Localized Flood Risk Reduction Projects
- > Structural Retrofitting of Buildings
- > Non-Structural Retrofitting of Buildings
- > Stormwater Management
- > Floodwater Storage and Diversion
- > Floodplain and Stream Restoration
- > Wetland Restoration and Creation
- > Project Scoping
- > Hazard Mitigation Planning
- > Technical Assistance



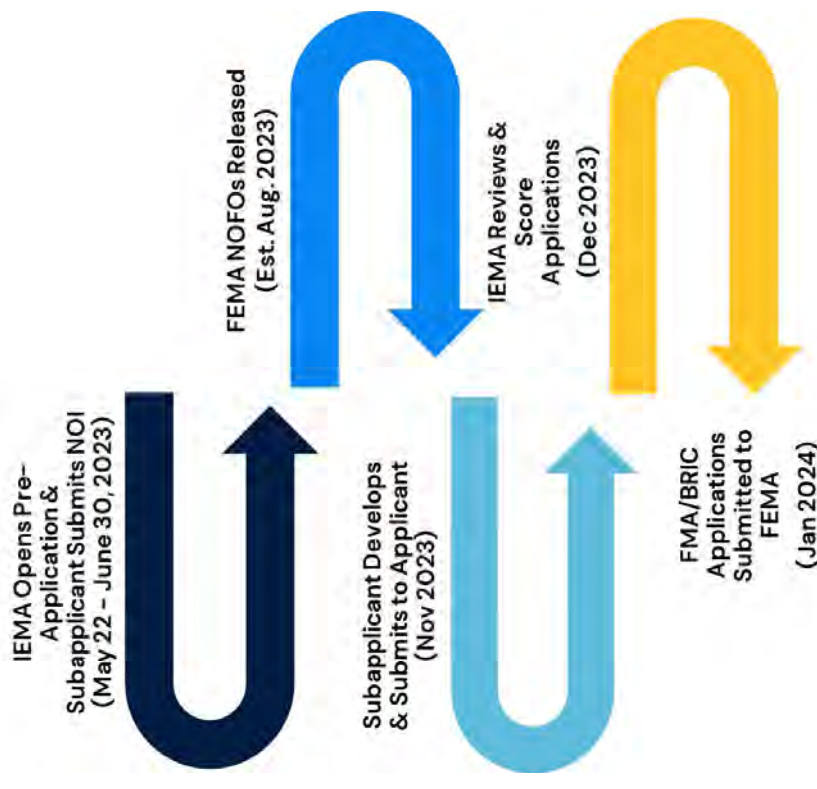
Image Source: Associated Press.

## → Eligible FMA Activities

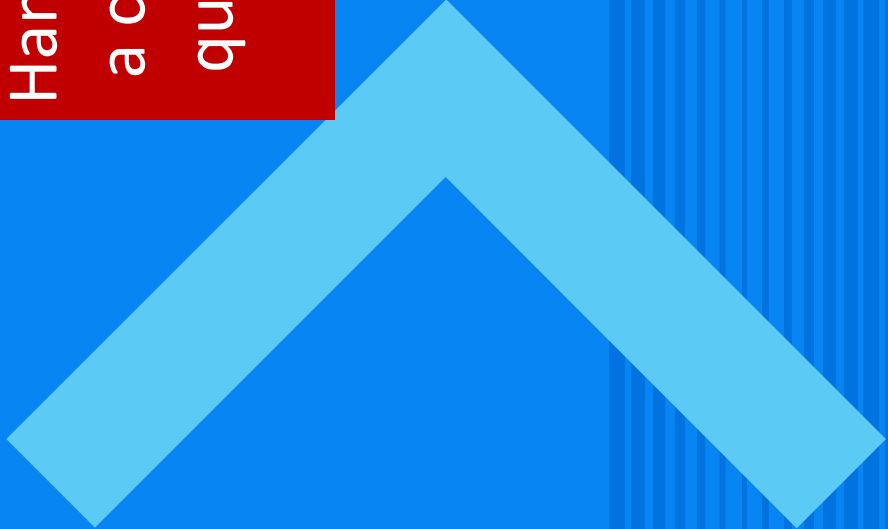
## Illinois Emergency Management Agency and Office of Homeland Security (IEMA-OHS) Funding Priorities:

- > Completion of FEMA Hazard Mitigation Plans.
- > Adoption of 2018 or 2021 versions of the International Building Code and International Residential Code.
- > Mitigation projects to enhance adaptation to climate change and developing an effective response to climate change.
- > Mitigation projects to address inequities and inequities to provide the greatest support to economically disadvantaged rural communities.
- > Acquisition of substantially damaged flood-prone structures, severe repetitive loss structures, and repetitive loss structures.

## Anticipated Application Timeline



→ **Notices of Intent for FEMA BRIC & FMA are due to 6/30/23!**



Please use the Chat or the “Raise your Hand” feature to ask a question or provide a comment and the ICF team will answer questions and/or unmute participants in the order they are received

Public Meeting Q&A



Recap & Adjourn

## **Friendly Reminders:**

- If you received a data request from us, please respond at your earliest convenience
- If you are a Mitigation Committee representative that has not yet filled out a Letter of Support, please drop your email in the chat now and we'll send you a blank form
- We will wrap-up the Plan Update and submit to the Illinois Emergency Management Agency for review in early June 2023
- If you have any remaining questions or comments regarding today's presentation, then please email them to [ema@mchenrycountyil.gov](mailto:ema@mchenrycountyil.gov)

→ **Wrap-Up & Adjourn**

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Thank You!





# Appendix D: Analysis of McHenry County Public Survey and Interviews

**MCH**  
MCHENRY COUNTY · IL

July 2023

Analysis of McHenry County Public Survey and Interviews

Olha Brezden

May, 2023

## *Introduction*

Natural disasters have increased in Illinois by 257% over the last 40 years (Bessler, 2022). The state experienced 1500 flood events from 2000 to 2018, resulting in \$3 billion in damages. Furthermore, Illinois is prone to tornados and extreme heat, with temperatures in the Chicagoland area rising an average of 5-9 °F (Cusick, 2020). Emergency managers, government officials, and residents must proactively adjust and take a long-term approach to adapting community infrastructure, businesses, and residences against changing weather patterns. To assist state and local jurisdictions with the cost of mitigation projects, the Federal Emergency Management Agency (FEMA) manages grant programs; program eligibility is contingent on a FEMA-approved Hazard Mitigation Plan (HMP). A HMP is vital to acquiring federal grant dollars but requires specialized expertise to address the threats and implement multi-year projects.

Even though communities have conducted disaster planning for decades, Congress recognized the need for an enhanced planning methodology to help communities reduce the consequences of disasters. This methodology, entitled the Disaster Mitigation Act of 2000, updated the mitigation section of the Robert T. Stafford Act by emphasizing coordination in mitigation planning across all state and local entities and incentivizing mitigation planning as a condition of grant dispersal (Federal Emergency Management Agency [FEMA], 2020). Consequently, emergency managers shifted from a strict disaster response planning process to incorporate mitigation by leading communities through pre-disaster planning. Developing long-term strategies based on identified risks is essential to breaking a cycle of disaster damage and reconstruction within a given jurisdiction (FEMA 2022).

