

2023 Chippewa County Multi-Hazard Mitigation Plan

Prepared for:



Prepared by:



Upper Minnesota Valley
REGIONAL DEVELOPMENT COMMISSION
Helping Communities Prosper

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EXECUTIVE SUMMARY

Chippewa County is located in western Minnesota, approximately 120 miles west of the Twin Cities metro area. The county is rural in nature and possesses quality farmland. The southwestern border is formed by the Minnesota River. The county is served by U.S. Highways 59 and 212 as well as MN State Highways 7, 23, 29, 40 and 277. It is also served by the Twin Cities and Western and Burlington Northern Santa Fe (BNSF) railroads along the western and southeastern borders.

Population levels have steadied in recent counts around with the most recent population being 12,598 in 2020. There are five communities in the county with Montevideo being the largest community with approximately 5,400 residents and also serves as the County Seat. The other communities include Clara City, Maynard, Milan and Watson.

Chippewa County and FEMA are currently in the process of updating the County's floodplain maps and at the time of this plan, they are not yet complete.

The planning process began in June 2022 with a virtual task force kick off meeting. Local meetings were held in each community to report on and update the 2015 strategies. In addition, City staff in each of the communities as well as County staff provided updated information and maps. Drafts of the updated strategies were also presented at City Council meetings for comment. A virtual wrap-up meeting was held in June 2023 to present a summary of tasks completed over the previous year.

Hazards Identified

The County, as well as each individual community reviewed their lists of potential hazards and took part in a slightly different hazard analysis scoring exercise using the Calculated Priority Risk Index to prioritize what disasters could have the greatest impact on local jurisdictions. This exercise considered probability, magnitude, warning time, and duration of identified disasters and gave each category a weighted value. The results of the County's scoring is given in the following table.

Table 1: Hazard Priority Risk Rankings, Chippewa County 2023

Natural Disasters	Score	Human Caused Disasters	Score
Windstorms	2.95	Hazardous materials incident	3.15
Hail	2.95	Water supply contamination	3.1
Extreme cold	2.85	Structural Fire	3.05
Winter storms	2.85	Wastewater treatment failure	2.8
Tornados	2.8	Infectious diseases	2.65
Dam/Levee Failure	2.65	Civil disturbance/terrorism/Cyber attack	2.15
Drought	2.5		
Flooding	2.5		
Extreme Heat	2.4		
Lightning	2.05		
Wildfire	1.95		
Erosion, landslides, and mudslides	1.2		

Hazard Priority Risk Ranking Categories	
Score	Priority Level
3.0-4.0	High
2.0-2.99	Moderate
0-1.99	Low

Natural Disasters Priorities

- Each city and the County Emergency Manager should continue to do periodic visits and review plan annually.
- Identify funding to purchase portable generators and transfer switches to community emergency operation centers.
- Assist with finding funding sources for and build safe shelters in all manufactured home parks, cities, city parks, county, and state parks and public golf courses. Identify a safe room for the campgrounds in cities and the greater county.
- Work with state agencies, local government and emergency managers to address flooding issues as a region. Create a network of print, radio, social media that reaches all citizens with maps of risk areas, shelters, contact information and what to do in the event of a flood.
- Prioritize bridges and culverts with annual flood concerns. Determine strategies to mitigate repeatedly flooded infrastructure (Ex. Replacing bridges, with clear-span bridges, replacing culverts).
- Identify and prioritize repeat flood-impacted township roads to be improved.
- Identify structures prone to flood hazards for future buyouts.
- Work with all units of government, fire departments, and schools to provide educational fire safety materials to the public.

Man-made or Technological Disasters Priorities

- Ensure that all Emergency Responders participate in Rail Car Incident Response Training.
- Continue to participate in regional exercise that test local plans and interaction between local agencies.
- Schedule discussions with school leaders, hospital administrators, emergency managers, law enforcement and local units of government to address performance in response to terrorism, focusing on schools and hospitals.
- Provide public education to residents, focusing on carbon monoxide poisoning, evacuation, and smoke alarms.
- Complete an annual inventory assessment of fire equipment, personnel, and training needs.

Chapter 1 : INTRODUCTION

1.1 HAZARD MITIGATION OVERVIEW

The Disaster Mitigation Act of 2000 amended the Stafford Act (42 U.S.C. 5121 et seq.), which established a national program for pre-disaster mitigation. The program is meant to control Federal costs of disaster assistance and streamline the administration of disaster relief.

As a result of the Disaster Mitigation Act of 2000, the Federal Emergency Management Agency (FEMA) requires jurisdictions to first have in place a multi-hazard mitigation plan, in order to be eligible for Hazard Mitigation Grant Program (HMGP) funds. Effective November 1, 2004, jurisdictions must update their plan within five years. FEMA has provided states with funding to assist local governments in funding these plans.

Hazard mitigation is defined as any action taken to eliminate or reduce the long-term risk to human life and property from natural and technological hazards. Potential types of hazard mitigation measures include: structural hazard control or protection projects; retrofitting of facilities; acquisition and relocation of structures; development of mitigation standards, regulations, policies, and programs; public awareness and education programs; and development or improvement of warning systems. The goal of hazard mitigation is to eliminate and reduce vulnerability to significant damage and/or repetitive damage from one or more hazards.

Hazard mitigation can provide a multitude of benefits to jurisdictions including saving lives; protecting public health and reducing injuries; preventing or reducing property damage; reducing economic losses; minimizing social dislocation and stress; decreasing agricultural losses; maintaining critical facilities in functioning order; protecting infrastructure from damage; protecting mental health; and reducing legal liability of government and public officials.

Hazard mitigation planning can break the cycle of disaster-repair-disaster within a community and prepare it for a more sustainable future. The development and application of long-term strategies that reduce or alleviate loss of life, injuries and property damage or destruction resulting from natural or human caused hazards accomplish the goals of hazard mitigation planning. These long-term strategies must incorporate a range of community resources including planning, policies, programs and other activities that can make a community more resistant to disaster. Mitigation planning efforts should both protect people and structures and minimize costs of disaster response and recovery. Mitigation is the cornerstone for emergency management and is a method for decreasing demand on scarce and valuable disaster response resources.

The hazard mitigation planning process involves numerous steps, including:

- Identification and screening of major hazards
- Review of existing capabilities and resources
- Analysis of the risks posed by those hazards
- Development, implementation, and maintenance of specific hazard mitigation measures

Although most mitigation measures are implemented on a continual basis, the post-disaster period often presents special hazard mitigation opportunities. Mitigation opportunities are often more apparent immediately following a disaster making both public officials and the general public more willing to consider taking mitigation actions and proactive in seeking special funding to assist implementation efforts.

1.2 PROJECT SCOPE

Chippewa County chose to engage in a comprehensive planning process to update their All-Hazard Mitigation Plan for several reasons: first, as a process, it helps the county determine its current state – social, economic and environmental trends in addition to the hazards that affect the county; second, it lays out a process that will guide the county on how it deals with both current and potential hazards; and third, it gives the public an opportunity to decide what projects they want the county and cities to complete in the future.

Chippewa County contracted with the Upper Minnesota Valley Regional Development Commission (UMVRDC) to facilitate an update to the County's 2015 Hazard Mitigation Plan. Funding for the development of this update was provided through FEMA's Hazard Mitigation Grant Program (HMGP). UMVRDC has worked with local jurisdictions in its five-county service area to update hazard mitigation plans and has experience in collecting and analyzing data, facilitating stakeholder outreach and leading planning processes including hazard mitigation planning. Under normal circumstances, Chippewa County's plan was scheduled for updating in 2020 as FEMA requires local hazard mitigation plans to be updated every five years to remain current and eligible for future funding opportunities. However, with the onset of the coronavirus pandemic, the normal five-year timeline was delayed. Taking this into consideration, FEMA has granted an exemption to the county to allow additional time to complete their plan update.

This plan update is a multi-jurisdictional plan in that it covers all of Chippewa County including the cities of Clara City, Maynard, Milan, Montevideo, and Watson. It should be noted that the eastern portion of the city of Granite Falls is also in Chippewa County, but for the purposes of this plan, Granite Falls' mitigation strategy is included in the Yellow Medicine County Hazard Mitigation Plan. Also included in the scope of this plan are the unincorporated areas including townships and school districts and other interests located outside of the incorporated boundaries of the cities.

Representatives from each of these jurisdictions were included on the planning task force committee and played an active role in soliciting public input, providing information, developing strategies and reviewing plan drafts. Each jurisdiction will also officially adopt the plan by resolution after it is approved by FEMA. The adopting resolutions from the County and the communities will be included after final approval by FEMA.

Chapter 2 : THE PLANNING PROCESS

As mentioned in the previous section, Chippewa County contracted with the Upper Minnesota Valley Regional Development Commission (UMVRDC) to write the original planning grant and County Hazard Mitigation plan and subsequent updates. In addition to the County, all cities within the county (Clara City, Maynard, Milan, Montevideo, and Watson) also participated in the original plan/updates through adopted participation resolutions and task force delegates. Chippewa County completed and adopted its initial All-Hazard Mitigation Plan, with FEMA approval in 2005.

An additional requirement of the Disaster Mitigation Act of 2000 requires a full All-Hazard Mitigation Plan update within five years of adoption. To meet this requirement, Chippewa County again contracted with the UMVRDC to write the plan update grant in 2008 and completed an All-Hazard Mitigation Plan update for the county in September 2010. In 2013, Chippewa County and the UMVRDC collaborated to complete a plan update for 2015. Chippewa County requested the continued participation from all cities within the county in updating the All-Hazard Mitigation Plan.

2.1 THE PLANNING TASK FORCE AND PARTICIPANTS

The Chippewa County planning task force was headed by Chippewa County Emergency Management Director, Stephanie Weick, who served as the primary point of contact for the plan. Members of the planning team included representatives from the public and governmental sectors including agencies and individuals representing underserved populations (Prairie Five Community Action, Countryside Public Health, and school administrators). The following list identifies those who were invited to serve on the planning task force as well as the organizations or departments they represent.

CHIPPEWA COUNTY HAZARD MITIGATION PLAN TASK FORCE

Stephanie Weick, Chippewa County Emergency Director

David Lieser, Chippewa County Commissioner

William Pauling, Chippewa County Commissioner

Scott Williams, Chippewa County Planning and Zoning Administrator/GIS

Jeremy Gilb, Chippewa County Engineer

Derek Olson, Chippewa County Sheriff

Michelle May, Chippewa County Auditor Treasurer Coordinator

Josh Macziewski, Chippewa County Ag and Drainage Inspector

Richard Groothuis, City of Maynard Mayor

Nicole Strassburg, City of Maynard Clerk

Gary Nelson, City of Clara City Mayor

Steve Jones, City of Clara City Administrator

Jeff Sager, City of Clara City Public Works Director

Rhonda Pieper, City of Clara City Councilmember

Ronald Anderson, City of Milan Mayor
James Anderson, City of Milan City Councilmember
Veronica Blommel, City of Milan Clerk

Nathan Schmidt, City of Montevideo Council President
Beverly Olson, City of Montevideo Council Member
Robert Wolfington, City of Montevideo Manager
Jack Gottfried, City of Montevideo Community Development Director
Aaron Blom, City of Montevideo Public Works Director
Glennis Lauritsen, City of Montevideo Clerk

Todd Tongen, City of Watson Mayor
Nicole Koenen/Alan Marohl, City of Watson Clerk/Treasurer
Todd Vogel, City of Watson Council Member

James Schmaedeka, Township Association Officer
Ron Abel, Township Association Officer
Charles DeGrote, Township Association Officer
Bill Luschen, Township Association Member Officer
John Bristle, Township Association Officer

Wade McKittrick, Montevideo Public Schools Superintendent
Tyler Sachariason, Montevideo Chamber President
David Bothun, Countryside Public Health

Larissa Schwenk, Head Librarian, Montevideo
Joseph Skallerud, Chippewa County-Montevideo Hospital Safety Director
Jill Rothschild, MN Valley Co-op Light-Power
Ted Nelson, Prairie Five Rides Program Manager
Tom Warner, Soil and Water Conservation District
Ethan Jenzen, DNR Waters Area Hydrologist

Kevin Ketelsen, Upper Minnesota Valley Regional Development Commission
Kristi Fernholz, Upper Minnesota Valley Regional Development Commission

2.2 REVIEW OF EXISTING PLANS, CAPABILITIES, AND VULNERABILITIES

For hazard mitigation to be successful, it is helpful to look for ways to implement mitigation activities through existing plans, ordinances and policies. UMVRDC staff referred to a variety of planning documents during plan development and a list of these documents is provided in the following table.

Table 2.1 Documents Applicable to Hazard Mitigation in Chippewa County

Name of Plan	Date Completed or Updated	Available	Relevant Information
Minnesota State Hazard Mitigation Plan	2019	MN Department of Public Safety	Risk assessment, hazard profiles, county plan must conform to State Hazard Mitigation Plan
Chippewa County Comprehensive Plan	2003	Planning and Zoning	Population profile, population projections, vision statement
Chippewa County Zoning Ordinance	1996	Planning and Zoning	Land use, sewage and water supply, public roads, and recreational parks, floodplain regulations, setbacks from blufflines (erosion)
Montevideo and Township Fire Rescue Agreement	2019	Emergency Manager	Montevideo fire district
Chippewa County Emergency Operations Plan	2022	Emergency Management	Emergency operation plans, responsibility, critical facilities
Montevideo Comprehensive Plan	2013	City of Montevideo	Population profile, city land statistics, and maps
Clara City Comprehensive Plan	2012	City of Clara City	Population profile, city land statistics, and maps
Milan Comprehensive Plan	2013	City of Milan	Population profile, city land statistics, and maps
Chippewa County Water Plan	2013-2018	Planning and Zoning	Water and wastewater supply information.
All Cities in Chippewa County Wellhead Protection Plan	Varies by city	Cities	Water/well protection measures
Minnesota River Basin Plan	2001	MN Pollution Control Agency	Pollution, ground water, and clarity
Resilience Report for Chippewa County	2012	Emergency Management	Reference for the management and mitigation of floods and other risks

Since hazard mitigation spans all facets of a community and county, some mitigation actions can be carried out by enforcing existing ordinances or following local policies, such as a comprehensive plan, building codes or a zoning ordinance. Therefore, it is beneficial to review what regulatory mechanisms are in place and note any deficiencies that may exist. To do this, UMRDC surveyed the cities and county to assemble an inventory of current plans, ordinances and policies they currently have in place as well as an evaluation of their local capabilities in terms of administrative, fiscal, political and technical capabilities. The results of these surveys gave an indication as to what areas may prove to assist or hinder the jurisdictions' abilities to implement the various strategies of this plan. A summary of these inventories and assessments is given in Appendix IV.

A hazard analysis and risk assessment were also updated as part of the early stages of the planning process. The method used in the risk assessment was the Calculated Priority Risk Index, which scores each disaster 0-4 in four categories: frequency of occurrence, warning time, potential severity, and risk level. A more detailed description of this process and its results can be found in Chapter 4.

2.3 PLANNING PROCESS AND TIMELINE

March 3, 2022 – Kevin Ketelsen of the UMRDC and Stephanie Weick met at the UMRDC office in Appleton to go over the proposed timeframe and tasks for the planning process. It was also decided that a virtual kickoff meeting during the late afternoon would hopefully produce the best attendance. Communication to the planning task force would be done via email by Stephanie as she had the contact information of the members. She would also promote events/feedback/input via Facebook and the County website when appropriate.

March 28, 2022 – Kevin Ketelsen and Kristi Fernholz of the UMRDC and County Emergency Management Director, Stephanie Weick met virtually via Teams with Jennifer Davis and Kristen Dellwo from MN Homeland Security/Emergency Management (HSEM) for introductions and to go over the proposed timeline and HSEM gave examples of some best practices and available resources to help with the development of the plan.

May 19, 2022 – UMRDC staff, Stephanie Weick and Scott Williams (county GIS) met via Teams to discuss potential mapping services to be included in the plan. Since U-Spatial does not produce static maps for plans any longer, the County GIS department was asked about the possibility of providing these maps for the plan update. Mr. Williams felt he would have time to produce any maps needed for the plan as long as he was provided the data to make them.

June 23, 2022 – Planning Kickoff Meeting - On Thursday, June 23, 2022, Chippewa County Emergency Management convened key county, city, and township representatives, as well as neighboring jurisdictions and other stakeholders to participate in the 1st Planning Team Meeting for the update of the Chippewa County Hazard Mitigation Plan. The purpose of the meeting was to formally present information about the Chippewa County Hazard Mitigation Plan update and to discuss key items that would inform plan development. The meeting was held via Zoom webinar video conference and was facilitated by Kevin Ketelsen of the Upper Minnesota Valley Regional Development Commission. A more detailed summary of the meeting, including participants and presentation materials can be found in Appendix II.

July 2022 – After the June 23rd kickoff meeting, County Emergency Management sent out a “Mitigation Ideas Worksheet” to the entire planning task force to provide any ideas they had for potential mitigation projects or any concerns they had related to potential disasters. Also, during the month of July, local jurisdictions were asked to review their critical facilities map and current land use maps from the 2015 plan for accuracy and/or any updates. Once the maps were confirmed, city clerks and city managers were asked to provide an inventory of local plans, ordinances and policies currently in place as well as to complete a local capabilities assessment. Also, in late July, a press release was issued notifying the public that the County was in the process of updating its hazard mitigation plan. This was posted on the County Emergency Management Facebook page, Clara City newspaper and through the Montevideo Chamber of Commerce. Copies of these items can be found in Appendix I.

September 2022-March 2023 – UMRDC scheduled meetings with representatives in all local jurisdictions and County EM to review and discuss past and future mitigation strategies. These meetings were held with community representatives such as elected officials, city/county employees, emergency

response volunteers, and public works/utilities personnel. At these meetings, those in attendance also participated in a revised hazard analysis scoring exercise since the 2015 plan did not address a comprehensive list of disasters. Also, during this timeframe (on January 25, 2023), additional input was sought through County EM Facebook page as well as notices that were hung at the local post offices in Milan, Maynard, Watson and Clara City as well as the Montevideo Market (grocery store) in Montevideo.

March - April 2023 – UMVRDC staff attended the Chippewa County Townships annual meeting in Maynard. Information about the plan was shared and those in attendance were asked to contact the County or UMVRDC with any additional input. Also, during March and April 2023, County Emergency Manager and County Sheriff attended City Council meetings to present drafts of their respective updated mitigation strategies and collect any additional feedback. These meetings were held on the following dates:

Chippewa County Elected Officials meeting times:

Clara City City Council – Tuesday, March 14th, 6:30pm

Montevideo City Council – Monday, March 20th, 7pm

Maynard City Council – Monday, April 10th, 7pm

Watson City Council – Tuesday, April 11th, 7pm

Milan City Council – Tuesday, May 2nd, 7pm

June 22, 2023 – Planning process wrap-up meeting – On Thursday, June 22, 2023, a virtual meeting was held to provide a summary of completed activities since the kick-off meeting and next steps. Chippewa County Emergency Management convened key county, city, and township representatives, as well as neighboring jurisdictions and other stakeholders to participate in the second Planning Team Meeting for the summary of the Chippewa County Hazard Mitigation planning process. The purpose of the meeting was to provide a summary of what had been done over the past year since the kick-off meeting. The meeting was held via Zoom webinar video conference and was facilitated by Kevin Ketelsen of the Upper Minnesota Valley Regional Development Commission. A more detailed summary of this meeting, including participants and presentation materials can be found in Appendix II.

In general, videoconferencing was used for the two task force meetings and in-person meetings were held for local jurisdictions and the large County planning group meeting. Phone calls and emails were used for direct requests and follow-up with city and county staff. Emails were also used to communicate to planning task force.

Table 2.2 Chippewa County & Cities Participation in All-Hazard Mitigation Plan Update

Jurisdiction	Adopted Updated Plan (2015)	Documented Participation in 2022-23 Planning Process	Task Force Mtg. 1 (6/23/22)	Local meetings	Task Force Mtg. 2 (6/22/23)
County	x	x	x	x	x
Clara City	x	x		x	
Maynard	x	x		x	
Milan	x	x		x	
Montevideo	x	x	x	x	
Watson	x	x	x	x	x
Townships	x	x	x	x	

A 15-day public review and comment period was also held for the general public to review a draft of the plan prior to submission to MN HSEM and FEMA for approval. The document was posted on the Chippewa County and UMRDC websites. Notices of the comment period were published in the Montevideo and Clara City newspapers and posted in the communities without newspapers (Maynard, Milan, and Watson). Notices were also posted on the County's Facebook pages (General, Emergency Management and Sheriff's Department). All participants during the planning process were also notified via email from County Emergency Management.

After the public comment period, the plan will be sent to Minnesota HSEM and FEMA for review and approval. Once approved by FEMA, each of the participating jurisdictions (cities and county) will officially adopt the plan by resolution. The County as well as city will be sent an electronic copy of the plan. A copy of the Chippewa County and individual city resolutions adopting the All-Hazard Mitigation Plan will be included in Appendix VIII of the final plan after adoption.

Chapter 3 : CHIPPEWA COUNTY PROFILE

3.1 LOCATION

Chippewa County is 582.8 square miles located in southwestern Minnesota approximately 120 miles west of Minneapolis-St. Paul Metropolitan Area and 70 miles southwest of the city of St. Cloud. Chippewa County is bordered by Swift County to the north, Kandiyohi County to the east, Renville County to the southeast, Yellow Medicine County to the southwest, and Lac qui Parle County to the west. The Minnesota River forms the angled southwest border. Trees, rolling hills and vast agricultural land characterize the rest of the county. Chippewa County has five cities (and part of Granite Falls) and 16 townships.

3.2 HISTORY

Chippewa County runs through the much larger Glacial River Warren Valley in western Minnesota. All early Minnesota explorers followed the Minnesota River which had a system of major trails on both sides of the river. The first wave of inhabitants came as French-Canadian voyageurs and missionaries from settlements in the eastern portion of the United States. Following the Civil War, Americans from New York and New England were able to travel by railroad, boat and ox cart to the newly opened land where they established most of the governmental structure for the county, townships and towns. During the 1700s Europeans established a fur-trading post near the rivers and traded with area Native Americans.

Many towns in Minnesota were settled in areas that had access to water, especially areas where water could serve as energy, transportation and a way to dispose of unwanted waste.

Montevideo was settled in the 1870s and is located overlooking the valleys of the Chippewa and Minnesota Rivers. After the city was platted, Montevideo became an agricultural center. Clara City, Maynard, Watson, and Milan were all platted in 1879-1888 as a result of the railroad expansion in the area. East Granite Falls, located in Chippewa County is located on the east side of the Minnesota River and is part of the municipality of Granite Falls in Yellow Medicine County.

For nearly 150 years, agriculture has remained the number one industry in Chippewa County. Crops grown are extremely diverse and include wheat, oats, corn, soybeans, and sugar beets. Currently, some farmers are exploring new markets for their organically grown feed grains, produce, and free-range organic meats such as poultry, beef, lamb, and pork. Industry in the county continues to expand and numerous manufacturing jobs are created along with an evolving the retail sector to keep pace with growing demands.

3.3 PHYSICAL CHARACTERISTICS

3.3.1 CLIMATE AND PRECIPITATION

A wide range of seasonal temperatures characterizes Chippewa County. The hottest day that Chippewa County has recorded was 110 degrees F in July 1988; the coldest day was -39 degrees F in February 1936

(Source: Midwest Regional Climate Center) shown in Table 3.1. The sun shines 65 percent of the time in summer and 45% in winter. Prevailing winds are from the south.

Total annual precipitation is about 24 inches, 75% of which usually falls in the growing season between May and September, shown in Table 3.2 below.

Table 3.1 Chippewa County Avg. Monthly Temperature and Record Highs & Lows, 1971 - 2022

Month	Average High	Average Low	Mean	Record High	Record Low
January	22° F	1° F	11° F	69° F (1981)	-35° F (1977)
February	28° F	7° F	18° F	64° F (1981)	-39° F (1936)
March	40° F	20° F	30° F	83° F (2012)	-20° F (1984)
April	58° F	34° F	45° F	100° F (1980)	2° F (1975)
May	71° F	46° F	58° F	99° F (1987)	22° F (2005)
June	80° F	56° F	68° F	105° F (1979)	37° F (1998)
July	84° F	60° F	72° F	110° F (1988)	35° F (1971)
August	82° F	58° F	69° F	106° F (1988)	35° F (1971)
September	74° F	48° F	61° F	103° F (1978)	21° F (1974)
October	60° F	36° F	48° F	92° F (1993)	12° F (1993)
November	42° F	22° F	32° F	80° F (1999)	-19° F (1977)
December	27° F	8° F	17° F	63° F (1998)	-32° F (1983)

Source: Midwestern Regional Climate Center Monthly Data Summary. Data pertains to station at Montevideo.

Table 3.2 Chippewa County Average Monthly Precipitation & Snowfall, 1971 - 2022

Month	Precipitation in inches	Snowfall in inches
January	0.77	8.9
February	0.77	8.4
March	1.30	8.1
April	2.30	3.5
May	2.99	0.1
June	3.86	-
July	3.31	-
August	3.28	-
September	2.43	-
October	1.91	0.9
November	1.06	5.1
December	0.76	7.2
Annual	24.74	42.2

Source: Midwestern Regional Climate Center Monthly Data Summary. Data pertains to station at Milan.

Table 3.3 Normal Monthly Temperatures and Precipitation Amounts, 1991-2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Temp (°F)	21.9	26.8	39.3	55.3	68.8	78.5	82.2	80.1	73.5	59.0	41.8	27.6
Min Temp (°F)	2.0	5.4	18.4	31.7	45.4	56.1	59.8	57.1	48.1	34.7	21.1	9.1
Precip. (in.)	0.67	0.76	1.90	2.48	3.66	4.35	3.82	3.96	3.01	2.46	1.56	0.82
Normal Annual Precipitation Amount: 29.5"												

Source: Midwestern Regional Climate Data Center

3.3.2 GEOLOGY AND TOPOGRAPHY

Chippewa County contains 374,400 acres of land and water, all influenced by glaciation. Most of Chippewa County is covered by nearly level to rolling ground moraine deposits of clay, sand and rocks deposited by the melting glacial sheet. Relatively flat, glacial lake deposits are found in the east and central part of the county. A large sandy outwash delta covers the northeast corner of the county.

