2022-2027
Stephenson County Multi-Hazard Mitigation Plan

This update to the 2017-2022 plan was funded by an Illinois Emergency Management Agency (IEMA) grant awarded to Stephenson County and created by and for the municipalities and unincorporated areas of Stephenson County. It expires in 2027; annual maintenance is prescribed in Chapter 5. Mitigation actions are found in Chapter 4.

TABLE OF CONTENTS

SUMMARY BY CHAPTER

Chapter 1: Planning

Hazard mitigation planning is defined, and its benefits are explained. The local planning process is covered, including how the plan update was prepared and who was involved. Information is provided about planning team membership, planning team participation, meetings by jurisdiction, and a countywide survey of residents. Outreach to adjacent jurisdictions and government agencies (local, state, and federal) is accounted for, and plans, studies, reports, and technical data used to prepare the document are noted.

Chapter 2: Planning Context

Such context includes background on the natural and built environment used to prepare the plan.

Chapter 3: Capabilities, Hazard ID, & Risk Assessment

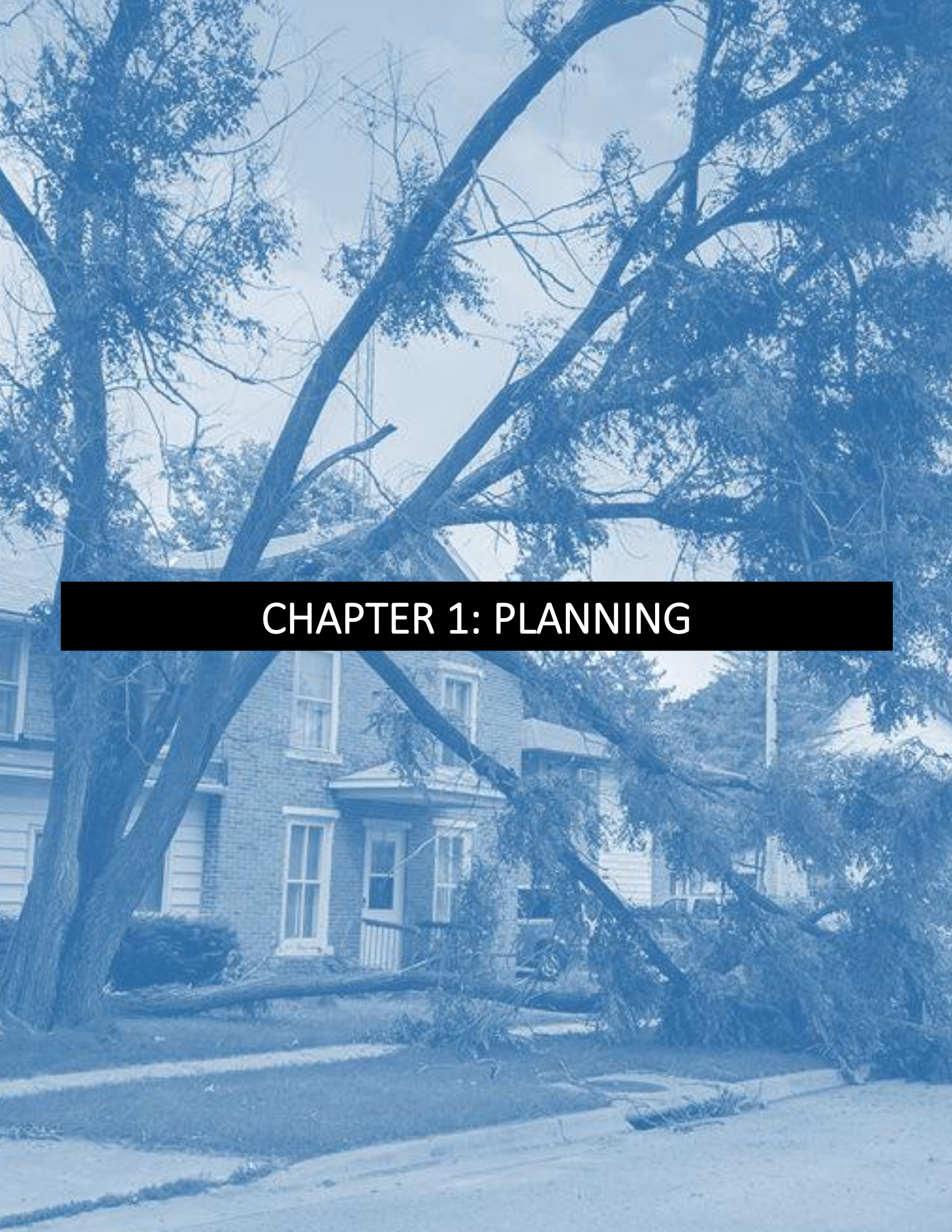
Capabilities by community are listed (including existing authorities, policies, programs, and resources), and the ability to expand/improve on them is considered. Hazard profiles, which explain the type, location, and extent of all natural hazards impacting Stephenson County jurisdictions, are provided. The probability of hazard occurrence is analyzed by hazard. The impacts of identified hazards are reviewed, and vulnerabilities for each jurisdiction are discussed and illustrated on a web-based interactive map. The chapter also covers development trends, outlines hazard-specific scenarios, and incorporates the following tables: Capabilities by Community; Assets, Vulnerabilities, and Risks by Community; Community Assets in Floodway/Floodplain - Stephenson County. Finally, counts of losses (including repetitive) are noted, and continued participation in/compliance with the National Flood Insurance Program (NFIP) is covered.

Chapter 4: Mitigation Strategy

Includes revised goals, objectives, actions, and an action plan (including prioritization). In addition, actions completed since the previous plan was adopted are listed.

Chapter 5: Post-Planning/Implementation

Integration, implementation, and administration, as well as methods for maintaining, monitoring, evaluating, and updating the plan between 2017 and 2022 are addressed. Public participation during plan maintenance is covered. Appendix E indicates resolutions of adoption by participating jurisdictions (county and municipal).



CHAPTER 1: PLANNING

CHAPTER 1: PLANNING

OVERVIEW

This chapter lays the groundwork for the hazard mitigation planning process. The term is defined, federal requirements are noted, and the local planning process is described (including pre-planning work). Furthermore, Chapter 1 addresses the planning team, stakeholders (within and outside of the county), and the public, as well as completed outreach and research.

What is hazard mitigation planning?

Mitigation is defined as "sustained actions taken to reduce or eliminate long-term risk to life and property from hazards."[1] As part of hazard mitigation planning, state, tribal, and local governments identify "natural disaster risks and vulnerabilities that are common in their area" and "develop long-term strategies for protecting people and property from similar events."[2] Jurisdictions must develop hazard mitigation plans to obtain certain non-emergency disaster assistance. The 2022-2027 plan has been shaped to meet the requirements of the Disaster Mitigation Act of 2000 and Stafford Act (44 CFR Part 201).

Roadway and bridge covered with floodwater near Pearl City, IL. Photo credit: SCEMA.

[1] Local Mitigation Planning Handbook, Federal Emergency Management Agency, published March 2013
[2] "Hazard Mitigation Planning," Federal Emergency Management Agency, accessed May 10, 2022

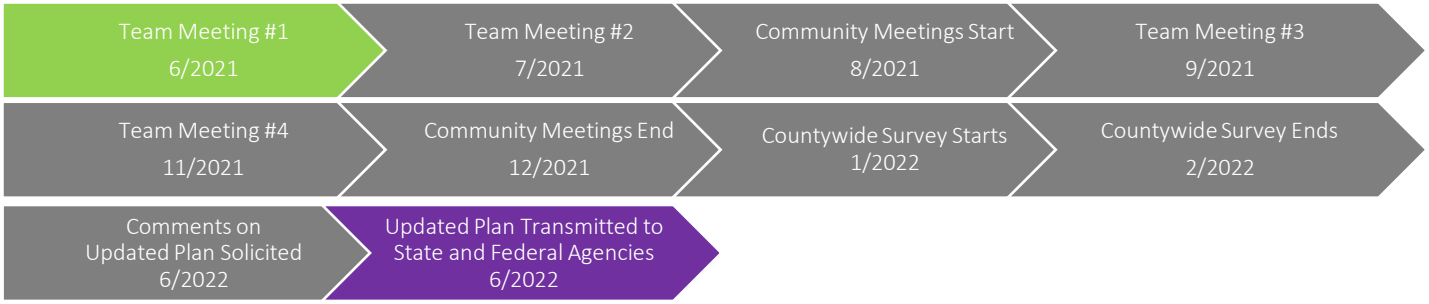
LOCAL PLANNING PROCESS

Pre-Planning

On October 16, 2020, the Stephenson County Emergency Management Agency (SCEMA) received a notice of award from the Illinois Emergency Management Agency (IEMA) regarding a grant to update the 2017 hazard mitigation plan. Previous awards were presented to and plans were published by the City of Freeport Community and Economic Development Department on behalf of the county. SCEMA requested that Blackhawk Hills Regional Council (BHRC), northwest Illinois' regional planning organization, provide planning support services for the 2022 plan update.[3]

Timeline

Illustration 1.1: Timeline



Planning Team

The planning process began with efforts to reassemble participants in previous planning efforts. New members representing various Stephenson County interests were recruited by SCEMA and BHRC.

Table 1.1: Planning Team Members

Team Member	Title	Affiliation
1. Aaron Dinderman	Resource Conservationist	Stephenson County Soil and Water Conservation District
2. Aaron Dykema	Lieutenant	Freeport Police Department
3. Aaron Miller	Regional Manager	Nicor Gas
4. Alisha Lizer	Trustee	Village of Dakota
5. Andrea Winter	Development Director	Greater Freeport Partnership
6. Andy Shaw	GIS Mapping and E-Zone Specialist	BHRC
7. Babette Jamison-Varner	Executive Director	Freeport Housing Authority
8. Berin Jackson	Superintendent of Recreation	Freeport Park District
9. Beth Henning	Zoning Director	Stephenson County Zoning
10. Bobbie Bahr	Emergency Response Coordinator	Stephenson County Health Department
11. Bradley Liggett	Fire Chief	Freeport Fire Department
12. Charlie Hableib	Village President	Village of Rock City
13. Charlotte Hazel	n/a	American Red Cross
14. Cindi Mielke	Director of Retired and Senior Volunteer Program	Highland Community College
15. Curt Suttman	Director of Information Technology	City of Freeport
16. Dale Rasmussen	County Engineer	Stephenson County
17. Daniel Payette	Executive Director	BHRC
18. Denise Osadjan	Village President	Village of Cedarville
19. Doug Toepfer	Emergency Preparedness Coordinator	FHN
20. Eric Bruning	Fire Chief	Village of German Valley

[3] The 2017 plan was prepared by Blackhawk Hills Regional Council for the City of Freeport. The 2008 document was created by Vandewalle and Associates, based in Madison, WI, for the City of Freeport.

21. George Gaulrapp	External Affairs Manager	ComEd
22. Georgia Newcomer	County Administrator	Stephenson County
23. Greg Munda	Director of Facilities and Grounds	Freeport School District
24. Jay Herder	Director	Freeport Area Church Cooperative
25. Jodi Miller	Mayor	City of Freeport
26. Joe Ginger	President	Friends of the Pecatonica River
27. Ken Nesemeier	Administrative Lieutenant	Stephenson County Sheriff's Office
28. Kevin Countryman	Director	Stephenson County Emergency Management
29. Kim Kopp	Village President	Village of Ridott
30. Kirk Chezem	Village Treasurer	Village of Ridott
31. Kirstin Hinds	Director of Community and Economic Development	City of Freeport
32. Lee Butler	President	Yellow Creek Watershed Partnership
33. Leroy Wernet	Village President	Village of Winslow
34. Leslie Luther	Executive Director	American Red Cross of Northwest Illinois
35. Marcia Derrer	Executive Director	Northwest Illinois Community Action Agency
36. Margaret Larson	County Director	University of Illinois Extension
37. Marilyn Sucoe	Illinois NFIP Coordinator (acting)	IDNR
38. Matthew Summers	Police Chief	Freeport Police Department
39. Mike Munda	GIS Technician	Stephenson County
40. Mike Tichler	Village Trustee	Village of Pearl City
41. Mike Wichman	Fire Chief	Freeport Rural Department
42. Nancy Moran	Village Clerk	Winslow
43. Nick Jupin	RHCC Readiness and Response Administrator	NIPARC
44. Randy Bukas	City Manager	City of Freeport
45. Rich Haight	n/a	Highland Community College
46. Rich Kinney	Warning Coordination Meteorologist	NOAA
47. Rick McDonough	Emergency Response Coordinator	Stephenson County Health Department
48. Ron Pina	Fire Chief	Village of Winslow
49. Ron Schneider	Executive Director	Freeport Park District
50. Scott Townsend	Assistant Director	Stephenson County Emergency Management
51. Shane Littel	Maintenance	Village of Orangeville
52. Steve Buss	Village President	Village of Lena
53. Steve Olson	President	Village of Davis
54. Steve Stovall	Chief Deputy	Stephenson County Sheriff's Office
55. Sunshine Mergen	Emergency Services Disaster Coordinator	Salvation Army
56. Tara Walters	Regional Planner	BHRC
57. Terra McParland	n/a	IDNR
58. Terry Groves	Assistant Director	Stephenson County Zoning
59. Tim Thorson	Captain	Salvation Army
60. Tom Scudder	Village President	Village of Orangeville
61. Travis Davis	Deputy Police Chief	Freeport Police Department
62. Victoria Hansen	Manager	Stephenson County Farm Bureau
63. William Hadley	Board Chairman	Stephenson County Board

Not all of the above members participated in formal activities; those that did not were kept up-to-date through communications that included agendas, presentations, links to surveys, and draft planning documents.

Table 1.2: Planning Team Meetings and Participants

Team Meeting #1/Kick-Off June 21, 2021 at remote Synopsis: introduction to hazard mitigation planning, timeline and requirements review, hazards overview, mission statement discussion	Team Meeting #2 July 19, 2021 at Stephenson County Farm Bureau Synopsis: climate presentation and discussion with state climatologist, current plan overview, hazards mapping activity	Team Meeting #3 September 20, 2021 at Greater Freeport Partnership Synopsis: hazard risk assessment, risk index scoring activity	Team Meeting #4 November 15, 2021 at Stephenson County Emergency Management Agency Synopsis: NFIP presentation, mitigation actions updates, community engagement/public input
Attendees: 1. Aaron Miller (Nicor Gas) 2. Andrea Winter (Greater Freeport Partnership) 3. Beth Henning (Stephenson County) 4. Bobbie Bahr (Stephenson County Health Department) 5. Bradley Liggett (City of Freeport) 6. Charlie Hableib (Village of Rock City) 7. Cindi Mielke (Highland Community College) 8. Curt Suttman (City of Freeport) 9. Daniel Payette (BHRC) 10. Doug Toepfer (FHN) 11. Greg Munda (Freeport SD 145) 12. Jodi Miller (City of Freeport) 13. Kim Kopp (Village of Ridott) 14. Kirstin Hinds (City of Freeport) 15. Leslie Luther (American Red Cross) 16. Marcia Derrer (Northwest Illinois Community Action Agency) 17. Margaret Larson (UIEX) 18. Marilyn Sucoe (IDNR) 19. Mike Tichler (Village of Pearl City) 20. Ron Pina (Village of Winslow) 21. Scott Townsend (SCEMA) 22. Shane Little (Village of Orangeville) 23. Tara Walters (BHRC) 24. Terry Groves (Stephenson County) 25. Travis Davis (City of Freeport) 26. Leroy Wernet (Village of Winslow) 27. Andy Shaw (BHRC) 28. Berin Jackson (Freeport Park District) 29. Matthew Summers (City of Freeport)	Attendees: 1. Alisha Lizer (Village of Dakota) 2. Andrea Winter (Greater Freeport Partnership) 3. Berin Jackson (Freeport Park District) 4. Beth Henning (Stephenson County) 5. Bobbie Bahr (Stephenson County Health Department) 6. Bradley Liggert (City of Freeport) 7. Cindi Mielke (Highland Community College) 8. Daniel Payette (BHRC) 9. Doug Toepfer (FHN) 10. Eric Bruning (Village of German Valley) 11. George Gaulrapp (ComEd) 12. Jodi Miller (City of Freeport) 13. Kim Kopp (Village of Ridott) 14. Kirstin Hinds (City of Freeport) 15. Margaret Larson (UIEX) 16. Mike Tichler (Village of Pearl City) 17. Nick Jupin (NIPARC) 18. Ron Schneider (Freeport Park District) 19. Scott Townsend (SCEMA) 20. Tara Walters (BHRC) 21. Terra McParland (IDNR) 22. Terry Groves (Stephenson County) 23. Tom Scudder (Village of Orangeville) 24. Travis Davis (City of Freeport) 25. Victoria Hansen (Stephenson County Farm Bureau)	Attendees: 1. Andrea Winter (Greater Freeport Partnership) 2. Berin Jackson (Freeport Park District) 3. Beth Henning (Stephenson County) 4. Bobbie Bahr (Stephenson County Health Department) 5. Charlotte Hazel (American Red Cross) 6. Daniel Payette (BHRC) 7. George Gaulrapp (ComEd) 8. Greg Munda (Freeport SD 145) 9. Kevin Countryman (SCEMA) 10. Kim Kopp (Village of Ridott) 11. Kirk Chezem (Village of Ridott) 12. Marcia Derrer (Northwest Illinois Community Action Agency) 13. Margaret Larson (UIEX) 14. Marilyn Sucoe (IDNR) 15. Mike Tichler (Village of Pearl City) 16. Ron Pina (Village of Winslow) 17. Scott Townsend (SCEMA) 18. Shane Little (Village of Orangeville) 19. Tara Walters (BHRC) 20. Terra McParland (IDNR) 21. Travis Davis (City of Freeport)	Attendees: 1. Aaron Dykema (City of Freeport) 2. Aaron Miller (Nicor Gas) 3. Andy Shaw (BHRC) 4. Berin Jackson (Freeport Park District) 5. Beth Henning (Stephenson County) 6. Bobbie Bahr (Stephenson County Health Department) 7. Daniel Payette (BHRC) 8. Greg Munda (Freeport SD 145) 9. Kevin Countryman (SCEMA) 10. Kim Kopp (Village of Ridott) 11. Kirk Chezem (Village of Ridott) 12. Leslie Luther (American Red Cross) 13. Marcia Derrer (Northwestern Illinois Community Action Agency) 14. Marilyn Sucoe (IDNR) 15. Ron Pina (Village of Winslow) 16. Scott Townsend (SCEMA) 17. Tara Walters (BHRC)

Participating Units of Local Government (ULG)

All of Stephenson County's cities and villages were invited to participate in the process. Participating ULGs (all ULGs in Stephenson County) included:

Table 1.3: Participating ULGs

Date
1. City of Freeport
2. Village of Cedarville
3. Village of Dakota
4. Village of Davis
5. Village of German Valley
6. Village of Lena
7. Village of Orangeville
8. Village of Pearl City
9. Village of Ridott
10. Village of Rock City
11. Village of Winslow
12. Stephenson County

Stephenson County Emergency Management Agency directors and BHRC staff met with representatives from participating communities to review past progress, capabilities, assets, hazards, vulnerabilities, goals, etc. Meetings included elected officials, staff, and other community representatives and were held in the following communities:

Table 1.4: Community Meetings[4]

Date	Jurisdiction
August 10, 2021	Village of Orangeville
August 20, 2021	Village of Lena
August 26, 2021	Village of Ridott
August 31, 2021	Village of Winslow
September 1, 2021	Village of Cedarville
September 29, 2021	Stephenson County
October 25, 2021	Village of German Valley
October 26, 2021	Village of Pearl City
October 27, 2021	Village of Dakota
November 4, 2021	Village of Davis
December 2, 2021	City of Freeport

At each meeting, participants were asked to suggest mitigation actions to include in the updated plan. Additionally, information about community plans and planning documents was discussed. Maps of the ULG were annotated by participants, who were asked to record the location of community/critical facilities, vulnerabilities, past hazard events, and other points of interest.

Adjacent Jurisdictions

Prior to the official public comment period, emergency management agency directors from adjacent counties (Jo Daviess, Winnebago, Carroll, and Ogle in Illinois, as well as Green and Lafayette in Wisconsin) were invited via email to provide input on Stephenson County's draft plan (a copy of the draft plan was also provided via email). At the same time, the Stephenson County planning team was further solicited for input, especially regarding refinement of the draft plan's hazard profiles and mitigation actions.

[4] Due to community member availability, a 1-on-1 meeting was not held with Village of Rock City officials; instead, comments were solicited from the village president via email

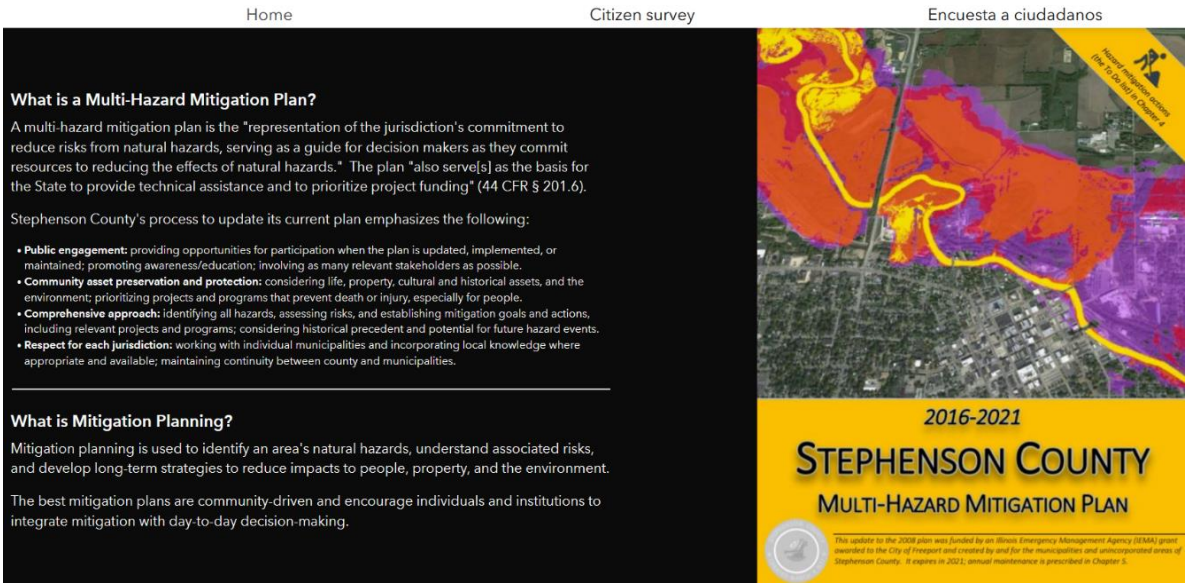
Public Comment

Stephenson County Emergency Management Agency solicited comments from the public between June 4, 2022, and June 18, 2022, issuing notice about the period in the Freeport Journal Standard. The plan was posted on City of Freeport, Stephenson County, and plan update websites. Printed copies were made available at Freeport City Hall, Stephenson County Emergency Management Agency, and municipal libraries. Further, a link to the plan update website was emailed to known stakeholders, including planning team members, adjacent jurisdictions, and state and federal agencies - notably, the Illinois Department of Natural Resources (IDNR), IEMA, and National Oceanic and Atmospheric Administration (NOAA). Stephenson County Emergency Management Agency also issued a press release and posted a link to the plan on its social media.

Public Website

Information about the planning process, including links to English and Spanish-language surveys, was included on a website created for the process.

Screen captures 1.1 and 1.2: Stephenson County Multi-Hazard Mitigation Plan Update website



RESEARCH

Planning Team Survey
Initial information about hazards, hazard concerns, and hazard experiences was collected through a survey of planning team participants. Feedback on a mission statement was also recorded. 25 responses were received.

Public Survey
The planning team collected information from stakeholders living and working in Stephenson County. 194 responses were received from January 26, 2022, to February 10, 2022.

Plans, Studies, Reports, & Technical Data
The county's multi-hazard mitigation plan includes data and analysis from previous planning initiatives, including comprehensive and land use plans.

Mission Statement adopted by Planning Team:

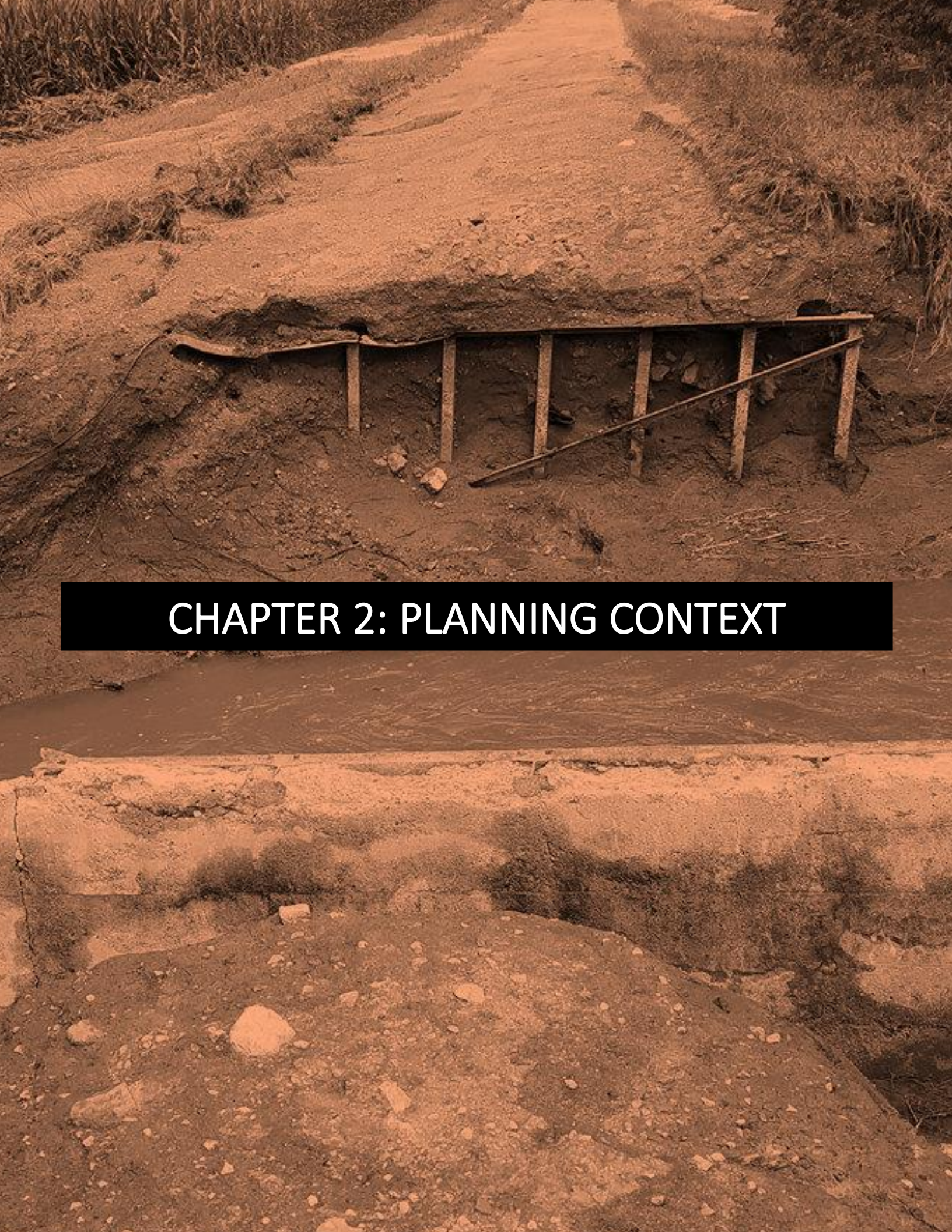
Through partnerships and careful planning, stakeholders will identify and reduce Stephenson County's vulnerability to natural hazards in order to protect the health, safety, quality of life, environment, and economy of Stephenson County and its municipalities.

Table 1.5: Documents Incorporated or Reviewed

Focus on Local/County	Focus on Regional/State/Federal
2008 MITIGATION PLAN	

• Flood Insurance Studies:
  ○ City of Freeport - 1976
  ○ Unincorporated Areas of Stephenson County - 1982
  ○ Village of Winslow - 1982
  ○ Village of Pearl City - 1989
• Reconnaissance Report for General Investigations Study: Freeport on Pecatonica River, Illinois – US Army Corps of Engineers (USACE), Rock Island District - 1995
• Stephenson County Disaster Plan - 2006
• Future Land Use Plan for Stephenson County - 2000
• City of Freeport East Side Revitalization Strategy - 2007
• County and municipal zoning and subdivision ordinances
• County and municipal land use plans
	• Illinois Natural Hazard Mitigation Plan - 2004
	• Rock River Basin Assessment, Illinois Environmental Protection Agency (IEPA) - 2006
	• National Weather Service Quad Cities Service Guide (NWS) - 2007
	• National Oceanic and Atmospheric Administration (NOAA) Storm Events Database*
	
	**Name updated since 2008*

2017 MITIGATION PLAN	
• Stephenson County Comprehensive Plan - 1954, 1970, 2001 • Storm Drainage & Erosion Control Management Design Manual - 2008 • City of Freeport Comprehensive Plan - 2010 • East Side Revitalization Strategy - 2007 • East Side Revitalization: Reducing the Impacts of Flooding and Floodway Regulations - 2013 • Freeport Revitalization Project - 2013 • Green Infrastructure Guide Book - 2013 • The Spark: Rekindling Freeport's Legacy of Innovation - 2013 • Third Ward Healthy Neighborhoods - 2013 • Freeport Forward! Riverfront Enterprise Area Plan - 2016 • Digital Flood Insurance Rate Maps (DFIRMs)/Flood Insurance Rate Maps (FIRMs) • Websites: Freeport Forward! and Rawleigh Complex Redevelopment	• Illinois Natural Hazard Mitigation Plan - 2013 • National Oceanic and Atmospheric Administration (NOAA) Storm Events Database • Threat and Hazard Identification and Risk Assessment – 2015
2022 MITIGATION PLAN	
• City of Freeport Comprehensive Plan - 2020	• National Oceanic and Atmospheric Administration (NOAA) Storm Events Database • Illinois Natural Hazard Mitigation Plan - 2018



CHAPTER 2: PLANNING CONTEXT

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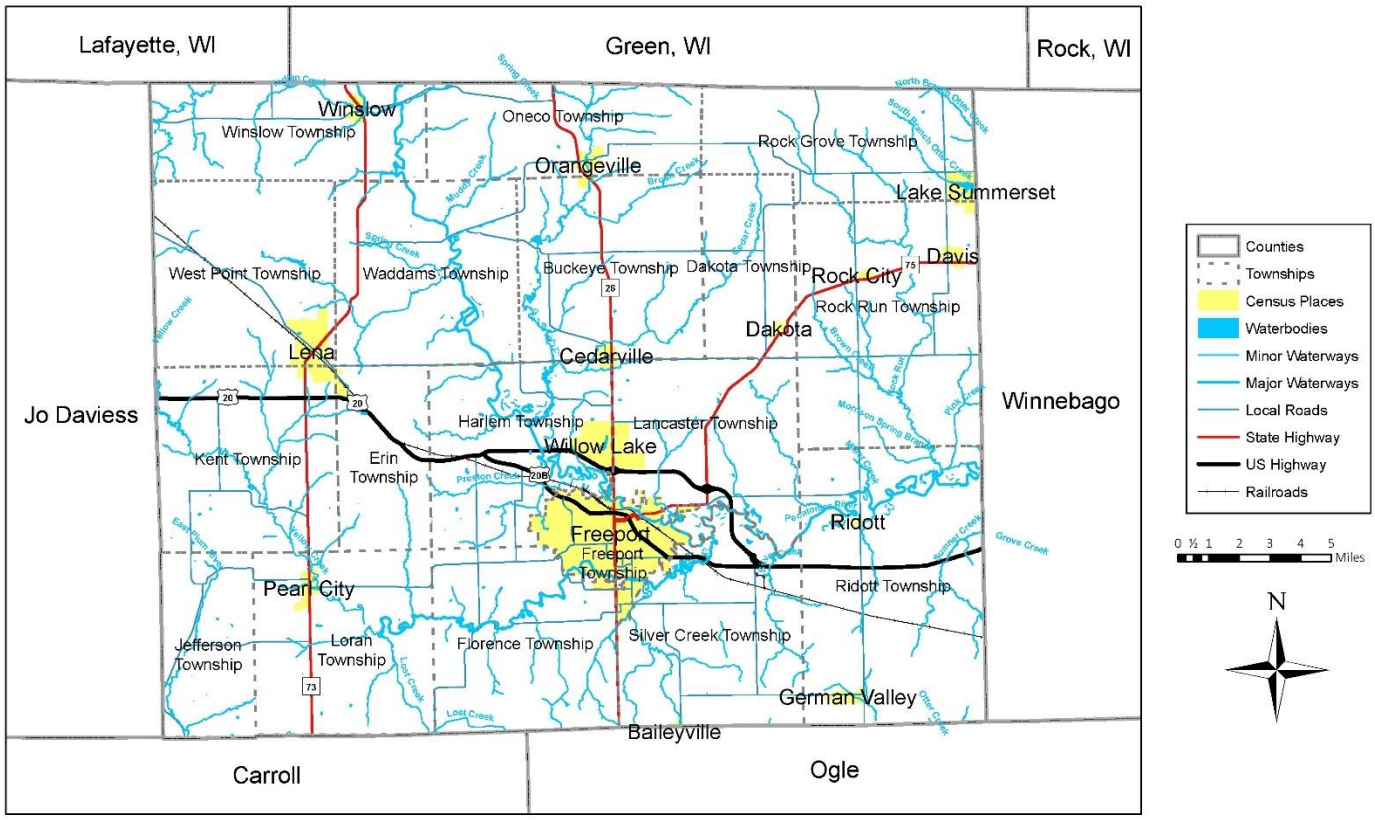
OVERVIEW

Chapter 2 provides geographic, geologic, climatic, demographic, and other planning context for hazard mitigation strategies. All of the maps included in Chapter 2 have been updated for 2022.