To proactively offset the impact of a disaster, a local or state planner with mitigation experience recruits a mitigation strategy team, reviews the local Threat and Hazard Identification and Risk Assessment (THIRA), and develops priorities based on the identified risks. Input from affected stakeholders, to include the public, is solicited. Surveys and interviews regarding mitigation project priorities and overall concerns are sent out and conducted, and valid results incorporated into the planning process.

### *Methodology*

McHenry County EMA, ICF and research team conducted public survey questioner and interviews with participating and not-participating jurisdiction representatives. The public surveys provided perspective from McHenry County residents on the prioritization of the mitigation projects in the county. In addition, it helped determine the residents' view of the natural hazard threats and actions the government should take to mitigate the hazards. The surveys provided information regarding residents' awareness of natural disasters. Finally, surveys included recommendations for the government regarding natural hazard mitigation and community needs. The survey consisted of 26 questions. Below are three representative questions:

- Have you ever experienced a natural disaster in McHenry County?
- Which one natural hazard do you feel is the greatest threat to your community?
- Do you know who to contact to learn more about natural hazard risks in your community?

Second, the interviews were conducted with elected officials and conducted a qualitative analysis on the data provided. Two groups of elected officials were interviewed: elected officials of participating jurisdictions and elected officials of nonparticipating jurisdictions. A non-participating jurisdiction was defined as jurisdictions and townships that did not respond to a

McHenry County email requesting the submission of the Statement of Intent and monthly participation in HMP update meetings, whereas participating jurisdictions met these requirements. The Statement of Intent is a non-binding document where jurisdictions agree to a certain level of participation in the HMP update. Interviews aimed to discover knowledge regarding HMPs, the process behind HMP updates, and whether the jurisdiction has any hazard mitigation projects. Additionally, the interviews should reveal difficulties encountered with the planning process during the HMP update. There are four questions for all interviewees. The four questions answered by all interviewees are listed below.

- What natural hazard poses the greatest threat to your community?
- What is your community currently doing to prepare against those natural hazards?
- What barriers (financial, expertise, etc.) have you encountered to implementing a hazard mitigation project?
- How are you currently disseminating disaster-related information with residents before, during, and after a disaster?

*Public Survey results*

The survey for the McHenry County residents was conducted to determine how the public prioritizes natural hazards and to encourage the public’s ideas on the county government hazard mitigation actions. There were 597 responses from a county population of 311,112, and three jurisdictions – the City of McHenry (206 responses), the Village of Algonquin (134 responses), and the Village of Grafton (65 responses) – accounted for almost 68% of the surveys returned. See Table 1 for the list of jurisdictional participation.

Table 1: *Question 1: What township do you live in?*

<b>Township</b>	<b>Number of Responses</b>
Alden	4
Algonquin	134
Burton	9
Cary	1

Chemung	7
Coral	18
Crystal Lake	2
Dorr	35
Dunham	1
Grafton	65
Grant	1
Greenwood	23
Hartland	3
Hebron	6
Huntley	1
Johnsburg	1
Kane	1
Marengo	7
McHenry	206
Nunda	42
Richmond	13
Riley	4
Seneca	5
Village of Lakewood	1
Johnsburg	4
Lake in the Hills	1
Unknown	2
<b>Grand Total</b>	<b>597</b>

Most responders (318) indicated they had experienced a natural hazard event in McHenry County. Out of those 318 respondents, the majority listed multiple natural hazard events. Winter snow and ice storms were among the most experienced events reported by residents of McHenry County, followed by extreme cold and heat events. See Table 2 for natural hazard responses.

**Table 2**

*Question 4: If "Yes", which of these natural hazards have you experienced?*

<b>Natural Hazards</b>	<b>Count</b>
bad water supply	1
Dam Failure	2
Derecho	2
Drought	58
Earth tremor	1
Earthquake	5
Extended power outage*	5
Extreme Cold	208
Extreme Heat	124
Flood	100
Groundwater	32
Hail*	163
High Winds	1
Home explosion in town of Marengo	1
Lightning	142
None	279
Sewer Backup	21
Thunderstorm-Microburst	187
Tornado	67
Winter Storm-Ice	196
Winter Storm-Snow	234

\*includes multiple responses related to hail damage

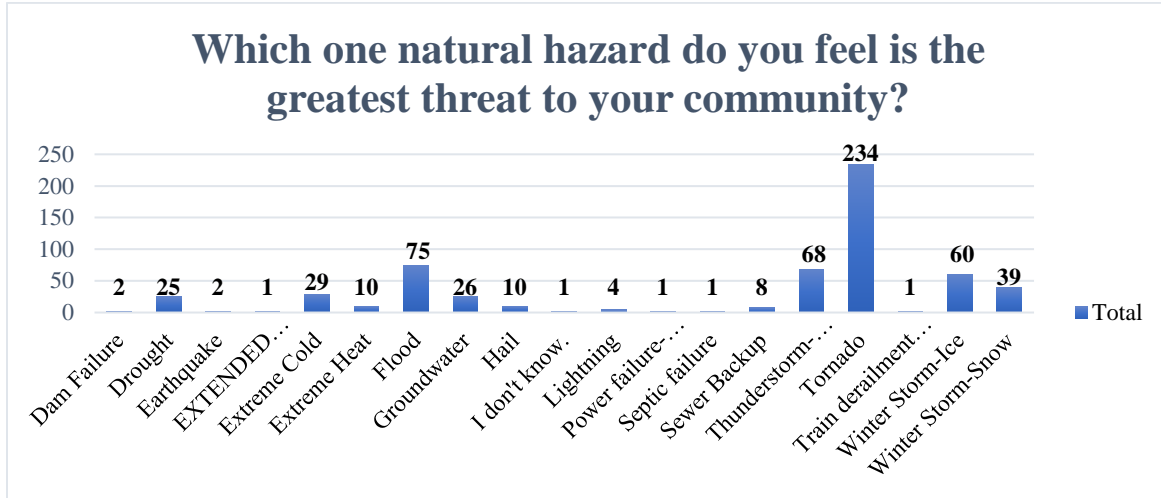
\*\*includes different responses all related to an extended power outage

McHenry County residents were also asked about their perception of natural hazard events that threaten their community and how they prepare for a natural hazard event (see Figure 1). Residents reported the top three hazards as tornados (234 responses), flooding (75 responses), and thunderstorm-microburst (68 responses). When asked which natural hazard poses the second greatest threat to the community (see Figure 2), the top three selections were thunderstorm-microburst (103 responses), winter-ice and snowstorm (157 responses), and tornado (83 responses).