The Minnesota River flows in a deep valley forming the western border of the county. The valley was cut by water draining from Glacial Lake Agassiz, which covered most of the Red River Valley.

Outside the Minnesota River Valley, the county's average elevation is 1,050 feet above sea level. Topography gradually rises to the east; with the highest point in the County 1,142 feet above sea level in the southeastern corner. Rugged valley walls and a flat floor characterize the Minnesota River Valley, while row crops and grassland characterize the remaining region. The topography of Chippewa County's watersheds includes gently twisting glacial till plains, nearly level to undulating ground moraines, and nearly level to gently sloping lands with a complex mixture of well and poorly drained soils.

3.3.3 SOILS

Soils data indicate general patterns of soil suitability and limitations for land uses and can be used to determine flooding potential, load bearing capacities, permeability, surface drainage, and percolation rates. Chippewa County contains 11 general soil associations. Soil parent material in Chippewa County ranges from clay in the east to sandy loam in the Minnesota River Valley.

Soil erosion affects cropland, urban areas, roadsides, lakeshores, stream banks and drainage systems. The potential for wind erosion occurs when wind velocities increase above 12 miles per hour. Wind speeds above this mark overcome the force of gravity and dislodge soil particles. Soils with fine granulated structure are most susceptible to erosion, including sandy loam, loamy sand, and sand. November through June is the worst time for wind erosion when field surfaces are typically dry and strong northwest winds are prevalent. Water erosion in Chippewa County generally occurs the most between the months of April and June when fields have been tilled and planted, but a crop canopy has not yet developed to protect the surface. Soil is most vulnerable to both wind and water erosion when unprotected by vegetative cover.

3.3.4 LAND USE AND COVER

The pre-settlement vegetation of Chippewa County has undergone significant change since settlement began in the 1870s. Before it was settled, Chippewa County was predominately covered with prairie, wet prairie and river bottom forest vegetation along the Chippewa and Minnesota Rivers. Fire played a

main role in limiting the woody vegetation of Chippewa County. The forests were restricted to areas where natural firebreaks (such as rivers, lakes and rough topography) prevented the spread of fire from the adjacent prairie lands.

Today, land use in Chippewa County can be divided into four general categories: agricultural, woodland, water and wetlands, and other (includes urban uses). Agriculture is the most prevalent use, composing approximately 87% of the county land, woodland makes up three percent, and water and wetlands make up one percent of the land in Chippewa County. Other uses are about one percent. A more detailed breakdown of land uses is found in Table 3.4 below.

Table 3.4 Chippewa County Land Use & Cover

Land Use	Acres	% of Total
Urban and Rural Development	8,069	2%
Cultivated Land	327,003	87%
Hay/Pasture/Grassland	21,933	5%
Brush Land	931	2%
Forested	11,714	3%
Water	4,114	1%
Bog/Marsh/Fen	2,481	0%
Mining	143	0%
Total	338,170	100%

Source: Minnesota Land Management Information Center

“Minnesota Land Use Land Cover: 1990’s Census of the Land (8 category statewide)”.

Agricultural land is the dominant use in every township. Farms in Chippewa County have generally increased in size over the years with 547 acres being the most recently reported average farm size (U.S. Census of Agriculture, 2017). As the size of farms increased, the overall number of farms decreased. In 1964 there were 1,551 farms in Chippewa County and today, 623 farms remain. Table 3.5 below shows the comparisons of farms and farm size over the years in the County.

Table 3.5 Chippewa County Farm Comparisons from 1997-2017

Farms	1997	2002	2007	2012	2017
Farms (number)	618	694	720	674	623
Land in farms (acres)	318,472	339,652	367,926	335,109	341,030
Land in farms, avg. size of farm (acres)	515	489	511	497	547

Source: US Census of Agriculture, 2017

3.3.5 HYDROLOGY

Chippewa County’s lakes, streams and groundwater are some of its most significant resources, however vulnerable to pollution from a wide variety of human activities and/or disasters. Water quality has become one of the most important environmental issues facing the county and state. Water is used for

domestic and residential purposes, industry, agriculture and recreation. The health, safety and welfare of the public are directly linked to the county's water supply.

Groundwater

Groundwater generally travels southwestward in Chippewa County. Cretaceous sandstone aquifers are present over most of the area, but yields in many places are not satisfactory, as aquifers are generally less than ten feet thick. Groundwater is found in three principal aquifers: near surface sand and gravel aquifers, buried sand and gravel aquifers and aquifers within Cretaceous deposits. Usable groundwater is mainly found in areas of gravel deposits and glacial drift. The depth of water varies from shallow enough to be withdrawn by a centrifugal pump to over 100 feet below the surface.

Recharge of the major aquifers in Chippewa County occurs through precipitation, primarily in sand and gravel where infiltration rates are high and topography is rolling. Recharge of confined aquifers is greatest where unconfined aquifers are present. Recharge areas include gravel pits, wetlands and ponds, lakes and rivers and road ditches. Recharge can also occur, although more slowly, through confining layers into confined aquifers throughout the county. Most recharge occurs in spring from snowmelt and rainfall when ground water demands by growing vegetation are minimal and precipitation can soak through to the water table. There is generally little recharge during the active growing season. Chippewa County aquifers are recharged in Swift County. Parts of Chippewa County may also serve as recharge areas for ground water resources of neighboring counties.

Rivers

Chippewa County lies within the Minnesota River Basin and is drained by three watersheds: the Minnesota River Headwaters, Minnesota River Granite Falls and the Chippewa River. As the entire county was covered with glacial sheets of ice until approximately 9,500 years ago, surficial drainage is very young. All of Chippewa County drains into the Minnesota River, which then drains to the Mississippi River. Hawk Creek, as Judicial Ditch 7, drains the eastern part of the county and runs into the Minnesota River. Shakopee Creek drains the northeastern part of the county and Dry Weather Creek drains the central part. Both of these creeks flow into the Chippewa River. The Chippewa River and a number of small creeks drain the final western third of the county. Other small creeks flow directly into the Minnesota River. An extensive system of county ditches and tile lines has modified the water flow since the county was settled. Many marshy areas that existed before the area was settled have been drained for agricultural purposes.

Lakes

Lac qui Parle is the most prominent lake in the county. It was created by the Lac qui Parle Flood Control Project and completed in 1951. The reservoir behind the Lac qui Parle Dam has a capacity of 122,800 acre-feet and was designed for flood control, recreation, fish and wildlife conservation. Chippewa County has 79 lakes of 10 acres or more. These lakes cover an area of 9,158 acres which represents approximately 2.4 percent of the total area of the county.

Wetlands

The term "wetlands" refers to low depressions in the landscape covered with shallow and sometimes intermittent water. Wetlands are also commonly referred to as marshes, swamps, potholes, sloughs,

shallow lakes, and ponds. Wetlands differ in size, shape, and types of wet environment and derive their unique characteristics from climate, vegetation, soils and hydrologic conditions. Some have surface water only in the springtime during thaws or after rainstorms, while others may form shallow lakes that rarely dry up. They are classified according to their depth of water, total area, and seasonal life span.

Originally, wetlands were located throughout the entire county. With the advent of intensive agriculture practices and the application of land drainage techniques, many of the wetlands located on lands that were flat and suited to agricultural use have been drained, leaving relatively few wetlands in the flat till plain areas of the county. Most of the remaining wetlands are found in the moraine areas of the northern half of the county where the wetlands have either been preserved or where drainage is not economically feasible.

3.4 CLIMATE CHANGE

The United States Environmental Protection Agency (EPA) defines climate change as any significant change in the measures of climate lasting for an extended period of time. It includes major changes in temperature, precipitation, wind patterns, or other effects, that occur over several decades or longer.

According to the EPA, global average temperature has increased between 2-3°F from 1901 to 2021. Changes of one or two degrees in the average temperature of the planet can cause potentially dangerous shifts in climate and weather. Several places have seen changes in rainfall, resulting in more floods, droughts, intense rain, and more frequent and severe heat waves. As these changes in weather and climate changes become more pronounced in the coming decades, they will likely present challenges to our society and our environment.

The 2019 Minnesota State Hazard Mitigation Plan also states, “Minnesota has a highly variable, continental-type climate as described below. Despite its high degree of natural variability, climate scientists are finding clear evidence that recent temperature and precipitation increases are exceeding the historical variability of Minnesota’s climate and can be attributed to climate change.

Minnesota’s position near the center of the continent, and halfway between the Equator and North Pole, subjects it to a wide variety of air mass types throughout the year. Frequent outbreaks of continental polar air occur in every season, with occasional bitterly cold Arctic outbreaks during the winter. Similarly, the state experiences occasional mild to warm conditions in all seasons, with extreme heat episodes common during the summer, particularly in the southern and western portions of Minnesota.”

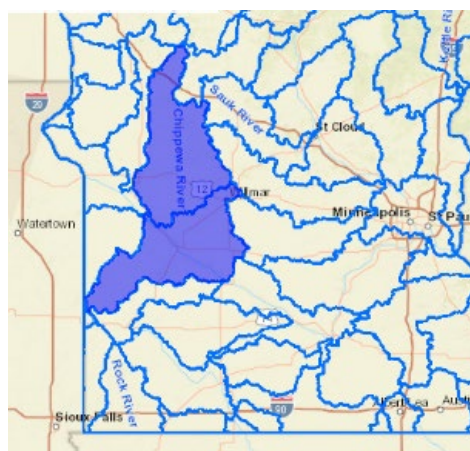
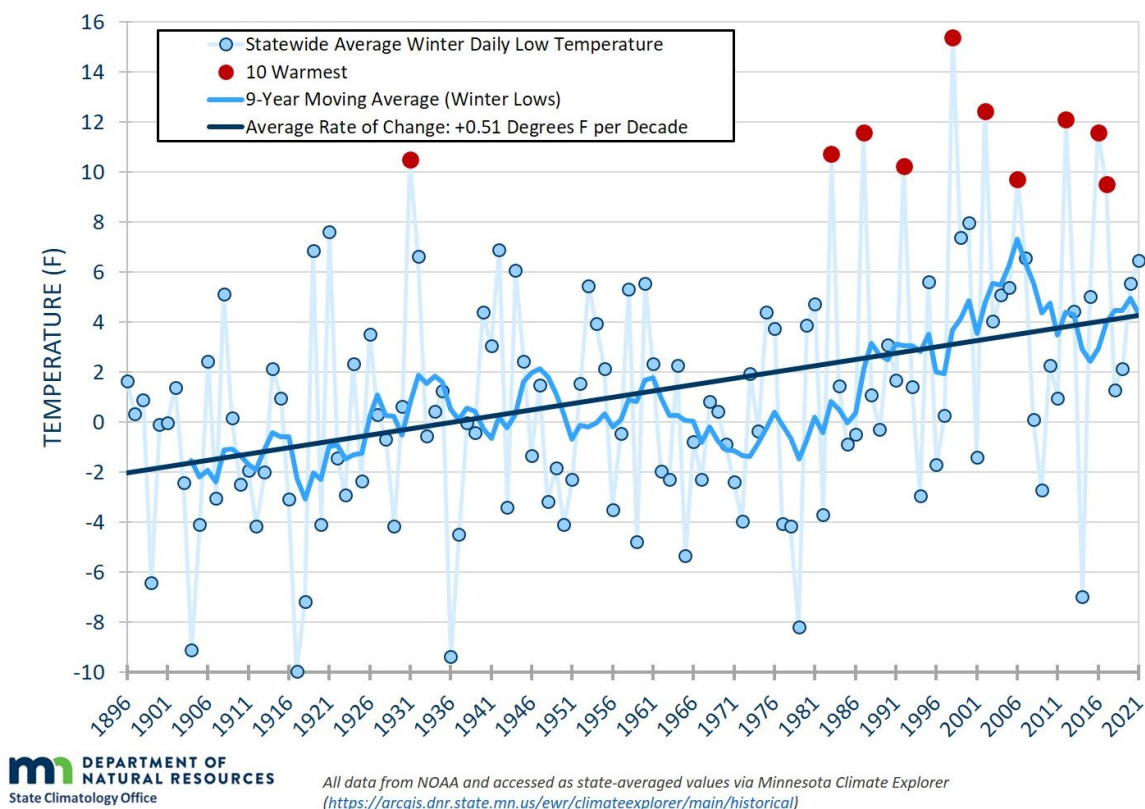
History of Climate Change in Chippewa County/Minnesota

According to the Minnesota State Hazard Mitigation Plan (2019), climate change in Minnesota is already occurring in ways that will affect the environment, the economy and everyday life. Historical weather data show changing trends in some weather phenomenon over the past few decades, and future changes are likely. Intense study of these topics will continue into the future.

The Minnesota State Climatology Office reports that Minnesota has warmed by three degrees (F) between 1895 and 2020, while annual precipitation increased by an average of 3.4”. The increase in

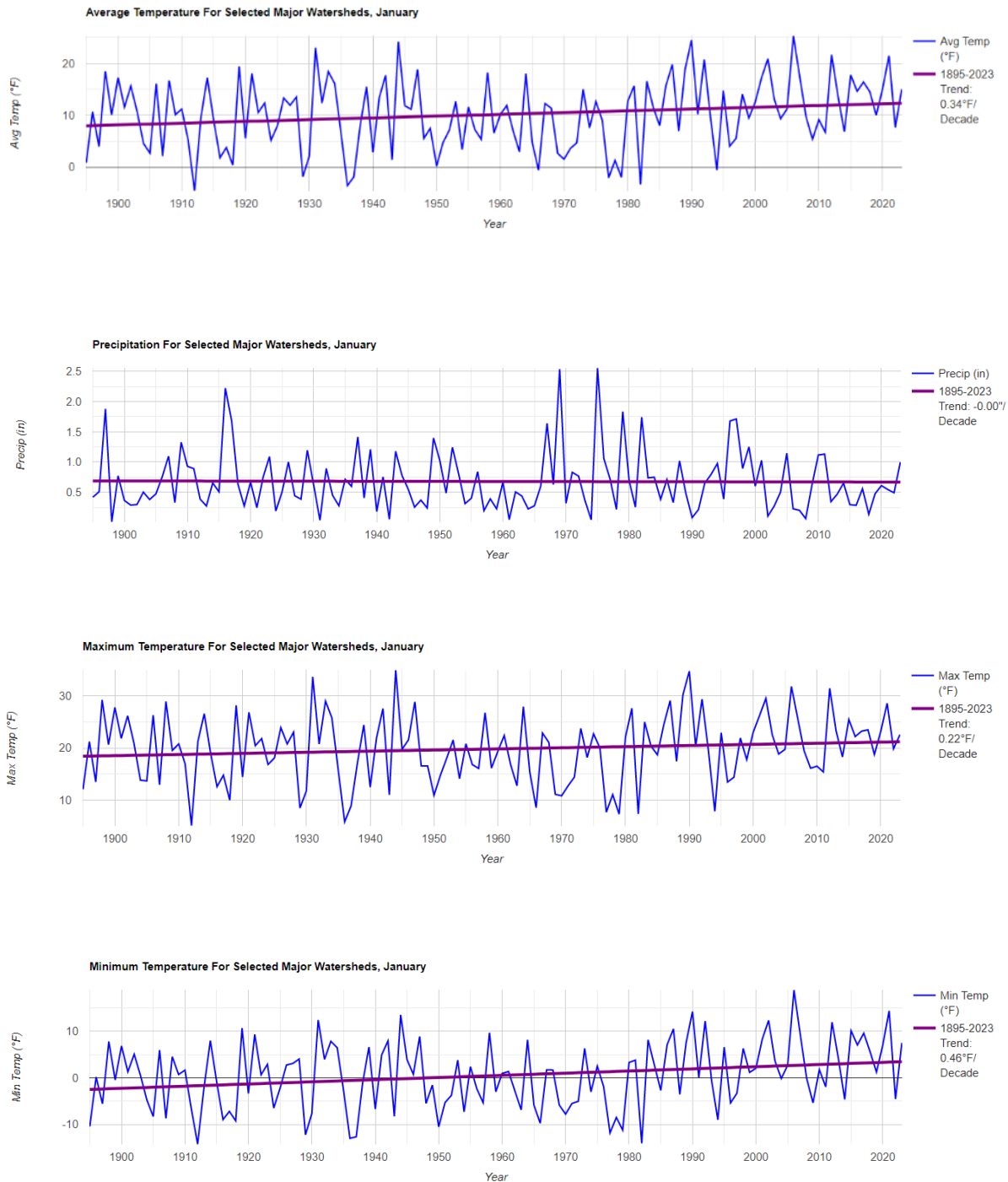
temperatures during the winter months has occurred at a rate 2-3 times faster than during the summer months from 1895 to 2021 and even more rapidly since 1970. In addition, Minnesota is not getting as cold as it once did. The intensity of rain events has also increased as 1-3" rainfalls are becoming more common. The State is expecting these trends to continue through the 21st century. The following figure shows the warming trend of the average winter minimum temperatures since 1896.

Figure 3.1 Minnesota Average Winter Daily Minimum Temperatures (December through February, 1896-2021)



Closer to home in Chippewa County, average temperature trends are similar to statewide figures. Using the MN DNR's [Climate Trends Tool](#), and selecting the watersheds of Chippewa County (Chippewa River and Minnesota River-Yellow Medicine River watersheds, shown at left), shows that the average temperature has increased by .34 degrees F from 1895 to 2023 while the average precipitation has remained unchanged. The minimum temperature for the two watersheds has increased .46 degrees F while the average maximum temperature has increased less than half of that at .22 degrees F. These trends are illustrated in the following graph plots.

Figure 3.2 Chippewa River & Minnesota River Historic Temperature and Precipitation Trends, 1895-2023*



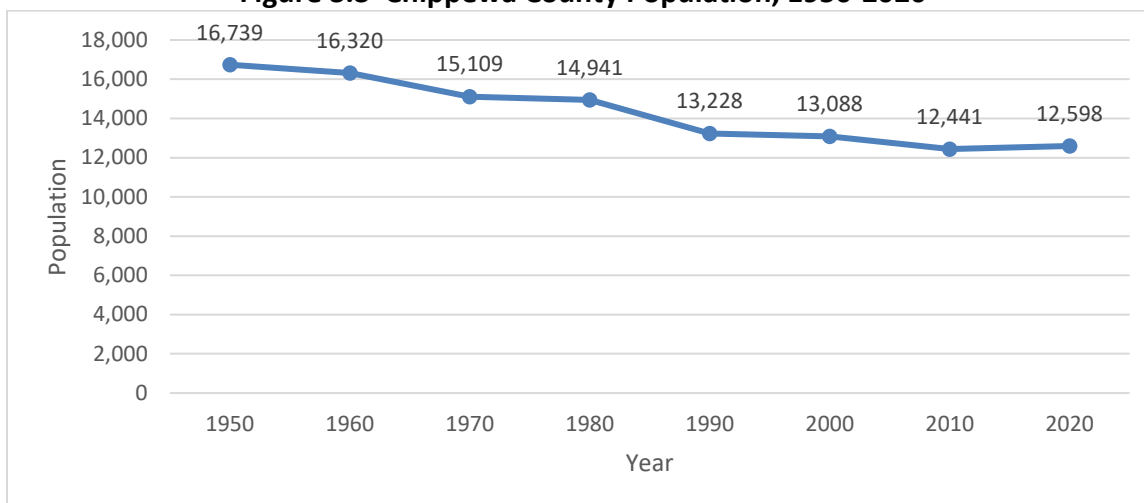
*The four graphs above were generated using the Minnesota DNR's [Minnesota Climate Trends tool](#)

3.5 DEMOGRAPHICS

3.5.1 POPULATION

The 2020 U.S. Census reported that Chippewa County has a current population of 12,598 people. This is a 1.3% increase from 2010, marking the first increase in population since 1940 and indicating a potential stabilization in the population. Prior to this slight increase, the county's population had been on a continual decline since 1950.

Figure 3.3 Chippewa County Population, 1950-2020



Source: U.S. Census

Table 3.6 identifies population projections for Chippewa County. The State Demographic Center projects that Chippewa County's population will decrease by almost 660 residents by 2035 from the 2020 Census figure.

Table 3.6 Chippewa County Population Projections

	2010 Population	2020 Population	2025 Projection	2035 Projection
Chippewa County	12,443	12,598	12,112	11,938

Source: U.S. Census; Minnesota State Demographic Center, May 2023

Chippewa County is home to five cities (and part of Granite Falls) and sixteen townships. The following is a brief city-specific discussion of population and number of households.

Montevideo

The city of Montevideo is situated in the Minnesota River Valley. The city is located along the southern edge of Chippewa County, surrounded by Sparta Township. U.S. Highways 59 and 212 run through the city, as do State Highways 7 and 29. Montevideo is the largest employment center and, as the county seat, provides most of Chippewa County's governmental services. Montevideo has a population of 5,398 residents and 2,426 households (U.S. Census, 2020, American Community Survey).

Clara City

Clara City is the county's third largest city with a reported population of 1,423 residents and 584 households (U.S. Census Bureau, 2020). In addition to State Highway 23, State Highway 7 runs east/west along the southern edge of the city, County Road 2 runs north/south through the city, and the Burlington Northern Railroad runs parallel to Highway 23.

Milan

The city of Milan is located approximately 15 miles northwest of Montevideo and approximately two miles north of Lac qui Parle Lake. Milan is Chippewa County's third smallest city with an estimated 428 people and 126 households (U.S. Census Bureau, 2020). U.S. Highway 59 and State Highway 7 are joined at this point and run through the city from the northwest to the southeast. State Highway 40 runs along the southern edge of the city.

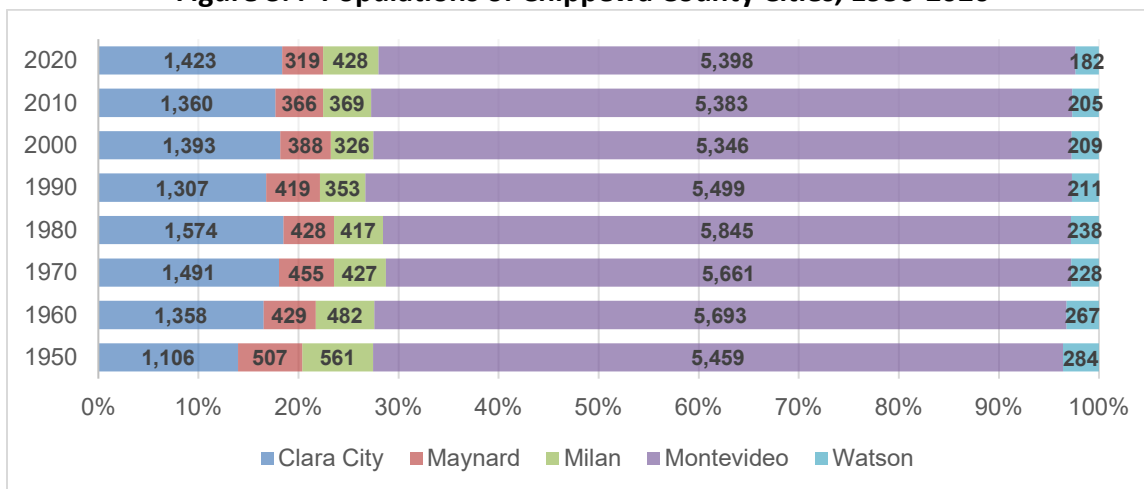
Maynard

The city of Maynard is located in the southern part of Chippewa County between Clara City and Granite Falls on State Highway 23. County Road 4 dissects the city cutting from the north to the southeastern part of the city. In addition, the Burlington Northern Railroad runs parallel to Highway 23. Maynard is the county's second smallest city with 319 people and 173 households (U.S. Census Bureau, 2020).

Watson

The city of Watson is located approximately five miles northwest of Montevideo along the joined U.S. Highway 59 and State Highway 7. The city is located approximately two miles northeast of the Minnesota River. Watson is the county's smallest city with an estimated population of 182 residents and 87 households (U.S. Census Bureau, 2020).

Figure 3.4 Populations of Chippewa County Cities, 1950-2020



Source: U.S. Census, 2020

3.5.2 AGE AND-RACE CHARACTERISTICS

Since 1970, the county's population has "aged." Minnesota Planning predicts that the percent increase in elderly population will grow at a faster rate than the total population over the next 25 years. It is during this time frame that "baby boomers" will reach retirement age. This is a strong indicator of the need for many senior-related services, including senior housing and transit services. This trend also shows the importance of planning for disasters as many in this demographic may require additional assistance before, during and after a disaster event. Evacuations and sheltering may present some challenges to the elderly who have limited mobility, hearing difficulties and vision problems. According to the 2020 American Community Survey 5-year Estimates, Chippewa County has a median age of 40.6, which is two years older than the state's figure of 38.3. When looking at potentially vulnerable age groups, the 75+ age group might be a sector of the population that may need extra attention. As the following table indicates, Chippewa County and all but one of its communities have larger proportions of the 75+ demographic than the state.

Table 3.7 Chippewa County Age Characteristics, 2020

	Under 18	18 and Older	65 and over	75 and over
Clara City	29.7%	70.3%	25.6%	13.3%
Maynard	25.2%	74.8%	20.2%	8.1%
Milan	23.4%	76.6%	17.6%	6.9%
Montevideo	19.5%	80.5%	21.5%	11.3%
Watson	21.3%	78.7%	12.4%	3.4%
Chippewa County	23.3%	76.7%	21.2%	9.9%
Minnesota	23.2%	76.8%	15.8%	6.5%

Source: 2020 American Community Survey, U.S. Census Bureau,

The racial make-up of Chippewa County has been slowly changing in recent years. According to the 2021 American Community Survey, Chippewa County has seen a decline in the white population while the number of people of other races increased. From 2011 to 2021, the white population declined by almost 6%, while many of the other races increased by significant percentages. The next largest race in Chippewa County is the Hispanic or Latino origin, consisting of 991 residents, or almost 8% of the total population. It should be noted that while the county's minority population continues to increase, it still only comprises approximately 12% of the total.