GEOGRAPHY

Geography & Governance

Map 2.1: Political Divisions – Stephenson County



Stephenson County is located in northwest Illinois and covers approximately 564.52 square miles.[5] The county shares a western border with Jo Daviess County, an eastern border with Winnebago County, and a southern border with Carroll County and Ogle County. Its northern border is shared with Green County, WI, and Lafayette County, WI. The Stephenson County Board, the county's governing body, consists of twenty-two elected members.

[5] "Quick Facts: Stephenson County, Illinois," US Census Bureau, accessed February 23, 2022

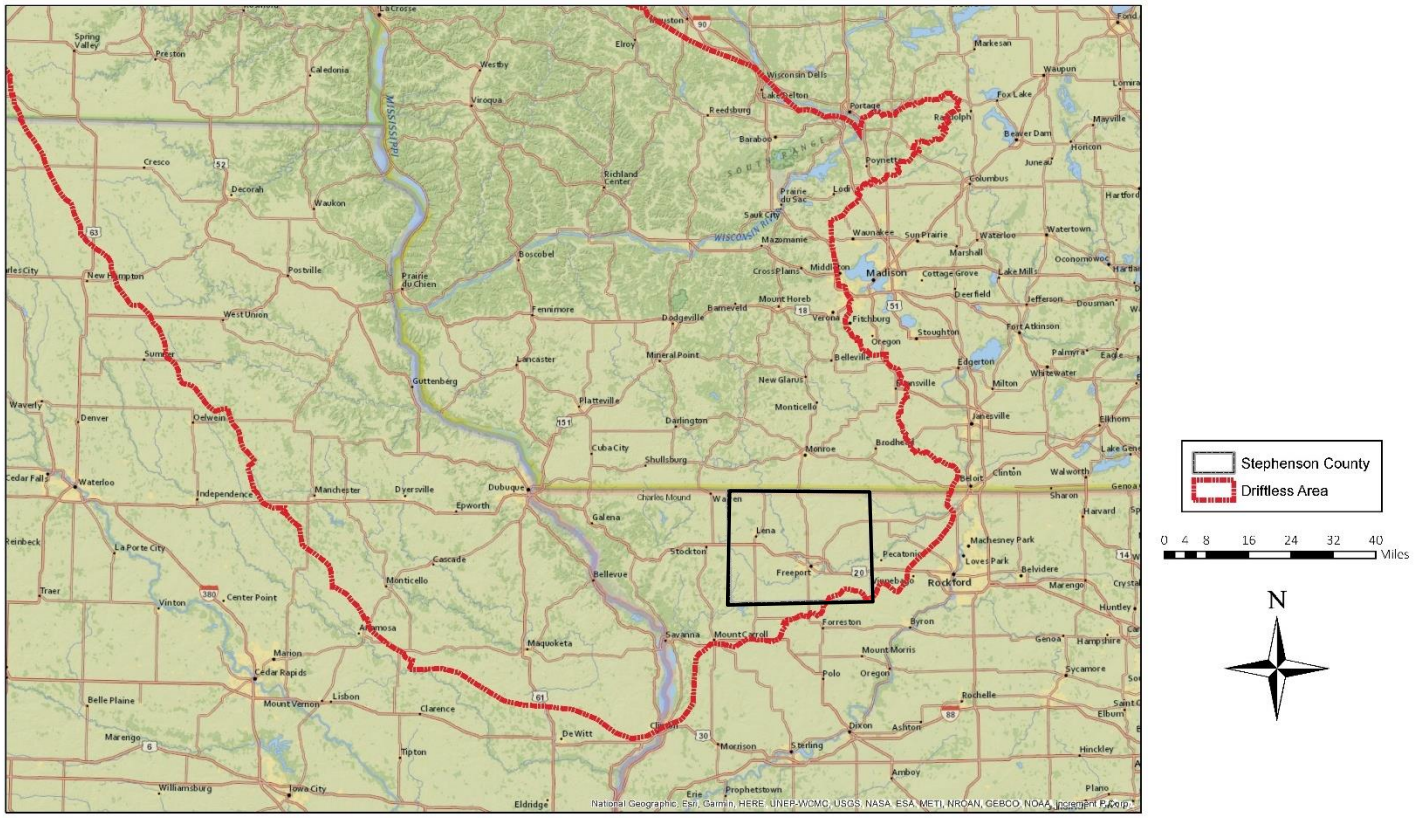
Table 2.1: Selected Units of Government – Stephenson County

Municipalities	Townships (18)	Fire Protection Districts (13)	School Districts (5)	College Districts (1)
CITIES (1)	Buckeye	Cedarville/McConnell	Dakota	Highland Community College
Freeport	Dakota	Dakota	Freeport	
	Erin	Davis	Lena-Winslow	
VILLAGES (10)	Florence	Freeport City	Orangeville	
Cedarville	Freeport	Freeport Rural	Pearl City	
Dakota	Harlem	German Valley/Ridott		
Davis	Jefferson	Lena		
German Valley	Kent	Orangeville		
Lena	Lancaster	Pearl City/Kent		
Orangeville	Loran	Pecatonica		
Pearl City	Oneco	Rock City		
Ridott	Ridott	Shannon		
Rock City	Rock Grove	Winslow		
Winslow	Rock Run			
	Silver Creek			
	Waddams			
	West Point			
	Winslow			

Physical Geography

Stephenson County is positioned on the southeastern edge of the Driftless Area, an unglaciated hilly region that includes northwest Illinois and portions of Wisconsin, Iowa, and Minnesota. Generally, the county's topography rolls gently.

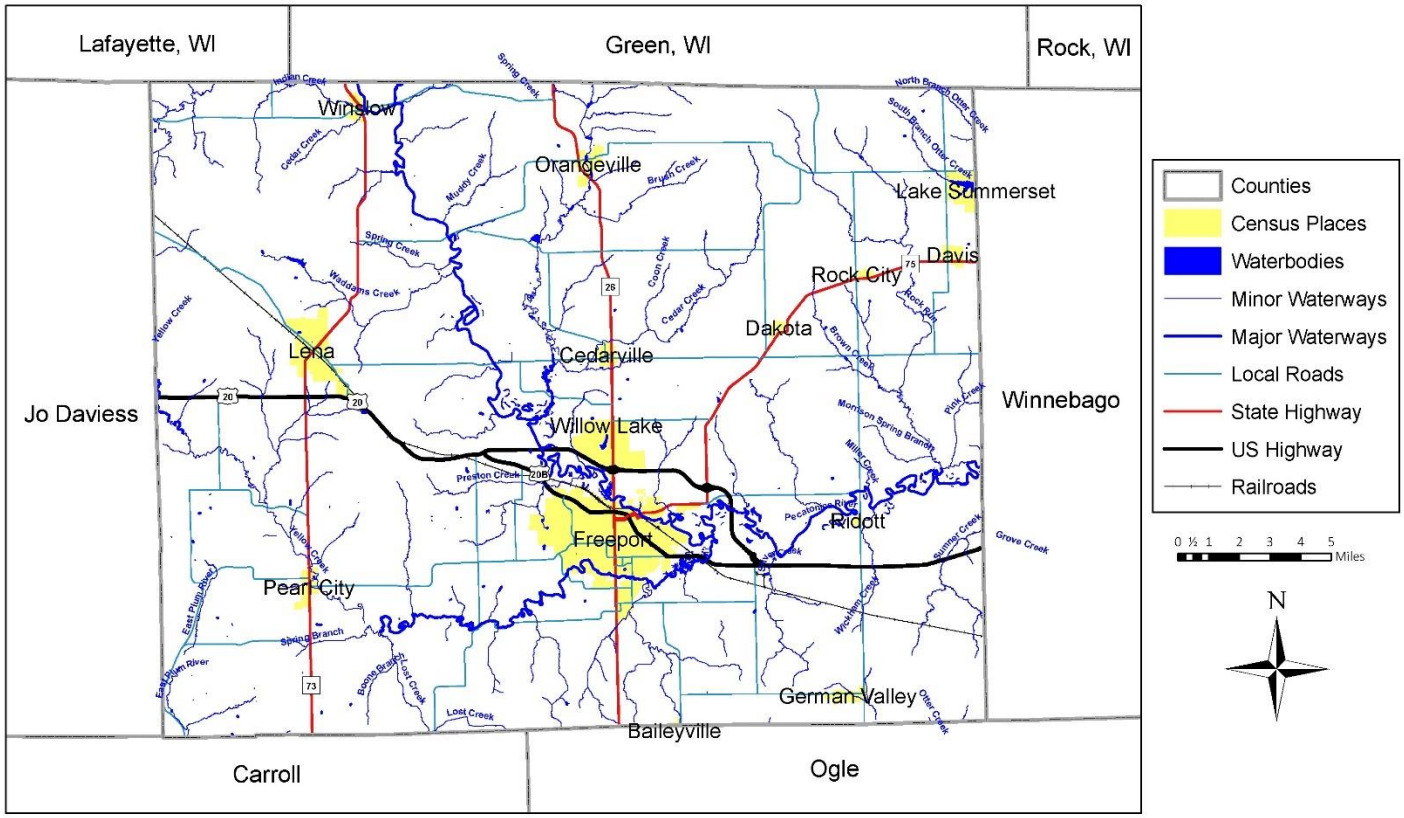
Map 2.2: Driftless Area



FEATURES

Waterways & Waterbodies

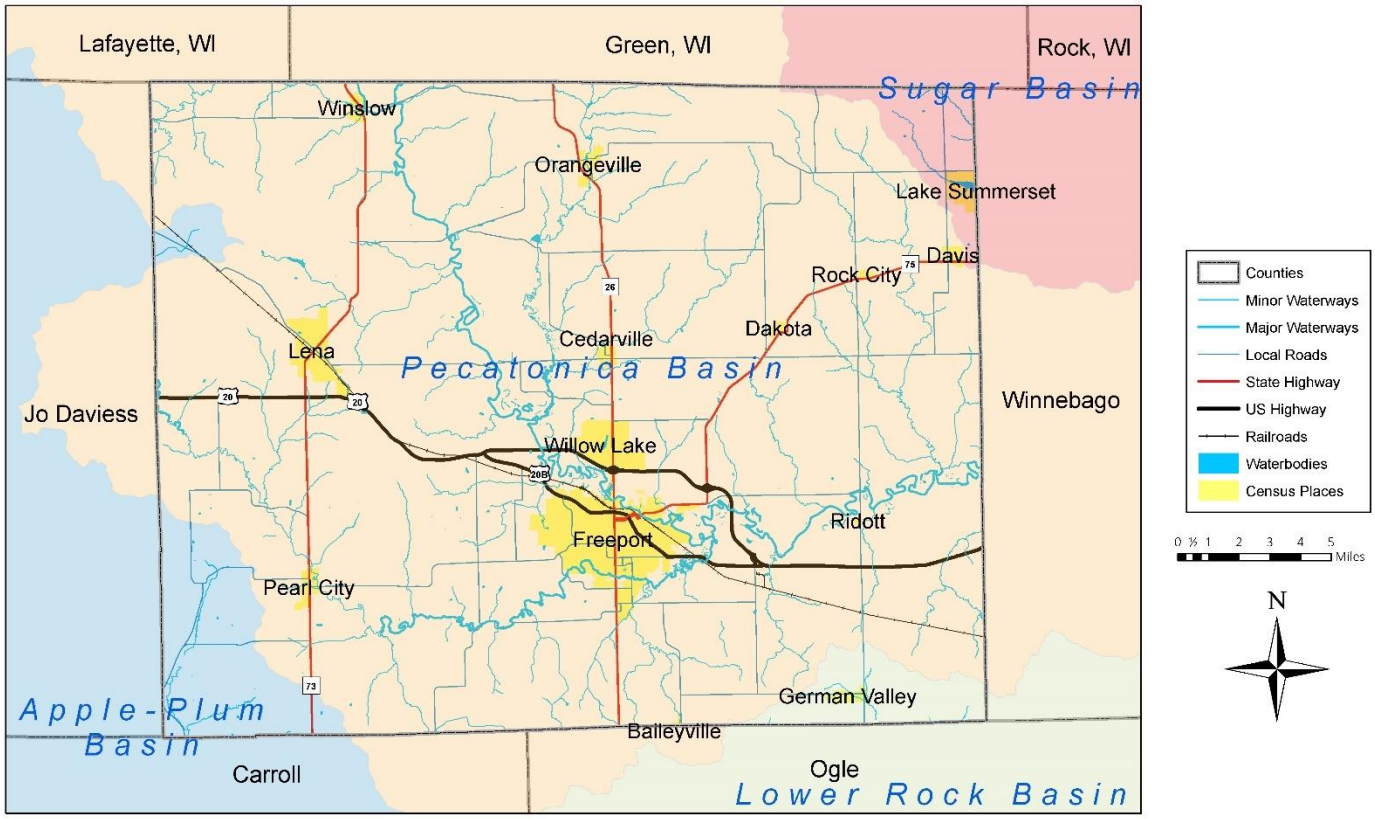
Map 2.3: Rivers and Lakes – Stephenson County



One of Stephenson County's most prominent natural features is the Pecatonica River, which begins in Iowa County in Wisconsin, enters into northern Illinois through Green County, WI, and then empties into the Rock River in Winnebago County. Stephenson County is impacted by flooding along the Pecatonica River and various area creeks (e.g., Yellow Creek, Currier Creek, etc.). Most of these creeks are tributaries to the Pecatonica River. Lakes in Stephenson County include artificial bodies of water like Lake Le-Aqua-Na, Lake Summerset, and Willow Lake.

Watersheds

Map 2.4: Watersheds/Drainage Basins – Stephenson County



A watershed is an area that drains into a common waterway or waterbody. Stephenson County is located almost entirely within the Pecatonica River Watershed, which in addition to Stephenson County, covers the counties of Jo Daviess, Carroll, Ogle, and Winnebago in Illinois.[6] The Pecatonica River Watershed is connected to the Rock River Watershed and Mississippi River Watershed. Generally speaking, water in the county flows from the Pecatonica River to the Rock River to the Mississippi River.

Table 2.2: Acres of Watershed – Stephenson County[7]

Pecatonica River Watershed	Apple-Plum River Watershed	Lower Rock River Watershed
ACRES OF COUNTY IN WATERSHED 335,098.77	*ACRES OF COUNTY IN WATERSHED* 18,620.95	*ACRES OF COUNTY IN WATERSHED* 343,098.26
% OF COUNTY IN WATERSHED 93%	*% OF COUNTY IN WATERSHED* 5.15%	*% OF COUNTY IN WATERSHED* 95%
MUNICIPALITIES IN WATERSHED All municipalities but German Valley.	*MUNICIPALITIES IN WATERSHED* No municipalities in Stephenson County.	*MUNICIPALITIES IN WATERSHED* All municipalities in Stephenson County.

Flooding occurs over areas defined by watersheds and is not solely contained within the bounds of political divisions, necessitating that neighboring jurisdictions work together to effectively manage flood risks and minimize the potential for damage. Policy makers must consider that within a watershed, development upstream directly affects communities downstream.

[6] "Science in Your Watershed," United States Geological Survey, accessed May 10, 2022
[7] Blackhawk Hills Regional Council analysis, based on the "National Hydrography Dataset," United States Geological Survey, produced 2016

Land Cover, Soils, & Slopes

Map 2.5: Land Cover – Stephenson County

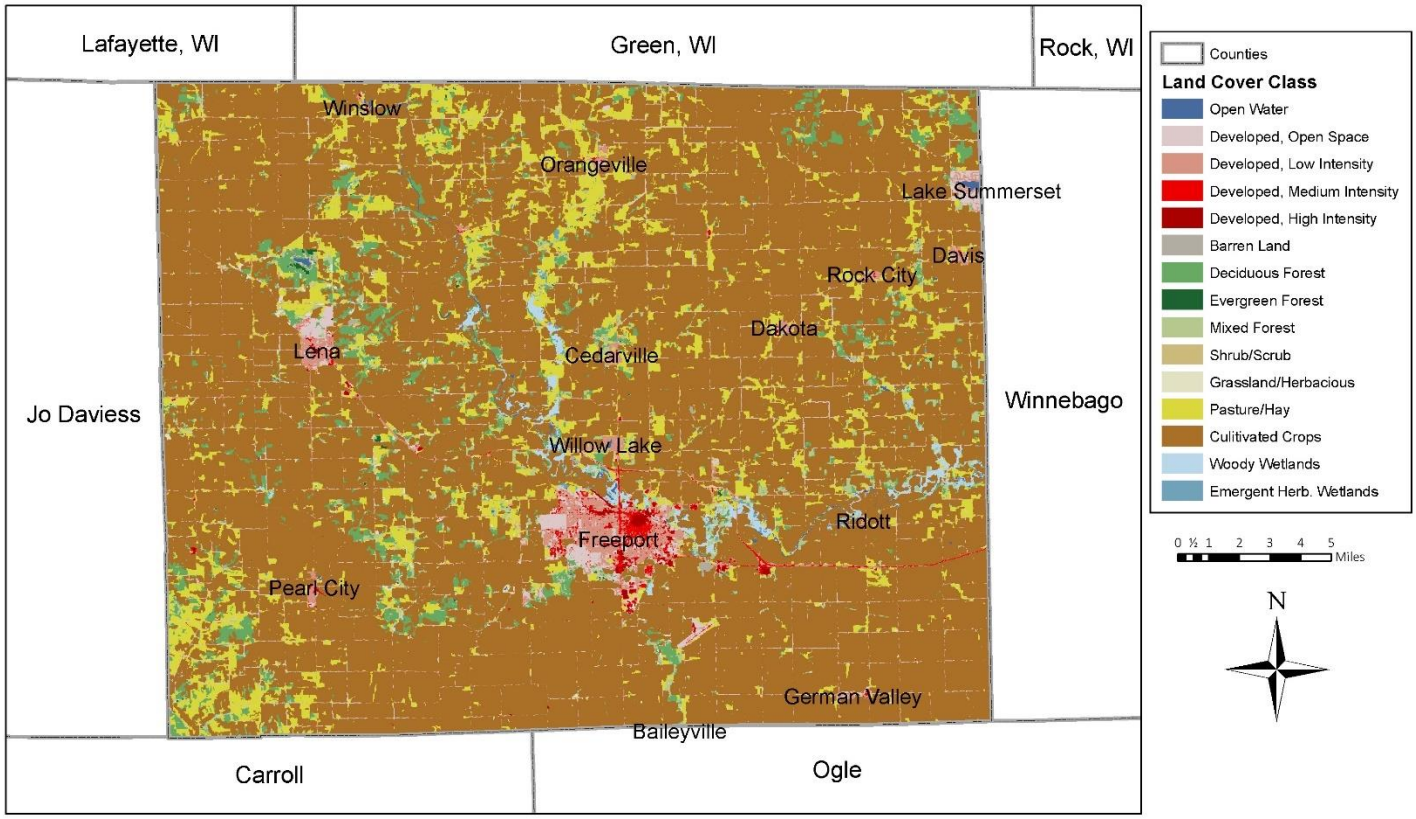
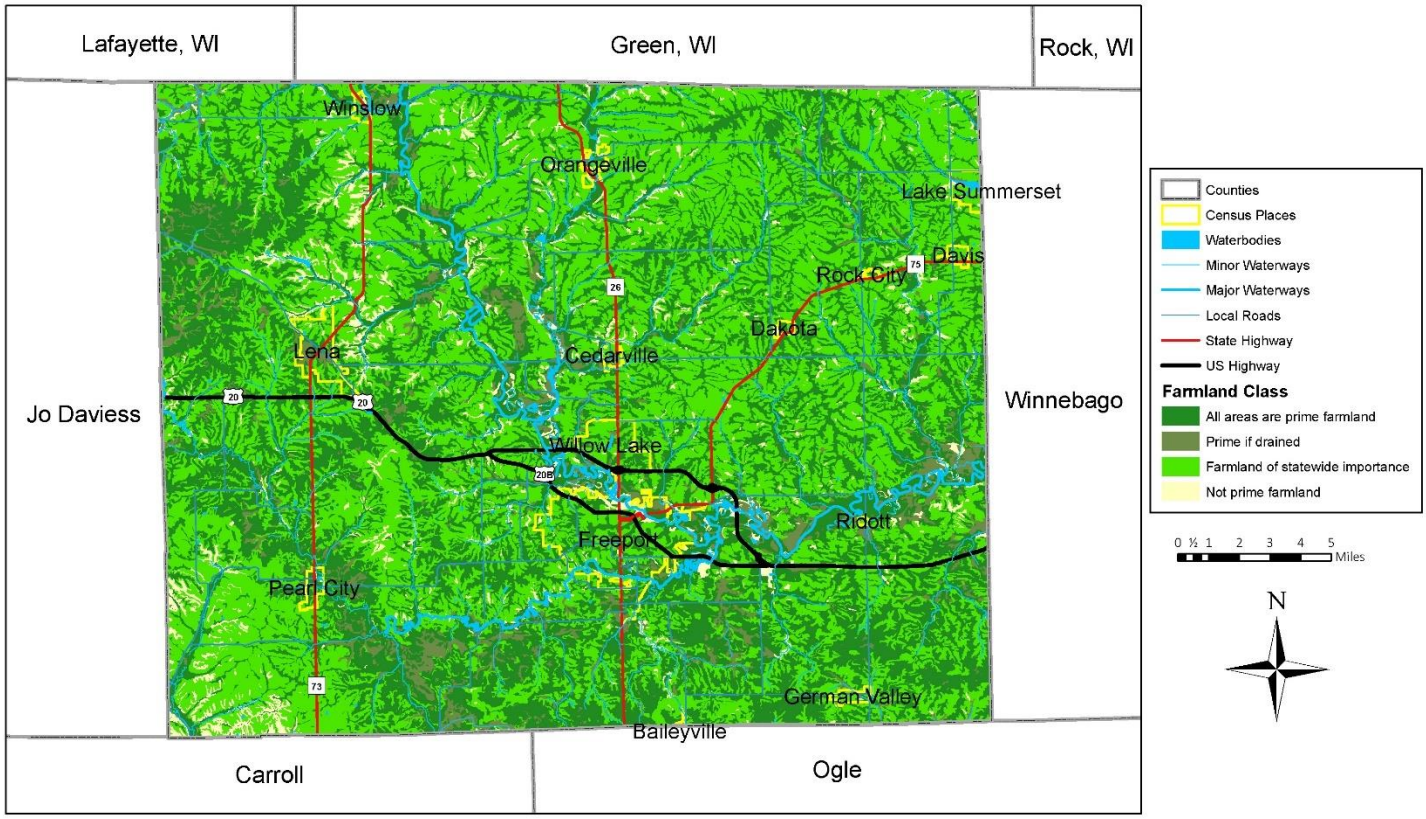


Table 2.3: Land Cover by Classification and Area – Stephenson County[8]

National Land Cover Database Classification	Area (sq mi)	Percent
Cultivated Crops	417.6539	74.08%
Pasture/Hay	60.6008	10.75%
Deciduous Forest	22.1159	3.92%
Developed Open Space	20.8659	3.70%
Developed Low Density	14.3015	2.54%
Mixed Forest	13.9224	2.47%
Woody Wetlands	4.1204	0.73%
Developed Medium Density	3.5047	0.62%
Grassland Herbaceous	2.7567	0.49%
Open Water	1.6373	0.29%
Developed High Density	1.2398	0.22%
Emergent Herbaceous Wetlands	1.2379	0.22%
Evergreen Forest	0.4576	0.08%
Barren Land	0.4431	0.08%
Shrub/Scrub	0.1862	0.03%

[8] Blackhawk Hills Regional Council analysis, based on the "NLCD 2019 Land Cover (CONUS)," Multi-Resolution Land Characteristics Consortium, produced 2021

Map 2.6: Prime Farmland – Stephenson County



Nearly all land in Stephenson County is classified as farmland of statewide importance, prime if drained, or prime.

Table 2.4: Soil by Classification and Area – Stephenson County [9]

Soil Classification	Area (sq mi)	Percent
Farmland of statewide importance	275.02	48.71
Prime farmland	237.77	42.11
Prime if drained	27.62	4.89
Not prime farmland	24.25	4.29

Soil erosion varies according to slope. According to IEPA's Rock River Basin Assessment, published in March 2006, "flat upland areas and floodplains [, which are common in Stephenson County,] generally have a low potential for soil erosion." However, "areas of steeper slopes adjacent to floodplains are susceptible to severe soil erosion[.]"[10] These steeper slopes are also present in Stephenson County. Erosion contributes to the destruction of fertile land. Landowners and farmers can use soil conservation methods (e.g., planting cover crops) to break the erosion cycle and maintain topsoil. These methods can decrease flooding potential, prevent washouts, and improve water quality.

[9] Data unchanged from the following: Blackhawk Hills Regional Council analysis, based on "Web Soil Survey," Natural Resources Conservation Service, United States Department of Agriculture (USDA), accessed February 3, 2016, produced 2016

[10] "Rock River Basin Assessment: An Overview of the Rock River Watershed in Illinois," Illinois Environmental Protection Agency, published March 2006

Geology

Map 2.7: Bedrock – Stephenson County

ISGS data[11] indicates most Stephenson County bedrock is of the Galena-Platteville group, including limestone (45%), dolostone/dolomite (45%), and shale (10%). Furthermore:

- Some river bedrock is of the Ancell group and consists of sandstone (60%), dolostone/dolomite (30%), limestone (10%), and evaporate (no percentage given).
- Portions of southern and western Stephenson County bedrock is of the Maquoketa Group, which consists of shale (20%), limestone (70%), and siltstone (10%).
- Finally, there are small pockets of the Silurian group in the county's southwest quadrant. These pockets include dolostone/dolomite (50%), limestone (50%), and coral bedrock (no percentage given).

Dolostone/dolomite and limestone (both prominent in Stephenson County bedrock) are susceptible to dissolution from sources of water, including snow and rain. The dissolution process can lead to the formation of sinkholes and the development of karst, which "refers to a landscape that typically is pockmarked with sinkholes, may be underlain by caves, and has many large springs that discharge into stream valleys."[12] When undertaking hazard mitigation actions related to land use, policy makers should note the presence of karst, as well as preservation-worthy dolomite and upland prairies in Stephenson County.

[11] "Illinois Geologic Map Data," United States Geological Service, accessed May 10, 2022
[12] "Karst Landscapes of Illinois: Dissolving Bedrock and Collapsing Soil," Illinois State Geological Survey, accessed May 10, 2022

Climate

The county's climate is classified as a mix of Dfb and Dfa ("humid continental") under the Koppen-Geiger climate classification. Britannica explains that "hot summers and cold winters" and the "changeable nature of weather in all seasons is a characteristic feature of [Dfb and Dfa climates]." Predicted changes in climate may intensify or prolong certain hazards (including, but not limited to, drought, flooding, and severe thunderstorms) and should be addressed.

Map 2.8: Koppen-Geiger Climate Zones

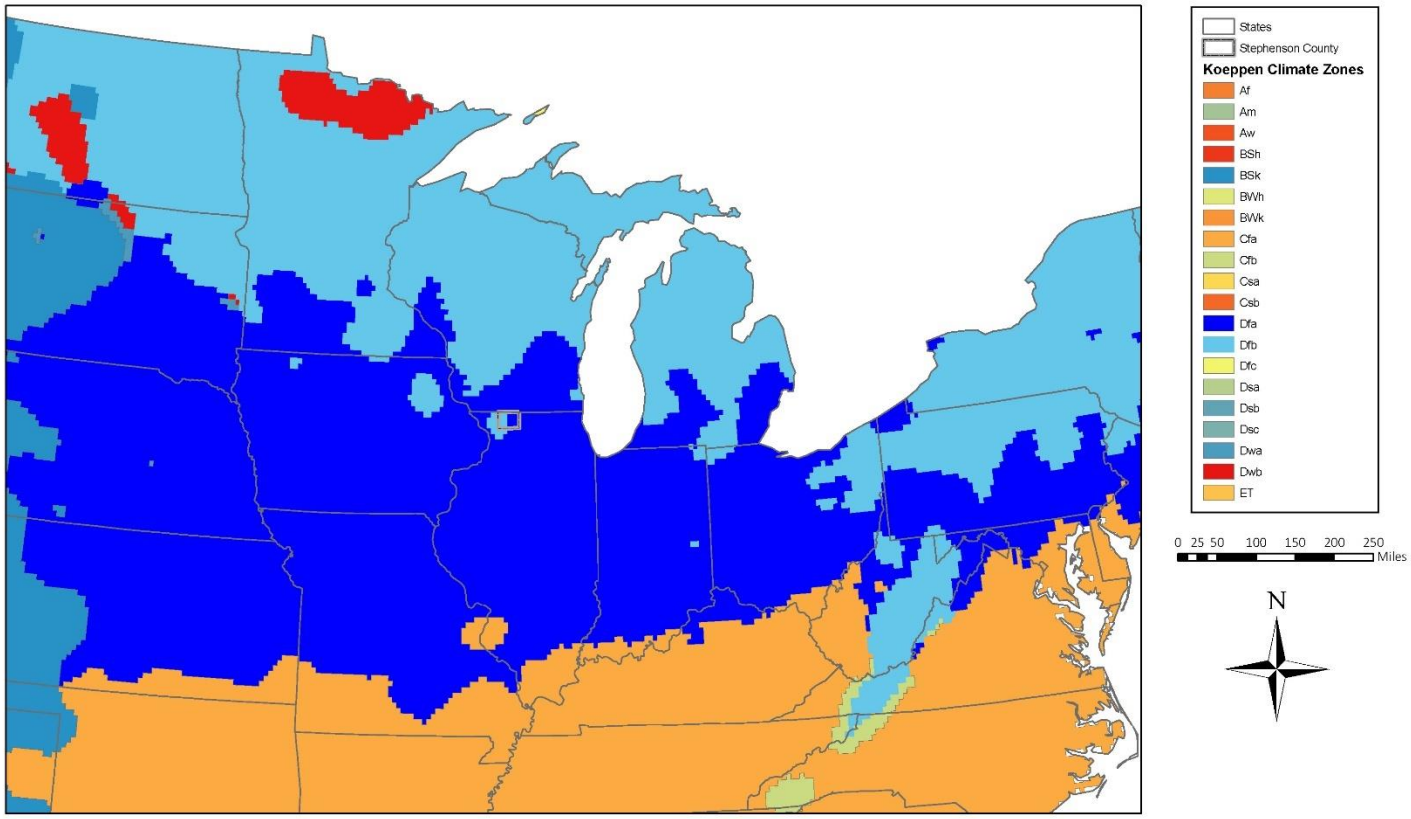


Table 2.5: Precipitation and Temperature Normals – Stephenson County[13]

Place	Precipitation (in) - Annual	Min Tmp (F) - Annual	Avg Tmp (F) - Annual	Max Tmp (F) - Annual	Low Tmp (F) - Monthly	High Tmp (F) - Monthly
Stephenson County (Freeport WWP, IL US) 2006-2020	41.16°	37.9°	47.8°	57.7°	11.6° (January)	82.7° (July)

[13] "U.S. Climate Normal Quick Access," National Centers for Environmental Information, National Oceanic and Atmospheric Administration, accessed May 10, 2022

POPULATION[14]

Stephenson County's population has steadily declined since at least 2000.