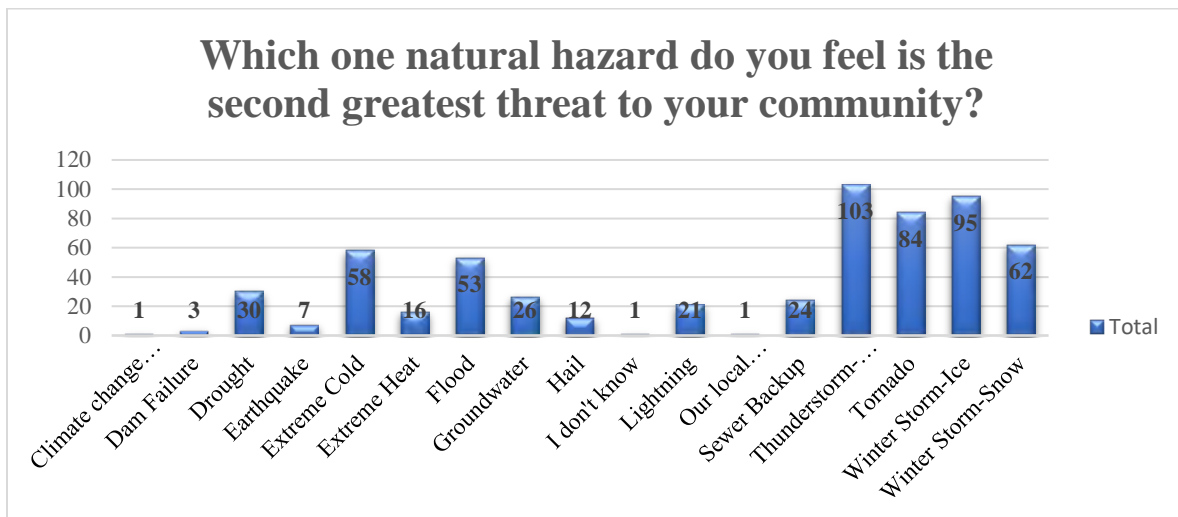
**Figure 1**

*Public Survey Responses of Greatest Natural Hazard Threat in McHenry County*



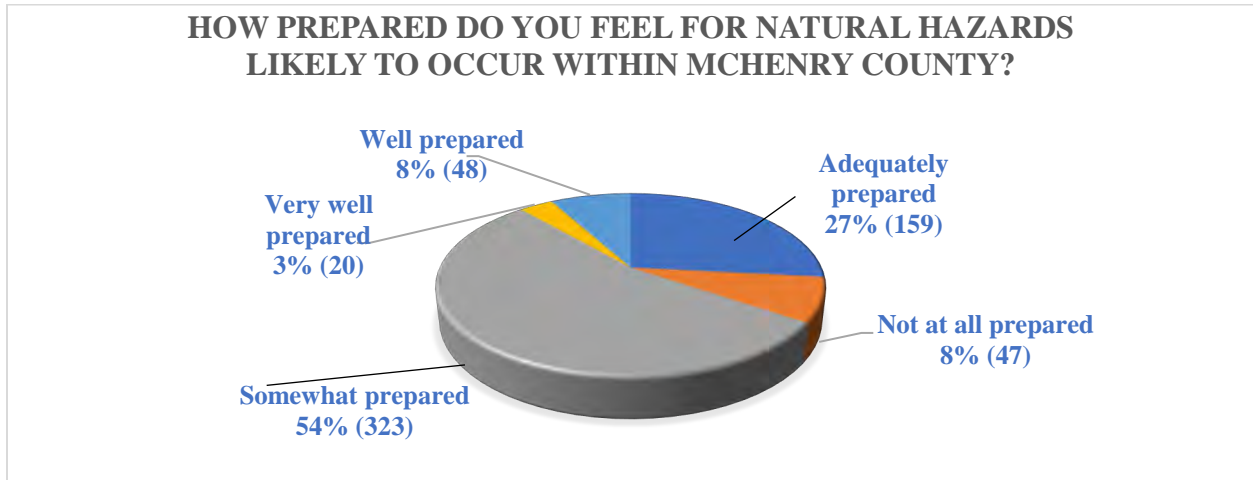
**Figure 2**

*Public Survey Responses of Second Greatest Natural Hazard Threat in McHenry County*



**Figure 3**

*Question 8: How prepared do you feel for natural hazards occurring in your community?*



McHenry County residents were asked if they were prepared for a natural hazard event; 54% reported that they were some-what prepared, 27% reported being adequately prepared, 8% reported being well prepared, 8% reported that they were not prepared at all, and 3% reported that they are very well prepared (Figure 3). When asked how the residents prepared for a natural hazard event, most responded by stockpiling essentials such as water (362 responses), food (355 responses), and medicine (405 responses). See Table 3.

**Table 3**

**Question 9:** What steps have you or someone in your home taken to prepare for a natural disaster?

7 Day Prepare Kits/Go Bags for each household member staged in secure location within dwelling. Stocked supplies for approx. 30 days of meals ready to eat and two weeks' worth of water and treatment tabs.	1
Common sense to prepare home for heating with firewood and activities to stay sane for all household members.	
Above as needed when warned	1

All the above	1
Alternative sources for heat in winter	1
Batteries	478
Battery-powered radio	244
Bug out bag	1
Crime	2
Discussed utility shutoffs	172
Family protection	1
Fire extinguishers	396
Firewood (emergency heat), contact with neighbors (cell phone/text message)	1
Flashlight	531
Food	355
Cut back trees from house building	1
Solar power backup	1
Hand crank radio	1
Medical supplies (First Aid Kit)	405
No steps have been taken.	1
NOAA radio	1
Personal protection equipment	1
Pet supplies	1
Planned a sewer shut-off from the village sewers.	1
Practiced a fire escape plan	135
Prepare other family members outside of home	1
Private	1
Received First Aid/CPR training	234
Rechargeable batteries for phones	1
Safe shelter	1
Solar charger	1
Tools, camping gear, survival equipment	1
Water	362
We are a nurse/ paramedic FF family	1
Whole house generator	23

Residents were also asked if they had flood insurance. Only 207 respondents provided an answer, with the majority indicating a lack of flood insurance (77%); only 12% stated that they

had flood insurance, and 11% were unsure. Over 65% of respondents did not provide a reason for not having flood insurance. See Table 4 for all answers provided.