Table 3.8 Chippewa County Race and Hispanic Origin, 2021

Race and Hispanic Origin, 2021	Number	Percent	% Change, 2011-21 (Chippewa Co.)	% Change, 2011-21 (MN)
Total population	12,509	100%	1.0%	7.4%
White	10,980	87.8%	-5.8%	0.4%
Black or African American	145	1.2%	126.6%	42.2%
American Indian or Alaska Native	216	1.7%	227.3%	-8.0%
Asian or Other Pacific Islander	322	2.6%	261.8%	35.8%
Some Other Race	668	5.3%	156.9%	66.5%
Two or More Races	178	1.4%	-26.7%	121.8%
Hispanic or Latino Origin	991	7.9%	69.1%	31.6%

Source: 2021 American Community Survey, U.S. Census, DEED Chippewa County Profile

Similarly, the county experienced a significant increase in the number of foreign-born residents over the same period. From 2011-2021, the number of foreign-born residents increased by 106.7% or 396 residents. This rate of increase was greater than the state's increase over the same timeframe (30.6%). The majority of the foreign-born residents are natives of Latin America, Oceania, and Asia. The total number of foreign-born residents in Chippewa County is 767 or about 6% of the total population.

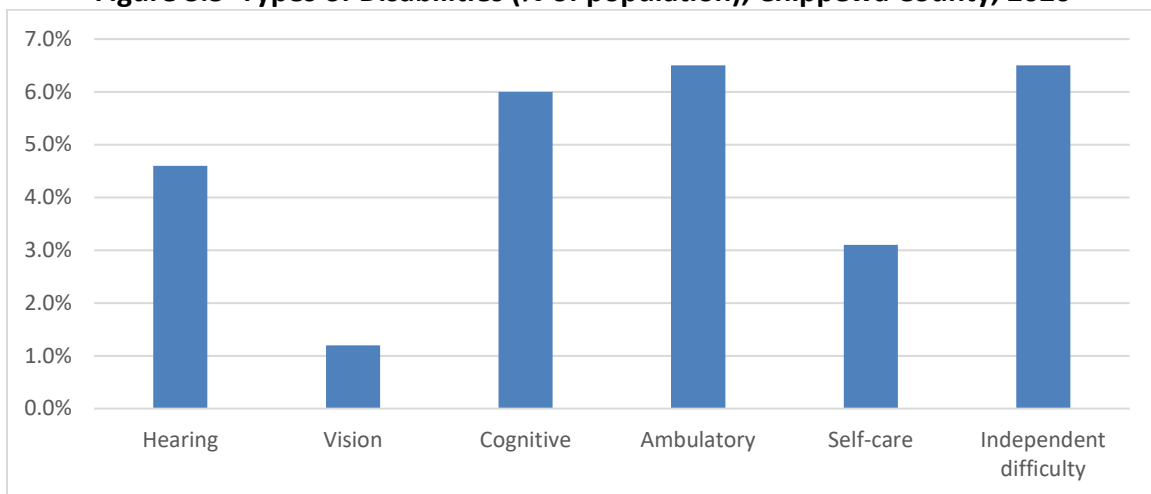
3.5.3 HOUSEHOLDS

Household characteristics have a direct impact on land use, housing needs, social services, and educational expenses. Changes in household size have a direct and proportional effect on demand exerted and types of housing necessary for communities. As household size decreases, the demand for housing units will increase. Chippewa County has an estimated 5,240 households according to the 2021 American Community Survey 5-Year Estimates with an average household size of 2.33.

3.5.4 POPULATION WITH DISABILITIES AND AT-RISK POPULATION

Another factor in determining the vulnerability of a population is the percentage of the population with disabilities. According to the 2020 American Community Survey, 13.4% of the county's population is disabled in some way. This is higher than the state's percentage of 10.9%. The proportion of the population with various disabilities is summarized in the following figure.

Figure 3.5 Types of Disabilities (% of population), Chippewa County, 2020



Source: 2020 American Community Survey, 5-Year Estimates

As mentioned earlier, it is helpful to identify populations within the planning area that may be at risk or more vulnerable than the general population. This may be a result of age, income, housing, mobility, education level, and language. Using data collected by Headwaters Economics Profile System and comparing Chippewa County to the nation as a whole, most of the “at risk” categories are less than the national average. There were just three categories where Chippewa County had a higher percentage than the rest of the U.S. – population under 5, population over 65 and population with disabilities. This is not to say there are few segments of the population that are at risk or vulnerable, but rather those individuals make up a smaller percentage of the population than the national averages.

Table 3.9 Chippewa County/U.S. Percentage of Populations at Risk, 2021

Indicators, 2021	Chippewa County	U.S.
Population under 5	6.4%	5.9%
Population over 65	21.0%	16.0%
Population Non-White (all other races)	12.2%	31.8%
Population Hispanic	7.9%	18.4%
Population without a High School Diploma	9.1%	11.1%
Population that speak English "Not Well"	1.9%	4.1%
Population in "Deep Poverty"	5.2%	5.3%
Families Below Poverty	6.7%	8.9%
Families that are Single Mother Households and Below Poverty	3.9%	3.9%
Households Receiving Food Stamps (SNAP)	6.1%	11.4%
Population that "Did Not Work"	15.2%	22.7%
Rentals where Gross Rent Exceeds 30% of Household Income	32.6%	46.0%
Housing that are Mobile Homes	1.7%	5.2%
Households that are Single Female with Children under 18	7.0%	7.6%
Households with No Car	7.1%	8.3%
Population over 65 and Living Alone	32.6%	33.1%
Population with Disabilities	13.9%	12.6%
Population without Health Insurance	8.0%	8.5%

Source: U.S. Department of Commerce, 2022, American Community Survey Office, Washington, D.C., reported by Headwaters Economics

3.5.5 HOUSING

The conditions, type and variety of housing offered by communities directly influence the sustainability and vitality of the entire county. The 2020 Census reports that Chippewa County has 5,627 total housing units, with 5,150 of them occupied and 477 vacant. The age of the county's housing stock is shown in Table 3.8.

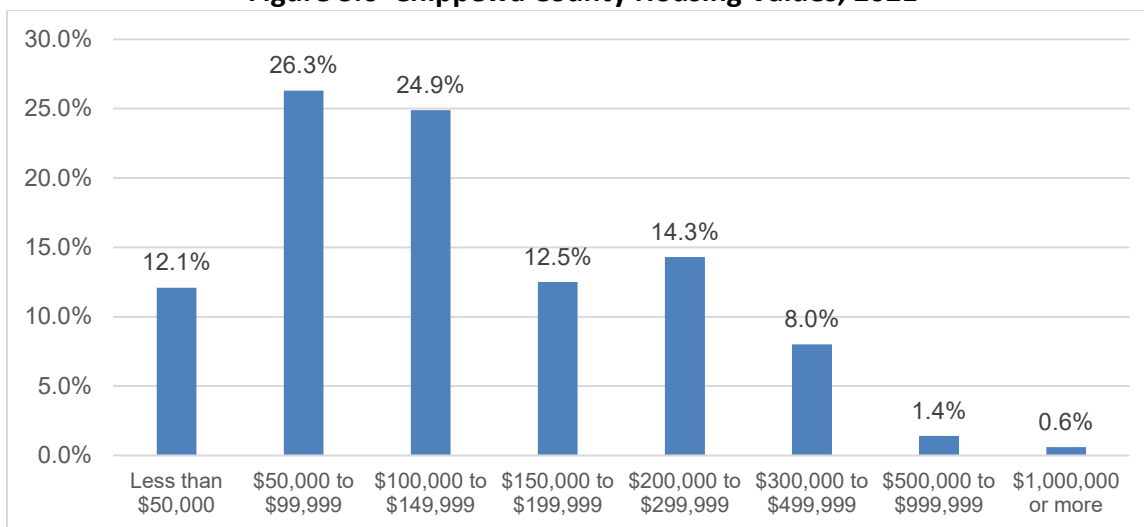
Table 3.10 Chippewa County Housing Year Built, 2021

Year Built	Total Structures Built	% of-total
After 2020	3	0.1%
2010 or 2019	121	2.1%
2000 to 2009	378	6.7%
1990 to 1999	450	8.0%
1980 to 1989	316	5.6%
1970 to 1979	825	14.6%
1960 to 1969	462	8.2%
1950 to 1959	918	16.3%
1940 to 1949	541	9.6%
1939 or earlier	1,631	28.9%
Total	5,645	100%
Median Year Built	1960	

Source: 2021 American Community Survey 5-Year Estimates

Housing values are another important data set to considering mitigation strategies and determining potential loss. Almost 64% of the housing stock is valued under \$150,000 according to the 2021 American Community Survey (ACS) 5-Year Estimates, with 51.2% falling between \$50,000 and \$149,999. The median house value is \$121,900.

Figure 3.6 Chippewa County Housing Values, 2021



Source: 2021 ACS 5-Year Estimates

3.6 ECONOMIC CONDITIONS

Chippewa County's economic atmosphere supports an agricultural base, recreation, tourism, services, retail, trade and government. The county possesses strong and mature manufacturing and service-related industries. This, along with excellent access to transportation systems and close proximity to the major urban centers; Chippewa County is positioned to have a vibrant economy for many years to come.

Almost 65% of Chippewa County residents 16 years old and over are in the labor force and three percent are unemployed, according to the 2020 American Community Survey and Minnesota Department of Employment and Economic Development (Jan. 2022). Table 3.11 provides an in-depth breakdown of occupations by business and industry types in Chippewa County in 2020. The largest sector in the county is the Education, Health, and Social Services sector followed by the Manufacturing and Retail Trade sectors.

Table 3.11 Chippewa County Industries for the Employed Civilian Population, 16 Years and Older, 2020

Industry Sector	% of Workforce
Agriculture, Forestry, Fishing and Hunting, and Mining	8.0%
Construction	7.4%
Manufacturing	17.4%
Wholesale Trade	2.5%
Retail Trade	12.2%
Transportation and Warehousing, and Utilities	3.6%
Information	1.2%
Finance, Insurance, Real Estate and Rental and Leasing	3.7%
Professional, Scientific, Management, Administrative, and Waste Management Services	6.0%
Educational, Health and Social Services	24.5%
Arts, Entertainment, Recreation, Accommodation and Food Services	6.3%
Other Services (except public administration)	3.7%
Public Administration	3.4%
Total	100%

Source: U.S. Census, 2020 American Community Survey 5-Year Estimates

As shown in Table 3.12 below, the highest percentages of households (21.4%) and families (21.2%) fall into the income range of \$50,000 to \$74,999 in Chippewa County. The estimated median household and family incomes for Chippewa County in 2020 was \$57,301 and \$70,783 respectively. These figures were significantly lower than the statewide median incomes of \$73,383 (household) and \$92,692 (family).

Table 3.12 Chippewa County Income Statistics, 2020

	Households		Families	
	Number	Percentage	Number	Percentage
Less than \$10,000	246	4.8%	33	1.0%
\$10,000 to \$14,999	210	4.1%	47	1.5%
\$15,000 to \$24,999	549	10.7%	255	7.7%
\$25,000 to \$34,999	477	9.3%	252	7.6%
\$35,000 to \$49,999	729	14.2%	480	14.5%
\$50,000 to \$74,999	1,098	21.4%	702	21.2%
\$75,000 to \$99,999	688	13.4%	553	16.7%
\$100,000 to \$149,999	765	14.9%	656	19.8%
\$150,000 to \$199,999	221	4.3%	209	6.3%
\$200,000 or more	144	2.8%	126	3.8%
Total	5,133	100%	3,313	100%
<i>Median household or family income</i>	<i>\$57,301</i>	<i>-</i>	<i>\$70,783</i>	<i>-</i>

Source: U.S. Census Bureau, 2020 American Community Survey
Note: Household count contains both families and persons living alone.

3.7 COMMUNITY INFRASTRUCTURE

This section identifies Chippewa County's schools, public facilities, parks and natural resources, and available modes of transportation offering transit, airport facilities, roads, and a multitude of trail opportunities. A complete listing of telecommunication and power facilities has been provided along with city-specific water and sewer systems currently in place throughout the county.

3.7.1 SCHOOLS

Chippewa County is home to all or portions of six School Districts: Lac Qui Parle Valley, Yellow Medicine East, Montevideo, Benson, Kerkhoven-Murdock-Sunburg (KMS), and MACCRAY (Table 3.13). Lac qui Parle Valley District covers the northwest corner of the county and includes Milan and Watson. Yellow Medicine East School District covers Granite Falls and the rest of the southern portion of Chippewa County. Montevideo School District includes the west central part of the county, which includes the city of Montevideo. Benson serves a small rural portion of the north central part of the county. The KMS district covers a rural area in the far northeast corner and the MACCRAY School District covers the eastern part of the county, which includes Clara City and Maynard.

Table 3.13 Chippewa County Schools

Chippewa County Schools	Locations
Montevideo Senior High School	Montevideo
Montevideo Middle School	Montevideo
Ramsey Elementary Schools	Montevideo
Sanford Education Center	Montevideo
Minnesota Valley Learning Center	Montevideo
Wildwood Montessori School	Montevideo
MACCRAY School District	Clara City
Heritage Plains Christian Academy	Montevideo
Wildwood Montessori Preschool	Montevideo
KMS Public Schools (no facility in Chippewa Co.)	Kerkhoven, Murdock
Lac qui Parle Valley (no facility in Chippewa Co.)	Appleton, Madison, Rural area between Appleton/Madison
Yellow Medicine East (no facility in Chippewa County)	Granite Falls
Benson Public Schools	Benson

3.7.2 PUBLIC FACILITIES

Public Facilities include city and town halls, county courthouse, libraries, parks, churches and historic resources. These places provide both public services and create an important sense of community character. Most public facilities are located in the cities. However, there are parks and wildlife management areas located in the rural areas of the county.

Table 3.14 Chippewa County/City Facilities

Clara City	Located in Floodplain?	Higher than average vulnerability to other disasters?	Why?
City Hall /Community Center/Fire Department	No	Terrorism	Government facilities are sometimes more of a target of terrorism.
Public Library	No	No	Public facility
Swimming Pool	No	Lightning	Pool guests may be vulnerable to lightning strikes if not warned.
Community Hall	No	No	Public gathering space
Nursing Home	No	Various disasters, evacuation of residents may be challenging	While structures are structurally sound, evacuating or sheltering the vulnerable population (elderly) could pose a challenge
Water Treatment Plant	No	Lightning (slight)	Lightning strikes can take out the power/electronic components of the facility.
Wastewater Plant	No	Lightning (slight)	Lightning strikes can take out the power/electronic components of the facility.
MACCRAY School District (Grades PS-12)	No	Wildfire, terrorism (very slight)	School has grassland adjacent. Schools have become more susceptible to violence in recent years
Maynard			
Maynard City Hall/Library/Community Center	No	Terrorism	Government facilities are sometimes more of a target of terrorism.
Water tower	No	Terrorism (slight)	Water supply
Water treatment facility	No	Lightning (slight)	Lightning strikes can take out the power/electronic components of the facility.
Wastewater treatment facility	No	Lightning (slight)	Lightning strikes can take out the power/electronic components of the system.
Maynard Event Center	No	No	Community gathering space
Milan			
Fire Hall/City Hall	No	Terrorism	Government facilities are sometimes more of a target of terrorism.
Public Library	No	No	Public gathering space
Milan Village Arts School	No	No	Cultural facility
Montevideo			
City Hall/Police Department	Yes**	Terrorism	Government facilities are sometimes more of a target of terrorism.
Fire Department	No	No	Emergency facility/equipment
Chippewa County Courthouse	No	Terrorism	Government offices tend to be higher target for terrorism
Historic Chippewa City	Yes	Strong winds/tornados	Buildings are old and may be more susceptible to strong winds/tornados
Armory	No	Terrorism	Governmental facility
Wells/water supply	No	Hazardous materials	One well is located near busy highway and may be vulnerable to a potential hazardous materials spill
Community Center/Senior Center	No	Tornado	Facility itself is not more vulnerable, but is used as senior center during the week
Public Library	No	No	Public gathering space
Hospital – CCM Health	No	Tornado, fire, hazardous materials, terrorism	Structure itself is sound, but evacuation or mobilization of patients and guests may be challenging if required
Outdoor Swimming Pool	No	Lightning	Pool guests may be vulnerable to lightning strikes if not warned.
Schools	No	Terrorism (slight)	Schools have become more susceptible to

			violence recently
Water Treatment Plant	No	Lightning (slight)	Lightning strikes can take out the power/electronic components of the facility.
Wastewater Treatment Plant	Yes**	Lightning (slight)	Lightning strikes can take out the power/electronic components of the facility.
Landfill	No	No	Waste disposal facility would need to be operational especially after major storms
**Facilities are located in 2023 FEMA proposed floodplain, but are not in the current map. Once the recently completed levee is certified by ACE, these facilities will not be considered in the 2023 proposed floodplain.			
Watson			
Watson City Hall/Community Center	No	No	Public gathering space
Watson Town Hall	No	No	Public gathering space, City Hall
Pump House and wells	No	Lightning (slight)	Lightning strikes can take out the power/electronic components of the facility.
Wastewater lift station	No	Lightning (slight)	Lightning strikes can take out the power/electronic components of the system..
Rural Chippewa County			
Swensson Farm Museum	No	Windstorm, tornado, lightning	Buildings are old and may be more susceptible to strong winds/tornados. Guests may also be vulnerable to thunderstorms if outside.
Lac qui Parle Mission	No	Windstorm, tornado, lightning	Building is old and may be more susceptible to strong winds/tornados. Guests may also be vulnerable to thunderstorms if outside.
Chippewa County Park #1	No	Wind, tornado	Campers outdoors
Chippewa County Park #2	Yes	Wind, tornado	Campers outdoors
Lac qui Parle State Park Upper Campground	No	Wind, tornado	Large groups of people outdoors
Lac qui Parle Mission	No	Wind, tornado	Historic structure, cultural significance.

3.7.3 TRANSPORTATION

Roads

Chippewa County is well served by an extensive roadway network that connects the county with the rest of the region and Minnesota. State, county, township, and city roads are all included in the roadway network. It is the primary means of transportation for both goods and people within and out of the county. A map of the Chippewa County Transportation system can be found in Appendix 1.

Trunk Highway System

Chippewa County has five Minnesota State Trunk Highways: 7, 23, 277, 40 and 29, and two U.S. Trunk Highways: 212 and 59/7. Highway 59 is considered a U.S. Trunk Highway, but where Highway 7 joins 59 in Montevideo, 59 is considered a State Highway. These roads are constructed and maintained by the Minnesota Department of Transportation (MnDOT). Chippewa County has 6.8 miles of US Highways and 126 miles of State Highways.

County Roads

These roads are established, constructed and improved by the County Boards. They are under the sole authority of the County Board and stretch to 53.7 miles. There are currently 244 miles of County State-Aid Highways under the jurisdiction of the County.

Township Roads

A road established by and under the authority of the township board or reverted to township jurisdiction by the County Board. These roads are constructed and maintained by township boundaries and Chippewa County contains 706.9 miles of township roads.

City Streets

These roads serve as direct access from residential properties and/or commercial establishments and are classified as any street under the jurisdiction of a municipality not otherwise designated as a trunk Highway, County State Aid Street, Highway or County Highway. Municipal streets total 62.2 miles.

Transit

Mass transit is an essential public service to provide for increased capacity on heavily traveled roads, transportation access to disabled persons or those otherwise unable to drive, supports dense land use development, decreases dependence on car use, and helps prevent the creation of additional air pollution from diminished individual car use.

Chippewa County has one large mass transit provider, Prairie Five Rides. Prairie Five Community Action Council, Inc. serves the entire five county region including city systems in seven communities in the five-county service area - Appleton, Benson, Canby, Dawson, Madison, Montevideo, and Ortonville.

Airports

The Chippewa County airport is located in Montevideo. Montevideo airport has a paved runway, 4,000 feet in length and 75 feet wide; and on average, six planes land a day. Montevideo also has a turf runway, 2,361 feet in length and 165 feet wide.

Railroads

Two rail lines operate in Chippewa County, the Burlington Northern Santa Fe (BNSF) line and the Twin Cities and Western Railroad Company (TC&W), mainly for agricultural purposes. The BNSF line operates a class four rail line in the southeastern portion of the county, running on the northern side of State Highway 23 east of Clara City. West of Clara City it continues along through Maynard and passes just northwest of Granite Falls. The BNSF rail line owns approximately 1,626 miles of line (35%) of the total rail mileage in the state. TC&W line is a class three line running along the western edge of the county, parallel to the combined State Highway 7 and U.S. Highway 59 in the northern half of the county until Montevideo, where the rail line continues parallel to the Minnesota River on the north. BNSF runs 16 trains a day at 49 miles per hour and the Twin Cities Western runs two trains a day at 40 miles per hour.

3.7.4 TELECOMMUNICATION AND POWER FACILITIES

Internet, Electric, Gas and Phone

Table 3.15 below identifies the telecommunication and power facilities within Chippewa County.

Table 3.15 Chippewa County Telecommunication and Power Facilities

City	Telecommunication Internet, Cable		Electric	Gas	Phone
Clara City	Clara City Telephone Co.	Mediacom MVTV Wireless	Xcel	Dooleys	Clara City Telephone Co.
Maynard	MVTV Wireless	Mediacom	Xcel MN Valley Co-op	Dooleys	Clara City Telephone
Milan	Federated Telephone Co.	MVTV Wireless	Ottertail Power Company	--	Federated Telephone Co.
Montevideo	MVTV Wireless Charter	Quest	Xcel MN Valley Co-op	Great Plains Natural Gas	Charter Communications
Watson	MVTV Wireless Farmers Mutual Telephone		Xcel	Dooleys	Century Link, Farmers Mutual

MN Valley Electric Cooperative serves most of the rural areas of the county. Xcel Energy serves the far western part of the county including the City of Montevideo and rural areas along US. Highway 59 from Lac qui Parle Lake to just south of Wegdahl. Xcel also serves Clara City and Maynard as well as a small rural area in the southeastern part of the county. Otter Tail Power serves Milan and the far northwestern part of the county. Kandiyohi Power Co-op serves the far northeastern rural portion of the county. And finally, Renville-Sibley Coop Power Association serves a small area of the rural southeastern part of the county.

Radio

There are three FM and two AM radio stations that serve the county. Montevideo has KMGM (FM), KRAM (FM) and KDMA (AM) that provides up-to-date weather readings. Granite Falls has KKRC (FM) and KOLV (AM) that provides up to date weather readings.

3.7.5 SEWER AND WATER SYSTEMS

All cities in Chippewa County have municipal water and sewer systems. The City of Watson recently completed the construction of a new sewer and water system in the city. The wastewater generated by the city of Watson is now pumped to Montevideo for treatment. Residents outside these areas are served by individual wells and septic systems.

3.7.6 EMERGENCY RESPONSE/PUBLIC SAFETY

A county's ability to respond to an emergency situation or event is based on service areas, facilities, and equipment. An understanding of response times and abilities is critical in protecting the citizens of Chippewa County. The existing facilities and equipment in the county are intended to address local needs and support regional needs. Chippewa County is considered a mutual aid county and provides and receives support from adjacent counties. The following summary and description serve as an inventory of the response facilities for Chippewa County.

Medical Facilities

Chippewa County is served by four clinics and one hospital. All Chippewa County medical facilities are identified in Tables 3.17. Three clinics are served by the healthcare providers of the Montevideo Clinic and the VA Clinic has its own staff. Montevideo has two ambulances and Clara City has one ambulance. Granite Falls has three ambulances. The Montevideo ambulances are backed up by the ambulance service in Clarkfield. Both Montevideo and Appleton provide ambulance service for Milan.

Table 3.16 Chippewa County Ambulance Services

Ambulance Services	Number of Ambulances
Clara City	1 ambulance
Granite Falls <i>(provides service to the southern rural area of the county)</i>	4 ambulances, 1 with Advanced Life Support
Maynard	Served by Montevideo and Clara City
Milan	Served by Montevideo and Appleton
Montevideo	3 ambulances, 1 with Advanced Life Support
Watson	Served by Montevideo

Table 3.17 Chippewa County Healthcare Facilities

Clinic Name
CCM Health Hospital and Clinic - Montevideo
CCM Health Clinic - Montevideo
CCM Health Clinic - Clara City
CCM Health Clinic - Milan
Montevideo VA Clinic

Fire Services

There are no full-time fire departments in Chippewa County. All four fire departments within the county are served by volunteer firefighters. The four departments are based in Clara City, Maynard, Milan, and Montevideo. Montevideo Fire Department also provides fire protection for the City of Watson. The Department of Natural Resources (DNR) is responsible for fire protection on state forest and parkland. The DNR and USFWS work closely with local fire units for protection of these lands through contracting agreements. Additionally, all fire departments have mutual aid agreements.

All departments have firefighting vehicles such as pumpers, tankers, grass rigs, UTVs and Montevideo has a ladder truck. For a complete list of vehicles, refer to the Chippewa County Emergency Operations Plan (EOP).

Other equipment available throughout Chippewa County includes personal protection equipment and turnout gear/wetland gear for firefighters, thermal imaging cameras, compressors, containment fill station, and defibrillators.

Emergency Operations Center

Located in Chippewa County Assembly Room in Montevideo, the center provides a point for strategic command for all events in Chippewa County.

The Montevideo City Hall is a back-up EOC. Services available include multiple phone lines, access to internet and fax, and desk space.

Emergency Warning Systems

The Chippewa County Public Service Answering Point (PSAP) is the Chippewa County warning point. The Chippewa County Sheriff has overall responsibility to ensure all notifications received by the warning point are handled properly. The Chippewa County warning points are responsible for proper receipt and dissemination of all emergency notifications. The National Weather Service tower in Appleton and the Marshall NAWAS Warning Point are responsible for disseminating all watches and warnings to the Chippewa County warning point, except warnings for conditions generated within the county itself.

The Chippewa County Warning Point is at the Law Enforcement Center in Montevideo, which has 24-hour warning capability. All cities in Chippewa County have emergency sirens in working condition. All city sirens have battery backup power.

Chippewa County Emergency Management also utilizes the CodeRED emergency notification system. CodeRED allows emergency officials to notify residents and businesses by telephone, cell phone, text message, email and social media regarding time-sensitive general and emergency notifications. Only authorized officials have access to the CodeRED system. Any message regarding the safety, property or welfare of the community will be disseminated using the CodeRED system. These typically include AMBER alerts, notifications of hazardous traffic or road conditions, evacuation notices and severe weather conditions like tornado and blizzard warnings.

Police Departments

Police protection in the county is provided by the Chippewa County Sheriff's Department. Montevideo is the only community with its own police department. Other communities contract with the County Sheriff's Department for police protection as it is not feasible for the smaller communities to fund their own police departments.