Table 2.6: County and Municipal Population Totals

Place	2000	2010	2020	% Change (2010 to 2020)
Stephenson County (countywide)	48,979	47,711	44,630	-6.5%
Cedarville	719	741	663	-10.5%
Dakota	499	506	500	-1.2%
Davis	662	677	589	-13.0%
Freeport	26,443	25,638	23,973	-6.5%
German Valley	481	463	433	-6.5%
Lena	2,887	2,912	2,772	-4.8%
Orangeville	751	793	766	-3.4%
Pearl City	780	838	790	-5.7%
Ridott	159	164	124	-24.4%
Rock City	313	315	293	-7.0%
Winslow	345	338	281	-16.9%

[14] "P1. Race: 2020," "P1. Race: 2010," and "DP-1. Profile of General Demographic Characteristics: 2000," US Census Bureau, accessed March 1, 2022.

UTILITIES

These include communication lines (copper, coaxial, or fiber optics), transportation, power (electric or gas), as well as drinking water and wastewater systems.

Table 2.7: Utilities by Municipality – Stephenson County

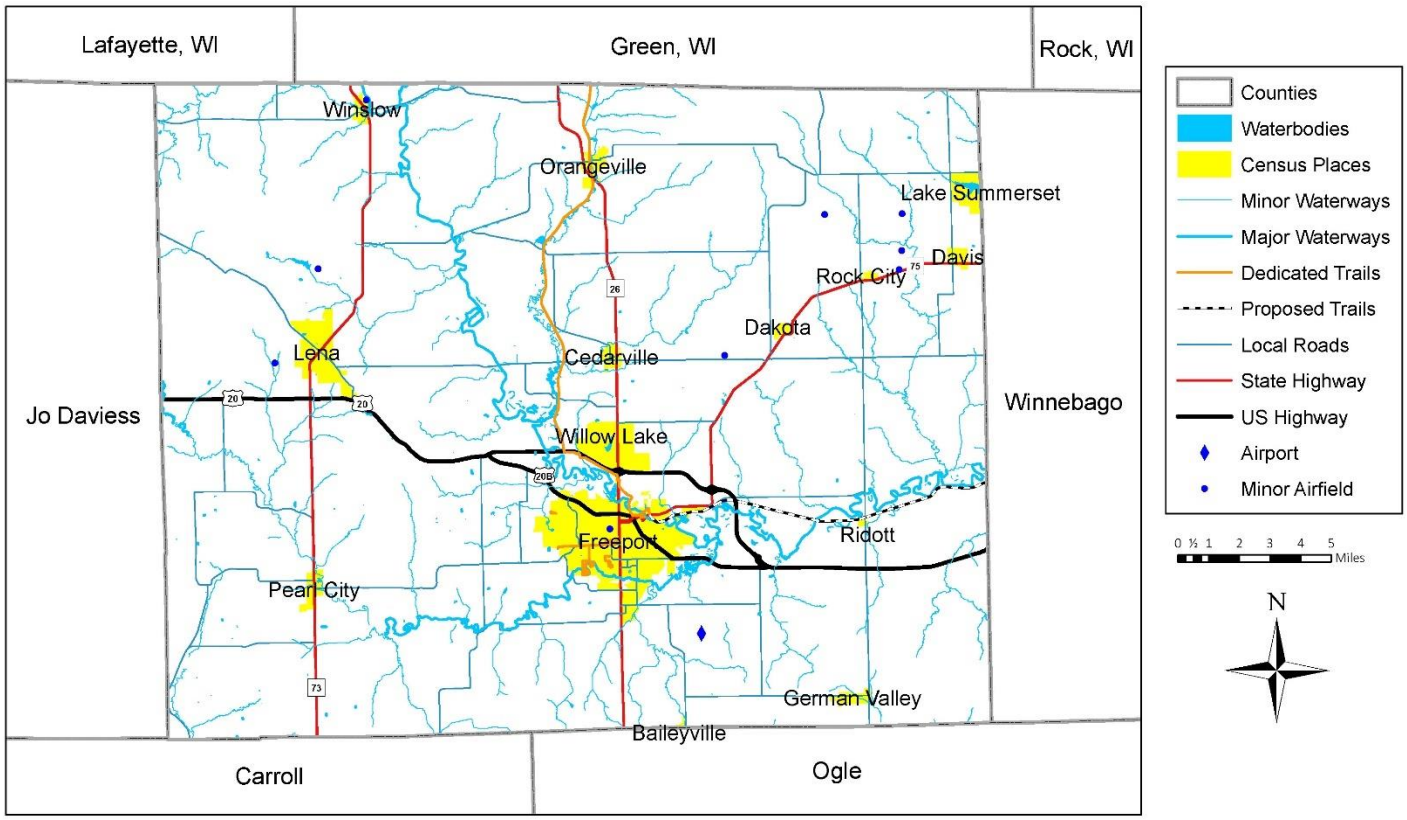
Public or Private Utility	Cedarville	Dakota	Davis	Freeport	German Valley	Lena	Orangeville	Pearl City	Ridott	Rock City	Winslow
Water	Public	Public	Public	Public	Public	Public	Public	Public	Private	Public	Public
Wastewater	Public	Public	Public	Public	Public	Public	Public	Public	Private	Public	Public
Electric	ComEd										
Natural Gas	Nicor Gas										
Communications	National: Comcast, Frontier, Mediacom, US Cellular, Verizon, Rise Broadband Local/Regional: Aero Group, iFiber, JCWIFI										

Most municipalities have public water and public wastewater treatment systems. Municipalities with public water and public wastewater treatment systems manage their own facilities. Ridott is the only municipality in Stephenson County without public systems. Residents and businesses in unincorporated Stephenson County rely on private on-site waste treatment (septic) systems and private on-site wells. Residents of unincorporated Willow Lake and Lake Summerset receive water and wastewater treatment through community systems operated by Northern Hills Utilities (Willow Lake) and Otter Creek Lake Utility District (Lake Summerset). There is also a community wastewater treatment system located at W Stephenson St Rd and N/S Rink Rd that serves multiple trailer and manufactured homes.

ComEd supplies electric service to all of Stephenson County; Nicor Gas supplies natural gas service to most of the county, with the exception of unincorporated areas (including Lake Summerset). Communications services are provided by a number of companies, including national companies like Comcast, Frontier, Mediacom, and Rise Broadband. National companies US Cellular and Verizon provide cellular service. Regional service providers like Aero, iFiber, and JCWIFI offer Internet, VoIP, and/or broadband transport services to public and private sector end users.

TRANSPORTATION & OTHER INFRASTRUCTURE

Map 2.8: Transportation Infrastructure – Stephenson County



1,314.42 miles of roadway exists in Stephenson County (township roadway accounts for 810.69 miles).[15] The Pecatonica River is a navigable waterway; however, neither public nor private barges use it for transport. Although Stephenson County has nine airports, most are small and for private use. The Jane Addams Trail, a dedicated trail, occupies an old railbed.

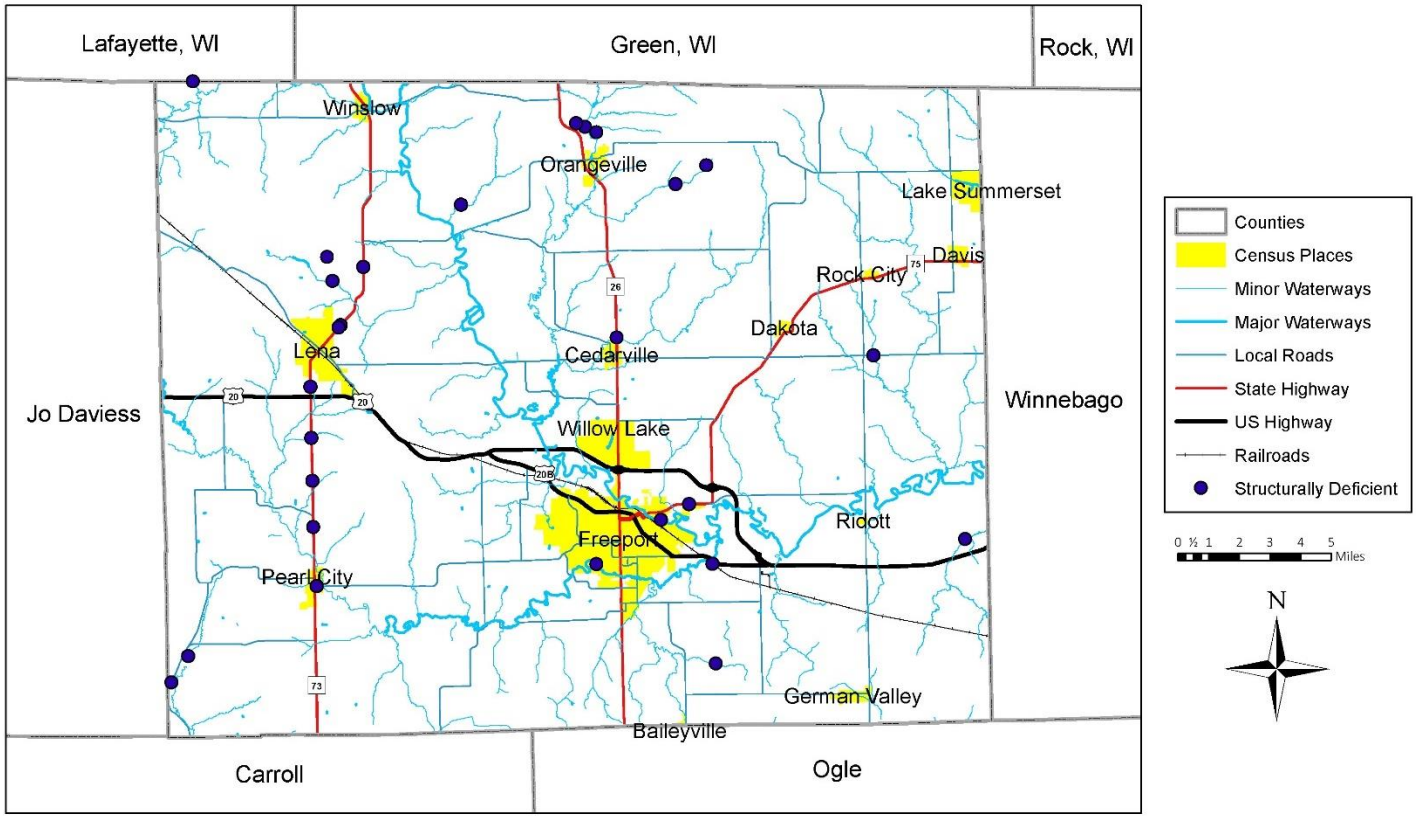
Table 2.8: Trains, Planes, and Automobiles – Stephenson County [16]

Major Roadways	Railways	Airports (public use)	Heliports
US Hwy 20 IL Rte 26 IL Rte 73 IL Rte 75	Canadian National • Route: track runs SE to NW, intersecting Freeport and Lena; parallels US Rte 20 Freeport to Lena; parallels W Stage Coach Rd Lena to the county line • Freight: petroleum, chemicals, grain, fertilizers, coal, metals, minerals, forest products, and automobiles	Airports • Publicly-owned, public use (1): Albertus (Freeport) • Privately-owned, public use (1): Ronald K. Dornink (Freeport)	Heliports • Privately-owned, private use (1): FHN Memorial Hospital (Freeport)

[15] "2021 Illinois Travel Statistics," Illinois Department of Transportation, accessed May 10, 2022
[16] "Airport Data and Information Portal," Federal Aviation Administration, accessed May 10, 2022

Structurally deficient bridges, as identified by the Illinois Department of Transportation, may be particularly susceptible to flooding.

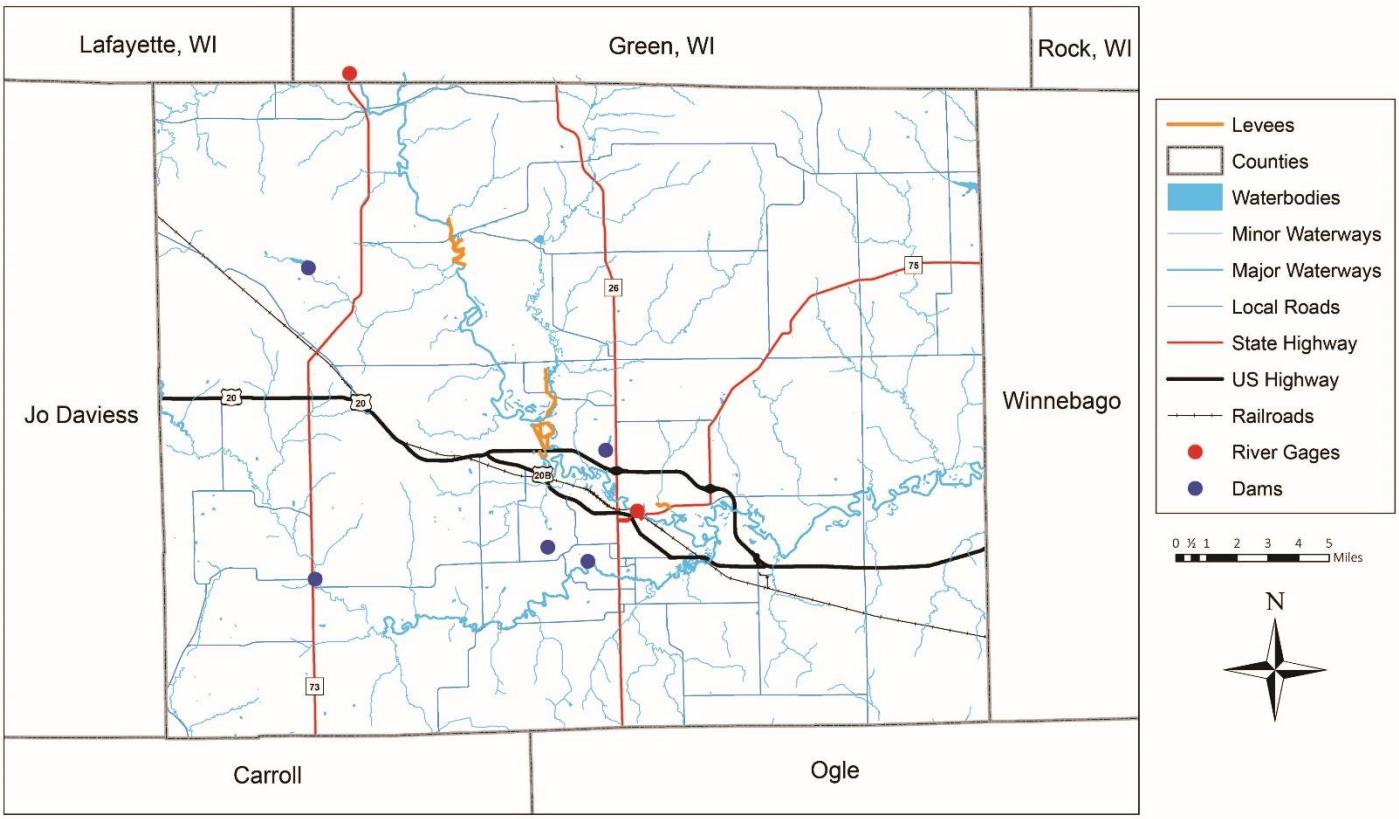
Map 2.10: Structurally Deficient Bridges – Stephenson County



The National Inventory of Dams (NID), maintained by USACE, counts four dams in Stephenson County. Dams are included by USACE if they meet certain risk thresholds. Another dam (not counted by NID) is found in Krape Park in Freeport. Another NID dam rests just outside of northeastern Stephenson County in Winnebago County and supports the resort community of Lake Summerset, which is partially located in Stephenson County. Earthen levees border segments of the Pecatonica River north of Freeport (e.g., near McConnell). Other earthen levees may exist elsewhere in the county and its municipalities.

A system of USGS streamgages measures water levels nationally. USGS maintains a streamgage on the Pecatonica River that measures water levels near Freeport. Nearby streamgages include one in Martintown, WI, near Winslow in northwestern Stephenson County and one in Shirland, IL, in adjacent Winnebago County (the streamgage in Shirland is not pictured on Map 2.11).

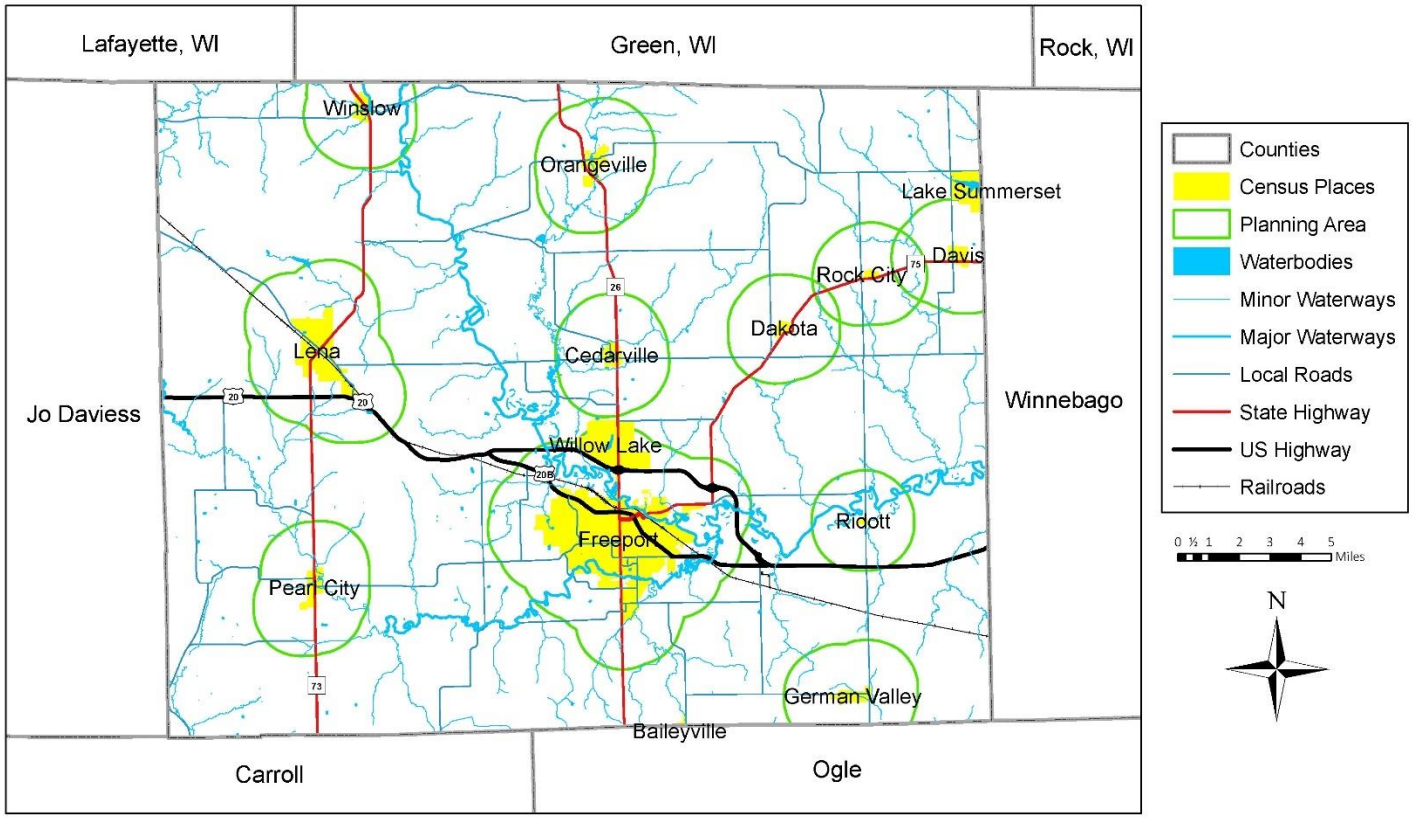
Map 2.11: Streamgages and Notable Dams – Stephenson County



FUTURE LAND USE & PLANNING AREAS

The only Stephenson County community that has recently addressed future land use is the City of Freeport, which updated its comprehensive plan in 2020.

Map 2.12: Future Land Use & Planning Areas – Stephenson County



Portions of Freeport's recently updated comprehensive plan relevant to hazard mitigation considerations include (by goal.objective.policy):

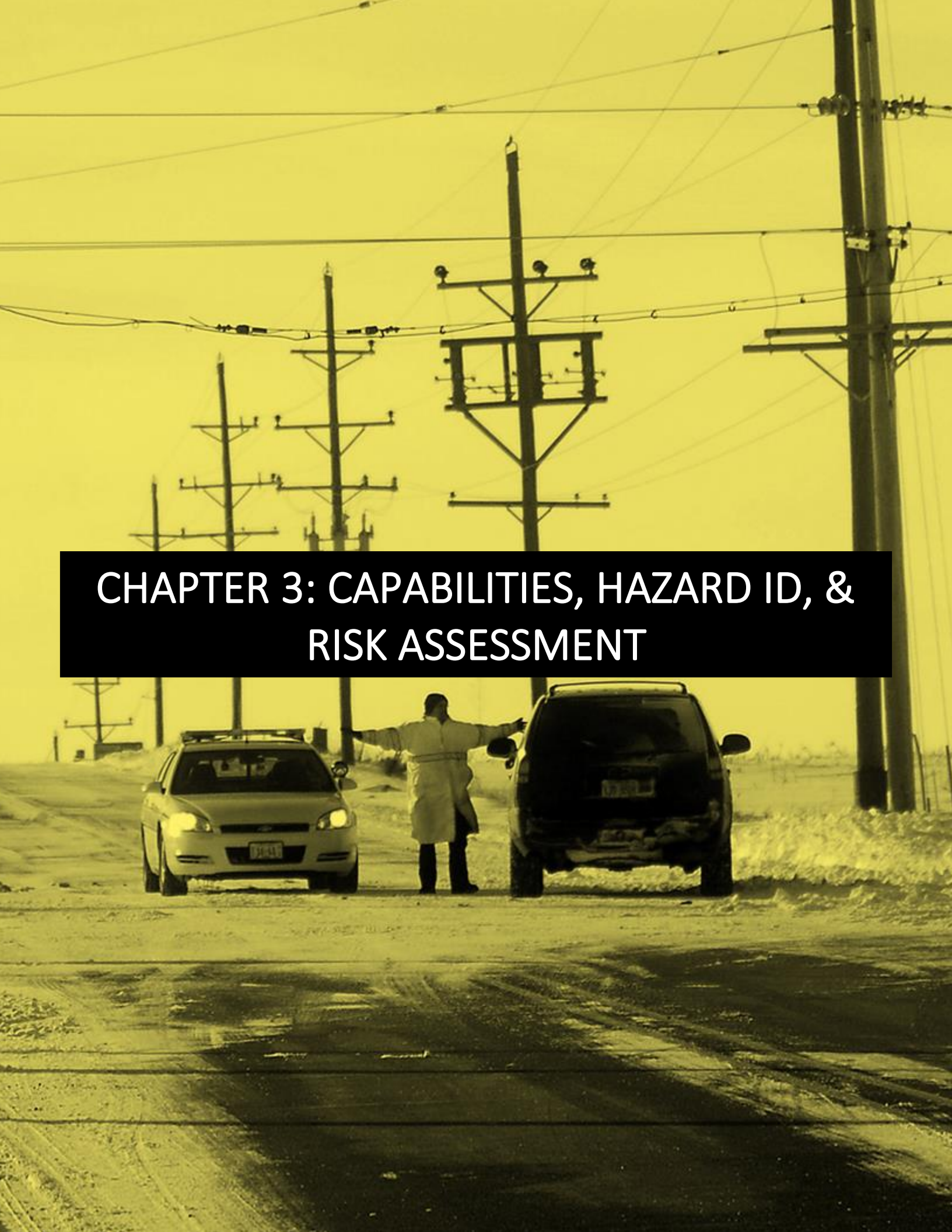
Chapter 3: Land Use and Zoning

4 Update zoning ordinance to reflect desired development patterns.

Chapter 4: Transportation and Infrastructure

2.2.2. Acquire property subject to flooding, construction of brownfield clean-up projects, and removal of facilities and homes from as identified in the County's Multi-Hazard Mitigation Plan, from the / floodway.

2.4 Coordinate with the Stephenson County Multi-Hazard Mitigation Plan, the Pecatonica River Watershed Alliance, Rock River Watershed Group, government officials, representatives from emergency management agencies, and advocacy groups to maintain the effectiveness of community resiliency measures.



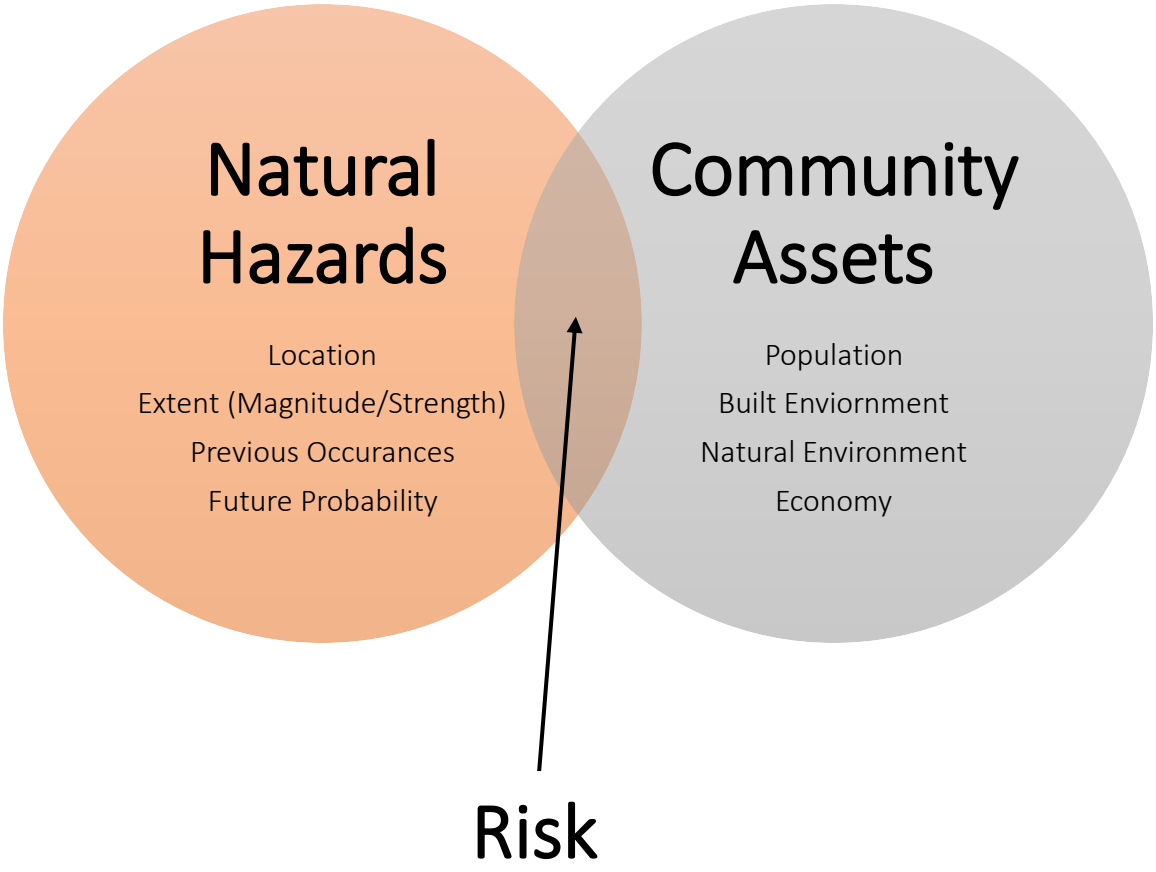
CHAPTER 3: CAPABILITIES, HAZARD ID, & RISK ASSESSMENT

CHAPTER 3: CAPABILITIES, HAZARD ID, & RISK ASSESSMENT

OVERVIEW

Chapter 3 identifies community capabilities in Stephenson County and its municipalities (and addresses the various jurisdictions' ability to improve such capabilities). Hazard profiles covering type, location, extent, and probability are included. Each identified hazard's impact on jurisdictions is noted.

Illustration 3.1: Relationship between Hazards, Assets, and Risk[17]



[17] Adapted from the now defunct mitigationguide.org

COMMUNITY CAPABILITIES INVENTORY

Information about community capabilities was collected from local stakeholders, as well as relevant governmental databases. If information was unavailable or the capability did not apply, n/a (not available or not applicable) is indicated in the respective column/row. With few exceptions, relative ability to expand and improve on existing capabilities (including policies, programs, and projects) is limited due to financial and staffing scarcities. Of particular importance is demographic decline, supply chain, and inflation issues, which influence local ability to develop the following.

Table 3.1.1: Capabilities by Community - Stephenson County

Capability	Stephenson County	Cedarville	Dakota	Davis	Freeport	German Valley	Lena	Orangeville	Pearl City	Ridott	Rock City	Winslow
International Building Code	N	N	N	N	Y	N	N	Y	N	N	N	N
Capital Improvements Plan	N	Y	N	N	Y	N	Y	N	N	N	N	Y
Covered by CEDS	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Future Land Use Map	Y	N	N	N	Y	N	N	N	N	N	N	N
Comprehensive Plan	Y	N	N	N	Y	N	N	N	N	N	N	N
COOP or COG	N	N	N	N	N	N	N	N	N	N	N	N
Emergency Operations Plan	Y	N	N	Y	N	N	N	N	N	N	N	N
Evacuee or Refugee Plan	N	Y	N	Y	N	N	N	N	N	N	N	Y
IPWMAN Member	Y	N	N	N	Y	N	N	N	N	N	N	N
NFIP Community Number	170639	170842	170843	171338	170640	171339	171340	170641	170642	170643	171341	170644
NFIP Participation-Entry	Y-12/27/74	Y-4/11/75	N-n/a	N-n/a	Y-11/2/73	N-n/a	Y-3/3/11	Y-8/16/74	Y-5/3/74	Y-4/16/76	N-n/a	Y-3/15/74
NFIP FIRM Current Effective Map	3/16/15	3/16/15(M)	3/3/2011	3/3/2011	3/16/15	3/3/2011	3/16/15(M)	3/16/15(M)	3/3/11	3/16/15	3/3/2011	3/16/15
NFIP Community Ratings System	N	N	N	N	N	N	N	N	N	N	N	N
Floodplain Ordinance Updated	1/2015	3/2015	n/a	n/a	3/2015	n/a	3/2015	n/a	n/a	9/2010	n/a	2/2015
Erosion Management Ordinance	N	N	N	N	Y	N	N	N	N	N	N	N
Smart Growth Ordinance	N	N	N	N	N	N	N	N	N	N	N	N
Stormwater Management Ordinance	N	N	N	N	Y	N	N	N	N	N	N	Y
Subdivision Ordinance	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N
Zoning Regulations	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Brownfields Redevelopment Plan	N	N	N	N	Y	N	N	N	N	N	N	N
StormReady Certification	Y	N	N	N	N	N	N	N	N	N	N	N
Community Hazards Aware. Prog.	Y	N	N	N	N	N	N	N	N	N	N	N
Planning Commission	Y	Y	N	Y	Y	N	Y	N	N	N	N	N
Community Planner	Y	N	N	N	Y	N	Y	N	N	N	N	N
Chief Building Official/Inspector	Y	Y	N	N	Y	N	N	N	N	N	N	N
Civil Engineer	Y	N	N	N	Y	N	N	N	N	N	N	N
Floodplain Manager	Y	N	N	N	Y	N	N	N	N	N	N	N
Grant Writer	N	N	N	N	Y	N	Y	N	N	N	N	N
Community Messaging System	N	N	CodeRED	CodeRED	N	CodeRED	N	N	N	N	N	N

Note: Communities without engineering or grant writing staff typically contract with private consulting firms. Some communities are able to use their respective school district's messaging system, although the audience is limited.