**Table 4**

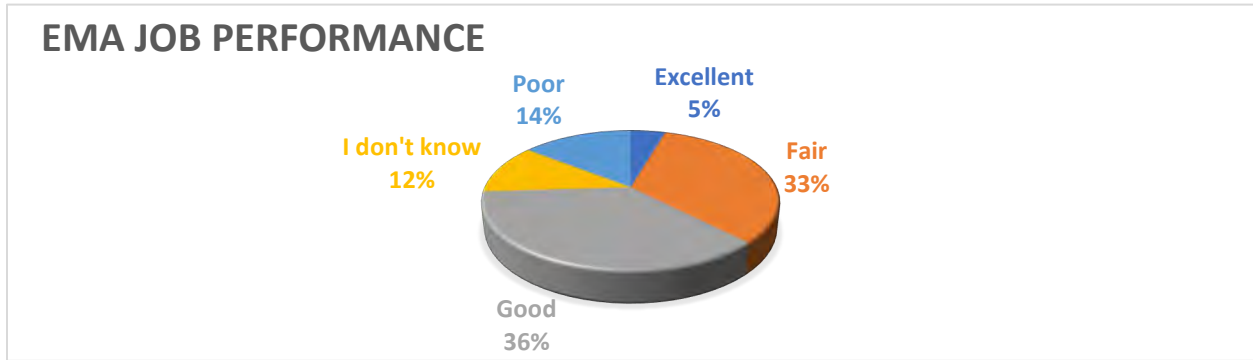
*Question 19: Do you have flood insurance? If no, why not?*

<b>Why not?</b>	<b>#</b>
Answer is not "no"	1
Did not know it was an option	4
Have flood insurance	13
House is elevated	21
House is on the hill up from the lake, flood insurance not needed or required	1
N/A	3
Never floods	10
Not in a floodplain	141
Too expensive	6
You made me answer to submit. Bad survey programmer?	1
(blank)	390

Residents were also asked about how McHenry County EMA coordinates awareness and prepares residents for natural hazard events. Out of 597 respondents, just over a third, or 217, indicate the county does a good job in preparing residents for natural disasters, whereas 14% believe the county is doing a poor job. Many respondents (458) reported not knowing who to contact regarding hazard risk and mitigation information. See Figure 4 for the complete breakdown of responses.

**Figure 4**

*McHenry County Emergency Management Agency Performance*



*Note:* total of 597 responses

Residents were asked if they were interested in making their homes more resilient to natural hazards, and a majority (72%) indicated they were interested. However, most residents (77%) reported not knowing who to contact to find out more information about the hazards they might encounter.

Residents reported email (229 responses) as the most effective way to receive information regarding natural hazard risks and mitigation practices. Residents also listed text messages (146 responses), county and municipal webpages (65 responses), and physical mail (56 responses) as effective ways of receiving information. Few residents reported Facebook (27 responses), television (23 responses), workshops (15 responses), radio (10 responses), and newspaper (10 responses) as an effective way of receiving information regarding natural hazards.

See table 5.

**Table 5**

*Question 23: What is the most effective way to receive information?*

<b>Most effective way to receive information</b>	<b>Responses</b>
County & village newsletter	1
County or Community website	196
Email	389

Facebook	117
FEMA classes	1
Independent research. I don't need government to be my daddy.	1
Infographic postcard	1
Instagram	21
Internet	1
Land line phone voice message, siren warnings for threat of tornado	1
McHenry County Blog	1
National Weather Service Radio alerts	1
Newspaper	76
Nextdoor	2
Nextdoor App	1
Personal research	1
Physical Mail	153
Public workshops/meetings	73
Radio	95
Social media like Nextdoor Library info.	1
Television	128
Text Message	248
Twitter	16
YouTube	33
<b>Total</b>	<b>1558</b>

McHenry County residents provided ideas for EMA, municipal, and township governments on projects or activities that would reduce the impacts of natural disasters. Twenty-three McHenry County residents recommended that government officials conduct educational events to increase awareness regarding natural hazard events and mitigation practices. Sixteen residents provided recommendations, such as having mock scenarios for severe natural hazard events, and twelve residents were interested in organizing a volunteer network. Seven residents indicated the need to open shelters for community members in case of natural hazard events. Twelve residents suggested that the government should improve communication with the community during natural hazard events, suggesting having Nixle alerts and social media notifications. The

following is the list of ideas that few residents provided in the optional question: making tornado sirens louder or having more sirens installed, having better building codes, having a flood buyout program, having power generators for outages, investing in tree maintenance, having flood barriers, investing in solar panels, having underground electric lines, having erosion control and water and land conservation practices. Table 6 indicates the top five ideas.

**Table 6**

*Survey Responses on Reducing Impact of Natural Hazards in McHenry County*

Recommendation	Education on natural hazards	Mock Scenarios	Volunteer work	Community shelter	Improving communication
Responses	23	16	12	7	12

*Non-participating Jurisdictions Interviews*

Researchers conducted 12 interviews with representatives of non-participating jurisdictions out of 30 non-participating jurisdictions listed. Researchers interviewed five township highway commissioners and four township supervisors representing Algonquin, Alden, Chemung, Dunham, Greenwood, Grafton, Marengo, Nunda, and Seneca, and two administration directors and one village clerk representing the Villages of Prairie Grove, Hebron, and Barrington Hills.

The representatives were asked about the natural hazards their communities experience and which hazards pose a danger to the communities. Representatives of non-participating jurisdictions were asked about the hazards their communities face and which threats pose a danger to the communities. The representatives of non-participating jurisdictions reported ice storms, summer storms, high winds, extreme cold, major and minor flooding, drought, and tornado concerns. Note that all jurisdiction representatives listed multiple hazards. Six

representatives indicated experiencing extensive power outages due to different natural hazard events. Six representatives listed a tornado concern as a dangerous threat to their community, with four stating that their jurisdiction had never experienced a tornado (even though it was a concern), one stated that their jurisdiction experienced a tornado in 2008, and one stated that their jurisdiction may have experienced a tornado three weeks prior but was unsure if it was officially declared or just a high-wind incident. Table 7 lists the natural hazards they believe are most significant.

**Table 7**

*Non-Participating Jurisdiction Responses on Natural Hazard Threats*

Drought	Major flooding	Minor flooding	High winds	Ice storm	Summer storm	Tornado	Extreme Cold
1	5	4	5	7	3	6	2

*Note.* Multiple hazards were selected by all representatives.

*Note.* Minor floods constitute flooding of roads and farms, and major flooding is structural flooding in this survey

The representatives of non-participating jurisdictions were asked what their community was doing to mitigate natural hazards. The non-participating jurisdictions reported little hazard mitigation actions. Two jurisdictions reported having or are in the process of developing community outreach programs. For example, Barrington Hills participates in the volunteer outreach program named Barrington Area Conservation, which promotes water conservation. Barrington Hills reported groundwater contamination as their significant hazard. One jurisdiction reported working on getting grant money for a community shelter. That jurisdiction representative reported extended power outages during a recent ice storm. Village of Prairie Grove representative stated that their community does tree maintenance to prevent power



outages. The representative of Prairie Grove indicated that the community is concerned with climate change and is promoting green energy use by joining Eligo Energy Aggregation. The representative advised that Prairie Grove was ranked as the greenest community in the U.S. in 2021. Nunda Township representative reported flooding along Fox River and advised that the township distributes sandbags to 400 residents living nearby Fox River. The township representative advised that there is a list of emails and phone numbers of all individuals qualifying for a sandbag program that the township contacts when preparing for flood events. Nunda township representative also advised that the township conducted a buy-out program for buildings that constantly flooded. See Table 8.