Countryside Public Health

Countryside Public Health Services is the County Department of Health for Chippewa, Swift, Lac qui Parle, Big Stone and Yellow Medicine counties. Part of their mission is designed to protect the health of the general population by emphasizing the prevention of disease, injury, disability and death through effective coordination, use of community resources, and provide education, training, WIC program, disease prevention and control and environmental programs. Countryside Public Health has the ability to respond to health emergencies and is part of the Medical Reserve Corps (MRC) for volunteers, which is part of a nationwide initiative to pre-register, manage, and mobilize volunteers to help their communities respond to all types of disasters.

Heavy Equipment Inventory

The County Highway Department as well as Clara City, Milan and Montevideo have equipment that can be used in case of an emergency from tornados to floods. For a complete list of available equipment, refer to the County's Emergency Operation Plan.

3.7.7 PROPERTY

Land Uses

Land uses are regulated in Chippewa County through county ordinances. Cities in Chippewa County have zoning ordinances that regulate the building construction and location of manufactured home parks. The cities of Clara City, Maynard, Milan, Montevideo, and Watson have also adopted zoning ordinances. The County Zoning Ordinance requires 30' (in the Scenic Sub-District) and 20" (in the Recreational Sub-District) setbacks from bluff-lines to prevent potential adverse erosion.

Manufactured Home Parks

There is one manufactured home park (Northdale Estates) in Chippewa County located on the north side of Montevideo. Manufactured home parks are allowed as a conditional use and must follow guidelines as set forth in the Chippewa County Ordinance Code.

Current Codes

Chippewa County has a floodplain ordinance adopted in 1993 and amended in 1997. The floodplain ordinance regulates permitted uses and development in the 100-year floodplain. Montevideo and Clara City have also adopted floodplain ordinances.

Montevideo and Granite Falls have adopted the universal building code. Construction of new buildings in Montevideo and Granite Falls require the use of tie-downs in the foundation in order to withstand high wind conditions. Montevideo also requires roof tie-downs. Other cities and the county do not regulate the use of tie-downs.

Chapter 4 HAZARD PROFILES

This plan discusses both Natural Hazards as well as Manmade Hazards. To identify what hazards to include in this plan, the planning committee began by evaluating the list of hazards identified in the 2019 Minnesota State Hazard Mitigation Plan and determining if each could pose a threat to Chippewa County.

While FEMA only requires jurisdictions to evaluate natural disasters, the County also decided to include technological or human-caused hazards in the original hazard mitigation plan and subsequent updates and thought it would be beneficial to continue to include them in this update as well, so they are also addressed in this plan. It should be noted that since these hazards are not required to be addressed by FEMA, they are not eligible for funding assistance through FEMA's Hazard Mitigation funding programs. However, it is possible there may be additional funding sources through other local, state, and federal programs depending on the identified strategies and projects.

The hazard inventory chapter is divided into two parts: Natural Hazards and Manmade/Technological Hazards, as defined by the Minnesota State Hazard Mitigation Plan.

Natural Hazard – Definition

Natural hazards are those presented by the physical world, rather than those presented by humans. In a natural hazard, there is an interaction between the physical world, the constructed environment, and the people that occupy them. Natural Hazards are primarily atmospheric or geologic.

Manmade/Technological Hazard – Definition

Technological hazards are those presented by humans, rather than those presented by nature. They are comprised of substances and processes that are flammable, combustible, explosive, toxic, noxious, corrosive, oxidizers, irritants, or radioactive.

Using the MN State Hazard Mitigation Plan's list of disasters as a starting point, the following Natural and Manmade/Technological disasters were considered to be included in this plan. Those disasters that are **bolded** below were included in this plan update. Those that were omitted were not considered to be threats to the County by the planning committee due to very limited probability or complete absence or probability. The 2015 plan document discussed "Violent Storms/Extreme Temperatures" which included windstorms, tornados, hail, extreme heat/cold, lightning, and winter storms. This update evaluated each disaster separately to stay consistent with the State of Minnesota's plan format.

1. **Flooding**
2. **Wildfire**
3. **Windstorms** (previously included under Violent Storms/Extreme Temps)
4. **Tornadoes** (previously included under Violent Storms/Extreme Temps)
5. **Hail** (previously included under Violent Storms/Extreme Temps)
6. **Dam/Levee Failure**
7. **Extreme Heat** (previously included under Violent Storms/Extreme Temps)
8. **Drought**

9. **Lightning** (*previously included under Violent Storms/Extreme Temps*)
10. **Winter Storms** (*previously included under Violent Storms/Extreme Temps*)
11. **Erosion, Landslides and Mudslides**
12. Coastal Erosion and Flooding (excluded as hazard is not present)
13. Land Subsidence (Sinkholes and Karst) (excluded as hazard is not present)
14. **Extreme Cold** (*previously included under Violent Storms/Extreme Temps*)
15. Earthquakes (excluded due to extremely low probability)
16. **Infectious Diseases**
17. **Structural Fire**
18. **Hazardous Materials**
19. **Water Supply Contamination**
20. **Wastewater Treatment System Failure**
21. **Civil Disturbance/Terrorism**

The planning committees in each of the communities as well as the County planning committee performed a hazard analysis using the **Calculated Priority Risk Index**. This method considers the probability, vulnerability, warning time and duration of each disaster and assigns a weighted value to each category. The previous plan used a similar scoring method without the weighted values. The County felt it would be good to reevaluate the hazards to see if any priorities have changed since the original scoring exercise was done. The following table gives the definitions of the categories and their weighted values. (Individual communities' hazard analyses can be found in Appendix VI.)

A jurisdictional capabilities assessment was also conducted by each of the cities and county to review the plans and programs that are in place for the implementation of mitigation efforts, as related to each natural hazard. An assessment was also conducted for local jurisdictions to identify the plans, policies, programs, staff, and funding they have in place to incorporate mitigation into other planning mechanisms (see Appendix IV).

Calculated Priority Risk Index (CPRI) Definitions

CPRI Category	Degree of Risk			Assigned Weighting Value
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of events. Annual probability of less than 0.001	1	45%
	Possible	Rare occurrences with at least one documented or anecdotal historic event. Annual probability that is between 0.01 and 0.001.	2	
	Likely	Occasional occurrences with at least two or more documented historic events. Annual probability that is between 0.1 and 0.01	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability that is greater than 0.1.	4	
Magnitude/Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). Injuries or illnesses are treatable with first aid and there are no deaths. Negligible quality of life lost. Shutdown of critical facilities for less than 24 hours.	1	30%
	Limited	Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability and there are no deaths. Moderate quality of life lost. Shut down of critical facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least one death. Shut down of critical facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and multiple deaths. Shut down of critical facilities for more than 1 month.	4	
Warning Time	More than 24 hours	More than 24 hours	1	15%
	12 to 24 hours	12 to 24 hours	2	
	6 to 12 hours	6 to 12 hours	3	
	Less than 6 hours	Less than 6 hours	4	
Duration	Brief	Up to 6 hours	1	10%
	Intermediate	Up to 1 day	2	
	Extended	Up to 1 week	3	
	Prolonged	More than 1 week	4	

Table 4.1 Chippewa County Hazard Analysis Results, 2022-23

Hazard/Disaster	Probability (45%)	Magnitude/ Severity (30%)	Warning Time (15%)	Duration (10%)	Weighted score
Natural Disasters					
Windstorms	3	3	4	1	2.95
Hail	3	3	4	1	2.95
Extreme cold	4	2	1	3	2.85
Winter storms	4	2	1	3	2.85
Tornados	2	4	4	1	2.8
Dam/Levee Failure	1	4	4	4	2.65
Drought	3	2	1	4	2.5
Flooding	2	3	2	4	2.5
Extreme Heat	3	2	1	3	2.4
Lightning	3	1	2	1	2.05
Wildfire	1	2	4	3	1.95
Erosion, landslides, and mudslides	1	1	1	3	1.2
Coastal erosion and flooding	N/A – Were not considered to be threats to the County.				
Land subsidence (sinkholes/Karst)					
Earthquakes					
Human Caused Disasters					
Hazardous materials incident	3	3	4	3	3.15
Water supply contamination	2	4	4	4	3.1
Structural Fire	3	3	4	2	3.05
Wastewater treatment failure	2	3	4	4	2.8
Infectious diseases	2	3	3	4	2.65
Civil disturbance/terrorism/ Cyber attack	2	2	3	2	2.15

Hazard Priority Risk Ranking Categories	
Score	Priority Level
3.0-4.0	High
2.0-2.99	Moderate
0-1.99	Low

Overall, wind, hail, extreme cold, winter storms and tornados ranked toward the top of the Moderate category for natural disasters while hazardous materials, water supply contamination, and structural fire scored as High priorities for the Technological disasters. This exercise was used as a tool for the County and local planning committees to use when considering strategies and priorities.

Changes in Development

With each plan update, it is important to identify any new areas of development that may be vulnerable to disasters that may need to be addressed by additional strategies.

Clara City

Clara City's future growth area for development was identified north, south, and far south of the city. On the north end of the city lies Hawk Creek Acres, with 20 lots available for residential development, with nine new houses built. To the north of that a new assisted living facility was built. South of the city is the Hanson Addition, with ten lots open for residential development and five homes built. Lastly, far south of Clara City, agricultural land is available for future development behind Donner's Crossroads.

Maynard

Maynard's future potential growth areas for development have been identified in three general areas. The first is located along the railroad to convert agricultural lands to industrial and residential. The second area is south of Highway 23, that is primed for industrial expansion. The final area is within the municipal boundary of Maynard and encouraging residential infill throughout the city.

Milan

Milan's future growth area for development was identified by Milan staff as south of the existing city infrastructure, south of State Highway 40. This would most likely be residential development on open agricultural land. However, while there is a need for new housing in the community, it is currently not feasible without some form of financial assistance and as such, there are no immediate plans for development.

Montevideo

Montevideo's future growth area for development as identified by Montevideo staff are located in the northeast quadrant of the City, lots adjacent to Highway 7, land along 24th Street and Ashmore Avenue, and Williams Avenue in the southeast. The lots in the northeast should see growth in commercial and industrial areas, with residential and light industrial areas in the southeast part of the community along Williams Avenue and 24th Street and Ashmore Avenue in the eastern part of Montevideo, north of Highway 7. This area in the southeast part of the community will see the addition of a New Veterans Administration Home in with 72 units and approximately 160 employees. This location is near the main public school campus, National Guard Armory and residential area.

Watson

Watson's future growth areas for development (as identified by Watson staff) remain the northeast, southeast, and southwest corners of the municipal boundary. The City has no land available within city limits and the development areas would be slated for residential homes.

4.1 FLOODING

A flood is defined as an overflowing of water onto an area of land that is normally dry. For floodplain management purposes, the Federal Emergency Management Agency (FEMA) uses the following definition of “100-year or 1 percent flood.” There are three types of flooding included in this section – riverine flooding, flash flooding, and ice jam floods.

Riverine flooding is also known as overbank flooding and involves water rising out of the banks of streams and rivers.

Flash flooding typically occurs near streams, ponds, and low-lying areas. The flooding is caused by extreme amounts of rainfall in a short timeframe with significant runoff. Warning time for flash flooding is typically minimal.

Ice jam floods occur in the spring of the year during snow melt and can be accelerated by early spring rains. Large chunks of ice and debris can get lodged when water flow is restricted, thus causing the water flow to back up in the waterway.

The term “100-year flood” is the annual one percent chance that water levels will reach or exceed a defined flood elevation threshold. Thus, a 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within a special flood hazard area shown on a map has a 26% chance of suffering flood damage during the term of a 30-year mortgage. One hundred-year floodplains have been identified, mapped and used for further analysis using the county’s Geographic Information Systems (GIS).

Floods generally occur from natural causes, usually weather-related, such as a sudden snowmelt, often in conjunction with a wet or rainy spring or with sudden and very heavy rain falls. Floods can also result from human causes such as a dam impoundment bursting. Additional water hazards considered in this section include flash floods, washouts, and ice freezes that have potential to affect dams and culverts. In the spring of 2009 and 2010, a great amount of water overflowed roads causing a major washout and road closures throughout the county.

At the time of this plan, FEMA was in the process of updating the County’s floodplain maps. There has been continued discussion about the accuracy of the maps, specifically within the city of Montevideo and unincorporated areas of the County. As mentioned elsewhere in this plan, the City of Montevideo recently completed a levee project around their wastewater treatment facility near the Minnesota River. This levee was designed to hold back flood waters of a 1% event or more and therefore, protect properties to the south and east of the levee. However, with the levee being recently completed, it has not yet been officially certified by the U.S. Army Corps of Engineers and therefore, the proposed flood maps do not acknowledge its protection. The City and County would like to delay adoption of the new maps until the levee can be certified and at which time the maps can accurately show the redefined floodplain areas. In addition, there are also numerous new floodplain areas throughout the rural area

that were not identified in previous versions of the maps and may impact future land use if inaccurate. The County and landowners would like to continue to discuss the accuracy of these new areas with state and federal officials before the maps become official. (See map of proposed floodplain areas in Appendix V.)

Participation in National Flood Insurance Program

The National Flood Insurance Program enables property owners to purchase flood insurance. In return, communities agree to adopt and implement local floodplain management regulations that contribute to protecting lives and reducing the risk of new construction and substantial improvements from future flooding. The following table shows the jurisdictions that currently participate in the NFIP in Chippewa County.

Table 4.2 National Flood Insurance Program Participants in Chippewa County

Jurisdiction	CID	Initial FHB Identified	Initial FIRM	Current Effective Map Date	Reg Emer Date
Chippewa Co.	270066#	4/20/1979	6/17/1986	5/19/1987	6/17/1986
Clara City	270067	5/17/1974	N/A	NSFHA	6/8/2004
Granite Falls	270068A	11/16/1973	4/1/1977	10/7/2021	4/1/1977
Maynard	270587	11/15/1974	-	11/15/1974	3/10/11E
Montevideo	275243	-	5/26/1972	8/29/1975	5/26/1972
Communities NOT Participating in NFIP					
Jurisdiction	CID	Initial FHB Identified	Initial FIRM	Current Effective Map Date	Reg Emer Date
Milan	270589#	11/1/1974	-	7/15/1977	11/1/1975

Source: FEMA Community Status Book, 2022

“E” = Emergency entry into the program

“NSFHA” = No Special Flood Hazard Area – all Zone C

Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the National Flood Insurance Program (NFIP). Over 1,500 communities participate nationwide.

In CRS communities, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community’s efforts that address the three goals of the program:

1. Reduce and avoid flood damage to insurable property
2. Strengthen and support the insurance aspects of the National Flood Insurance Program
3. Foster comprehensive floodplain management

Granite Falls and Montevideo are currently the only cities in Chippewa County that participate in the Community Rating System.

Table 4.3 Communities Participating in the Community Rating System

	CRS Entry Date	Current Effective Date	Current Class	% Discount SFHA	% Discount Non-SFHA	Status
Granite Falls	5/1/2013	10/1/2020	10	0	0	Retrograde
Montevideo	5/1/2010	10/1/2020	6	20%	10%	Cycle

Source: FEMA

FEMA mandates that all communities participating in the NFIP must identify continued compliance with the program. The following are descriptions of Clara City, Montevideo, and Chippewa County processes for continued compliance.

Clara City

Clara City does not currently have any designated flood hazard areas, however the **proposed** flood zone map recently released by FEMA depicts areas adjacent to Hawk Creek on the eastern side of the community to become Flood Zone A. At this time, almost none of the community's existing development is expected to be in critical areas. Some undeveloped areas could be flood prone. Once the new maps are published, the City (and Planning Commission) will develop a new flood plain ordinance to regulate all areas within the city. City Administrator Steve Jones is a Certified Flood Plain Manager and will work with the Planning Commission and City to draft an appropriate plan.

In 2023, the City completed two small flood control projects that helps to manage two flood prone areas (Wachtler Avenue and the Main Lift Station), and recent high water events in 2023 were better managed than in the past.

Below are three strategies that Clara City intends to complete as methods to continue compliance with the National Flood Insurance Program.

Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps.
2. Work with the MN DNR on a new Flood Plain Ordinance.
3. Discourage development in "flood-prone" areas.

Maynard

The City of Maynard was entered into the NFIP on November 15, 1974. City staff was not aware of a floodplain ordinance currently in place. Information about the State of Minnesota's NFIP program, DNR contact person, and sample floodplain ordinances were shared with the City. The current Zone A floodplain in Maynard is undeveloped and is unlikely to be developed in the near future, if ever. However, the City may want to consider adopting a floodplain ordinance to have the ability to regulate these areas and prevent future flood damage.

Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps.

2. Work with the MN DNR NFIP Coordinator or Floodplain and Shoreland Planner to adopt a new Flood Plain Ordinance.
3. Discourage development in “flood-prone” areas.

Milan

Milan has a flood hazard area identified within their community and has been mapped by FEMA, but is not currently a participant in the National Flood Insurance Program. City officials indicated they have not participated in the NFIP due to the fact that the area of the community (eastern side) that is mapped would likely never be developed and the western half of the community (west of U.S. Highway 59), including future development areas is on higher ground that has never had flooding problems.

Montevideo

The City of Montevideo utilizes digital FIRM maps dated August 29, 1975 to illustrate the location of 100 and 500-year floodplain boundaries within municipal limits. In order to prevent development in the 100-year floodplain, Montevideo passed a Floodplain Management Ordinance in September of 1989. The process that Montevideo uses to monitor potential development in the floodplain is through tracking building permits. The City educates all potential development applicants that development in the 100 and 500-year floodplains is very difficult to attain and many applicants do not move forward with the building permit application. If an applicant decides to continue the permit application, they would fill out a building permit application and included on the permit is an area for the Zoning Administrator to review and make comments. In this space, the Zoning Administrator would identify whether a property is located in the 100 or 500-year floodplain. If the site is in the designated floodplain, the application is sent to the DNR Area Hydrologist for review and comment. If the applicant continues and applies for a zoning variance/conditional use permit/special use permit, the Board of Zoning Adjustment would host a public hearing and make a recommendation to the City Council.

In addition to a strictly enforced Floodplain Ordinance, the City of Montevideo is an active participant in the Community Rating System program facilitated by FEMA. From 2007-2009, Montevideo applied to become part of the program and in November 2009, Montevideo was accepted and initially ranked a Class 5 City. The City currently has a Class 6 rating, as noted above, which allows all property owners that reside in a Special Flood Hazard Area a 20% discount off their flood insurance policy. It also allows a 10% discount off flood insurance policies for those who live in a Non-Special Flood Hazard Area. To maintain their status as a Class 6 Rank, Montevideo must track all flood and insurance-related questions and enforce the 50% improvement rule (properties in the flood zone cannot be improved 50% beyond their value).

Montevideo has extended numerous efforts to educate citizens regarding flood protection. The City created a handout “Flood Protection Information” that gives background on the city’s flooding history, discusses learning if a property is located in a floodplain, mandatory purchase requirements for flood insurance, and provides additional information on Flood Information Rate Maps, elevation certificates, historical flooding data, zoning maps, building permit requirements in flood zones, and a comprehensive list of flood related resources. Further, Montevideo works with residents that live in floodplains by

providing information on depth of flooding over a building's first floor, past flood problems in the area, copies of elevation certificates on buildings built past 1997, flood-proofing, and will visit properties to review its flood problems and explain ways to stop flooding or prevent flood damage. These services are offered free of charge.

Below are six strategies that the City of Montevideo intends to complete as methods to continue compliance with National Flood Insurance Program.

Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps.
2. Work with the MN DNR to review and update the Floodplain Management Ordinance as required.
3. Work with the MN DNR on all development applications in identified Flood Hazard Areas.
4. Discourage zoning variances in Flood Hazard Areas.
5. Encourage all property owners in Flood Hazard Areas to purchase flood insurance.
6. Continue to comply with Community Rating System requirements.

Chippewa County

Chippewa County utilizes digital FIRM maps dated August 1975, to illustrate the location of 100 and 500-year floodplain boundaries within the unincorporated areas of the county. To prevent future development in the 100-year floodplain, Chippewa County passed a Floodplain Management Ordinance (last amended in June 1997) that is actively updated as the MN DNR instructs. The permitting process in Chippewa County is quite extensive. A permit application is completed by an applicant and is reviewed by the Zoning Administrator. The Zoning Administrator reviews the digital FIRM maps to determine whether a property is in the floodway and what type of use the applicant proposes. If the permit is for a permitted use in the floodway, the permit goes to the Planning Commission and later the County Commission for approval. If the use is not permitted, the responsibility falls to the applicant to hire a surveyor and get elevation data of the property and submit the information to FEMA. The purpose would be to attain a document from FEMA to determine whether or not the property is in the floodplain. If this ruling is made, then the application is routinely processed. If the ruling is not made, the applicant may apply for a conditional use permit with additional standards determined in the Floodplain Management Ordinance; and must be approved by both the Planning Commission and County Commission.

In addition to a Floodplain Management Ordinance, Chippewa County's 2013-23 Water Plan also identifies a need to prepare the County against the impacts of flood events. The Water Plan Committee created three specific goals related to flooding (Goals 6, 7, and 8). These goals are specifically related to soil erosion (wind and water), stormwater management and shoreland protection. Further, the County supports no-net-loss of wetlands, promotes voluntary restoration of drained wetlands, may accept and

process eligible applications for wetland preservation on a countywide basis (wetland exempt from property tax), and will create a GIS layer of the SWCD Wetlands Inventory. Finally, the County intends to work with the Buffalo Lake Dam to continue assisting with water retention (raising water levels when water is low and dropping during high water volumes).

Below are five strategies that Chippewa County has committed to in order to continue with NFIP compliance. (The County plans to review and update their strategy and review process once the new flood maps are officially updated in the near future.)

Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps.
2. Work with the MN DNR to review and update the Floodplain Management Ordinance as required.
3. Work with the MN DNR on all development applications in identified Flood Hazard Areas.
4. Discourage zoning variances in Flood Hazard Areas.
5. Encourage all property owners in Flood Hazard Areas to purchase flood insurance.

4.1.1 HISTORY

The most severe flooding in Chippewa County occurs along the Chippewa and Minnesota Rivers when there is excessive rainfall, ice blockage of the channel, and/or rapid spring snow melt. Ice jams in eastern Granite Falls contribute to significant spring flooding. Flood damage may also result from improperly maintained or undersized ditches, excess drainage in the upper reaches of the watershed, or lack of upland retention structures. Hawk Creek and Shakopee Creek experience flooding problems whenever rainfalls exceed 4.5 inches. Major effects of excessive rainfall are flooding of agricultural lands and road washouts. According to estimates by the US Army Corp of Engineers, Soil Conservation Service, and FEMA, there are approximately 9,391 acres in the 100-year floodplain and 70.57 acres in the 500-year floodplain in Chippewa County.

In 1997 and 2001, the Minnesota River floodwater was high enough to affect many business districts and homes within Chippewa County, including Montevideo and Granite Falls. Both flood events were considered 100-year floods.

Hawk Creek Flooding

Hawk Creek flows through parts of Clara City and Maynard. In the 1950s, parts of Hawk Creek were channelized as a part of a USDA Flood Reduction project to help speed the flow of water and reduce flooding. This worked at a local level to control flooding, but the faster flows may have increased flooding downstream.

It should also be noted that the City of Willmar, in neighboring Kandiyohi County, discharges three million gallons of effluent daily from its wastewater treatment plant into Hawk Creek. During rain events, it has reached as high as seven million gallons per day. During flood events, there is an EQ basin which can hold one million gallons.

Montevideo Flood History

Montevideo sits at the confluence of the Chippewa and Minnesota Rivers. During the major flood events, such as those in 1997 and 2001, the Chippewa River actually started to flow backwards because of the high waters of the Minnesota River. Businesses and residences in the Smith Addition have been flooded during these major events. Over 100 homes have been bought out and about 12 remain. One commercial business was moved after the 1997 floods. The remaining 10 businesses in jeopardy of being flooded want relocation or better protection.

In 2009, Montevideo began to raise its existing levee system. The U.S. Army Corps of Engineers had studied the effects of this change in terms of how this may change where floodwaters threaten homes or businesses. This extensive project was recently completed in 2023 and will protect the wastewater treatment facilities and properties downstream. Flood events happen periodically in the city, but these smaller floods do not cause damage. City crews usually respond by making sure pumps and all flood proofing are working properly. Other large flood events that caused damage happened in 1952 and 1969. In 1993, Montevideo was able to avoid damage through constant pumping at a cost of \$118,482. In 1997, the city spent \$1 million for flood fighting efforts and cleanup. FEMA reimbursed the city \$729,000. In 2001, the city spent about one million for flood fighting efforts and cleanup. FEMA reimbursed the City \$712,000.

More recently and since the last plan update, the City of Montevideo has completed additional flood mitigation projects. These projects were funded by the MN DNR Flood Hazard Mitigation Grant Assistance Program and federal funds and are summarized below.

Table 4.4 Montevideo MN DNR Flood Hazard Mitigation Grant Assistance Program Awards, 2014-2020

Year	Project type	Award Amount
2014	Buyout	\$10,400
2014	Levee project	\$2,700,000
2017	Buyout	\$10,025
2017	Levee project	\$450,000
2018	Buyout	\$13,500
2018	Federal Flood Control Project (levee project)	\$2,788,132
2020	Final phase – federal flood control project	\$2,500,000

Source: MN DNR, 2023

Milan Flood History

On March 23, 2009, approximately one mile southwest of Milan, a township road was washed out. Local rainfall totals varied from two to three inches before the storm moved north. Along with heavy rainfall and thick ice remaining on streams, creeks, and rivers, ice jams developed and caused flooding of roads and local communities. Several major rivers rose during this time period and caused additional road closures and some minor property damage.

Maynard Flood History

Maynard has three bridges that hold back ice that causes flooding. In 1997, the city was reimbursed \$12,686 from FEMA for flood fighting efforts, cleanup and repair. In 2001, the city was reimbursed \$16,639 from FEMA.

In June of 2014, Maynard experienced some flash flooding resulting from several rounds of thunderstorms passing through the area. Each round of storms produced one to two inches of rainfall and totaled four to six inches producing widespread areas of flooding and flash flooding. It was reported that there was approximately four feet of water over 90th Street SE south of Maynard. Several basements were flooded in the northern part of the community from Amy Street to Ruth Street and north to Jessie Avenue. Some homes on the south side of town near Swift Avenue also reported basement flooding.