Table 3.1.2: Flood Zones by Stephenson County Community

Community	Flood Zones
Stephenson County	Zones A, AE, and AE with Floodway
Cedarville	Zone A
Dakota	No SFHA
Davis	No SFHA
Freeport	Zone AE with Floodway
German Valley	No SFHA
Lena	Zone A
Orangeville	Zone A
Pearl City	Zone AE
Ridott	Zone AE
Rock City	No SFHA
Winslow	Zones AE and AE with Floodway

The Federal Emergency Management Agency (FEMA) explains flood zones as follows:

> Flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the [Flood Insurance Rate Map or] FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

DEVELOPMENT TRENDS

Land Value

Stephenson County's total estimated equalized assessed value (EEAV) was $815,464,618, as reported in 2020 using 2019 data (just under $2.5 billion in total land and improvement value, otherwise known as fair cash value, which is "the amount for which a property can be sold in the due course of business and trade, not under duress, between a willing buyer and a willing seller").[18] A rough calculation using the total EEAV included in the 2017 plan suggests that assessed values have not kept pace with inflation. This is perhaps an indicator of development stagnation.

The following table breaks down EAV by residential, commercial, industrial, mineral, and farm classifications.

Table 3.2.1: 2015 EAV, Fair Cash Value, and Parcels – Stephenson County[19]

Class	Equalized Assessed Value	Fair Cash Value	Parcels
Residential	$462,550,198	$1,387,650,594	17,684
Commercial	$100,939,158	$302,817,474	1,612
Industrial	$22,045,808	$66,137,424	162
Mineral	$8,710,402	$26,131,206	67
Farm	$216,936,552	$650,809,656	6,666

Note: table does not include total EAV or all parcels (excludes railroads).

The next few tables contain information about building replacement costs, building counts by construction type, and square footage by building type, sourced from Hazus 5.1.[20]

Table 3.2.2: Building Replacement Costs – Stephenson County

Class	Replacement Cost	Counts
Residential	$5,203,307	19,128
Commercial	$1,215,128	1,172
Industrial	$337,038	339
Agriculture	$132,894	361
Religion	$155,134	120
Government	$48,090	43
Education	$121,566	33
Totals	*$7,213,157*	*21,196*

Table 3.2.3: Building Counts by Construction Type – Stephenson County

Type	Buildings
Wood	14,525
Steel	500
Masonry	4,677
Concrete	317
Manufactured	867
Total	*20,886*

[18] "Fair Cash Value (35 ILCS 200/1-50 Sec. 1-50)," Illinois Complied Statutes, accessed May 11, 2022
[19] "Assessor Estimated EAV Report by Tax District - Stephenson County (2018 EEAV, 2019 tax year)," Stephenson County, published September 8, 2020
[20] "Hazus 5.1," Federal Emergency Management Agency, accessed February 17, 2022

Table 3.2.4: Square Footage by Building Type – Stephenson County

Class	Square Feet
Residential	30,031,690
Commercial	6,855,590
Industrial	2,134,530
Agriculture	997,630
Religious	733,560
Government	229,500
Education	534,580
Total	*41,517,080*

More information about flood-related exposure and vulnerability is found in the Hazard Identification section of this chapter.

Building Permits

The US Census Bureau collects data from counties and municipalities to keep track of new construction activity. Development remains limited within Stephenson County. New exposure to natural hazards like flooding is likely reduced with the lack of growth.

Table 3.3: Residential Building Permits – Stephenson County[21]

Year	1-unit Buildings	Greater than 1-unit Buildings
2020	11	1
2019	16	0
2018	12	0
2017	14	0
2016	10	0
2015	11	0
2014	8	0
2013	18	0
2012	24	0
2011	10	0
2010	27	0
2009	29	1
2008	30	2
2007	59	5
2006	72	9
2005	90	10
2004	108	0
2003	100	6
2002	108	4
2001	83	8
2000	81	8
1999	128	16

[21] "Building Permits Survey," US Census Bureau, accessed February 23, 2022

HAZARD IDENTIFICATION

Identifying Hazards

Planning team members identified the following hazards for inclusion in the 2022-2027 plan:

DF	**D**	**EQ**	**ET**
Dam failure	Drought	Earthquake	Extreme temperatures
E	**F/FF**	**LS**	**LF**
Erosion	Flooding/flash flooding	Landslide	Levee failure
ST	**SWS**	**W/LF**	
Severe thunderstorms	Severe winter storms	Wild/land fires	

Natural hazard events rising to the level of Major Disaster (excluding the COVID-19 pandemic) are noted in the following table:

Table 3.4: Major Disaster Declarations – Stephenson County[22]

Disaster Number	Declaration Title	Incident Start	Incident End
4461	Severe Storms and Flooding	2/24/2019	7/3/2019
1960	Severe Winter Storm and Snowstorm	1/31/2011	2/3/2011
1935	Severe Storms and Flooding	7/19/2010	8/7/2010
3283	Record Snow and Near Record Snow	2/5/2008	2/6/2008
1722	Severe Storms and Flooding	8/7/2007	8/8/2007
3269	Snow	11/30/2006	12/1/2006
3230	Hurricane Katrina Evacuation	8/29/2005	10/1/2005
1129	Severe Storms and Flooding	7/17/1996	8/7/1996
997	Severe Storms and Flooding	4/13/1993	10/22/1993
3068	Blizzards and Snowstorms	1/16/1979	1/16/1979
438	Severe Storms and Flooding	6/10/1974	6/10/1974
276	Heavy Rains and Flooding	8/30/1969	8/30/1969

[22] "Declared Disasters," Federal Emergency Management Agency, accessed February 15, 2022

HAZARD PROFILE

DF Dam failure	D Drought	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	LS Landslide	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Dam failure is an unprecedented event that may occur in Stephenson County, capable of countywide, multi-jurisdictional impacts.

Table 3.5.1: Typical Characteristics – Dam Failure

Damage ($)	Thousands to millions in damage to property
Location (Geographic Area)	Jurisdictions with or downstream of dams
Extent by Measure	n/a
Speed of Onset (Time)	Immediate to days
Duration (Time)	Minutes to hours

Table 3.5.2: Event Summary – Dam Failure

Events	n/a
Years with Event	n/a
Frequency (Probability)	n/a

Summary of Dam Failure Impacts & Vulnerabilities

- Freeport, Lena: residential and agricultural inundation downstream
- Stephenson County: residential and agricultural inundation downstream, especially those areas downstream of communities like Lake Le-Aqua-Na or Willow Lake

Dams with NID inspection and emergency action plan data are represented as follows:

Table 3.5.3: NID-listed Dams in Stephenson County

Name	Dam Owner	Storage (Acre Ft)	Last Inspection	Has Emergency Action Plan?	Last EAP Revision
Pearl City Lagoon Dam	Village of Pearl City	16	8/6/2022	Yes	4/30/2016
Lake Le-Aqua-Na Dam	Illinois Department of Natural Resources	1,013	8/1/2019	Yes	n/a
Highland Community College (HCC) Lake Dam	HCC	52	9/14/2020	Yes	7/31/2017
Willow Lake Dam	Willow Lake Association	299	8/6/2020	Yes	10/31/2016

HAZARD PROFILE

DF Dam failure	**D** **Drought**	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	LS Landslide	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Drought is an event that occurs in Stephenson County. It is capable of countywide, multi-jurisdictional impacts. The possibility of short but intense dry spells that fall below the threshold of meteorological drought should be considered, especially as climate change and its impacts develop. Data from the US Drought Monitor as of May 3, 2022 (see Illustration 3.2), suggests Stephenson County is currently experiencing abnormally dry conditions.

Illustration 3.2: US Drought Monitor – Illinois-Iowa-Wisconsin tristate area

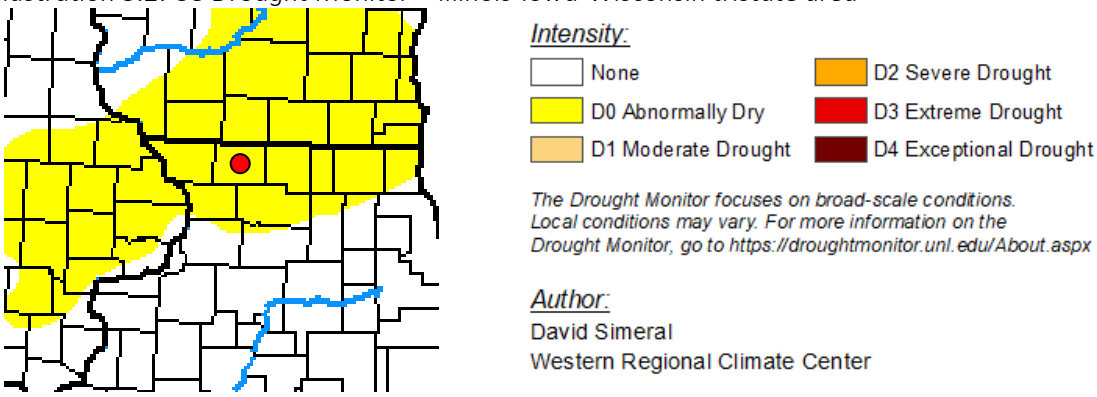


Table 3.6.1: Typical Characteristics – Drought

Damage ($)	Thousands to millions in damage to property
Location (Geographic Area)	Countywide
Extent by Measure	Less than -4.00 to greater than 4.00 (Palmer)
Speed of Onset (Time)	Months
Duration (Time)	Months to years

Table 3.6.2: Event Summary – Drought

Events	13
Years with Event	3 (2005, 2006, 2012)
Frequency (Probability)	12% probability of at least one drought event per year (1996-2021)

*Note: Data from NCDC Storm Events Database. Includes both excessive heat and extreme cold/wind chill. Formula is # of years with >0 hazard event / total years * 100.*

Summary of Drought Impacts & Vulnerabilities

- All municipalities: municipal water supply shortages, dry vegetation, loss of dry soil/erosion
- Stephenson County: private well water shortages, dry vegetation, agricultural production decline, loss of dry soil/erosion

HAZARD PROFILE

DF Dam failure	D Drought	**EQ** Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	LS Landslide	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Earthquake is an event that occurs in or impacts Stephenson County. It is capable of countywide, multi-jurisdictional impacts.

Illustration 3.3.1: 2018 Long-term National Seismic Hazard Map – Illinois and other states

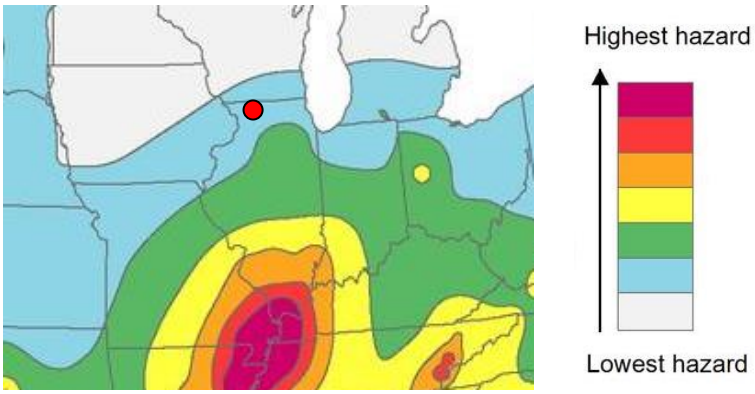


Table 3.7.1: Typical Characteristics – Earthquake

Damage ($)	Thousands to millions in damage to property
Location (Geographic Area)	Countywide
Extent by Measure	0.0 to 7.7 or greater (Richter)
Speed of Onset (Time)	Immediate
Duration (Time)	Seconds to minutes

Table 3.7.2: Event Summary – Earthquake

Events	4
Years with Event	n/a
Frequency (Probability)	8% probability of at least one earthquake event per year (1972-2021)

*Note: Data from USGS Earthquake Catalog (earthquakes within 100 km of Freeport). Formula is # of years with >0 hazard event / total years * 100.*

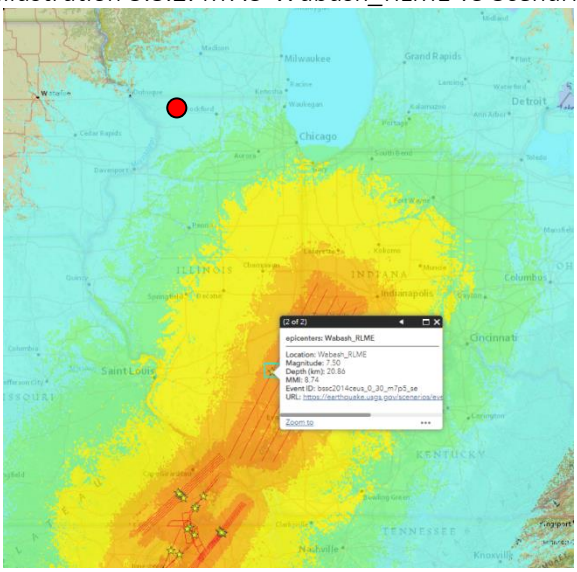
Summary of Earthquake Impacts & Vulnerabilities

- All municipalities: municipal water/wastewater infrastructure, transportation (including US 20 in Lena/Freeport, IL 26 in Orangeville/Cedarville/Freeport, IL 73 in Winslow/Lena/Pearl City, IL 75 in Dakota/Rock City/Davis; CN rail in Lena/Freeport), public and private buildings, private energy infrastructure, unreinforced masonry buildings
- Stephenson County: municipal water/wastewater infrastructure, transportation (including US 20, IL 26, IL 73, IL 75; CN rail), public and private buildings, private energy infrastructure, unreinforced masonry buildings

Hazus Earthquake Scenario

A ShakeMap scenario was run in Hazus to anticipate damage to Stephenson County from a major earthquake taking place in the New Madrid seismic zone in southern Illinois. Historic earthquakes and high intensity USGS scenario earthquakes available in ShakeMap can be used to "examine exposure of structures, lifelines, utilities, and transportation corridors to specified potential earthquakes." The M7.5-Wabash_RLME v5, a 7.5 magnitude scenario centered within the village of Olney, Richland County, Illinois (300 miles SSE of Freeport) and used here, is available at earthquake.usgs.gov.

Illustration 3.3.2: M7.5-Wabash_RLME v5 Scenario – Illinois and other states



In this scenario, zero Stephenson County buildings were damaged, zero essential facilities (moderate or greater) were damaged; there was also zero damage (moderate or greater) to transportation facilities, zero households displaced or seeking shelter, and zero casualties. Water and wastewater systems saw minimal modelled impacts of three potable water leaks, one potable water main break, and one wastewater leak. Economic losses in the scenario include minimal losses to public transportation assets, including $100 to highways, $600 to bus facilities, and $4,300 to airport facilities. Utility system economic losses included $11,800 to potable water systems, $5,900 to waste water systems, $2,000 to natural gas distribution, and $4,600 to electrical power facilities.

HAZARD PROFILE

DF Dam failure	D Drought	EQ Earthquake	**ET** **Extreme temperatures**
E Erosion	F/FF Flooding/flash flooding	LS Landslide	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Extreme temperatures is an event that occurs in Stephenson County. It is capable of countywide, multi-jurisdictional impacts.

Table 3.8.1: Typical Characteristics – Extreme Temperatures

Damage ($)	Thousands in damage to property
Location (Geographic Area)	Countywide
Extent by Measure	-30°s to 110°s (Fahrenheit)
Speed of Onset (Time)	Hours
Duration (Time)	Hours to days

Table 3.8.2: Event Summary – Extreme Temperatures

Events	12
Days with Event and Crop Damage	7 (2000, 2007, 2008, 2009, 2012, 2014, 2019)
Frequency (Probability)	28% probability of at least one extreme temperatures event per year (1996-2021)

*Note: Data from NCDC Storm Events Database. Formula is # of years with >0 hazard event / total years * 100.*

Summary of Extreme Temperatures Impacts & Vulnerabilities

- All municipalities: municipal water/wastewater infrastructure, underground utilities, transportation surfaces/substrates, aging population, hospital capacity in Freeport
- Stephenson County: municipal water/wastewater infrastructure, underground utilities, transportation surfaces/substrates, aging population

HAZARD PROFILE

DF Dam failure	D Drought	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	LS Landslide	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Erosion is an unmeasured event that occurs in Stephenson County. It is capable of countywide, multi-jurisdictional impacts.

Table 3.9.1: Typical Characteristics - Erosion

Damage ($)	Thousands in damage to property
Location (Geographic Area)	Countywide
Extent by Measure	n/a
Speed of Onset (Time)	Months
Duration (Time)	Months to years

Table 3.9.2: Event Summary - Erosion

Events	n/a
Years with Event	n/a
Frequency (Probability)	n/a

Summary of Erosion Impacts & Vulnerabilities

- All municipalities: dust storms, poor stormwater management/poor water holding capacity, loss of dry soil/erosion, loss of urban tree canopy
- Stephenson County: dust storms, poor stormwater management/poor water holding capacity, agricultural production decline, loss of arable farmland, streambank degradation

HAZARD PROFILE

DF Dam failure | D Drought | EQ Earthquake | ET Extreme temperatures
E Erosion | **F/FF Flooding/flash flooding** | LS Landslide | LF Levee failure
ST Severe thunderstorms | SWS Severe winter storms | W/LF Wild/land fires

Overview

Flooding/flash flooding is an event that occurs in Stephenson County. It is capable of countywide, multi-jurisdictional impacts. Stephenson County flooding – particularly in Freeport – received media attention in February 2018, October 2018, August 2019, and March 2021. The communities of Freeport, Orangeville, Pearl City, and Winslow are particularly susceptible to the hazard. The Village of Winslow experiences the event in a portion of its central business district, which contains governmental facilities (in particular, a fire station and post office) and century-old or more two-story mixed-use buildings. While still vulnerable, Orangeville and Pearl City have through mitigations reduced the number of residences within floodplain and floodway (although some homeowners have declined to participate in buyout programs). Some flood-prone homes may remain on private water or sewer systems.

As in Orangeville and Pearl City, there have been mitigations reducing exposure to homeowners in Freeport, the largest municipality in the region. However, realities of race and concentrated poverty have made buyouts difficult in Freeport. A notable quantity of prospective recipients of buyout funds – particularly on Freeport's east side near the Pecatonica River – are black, poor, or both. While residents targeted for relocation may receive an offer that represents a true fair market value, those values often fall far short of the amount of money needed to buy a new home, even a fixer upper. Limited available housing stock also reduces the chances of in-community relocations, even for those with sufficient funds to establish a new home in Freeport.

In 2021, Freeport was awarded approximately $3.4 million from FEMA (total project cost approximately $4.5 million) to support a voluntary purchasing and relocation program for Pecatonica River-impacted properties.

Table 3.10.1: Typical Characteristics - Flooding/Flash Flooding

Damage ($)	Thousands to millions in damage to property
Location (Geographic Area)	Countywide, especially near the municipalities of Winslow, Pearl City, Orangeville, and Freeport
Extent by Measure	13 feet to 19.76 feet or greater (varies by location)
Speed of Onset (Time)	Minutes to days
Duration (Time)	Hours to weeks

Table 3.10.2: Event Summary - Flooding/Flash Flooding

Events	49
Years with Event	72 (1914, 1915, 1916, 1917, 1918, 1919, 1920, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1932, 1933, 1934, 1937, 1938, 1942, 1943, 1944, 1946, 1948, 1949, 1950, 1951, 1952, 1953, 1955, 1959, 1960, 1962, 1963, 1965, 1966, 1967, 1969, 1971, 1972, 1974, 1975, 1979, 1980, 1982, 1985, 1986, 1989, 1990, 1993, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2004, 2005, 2007, 2008, 2009, 2010, 2011, 2013, 2014, 2015, 2017, 2018, 2019)
Frequency (Probability)	67% probability of at least one flash flooding event per year (1914-2021)

*Note: Data from NCDC Storm Events Database and Advanced Hydrologic Prediction Service. Formula is # of years with >0 hazard event / total years * 100.*

Summary of Flooding Impacts & Vulnerabilities

Flooding, like dam or levee failure, may have more location-specific impacts. Buyout and voluntary relocation projects have minimized certain risk to life and property. Stephenson County is primarily susceptible to the following flooding types:

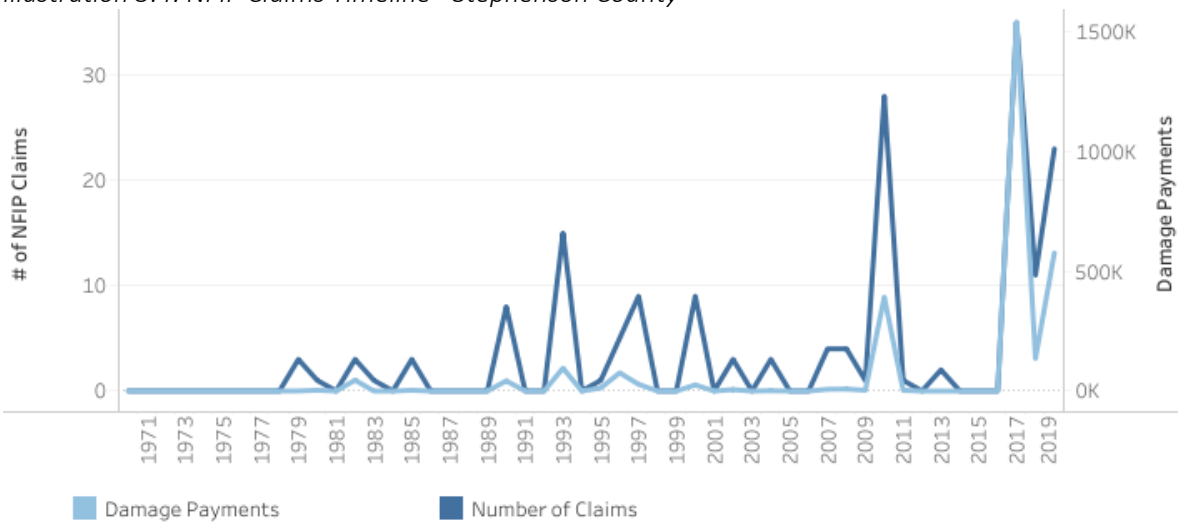
Table 3.10.3: Types of Flooding - Stephenson County[23]

Type	Characteristics
River Flood	Occurs when water levels rise over the top of river banks due to excessive rain from… persistent thunderstorms over the same area for extended periods of time, combined rainfall and snowmelt, or an ice jam.
Inland Flooding	Occurs when moderate precipitation accumulates over several days, intense precipitation falls over a short period, or a river overflows because of an ice/debris jam or dam/levee failure.
Flash Flood	Caused by heavy or excessive rainfall in a short period of time, generally less than six hours.

National Flood Insurance Program (NFIP) and Losses (including repetitive losses)

As part of a comprehensive risk assessment, FEMA requires that hazard mitigation plans "address NFIP insured structures that have been repetitively damaged by floods."[24]

Illustration 3.4: NFIP Claims Timeline - Stephenson County



Analyzing federal data, the Natural Resources Defense Council (NRDC) counted 173 NFIP claims totaling $3,003,592 made in Stephenson County as of September 30, 2019. The greatest number of claims occurred in 2017 (35 claims), followed by 2010 (28 claims) and 2019 (23 claims); $1,537,130 in payments were made in 2017, the largest to date. According to IDNR and IEMA, there have been 33 repetitive loss properties in the county; 13 are mitigated and 20 remain. As of May 31, 2018, NRDC's analysis found 0 severe repetitive loss properties in Stephenson County.

While "homes and businesses in high-risk flood areas with government-backed mortgages are required to have flood insurance,"[25] not all homeowners are required to have it. Those without insurance – particularly those on Freeport's

[23] "Severe Weather 101 – Floods," National Severe Storms Laboratory, National Oceanic and Atmospheric Administration, accessed May 12, 2022
[24] 44 CFR §201.6(c)(2)(ii)
[25] "Who's required to have flood insurance?," National Flood Insurance Program, Federal Emergency Management Agency, accessed May 16, 2022

flood-prone east side – may not have it because the product is not affordable. IDNR reports that as of May 23, 2022, there were 97 active NFIP policies in Stephenson County.

Hazus Flooding Scenario

Analysis conducted in May 2022 using the FEMA's Hazus 5.1 program estimates the potential for flooding-related losses related to Yellow Creek flooding. The 10-year flood represents a more frequent (10% annual chance of occurrence), typically less severe event; the 500-year flood represents a less frequent (.2% annual chance of occurrence), typically more severe event.

Table 3.10.4: Hazus Flooding Scenario – Yellow Creek

Use type	10-year flood losses	100-year flood losses	500-year flood losses
Residential	$6,680,000	$9,848,000	$12,005,000
Commercial	$3,769,000	$5,327,000	$6,341,000
Industrial	$1,569,000	$2,351,000	$2,837,000
Other	$912,000	$1,385,000	$1,863,000
Total	*$12,930,000*	*$18,911,000*	*$23,046,000*

Community Rating System (CRS)

CRS "is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of [NFIP]." According to a May 24, 2022, Illinois Department of Natural Resources memo to the Stephenson County Emergency Management Agency, only 73 of 893 eligible Illinois communities participate in CRS. A 2018 FEMA publication explains that "CRS discounts on flood insurance premiums range from 5% up to 45%[,] based on CRS credit points that are awarded to communities."[26] No Stephenson County jurisdictions participate in the program. Lack of participation is likely due to administrative burden and marginal reductions in insurance premiums at lower point totals. There are also few NFIP policy holders in the county.

[26] "A Local Official's Guide to Saving Lives, Preventing Property Damage, and Reducing the Cost of Flood Insurance (FEMA B 573)," National Flood Insurance Program, Federal Emergency Management Agency, published 2018

HAZARD PROFILE

DF Dam failure	D Drought	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	**LS** **Landslide**	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Landslide is an unprecedented event that may occur in Stephenson County. It is capable of localized impacts.

Table 3.11.1: Typical Characteristics - Landslide

Damage ($)	Thousands in damage to property
Location (Geographic Area)	Countywide
Extent by Measure	n/a
Speed of Onset (Time)	Immediate
Duration (Time)	Seconds to minutes

Table 3.11.2: Event Summary - Landslide

Events	n/a
Years with Event	n/a
Frequency (Probability)	n/a

Summary of Landslide Impacts & Vulnerabilities

- All municipalities: poor stormwater management/poor water holding capacity, loss of soil
- Stephenson County: poor stormwater management/poor water holding capacity, loss of soil, agricultural production decline, loss of arable farmland, streambank degradation/changed stream flows

HAZARD PROFILE

DF Dam failure	D Drought	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	LS Landslide	**LF** **Levee failure**
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Levee failure is an unprecedented event that may occur in Stephenson County. It is capable of countywide, multi-jurisdictional impacts.

Table 3.12.1: Typical Characteristics - Levee Failure

Damage ($)	Thousands to millions in damage to property
Location (Geographic Area)	Jurisdictions with or downstream of levees
Extent by Measure	n/a
Speed of Onset (Time)	Immediate to days
Duration (Time)	Minutes to hours

Table 3.12.2: Event Summary - Levee Failure

Events	n/a
Years with Event	n/a
Frequency (Probability)	n/a

Summary of Levee Failure Impacts & Vulnerabilities

- Freeport, Lena: residential and agricultural inundation downstream
- Stephenson County: residential and agricultural inundation downstream, especially those areas downstream of McConnell

The concern with levees in Stephenson County is perhaps less about failure and more about what their presence means for downstream communities. Various lengths of unaccredited infrastructure that channels floods may partially protect unincorporated communities or agricultural lands; however, they may also exacerbate flooding conditions in communities like Freeport.

HAZARD PROFILE

DF Dam failure	D Drought	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	LS Landslide	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	W/LF Wild/land fires	

Overview

Severe thunderstorms is an event that occurs in Stephenson County. It is capable of countywide, multi-jurisdictional impacts. This profile also addresses tornadoes, lightning, and hail, which are also events (usually associated with severe thunderstorms) that occur in Stephenson County, capable of countywide, multi-jurisdictional impacts.

Thunderstorm-related straight line winds (seen in 2017 and 2020) continue to be a notable damage contributor in the planning area. Straight line wind damage in 2020 was the result of the August 2020 Midwest derecho. While places like Forreston, IL, in Ogle County (just south of Stephenson County) were more significantly impacted by the derecho, worth noting is that Freeport recorded the largest hail of the event (2 in).