**Table 8**

*Preparation against natural hazards*

Programs	Developing Community Outreach Program	Setting up Shelter	Tree Maintenance	Sandbag Distribution (flood area)	Residential Buy-out Flood area program
Responses	2	1	1	1	1

Even though some jurisdictions could implement mitigation projects, the majority mentioned very few mitigation practices. For example, eight out of twelve representatives said that their community does nothing to mitigate flooding. Most of those representatives reported farm and road flooding due to rain and groundwater flooding. Representatives of those communities stated that there are some minor residential flooding issues. Six said that their community does not have tornado sirens; there were also six that stated their communities do not have backup power generators in the municipal buildings. All representatives mentioned that

their community had experienced power outages. All 12 representatives stated that they do not have a Capital Improvement Plan, their communities do not have structural flood control or flood reduction projects in place, and their communities do not have any buildings elevated, floodproofed, or otherwise retrofitted.

When asked about barriers to conducting hazard mitigation in their community, the interviewees mentioned multiple issues. Six representatives reported funding issues, six reported knowledge issues of hazard mitigation projects and six needed experts in the jurisdictions who would know how to manage the projects. Most jurisdictions were unaware that the county was conducting an HMP update, with some needing to learn what the HMP entails. Seven jurisdictions reported staffing issues as a barrier to participation. For example, Dunham and Nunda Townships reported having only one full-time employee in the public works department and could not send anyone to the McHenry County monthly HM meeting (meeting attendance is required to be considered a participating jurisdiction). Six jurisdictions reported needing more knowledge of mitigation actions.

Researchers learned that representatives from 10 of 12 non-participating jurisdictions were unaware of the HMP update. After the interviews, two non-participating jurisdictions started participating in the HMP update. One indicated that they were interested in participating, seven said that they would consider participating, and one related that their jurisdiction does not need to participate.

Responding to question “How are you currently disseminating disaster-related information (preparedness, mitigation measures, sheltering, recovery actions) with residents before, during or after disasters?” the majority (eight) of non-participating jurisdictions share information on their official jurisdiction website. Four non-participating jurisdictions use

Facebook to disseminate information, one uses Nixle to send alerts, and one mails newsletters to residents. One jurisdiction advised that they call residents living next to the river. Two non-participating jurisdictions believe they do not have to communicate disaster-related information. See Table 9.

**Table 9**

*How jurisdictions disseminate information*

Information sharing	Municipal websites	Facebook	Nixle alerts	Mailing a newsletter	Call residents	No communication
Response	8	4	1	1	1	2

*Participating jurisdictions interviews*

Researchers conducted seven interviews with representatives of participating jurisdictions. They listed flash floods, minimal localized flooding, drought, ice storms, and windstorms as the greatest danger to their community. There were numerous mitigation projects both planned and completed. All jurisdictions had a Capital Improvement Plan which listed provisions for HM actions and had some structural flood control or flood reduction projects in place. The city of Crystal Lake had the greatest number of completed mitigation actions. For example, Crystal Lake reported implementing a buyout project of residences that flooded and invested \$7.4 million from city funding and \$1.9 million in grant funding for their Storm Water Initiative. The initiative had eight recently completed projects, such as the North Shore Storm Water/Wetland Improvement Project (2019), Pine Street/Oriole Trail (2021), and Green Oaks Swale (2018). The village of Crystal Lake acquired 11 lots in the North Shore Storm Water project and created stormwater storage, which replaced an aging sewer system. The Pine Street project included a buyout of five residences that experienced heavy flooding and created water

storage. The Crystal Lake representative stated that the jurisdiction received a grant from the Illinois Department of Natural Resources, as this project was selected in the grant application process for their Flood Mitigation Program. Therefore, the project’s cost was 100% covered by the grant. Speaking on a specific project, a Crystal Lake representative advised that initially, it took a lot of work to convince the public of a voluntary property buyout, with village representatives conducting numerous meetings with community members on the benefits of the buyout. The interviewee mentioned that a severe flooding event also helped influence public opinion regarding the buyouts.

All participating jurisdictions reported having zoning ordinances, up-to-date building codes, NFIP participation, having no developments in areas where the floodplain is not mapped, and constantly maintaining sewer systems. Examples of completed mitigation projects include underground electric power lines, water level monitoring systems, Tree City USA certification, and community education on HM. The barriers encountered in HM planning at their level are reflected in Table 10.

**Table 10**

*Participating Jurisdiction Barriers to Hazard Mitigation Planning*

Barriers	Funding	Expertise in grant writing	No back-up generators	Unreliable internet connection	Difficulty engaging the public	Cannot afford Nixle
Responses	7	3	3	1	2	1

*Note:* Nixle is a mass notification provider\

Table 11 shows the way participating jurisdictions disseminate information.

**Table 11**

*Methods of Information Dissemination*

Information Sharing	Facebook/social media website	Municipal website	Nixle alerts	Public meetings
Responses	7	7	4	3

*Recommendations*

Recommendations made:

- County EMAs should work on improving communication with jurisdictions and conduct education seminars promoting the importance of hazard mitigation practices.
- The county EMAs should invest time into increasing public awareness of hazard mitigation and its importance in overall community resiliency.

This study found a lack of knowledge of HMP by public and municipal representatives.. The public needs to know which hazards could impact their community and what can be done to mitigate them. Researchers recommend that the county EMA establish regular communication with jurisdictions and conduct educational seminars. Many jurisdictions know little about the importance of HMP, best practices in implementing mitigation activities, and grant applications. All municipal officials would benefit from educational seminars, and the seminars could also improve communication between the county's EMA and municipal officials. The seminars would also serve as a networking opportunity and encourage jurisdictions to work together.

*Conclusion*

Natural disasters cost millions of dollars per incident, uproot lives, and devastate communities. With natural disasters projected to increase, local communities must invest in mitigation practices to protect the public and reduce the economic burden.

### *References*

Bessler, K. (2022, May 4). *Natural disasters driving up home insurance cost in Illinois*. The Center Square. Retrieved December 8, 2022, from [https://www.thecentersquare.com/illinois/natural-disasters-driving-up-home-insurance-cost-in-illinois/article\\_d6b0300e-cbe4-11ec-8b0d-6706bf1543f3.html#:~:text=They%20allied%20billion%2Ddollar%20natural,%2C%E2%80%9D%20researcher%20Nick%20VinZant%20said.](https://www.thecentersquare.com/illinois/natural-disasters-driving-up-home-insurance-cost-in-illinois/article_d6b0300e-cbe4-11ec-8b0d-6706bf1543f3.html#:~:text=They%20allied%20billion%2Ddollar%20natural,%2C%E2%80%9D%20researcher%20Nick%20VinZant%20said.)