Clara City Flood History

Currently, flooding is caused by ice jams that occur along Hawk Creek at bridges in Clara City. Out of the five bridges in Clara City, one bridge has a history and potential to cause ice jams resulting in flooding. In 1997, Clara City was reimbursed \$24,008 from FEMA for flood fighting efforts, cleanup and repair. In 2001, the city was reimbursed \$14,479. More recently in 2017, the City received \$46,000 for storage and floodproofing infrastructure.

Recent Flooding Events (since 2015)

UPCOMING EVENTS

Wednesday, May 30th: Montevideo Farmers Market meeting at the Montevideo Public Library. Large meeting room at 4 p.m. New vendors are welcome along with customers.

Saturday, May 12th: Mother's Day Tea Party at the Chippewa County Historical Society Village Hall 2 p.m. Come dressed in your finest for tea served from antique teacups, sandwiches and events. There will also be a fashion show featuring antique clothing. Space is limited. To purchase a spot call 120-260-7616 and leave a voicemail or email chippewahistorical@gmail.com.

Saturday, April 29th: Prairie Arts Council "The Journey Home" Bluegrass and Country Roads concert. Prairie Arts Council is an adult choir from southwest Minnesota performing around the region since 1980 under the direction of Dan Hargrove and Kate Davidson. Concert held at United Methodist Church at 7:30 p.m. Tickets at the door or in advance at prairiearts.org.

Citizens appeal to council for support on trail
Jessica Sillen-Jacobson
Editor
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At last week's meeting of the Montevideo City Council, a number of citizens attended to express their hopes that the City would get behind a project for the Lake Snoopy Loop Trail. Bill Paulding spoke, noting that the project has been proposed by Geoff Hathaway, President of the Minnesota Trails Initiative. Hathaway has already had engineering work done on the project, with plans prepared and ready for the work to begin if financing and support can be found. Paulding, also a Chippewa County Commissioner, thanked the council for working with the county on recent projects such as the Hwy 17 and County Road 15 Safe Road Crossing project. "By the two firms of government working together, we were able to get that grant," he says. Paulding also noted that the Lake Snoopy Loop Trail Project could be an addition to not only that safety project but the safe route to schools projects. He also presented the council members with packets of letters from local community members in support of the idea of the project.

Paulding noted that with the Chippewa County Commissioners and Milan City Council working together on a bike trail from Milan Beach to Milan, both entities have contributed money to a fund for the maintenance of the trail. "So when the project needs maintenance, which all of those projects do, and that's the biggest scariest thing for anybody to take this on is who gets pined with that, but we've collaborated together and have that set up. And Jimmy, See COUNCIL. A4

State of Emergency declared for Montevideo, Chippewa County
At last Tuesday's meeting of the Chippewa County Board of Commissioners, the board passed a resolution declaring a State of Emergency for Chippewa County because of the damage in various parts of the county caused by flood waters. This Monday evening, the Montevideo City Council also passed a resolution declaring a State of Emergency for Montevideo for the same reasons. The declarations will allow the County and City to obtain funding available from the state for repairs needed because of flooding. According to the National Weather Service, as of Monday, the flood warning was still in effect for the Chippewa River and Minnesota River, with the flood waters starting to lower on the 21st, and falling from the "Major" level to "Moderate" on the 24th. The Minnesota River was recorded at flood stage 14 feet on Monday. This year's flooding ranked in the top ten flood events in Montevideo's history.

Photo by Jessica Sillen-Jacobson

In August 2016, a severe thunderstorm resulted in heavy rains in west central Minnesota. Approximately 9-10" of rain fell over a two-day span and resulted in severe flash flooding. The estimated amount of damage caused by this event is unknown. Nearby, the community of Willmar advised residents to limit their water consumption as their wastewater treatment facility was overwhelmed.

There have been two Federally-Declared Disaster events related to flooding in Chippewa County since the last plan update. DR-4442-MN was declared in June 2019 from flooding that occurred in March

and April 2019 and most recently, DR-4722-MN in July 2023 from April's flooding.

The significant flooding in late March 2019 occurred approximately five miles northwest of Milan near Lac qui Parle Lake. This was a result of spring snow melt from an above average snowpack for March, coupled with a few rainstorms and resulted in ice jam flooding in the area. This flooding resulted in numerous road closures for several days until flooding subsided, especially along streams and creeks adjacent to county roads.

Most recently, the spring of 2023 resulted in flooding as a result of significant snowfall melt and ice jams. In April 2023, the County Commissioners and Montevideo City Council passed resolutions declaring a state of emergency and allowing them to receive state funding to carry out repairs caused by the flooding. According to the Montevideo American News, the 2023 flooding ranked in the top ten flood events in Montevideo's history. Damage amounts were unavailable at the time of this plan's adoption. This flooding event later resulted in Chippewa County being a Federally Declared Disaster area (DR-4722-MN) on July 19, 2023 as mentioned above.

4.1.2 PROBABILITY

Please refer to the 2023 Flood Hazard Analysis for Chippewa County at the end of this section.

4.1.3 FLOODS AND CLIMATE CHANGE

The Minnesota Department of Health's 2018 Report, *Planning for Climate & Health Impacts in Southwest Minnesota* states that changes in temperature and precipitation have been recorded in Minnesota and across the Midwest. Climate records show that we are experiencing an increase in warmer, wetter conditions as well as an increase in extreme weather events and related natural disasters. Experts expect these conditions to continue well into the future. By mid-century, Minnesotans can expect much warmer winters, more severe summer heat waves, a higher frequency of very heavy rain events and a higher frequency of late growing season drought conditions. Extreme rainfall events will increase flood risk, particularly in floodplain areas, leading to a myriad of other issues and disruptions related to transportation, utilities, and infrastructure as well as lake/stream/river pollution, reduced ag yields and threaten drinking water quality.

Table 4.5 Summary of Expenses from 2019 Flooding

Townships	
Big Bend	\$3,700
Crate	Waiting on assessment
Grace	\$7,820
Granite Falls	\$10,000
Havelock	\$39,000
Kragero	\$7,000
Leenthrop	\$26,000
Lonetree	\$28,755
Louriston	\$1,000
Mandt	\$2,000
Rheiderland	\$1,800
Rosewood	\$3,500
Sparta	\$100,000
Stoneham	Waiting on assessment
Tunsberg	\$500
Woods	Waiting on assessment
Cities	
Montevideo	\$550,000
Maynard	\$1,000
Clara City	\$50,700
Watson	0
Milan	0
Other County Departments	
Drainage Department	\$650,000
Land Resource - Wegdahl	\$5,000
Watson Lion Park/DNR	\$5,000
Highway	\$38,000
Total	\$1,530,775

Source: Chippewa County Emergency Management, 2023

In addition, the Minnesota DNR's publication, "[*Minnesota's Climate is Already Changing, \(2019\)*](#)" there has been a 20% increase in 1" rains, a 65% increase in 3" rains, and the ten warmest and wettest years on record have all occurred in the past 20 years. It also states that "since 2000, widespread rains of more than 6" are four times more frequent than in the previous three decades," with climate projections indicating these heavy rains will continue to increase into the future.

4.1.4 VULNERABILITY

Chippewa County and UMRDC utilized U-Spatial Research Computing of the University of Minnesota-Duluth to conduct a flood hazard analysis of the county and is a required element of local hazard mitigation plans. See complete analysis at the end of this section.

While federal, state and local funding has resulted in the acquisition of 15 repetitive loss (RL) properties in the county (fourth most is the state), there are still 17 repetitive loss properties as well as one severe repetitive loss (SRL) property yet remaining in the floodplain. This places Chippewa county at #6 in the top ten NFIP communities with remaining RL/SRL properties within their jurisdiction.

The 2019 Minnesota State Hazard Mitigation Plan reports that there are 13 state-owned structures remaining in 1% Chance Annual Floodplain areas in the county with an estimated replacement value totaling \$1,116,294. It should be noted that some of these structures or facilities are intended to be located near the floodplain by design. In addition, the database containing state structures was somewhat unreliable for locational accuracy, so all records would need to be located with certainty with high resolution imagery or field visits in order to understand the risk to state-owned structures.

The Chippewa River and Big Bend Cemetery. The bank of the Chippewa River has eroded away during flood events; thus as the river rises higher and faster, banks erode further and further. Some landowners lost many acres of land to the Chippewa River. The Big Bend Cemetery lost land to the river and was in a crisis state as the river moved closer to the Big Bend Lutheran Church Cemetery. The bank was only 15 feet from the nearest known gravesite and the Chippewa River has eroded over 75 feet of its bank in the last 50 years with approximately 25 feet of erosion occurring in the last ten years alone. Preliminary cost estimated of moving the cemetery out and developing a new cemetery was \$1,627,122.75. Seven hundred and forty-one gravesites are within the 100 year-flood level, which is similar to the water levels recorded during the floods of 1997 and 2001. Of those gravesites, 70%, or 519, would require special care, as they were dug prior to 1965 and do not have vaults.

The Army Corp of Engineers collaborated with Chippewa County to protect approximately 900 linear feet of stream bank with riprap protection. Topsoil and seeding were placed over the riprap to establish vegetative protection on the eroded slope. Nearly 8,600 tons of riprap and 1,700 tons of topsoil were placed along the streambank. Chippewa County and the Army Corp of Engineers executed a project agreement on September 29, 2005, and the construction contract was awarded on July 31, 2006. The project ended in November 2006 and with a project cost of \$560,000 dollars.

Salvage Yard. A salvage yard in Chippewa County (near Montevideo) is located in the floodplain. While the building is out of flood danger; the yard has had severe flooding during past events. Debris flow and hazardous material spills during major flood events is a realistic problem. Currently no programs exist to

move and clean up the site, although it is a priority for Chippewa County. Estimates to relocate and clean up the site range from \$350,000 and higher. The site currently has a plan to implement during flood events to protect water quality (elevate items off the ground and from water flow). The project currently lacks funding as well as a new site for relocation.

4.1.5 PROGRAM GAPS OR DEFICIENCIES FOR FLOODS

- The salvage yard near Montevideo needs to be moved out of the floodplain. Currently the project is not financially feasible and a new location has not been secured.
- A few businesses remain in identified 100-year floodplains, including nonconforming structures and uses currently “grandfathered in” in both the county and Montevideo land use plans and ordinances.
- Clara City and Maynard have homes at risk during 100-year flood events and have not fully addressed the 100-year flood risks in its planning and zoning.
- Local resources are not adequate for a severe and prolonged flood and there is a need for assistance from outside the community during an emergency.
- After several rounds of planned buyouts in Montevideo, about 12 homes and 10 businesses still remain in the 100-year floodplain.
- The discharge from the Willmar wastewater treatment plant is released into Hawk Creek. It is believed that because of the warm water, more ice builds up on Hawk Creek, creating a larger issue. More investigation into this issue is necessary.
- DNR forestry staff suggest that the costs and hazards associated with downed trees as debris flow might be mitigated through improved “sanitation cutting” in the floodplain. There are provisions within the Reinvest in Minnesota (RIM) set aside program that allows limited timber cutting on lands enrolled in the program. However, the cutting must be allowed in a timber management plan prepared by a DNR forester. Not all SWCDs and landowners have been utilizing this aspect of the RIM program.

Flood Hazard Analysis for Chippewa County

The following section was prepared by:

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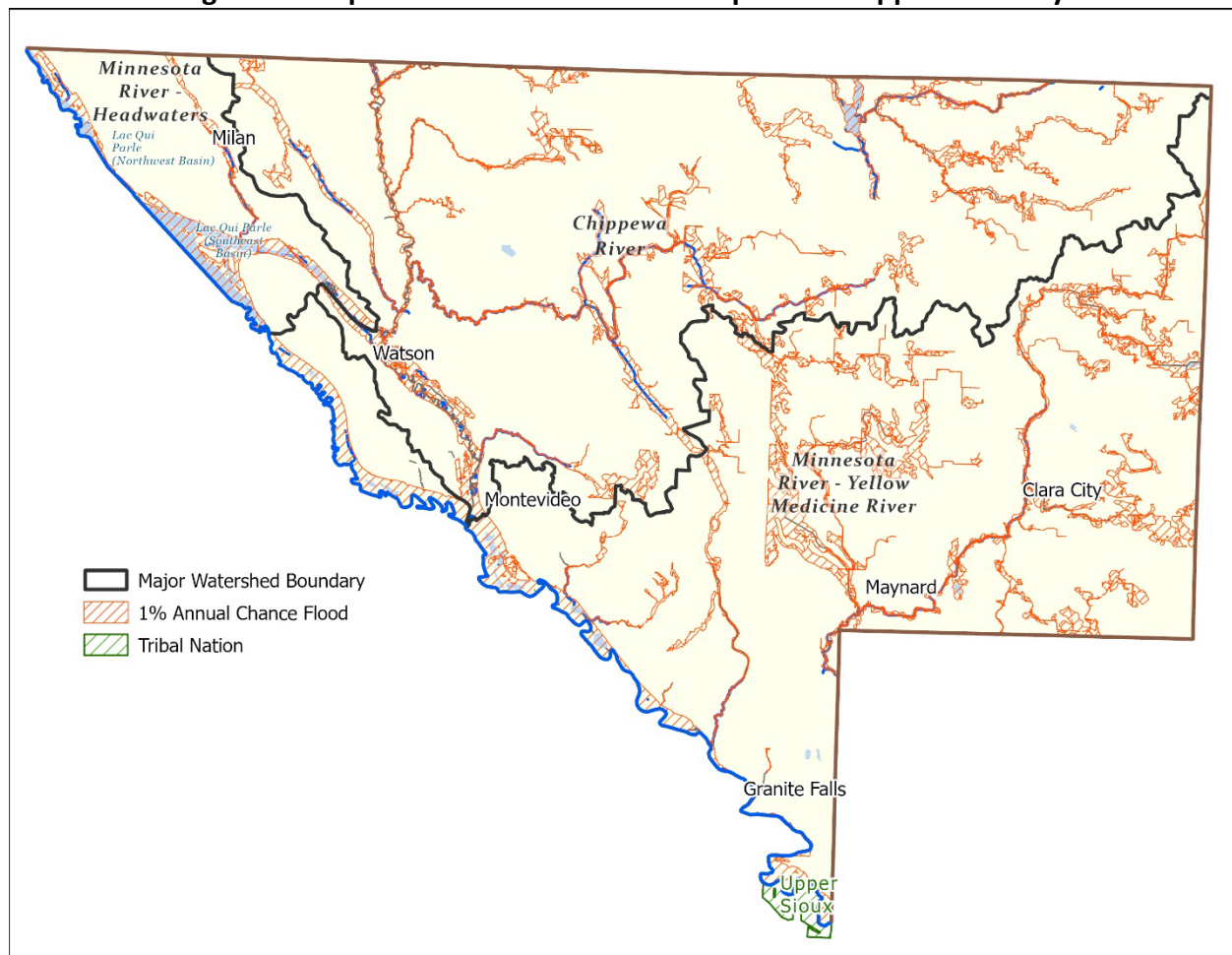
Prepared for: Upper Minnesota Valley Regional Development Commission

Level II Flood Hazard Analysis performed using FEMA Hazus

CHIPPEWA COUNTY HAZUS FLOOD ANALYSIS

A potential risk and economic loss analysis for a 1% annual chance flood was performed using a FEMA tool, Hazus for ArcGIS. A Digital Flood Insurance Rate Map (DFIRM) defined the 1% annual chance flood boundary. Flood cross-section and base flood elevation data were used to generate depth grids where available. The remainder of the county's depth grids were modeled in HAZUS using the EQL method. The resulting Hazus 1-percent annual chance floodplain output is shown in Figure 4.1.

Figure 4.1 1-percent Annual Chance Floodplain in Chippewa County



Source: (MN DNR, 2021a)

VULNERABILITY

Potential economic loss estimates were based on county-specific building data. Chippewa County provided parcel tax and spatial databases that included building valuations, occupancy class, square footage, year built, and number of stories. The quality of the inventory is the limiting factor to a Hazus flood model loss estimation. Best practices were used to use local data and assumptions were made to populate missing (but required) values.

Hazus reports the percent damage of each building in the floodplain, defined by the centroid of each building footprint. After formatting the tax and spatial data, 12,566 points were input to Hazus to represent buildings with a total estimated building plus contents value of \$1.7 billion. Approximately 61% of the buildings (and 55% of the building value) are associated with residential housing.

The estimated loss by occupancy class for the entire county is shown in Table 4.6.

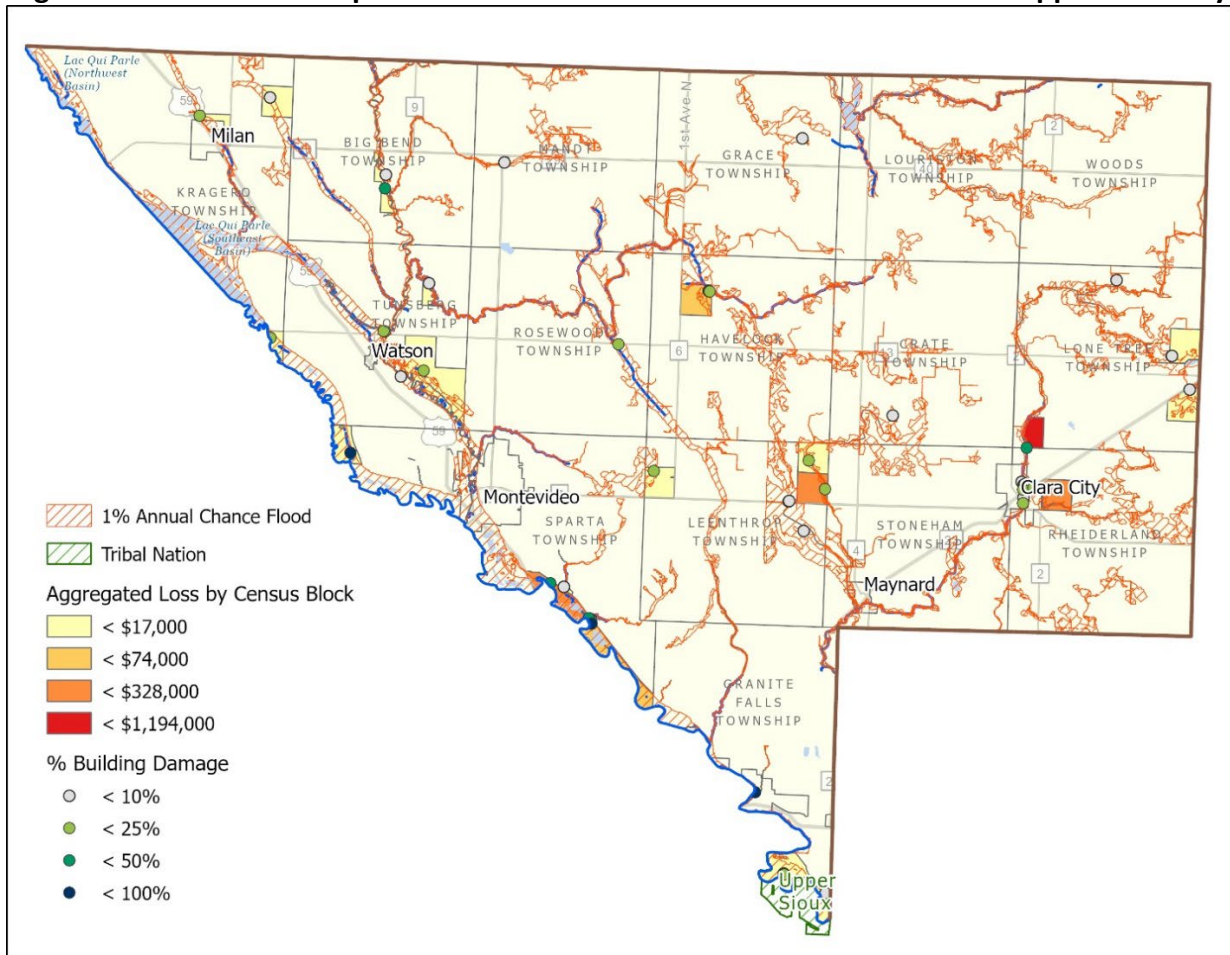
Table 4.6 Summary of 1-percent Annual Chance Flood Loss Estimation by Occupancy Class

General Occupancy	County Total Buildings	County Building and Contents Value	Floodplain Total Buildings	Floodplain Building + Contents Value	Buildings with damage	Building + Contents Loss
Residential	7,603	\$921,242,248	118	\$22,906,950	22	\$1,588,422
Commercial	624	\$257,317,516	113	\$20,340,000	2	\$1,752
Other	4,339	\$484,673,750	56	\$13,481,650	16	\$541,308
Totals	12,566	\$1,663,233,514	287	\$56,728,600	40	\$2,131,482

SOURCE: (FEMA, 2021)

The distinction between building attributes within a parcel was not known, so the maximum percent damage to a building in that parcel was used to calculate loss estimates for the entire parcel. The sum of all the losses in each census block were aggregated for the purposes of visualizing the loss. An overview of these results with the percent damage of buildings is shown in Figure 2. Please note: It is possible for a building location to report no loss even if it is in the flood boundary. For example, if the water depth is minimal relative to 1st-floor height, there may be 0% damage.

Figure 4.2 Overview of 1-percent Annual Chance Flood Loss Estimation in Chippewa County



SOURCE: (FEMA, 2021)

Hazus Critical Infrastructure Loss Analysis

Critical facilities and infrastructure are vital to the public and their incapacitation or destruction would have a significant negative impact on the community.

Buildings identified as essential facilities for the Hazus flood analysis include hospitals, police and fire stations, and schools (often used as shelters). Essential facilities within floodplains are vulnerable to structural failure, extensive water damage, and loss of facility functionality during a flood, thereby negatively impacting the communities relying on these facilities' services. Three of Chippewa County's essential facilities included in the Hazus flood analysis are located within the 1-percent annual chance floodplain. These facilities are all in the city of Montevideo and include a supervised living facility as well as a fire station and law enforcement facility. The fire station and law enforcement facility are located at the same site.

Extreme precipitation resulting in flooding may overwhelm water infrastructure, disrupt transportation and cause other damage. Particularly where stormwater, sewage and water treatment infrastructure is aging or undersized for more intense rainstorms, extreme rain events may pose both health and ecological risks in addition to costly damage (USGCRP, 2018).

It is important to identify any critical infrastructure within the 1-percent annual chance floodplain, given the higher risk of the facility or infrastructure being incapacitated or destroyed during a flood. Fortunately, none of Chippewa County's critical infrastructure was determined to be in the 1-percent chance flood boundary using the available facility data.

Community Vulnerability

Potential economic losses were estimated by Census Minor Civil Division. The City of Granite Falls would suffer significant estimated losses in the 1-percent annual chance flood. Lone Tree and Sparta Townships also have significant estimated losses. All jurisdictions with buildings identified in the 1-percent annual chance flood zone listed in Table 4.7.

Table 4.7 1-percent Annual Chance Flood Building-Related Loss Estimates by Jurisdiction

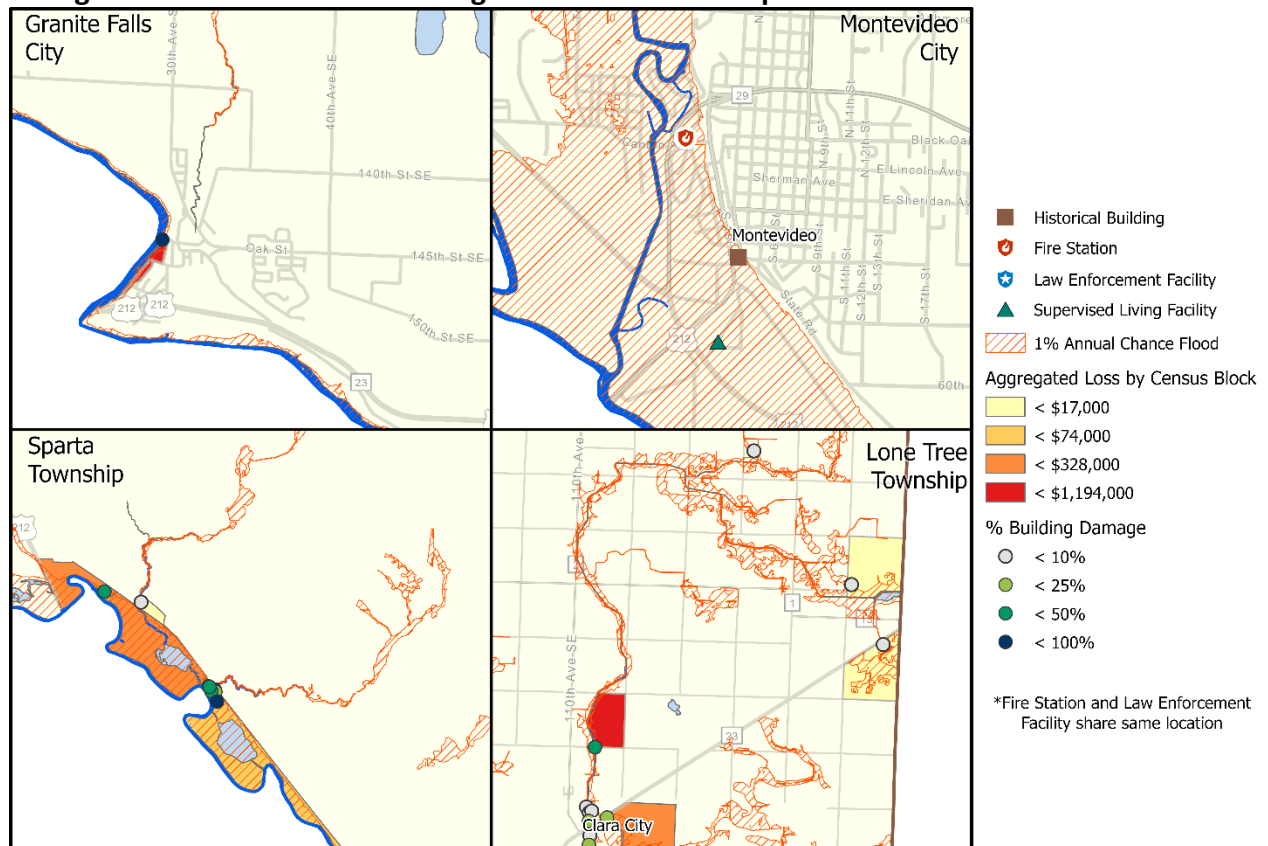
Jurisdiction (county subdivision)	Count of Buildings in Floodplain	Estimated Building and Contents Loss*
Big Bend Township	1	\$16,789
Clara City City	5	\$36,349
Granite Falls City	1	\$1,193,544
Granite Falls Township	4	\$9,337
Havelock Township	4	\$31,531
Kragero Township	3	\$2,388
Leenthrop Township	3	\$191,007
Lone Tree Township	4	\$331,047
Rheiderland Township	1	\$74,283
Rosewood Township	1	\$2,403
Sparta Township	9	\$226,812
Tunsberg Township	4	\$15,992
Total	40	\$2,131,482

SOURCE: (FEMA, 2021)

*It is possible for a building to register no loss even if it is in the flood boundary. For example, if the water depth is minimal relative to 1st-floor height, there may be 0% damage.