Table 3.13.1: Typical Characteristics - Thunderstorm Wind

Damage ($)	Thousands to millions in damage to property
Location (Geographic Area)	Countywide
Extent by Measure	Wind gusts of at least 58 mph or greater (up to 128 mph gust recorded in neighboring Wisconsin) Up to 16.91 inches of rain in 24-hours in Aurora, IL
Speed of Onset (Time)	Minutes to hours
Duration (Time)	Minutes to hours

Table 3.13.2: Event Summary - Thunderstorm Wind

Events	225
Years with Event	46 (1956, 1967, 1968, 1971, 1972, 1974, 1975, 1978, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1990, 1992, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021)
Frequency (Probability)	70% probability of at least one thunderstorm wind event per year (1955-2021)

*Note: Data from NCDC Storm Events Database. Formula is # of years with >0 hazard event / total years * 100.*

Table 3.13.3: Typical Characteristics - Tornadoes

Damage ($)	Thousands to millions in damage to property
Location (Geographic Area)	Countywide, path-related
Extent by Measure	EF0 (65 mph) to EF5 (200+ mph)
Speed of Onset (Time)	Seconds to minutes
Duration (Time)	Minutes to hours

Table 3.13.4: Event Summary - Tornadoes

Events	16
Years with Event	11 (1958, 1959, 1965, 1971, 1998, 1999, 2003, 2009, 2010, 2017, 2020)
Frequency (Probability)	15% probability of at least one tornado event per year (1950-2021)

*Note: Data from NCDC Storm Events Database and the Midwestern Regional Climate Center. Formula is # of years with >0 hazard event / total years * 100.*

Table 3.13.5: Typical Characteristics - Lightning

Damage ($)	Thousands in damage to property
Location (Geographic Area)	Countywide, localized strike
Extent by Measure	n/a
Speed of Onset (Time)	Immediate
Duration (Time)	Seconds

Table 3.13.6: Event Summary - Lightning

Events	5
Years with Event	5 (1999, 2000, 2006, 2009, 2018)
Frequency (Probability)	20% probability of at least one lightning event per year (1996-2021)

*Note: Data from NCDC Storm Events Database. Formula is # of years with >0 hazard event / total years * 100.*

Table 3.13.7: Typical Characteristics - Hail

Damage ($)	Thousands in damage to property
Location (Geographic Area)	Countywide, localized fall
Extent by Measure	1" (severe criteria) to 4 1/2" or greater
Speed of Onset (Time)	Immediate
Duration (Time)	Seconds to minutes

Table 3.13.8: Event Summary - Hail

Events	107
Years with Event	23 (1972, 1973, 1974, 1975, 1981, 1984, 1987, 1988, 1991, 1992, 1996, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2020)
Frequency (Probability)	35% probability of at least one hail event per year (1955-2021)

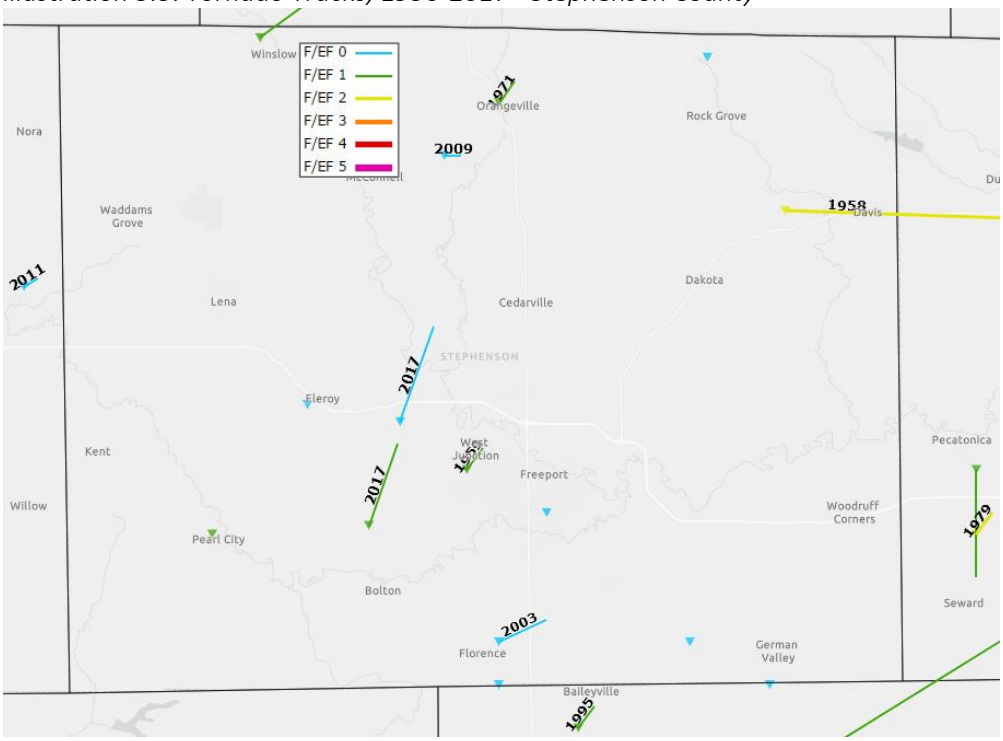
*Note: Data from NCDC Storm Events Database. Formula is # of years with >0 hazard event / total years * 100.*

Summary of Severe Thunderstorms Impacts & Vulnerabilities

- Municipalities: disruption and/or destruction of above-ground utilities, pole buildings, public and private buildings, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes
- Stephenson County: disruption and/or destruction of above-ground utilities, pole buildings, public and private buildings, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes, crops and livestock

The following illustrates confirmed tornadoes since 1950:

Illustration 3.5: Tornado Tracks, 1950-2017 - Stephenson County[27]



Stephenson County has a population density of 79.2 people per square mile.[28] NOAA's Storm Prediction Center reports that the average path length of a tornado is 3.5 miles. In addition, the widest tornado ever recorded in Stephenson County was 200 yards. Using the above density, a tornado path length of 3.5 miles, and a tornado width of .17 miles (.11 * a 1.5 buffer factor, to account for indirect impacts), an estimate might be that about 47 people would be impacted by an event as described. Such number increases to about 1,198 in highly populated Freeport. Of course, housing unit density is not uniform (when considering spatial layout, multi-family dwelling units, etc.), and other factors are important, including housing construction type, wind speeds, proximity, etc. Still, the above provides an understandable approximation of impact and vulnerability, based – in part – on recorded history.

[27] Tornado Tracks, 1950-2017, Midwestern Regional Climate Center, accessed May 13, 2022
[28] "Stephenson County, IL," Census Reporter (based ACS 2020 5-year), accessed May 16, 2022

HAZARD PROFILES

DF Dam failure | D Drought | EQ Earthquake | ET Extreme temperatures
E Erosion | F/FF Flooding/flash flooding | LS Landslide | LF Levee failure
ST Severe thunderstorms | **SWS Severe winter storms** | W/LF Wild/land fires

Overview

Severe winter storms is an event that occurs in Stephenson County. The event is capable of countywide, multi-jurisdictional impacts.

Table 3.14.1: Typical Characteristics

Damage ($)	Thousands in damage to property
Location (Geographic Area)	Countywide
Extent by Measure	Up to 36" of snowfall in 24 hours in Astoria, IL
Speed of Onset (Time)	Hours to days
Duration (Time)	Hours to days

Table 3.14.2: Event Summary

Events	57
Years with Event	21 (1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2006, 2007, 2008, 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2019, 2020, 2021)
Frequency (Probability)	84% probability of at least one winter storm event per year (1996-2021)

*Note: Data from NCDC Storm Events Database. Formula is # of years with >0 hazard event / total years * 100.*

Summary of Severe Winter Storms Impacts & Vulnerabilities

- Municipalities: above-ground utilities, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes, public safety and public access, building collapse from accumulated snow
- Stephenson County: above-ground utilities, private energy infrastructure, individuals and groups recreating, vehicles and mobile homes, crops and livestock, public safety and public access, county transit system, building collapse from accumulated snow

HAZARD PROFILE

DF Dam failure	D Drought	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF Flooding/flash flooding	LS Landslide	LF Levee failure
ST Severe thunderstorms	SWS Severe winter storms	**W/LF** Wild/land fires	

Overview

Wild/land fires is an event that may occur in Stephenson County. The event is capable of countywide, multi-jurisdictional impacts. According to a recent First Street Foundation analysis, wildfire risk in Stephenson County is very low to little.

Table 3.15.1: Typical Characteristics

Damage ($)	Thousands in damage to property
Location (Geographic Area)	Countywide, especially in unincorporated areas
Extent by Measure	n/a
Speed of Onset (Time)	Minutes
Duration (Time)	Minutes to days

Table 3.15.2: Event Summary

Events	n/a
Years with Event	n/a
Frequency (Probability)	n/a

*Note: Data from NCDC Storm Events Database. Formula is # of years with >0 hazard event / total years * 100.*

Summary of Wild/land Fires Failure Impacts & Vulnerabilities

- Municipalities: fires may spread from unincorporated areas to cities and villages, especially those adjacent to agricultural fields and grasslands and lacking buffers
- Stephenson County: agricultural fields, grasslands, farmsteads, rural buildings

HAZARD RANK

Ranking Hazards: Statewide

As part of the planning process for the 2018 Illinois Natural Hazard Mitigation Plan, the statewide committee ranked hazards on a scale of low (least severe) to severe (most severe). Stephenson County received an overall hazard rating of medium.

Table 3.16: Natural Hazard Severity in Stephenson County, 2018 Illinois Hazard Mitigation Plan

Hazard	Rating
Severe Storms	Severe
Severe Winter Storms	High
Drought	High
Extreme Heat	Medium
Floods	Medium
Tornado	Medium
Earthquake	Low

Planning Team Concern

The top three concerns (with 1 representing the top concern) of the planning team regarding hazards in Stephenson County, articulated following discussion and survey, are indicated as follows:

DF Dam failure	D Drought	EQ Earthquake	ET Extreme temperatures
E Erosion	F/FF (1) Flooding/flash flooding	LS Landslide	LF Levee failure
ST (2) Severe thunderstorms	SWS (3) Severe winter storms	W/LF Wild/land fires	

Ranking Hazards: Locally

Hazard severity was also ranked by considering intensity/severity, occurrence, and planning team concern. Flooding/flash flooding, severe thunderstorms, and severe winter storms hazards topped the list.

Table 3.17.1: Intensity/Severity

Potential intensity/severity?	What type of damage is caused by the event?
3 - High severity	Deaths/injuries presumed likely Thousands to millions of dollars in damage presumed likely
2 - Moderate severity	Deaths/injuries presumed possible Thousands to millions of dollars in damage presumed likely
1 - Low severity	Deaths/injuries presumed possible Thousands to millions of dollars in damage presumed possible

Table 3.17.2: Occurrence

Score	Probability of occurrence based on historical events
2	>0%
1	0%

Table 3.17.3: Planning Team Concern

Score	Level of concern
4	Top concern to planning team
3	Second most important concern to planning team
2	Third most concern to planning team
1	All others

Table 3.17.4: Hazard Formula

Hazard	Intensity/Severity	Occurrence	Planning Team Concern	Rank
Dam failure	2	1	1	4
Drought	1	2	1	4
Earthquake	3	2	1	6
Extreme temperatures	2	2	1	5
Erosion	1	2	1	4
Flood/flash flooding	2	2	4	8
Landslide	2	1	1	4
Levee failure	1	1	1	3
Severe thunderstorms	3	2	2	7
Severe winter storms	2	2	3	7
Wild/land fires	2	2	1	5

ASSETS, VULNERABILITIES, & RISKS INVENTORY

Information about community assets was collected from local stakeholders. If information was unavailable or the asset or vulnerability did not apply, n/a (not available or not applicable) is indicated in the respective column/row.

Table 3.18: Assets, Vulnerabilities, and Risks by Community - Stephenson County

Asset, Vulnerability, or Risk	Stephenson County	Cedarville	Dakota	Davis	Freeport	German Valley	Lena	Orangeville	Pearl City	Ridott	Rock City	Winslow
Critical Facility in Floodplain	Y	N	N	N	Y	N	N	Y	Y	N	N	Y
Designated Cooling/Heating Center	N	Y	N	Y	N	Y	N	N	Y	Y	N	Y
Designated Place of Refugee	N	Y	N	N	N	Y	N	N	Y	Y	N	Y
Designated Storm Shelter	N	N	N	N	N	N	N	N	N	Y	N	Y
Fixed Water Tower Generator*	n/a	Y	N	N	N	N	Y	N	Y	n/a	N	N
Fixed Wastewater Treatment Plant Generator*	n/a	n/a	N	N	Y	Y	Y	Y	Y	n/a	N	N
Lightning Detection System	n/a	N	N	N	N	N	N	N	N	N	N	N
Outdoor Warning Sirens	N	Fire	Fire	Y	Y	N	Fire	Fire	Y	Y	Fire	Y
Combined Sanitary and Storm Sewer	n/a	N	N	N	N	N	N	N	n/a	n/a	N	N
Manufactured Home Community	Y	N	N	N	Y	N	N	N	N	N	N	N
Federal Facility	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State Facility	Y	N	N	N	Y	N	N	N	N	N	N	N
EMS Facility	n/a	N	N	N	Y	Y	Y	N	Y	N	Y	N
Fire Department Facility	n/a	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Police Department Facility	Sheriff	Y	N	Combined	Y	Combined	Y	N	Y	N	N	N
Health Clinic	n/a	N	N	N	Y	N	Y	Y	N	N	N	N
Hospital	n/a	N	N	N	Y	N	N	N	N	N	N	N
Local Newspaper	n/a	N	Y	N	Y	N	Y	Y	N	N	N	N
Local Radio	n/a	N	N	N	Y	N	N	N	N	N	N	N
Railheads/Railyards/Rail Spurs	Y	N	N	N	Y	N	Y	N	N	N	N	N
Park/Recreation Site	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Civic/Cultural Center	Y	Y	N	Y	Y	N	Y	Y	Y	N	N	Y
Museum	n/a	Y	N	N	Y	Y	Y	N	N	N	Y	Y
Multi-Family Housing (four units or more)	n/a	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y
Assisted Living/Nursing Facility	County	N	N	N	Y	N	Y	N	N	N	N	N
Financial Institution	n/a	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y
Energy or Fuel Production	n/a	N	N	N	Y	N	Y	N	N	N	N	N

*Note: * = mobile or portable generators not considered.*

In addition to the above community assets, the planning team identified five manufactured/mobile home communities in Stephenson County:

- Knollwood Estates
- Timber Ridge
- West Town
- Woodridge Estates
- W Stephenson St Rd and N/S Rink Rd

Some facilities in Stephenson County are located in the floodway, floodplain, or prone to flooding. Those facilities reported by local officials, residents, and other sources are listed in the following table.

Table 3.19: Community Assets in Floodway, Floodplain, or Prone to Flooding - Stephenson County

Asset	Jurisdiction	Estimated Replacement Cost	Notes
Health Department Highway Department (roadway) Nursing Home (roadway)	Stephenson County	$5 million - $10 million $250k - $500k (roadway improvements) $250k - $500k (roadway improvements)	
Wastewater Treatment Plant	Village of Cedarville	$10 million	
Wastewater Treatment Plant (roadway)	Village of Dakota	$250k - $500k (roadway improvements)	
n/a	Village of Davis	n/a	
Wastewater Treatment Plant Fire Department Training Facility	City of Freeport	$50 million - $100 million $500k - $1 million	Since the 2017 plan, Taylor Park School has been decommissioned. However, the structure is still extant.
Lift Station	Village of German Valley	$250k - $500k	
n/a	Village of Lena	n/a	
Fire Department Training Facility Wastewater Treatment Plant	Village of Orangeville	$500k - $1 million $10 million	
Pearl City CUSD 200 Bus Garage Lift Station (x2) Well Wastewater Treatment Plant	Village of Pearl City	$500k - $1 million $250k - $500k $500k - $1 million $10 million	At least one lift station was raised. The well is in the process of being raised.
n/a	Village of Ridott	n/a	
n/a	Village of Rock City	n/a	
Fire Station Museum Post Office Wastewater Treatment Plant	Village of Winslow	$500k - $1 million $500k $1 million - $5 million $10 million	

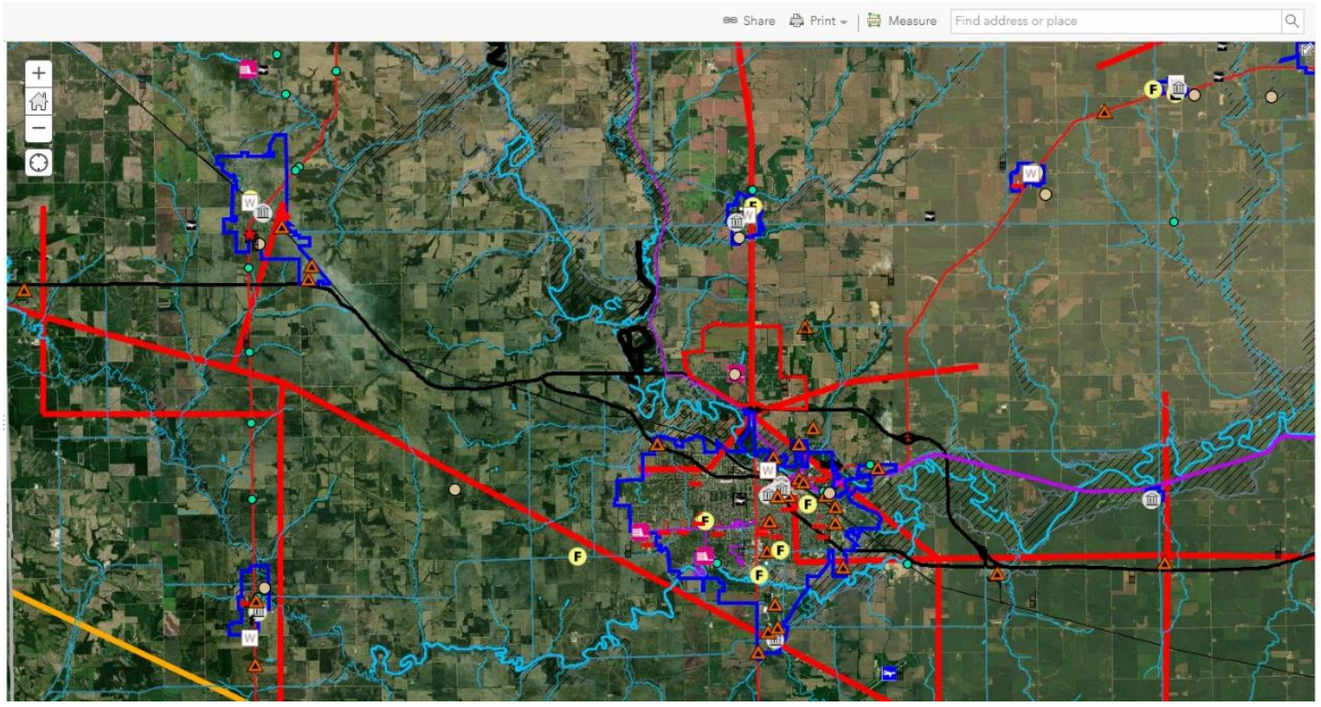
IMPACTS, VULNERABILITIES, & RISK ASSESSMENT MAPS BY JURISDICTION

SCEMA leadership and BHRC staff met with elected officials and key personnel from cities and villages in Stephenson County to develop the following map. Hosted online at https://arcg.is/1Xbu8m, this version replaces the static maps created for each jurisdiction and included in the 2017 publication.

The new map has the benefit of being dynamic, readily updatable, and more usable. Key map layers or features include FEMA-designated floodplains and floodways, critical facilities, and points of vulnerability. Mappable mitigation actions (i.e., those with associated coordinates) are also included on the map.

Please visit the ArcGIS site at the link above to view the latest version of the map.

Screen capture 3.1: Stephenson County Impacts, Vulnerabilities, and Risk Assessment Map



CHAPTER 4: MITIGATION STRATEGY

CHAPTER 4: MITIGATION STRATEGY

OVERVIEW

In this chapter, the goals, objectives, and actions of the mitigation strategy are addressed. Progress with respect to general implementation and individual actions taken is noted. This chapter also covers a comprehensive range of actionable projects and programs. Actions that are no longer priorities or have been completed have been removed. Prioritization is addressed in the final column of each mitigation actions table, based in part on the benefits and costs listed.

Illustration 4.1: Sequence of Goals, Actions, and Action Plan[29]

[29] Adapted from the now defunct mitigationguide.org

GOALS & OBJECTIVES

The goals and objectives established in the 2017 plan remain unchanged and are as follows:

1. Protect life
    a. Support public health systems
    b. Support public safety systems
    c. Implement modern hazard warning systems
    d. Plan for vulnerable/special needs populations
    e. Enact projects, programs, and policies that consider present and future generations
    f. Consider individual and community needs before, during, and after disasters

2. Protect critical facilities, infrastructure, and environmental health
    a. Harden civic, government, and private facilities
    b. Protect water quality
    c. Preserve open spaces, wetlands, and other natural resources
    d. Protect historic and cultural assets and information

3. Improve planning and regulator practices
    a. Encourage best practices in residential, commercial, and industrial development
    b. Ensure that building codes and zoning ordinances discourage flood zone development
    c. Enforce codes, zoning ordinances, subdivision ordinances, and other planning/regulatory policies or laws
    d. Help communities land-locked by floodway/floodplain find alternative means of development
    e. Interconnect hazard mitigation, comprehensive, and other community studies, plans, and processes
    f. Include mitigation strategies in official documents and maps

4. Promote individual and community resiliency
    a. Help individuals support themselves in times of disaster
    b. Help communities support themselves in times of disaster

5. Encourage communication and develop relationships
    a. Develop awareness and education programs
    b. Pursue regular community outreach
    c. Improve communication/coordination: first responders, relief agencies, and support organizations
    d. Improve communication/coordination between municipalities
    e. Improve communication/coordination between SCEMA and municipalities (and vice-versa)

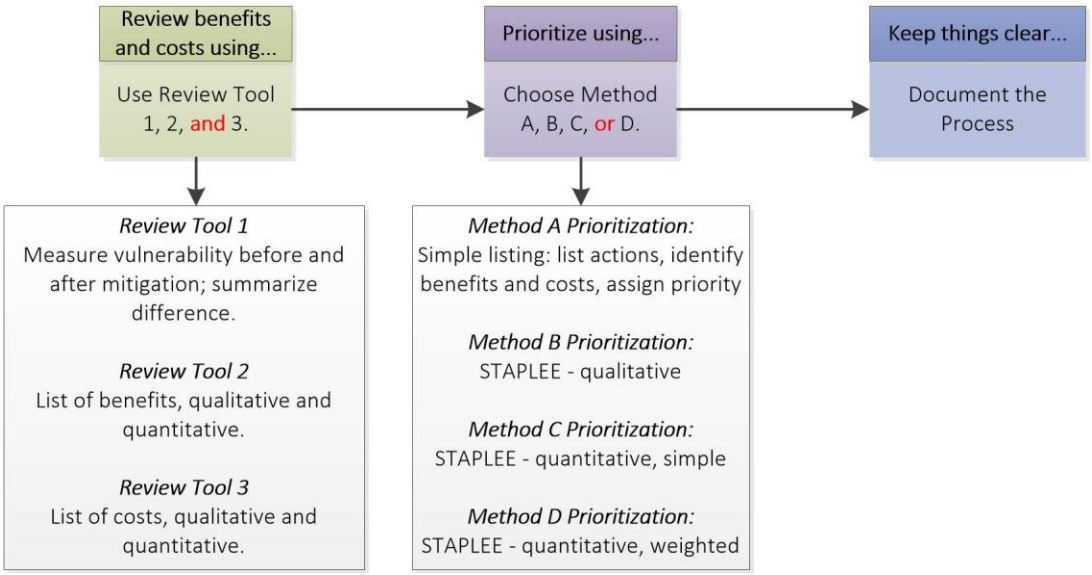
ACTIONS & ACTION PLAN

Achieving plan goals requires taking action by way of specific projects, programs, and policies. Post-planning efforts should be focused on executing actions, measuring implementation progress, and adjusting the plan as needed.

Prioritization

FEMA's "Using Benefit-Cost Review in Mitigation Planning" explains that the planning team "needs to select the most cost-effective actions for implementation first, not only to use resources efficiently, but to make a realistic start toward mitigating risks."[30] The planning team pursued simple listing approaches to both the benefit-cost review/analysis and prioritization process.

Illustration 4.2: Approaches to Benefit-Cost Analysis and Prioritization



Projects and programs were collected from multiple sources, including past hazard mitigation plans, lead agencies, planning team members, community meetings, and members of the public. Actions were prioritized based on input from the same sources.

Members of the planning team and the public also considered STAPLEE criteria[31] when selecting projects, including:

- Social (community acceptance, effect on segment of population)
- Technical (technical feasibility, long-term solution, secondary impacts)
- Administrative (staffing, funding allocated, maintenance/operations)
- Political (political support, public support, local champion)
- Legal (local authority, potential legal challenge)
- Economic (benefits of action, costs of action, contributes to goals, outside funding required)
- Environmental (effect on air/water/land, endangered species, HAZMAT/waste sites, consistent with comprehensive plan, consistent with state/federal laws)

[30] "Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)," Federal Emergency Management Agency, published May 2007
[31] "Handout 16-7: STAPLEE Criteria Worksheet," State and Local Mitigation Planning How-To Guide: Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies, Federal Emergency Management Agency, published 2003

The results of data collection, discussions, and planning team/public review are contained within tables (one table for each participating community) on the following pages. As an introduction, the following table explains abbreviations and symbols used.

Table 4.1.1: Abbreviations and Symbols for Projects, Programs, and Policies Lists

Primary Hazard Addressed	Estimated Time to Complete	Match with Local Goal(s)
DF – dam failure D – drought EQ – earthquake ET – extreme temperatures E – erosion F/FF – flooding/flash flooding LS – landslide LF – levee failure ST – severe thunderstorms SWS – severe winter storms W/LF – wild/land fires O – Other	0-2 years 2-5 years 5+ years Cont. – continual	1 - protect life 2 - protect critical facilities, infrastructure, and environmental health 3 - improve planning and regulatory practices 4 - promote individual and community resiliency 5 - encourage communication and develop relationships
Cost of Project or Program	**Prioritization**	
$ --- $0 to under $10,000 $$ --- $10,000 to under $100,000 $$$ --- $100,000 to under $1,000,000 $$$$ --- $1,000,000 or greater	High ●●● Medium ●● Low ●	

The following mitigation actions were completed in the past five years:

Table 4.1.2: Mitigation Actions Completed

Date	Jurisdiction
Stephenson County	Conduct countywide water demand and supply study; conduct public NFIP/repetitive loss outreach; provide information about CRS; support NG-9-1-1; keep bridge piers clear of debris
Village of Cedarville	Address localized ponding near Cedar/Washington and Harrison/Homestead; address erosion near Oakridge Dr
Village of Dakota	Update/replace streetlights and exterior facility lighting
Village of Davis	Update/replace streetlights and exterior facility lighting
City of Freeport	Identify, prioritize, and implement buyouts/mitigations for flood-prone properties; update/replace streetlights and exterior facility lighting; develop a social median and website strategy; obtain Tree City USA status; create re-use (no-use) plan for acquired land/property in floodway/floodplain
Village of German Valley	Update/replace streetlights and exterior facility lighting
Village of Lena	Update/replace streetlights and exterior facility lighting; increase capacity of Town Line Rd culvert; Dredge Lake-Le-Aqua-Na
Village of Orangeville	Remove debris from Richland Creek; identify and prioritize river/stream banks for erosion control measures; study Richland Creek bottlenecks and increase culvert capacity where appropriate (especially Ewing St)
Village of Pearl City	Address ponding near IL 73/Pearl City; identify, prioritize, and implement buyouts/mitigations for flood-prone properties
Village of Ridott	Improve park drainage system; update/replace streetlights and exterior facility lighting
Village of Rock City	n/a
Village of Winslow	Replace School St Bridge
All	Explore CRS participation

Mitigation actions removed from the following tables may be found in Table 4.14.

Table 4.2: Mitigation Actions – Stephenson County

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
D1.1	Inventory water sources and determine suitability for use in firefighting	2-5 years	• Fire protection districts/MABAS • SCEMA	1,2,3	• Increase firefighting capability/capacity	• Coordination/communication • Staff time	$	Low ●
E1.1	Identify, prioritize, and implement streambank restoration projects	0-2 years	• Conservation organizations • Stephenson County Farm Bureau	2,3	• Reduce runoff • Improve water quality	• Coordination/communication	$$	Medium ●●
ET1.1	Establish new or upgrade existing heating/cooling centers	2-5 years	• Fire protection districts/MABAS • Freeport Housing Authority • SCEMA	1,4	• Ensure adequate capacity • Enhance security for administrators and users	• Cost of new construction/upgrades	$$$	Low ●
ET1.2	Seek funding for residential weatherproofing programming	Cont.	• County, township, and municipal officials • Community action agencies	1,4	• Reduce cooling/heating costs for residents and businesses	• Coordination/communication • Outreach/program funding	$$	High ●●●
F/FF1.1	Install additional streamgages on Pecatonica River and Yellow Creek	2-5 years	• SCEMA • USGS	3	• Ability to forecast/predict river rise and fall	• Coordination/communication • Cost of engineering/technical assistance	$$$	High ●●●
F/FF1.2	Study impacts of non-accredited levees on countywide flooding	2-5 years	• ACE • SCEMA	2	• Determine effectiveness and consequences of failure • Knowledge of influence on flooding upstream/downstream	• Cost of engineering/technical assistance	$$	Low ●
F/FF1.3	Identify, prioritize, and implement buyouts/mitigations for flood-prone properties	5+ years	• IEMA/FEMA • IDNR/OWR • County officials • SCEMA	1,2,4	• Direct development away from potential hazards/risk areas • Reduce flooding issues	• Cost of land acquisition • Individual/neighborhood reluctance	$$$$	High ●●●
F/FF1.4	Keep bridge piers clear of debris	Cont.	• ACE • Conservation organizations • Municipal officials • Stephenson County Highway Department • Townships	2	• Allow water to flow freely • Reduce dangerous currents • Improve aesthetics	• Staff time	$$	High ●●●
F/FF1.5	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
F/FF1.6	Determine feasibility of bistate Pecatonica River Watershed networking group	0-2 years	• Conservation organizations • County, township, and municipal officials • IDNR	2,3	• Develop relationships in-state and out-of-state • Develop comprehensive approach to flooding-related issues	• Coordination/communication • Staff time	$	Medium ●●
F/FF1.7	Participate in state and federal floodplain management training webinars to support local compliance with NFIP	Cont.	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Staff time	$	High ●●●
F/FF1.8	Map flood-prone areas in communities without flood hazard areas	0-2 years	• Municipal officials • SCEMA • FEMA	2, 3	• Understand extent and severity of risks	• Coordination with FEMA	$	Medium ●●
ST1.1	Implement a countywide storm warning system	2-5 years	• Fire protection districts/MABAS • Municipal officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of new construction/upgrades	$$$	High ●●●
ST1.2	Maintain Stephenson County StormReady status	2-5 years	• SCEMA	4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
O1.1	Develop evacuation and sheltering plan for refugees	0-2 years	• American Red Cross • County, township, and municipal officials • SCEMA	1,4,5	• Formalize informal plans	• Coordination/communication	$	High ●●●
O1.2	Develop Stephenson County capital improvement plan	0-2 years	• Stephenson County Highway Department	3	• Facilitate long-term strategic planning • Improved chance of coordinating county and municipal projects	• Coordination/communication • Cost of document	$$	Medium ●●
O1.3	Develop Stephenson County continuity of government plan	0-2 years	• County officials	3,5	• Government services continue for constituents • Increased coordination between county departments	• Coordination/communication • Follow-through	$	High ●●●
O1.4	Encourage municipal participation in IPWMAN	Cont.	• Municipal officials • SCEMA • Stephenson County Highway Department	5	• Access to personnel and equipment not available locally • Build relationships with other jurisdictions • Formalize informal plans	• Yearly membership fee	$	High ●●●
O1.5	Design, fabricate, and install uniform signage for sheltering assets (heating and cooling centers, storm shelters, etc.); support with	0-2 years	• County, township, and municipal officials • SCEMA	5	• Recognized readily by members of the public	• Coordination/communication • Cost of signage	$	Medium ●●

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
	awareness campaign							
O1.6	Map sheltering assets (heating and cooling centers, storm shelters, etc.)	0-2 years	• County, township, and municipal officials • SCEMA	5	• Recognized readily by members of the public	• Coordination/communication • Cost of signage	$	Medium ●●
O1.7	Establish IT service continuity plan	0-2 years	• County officials	3,5	• Government services continue for constituents • Increased coordination between county departments	• Coordination/communication • Follow-through	$	High ●●●
O1.8	Hire county communications/social media manager	0-2 years	• County officials	5	• Increased and improved communication with the public	• Cost of personnel	$$	High ●●●
O1.9	Install dry hydrant at kayak launch on Farwell Bridge Rd	0-2 years	• Conservation organizations	1,2	• Increased firefighting capability	• Regulatory agency approval • Cost of construction • Susceptible to drought	$$	Low ●
O1.10	Update comprehensive plan and future land use map	2-5 years	• Conservation organizations • Freeport Park District • Stephenson County Zoning	3	• Master document from which all other documents are created • Direction for future development/redevelopment • Reconcile difference between local and county maps and plans	• Building public and official interest • Cost of planning	$$	High ●●●
O1.11	Install backup generators at county critical facilities	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.12	Develop a social media and website strategy for emergency management	0-2 years	• SCEMA	5	• Ensure content is timely, fresh, and useful • Improve ability to respond to disaster by enhancing disaster literacy	• Staff time		Medium ●●

Table 4.3: Mitigation Actions – Village of Cedarville

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
ST1.1	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.2	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.3	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.4: Mitigation Actions – Village of Dakota