Cusick, D. (2020, July 16). Chicago learned climate lessons from its deadly 1995 Heat wave. Scientific American. <https://www.scientificamerican.com/article/chicago-learned-climate-lessons-from-its-deadly-1995-heat-wave1/>

Federal Emergency Management Agency (n.d.a). *Building Resilient Infrastructure and Communities*. Retrieved April 21, 2023 at <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

Federal Emergency Management Agency. (2022, November 4). *Hazard Mitigating Planning*. Retrieved from [Hazard Mitigation Planning | FEMA.gov](https://www.fema.gov/hazard-mitigation-planning)



→ Appendix E: NCDC  
Storms Event Database



July 2023

















→ Appendix F: National Risk  
Index Report



July 2023

# National Risk Index



April 17, 2023

## McHenry County, Illinois

# Summary

Risk Index is **Relatively Moderate**

Score **85.7**



Expected Annual Loss is **Relatively Moderate**

Score **87.6**



Social Vulnerability is **Very Low**

Score **11.5**



Community Resilience is **Very High**

Score **87.0**



**While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.**

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the **About the National Risk Index** and **How to Take Action** sections at the end of this report. Or, visit the National Risk Index website at [hazards.fema.gov/nri/learn-more](https://hazards.fema.gov/nri/learn-more) to access supporting documentation and links.

## Risk Index

The Risk Index rating is **Relatively Moderate** for **McHenry County, IL** when compared to the rest of the U.S.



Score

**85.71**

National Percentile

**85.71**

Percentile Within Illinois

**91.20**

0

100





86% of U.S. counties have a lower Risk Index

91% of counties in Illinois have a lower Risk Index

### Risk Index Legend

- Very High
- Relatively High
- Relatively Moderate
- Relatively Low
- Very Low
- No Rating
- Not Applicable
- Insufficient Data

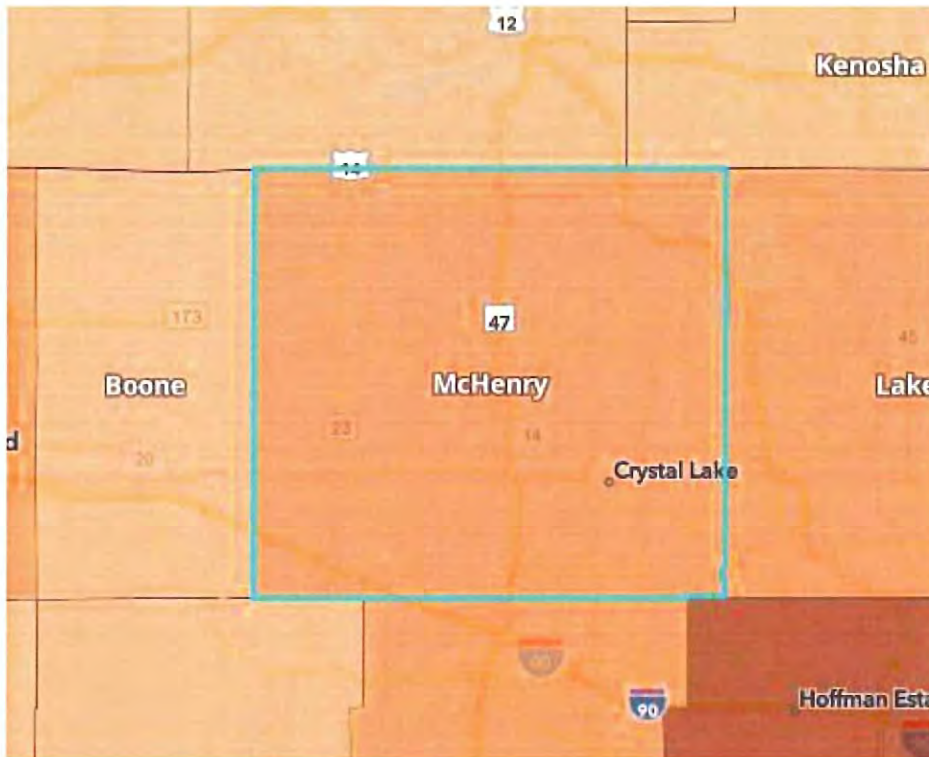
## Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's Expected Annual Loss value, community risk factors, and the adjustment factor used to calculate the risk value.

Hazard Type	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Score
<b>Tornado</b>	\$21,579,079	Very Low	Very High	0.91	\$19,490,840	97.1
<b>Cold Wave</b>	\$2,396,547	Very Low	Very High	0.91	\$2,188,278	97.4
<b>Strong Wind</b>	\$1,945,266	Very Low	Very High	0.91	\$1,767,008	90.2
<b>Riverine Flooding</b>	\$1,406,968	Very Low	Very High	0.91	\$1,288,893	72.5
<b>Heat Wave</b>	\$1,320,394	Very Low	Very High	0.91	\$1,201,103	90.8
<b>Lightning</b>	\$901,067	Very Low	Very High	0.91	\$815,976	92.4
<b>Earthquake</b>	\$774,437	Very Low	Very High	0.91	\$710,835	75.5
<b>Ice Storm</b>	\$153,621	Very Low	Very High	0.91	\$139,522	65.5
<b>Winter Weather</b>	\$139,961	Very Low	Very High	0.91	\$127,089	69.6
<b>Landslide</b>	\$122,400	Very Low	Very High	0.91	\$105,199	78.7
<b>Hail</b>	\$74,695	Very Low	Very High	0.91	\$70,113	40.5
<b>Wildfire</b>	\$62,070	Very Low	Very High	0.91	\$55,728	54.9
<b>Hurricane</b>	\$29,754	Very Low	Very High	0.91	\$26,564	22.5
<b>Drought</b>	\$14,503	Very Low	Very High	0.91	\$15,242	43.7
<b>Avalanche</b>	--	Very Low	Very High	0.91	--	--
<b>Coastal Flooding</b>	--	Very Low	Very High	0.91	--	--
<b>Tsunami</b>	--	Very Low	Very High	0.91	--	--
<b>Volcanic Activity</b>	--	Very Low	Very High	0.91	--	--

# Expected Annual Loss

In **McHenry County, IL**, expected loss each year due to natural hazards is **Relatively Moderate** when compared to the rest of the U.S.



Score **87.56**

National Percentile

**87.56**

Percentile Within Illinois

**91.20**

0 100

**88%** of U.S. counties have a lower Expected Annual Loss

**91%** of counties in Illinois have a lower Expected Annual Loss

## Expected Annual Loss Legend

- Very High
- Relatively High
- Relatively Moderate
- Relatively Low
- Very Low
- No Expected Annual Losses
- Not Applicable
- Insufficient Data

**Composite Expected Annual Loss** **\$30,920,760.97**

**Composite Expected Annual Loss Rate National Percentile** **21.3**

Building EAL **\$11,851,930.34** Population EAL **1.61 fatalities**

Building EAL Rate **\$1 per \$6.65K of building value** Population EAL Rate **1 per 192.23K people**

Agriculture EAL **\$353,115.17** Population Equivalence EAL **\$18,715,715.46**

Agriculture EAL Rate **\$1 per \$531.90 of agriculture value**

## Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type. **14 of 18** hazard types contribute to the expected annual loss for **McHenry County, IL**.