Figure 4.3 shows jurisdictions in the county with the highest potential losses as well as critical infrastructure in the 1% annual chance flood zone. In addition to the aggregate economic loss by census block, the point locations used to represent flooded buildings are symbolized by percent damage to the building. The location of a registered historical site within the flood zone was also included.

Figure 4.3 Communities with Significant Estimated 1-percent Annual Chance Flood Loss



SOURCE: (FEMA, 2021)

SOURCES

FEMA. (2021). *Hazus* | FEMA.gov. <https://www.fema.gov/flood-maps/products-tools/hazus#2>

(End of Hazus Report)

4.2 WILDFIRE

A wildfire is an uncontrolled fire spread through vegetative fuels, posing danger and destruction to property. Wildfires can occur in undeveloped areas and spread to urban areas where structures and other human development are more concentrated. While some wildfires are started by natural causes such as lightning, humans cause four out of every five wildfires. Burning debris, arson, and carelessness are the leading causes of wildfires. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on state and national forest lands. The greatest risks of wildfires are the destruction of timber, property, wildlife, and injury or loss of life to people living in or using the area for recreational activities.

Wildfire risks are not limited to public lands. There are extensive tracts of privately owned grasslands as well. These include both conservation program lands (CRP, RIM, CREP, etc.) and “rough ground” that has been hayed, pastured, or left wild. These private lands particularly in combination with public lands (such as WMA, SNA, State Parks, WPA, etc.) can combine to create substantial blocks of grasslands.

To date, there has been very little injury or loss of property resulting from wildfire in the Upper Minnesota Valley Region. However, there are some risks that should be managed to mitigate potential disasters.

4.2.1 HISTORY

Wildfires occur throughout the state of Minnesota. According to the Minnesota State Fire Marshal, there are more than 2,000 annual wildfires with an estimated loss of more than \$13 million dollars.

Milan Area Wildfire, April 2003. On April 12, 2003, a wildfire started on a vacant farm near Chippewa County Road 30. Fifteen fire departments responded to the call over the weekend. Many of these fire departments do not have equipment to fight prairie fires and ended up with damaged and lost equipment. Many clutches on the fire trucks went out from driving on the bumpy prairie and at least one injured firefighter was reported.

The demands of this and other fires over the weekend stretched the resources of local, volunteer fire departments and the DNR crews that joined to battle the blazes. They obtained critical assistance from a DNR forestry tanker plane based in Brainerd and later National Guard helicopters with 500-gallon buckets.

Wildfires that raced through grasslands south of Appleton over that weekend scorched an estimated 3,300 acres; approximately 1,700 of these acres were part of the Lac qui Parle Wildlife Management Area. The fire could have spread further if it was not for back burning efforts that kept the blaze south of Highway 119 and away from Milan Beach. On Sunday, the wind speed increased and rekindled the fire. Conditions of powerful winds and bone-dry tinder set the stage for the Sunday fire.

Wildfire behavior is based on three primary factors: fuel, topography, and weather. When dry weather mixes with windy conditions, areas with fuel have the potential for a wildfire to spread out of control as it did in the 2003 fire near Milan. Chippewa County currently has 18,263.1 acres enrolled in CREP, RIM, CRP and the Wetland Reserve Program. These areas are left for wildlife habitat and are not burned on a

regular basis. As a result, years of dead grasses accumulate on these lands and are a good fuel for any fire that may start. The Minnesota River Valley and the Wildlife Management Areas also provides an abundance of fuel for wildfires. Wildlife Management Areas occupy approximately 12,000 acres in Chippewa County.

Topography is an important factor in determining wildfire potential because it affects the movement of air and fire over the ground surface. The slope and shape of terrain can change the rate at which the fire travels. The majority of Chippewa County is relatively flat, which allows for fire to spread quickly. The Chippewa River Valley has some defined slope while the Minnesota River Valley is wide around Lac qui Parle Lake and has a more defined slope below the Lac qui Parle dam.

Weather affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity, and wind affect the severity and duration of wildfires. These conditions are similar throughout the county. Although higher wind speeds are possible in the northern portion of the county due to the lack of vegetation and slope, the area is dominated by agricultural uses and lacks major stands of forests.

According to Chippewa County Emergency Management, there have not been any major wildfires in the county since the last plan update (2015).

4.2.2 PROBABILITY

Based on past occurrences, the current probability for wildfires is low. Much of the County is used as farmland with little natural fuel available to ignite. However, there are natural areas along waterways and wetlands that may slightly increase the probability of a wildfire during extremely dry conditions. In Chippewa County, the primary area for wildfire risk is along the Minnesota River valley on the western border of the county. However, much of this risk is considered to be “very low” according to the MN DNR. There are areas of “moderate risk” immediately adjacent to the river, but makes up a very low percentage of the area. Outside of the river valley area, there are a few scattered areas of “very low” to “low” risk in the rural areas of the county. Additionally, wildfires tend to occur most frequently in the early spring after snow melt and late fall when there is a lot of dead plant material and windier conditions. See Chippewa County Wildfire Hazards Map in the Appendix for locations of areas of risk.

4.2.3 WILDFIRES AND CLIMATE CHANGE

As mentioned earlier in this plan, the impacts of climate change have resulted in warmer temperatures and more intense precipitation events. However, the precipitation events, while producing more rain amounts, are projected to be spaced further apart, leading to drier conditions. These dry conditions would then make wildfires more likely.

4.2.4 VULNERABILITY

Due to the predominance of agricultural lands in the county, there is not a significant number of acres of grasslands or woodlands aside from land adjacent to rivers and wetlands and land not suited for row crop farming. (See attached Chippewa County Wildfire Hazards Map for areas of risk in Appendix V.)

Some of these areas abut communities such as Clara City, Milan, Montevideo, and Watson. However, if a fire were to occur in these areas, there is minimal risk to property and structures. There are also several dry hydrants located throughout the County that allow tankers to draw water from natural bodies of water to improve efficiencies of fighting both wildfires and structural fires in the rural areas of the County. They are located at:

Mandt Township: North of Montevideo along Highway 29, East side of Highway 29 at 30th St NW

Sparta Township: Minnesota River public access off of County Road 15 in Wegdahl
3 miles west of Montevideo on County Road 15 (Waterman or Zempel Bridge)

Tunsberg Township: North of Watson on County Road 9 and ½ mi east on County Road 13

4.2.5 PROGRAM GAPS OR DEFICIENCIES

- Currently, county zoning lacks regulations regarding vegetation on property. One of the problems with past fires is the undergrowth and overhanging trees near residential structures. Although aesthetically appealing, vegetation around homes has destroyed numerous dwellings in past fires.
- There is currently no program to ensure that fire is considered when planning conservation plantings that include woody cover. Firebreaks should be included to protect homes and woody cover as well as allowing the use of fire as a management tool. (If a tree and shrub planting is placed in the middle of a prairie planting, it may be difficult to accomplish a prescribed management burn of that property without damaging or destroying the woody component. It may also be impossible to protect that planting in the event of a wildfire.)
- Because of the rough terrain and location of wildfires many of the fire departments do not have adequate equipment to fight wildfires. Fire vehicles are not able to access these areas due to their large size and weight. The Maynard Fire Department indicated their UTV is in need of replacement.

4.3 WINDSTORMS

A windstorm hazard is a wind strong enough to cause light damage to trees and buildings. Wind speeds during a windstorm typically exceed 34 miles per hour (29.5 knots). Wind damage can be caused by gusts or sustained winds. For the purposes of this plan, tornados will be categorized and discussed as a separate hazard from windstorms. Windstorms encompass a large variety of damaging wind types, including:

- Straight-line wind - thunderstorm wind not associated with rotation
- Downdraft - a small-scale column of air that rapidly sinks toward the ground
- Downburst - a strong downdraft with an outrush of damaging winds on or near the earth's surface

- Gustnado - small whirlwind originating from the ground and not connected to any cloud-based rotation
- Derecho - widespread, long-lived, straight-line windstorm that is associated with a fast-moving group of severe thunderstorms known as a mesoscale convective system. Derechos can cause hurricane-force winds, tornados, heavy rains, and flash floods.

Source: NOAA National Severe Storms Laboratory

Windstorms can and do occur in all months of the year, but the most severe windstorms typically occur during severe thunderstorms in the warmer months of April through September. These include tornados and downburst or straight-line winds. Winds of greater than 60 mph are also associated with intense winter, spring, and fall low-pressure systems. These can inflict damage to buildings and in some cases can overturn high profile vehicles.

Also, strong winds combined with saturated soils can lead to widespread loss of trees. This becomes a problem in communities when downed trees injure people, damage property, knock down power lines, or impede traffic. Downed power lines present a risk of electrocution or fire. Risks associated with downed trees can be managed through proper tree selection and proper maintenance programs. Some communities desire the look and feel of tree-shaded roads, however, this may lead to the planting of trees that are too large for the boulevards, resulting in a greater risk of property damage.

Table 4.8 Effects of Wind Speed

Wind speeds	Effects
26-38 knots (30-44 mph)	Trees in motion. Lightweight loose objects (e.g., lawn furniture) tossed or toppled.
39-49 knots (45-57 mph)	Large trees bend; twigs, small limbs break; and a few larger dead or weak branches may break. Old/weak structures (e.g., sheds, barns) may sustain minor damage (roof, doors). Buildings partially under construction may be damaged. A few loose shingles may be removed from houses. Carports may be uplifted; minor cosmetic damage may occur to mobile homes.
50-64 knots (58-74 mph)	Large limbs break; shallow-rooted trees may be pushed over. Semi-trucks may be overturned. More significant damage to old/weak structures occurs. Shingles, awnings may be removed from houses; mobile homes and carports incur minor structural damage.
65-77 knots (75-89 mph)	Widespread damage to trees with trees broken/uprooted. Mobile homes may incur more significant structural damage; Roofs may be partially peeled off industrial/commercial/warehouse buildings. Some minor roof damage may occur to homes. Weak structures (e.g., farm buildings, airplane hangars) may be severely damaged.
78+ knots (90+ mph)	Many large trees broken and uprooted. Mobile homes may be severely damaged; moderate roof damage to homes may occur. Roofs may be partially peeled off homes and buildings. Moving automobiles may be pushed off dry roads. Barns and sheds may be demolished.

Source: National Weather Service, 2018

4.3.1 HISTORY OF WINDSTORMS

Windstorms are fairly common in Chippewa County and occur to some extent almost annually. The following table summarizes the windstorms that have occurred since 2015. Most recently in May 2022, the County experienced widespread wind damage from a couple of severe thunderstorms. Damage included lots of downed trees, damaged outbuildings and grain storage as well as roof damage to many homes. As a result of these two events, Chippewa County was included in the federally-declared disaster events on July 8, 2022 (FEMA-4658-DR-MN) for severe storms, straight-line winds, tornadoes, and flooding that occurred during the period of May 8 through May 13, 2022 and on August 9, 2022 (FEMA-4666-DR-MN) for severe storms, straight-line winds, tornadoes, and flooding occurring during the period of May 29 through May 30, 2022.

Table 4.9 Reported Chippewa County Windstorms, 2015-2022

Date of Event	Windstorm Event Description
July 17, 2015, Montevideo (2 events)	A measured wind gust of 55 knots was reported by the Montevideo County Airport wind sensor. Large construction barricades were blown over in Montevideo.
June 12, 2016, Montevideo	There was wind damage to a pole barn, and two 18-wheelers were blown off the road, northeast of Montevideo.
July 16, 2016, Montevideo and Granite Falls (2 events)	Numerous trees and power lines were blown down across a widespread area of Montevideo. Several sources from the media, law enforcement and trained spotters reported widespread damage across the city of Granite Falls. Numerous trees and power lines were blown down along with some roof damage to businesses. The area affected included the east side of Granite Falls, which is east of the Minnesota River and in Chippewa County.
August 28, 2016, Montevideo	Multiple trees were blown down northeast of the Montevideo airport.
June 11, 2017, Montevideo	Power lines and trees were blown down in town.
September 19, 2017, Clara City	Windspeeds recorded at 51 knots.
September 22, 2017, Watson	Several trees were blown down near Watson.
May 28, 2018, Montevideo	Several trees and power lines were blown down around Montevideo.
June 4, 2019, Clara City	A Minnesota Department of Transportation wind sensor west of Clara City, measured wind gusts over 60 mph for a period of 10 minutes. The peak wind was 63 mph.
August 8, 2020, Granite Falls	Numerous trees and power lines were blown down on the north and northeast side of Granite Falls. There was a measured wind gust of 122 mph on a wind farm north of Granite Falls. However, this measurement was taken at 200 feet above the ground.
May 12, 2022, Watson	A large tree was blown down northwest of Watson.
May 12, 2022, Montevideo	There was a concentrated area of wind damage from the southeast portion of Montevideo, then northeast for a few miles over rural western Chippewa County. Several trees, sheds and barns were damaged, including major damage to an apartment garage in the City of Montevideo.
May 12, 2022, Gluek	There was sporadic tree and shed damage to farms north of Gluek and into Louriston Township.

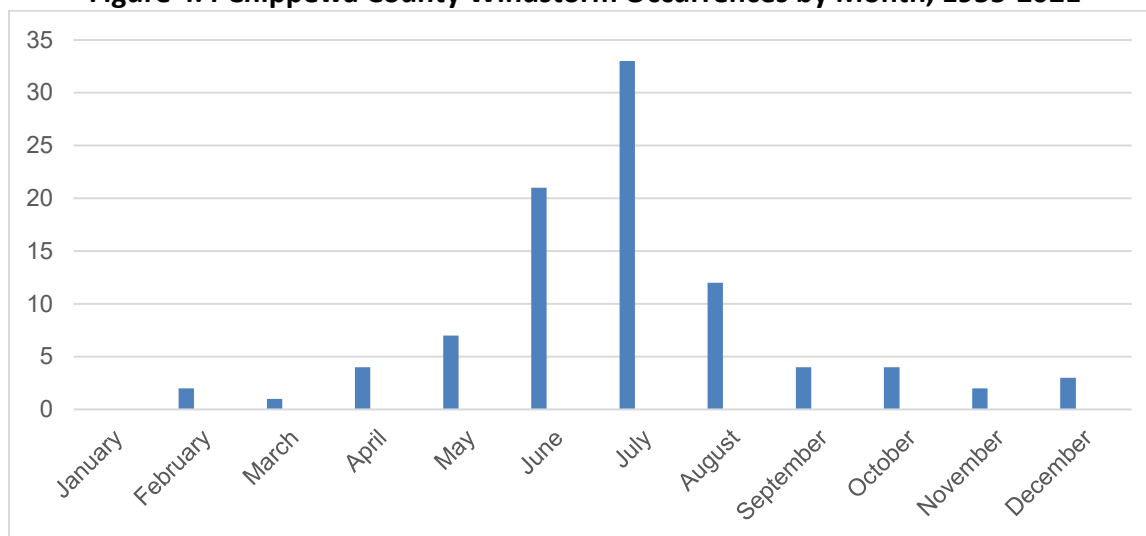
May 12, 2022, Clara City	Sporadic damage to trees and sheds northeast of Clara City.
May 30, 2022, Wegdahl	Several trees and power lines were blown down near Wegdahl.
July 23, 2022, Clara City	Wind speeds measured at 51 kts.
July 23, 2022, Clara City	Wind speeds measured at 52 kts.

Source: National Climatic Data Center, 2023

4.3.2 PROBABILITY OF OCCURRENCE

Windstorms can happen any month of the year, but based on historical occurrences, most windstorm events tend to occur in the months of May through August. This is also the time of year when thunderstorms are most likely to occur. The following table using data from the National Center for Environmental Information, shows the number of “Strong wind,” “High wind,” and “Thunderstorm wind” events from 1955 through 2021. July has historically had the most wind events, with June and August having the second and third most events. While the number of wind events and their intensity may vary month to month and year to year, this overall trend is expected to continue.

Figure 4.4 Chippewa County Windstorm Occurrences by Month, 1955-2021



Source: NOAA (National Center for Environmental Information), 2021

The frequency of windstorms can vary greatly from year to year, but since 1955, there have been around one per year. The table below shows the number of wind events classified by the National Center for Environmental Information since 1955. While this data may not be extremely accurate, since not all wind events over that time frame were reported, it does give an approximate range of average annual occurrences.

Table 4.10 Chippewa County Average Annual Wind Events, 1955-2021

	Thunderstorm Wind, 1955-2021	High Wind, 1996-2021
Events	77	15
Years	66	25
Average/year	1.17	0.6

Source: National Center for Environmental Information, 2021

4.3.3 WINDSTORMS AND CLIMATE CHANGE

At the current time, there is limited data available that supports an increase in windstorm events and climate change. The Minnesota State Hazard Mitigation Plan (2019) states that the *“Lack of high-quality long-term data sets makes assessment of changes in wind speeds very difficult (Kunkel, et al., 2013). In general, one analysis found no evidence of significant changes in wind speed distribution. Other trends in severe storms, including the number of hurricanes and the intensity and frequency of tornados, hail, and damaging thunderstorm winds, are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (USGCRP, 2017).”*

4.3.4 VULNERABILITY

Similar to tornados, windstorms tend to impact weaker structures such as mobile homes, older homes, out buildings such as sheds, barns, grain bins, and trees. Straight line winds, like those in a derecho, can produce hurricane force winds and result in as much damage or more due to the larger geographic area they cover. The lack of storm shelters in some areas, especially mobile home parks leave some members of the community quite vulnerable during these events. Above ground power lines are also vulnerable to windstorms and can leave large neighborhoods or rural areas without power for hours, if not days depending on the storm’s magnitude.

4.3.5 PROGRAM GAPS AND DEFICIENCIES FOR WINDSTORMS

- As much as 10% of homes (approximately 500) in the county lack basements that would provide shelter in the event of a tornado or damaging winds from a severe thunderstorm.
- Most power lines in the county are above ground and subject to damage from ice storms, wind and falling tree limbs. There are few community requirements that discourage the planting of large trees near power lines.
- Watson, population 182, could benefit from a safe room in the community to serve residents that do not have safe places to go during severe weather.
- Lac qui Parle State Park Upper Campground does not have a storm shelter for campers. Strong winds have impacted campers recently and DNR staff would like to provide shelter for campers.
- Lagoon Park in Montevideo could benefit from a storm shelter as it is a popular camping location.
- Buffalo Lake Park (County Park) does not have a storm shelter for campers.

4.4 TORNADOS

Tornados are the most violent of all storms facing Midwestern residents and communities. A tornado is a rapidly rotating column of air, spawned by a cumulonimbus cloud. When it drops to the ground it can create significant damage and loss of life. Tornados always occur in association with thunderstorms.

While tornados tend to be somewhat more common in southern Minnesota, they have occurred in all counties in the state.

Tornados are most likely to occur during warm, humid spells during the months of May, June, July, and August but have occurred as early as March and as late as November in Minnesota. On occasion, tornados called cold air funnels occur after the passage of a cold front when air is much less humid, but the air aloft is very cold creating enough instability to make funnel clouds. Most tornados occur during the warm part of the day – late afternoon or early evening; over 80 percent of tornados occur between noon and midnight.

The tornado's path typically ranges from 250 feet to a quarter of a mile in width. The speed that a tornado travels varies but is commonly between 20 and 30 mph. However, larger and faster tornados have occurred in Minnesota. Most tornados stay on the ground for less than five minutes. Tornados frequently move from the southwest to the northeast but can vary in direction during some instances.

A tornado's magnitude is measured by the Enhanced Fujita Scale. The Enhanced Fujita Scale, or EF Scale, became operational on February 1, 2007, and is used to assign a tornado a 'rating' based on estimated wind speeds and related damage. When tornado-related damage is surveyed, it is compared to a list of Damage Indicators (DIs) and Degrees of Damage (DoD) which help estimate better the range of wind speeds the tornado likely produced. From that, a rating (from EF0 to EF5) is assigned.

The EF Scale was revised from the original Fujita Scale to reflect better examinations of tornado damage surveys so as to align wind speeds more closely with associated storm damage. The new scale has to do with how most structures are designed.

Table 4.11 Enhanced Fujita (EF) Scale Definitions

EF SCALE	
EF Rating	3 Second Gust (mph)
0	65-85
1	86-110
2	111-135
3	136-165
4	166-200
5	Over 200

Source: National Weather Service

4.4.1 HISTORY OF TORNADOS

Like all Minnesota counties, Chippewa County has not been immune to tornados in its history.

According to the National Centers for Environmental Information, there have been 21 tornados reported in Chippewa County since 1960. All of these tornados were reported to be fairly minor in magnitude and were classified as either EF0 or EF1 and F0/F1 prior to 2007.

Looking at a larger geographic radius of 100 km from Montevideo, the Storm Prediction Center shows similar data. Within this larger area, almost 87%, or 354, of all tornados were classified as F/EF0 or F/EF1 from 1950-2019 and resulted in only 22 or 8.6% of related injuries and two fatalities or 14% of the total. On the other hand, the F/EF4 and F/EF5 tornados, while only accounting for around 1% of all tornados, resulted in 72% of all tornado-related injuries and 79% of tornado deaths.

While past tornados in Chippewa County have been fairly minor in nature, perhaps the most devastating tornado in recent history occurred just outside of its borders in the Yellow Medicine County portion of Granite Falls on July 25, 2000. One person was killed, over a dozen injured, and millions of dollars of damage was done to residences, businesses, and public facilities in and around Granite Falls. Chippewa County felt some of its impact as it had two homes damaged by the strong winds of the storm.

The tornado first touched down in rural Yellow Medicine County, eight miles west and three miles north of Granite Falls. The tornado lifted before exiting Granite Falls, leaving a concentrated damage path two miles long and 500 feet wide, through a primarily residential area of Granite Falls. Most of the damage in Granite Falls was caused by F2 to F3 wind speeds. However, this tornado was eventually classified as a minimal F4 tornado, based on the twisted wreckage of an overturned railroad car near the intersection of 9th Avenue and 14th Street in Granite Falls.

Most recently, a couple of small tornados were reported near Milan and Bunde in 2022. Both were rated EF0 and caused some significant damage to trees and farm outbuildings.

Table 4.12 Recent Tornados in Chippewa County, 2015-2022

Magnitude, Date, Location	Description
EF1 Tornado – May 16, 2015, near Watson	A tornado produced damage at a farm. A 100' x 70' long machine shed was destroyed when it was pushed off its foundation, with metal blown 1.5 miles downwind. Much of the equipment inside the shed was destroyed. A metal fence was blown down, and dozens of trees were broken. The tornado even clipped off some of the new soybeans that had emerged and were only one or two inches out of the ground.
EF0 Tornado – May 16, 2015, near Gluek	Tornado moved across open fields. It was recorded on video by numerous storm chasers. This tornado moved across an open field. It was photographed and recorded on video by two independent storm chasers and viewed by multiple trained spotters.
EF0/EF1 Tornado – September 19, 2017, south of Montevideo	This tornado began on the Chippewa County side of the Minnesota River, just east of the Montevideo golf course. It moved east-northeast across the south side of Montevideo. Most of the damage was to trees, but siding and shingles were taken off a few homes and the Montevideo Community Center. This tornado uprooted or snapped dozens of trees south of Montevideo and just east of the Minnesota River.
EF0 Tornado - May 30, 2022, 3 miles N/NE of Milan	A brief tornado developed about 3 miles north northwest of Milan. It uprooted several trees and then moved into Swift County where it significantly damaged farm outbuildings. Maximum winds for the Chippewa County portion were estimated at 70 mph.
EF0 Tornado - August 28, 2022, 3 miles SE of Bunde	Storm chaser video showed the tornado touched down in a field in Chippewa County and hit a tree, taking down large branches. It continued moving across a bean field, then moved across a road and tracked into Kandiyohi County, where it entered a corn field and eventually dissipated.

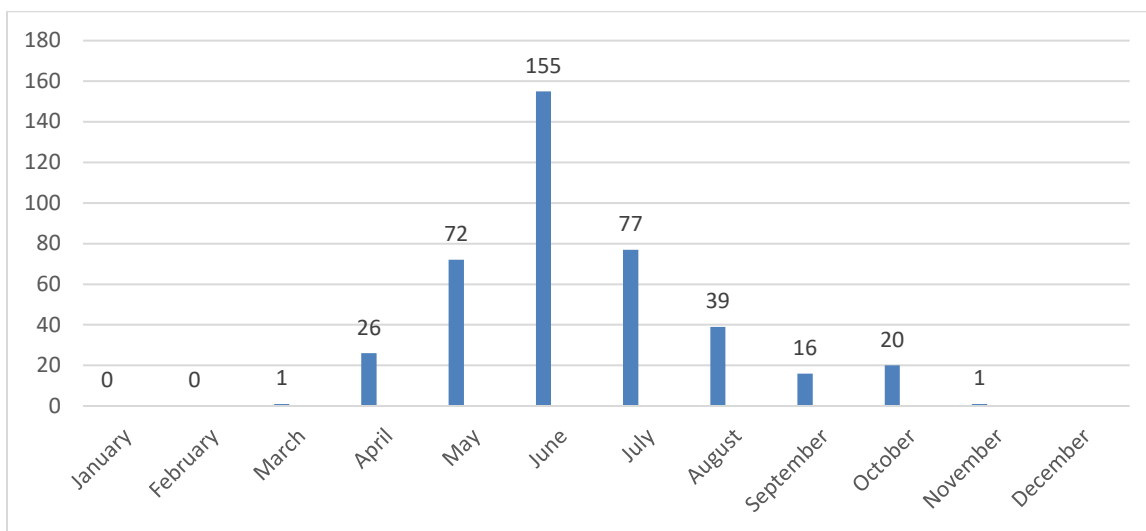
Source: National Climate Data Center, 2023

A map showing tornado paths in Chippewa County from 1956-2021 can be found in Appendix V.