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Secure easement and improve roadway to ensure access to water system	5+	• Municipal officials	2	• Ensures access to essential system, especially during flooding	• Cost of securing easement, improvements	$$	Medium ●●
F/FF1.2	Enact NFIP-compatible floodplain ordinance and enroll in NFIP	0-2 years	• Municipal officials • SCEMA	3	Compensate for flooding losses • Encourage environmentally/hazard conscious development • Support individual awareness and preparedness	• Cost of flood insurance and compliance • Coordination with county • Infrequent/localized flooding • Staff/elected official time	$	High ●●●
ST1.1	Install outdoor warning siren	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
ST1.2	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.3	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.4	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Create future land use map/comprehensive plan	years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.5: Mitigation Actions – Village of Davis

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Pursue upgraded aerators and rock filter operating system for wastewater treatment plant	2-5 years	• IEPA • Municipal officials • USDA	2	• Improve capacity and efficiency of system	• Cost of engineering/technical assistance, equipment, and installation	$$	Medium ●●
F/FF1.2	Add or improve green detention/retention and other infrastructure to address local ponding	2-5 years	• Municipal officials	1, 4	• Prevent flooding issues • Encourage environmentally/hazard conscious development	• Cost of engineering/technical assistance	$$	Medium ●●
F/FF1.3	Enact NFIP-compatible floodplain ordinance and enroll in NFIP	0-2 years	• Municipal officials • SCEMA	3	Compensate for flooding losses • Encourage environmentally/hazard conscious development • Support individual awareness and preparedness	• Cost of flood insurance and compliance • Coordination with county • Infrequent/localized flooding • Staff/elected official time	$	High ●●●
ST1.1	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.2	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.3	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.4	Connect well and water tower using SCADA system	0-2 years	• Municipal officials	2, 5	• Increase response time for flooding issues	• Cost of engineering/technical assistance • Coordination/communication	$$	High ●●●

Table 4.6: Mitigation Actions – City of Freeport

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
EQ1.1	Determine what earthquake protections existing codes provide, if any	0-2 years	• Municipal and county officials • SCEMA	3	• Anticipate damage to structures • Take corrective or pursue preventive maintenance/upgrades	• Staff time	$	Low ●
F/FF1.1	Participate in CRS	2-5 years	• Freeport Housing Authority • Municipal officials • SCEMA	4	• Reduce costs associated with flood insurance	• Coordination with county • Staff/elected official time	$	High ●●●
F/FF1.2	Identify, prioritize, and implement buyouts/mitigations for flood-prone properties	5+ years	• IEMA/FEMA • IDNR/OWR • Freeport Park District • Municipal officials	1,2,4	• Direct development away from potential hazards/risk areas • Reduce flooding issues	• Cost of land acquisition • Individual/neighborhood reluctance	$$$$	High ●●●
F/FF1.3	Identify intersections and roadways prone to flooding	0-2 years	• Municipal officials • SCEMA	1,2,4	• Reduce flooding issues	• Staff time	$	High ●●●
F/FF1.4	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
F/FF1.5	Participate in state and federal floodplain management training webinars to support local compliance with NFIP	Cont.	• Municipal officials	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Staff time	$	High ●●●
ST1.1	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.2	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
O1.1	Establish IT service continuity plan	0-2 years	• County officials	3,5	• Government services continue for constituents • Increased coordination between county departments	• Coordination/communication • Follow-through	$	High ●●●
O1.2	Install backup generators at city critical facilities	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.3	Develop City of Freeport continuity of government plan	0-2 years	• Municipal officials	3,5	• Government services continue for constituents • Increased coordination between city departments	• Coordination/communication • Follow-through	$	High ●●●
O1.4	Implement recommendations contained in the City of Freeport Comprehensive Plan and others	Cont.	• Municipal officials	1,2,3,4,5	• Address quality of service for residents and business • Reduce flooding issues	• Cost of engineering/technical assistance and construction • Overall effectiveness during heavy/extreme rain events • Staff time	$$$$	High ●●●
O1.5	Relocate and rebuild water production facility away from railway	5+ years	• IEPA • Municipal officials • USDA	1,2,4	• Affect numerous people and properties • Hardened infrastructure • Improved water delivery efficiency and operations • Reduced railway vulnerability	• Cost of new connections and land acquisition, decommissioning, and new water production facility	$$$$	High ●●●

Table 4.7: Mitigation Actions – Village of German Valley

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Increase capacity of Church St and Rock City Rd culverts	5+ years	• Municipal officials • IDOT • Stephenson County Highway Department • Townships	2	• Reduce flooding issues	• Cost of construction and engineering/technical assistance • Impact of other bottlenecks • Issues rare	$$$	Low ●
F/FF1.2	Relocate lift station	2-5 years	• Municipal officials	2	• Reduce potential for losses during flooding • Maintain system operations during flooding	• Cost of construction and engineering/technical assistance	$$	Medium ●●
F/FF1.3	Enact NFIP-compatible floodplain ordinance and enroll in NFIP	0-2 years	• Municipal officials • SCEMA	3	Compensate for flooding losses • Encourage environmentally/hazard conscious development • Support individual awareness and preparedness	• Cost of flood insurance and compliance • Coordination with county • Infrequent/localized flooding • Staff/elected official time	$	High ●●●
ST1.1	Install new outdoor warning siren	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
ST1.2	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.3	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.4	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.4	Upgrade wastewater treatment plant	2-5 years	• Municipal officials	3	• Harden facility against flooding • Ensure proper treatment of waste • Support community and economic development	• Cost of construction and engineering/technical assistance	$$$$	High ●●●

Table 4.8: Mitigation Actions – Village of Lena

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Improve stormwater, wastewater, and water connections to Adkins Energy and village's industrial corridor	5+ years	• BHRC • Municipal officials	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	Medium ●●
F/FF1.2	Improve drainage and stormwater capture along Pepin Dr and related areas	2-5 years	• Municipal officials	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	High ●●●
F/FF1.3	Address flooding at Fairway Dr and Stagecoach Rd and related areas	2-5 years	• Municipal officials • Stephenson County Highway Department	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	Medium ●●
F/FF1.4	Expand capacity of Townline Rd culvert	2-5 years	• Municipal officials	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	High ●●●
F/FF1.5	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
ST1.1	Install new outdoor warning siren	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
ST1.2	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.3	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.4	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.4	Add curb cutouts and ramps, especially near special needs populations	5+ years	• IDOT • Municipal officials • Stephenson County Highway Department	1,2,5	• Improve access and mobility	• Cost of construction and engineering/technical assistance	$$$	Medium ●●
O1.5	Create redevelopment plan for Canadian National Railway corridor	2-5 years	• IEPA • Municipal officials • Canadian National Railway	3	• Create buffers between different modes of transportation • Focus municipal goals with respect to community and economic development • Remediate brownfields	• Cost of engineering/technical assistance • Staff time	$$	Medium ●●
O1.6	Institute building permit and inspection programs	0-2 years	• Municipal officials	3,4	• Ensures building meets current International Building Code requirements • Ensures new buildings are not constructed in floodway/floodplain	• Staff time	$$	High ●●●

Table 4.9: Mitigation Actions – Village of Orangeville

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Identify, prioritize, and implement buyouts/mitigations for flood-prone properties	5+ years	• IEMA/FEMA • IDNR/OWR • Municipal officials • SCEMA	1,2	• Address properties persistently exposed to flooding • Reduce costs associated with cleanup	• Cost of acquisition • Not all property owners want to leave, even with fair compensation	$$$	High ●●●
F/FF1.2	Create re-use (no-use) plan for acquired land/property in floodway/floodplain	2-5 years	• Conservation organizations • Municipal officials	3	• Create green space/prairie habitat • Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services	$	High ●●●
F/FF1.3	Keep High St bridge piers clear of debris	Cont.	• ACE • Conservation organizations • Municipal officials • Stephenson County Highway Department • Townships	1,2	• Protect bridge from damage caused by debris and pressure from ice jams • Reduce potential for flooding	• Organizing workers/volunteers	$	High ●●●
F/FF1.4	Extend wastewater system to residents south of village limits (Freeport Rd)	2-5 years	• Municipal officials	2,4	• Support conservation and economic development	• Cost of construction and engineering/technical assistance	$$$	Medium ●●
F/FF1.5	Address stormwater drainage on Mill St	2-5 years	• Municipal officials	2,4	• Support conservation and economic development	• Cost of bridge/culvert improvements • Cost of stormwater system improvements	$$$	Medium ●●
F/FF1.6	Improve failing storm sewer on Main St	0-2 years	• Municipal officials	2,4	• Reduce losses/potential for losses during flooding	• Cost of construction and engineering/technical assistance	$$	High ●●●
F/FF1.7	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
ST1.1	Install stand-alone outdoor warning siren; connect to countywide system	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
ST1.2	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.3	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.4	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
ST1.5	Install backup generators at village critical facilities	2-5 years	• Municipal officials • Frontier	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
ST1.6	Upgrade village hall/community building to provide all hazards shelter	5+ years	• Municipal officials	1,2,4	• High-quality construction materials • Protection from all hazards	• Cost of incorporating all hazards shelter • Long-term maintenance challenge	$$$	Medium ●●
O1.1	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.2	Update/replace streetlights and exterior facility lighting	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.3	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.4	Upgrade well pumps and related infrastructure	0-2 years	• Municipal officials	1,2,4	• Ensure continual supply of water	• Cost of construction and engineering/technical assistance	$$	High ●●●
O1.5	Institute building permit and inspection programs	0-2 years	• Municipal officials	3,4	• Ensures building meets current International Building Code requirements • Ensures new buildings are not constructed in floodway/floodplain	• Staff time	$$	High ●●●

Table 4.10: Mitigation Actions – Village of Pearl City

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Identify, prioritize, and implement buyouts/mitigations for flood-prone properties	5+ years	• IEMA/FEMA • IDNR/OWR • Municipal officials • SCEMA	1,2	• Address properties persistently exposed to flooding • Reduce costs associated with cleanup	• Cost of acquisition • Not all property owners want to leave, even with fair compensation	$$$$	High ●●●
F/FF1.2	Create re-use (no-use) plan for acquired land/property in floodway/floodplain	2-5 years	• Conservation organizations • Municipal officials	3	• Create green space/prairie habitat • Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services	$	High ●●●
F/FF1.3	Study Yellow Creek bottlenecks and increase culvert capacity where appropriate	2-5 years	• ACE • IDOT • Municipal officials • SCEMA • Stephenson County Highway Department • Townships	1,2,3	• Improved understanding of Yellow Creek flows • Supports targeted investment in new infrastructure	• Cost of study	$$	Medium ●●
F/FF1.4	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
ST1.1	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.2	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.3	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.11: Mitigation Actions – Village of Ridott

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Elevate/protect route and structures for proposed bicycle path near floodway/floodplain	5+ years	• Conservation organizations • IDNR • Municipal officials • Tourism officials	1,2,4	• Ensure accessibility year-round • Reduce maintenance burden • Support local businesses and tourism	• Cost of improved bicycle path	$$	Medium ●●
F/FF1.2	Install removable boat dock/launch	5+ years	• IDNR • Municipal officials	2	• Greater flexibility when Pecatonica River floods	• Cost of boat dock/launch installation • Boat dock/launch maintenance	$$	Low ●
F/FF1.3	Inspect and flush pipe and tile system	2-5 years	• Municipal officials	2	• Determine how water flows within system • Improve park availability	• Cost of inspection • Cost of pipe and tile system improvements	$$	Medium ●●
F/FF1.4	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
F/FF1.5	Address bottleneck at River Rd / Rock City Rd bridge	2-5 years	• Municipal officials • Stephenson County Highway Department	1,2,4	• Reduces flooding along Pecatonica River • Supports targeted investment in new infrastructure	• Cost of engineering/technical assistance and construction	$$$$	High ●●●
ST1.1	Install new outdoor warning siren	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
ST1.2	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.3	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.4	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.4	Restore village hall/community building	5+ years	• Municipal officials	1,2,4	• No current indoor community gathering site • Preservation-worthy facility	• Condition of facility • Cost of incorporating all hazards shelter • Long-term maintenance challenge	$$$	Medium ●●

Table 4.12: Mitigation Actions – Village of Rock City

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Address ponding at Main St and IL 75	5+ years	• IDOT • Municipal officials	2,4	• Improve access to village	• Cost of stormwater system improvements • Lack of urgency	$$	Low ●
F/FF1.2	Enact NFIP-compatible floodplain ordinance and enroll in NFIP	0-2 years	• Municipal officials • SCEMA	3	Compensate for flooding losses • Encourage environmentally/hazard conscious development • Support individual awareness and preparedness	• Cost of flood insurance and compliance • Coordination with county • Infrequent/localized flooding • Staff/elected official time	$	High ●●●
ST1.1	Install outdoor warning siren	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
ST1.2	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for visitors and residents	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.3	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.4	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials • Local fire protection district	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●
O1.5	Upgrade well pumps and related infrastructure	2-5 years	• Municipal officials	1	• Avoid boil orders by maintaining system pressure	• Cost of upgraded/new pumps	$$	Medium ●●

Table 4.13: Mitigation Actions – Village of Winslow

#	Mitigation Action	Estimated Time to Complete	Potential Partner or Responsibility	Related Goal(s)	Benefit-Cost Analysis: Benefit(s) List	Benefit-Cost Analysis: Cost(s) List	Estimated Cost	Priority
F/FF1.1	Keep Winslow Rd bridge piers clear of debris	Cont.	• ACE • Conservation organizations • Municipal officials • Stephenson County Highway Department • Townships	1,2	• Protect bridge from damage caused by debris and pressure from ice jams • Reduce potential for flooding	• Organizing workers/volunteers	$	High ●●●
F/FF1.2	Replace catch basin covers/catch basins	Cont.	• Municipal officials	1,2	• Support proper drainage • Improve public safety • Opportunity to impact numerous people and properties	• Cost of catch basin covers/catch basins	$$	High ●●●
F/FF1.3	Identify, prioritize, and implement buyouts/mitigations for flood-prone properties	5+ years	• IEMA/FEMA • IDNR/OWR • Freeport Park District • Municipal officials	1,2,4	• Direct development away from potential hazards/risk areas • Reduce flooding issues	• Cost of land acquisition • Individual/neighborhood reluctance	$$$$	High ●●●
F/FF1.4	Improve berms/elevation at wastewater treatment plant	5+ years	• IEPA • Municipal officials • USDA	2	• Protect against inundation during extreme flooding events	• Marginal benefit associated with improving berms/elevation	$$$	Low ●
F/FF1.5	Relocate fire station outside of floodway/floodplain	5+ years	• Fire protection districts/MABAS • Municipal officials	1,2,4	• Prevent flooding from impacting fire equipment and access • Free existing property for other uses • Reduce pedestrian/traffic hazards • Affect numerous people and properties	• Cost of new fire station	$$$	Medium ●●
F/FF1.6	Relocate museum outside of floodway/floodplain	2-5 years	• Municipal officials • Museum officials	4	• Prevent flooding from impacting artifacts and displays	• Cost of flood-proofed/new museum	$$$	Low ●
F/FF1.7	Update floodplain ordinance (ensure compatibility with NFIP)	0-2 years	• Municipal officials • SCEMA	3	• Keep current with FEMA/NFIP regulations and FIRMs	• Coordination/communication	$	High ●●●
ST1.1	Install outdoor warning siren	2-5 years	• Fire protection districts/MABAS • Museum officials • SCEMA	1,4	• Support individual awareness and preparedness	• Coordination/communication • Cost of warning siren/warning siren system	$$	High ●●●
ST1.2	Harden existing or construct new sheltering facilities	2-5 years	• Municipal officials • SCEMA	1,4	• Provide protection during recreational/other events for residents and visitors	• Cost of hardened/new sheltering facilities • Lack of urgency	$$	Medium ●●
ST1.3	Obtain StormReady certification	0-2 years	• Municipal officials • SCEMA	1,2,4	• Support community/institutional awareness and preparedness	• Coordination/communication • Ensure compliance over time	$	High ●●●
ST1.4	Obtain Tree City USA status	0-2 years	• Municipal officials	2,4	• Encourage timely tree maintenance, including near utility lines/poles • Ensure healthy trees • Directed planting	• Coordination/communication • Cost of tree maintenance/removal • Ensure compliance over time	$$	Low ●
O1.1	Install backup generators at village critical facilities	2-5 years	• Municipal officials	2,4	• Ability to implement COOP/COG operations • Source of power for emergency communications and first responders	• Cost of backup generator • Generator maintenance	$$	Medium ●●
O1.2	Digitize paper records and distribute to libraries	0-2 years	• Libraries • Municipal officials	4	• Ability to implement COOP/COG operations • Maintain historical archive	• Coordination with libraries and other archives • Organizing workers/volunteers	$	High ●●●
O1.3	Update/replace streetlights and exterior facility lighting	2-5 years	• ComEd • Municipal officials	2,4	• Improve lighting for first responders and the public • Reduce energy use • Reduce light pollution	• Coordination with ComEd • Cost of streetlights	$$	Medium ●●
O1.4	Create future land use map/comprehensive plan	2-5 years	• Municipal officials • Stephenson County Zoning	3	• Direct development away from potential hazards/risk areas • Focus municipal goals with respect to community and economic development	• Cost of document and mapping services • Securing participation during planning process	$$	Medium ●●

Table 4.14: Removed Mitigation Actions Due to Lack of Relevance

Stephenson County • Model earthquake impacts on government and other public buildings • Create and distribute earthquake primer for homeowners, realtors, landlords, and tenants • Acquire drone for use during flooding/flash flooding events • Map and maintain master list of flood-impacted parcels; note parcels with improvements and parcels that have been mitigated • Implement GPS tracking for selected county vehicles • Develop evacuation/refugee plans for major transportation corridors (US 20, IL 73, IL 26, IL 75) or connect existing plans • Establish egress/regress routes for first responders and install signage in communities • Maintain evacuation/refugee plan for nuclear incidents • Ensure uniform awareness/preparedness literature and signage • Construct operations, storage, professional development, and fire training facility to serve multiple jurisdictions (including Sheriff, Emergency Management, and MABAS) • Create/update countywide map book for first responders • Develop hazard mitigation and preparedness education/training for various stakeholders	Village of Cedarville • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Connect warning siren to countywide system	Village of Dakota • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants	Village of Davis • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Connect warning siren to countywide system • Pursue alternatives/backups to radio repeater system
City of Freeport • Determine impact of earthquakes to civic and government buildings, especially critical facilities • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Create and distribute heating/cooling centers map for public use • Connect warning siren to countywide system • Identify and acquire land to be purchased for a multi-hectare wetland restoration/water detention project • Revisit and update mutual aid agreements • Fund visible, low cost, high impact bioswales and/or rain gardens • Incentivize and educate regarding the benefits of sewer backflow preventers • Digitize paper records and distribute to libraries	Village of German Valley • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants	Village of Lena • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants	Village of Orangeville • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Floodproof or relocate fire department training facility
Village of Pearl City • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Connect warning siren to countywide system	Village of Ridott • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Raise and divert water from Cherry Hill Rd	Village of Rock City • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Reduce pervious surface along Main St by introducing bioswales/rain gardens	Village of Winslow • Scenario plan impact of earthquake on historic central business district and governmental services • Distribute earthquake primer for homeowners, realtors, landlords, and tenants • Promote residential/commercial sump pump installation within historic central business district

CHAPTER 5: POST-PLANNING

CHAPTER 5: POST-PLANNING/IMPLEMENTATION

OVERVIEW

This chapter addresses plan adoption, the integration of the plan into participating jurisdictions' planning, and how to effectively monitor the plan.

ADOPTION

Each participating jurisdiction is responsible for approving a resolution adopting the plan, which is recommend to take place after FEMA approval. SCEMA will communicate to local jurisdictions the plan's status.

INTEGRATION, IMPLEMENTATION, & ADMINISTRATION

With the exception of Freeport, most local comprehensive plans and capital improvement plans are informal, considerably dated, or do not exist; as such, any formal integration of this plan with comprehensive plans and capital improvement plans will take place only when local elected officials/staff develop current and relevant documents. It will be pertinent to assign in each village an individual responsible for overseeing integration before such planning documents are created. Even without these documents, that particular individual – along with his or her fellow officials or staff – will be tasked with injecting hazard mitigation into official decision-making (especially with respect to projects and programs listed in this document for the particular jurisdiction).

In Freeport, the Director of Community and Economic Development will coordinate efforts to ensure proper integration. Existing planning documents should be reviewed and interpreted with the updated mitigation plan in mind. New planning documents or updates to planning documents should be prepared in a similar fashion. In Stephenson County, the Director of SCEMA will lead integration efforts. In the case of Freeport and Stephenson County, intergovernmental memorandums of understanding should be established.

Implementation responsibilities will be borne by the respective jurisdiction. Administration responsibilities will be borne primarily by SCEMA. SCEMA is encouraged to support municipal implementation of the plan.

MAINTAINING, MONITORING, EVALUATING, & UPDATING THE PLAN

Each community included in the plan should maintain a progress list. At the end of each calendar year, SCEMA should reach out to each municipality and collect lists of ongoing or completed actions (a month before, SCEMA should prompt municipalities with a reminder). This information should be added to a countywide record-keeping document. The planning team should meet in the new year after SCEMA has updated the countywide document to discuss future work plans and need for plan changes. Changes to the plan will require the approval of participating jurisdictions. SCEMA is responsible for making any approved changes.

Public Participation

Meetings of the planning team should be designed to include members of the public through the distribution of meeting notices. Such notices should be issued to traditional and social media outlets and public websites in advance of any committee meetings.

APPENDICIES A - E

Appendix A: Terms

Appendix B: Planning Team Agendas, Social Media, Press Release

Appendix C: Hazard Events Tracked by NOAA

Appendix D: Public Survey Results

Appendix E: Resolutions by Jurisdiction

Appendix A: Terms

- **Asset:** could be a person, place, or thing (including community assets)
- **Hazard:** "a natural, technological, or human-caused source or cause of harm or difficulty."[32] Similar to threat
- **Extent:** "the strength or magnitude of the hazard"[33]
- **Impact:** "the consequence or effect of the hazard"[34]
- **Location:** "the geographic areas in the planning area affected by the hazard"[35]
- **Natural hazard:** "a source of harm or difficulty created by a meteorological, environmental, or geological event"[36]
- **Probability:** "the likelihood of the hazard occurring"[37]
- **Repetitive loss:** see Hazard Profiles: Flooding (& related)
- **Risk:** at the intersection of assets and hazards (threats). Risks are articulated by describing the impacts of a hazard (threat) on an asset. Some liken risks to the sum of all hazards (threats), assets, and vulnerability. Others define risk "as the potential for an unwanted outcome resulting from an incident or occurrence, as determined by its likelihood and the associated consequences"[38]
- **Risk assessment:** process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards (defined in various FEMA literature)
- **Threat:** "any indication, circumstance, or event with the potential to cause loss of or damage to an asset" (including digital assets, information, knowledge, etc.)[39] Similar to hazard

[32] "Developing and Maintaining Emergency Operations Plans," Federal Emergency Management Agency, published November 2010
[33] "Local Mitigation Plan Review Guide," Federal Emergency Management Agency, published October 1, 2011
[34] Ibid
[35] Ibid
[36] Ibid
[37] Ibid
[38] "DHS Risk Lexicon: 2010 Edition," U.S. Department of Homeland Security, published September 2010
[39] "Risk Management Series: Handbook for Rapid Visual Screening of Buildings to Evaluate Terrorism Risks (FEMA 455)," Federal Emergency Management Agency, published March 2009

Appendix B: Planning Team Agendas, Social Media, Press Release

Planning Team Agenda

Agendas from the planning team meetings start on the following page.

Stephenson County Multi-Hazard Mitigation Planning Committee
Agenda

Date: June 21, 2021
Videoconference: https://us02web.zoom.us/j/87262015954?pwd=dmoyZlVRU0tBTm1vY1Bod0JFVnBFUT09
Meeting ID: 872 6201 5954
Passcode: 779996

2:00 pm	I.	**Welcome & Introductions**	Scott Townsend, Stephenson County EMA Daniel Payette, BHRC
2:05 pm	II.	**Hazard Mitigation Planning**	Tara Walters, BHRC
2:15 pm	III.	**Plan Update & Participation** a. Planning process timeline b. Participation requirements	Daniel Payette, BHRC
2:30 pm	IV.	**Stephenson County Hazards**	Tara Walters, BHRC
2:40 pm	V.	**Mission Statement Discussion**	Daniel Payette, BHRC
2:50 pm	VI.	**Next Steps** **a.** Complete the hazard planning questionnaire **b.** Schedule individual community planning meetings **c.** Next meeting – July 19, 2021 at 2 pm	Tara Walters, BHRC
3:00 pm	VII.	**Conclusion**	

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bhrc
Blackhawk Hills Regional Council

Stephenson County Multi-Hazard Mitigation Planning Committee Agenda

Date: July 19, 2021

Location: Stephenson County Farm Bureau – Walsh Room
210 W Spring St, Freeport, IL 61032

Videoconference: https://us02web.zoom.us/j/83849581830?pwd=Z0w2S0pFYTBRWUF1TElsU0lhTW5aZz09
Meeting ID: 838 4958 1830
Passcode: 126234

2:00 pm	I.	**Introductions & Mission Statement**	Daniel Payette, BHRC
2:05 pm	II.	**Presentation – Illinois State Climatologist**	Dr. Trent Ford, Illinois State Climatologist
2:35 pm	III.	**2016-2021 Plan Overview**	Daniel Payette, BHRC
2:50 pm	IV.	**Stephenson County Hazard Data** a. Mapping hazards activity/breakout sessions	Daniel Payette, BHRC Tara Walters, BHRC
3:50 pm	V.	**Next Steps** a. Next meeting – August 16, 2021 at 2 pm	Tara Walters, BHRC
4:00 pm	VI.	**Conclusion**	

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Stephenson County Multi-Hazard Mitigation Planning Committee
Agenda

Date: September 20, 2021

Location: Greater Freeport Partnership
110 W Main Street, Freeport, IL 61032

Videoconference: https://us02web.zoom.us/j/89164747913?pwd=VFY5c29pYVJoWXZVemhmQmtWeDBFQT09
Meeting ID: 891 6474 7913
Passcode: 853625

2:00 pm	I.	**Introductions & Attendance**	Daniel Payette, BHRC
2:05 pm	II.	**Hazard Risk Assessment**	Tara Walters, BHRC
2:25 pm	III.	**Risk Index Scoring Activity**	Daniel Payette, BHRC
2:45 pm	IV.	**Next Steps** a. Next meeting – October 25, 2021 at 2 pm i. Mitigation Actions b. Community Engagement c. Community Meetings to Schedule i. Davis ii. Dakota iii. Freeport iv. German Valley v. Pearl City	Tara Walters, BHRC
3:00 pm	V.	**Conclusion**	

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Stephenson County Multi-Hazard Mitigation Planning Committee
Agenda

Date: November 15, 2021

Location: Stephenson County Highway Department, Conference Room
295 W Lamm Road, Freeport, IL 61032

Videoconference: https://us02web.zoom.us/j/88490680628?pwd=RmxuMTI5dFZiQnJzeTBYQkVDVEl0QT09
Meeting ID: 884 9068 0628
Passcode: 200496

2:00 pm	I.	**Introductions & Attendance**	Daniel Payette, BHRC
2:05 pm	II.	**National Flood Insurance Program and Community Rating System**	Marilyn L. Sucoe P.E., CFM Illinois NFIP Coordinator (Acting) IDNR/OWR
2:25 pm	III.	**Mitigation Actions Updates**	Tara Walters, BHRC
2:45 pm	IV.	**Community Engagement/Public Input** a. Citizen Survey b. Webpage for public comment	Tara Walters, BHRC
3:00 pm	V.	**Conclusion**	

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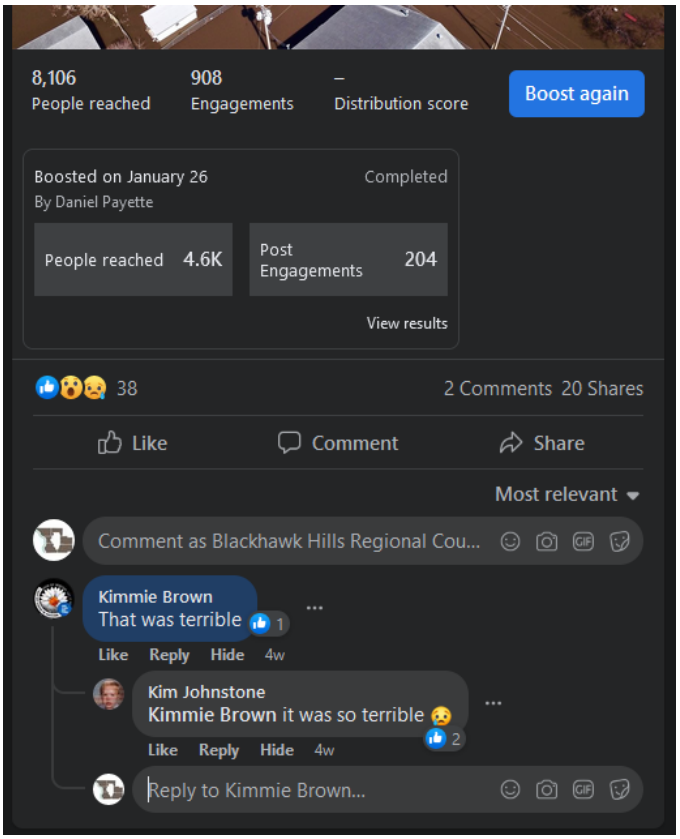
Social Media

Stephenson County Multi-Hazard Mitigation Survey ads on Facebook



Press Release

Media Contact:
Kevin Countryman
Director
Stephenson County Emergency Management Agency
815-599-0344
kcountryman@stephensoncountyil.gov

June 3, 2022
For Immediate Release

Review of 2022-2027 Stephenson County Hazard Mitigation Plan Requested

Planning team seeks public comment on final draft of countywide plan

Stephenson County Emergency Management Agency is seeking public comment on the 2022-2027 Stephenson County Multi-Hazard Mitigation Plan before it is presented to the Illinois Emergency Management Agency and Federal Emergency Management Agency for approval. The plan is available for review from June 4, 2022, to June 18, 2022, at the following locations:

- Online
  - City of Freeport website (https://cityoffreeport.org)
  - Stephenson County website (https://stephensoncountyil.gov)
  - Planning process website (https://tinyurl.com/28xu5t8a)

- In-person
  - Freeport City Hall (314 W Stephenson St, Freeport)
  - Stephenson County Emergency Management Agency / Stephenson County Highway Department (295 W Lamm Rd, Freeport)
  - Freeport Library (100 E Douglas St)
  - Lena Library (300 W Mason St, Lena)
  - Pearl City Library (221 S Main St, Pearl City)

If you have any questions, would like to make a comment, or are having difficulty obtaining a copy of the plan, please contact Kevin Countryman, Director, Stephenson County Emergency Management Agency.

###

Appendix C: Hazard Events tracked by NOAA

For information about individual events occurring in Stephenson County, visit the National Oceanic and Atmospheric Administration's Storm Events Database.