Hazard Type	Expected Annual Loss Rating	EAL Value	Score
Tornado	Relatively High	\$21,579,079	97.9
Cold Wave	Very High	\$2,396,547	98.2
Strong Wind	Relatively High	\$1,945,266	92.4
Riverine Flooding	Relatively Moderate	\$1,406,968	77.5
Heat Wave	Relatively Moderate	\$1,320,394	92.7
Lightning	Relatively High	\$901,067	94.4
Earthquake	Relatively Low	\$774,437	76.4
Ice Storm	Relatively Moderate	\$153,621	70.7
Winter Weather	Relatively Moderate	\$139,961	75.3
Landslide	Relatively Moderate	\$122,400	80.9
Hail	Relatively Low	\$74,696	46.9
Wildfire	Very Low	\$62,070	57.9
Hurricane	Very Low	\$29,754	25.3
Drought	Very Low	\$14,503	45.8
Avalanche	Not Applicable	--	--
Coastal Flooding	Not Applicable	--	--
Tsunami	Not Applicable	--	--
Volcanic Activity	Not Applicable	--	--

## Expected Annual Loss Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	\$2,396,547	\$426	\$2,313,088	0.20	\$83,032
Drought	\$14,503	n/a	n/a	n/a	\$14,503
Earthquake	\$774,437	\$639,980	\$134,457	0.01	n/a
Hail	\$74,695	\$33,686	\$18,932	0.00	\$22,077
Heat Wave	\$1,320,394	\$7,931	\$1,304,749	0.11	\$7,714
Hurricane	\$29,754	\$29,186	\$88	0.00	\$480
Ice Storm	\$153,621	\$61,600	\$92,022	0.01	n/a
Landslide	\$122,400	\$105,000	\$17,400	0.00	n/a
Lightning	\$901,067	\$104,698	\$796,369	0.07	n/a
Riverine Flooding	\$1,406,968	\$215,015	\$981,543	0.08	\$210,410
Strong Wind	\$1,945,266	\$214,882	\$1,717,919	0.15	\$12,465
Tornado	\$21,579,079	\$10,359,698	\$11,217,872	0.97	\$1,509
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	\$62,070	\$58,336	\$3,725	0.00	\$9
Winter Weather	\$139,961	\$21,493	\$117,553	0.01	\$916

## Exposure Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	\$3,676,766,992,43 9	\$78,827,571,9 40	\$3,597,751,600,00 0	310,151.00	\$187,820,49 9
Drought	\$117,755,627	n/a	n/a	n/a	\$117,755,62 7
Earthquake	\$3,677,483,521,00 0	\$78,827,121,0 00	\$3,598,656,400,00 0	310,229.00	n/a
Hail	\$3,676,766,992,43 9	\$78,827,571,9 40	\$3,597,751,600,00 0	310,151.00	\$187,820,49 9
Heat Wave	\$3,676,766,992,43 9	\$78,827,571,9 40	\$3,597,751,600,00 0	310,151.00	\$187,820,49 9
Hurricane	\$3,675,493,996,58 2	\$78,681,955,3 29	\$3,596,629,294,35 7	310,054.25	\$182,746,89 5
Ice Storm	\$3,676,108,305,82 4	\$78,820,623,5 47	\$3,597,287,682,27 6	310,111.01	n/a
Landslide	\$415,269,904,240	\$8,795,243,67 7	\$406,474,660,563	35,040.92	n/a
Lightning	\$3,676,579,171,94 0	\$78,827,571,9 40	\$3,597,751,600,00 0	310,151.00	n/a
Riverine Flooding	\$101,130,549,086	\$1,982,854,89 6	\$99,128,363,101	8,545.55	\$19,331,089
Strong Wind	\$3,676,766,992,43 9	\$78,827,571,9 40	\$3,597,751,600,00 0	310,151.00	\$187,820,49 9
Tornado	\$3,676,766,992,43 9	\$78,827,571,9 40	\$3,597,751,600,00 0	310,151.00	\$187,820,49 9
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	\$347,911,296,971	\$8,108,833,70 3	\$339,788,256,459	29,292.09	\$14,206,810
Winter Weather	\$3,676,766,992,43 9	\$78,827,571,9 40	\$3,597,751,600,00 0	310,151.00	\$187,820,49 9

## Annualized Frequency Values

Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	1.2 events per year	19	2005-2021 (16 years)
Drought	9.9 events per year	336	2000-2021 (22 years)
Earthquake	0.034% chance per year	n/a	2021 dataset
Hail	4.9 events per year	166	1986-2021 (34 years)
Heat Wave	0.7 events per year	12	2005-2021 (16 years)
Hurricane	0 events per year	1	East 1851-2021 (171 years) / West 1949-2021 (73 years)
Ice Storm	0.6 events per year	42	1946-2014 (67 years)
Landslide	0 events per year	0	2010-2021 (12 years)
Lightning	55.9 events per year	1,230	1991-2012 (22 years)
Riverine Flooding	1.1 events per year	26	1996-2019 (24 years)
Strong Wind	6.2 events per year	211	1986-2021 (34 years)
Tornado	0.4 events per year	24	1950-2021 (72 years)
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	0.004% chance per year	n/a	2021 dataset
Winter Weather	4.2 events per year	68	2005-2021 (16 years)