4.4.2 PROBABILITY

Using data from the Storm Prediction Center’s Tornado Risk Assessment tool shows that the greatest risk for tornadoes within a 100km radius of Montevideo is typically in June (61%), with May and July also being fairly active months. However, the tornado season is typically April through October. According to the National Centers for Environmental Information’s (NCEI) Storm Event Database, in Minnesota, tornadoes are most prevalent in the months of June (34%), July (25%), and May (16%); 63% of tornadoes occur between 2:30 PM - 7:00 PM. The majority of tornadoes are ≤ F1, have an average tornado path of three miles long, and a width slightly wider than 100 yards (NOAA, 2018).

Figure 4.5 Tornadoes by Month, 1950-2019
(Within 100km of Montevideo, MN)



Source: Storm Prediction Center (NOAA)

According to the Storm Prediction Center, there are 2.8 “tornado days” on average per year within 100km radius of Montevideo. When considering stronger tornadoes, F/EF2 or more, there has been one every two years on average and the same goes for F/EF4 or stronger tornadoes (0.6/year). When looking at past fatality rates, about one death per decade is a result of a tornado.

Table 4.13 Tornado-Day Statistics
(within 100km radius of Montevideo), 1950-2019

Average Tornado Days per Year	2.8
Average # of F/EF2 or Stronger Tornado Days per Year	0.5
Average # of F/EF4 or Stronger Tornado Days per Year	0.6
Average # of Killer Tornado Days per Decade	0.9

Source: Storm Prediction Center (NOAA)

Table 4.14 Tornadoes Reported in Chippewa County, 1968-2022

	Tornadoes 1968-2022
Events	16
Years	54
Average per year	0.30

Source: National Centers for Environmental Information, 2022

Using countywide data of past events from the National Centers of Environmental Information (shown in Table 4.14), the number of tornado events per year is slightly lower than those given in Table 4.13, perhaps indicating the value is somewhere in between.

4.4.3 TORNADOS AND CLIMATE CHANGE

A recent article from Yale Climate Connections of Yale University did not find any significant evidence that climate change has impacted tornadic activity. While they state that there has been an increase in the number of tornados in recent years, most have been very minor and likely due to the increased number of storm chasers today compared to years ago. The number of more severe tornados has not changed much in recent history, but the tornado season has started earlier in the year (even though tornados can occur at any time of the year). In addition, the location of tornados in the U.S. has seemed to have slightly shifted to the east, but the cause of that has yet to be determined.

Source: <https://yaleclimateconnections.org/2021/07/climate-change-and-tornados-any-connection/>

4.4.4 VULNERABILITY

As discussed earlier, tornados can occur anywhere in Chippewa County, putting all areas at risk. However, certain populations, neighborhoods and facilities may be more vulnerable than others. Adequate warning is one of the more important factors in preventing injury and death in the population. The presence of storm shelters and basements is another big factor in minimizing the potential for injury and/or death. The elderly and those with physical handicaps may also be at more risk due to limited mobility issues. There are seven nursing home/assisted living facilities in Chippewa County; four in, or near Montevideo, two in Granite Falls and one in Clara City. Residents of mobile home parks and those camping outdoors are also quite vulnerable due to limited sheltering opportunities. There is one mobile home park in Montevideo. There are four campground locations within the county: Lagoon Park (Montevideo), Lac qui Parle Upper Campground, Chippewa County Park #1 (Buffalo Lake), Chippewa County Park #2 (Wegdahl Park).

Traditionally, tornados are seen as a countywide hazard. In order to predict estimated damage caused by an F4/F5 tornado, Chippewa County based fiscal analysis on the recommendation of the National Weather Service (NWS) Data Management Department. According to the NWS, an acceptable method to create a damage cost estimate model from a F4/F5 tornado in a small community could be performed by using cost data from a previous tornado event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation totaled around \$250 million dollars and damaged approximately 95% of the city. To model an F4/F5 tornado, the NWS suggested approximating that 90% of each land use category be considered demolished. Using 2023 market values, Table 4.15 depicts this information, providing the number of parcels damaged and estimated damage value by city. Final damage amount is estimated at \$462,304,440 impacting 3,977 parcels of residences, commercial/industrial buildings, schools, churches, and government-owned properties (summation of all city parcels and assessed parcel values).

**Table 4.15 Chippewa County Estimated Potential Damage
by an F4/F5 Tornado (2023 Market Value)**

Geographic Area	Total Number of Parcels	Total Value of Parcels	90% of Total Parcels	Estimated Damage Value
Clara City	810	\$104,212,100	729	\$93,790,890
Maynard	284	\$16,274,700	256	\$14,647,230
Milan	265	\$13,879,900	239	\$12,491,910
Montevideo	2,893	\$372,698,900	2,604	\$335,429,010
Watson	165	\$6,606,900	149	\$5,945,400
County Total	4,417	\$513,671,600	3,977	\$462,304,440

Source: Chippewa County Assessor, April 2023

4.4.5 PROGRAM GAPS AND DEFICIENCIES FOR TORNADOS

- As much as 10% of homes (approximately 500) in the county lack basements that would provide shelter in the event of a tornado or damaging winds from a severe thunderstorm.
- Most power lines in the county are above ground and subject to damage from ice storms, wind and falling tree limbs. There are few community requirements that discourage the planting of large trees near power lines.
- Watson, population 182, could benefit from a safe room in the community to serve residents that do not have safe places to go during severe weather.
- Lac qui Parle State Park Upper Campground does not have a storm shelter for campers. Strong winds have impacted campers recently and DNR staff would like to provide shelter for campers.
- Lagoon Park in Montevideo could benefit from a storm shelter as it is a popular camping location.
- Buffalo Lake Park (County Park) does not have a storm shelter for campers.

4.5 HAIL

Hail is considered ice and is a result of severe thunderstorms. Hail forms when strong updrafts within the cumulonimbus cloud carry water droplets above the freezing level or when ice pellets in the cloud collide with water droplets. The water droplets freeze or attach themselves to the ice pellets and begin to freeze as strong updraft winds toss the pellets and droplets back up into colder regions of the cloud. Both gravity and downdrafts in the cloud pull the pellets down, where they encounter more droplets that attach and freeze as the pellets are tossed once again to higher levels in the cloud. This process continues until the hailstones become too heavy to be supported by the updrafts and fall to the ground as hail.

Most hail in Minnesota ranges in size from pea-size to golf-ball sized hail. Larger hailstones have been reported, but are much less common. Strong updrafts are usually associated with severe thunderstorms. The area covered by individual hailstorms is highly variable because of the changing nature of the cumulonimbus cloud. While almost all areas of southern Minnesota can expect some hail during the summer months, most hail is not large enough to cause significant crop or property damage.

4.5.1 HISTORY

Chippewa County has experienced 101 reported hail events since 1957 through November 2022. Of this total, 68 or 67% of the events produced hailstones 1" or larger in diameter while ten events produced hailstones of 2" or more in diameter. More recently, there have been thirteen hail events since 2015 in Chippewa County producing hailstones ranging in size from 0.75 to 2.0" in diameter.

Table 4.16 Recent Hailstorms in Chippewa County, 2015-22

Date, Location	Hail Size
July 16, 2016, Montevideo	2.0" diameter
July 4, 2017, near Clara City (two events)	1.0-1.5" diameter
July 9, 2017, near Watson (three events)	1.0-2.0" diameter
July 9, 2017, near Montevideo	1.75" diameter
June 4, 2019, Montevideo, near Montevideo (two events)	0.75-1.25" diameter
May 9, 2022, Montevideo (two events)	1.75-2.0" diameter
May 9, 2022, Montevideo airport	1.0" diameter
May 9, 2022, Clara City	1.5" diameter

Source: National Climatic Data Center, 2022

4.5.2 PROBABILITY

According to the Insurance Information Institute, Minnesota had the fourth most hail claim losses from 2017-19 (\$150,673). They also state that State Farm paid out over \$3.1 billion in hail claims in 2020, according to an April 2020 analysis by the insurer and was third in claims paid out in 2020. Texas was the state with the most hail claims paid for auto and home insurance, with \$474.6 million in losses, followed by Illinois (\$394.2 million), and Minnesota (\$259.2 million). According to the Storm Prediction Center, there are between 10 and 50 reports of $\geq 2"$ hail or larger per decade per 10,000 square nautical mile from 1955-2002 in Chippewa County. Like tornados, hailstorms also occur primarily during the late spring through early fall months of April through September. Also, based on historical County hail data provided above, there have been about 1.5 hail events (of any size) per year since 1957.

**Table 4.17
Chippewa County Hailstorms,
1957 - 2022**

Events	101
Years	65
Yearly Average	1.55

Source: National Climatic Data Center, 2022

4.5.3 HAIL AND CLIMATE CHANGE

According to the Yale Climate Connections, the impacts of climate change on hailstorms has yet to be determined. At this time, researchers believe that increased temperatures may result in larger hailstones and greater kinetic energy which could potentially result in increased property damage.

Studies have shown that the kinetic energy produced by slightly larger hailstones created in the more severe storms have increased by 2%. However, there has not been an observed global increase in the number of hailstorms.

Source: <https://yaleclimateconnections.org/2022/03/hailstorms-and-climate-change-what-to-expect/>

In addition, data referenced in the 2019 MN State Hazard Mitigation Plan also supports that current research on this correlation has been inconclusive. According to the U.S. Global Change Research Program (USGCRP) National Climate Assessment (NCA), trends in severe storms, including the numbers of hurricanes and the intensity and frequency of tornados, hail, and damaging thunderstorm winds are uncertain. Since the impact of more frequent or intense storms can be larger than the impact of average temperature, climate scientists are actively researching the connections between climate change and severe storms (*USGCRP, 2014*). The NCA reports that in Minnesota's neighboring Great Plains region to the west, fewer hail days are expected, but more frequent occurrences of larger hail in spring months are possible (*USGCRP, 2017*).

4.5.4 VULNERABILITY

There are no geographic differences in hail events, meaning all areas of the county have equal chances to experience a hailstorm. Depending on the size of hailstones, various levels of damage can result during a hailstorm. Larger stones can damage roofs, vehicles, siding, windows, and vegetation/crops. While people and property can be quite vulnerable to hail, the most frequent damage associated with hailstorms is crop loss. Being an agricultural area, most of the unincorporated land in the county is used as farmland. Depending on the growth stage of the plant, hail can be quite destructive, even smaller hail. Sometimes even when plant damage is not readily visible, hailstones can greatly reduce crop yields.

4.5.5 PROGRAM GAPS AND DEFICIENCIES

- None identified

4.6 DAM/LEVEE FAILURE

Dam failure is defined as the collapse or failure of an impoundment resulting in downstream flooding. Dam failures can cause loss of life and extensive property damages; and could result from an array of situations, including flood events, poor operation, lack of maintenance and repair, and terrorism.

The main purpose of dams is to hold water, which is important during high water or floods, especially during spring runoff and immediately after heavy rains. Although dams act to prevent harm from flooding, they do pose potential threats in the event of failure. Dam failure can push a wall of water down to the valley below, causing serious destruction in its path.

Dams that could affect Chippewa County include dams along the Minnesota River and Lac qui Parle Lake. The Lac qui Parle Flood Control and Water Conservation Projects were authorized by Congress in 1936 and partially constructed as a Work Progress Administration (W.P.A.) project. The U.S. Army Corps

of Engineers completed construction of their portion of the project between 1941 and 1951. Operation of the project was transferred from the state of Minnesota to the U.S. Army Corps of Engineers in 1950.

This project is located on the Upper Minnesota River in western Minnesota near the South Dakota border. It consists of the Highway 75 Dam, Marsh Lake Dam, Lac qui Parle Dam, the Watson Sag Weir, and the diversion channel on the Chippewa River. Although the Highway 75 Dam and Marsh Lake Dams are not located in Chippewa County, if they failed, they would have the potential to impact cities within Chippewa County.

The **Highway 75 Dam** impounds water for the Big Stone National Wildlife Refuge and is located just east of the city of Odessa in Big Stone County, northwest of Chippewa County.

The **Marsh Lake Dam** is part of the Lac qui Parle Flood Control Project on the Minnesota River near Appleton, Minnesota in Swift County. This dam is for water conservation purposes and does not affect the flooding of the Minnesota River. It is possible that in the event that it would fail during a flood event, it could cause another crest downstream. The Minnesota Department of Natural Resources operates the Lac qui Parle Wildlife Management Area, including the land around Marsh Lake. Marsh Lake Dam was constructed by the Works Progress Administration in 1939 and improved by the U.S. Corps of Engineers between 1941 and 1951. The dam has a fixed crest overflow spillway section 112 feet wide with a crest elevation of 937.6 feet. Unlike the Lac qui Parle Dam downstream, the Marsh Lake Dam cannot be operated to manage the lake's water level. Changes to this dam include rerouting the Pomme de Terre River to its original stream bed and allowing the level of Marsh Lake to drop periodically.

The **Watson Sag Weir** is used to reduce downstream flows at Montevideo by diverting a portion of the Chippewa River floodwaters into the Lac qui Parle reservoir.

The **Granite Falls Dam** is a "Low Hazard Dam" which indicates that failure is unlikely to result in loss of life and only minor increases to existing flood levels at roads and buildings is expected. A dam break analysis was performed and was filed with state and federal regulatory agencies. Maximum "Sunny Day Failure" was 5.2 feet with a stage increase of one foot or more between Granite Falls Dam and Minnesota Falls Dam. For a dam break at a 15-year event, stage increases were 2.0 feet or less.

The **Lac qui Parle Dam** is the highest dam and regulates water flow from the Lac qui Parle Lake. This is a "Low Head Dam" which means that if it failed, it is not life threatening to Montevideo. A dam failure was modeled for the "Probable Maximum Flood", which illustrated travel time from the dam to Montevideo at approximately six to seven hours. The water level would only raise stages in Montevideo by less than half a foot. For a "Normal High Pool" failure, the impact at Montevideo would be approximately five feet. The impact at Granite Falls is very similar.

The U.S. Corps of Engineers operates and maintains day use recreation areas below Lac qui Parle and Marsh Lake dams. Facilities consist of picnic areas, playground, privies, bank fishing, and drinking water.

Dams located within Chippewa County:

Handeen-Jahn Group Pond

Owner: Private (Audrey Arner, Richard Handeen, and Charles Jahn)
Location: Approximately two miles west of Montevideo
Year Built: 1975
Construction material: Earth type dam
Purpose – Flood protection
Dam length: 330'
Dam height: 29'
Structure height: 20'
Emergency action plan required? No
Risk assessment: N/A
Hazard potential classification: Low
Inspection frequency: Every 8 years
State regulated? Yes

Gravel Pit

Owner: Chippewa County
Location: Approximately one mile southeast of Montevideo
Year Built: 1994
Construction material: Earth type dam
Purpose – Flood risk reduction
Dam length: 200'
Dam height: 22'
Structure height: 25'
Emergency action plan required? No
Risk assessment: N/A
Hazard potential classification: Low
Inspection frequency: Every 8 years
State regulated? Yes

Granite Falls Dam

Owner: City of Granite Falls
Location: Granite Falls
Year Built: 1911
Construction material: Concrete
Purpose – Hydroelectric
Dam length: 300'
Dam height: 21'
Structure height: 16'
Emergency action plan required? Yes
Risk assessment: N/A
Hazard potential classification: Low
Inspection frequency: Every 3 years
State regulated? Yes

Shakopee Lake

Owner: SWCD of Chippewa County
Location: Approximately 10 miles southwest of Murdock
Year Built: 1976
Construction material: Earth type dam
Purpose – Flood risk reduction
Dam length: 700'
Dam height: 11'
Structure height: 18'
Emergency action plan required? No
Risk assessment: N/A
Hazard potential classification: Low
Inspection frequency: Every 8 years
Condition assessment: Poor
State regulated? Yes

Watson Sag Weir

Owner: USACE
Location: Approximately one mile north of Watson
Year Built: 1938
Construction material: Concrete/earth
Purpose – Flood risk reduction (primary), recreation, fish and wildlife pond, water supply
Dam length: 1,900'
Dam height: 23'
Structure height: 23'
Emergency action plan required? Yes
Risk assessment: Moderate
Hazard potential classification: Low
Inspection frequency: Every 5 years
State regulated? No

Chippewa Diversion

Owner: USACE
Location: Two miles west of Watson
Year Built: 1951
Construction material: Earth type dam
Purpose – Flood risk reduction (primary), recreation
Dam length: 12,000'
Dam height: 5'
Structure height: 20'
Emergency action plan required? Yes
Risk assessment: Moderate
Hazard potential classification: Low
Inspection frequency: Every 5 years
State regulated? No

4.6.1 HISTORY

The worst recorded dam failure in U.S. history occurred in Johnstown, Pennsylvania in 1889. More than 2,200 people were killed when a dam failed, sending a huge wall of water downstream destroying the town below. Although risks are fairly minimal, dam failure can occur in Minnesota. Several dam failures have occurred in Minnesota in the past, but none have been reported in Chippewa County.

4.6.2 PROBABILITY OF OCCURRENCE

The probability of a dam failure in Chippewa County is considered to be very low. This is based the fact there have been zero records of dam failure and dam conditions are inspected anywhere between three and eight years depending on the facility/structure (see inspection frequencies above).

4.6.3 CLIMATE CHANGE AND DAM FAILURE

While climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures. Climate change is adding a new level of uncertainty that needs to be considered with respect to assumptions made during the dam construction.

Dams are designed based on assumptions about a river's annual flow behavior. These assumptions will determine the volume of water behind the dam and the amount of water flowing through the dam at any one time. Changes in weather patterns due to climate change may change the hydrograph or expected flow pattern.

Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events are a mechanism that also results in increased discharges downstream. It is conceivable that heavier rainfalls at earlier times in the year could threaten a dam's designed margin of safety, causing dam operators to release greater volumes of water earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

4.6.4 VULNERABILITY

Dam failure, although the risk is minimal, has the potential to be devastating to the areas within the floodplain and around the stream directly below the dam in Montevideo and Granite Falls. If the Lac qui Parle Dam were to fail, Montevideo and Granite Falls would be impacted. Dam failure would cause immediate flash flooding, destruction of property, erosion of crops, and the potential destruction of infrastructure.

The USACE currently has the Chippewa and Watson dams listed as moderate-risk dams (DSAC-3) among its more than 700 dams. The risk ranking is based on a screening-level assessment in 2009 that cited concerns for overtopping (especially near the abutments and wingwalls of the two structures where velocities are higher) and intermittent scour downstream of Chippewa. The potential consequences of a breach in Chippewa during large floods only impact downstream water surface profiles by a few inches, so consequences related to the dam performance are minimal. Therefore, Chippewa and Watson are listed as low hazard dams.

4.6.5 PROGRAM GAPS AND DEFICIENCIES

None Listed.

4.7 EXTREME HEAT

Chippewa County's location in the Midwest away from coastal regions results in a climate that can have very extreme temperature fluctuations throughout the year. While temperatures in the county rarely surpass 100°F, the summer heat coupled with high levels of humidity can result in dangerous conditions for vulnerable humans and livestock. High humidity levels prevent our sweat from evaporating, which is what cools our bodies. If the sweat is slow to evaporate, our bodies tend to overheat, which can lead to health issues.

Extreme heat events are the leading cause of weather-related fatalities in the U.S. More than 600 people are killed by extreme heat every year, according to the Centers for Disease Control and Prevention. By comparison, the National Weather Service reports that about 80 tornado deaths a year are reported and in 2021, 145 people were killed in floods.

Table 4.18 Heat Index and its Effect on People

Classification	Heat Index/Apparent Temperature	General Effect on People in High-Risk Groups
Extremely Hot	≥130°F	Heat/Sunstroke HIGHLY LIKELY with continued exposure
Very Hot	105-129°F	Sunstroke, heat cramps, or heat exhaustion LIKELY, and heatstroke POSSIBLE with prolonged exposure and/or physical activity
Hot	90-104°F	Sunstroke, heat cramps, or heat exhaustion POSSIBLE with prolonged exposure and/or physical activity
Very warm	80-89°F	Fatigue POSSIBLE with prolonged exposure and/or physical activity

Source: National Weather Service

Heat Index has been developed as a measure that combines humidity and temperature to better reflect the risk of warm weather to people and animals. The index measures the apparent temperature in the shade. People exposed to the sun would experience an even higher apparent temperature. A heat index of 105°F is considered dangerous. With prolonged exposure, it could result in heat stroke, heat exhaustion, and heat cramps. People are reminded to use extreme caution when the heat index is between 90°F and 105°F. A heat index of 90°F occurs when the temperature is 90°F and the relative humidity is 50 percent. This is more of a problem when these conditions are present for several days in a row, allowing buildings to become hotter and hotter as the conditions persist.

A heat index of 105-114°F warrants a heat advisory. This occurs when air temperature reaches 95°F and the relative humidity is 50 percent. An excessive heat warning is issued when the heat index reaches

115°F. This occurs with an air temperature of 95°F and relative humidity of 60 percent. An index of 115°F or higher creates severe risk for both humans and animals.

4.7.1 HISTORY OF EXTREME HEAT

In July, the warmest month of the year, the normal high temperature is 84.9° F in most of Chippewa County. On average, the county experiences 19-20 days of 90° F or higher during a typical summer. The all-time recorded high is 113° F in Milan, which occurred in 1934.

Table 4.19 Chippewa County Temperature Extremes

	Highest Temp	Date	Lowest Temp	Date
Milan	113° F	July 21, 1934	-42° F	February 16, 1936
Montevideo	110° F	July 31, 1988	-39° F	February 16, 1936

Source: Midwest Regional Climate Center

While summers are typically warm but pleasant in Chippewa County, it is not uncommon to experience high dew points and temperatures in the 90s for several days in a row.

4.7.2 PROBABILITY OF OCCURRENCE

As mentioned above, the probability of temperatures reaching 100°F or higher in Chippewa County is somewhat rare. According to the MN Department of Natural Resources, Minneapolis has only reached 100 or higher just twice since 2015. However, when coupled with higher humidity levels, the heat can have a greater impact on people and animals.

4.7.3 EXTREME HEAT AND CLIMATE CHANGE

According to the State Climatologist, there is some evidence that current dew points are not only higher, but are occurring with greater frequency than was true in the past. If that is true, Chippewa County residents can expect an increasing number of hours with heat indexes in the danger category.

The average temperature in Minnesota has increased more than 3.0° F since record keeping began in 1895 and that increased warming has been occurring in recent decades (Interagency Climate Adaptation Team, p. 4). Midwest annual temperatures have generally been well above the 1901-1960 average since the late 1990s. The warmest decade on record occurred during the 2000s (Kunkel, K.E. et al, 2013). In addition, the Midwest has experienced major heat waves and their frequency has increased over the last six decades (Perera et al. 2012). In the U.S., mortality rates increase 4% on days with heat waves in comparison with non-heat wave days (Anderson and Bell 2011). It's been projected that heat stress will increase as summer temperatures and humidity continue to increase (Schoof, 2012).

4.7.4 VULNERABILITY

Extended periods of warm, humid weather can create significant risks for people, particularly the very young, those that are ill, and seniors who may lack air conditioning and proper insulation or ventilation in their homes. Animals and livestock are also at risk during extended periods of heat and humidity.

4.7.5 PROGRAM GAPS AND DEFICIENCIES

- Lack of designated community shelters in Milan, Montevideo

4.8 DROUGHT

Drought is defined as a prolonged period of dry weather or a lack of rainfall.

4.8.1 HISTORY

Since the last hazard mitigation plan update in 2015, the County has had periods of drought conditions, including a period of extreme drought (D3) in 2021. Prior to that, the drought conditions that occurred in the last seven years were most sporadic and fortunately short-lived. Aside from a two month stretch over the summer months of 2021 and late 2022 when drought conditions were considered severe (D2), past drought conditions were categorized as abnormally dry (D0) or moderate drought (D1).

Fortunately, most of these conditions were short lived aside from a stretch from June 2020 to April 2021 and again in late 2022 through the current date. For up-to-date drought conditions in Chippewa County, visit www.drought.gov/states/minnesota/county/Chippewa.

(Source: Drought.gov)

4.8.2 PROBABILITY

The probability was determined by reviewing previous weekly drought events recorded by the U.S. Drought Monitor since 2000. The U.S. Drought Monitor has four levels of drought severity, D1 through D4. Level D4, or exceptional drought, has not been reached in Minnesota in recent history. Drought Level D3, which results in corn being harvested early, emergency haying and grazing are authorized, wildfires are widespread, and surface water levels are at near record lows occurred for approximately 26 weeks in Chippewa County over the 20+ year span or for about 2% of the time since 2000. The county experienced approximately 60 weeks of Drought Level D2 which results in high fire danger, required burn permits, hardened ground conditions, low crop yields, slow/low river flow and snowpack is significantly lower and well levels decrease. This period accounted for approximately 5% of the 22-year time span. These frequencies of past drought levels can be used to infer the probability of similar droughts occurring in the future.

4.8.3 DROUGHT AND CLIMATE CHANGE

“Extreme rainfall events increase the probability of disaster-level flooding. However, there is also an increased probability that by mid-century heavy downpours will be separated in time by longer dry spells, particularly during the late growing season. Over the past century, the Midwest hasn’t experienced a significant change in drought duration. However, the average number of days without precipitation is projected to increase in the future, leading Minnesota climate experts to state with moderate-to-high confidence that drought severity, coverage, and duration are likely to increase in the state.” - *Planning for Climate & Health Impacts in Southwest Minnesota*, MN Dept. of Health, 2018

4.8.4 VULNERABILITY

Chippewa County’s reliance on the agricultural economy would likely be the most vulnerable to drought. Without adequate rainfall, crops cannot produce good yields, which results in a downturn of the local economy as there is a heavy reliance on agriculture in this part of the state. Another vulnerable resource is the area’s aquifers. Prolonged dry conditions can lead to diminished groundwater levels, thus jeopardizing communities’ and rural residents’ access to fresh water.