Table C.1: Hazard Events tracked by NOAA

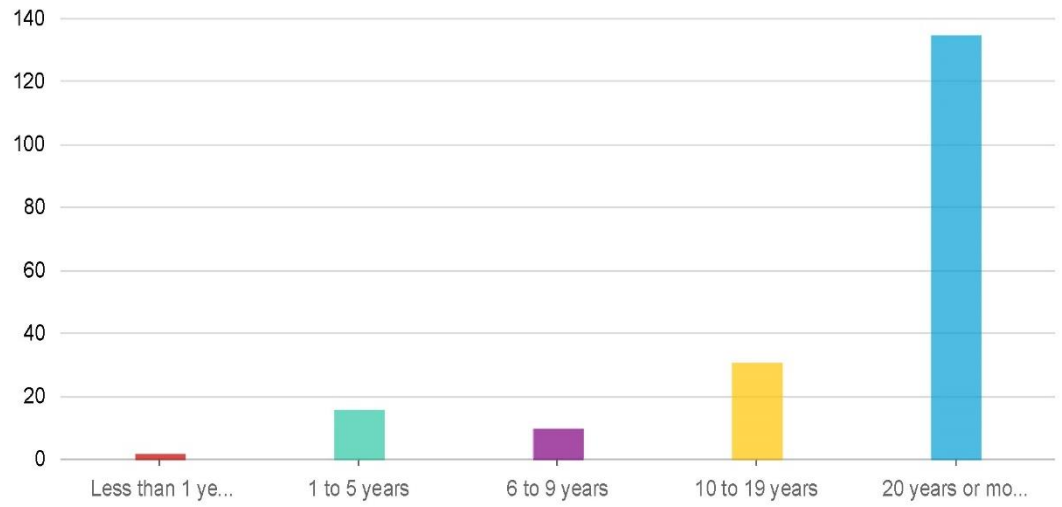
Storm Events	Details
DROUGHT (D) 13 events were reported between 01/01/1996 and 10/31/2021. Event types included: Drought	Number of Days with Event: 13 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 0 Number of Days with Event and Crop Damage: 2
EXTREME TEMPERATURES (ET) 12 events were reported between 01/01/1996 and 10/31/2021. Event types included: Excessive Heat and Extreme Cold/Wind Chill	Number of Days with Event: 12 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 0 Number of Days with Event and Crop Damage: 0
FLOODING (F/FF) 16 events were reported between 01/01/1996 and 10/31/2021. Event types included: Flood	Number of Days with Event: 15 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 3 Number of Days with Event and Crop Damage: 1
FLASH FLOODING (F/FF) 33 events were reported between 01/01/1996 and 10/31/2021. Event types included: Flash Flood	Number of Days with Event: 21 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 6 Number of Days with Event and Crop Damage: 1
THUNDERSTORM WIND (ST) 225 events were reported between 01/01/1955 and 10/31/2021. Event types included: Thunderstorm Wind	Number of Days with Event: 122 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 4 Number of Days with Event and Property Damage: 32 Number of Days with Event and Crop Damage: 3
TORNADOES (ST) 16 events were reported between 01/01/1950 and 10/31/2021. Event types included: Tornado	Number of Days with Event: 12 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 6 Number of Days with Event and Crop Damage: 1
LIGHTNING (ST) 5 events were reported between 01/01/1996 and 10/31/2021. Event types included: Lightning	Number of Days with Event: 5 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 3 Number of Days with Event and Crop Damage: 0

HAIL (ST) 107 events were reported between 01/01/1955 and 10/31/2021. Event types included: Hail	Number of Days with Event: 61 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 5 Number of Days with Event and Property Damage: 5 Number of Days with Event and Crop Damage: 3
WINTER STORMS (SWS) 57 events were reported between 01/01/1996 and 10/31/2021. Event types included: Winter Storm	Number of Days with Event: 57 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 0 Number of Days with Event and Crop Damage: 0
BLIZZARD (SWS) 4 events were reported between 01/01/1996 and 10/31/2021. Event types included: Blizzard	Number of Days with Event: 4 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 0 Number of Days with Event and Crop Damage: 0
HIGH WIND (Other) 15 events were reported between 01/01/1996 and 10/31/2021. Event types included: High Wind	Number of Days with Event: 13 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 4 Number of Days with Event and Crop Damage: 0
STRONG WIND (Other) 2 events were reported between 01/01/1996 and 10/31/2021. Event types included: Strong Wind	Number of Days with Event: 2 Number of Days with Event and Death: 0 Number of Days with Event and Death or Injury: 0 Number of Days with Event and Property Damage: 1 Number of Days with Event and Crop Damage: 0

Appendix D: Public Survey Results

Two Stephenson County Multi-Hazard Mitigation Surveys were published: one in English and one translated to Spanish. In total, 194 responses were received. No Spanish-language survey responses were recorded. The English version of the survey form and a summary of all responses are provided here. Not all respondents answered every question.

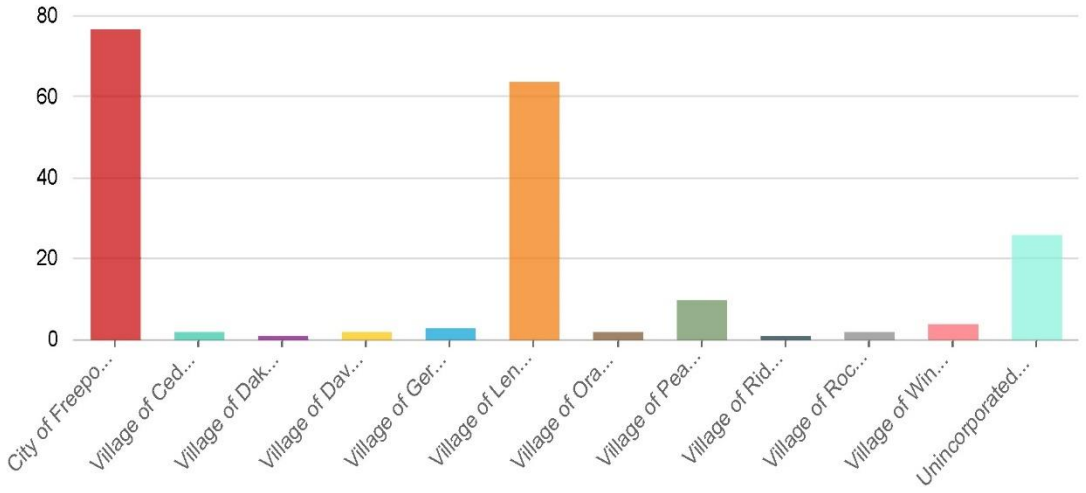
How long have you lived in Stephenson County? *



Answers	Count	Percentage
Less than 1 year	2	1.03%
1 to 5 years	16	8.25%
6 to 9 years	10	5.15%
10 to 19 years	31	15.98%
20 years or more	135	69.59%

Answered: 194 Skipped: 0

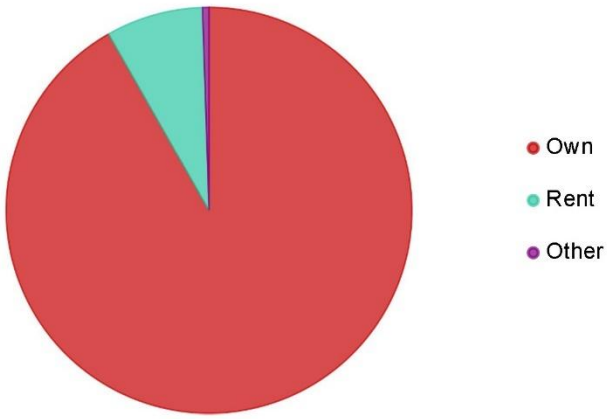
Where is your home located? *



Answers	Count	Percentage
City of Freeport	77	39.69%
Village of Cedarville	2	1.03%
Village of Dakota	1	0.52%
Village of Davis	2	1.03%
Village of German Valley	3	1.55%
Village of Lena	64	32.99%
Village of Orangeville	2	1.03%
Village of Pearl City	10	5.15%
Village of Ridott	1	0.52%
Village of Rock City	2	1.03%
Village of Winslow	4	2.06%
Unincorporated Stephenson County	26	13.4%

Answered: 194 Skipped: 0

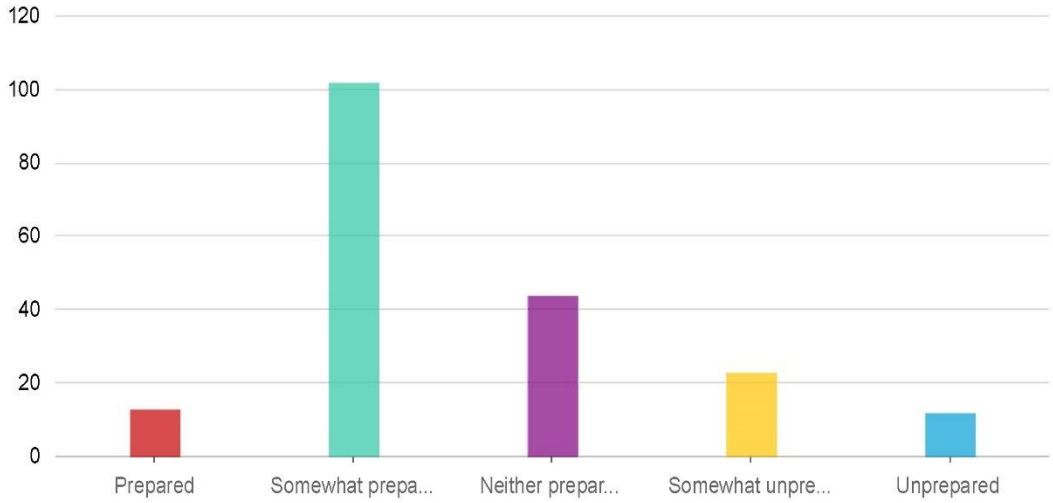
Do you own or rent your home? *



Answers	Count	Percentage
Own	178	91.75%
Rent	15	7.73%
Other	1	0.52%

Answered: 194 Skipped: 0

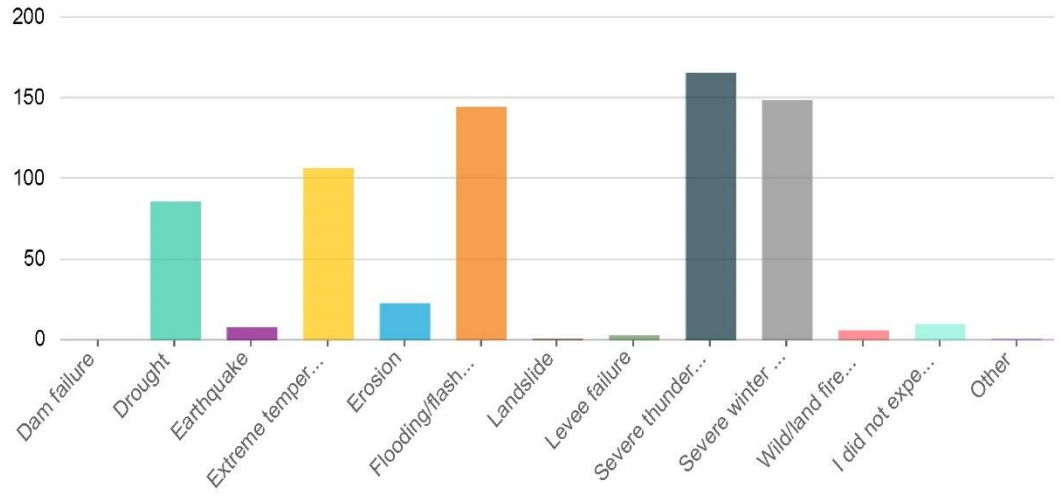
How prepared do you think Stephenson County is to withstand natur... *



Answers	Count	Percentage
Prepared	13	6.7%
Somewhat prepared	102	52.58%
Neither prepared nor unprepared	44	22.68%
Somewhat unprepared	23	11.86%
Unprepared	12	6.19%

Answered: 194 Skipped: 0

While living in Stephenson County, what natural hazard events have you... *

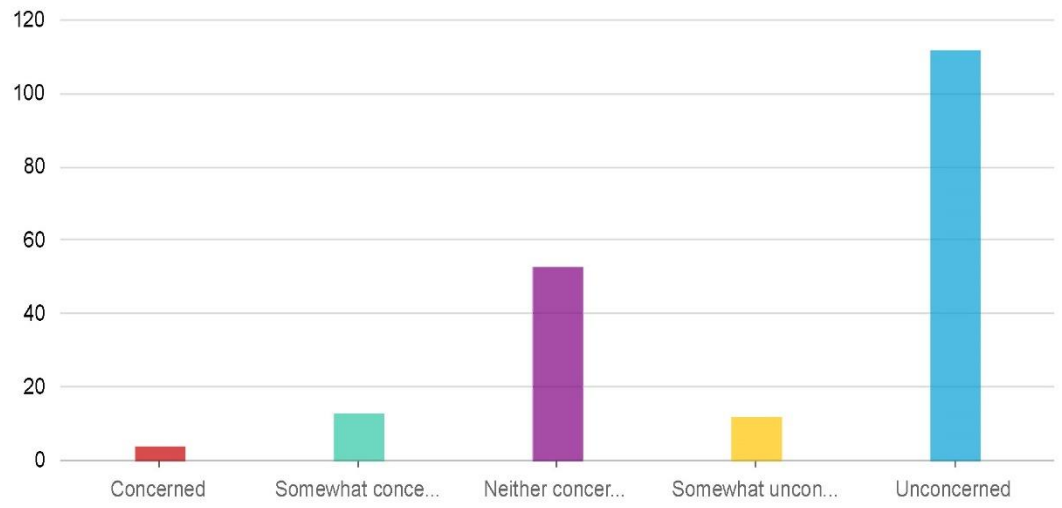


Answers	Count	Percentage
Dam failure	0	0%
Drought	86	44.33%
Earthquake	8	4.12%
Extreme temperatures	107	55.15%
Erosion	23	11.86%
Flooding/flash flooding	145	74.74%
Landslide	1	0.52%
Levee failure	3	1.55%
Severe thunderstorms (including windstorms, derechos, and tornados)	166	85.57%
Severe winter storms	149	76.8%
Wild/land fires	6	3.09%
I did not experience any natural hazard events in Stephenson County	10	5.15%
Other	1	0.52%

Answered: 194 Skipped: 0

> How concerned are you about the following natural hazard events negatively affecting Stephenson County?

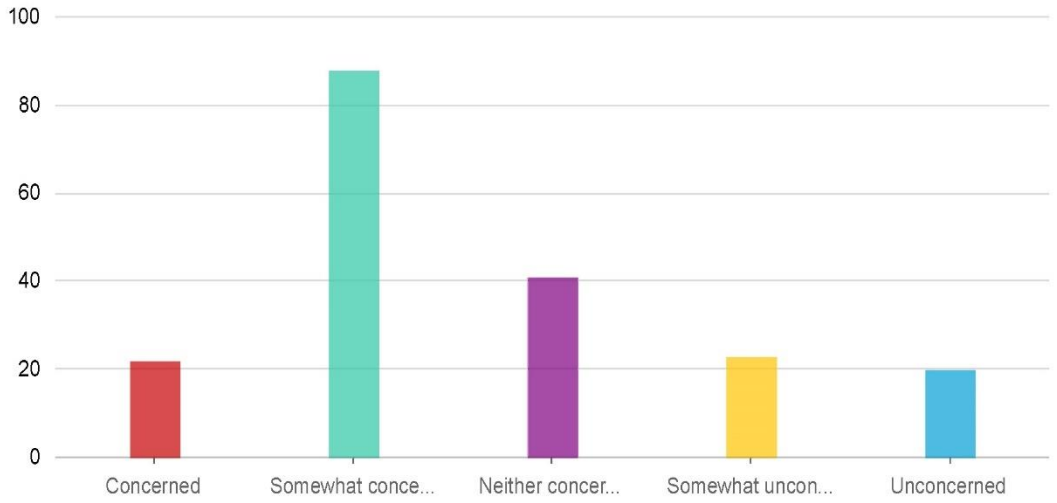
Dam failure *



Answers	Count	Percentage
Concerned	4	2.06%
Somewhat concerned	13	6.7%
Neither concerned nor unconcerned	53	27.32%
Somewhat unconcerned	12	6.19%
Unconcerned	112	57.73%

Answered: 194 Skipped: 0

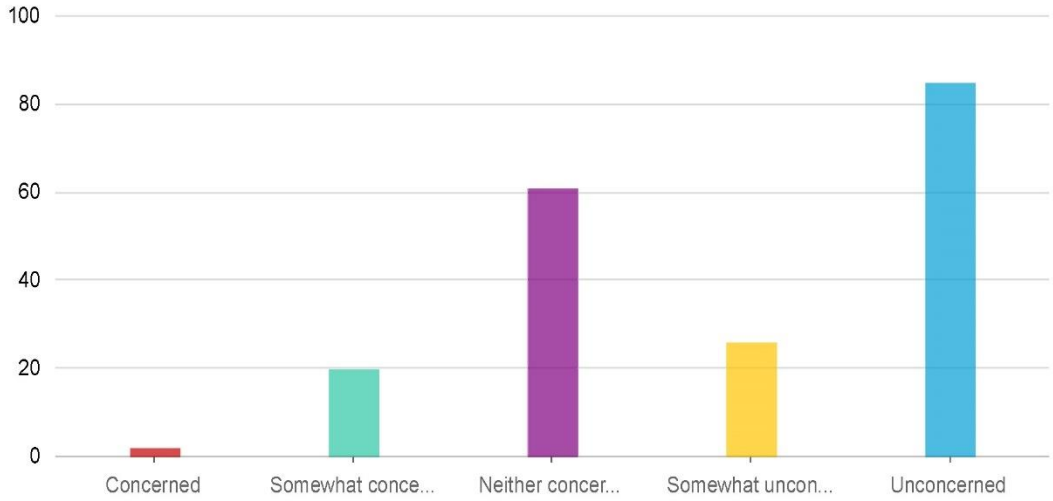
Drought *



Answers	Count	Percentage
Concerned	22	11.34%
Somewhat concerned	88	45.36%
Neither concerned nor unconcerned	41	21.13%
Somewhat unconcerned	23	11.86%
Unconcerned	20	10.31%

Answered: 194 Skipped: 0

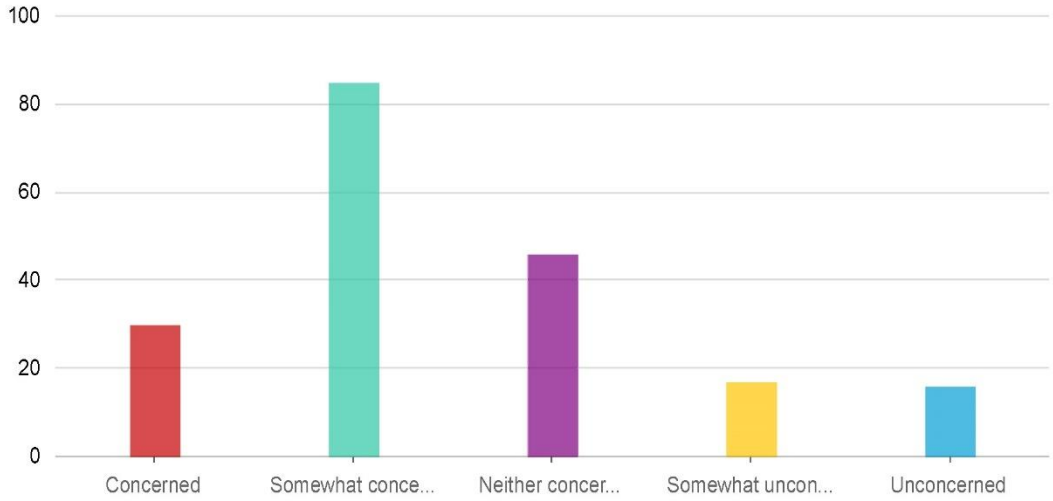
Earthquake *



Answers	Count	Percentage
Concerned	2	1.03%
Somewhat concerned	20	10.31%
Neither concerned nor unconcerned	61	31.44%
Somewhat unconcerned	26	13.4%
Unconcerned	85	43.81%

Answered: 194 Skipped: 0

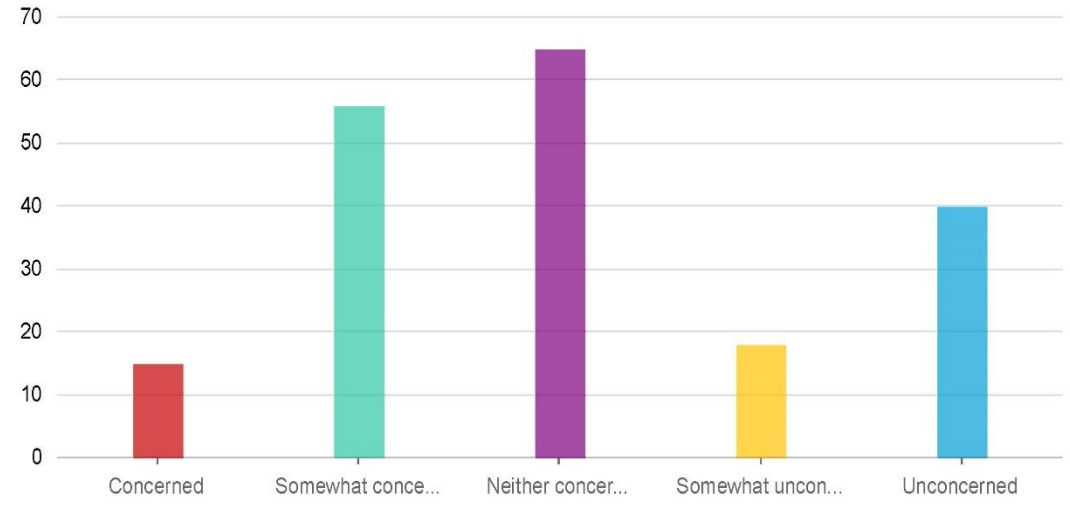
Extreme temperatures *



Answers	Count	Percentage
Concerned	30	15.46%
Somewhat concerned	85	43.81%
Neither concerned nor unconcerned	46	23.71%
Somewhat unconcerned	17	8.76%
Unconcerned	16	8.25%

Answered: 194 Skipped: 0

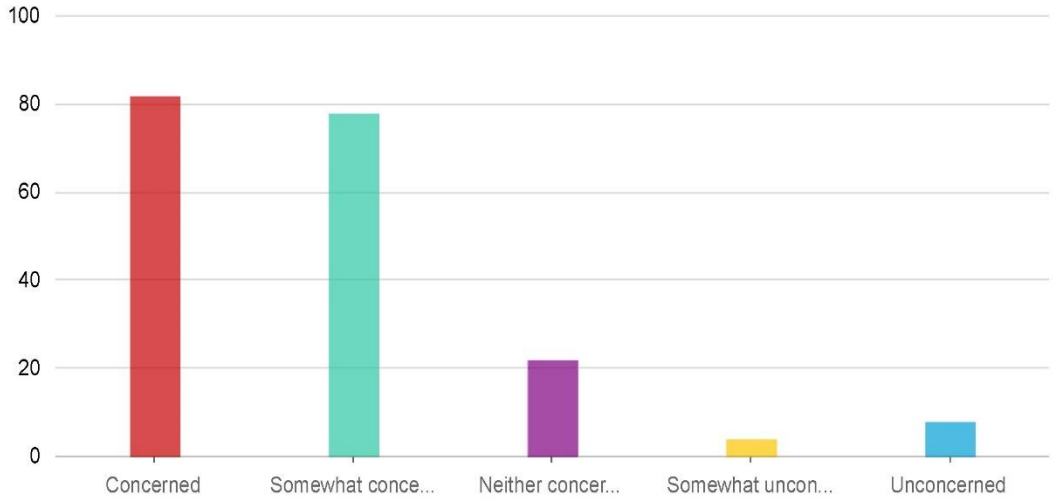
Erosion *



Answers	Count	Percentage
Concerned	15	7.73%
Somewhat concerned	56	28.87%
Neither concerned nor unconcerned	65	33.51%
Somewhat unconcerned	18	9.28%
Unconcerned	40	20.62%

Answered: 194 Skipped: 0

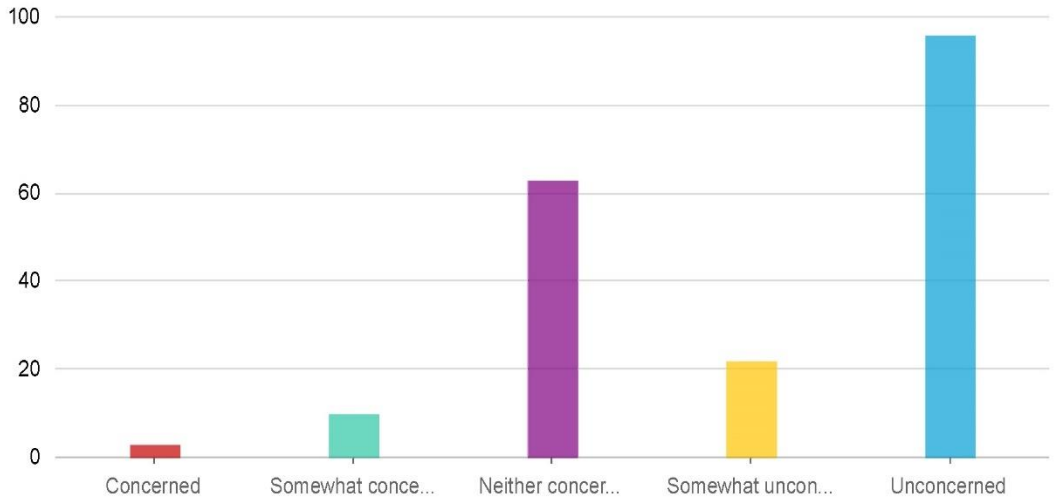
Flooding/flash flooding *



Answers	Count	Percentage
Concerned	82	42.27%
Somewhat concerned	78	40.21%
Neither concerned nor unconcerned	22	11.34%
Somewhat unconcerned	4	2.06%
Unconcerned	8	4.12%

Answered: 194 Skipped: 0

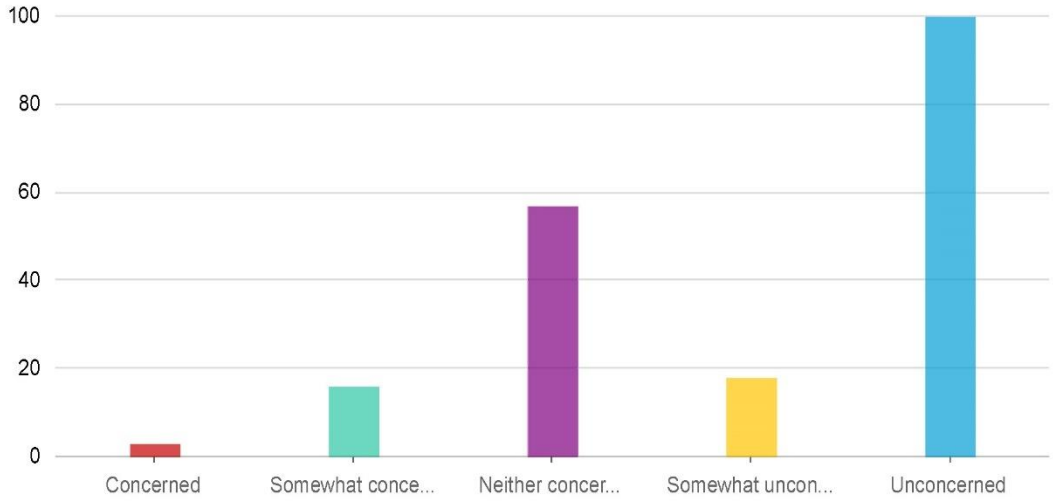
Landslide *



Answers	Count	Percentage
Concerned	3	1.55%
Somewhat concerned	10	5.15%
Neither concerned nor unconcerned	63	32.47%
Somewhat unconcerned	22	11.34%
Unconcerned	96	49.48%

Answered: 194 Skipped: 0

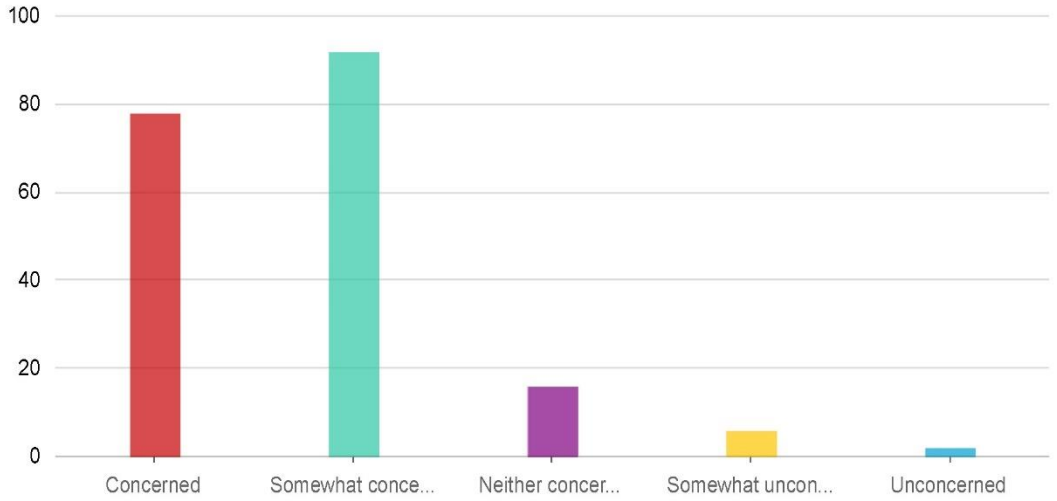
Levee failure *



Answers	Count	Percentage
Concerned	3	1.55%
Somewhat concerned	16	8.25%
Neither concerned nor unconcerned	57	29.38%
Somewhat unconcerned	18	9.28%
Unconcerned	100	51.55%

Answered: 194 Skipped: 0

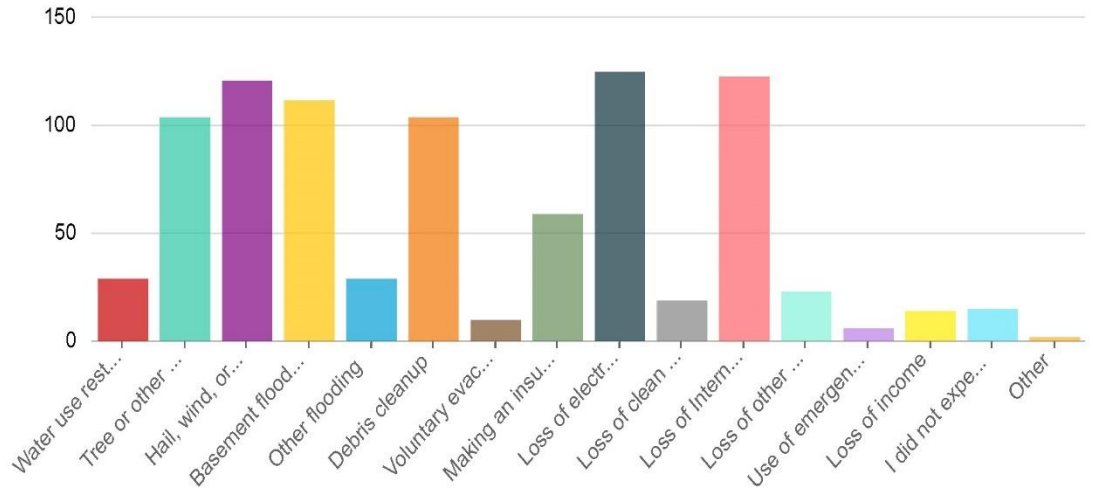
Severe thunderstorms (including windstorms, derechos, and... *



Answers	Count	Percentage
Concerned	78	40.21%
Somewhat concerned	92	47.42%
Neither concerned nor unconcerned	16	8.25%
Somewhat unconcerned	6	3.09%
Unconcerned	2	1.03%

Answered: 194 Skipped: 0

Did any of the above natural hazard events cause you to experience the followin... *