## Historic Loss Ratios

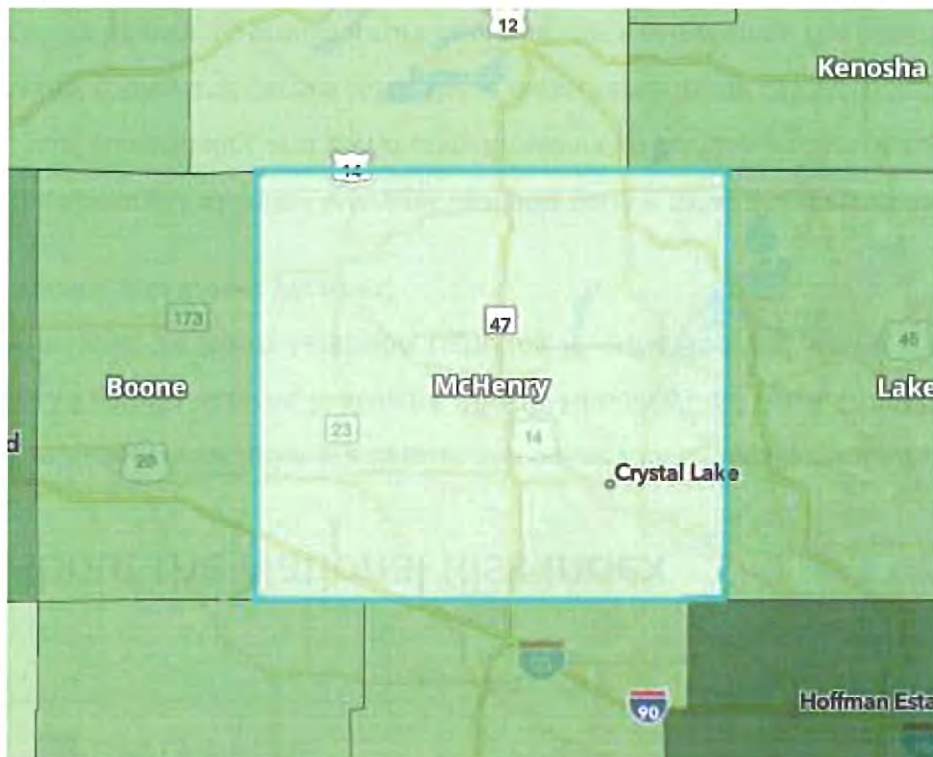
Hazard Type	Overall Rating
Avalanche	--
Coastal Flooding	--
Cold Wave	Very Low
Drought	Very Low
Earthquake	Relatively Low
Hail	Very Low
Heat Wave	Very Low
Hurricane	Very Low
Ice Storm	Very Low
Landslide	Very Low
Lightning	Relatively Low
Riverine Flooding	Very Low
Strong Wind	Very Low
Tornado	Relatively Moderate
Tsunami	--
Volcanic Activity	--
Wildfire	Very Low
Winter Weather	Very Low

## Expected Annual Loss Rate

Hazard Type	Building EAL Rate (per building value)	Population EAL Rate (per population)	Agriculture EAL Rate (per agriculture value)
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	\$1 per \$184.98M	1 per 1.56M	\$1 per \$2.26K
Drought	--	--	\$1 per \$12.95K
Earthquake	\$1 per \$123.17K	1 per 26.76M	--
Hail	\$1 per \$2.34M	1 per 190.03M	\$1 per \$8.51K
Heat Wave	\$1 per \$9.94M	1 per 2.76M	\$1 per \$24.35K
Hurricane	\$1 per \$2.70M	1 per 40.97B	\$1 per \$390.99K
Ice Storm	\$1 per \$1.28M	1 per 39.10M	--
Landslide	\$1 per \$750.74K	1 per 206.77M	--
Lightning	\$1 per \$752.90K	1 per 4.52M	--
Riverine Flooding	\$1 per \$366.61K	1 per 3.67M	\$1 per \$892.64
Strong Wind	\$1 per \$366.84K	1 per 2.09M	\$1 per \$15.07K
Tornado	\$1 per \$7.61K	1 per 320.72K	\$1 per \$124.44K
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	\$1 per \$1.35M	1 per 965.90M	\$1 per \$20.31M
Winter Weather	\$1 per \$3.67M	1 per 30.61M	\$1 per \$205.10K

## Social Vulnerability

Social groups in **McHenry County, IL** have a **Very Low** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.



Score **11.52**



**12%** of U.S. counties have a lower Social Vulnerability

**0%** of counties in Illinois have a lower Social Vulnerability

### Social Vulnerability Legend

- Very High
- Relatively High
- Relatively Moderate
- Relatively Low
- Very Low
- Data Unavailable

## Community Resilience

Communities in **McHenry County, IL** have a **Very High** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.



Score **87.01**



National Percentile

87.01

Percentile Within Illinois

0.70

0 100

13% of U.S. counties have a higher Community Resilience

99% of counties in Illinois have a higher Community Resilience

### Community Resilience Legend



## About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at [hazards.fema.gov/nri/map](https://hazards.fema.gov/nri/map).

Visit the National Risk Index website at [hazards.fema.gov/nri/learn-more](https://hazards.fema.gov/nri/learn-more) to access supporting documentation and links.

## Calculating the Risk Index

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

$$\text{Risk Index} = \text{Expected Annual Loss} \times \text{Social Vulnerability} \div \text{Community Resilience}$$

Risk Index scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit [hazards.fema.gov/nri/determining-risk](https://hazards.fema.gov/nri/determining-risk).

## Calculating Expected Annual Loss

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

$$\text{Expected Annual Loss} = \text{Exposure} \times \text{Annualized Frequency} \times \text{Historic Loss Ratio}$$

Expected Annual Loss scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit [hazards.fema.gov/nri/expected-annual-loss](https://hazards.fema.gov/nri/expected-annual-loss).

## Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SVI) published by the Centers for Disease Control and Prevention (CDC).

For more information, visit [hazards.fema.gov/nri/social-vulnerability](https://hazards.fema.gov/nri/social-vulnerability).

# Calculating Community Resilience

Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit [hazards.fema.gov/nri/community-resilience](https://hazards.fema.gov/nri/community-resilience).

# How to Take Action

There are many ways to reduce natural hazard risk through mitigation. Communities with high National Risk Index scores can take action to reduce risk by decreasing Expected Annual Loss due to natural hazards, decreasing Social Vulnerability, and increasing Community Resilience.

For information about how to take action and reduce your risk, visit [hazards.fema.gov/nri/take-action](https://hazards.fema.gov/nri/take-action).

# Disclaimer

The National Risk Index (the Risk Index or the Index) and its associated data are meant for planning purposes only. This tool was created for broad nationwide comparisons and is not a substitute for localized risk assessment analysis. Nationwide datasets used as inputs for the National Risk Index are, in many cases, not as accurate as available local data. Users with access to local data for each National Risk Index risk factor should consider substituting the Risk Index data with local data to recalculate a more accurate risk index. If you decide to download the National Risk Index data and substitute it with local data, you assume responsibility for the accuracy of the data and any resulting data index. Please visit the **Contact Us** page if you would like to discuss this process further.

The methodology used by the National Risk Index has been reviewed by subject matter experts in the fields of natural hazard risk research, risk analysis, mitigation planning, and emergency management. The processing methods used to create the National Risk Index have produced results similar to those from other natural hazard risk analyses conducted on a smaller scale. The breadth and combination of geographic information systems (GIS) and data processing techniques leveraged by the National Risk Index enable it to incorporate multiple hazard types and risk factors, manage its nationwide scope, and capture what might have been missed using other methods.

The National Risk Index does not consider the intricate economic and physical interdependencies that exist across geographic regions. Keep in mind that hazard impacts in surrounding counties or Census tracts can cause indirect losses in your community regardless of your community's risk profile.

Nationwide data available for some risk factors are rudimentary at this time. The National Risk Index will be continuously updated as new data become available and improved methodologies are identified.

The National Risk Index Contact Us page is available at [hazards.fema.gov/nri/contact-us](https://hazards.fema.gov/nri/contact-us).