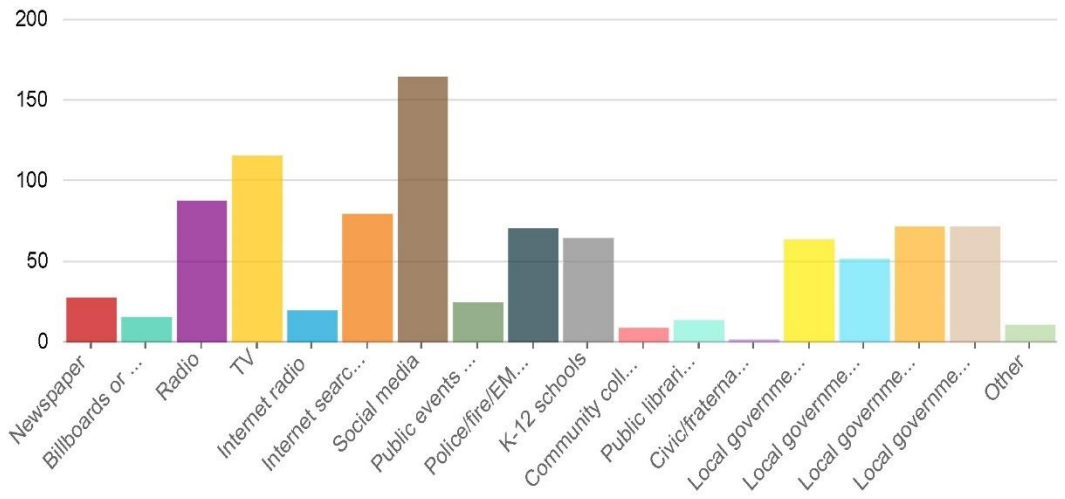


Percentage		age
Water use restrictions	29	14.95%
Tree or other vegetation damage	104	53.61%
Hail, wind, or water damage	121	62.37%
Basement flooding	112	57.73%
Other flooding	29	14.95%
Debris cleanup	104	53.61%
Voluntary evacuation	10	5.15%
Making an insurance claim	59	30.41%
Loss of electricity or heating fuel	125	64.43%
Loss of clean drinking water	19	9.79%
Loss of Internet or telephone (including cellular) service	123	63.4%
Loss of other service	23	11.86%
Use of emergency aid, including temporary food, clothing, or shelter assistance	6	3.09%

Loss of income	14	7.22%
I did not experience any disruptions caused by natural hazards	15	7.73%
Other	2	1.03%

Answered: 194 Skipped: 0

What are the best means of getting information to you? *



Percentage		age
Newspaper	28	14.43%
Billboards or outdoor advertising	16	8.25%
Radio	88	45.36%
TV	116	59.79%
Internet radio	20	10.31%
Internet search results (Google, Bing, Yahoo, etc.)	80	41.24%
Social media	165	85.05%

Public events (sports, festivals, concerts, etc.)	25	12.89%
Police/fire/EMS departments	71	36.6%
K-12 schools	65	33.51%
Community colleges	9	4.64%
Public libraries	14	7.22%
Civic/fraternal organizations	2	1.03%
Local government website	64	32.99%
Local government email	52	26.8%
Local government county text	72	37.11%
Local government social media	72	37.11%
Other	11	5.67%

Answered: 194 Skipped: 0

Please identify and describe any places in Stephenson County especially…

The backyards of the houses on Grant Street in Lena IL does not have proper drainage and always floods with heavy rains.	1
?????	1
w provost street (my address) and neighbors	1
W Grove St. Box 41	1
Along yellow creek, along the Pecatonica River, especially just downstream from where the yellow creek drops into the river.	1
Any area around Pecatonica River	1
Any area identified on the flood plain maps dated 2019 or prior, focus on 100 year flood plane levels. USGS foliage map showing areas stripped of natural vegetation and soil erosion protection. County EMA office records of previous storm reports and communications with NWS and USGS of damage impacts. Previous County EMA staff were working closely with NWS, USGS and USACE on areas of concern and mitigation for related impact criteria levels to acquire gap funding for underfunded government bodies in desperate need of critical infrastructure. Politics impeded and ended those goals.	1
Any area near the Pecatonica River including the Village of Winslow.	1
Any areas near/along Yellow Creek & Pecatonica River.	1
Anywhere along the Pecatonica River. Downtown Freeport, Pearl City	1
Areas near the Pecatonica River and areas near the Yellow Creek	1
Brick School Rd E of Bouray, low lands/flooding	1
bridge street in Winslow around the intersection of highway 73 tha comes into town	1
BUSINESS 20, CEDARVILLE ROAD, PEARL CITY.	1
Dam at highland, there are many tiled springs are Freeport. Those are starting to fail.	1
Down Stream from Reid Park. House's were bought and tore down but new drainage tubes were not installed. The area around West street and Chestnut and American and Pine and Locust and Moseley all flood during heavy rain including basements.	1
Downtown Freeport. North end and downtown of Pearl City. Downtown Winslow. McConnell.	1

East of the Pecatonica River in downtown Freeport. North of Yellow Creek on Hwy 26/Logans restaurant/old KMart building	1
East side and southern parts of of Freeport, Pearl City	1
East Side of Freeport has terrible flooding almost every year.	1
East side of Freeport Walnut road	1
East side of Freeport. Whistler Ave every time it rains heavy. Anywhere near the water.	1
East side of river	1
East side of the Pecatonica River in Freeport	1
East side. Avon street, Taylor park, route business 20 east of the old motel.	1
East side-flooding. I was on the Red Cross board in the 1990's and have been in hip waders til the water got too deep even for them. I've noticed flooded intersections near and north of Freeport High School.	1
East sidw	1
EASTSIDE OF TOWN S JOHANNA, PARKSIDE SCHOOL , HOUSING AUTHORITY, ETC	1
Empire street near Baptist church. Walnut street 1 block south of walnut. Both Strom sewer brop box areas.	1
Entire east side of Freeport.	1
Far east side of Freeport. South part of town experienced significant flooding in the past. County roads have become unpassable due to flooding. Wash out occurs on gravel roads as well. Extreme heat/cold and sever winter storms are experienced often as of late.	1
Flooding all along RockRun Creek & Pec river	1
Flooding in low lying areas near Yellow Creek and the Pecatonica River. Wind and storm damage in all of Stephenson County.	1
Freeport's East side. My home at E. Garden St. has had flooding in the past. My back yard floods no from heavy rain. Am concerned it may get into the house sometime.	1
Hancock	1

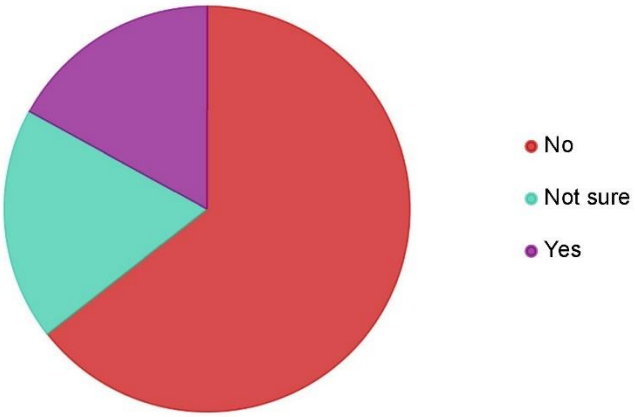
HWY 73 in coming into Pearl City, Pepin Drive cul-de-sac in Lena usually sees significant flooding.	1
Knowlton's second addition. This area is built on what was previously a swamp. It is still impacted b y the creek running through Reed Park that goes underground at West & Moseley and continues u nderground to the river. Land in this area has become Swiss cheese and many homes have suffere d foundation issues.	1
Krape Park sometimes has damaging flooding. The East side of Freeport. I don't know the streets on the East side that usually receive the most flooding. Flooding is a huge problem there and in so me streets in the other parts of the city of Freeport. Again, I don't know the street names.	1
Lena storm sewer system can't handle extreme rainfall. Much of county prone to flooding	1
Low lying areas along the Pecatonica River, including Ridott and parts of Freeport.	1
McConnell the dike no longer holds back the water	1
My family also owns a property at N Henderson Rd, and that area floods quite often. A few tim es it has been to the point of taking a boat through the flood water to get to the property, or driving 5 miles around flooding. The whole third ward has needed help since I was a child.	1
N/a	1
None	1
Our farm on Flansburg rd.	1
Pearl City First St.	1
Pearl city- flooding McConnell - flooding Winslow - flooding	1
Pearl city JUST south of us gets flooded and tornadoes regular	1
Pearl City rd and RT 73	1
Pearl city the whe town with flooding. When flood happens, the north side if town is cut off. Cannot get to the saftey zone fir fiid or water & noone brings it to us	1
Pearl City East of the Pecatonica River Bridge in Freeport	1
Pepin drive in Lena is always flooding.	1
Rock Grove Road in the town of Orangeville down to BOCO at the corner of HWY 26	1

Stephenson Street and Hancock Avenue in Freeport, Greenfield Drive and Quail Ridge Drive in Freeport, and Business Route 20 West at Preston Creek.	1
Taylor Park area	1
Taylor Park area South walnut road South 26 (Casey's to right after the bridge) North 26 (galena to the bypass) Krape Park American St area (west st to Blackhawk)	1
Taylor Park Elementary and that side of town.	1
Taylor Park School area	1
Taylor Park, Freeport Pearl City	1
Taylor Park, Pecatonica River and Krape Park (Yellow Creek)	1
The east side of the city and the south side.	1
The east side of the City of Freeport, as well as some areas in the county that boarder rivers, creeks, etc.	1
The East side of town by Taylor Park School which is now closed due to the flooding. Krape Park and the surrounding areas	1
The east side on the east side of the Pecatonica River is susceptible to flooding.	1
The entire east side of the city. East of route 26 and the Pecatonica river. ALL streets are a shambles and improperly maintained.	1
The entire east side of town. Downtown area	1
The houses along the river in Winslow and by the bridge over the Pec on Cedarville blacktop	1
The Taylor Park area near the Pecatonica River.	1
The whole east side	1
The whole east side of Freeport always floods as everyone knows, something should really be done about it. Those are lower income families and they may not have the means to just pack up and leave their homes.	1
The whole east side.	1
U	1

Yellow creek in Pearl City.	1

Answered: 73 Skipped: 121

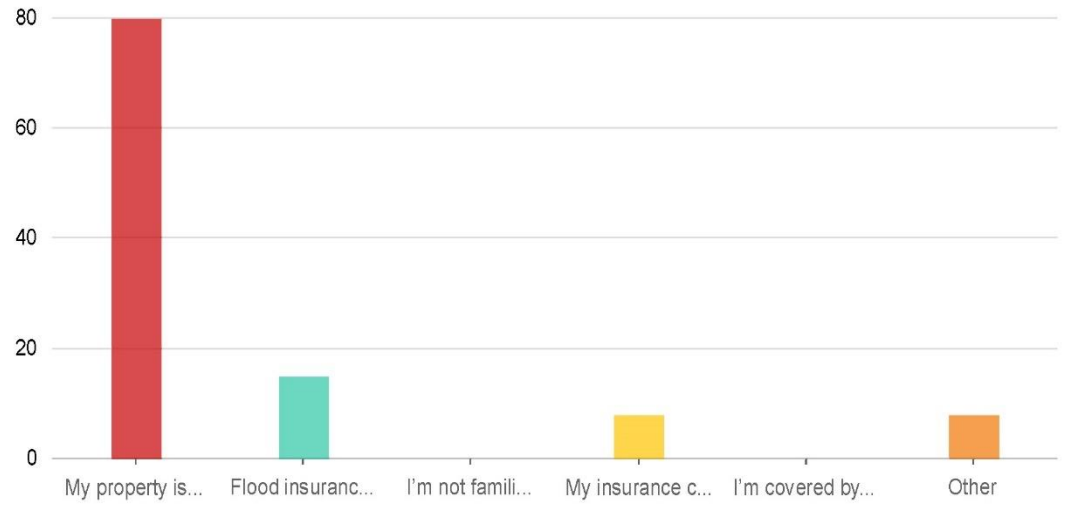
Do you have flood insurance for your home? *



Answers	Count	Percentage
No	125	64.43%
Not sure	36	18.56%
Yes	33	17.01%

Answered: 194 Skipped: 0

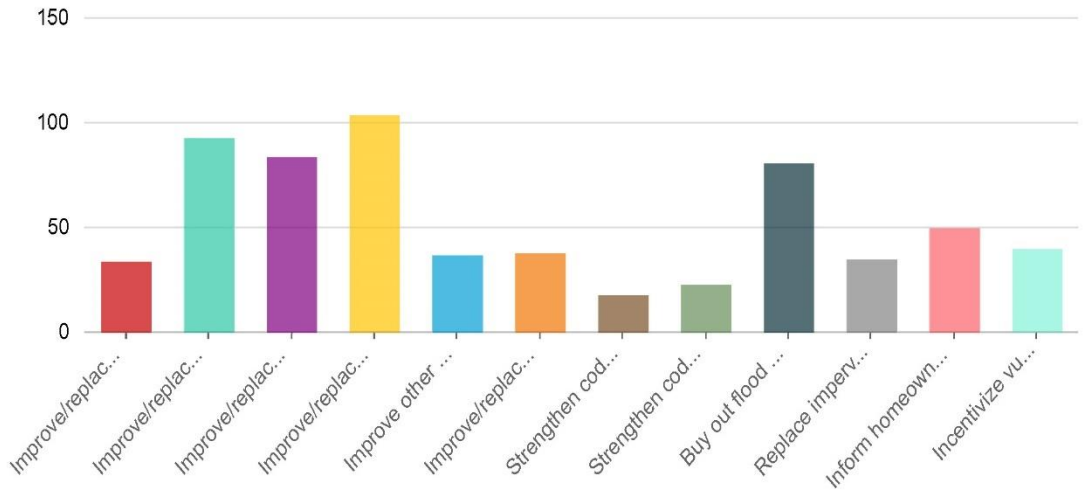
If you do not have flood insurance for your home, what is the main... *



Answers	Count	Percentage
My property is not susceptible to flooding	80	41.24%
Flood insurance is too expensive	15	7.73%
I'm not familiar with flood insurance	0	0%
My insurance company will not sell flood insurance to me	8	4.12%
I'm covered by other insurance	0	0%
Other	8	4.12%

Answered: 122 Skipped: 72

Select three projects that you believe Stephenson County communities could... *

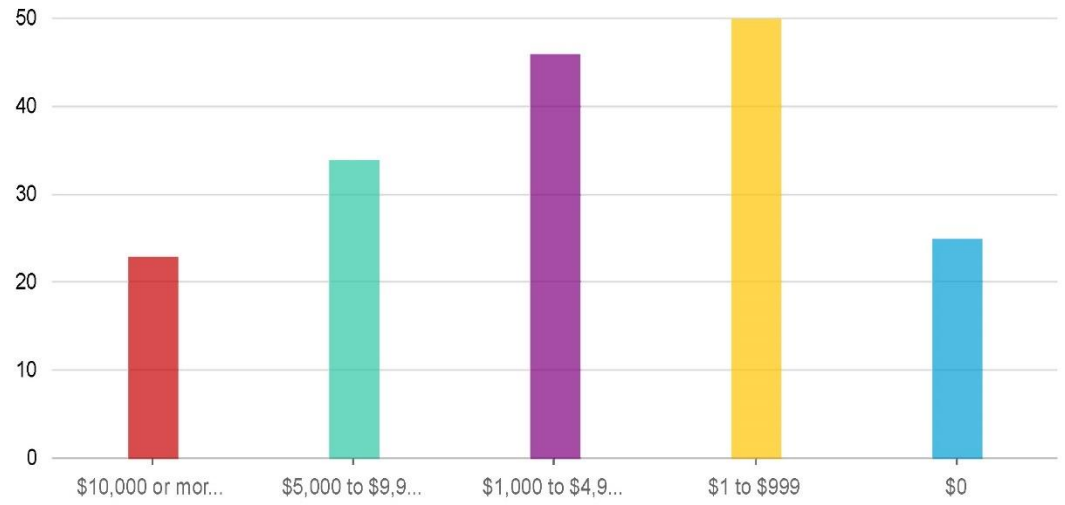


Percentage		age
Improve/replace hazard-susceptible critical facilities (e.g., police and fire stations, libraries, county/municipal offices, schools, hospitals, etc.)	34	17.53%
Improve/replace hazard-susceptible roadways	93	47.94%
Improve/replace hazard-susceptible bridges and culverts	84	43.3%
Improve/replace hazard-susceptible stormwater management infrastructure (e.g., storm sewers, retention and detention ponds, backflow preventers, etc.)	104	53.61%
Improve other hazard-susceptible public works, including water and wastewater plants and systems	37	19.07%
Improve/replace hazard-susceptible private utilities (e.g., electric, natural gas, telecommunications, etc.)	38	19.59%
Strengthen codes and ordinances to require better building performance	18	9.28%
Strengthen codes and ordinances to better regulate hazard-susceptible areas	23	11.86%

Buy out flood prone properties and develop permanent open space	81	41.75%
Replace impervious surfaces with green infrastructure	35	18.04%
Inform homeowners about ways they can mitigate risk	50	25.77%
Incentivize vulnerable homeowners to mitigate risk	40	20.62%

Answered: 191 Skipped: 3

How much money would you be willing to spend to protect your home...



Answers	Count	Percentage
$10,000 or more	23	11.86%
$5,000 to $9,999	34	17.53%
$1,000 to $4,999	46	23.71%
$1 to $999	50	25.77%
$0	25	12.89%

Answered: 178 Skipped: 16

What, if any, incentives would motivate you to improve your home to protect…

Count	Count
grants	3
rebates	3
Tax breaks	3
0	2
Don't know	2
already have done what we can	1
Cost matching grants	1
cost sharing on improvements, block or community-wide incentive grants	1
Credits or Interest free financing	1
Discount or credit on Property Tax if hazards are appropriately fixed to standard.	1
Education & saving on costs	1
Experience damage or have a mitigating threat.	1

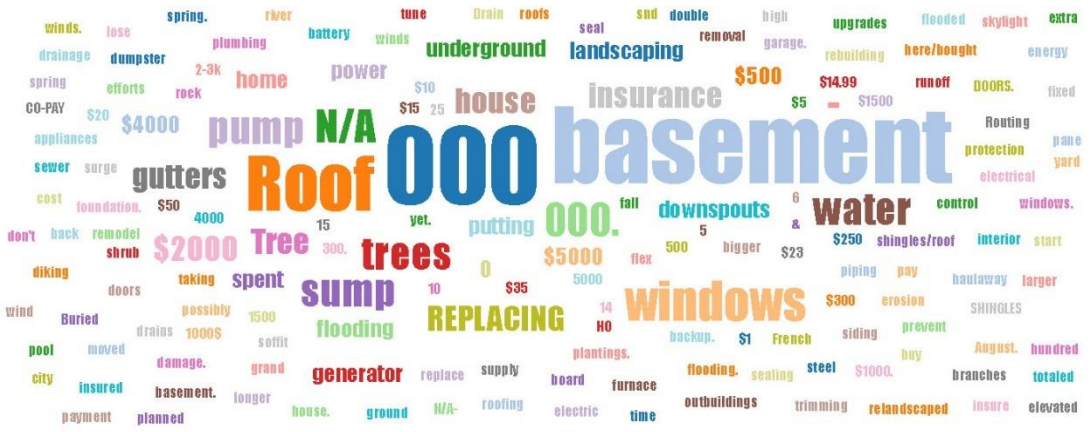
Financial, property tax breaks/	1
Gift card to menards	1
GOVERNMENT STIMULUS MONEY FOR HOMEOWNERS THAT PRONE TO FLOODS.	1
Grants or reimburstment	1
grants, interest free installment loans	1
Grants. Tax breaks.	1
I would improve my home if it was affordable.	1
I would need a grant or some type of loan, work on other homes in return fix theirs and are community would look better if more residents could be involved.	1
i would not make an insurance claim for roof or siding damage I would just pay out of pocket	1
If I had the money I would improve my home.	1
If I have a problem	1
If it happened to my neighbor.	1
Increase of natural disasters nearby or in region	1
Information on what the risks are and ways to help.	1
Knowledge of the issues that may effect my home	1
local or county wide grants, tax deductions	1
Matching funds.	1
money assistance	1
Money to pay for the improvements	1
moving my house	1
N/A	1
N/A-have HO INS	1
Need no incetives to motivate me to protect my property.	1

NON I PAY TAXES	1
None	1
None we have already invested in trying to save our farm, homes and buildings from flooding and s torms	1
None, if I felt my home was at risk I would improve it	1
Not sure.	1
Notification of potential hazard	1
Paid for	1
Paying for a portion of it	1
Payment for improvements, tax deductions, reduced cost	1
personal safety, rebates/credits	1
Property tax relief	1
Proprty tax relief	1
Providing the money to do so/helping.	1
rebates or such for replacement of roof, windows, etc.	1
Reduced flood insurance rates	1
Reduced insurance ratees.	1
Reduced insurance rates. Tax credits	1
Regulations currently prohibit proactive mitigation effforts, this is where realistic efforts are roadbloc ked.	1
Replacing or repairing storm water drainage tube's.	1
Seeing farmers leave vegetation/reparion zone around streams	1
some type of 1:1 incentive	1
Tax break	1

tax breaks or financial assistance to do improvements	1
Tax credits, rebates	1
Tax credits, rebates	1
Tax discount	1
Tax rebates/lower property taxes	1
Tax reduction	1
Tax relief	1
The right amount for a buy out, or services to help upgrade	1
Unknown	1
Unsure	1
We have no risk of flooding here and in the event of a thunderstorm or tornado we have a very safe basement. Our home has been here for over 100 years and we feel it is exceptionally safe	1
Yearly tax breaks or write offs	1

Answered: 77 Skipped: 117

If you have already spent money to protect your home against natural hazards,...



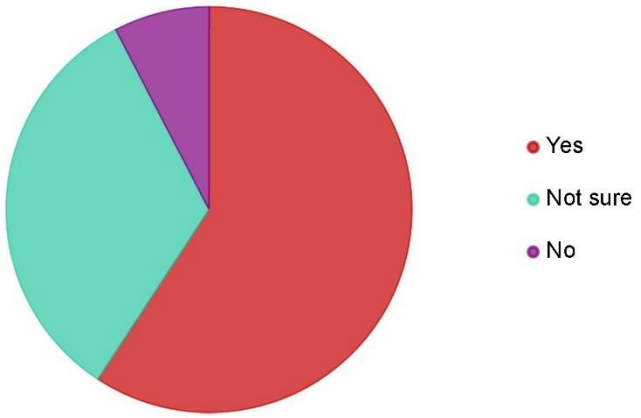
Count	Count
N/A	4
0	2
$1,000. Roof	1
$10,000 taking down trees that could possibly fall on the house from winds and new windows	1
$14.99 - flex seal	1
$1500 - tree removal	1
$2000	1
$2000 on bigger downspouts and putting rock all around the foundation.	1
$23,000 new roof, gutters, soffit and French Drain in basement with sump pump and battery backup.	1
$250 sump pump and piping	1
$300 on water and erosion control efforts, with landscaping, shrub and tree plantings.	1
$4000	1
$4000 new shingles/roof on garage.	1
$50,000 roof siding windows plumbing new electrical supply	1
$500 surge protection	1
$5000 rebuilding interior of basement and all appliances in basement and dumpster and haulaway from flooding.	1
1000$	1
14,000 new roof $5,000 landscaping to prevent runoff	1
15,000.	1
1500	1
2-3k, had to board up basement windows and replace furnace	1

25,000 - Roof,doors, and windows.	1
300. Routing gutters and drains around house and underground	1
4000	1
5,000 better windows snd basement sealing I have sewer back up insurance	1
500,000. Better steel roofing, diking along the river	1
5000	1
Around $500 for sump pump upgrades and replacing trees	1
Basement remodel after flooding in tune of 6 grand	1
Buried electric underground to outbuildings after wind damage. $1000.	1
CO-PAY FOR REPLACING SHINGLES AND REPLACING DOORS.	1
Don't know	1
Generator $2000	1
I am going to start on putting under ground drainage in the spring.	1
Just moved here/bought a home in August. None yet.	1
N/A- have HO INSURANCE	1
New, larger gutters & longer downspouts so no water in basement. Tree trimming so we don’t lose t rees or branches in high winds.	1
NO	1
not sure of the cost but our home is insured	1
Not yet	1
Our basement has flooded so we've spent time and energy on this	1
over 10,000	1
relandscaped my yard so water would not pool against the house.	1
ROOF - $35,000	1

Roof and skylight planned for this spring, $15,000 down payment	1
several hundred to insure anything in the basement was elevated on plastic shelving	1
sump pump in basement	1
Taken down trees, fixed and replaced at our expense city sidewalks, buy our own water for consumption, all totaled about $20,000.	1
Thousands on double pane windows, new roofs, new siding.	1
unknown	1
We added and pay for extra flood insurance	1
We have implemented different things to keep our basement from flooding yet it still happens. We have spent a few thousand dollars.	1
We have solar power and that at least saves us from power outages	1
Whole- house generator, $5000	1

Answered: 58 Skipped: 136

If you owned a home that was located in a FEMA-designated floodplai... *

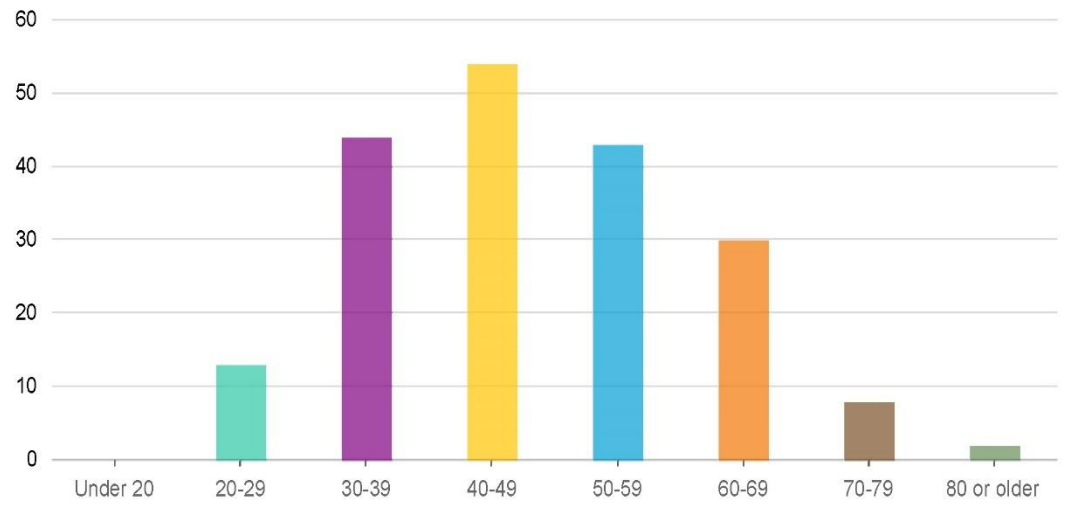


Answers	Count	Percentage
Yes	109	56.19%
Not sure	61	31.44%
No	14	7.22%

Answered: 184 Skipped: 10

page_3

What is your age? *

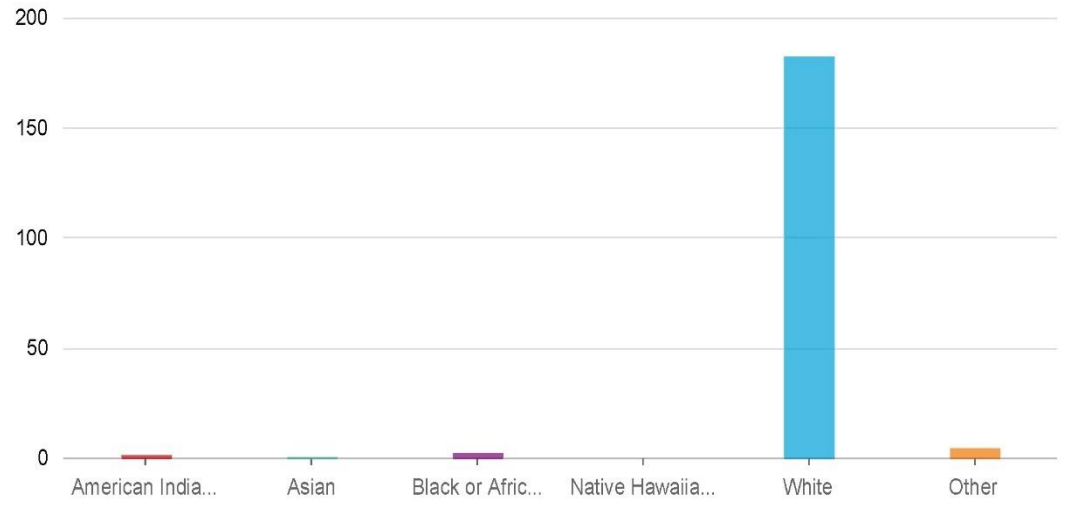


Percentage		age
Under 20	0	0%
20-29	13	6.7%
30-39	44	22.68%
40-49	54	27.84%
50-59	43	22.16%

60-69	30	15.46%
70-79	8	4.12%
80 or older	2	1.03%

Answered: 194 Skipped: 0

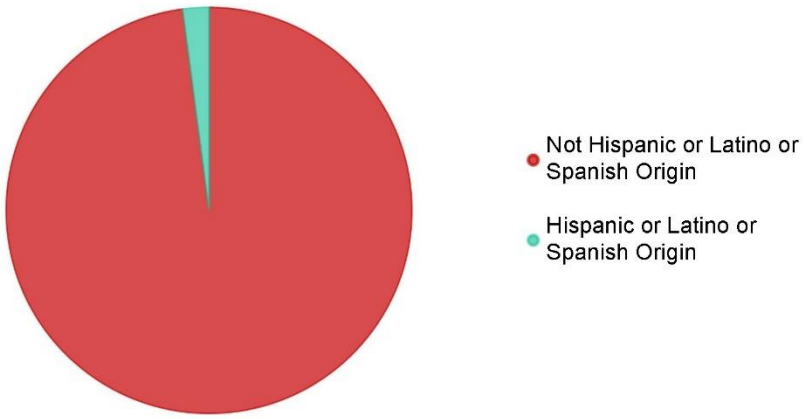
What is your race? *



Answers	Count	Percentage
American Indian or Alaska Native	2	1.03%
Asian	1	0.52%
Black or African American	3	1.55%
Native Hawaiian or Other Pacific Islander	0	0%
White	183	94.33%
Other	5	2.58%

Answered: 194 Skipped: 0

What is your ethnicity? *



Answers	Count	Percentage
Not Hispanic or Latino or Spanish Origin	188	96.91%
Hispanic or Latino or Spanish Origin	4	2.06%

Answered: 192 Skipped: 2

Appendix E: Resolutions by Jurisdiction

Table E.1: Resolutions by Jurisdiction

Jurisdiction	Resolution Approval Date	Signatories
City of Freeport		
Village of Cedarville		
Village of Dakota		
Village of Davis		
Village of German Valley		
Village of Lena		
Village of Orangeville		
Village of Pearl City		
Village of Ridott		
Village of Rock City		
Village of Winslow		
Stephenson County		

Template Resolution

RESOLUTION # _____

STEPHENSON COUNTY MULTI-HAZARD MITIGATION PLAN ADOPTION

WHEREAS, the _____(insert Jurisdiction)_____ recognizes the threat that natural hazards, including drought, earthquakes, extreme temperatures, flooding, severe thunderstorms, and severe winter storms, pose to people and property, residents and workers; and

WHEREAS, implementing mitigation actions before disasters and hazard events occur will reduce the potential for death, injury, and harm to property and

WHEREAS, an up-to-date multi-hazard mitigation plan, adopted by participating jurisdictions, is required as a condition for certain hazard mitigation grants; and

WHEREAS, the _____(insert Jurisdiction)_____ participated in the local planning process, which involved other units of government based in Stephenson County, to prepare the Stephenson County Multi-Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED that the _____(insert Jurisdiction)_____ hereby adopts the Stephenson County Multi-Hazard Mitigation Plan as its official multi-hazard mitigation plan.

ADOPTED this _____ day of _____ 2022.

_____
First Last, Title

_____
Attested by: First Last, Title


STEPHENSON COUNTY
CREATED MARCH 4, 1837