4.8.5 PROGRAM GAPS AND DEFICIENCIES FOR DROUGHTS

- County has no estimates of annual recharge rates or the capacities of the various aquifers.
- Water conservation provisions and use restrictions in times of drought are not included in county ordinances.

4.9 LIGHTNING

While windstorms and tornados are significant hazards associated with severe thunderstorms, lightning is the most frequent hazard associated with thunderstorms and the hazard that results in the greatest loss of life. Lightning occurs to balance the difference between positive and negative discharges within a cloud, between two clouds and between the cloud and the ground. For example, a negative charge at the base of the cloud is attracted to a positive charge on the ground. When the difference between the two charges becomes great enough a lightning bolt strike. The charge is usually strongest on tall buildings, trees and other objects protruding from the surface. Consequently, such objects are more likely to be struck than lower objects.

While cloud-to-ground lightning poses the greatest threat to people and objects on the ground it actually accounts for only 20% of all lightning strikes. The remaining lightning occurs within the cloud, from cloud to cloud, or from the ground to cloud. Within-cloud lightning is the most common type.

4.9.1 HISTORY

There have been isolated lightning strikes reported in the five communities which have caused moderate damage in some cases. Strikes to electronic systems and power sources were the main incidents. More details can be found in the individual community reports.

4.9.2 PROBABILITY

The probability of lightning in Chippewa County is fairly high as there are on average 20 to 25 thunderstorms days in Minnesota. Within these storms, multiple lightning strikes can be produced depending on the conditions. However, due to the extreme localized nature of a lightning strike, the probability of causing personal injury or property damage is relatively low.

4.9.3 LIGHTNING AND CLIMATE CHANGE

Several studies in recent years have projected that the number of lightning strikes will increase due to climate change. Increased air temperatures will likely result in stronger updrafts and therefore more thunderstorms.

4.9.4 VULNERABILITY

All people and structures are vulnerable to lightning. Lightning strikes to humans can cause significant bodily injury if not death. Lightning strikes to structures can cause fires or severe burns, especially if conditions are dry. People that are outdoors either working or gathering, especially if they are located in an open area or higher ground, are most vulnerable to lightning strikes during the warmer months as that is when thunderstorms primarily occur and is also the time of year when people congregate outside.

in larger groups. Unprotected electrical systems and electronic controls are also vulnerable to lightning strikes as surges in electricity can cause damage.

4.9.5 PROGRAM GAPS AND DEFICIENCIES

- Lack of adequate shelter for large numbers of people at outdoor summer events and gatherings.

4.10 WINTER STORMS

Because most of Chippewa County is relatively flat, dangerous winter conditions are created when the wind blows including drifting, white-outs and wind chills.

Chippewa County experiences three basic types of winter storms: blizzards, heavy snow events and ice storms (including freezing rain, freezing drizzle and sleet).

Blizzards, the most violent of winter storms, are characterized by low temperatures usually below 20° F, strong winds in excess of 35 miles per hour, and blowing snow that creates visibility issues at one-quarter mile or less for at least three hours. Blowing snow can result in whiteouts and drifting on the roadways, leading to stranded motorists and the difficulty or inability of emergency vehicles to respond to incidents. While blizzards can occur in Chippewa County from October through April, they most commonly occur from November through the end of March.

Freezing rain, the most serious of ice storms, occurs during a precipitation event when warm air aloft exceeds 32° F while the surface remains below the freezing point. When precipitation originates as rain or drizzle contacts physical structures on the surface, ice forms on all surfaces creating problems for traffic, utility lines, and tree limbs.

Sleet forms when precipitation originates as rain falls through a rather large layer of the atmosphere with below freezing temperatures, allowing raindrops to freeze before reaching the ground. Sleet is also commonly referred to as ice pellets. Sleet storms are usually of shorter duration than freezing rain and generally create fewer problems.

In Minnesota, six or more inches of snow in a 12-hour period or eight or more inches of snow in a 24-hour period defines a heavy snow event. Snow is considered heavy when visibility drops below one-quarter mile regardless of wind speed. Drifting and blizzard conditions can occur even if there are no new snow accumulations.

4.10.1 HISTORY

Between November 1993 and December 2021, the National Climatic Data Center reported 36 blizzards. During the winter of 1996-1997, drifts were higher than most street vehicles and its snow melt contributed to record spring flooding. The winters of 2018-19, 2013-14, 1995-96 and were also exceptionally extreme. Six blizzards were reported in the winter season of 2013-14, while four were reported during the 1995-96 winter and three were reported during the 1996-97 winter. In addition, heavy snow, high wind and winter storms made these three winters difficult for Chippewa County. The

winter of 1996-1997 was declared a Presidential disaster because of the snow emergency. There were many school closings during this winter. Snow removal was extremely expensive and large snow load both damaged and destroyed buildings. The roof on the wastewater treatment plant in Clara City was destroyed during the winter of 1996-97 because of the snow load. There was also record setting snowfall in December of 2010 and April of 2013. Most recently, the December 23, 2020 blizzard was brought up by several communities as having an impact on the area. The storm developed quickly and caught many off guard. Numerous motorists were stranded along Highway 7 between Montevideo and Clara City with many seeking shelter in Clara City.

Table 4.20 Chippewa County Winter Storm Events/Blizzards, 2015 - 2022

Winter	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Winter storms/Blizzards	3/1	1/0	3/1	4/3	3/2	1/1	1/1

Source: National Climatic Data Center

There are two weather stations in Chippewa County located in Milan and Montevideo. Tables 4.21 and 4.22 show the snowfall records for these two weather stations. Milan had a record snowfall of 92 inches during the 1996-1997 winter season. In 1996, the blizzard of mid-January dropped record amounts of snow on both Milan and Montevideo.

Table 4.21 Chippewa County Snowfall Extremes by Month, 1951 – Mar. 2022

Month	Milan		Montevideo	
	High (in)	Year	High (in)	Year
January	29.5	1975	33	1982
February	25.5	1952	28	1962
March	33.5	1951	44	1951
April	29.7	2018	28.5	2018
May	2.0	2017	1	1954
October	8.5	2020	6	1991
November	20	2001	25	1985
December	25.3	2010	32.5	2010
Season (Jul-Jun)	92	1996-1997	82.2	1983-1984

Source: Midwest Regional Climate Center

Table 4.22 Chippewa County Largest One-day Snowfall in Milan and Montevideo from 1951 – Mar. 2022

Month	Milan		Montevideo	
	1-Day Max (in)	Date	1-Day Max (in)	Date
January	11.0	1/18/1996	12.0	1/18/1996
February	12.0	2/20/2011	12.0	2/21/2011
March	15.0	3/21/2008	14.0	3/3/1989
April	15.0	4/11/2008	14.0	4/15/2018
May	2.0	5/1/2017	2.0	5/1/2017

October	5.8	10/20/2020	6.0	10/31/1991
November	13.0	11/10/2014	12.0	11/28/1983
December	10.0	12/9/2012	12.0	12/9/2012

Source: Midwest Regional Climate Center

4.10.2 PROBABILITY

To determine the probability of future winter-related storm events in Chippewa County, records of previous winter storms were totaled and divided by the dataset's period of record, resulting in the annual relative frequency of winter storms. Based on records in the NCEI Storm Events Database from 1996 through January 2022, the relative frequency of winter storm events in Chippewa County is 2.15 per year. This relative frequency can be used to infer the probability of these events occurring in the future.

4.10.3 WINTER STORMS AND CLIMATE CHANGE

Winter storms have had a large impact on public safety in Minnesota historically. Snowstorm frequency and annual total snowfall have the potential to increase in the future. These events increase energy demand and pressure on the systems that provide energy that can result in power outages. As these events increase in the future there is a risk of reduced reliability in services, increased number of outages, and rising energy costs that can affect public health.

Climate change will likely have different effects on different geographical regions of the country as well as within the state of Minnesota. In the absence of downscaled modeling, more specific predictions for smaller geographical areas are not available at this time. Therefore, the climate change risks associated with Chippewa County are not mutually exclusive, but rather the effects in the county may differ from those of the state and Midwest region.

Recent winters have shown to be shorter and warmer than previous years. If these trends continue, scientists predict more severe and intense winter storms. A warmer air atmosphere holds more moisture which then results in more precipitation in either the form of rain or snow. With sea temperatures on the rise, storms tend to have more energy which can result in higher intensity and frequency.

4.10.4 VULNERABILITY

All areas of the county are equally vulnerable to winter storms. Transportation routes, power supply and structures are the most vulnerable to winter storms. Ice and drifting snow make roads and streets impassable. Ice and winds can weigh down power lines causing them to break. Extremely heavy, wet snow can cause structural damage to weaker roofs. The location, frequency and intensity of winter storms varies greatly from year to year making some winters worse than others.

4.10.5 PROGRAM GAPS AND DEFICIENCIES

- Most powerlines the rural areas of the county are located above ground making them vulnerable to power outages from ice/wind. However, burying powerlines in the rural parts of

the county also makes the lines vulnerable to rodents chewing them and causing outages. These problem areas are difficult to locate underground, therefore utility providers will likely continue to run their lines above ground.

- Deteriorating wooden power poles, many were installed in late 1940s and are still in use.
- Availability of back-up generators in Montevideo for public works building.
- Lack of designated community shelters in Milan, Montevideo

4.11 EROSION, LANDSLIDES, AND MUDSLIDES

Erosion is the gradual wearing-away of land surface materials, especially rocks, sediments, and soils, by the action of water, wind, or a glacier. Usually, erosion also involves the transfer or eroded material from one place to another (The American Heritage Dictionary of Student Science). Erosion can occur on farmland, stream banks, bluffs, and coastlines and can be the result of both natural and man-made activities.

4.11.1 HISTORY

There have not been any landslides or major erosion events in the county.

4.11.2 PROBABILITY

According to the Chippewa County Water Plan (2013), Chippewa County soils are subject to both water and wind erosion. Water erosion results from soil removed from its original location by the force of water to lower slopes and plots. The potential for wind erosion occurs when wind velocities exceed 12 mph. The Chippewa County Water Plan states that approximately 55% of the land is classified as having potential for moderate water erosion. The Chippewa County Comprehensive Local Water Plan Update (2013) lists erosion and sediment control as a priority issue for the county.

4.11.3 EROSION AND CLIMATE CHANGE

Increased heavy rain events in the future would result in more chances for soil erosion and landslides to occur. Also, warmer winters and less ice on lakes and rivers could also lead to increased chances of shoreline and streambank erosion. In addition, impervious surfaces from human development as well as the predicted increases in heavy rain events in the future may contribute to flash flooding leading to erosion for stream and riverbanks in Chippewa County.

4.11.4 VULNERABILITY

While a vast majority of the county is relatively flat, areas adjacent to streams and waterways tend to possess some more slope and are sometimes more vulnerable to occasional washout or erosion. These areas would be located primarily on the western boundary of the county along the Minnesota River valley. In addition, there are some areas including behind the downtown business district that are more steeply inclined. Areas with steep slope are more susceptible to erosion, washouts, and minor landslides after periods of heavy rains. It is somewhat common for rural gravel roads to partially wash out after spring flooding and/or heavy spring rains.

4.11.5 PROGRAM GAPS AND DEFICIENCIES

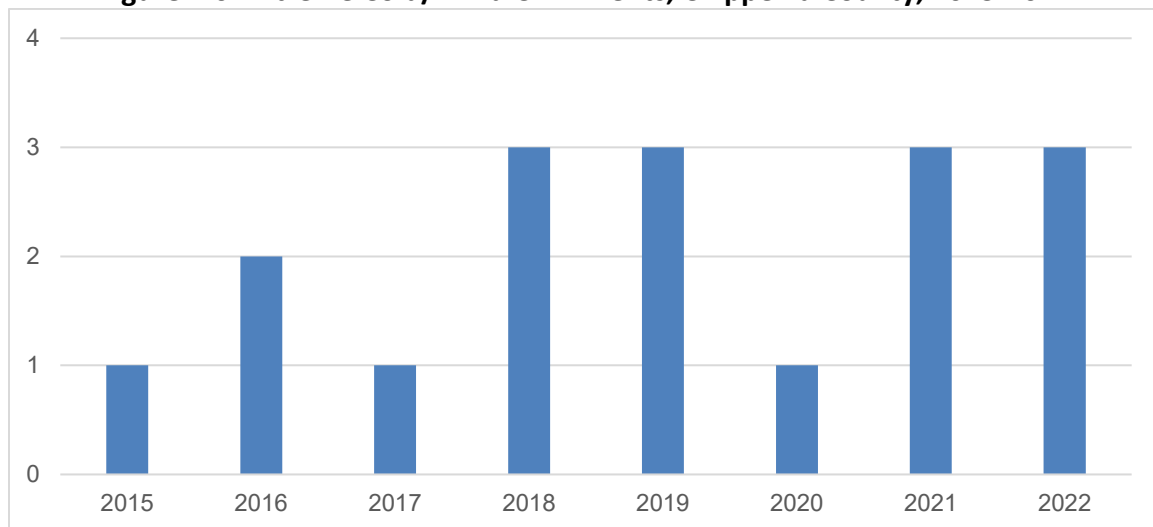
- More education is needed on the devastating impacts erosion could have on the county, as well as prevention techniques.
- Area behind Montevideo business district has a steep slope.

4.12 EXTREME COLD

4.12.1 HISTORY

In the past seven years, Chippewa County has experienced one to three extreme cold events, which are typically categorized by having windchill values of -30°F or below.

Figure 4.6 Extreme Cold/Wind Chill Events, Chippewa County, 2015-2022



Source: National Centers for Environmental Information, NOAA, 2023

4.12.2 PROBABILITY

The number of extreme cold days in any given year is somewhat unpredictable. January is the coldest month on average, with daytime highs of averaging 22°F and nighttime lows of 0°F, but these averages do not tell the entire story. Maximum temperatures in January have been as high as 69°F and as low as -42°F in Chippewa County. In addition, extremely cold temperatures can occur anytime between December and February. The winter months, on average, produce about 37-42 days of 0°F or lower, which, when coupled with even the slightest winds, make for extremely dangerous conditions.

4.12.3 EXTREME COLD AND CLIMATE CHANGE

As mentioned earlier in this plan, Minnesota's climate has warmed, especially the colder, winter months. The increase in temperatures during the winter months has occurred at a rate 2-3 times faster than during the summer months from 1895 to 2021 and even more rapidly since 1970. In addition, Minnesota is not getting as cold as it once did. While Minnesota's location in the Midwest will certainly result in periods of extremely cold temperatures in the winter, according to the MN DNR's State

Climatology Office, “The frequencies of -35° F readings in northern Minnesota and -25° F readings in the south have fallen by up to 90% with the long-term decline in cold extremes is all but guaranteed to continue.”

4.12.4 VULNERABILITY

Cold weather is often accompanied by winds creating a dangerous wind chill effect, putting both people and livestock at risk. Most of the county is at risk of this kind of weather because of its relatively flat, open character. More wooded, hilly areas of the county are less severely affected by wind chill. Wind chills of -35° F and lower can present significant risk, particularly if people are not properly clothed or protected. A -15° F air temperature with wind speeds of 10 miles per hour creates a wind chill of -35° F. Under these conditions, frostbite can occur in just minutes on exposed skin.

4.12.5 PROGRAM GAPS AND DEFICIENCIES

- The City of Milan does not have an officially designated community shelter in the event of extreme cold temperatures.

TECHNOLOGICAL HAZARDS – INTRODUCTION

Source: Minnesota State Hazard Mitigation Plan

Technological hazards are a part of everyday life, a result the modern world in which we live. The challenge is to benefit from the use of technology while limiting potential harm to the community. In order to fully realize the benefits of technology, it is necessary to plan an effective response to unwanted technological emergencies before they occur.

From a hazard mitigation perspective, the existence of technological hazards in the community poses a risk to life, health, or property, just as natural hazards do. The use of hazardous materials in manufacturing and transportation can be extremely harmful if an unwanted release occurs and the use of nuclear materials in the presence of a community creates risks that must be managed. While dam failure can result from natural hazards, dams will still have a catastrophic impact on those downstream, if poor engineering or construction causes it to fail. Further, the furnishings in our homes make a pleasant living environment, but are often flammable and produce toxic gases if ignited.

For the purposes of this plan, technological hazards identified are organized into these groups:

- 1. Infectious Diseases**
- 2. Fire**
- 3. Hazardous Material**
- 4. Water Supply Contamination**
- 5. Wastewater Treatment System Failure**
- 6. Civil Disturbance/Terrorism/Cyber Attack**

4.13 INFECTIOUS DISEASES

An infectious disease is defined as an organism or virus that has the potential to spread or affect a population in adverse ways. Infectious diseases have the potential to affect any form of life at any time based on local conditions, living standards, basic hygiene, pasteurization, and water treatment. Despite breakthroughs in both medicine and technology, infectious diseases continue to pose a major public health risk. Today, the issue of emerging and re-emerging infectious diseases is at the forefront of public health concern especially in light of the recent coronavirus pandemic. The very young, older adults, immunocompromised individuals, and hospitalized or institutionalized patients are at an increased risk for many infectious diseases. Changes in demographics, lifestyle, technology, land use practices, food production and distribution methods, childcare practices, immunization, as well as increasing poverty, have roles in emerging infections.

Many infectious diseases are preventable and controllable. Prevention and control of infectious diseases involve collection of accurate condition assessment data. Outbreak detection and investigation and the development of appropriate control strategies (both short and long term) are based on specific epidemiological data. These activities require close collaboration among clinical providers (especially infection-control practitioners within hospitals), clinical laboratories, state and local health departments, and federal agencies. Furthermore, a need exists for continued education of food industry professionals,

health-care students and providers, as well as research to improve immunizations, diagnostic methods, and therapeutic modalities. The prevention of infectious diseases requires multidisciplinary interventions involving public health professionals, medical practitioners, researchers, community-based organizations, private and volunteer groups, industrial representatives, and educational systems.

4.13.1 HISTORY

In contrast to typical natural disasters in which critical components of the physical infrastructure may be threatened or destroyed, an infectious disease outbreak may also pose significant threats to the people responsible for critical community services due to widespread absenteeism in the workforce. In the non-health sector, this might include highly specialized workers in the public safety, utility, transportation, or food service industries, and will likely vary from jurisdiction to jurisdiction. State and local officials should carefully consider which services and key personnel within relevant firms or organizations are essential. It is important to identify where absenteeism would pose a serious threat to public safety or would significantly interfere with the ongoing response to the outbreak. To offset this issue, Countryside Public Health has collaborated with Chippewa County to create a Continuity of Operations Plan that determines priority activities that will help to ensure an office will be able to remain open during times of high absenteeism.

In general, infectious diseases would have no effect on physical property, but there could be a negative impact on the economy if a widespread outbreak were to occur. As a result of an outbreak, businesses may be forced to shut down for an extended period. Chippewa County's entire population is susceptible to exposure from an infectious disease because of the random nature of diseases. Infection rates and exposure risk will vary based on the disease, individual sanitation habits and personal behaviors. Large population concentrations and sites with large numbers of people are especially at risk in the event of an outbreak. Many of these impacts were realized during the recent COVID-19 pandemic from March 2020 through early 2022. According to usafacts.org, Chippewa County reported 3,260 cases of COVID-19 and 48 deaths. The number of cases spiked the greatest during the winter months of this time span.

4.13.2 PROBABILITY

It is difficult to predict the probability of an infectious disease. Several diseases are seasonal in nature like influenza, pneumonia, and Lyme disease and vary in severity from one year to the next. While the coronavirus pandemic is still fresh on everyone's minds, global pandemics like that are fairly rare and tend to occur every 100 years or so. However, previously unknown or new strains of viruses may arise at any time.

4.13.3 INFECTIOUS DISEASE AND CLIMATE CHANGE

Warmer temperatures could provide more favorable conditions for vector borne diseases such Lyme disease and West Nile Virus as the warmer winter months allow for the carriers of these diseases to survive. Also, as temperatures warm, animals leave their native habitats and move to new territories where they interact with new species. Scientists are also seeing certain disease-causing fungi spread into new areas that were previously too cold for them to survive. As water temperatures warm, we could see more frequent and more severe instances of harmful algal blooms, which can be very harmful and potentially fatal to dogs and other animals.

4.13.4 VULNERABILITY

As the past couple of years have shown with the global coronavirus pandemic, infectious disease can have a significant impact on people of all ages as well as the global economy. While no one can be considered “safe” or immune to all potential viruses, the younger, elderly and those who are immunocompromised are typically more affected by infectious diseases.

4.13.5 PROGRAM GAPS OR DEFICIENCIES

- Having adequate PPE was identified as an issue during the recent pandemic.
- Local resources may be inadequate in handling the volume of care needed during a widespread disease outbreak and therefore communities are reliant on state and federal resources. As a result, rural areas like Chippewa County are not always a top priority compared to more populated areas.

4.14 STRUCTURAL FIRE

Urban fires are blazes that spread through structures, posing danger and destruction to property. These fires include any instance of uncontrolled burning which results in structural damage to residential, commercial, industrial, institutional or other properties in developed areas. Fires can occur in any community and pose threats year-round.

4.14.1 HISTORY

According to the State Fire Marshal Division, three people in Chippewa County have lost their lives due to fire since 1990. In 2018, the most recent year that fire data is available, Chippewa County had a total of 30 fire runs, 51 “other” runs, and had a total dollar loss of \$302,400. Chippewa County’s fire rate has been between 325 and 479 between 2015 and 2018 and was usually similar to the statewide fire rate during the same time period. The fire rate equals one fire per number of persons indicated. Fires tend to be more common in cities because of the density and number of both residential and commercial structures.

Table 4.23 Chippewa County Number of Fire/Other Runs, 2015-2018

Community	Total Fire Runs	Total Other Runs	Total Dollar Loss
Chippewa County	146	267	\$1,148,850
Clara City	43	38	\$7,400
Maynard	18	74	\$567,050
Milan	11	8	\$30,000
Montevideo	66	147	\$518,800
Watson	8	0	\$25,000

Source: MN State Fire Marshal’s “Fire in Minnesota: Annual Reports”, 2015-2018

Table 4.24 Chippewa County Average Fire Loss per Fire, 2015-18

Year	Average Dollar Loss per Fire
2015	\$8,886
2016	\$10,836
2017	\$3,778
2018	\$10,800

Source: MN State Fire Marshal's "Fire in Minnesota: Annual Reports", 2015-2018

4.14.2 PROBABILITY

Based on past fire calls data and the size of community, the probability of a structural fire occurring is anywhere between 1% and 13% on a daily basis (Average # of calls per year/365 days). Watson, which is also the smallest community in the county, had the fewest calls and Montevideo, which is the largest community in the county, averaged the most calls in a given year.

Table 4.25 Fire Calls per Community, 2018-2022

	Clara City	Milan	Maynard	Montevideo	Watson
2018	13	3	3	40	3
2019	10	4	10	50	2
2020	13	5	2	62	5
2021	9	6	8	40	5
2022	11	2	5	42	1
Calls/year	11.2	4.0	5.6	46.8	3.2

Source: Chippewa County Emergency Management, 2022

4.14.3 STRUCTURAL FIRE AND CLIMATE CHANGE

There may be a slight increase in the probability of structural fires due to prolonged periods of drought caused by climate change. Drier conditions may lead to an increase in fire danger. The [National Oceanic and Atmospheric Administration \(NOAA\) suggests](#) that climate change has resulted in drier atmospheric conditions and a longer wildfire season, which may in turn result in more structural fires as well.

4.14.4 VULNERABILITY

While almost any structure is vulnerable to structural fire, older homes, especially those that use woodburning as their primary heat source and possibly have outdated electrical wiring may be more vulnerable than others. Also, older commercial structures built before fire suppression systems were mandated are also slightly more vulnerable to fire damage than newer buildings. Larger agricultural buildings are also vulnerable due to their remote location away from fire responders and water sources. Populations that are vulnerable include infants, elderly and those that are physically handicapped as they may have difficulty evacuating a burning building.

4.14.5 PROGRAM GAPS OR DEFICIENCIES

- Although not in use very often, homes with chimneys pose a large threat of fires. Specialized training classes, such as chimney cleaning, safe cooking in the kitchen, and holiday hazards, could be offered to residents.

- Residents living in higher density areas should be more educated on fire prevention.
- In the back of the Main Street in Montevideo, there are large power lines behind the tall buildings that limit accessibility in the event of a major structure fire.
- Large agricultural production operations in the rural areas pose a fire risk to property and livestock due to the remote location away from water supplies.

4.15 HAZARDOUS MATERIALS

Hazardous materials are chemical substances, which if released or misused can threaten the environment and/or health of a community. These chemicals are used in industry, agriculture, medicine, research, and consumer goods throughout Chippewa County. Hazardous materials are found in the county in the forms of explosives, flammable and combustible substances, corrosives, poisons, and radioactive materials.

A hazardous material spill or release poses risks to life, health, and property. An incident can force the evacuation of a few people, a section of a facility, or an entire neighborhood or community, resulting in significant economic impact and possible property damage. Spilled material is costly to clean up and may render the area of the spill unusable for an extended period of time. Hazardous materials incidences are generally associated with transportation accidents or accidents at fixed facilities.

4.15.1 HISTORY

Hazardous materials exist as part of everyday life in Chippewa County. These materials make life easier and more comfortable for residents throughout the county. The challenge is to use, store, and transport hazardous materials in a safe way that does not harm communities and prepare an effective response to unwanted releases of hazardous materials when they occur. A hazardous materials accident can occur almost anywhere at any time.

Minor incidents have occurred, but these have had little or no impact on the community at large. The likelihood of a major event is considered to be marginal, but an isolated minor accident is of constant concern.

From 2000 to 2009, six pipeline breaks have occurred in Chippewa County. Three of the six breaks took place in 2001. Two of the breaks took place in Montevideo as a result of excavation. The other break occurred in Rhinelander Township, when a third-party excavated with a backhoe and hit a 2-inch natural gas pipe. In 2002, another 2-inch natural gas pipeline was hit during an excavation and caused a natural gas leak in Montevideo, requiring natural gas to be turned off for the area. During 2004, a homeowner in Montevideo was digging and broke a 1.5-inch natural gas pipeline that serviced the home. The most recent pipeline damage occurred on November 15, 2006 in Rhinelander Township, located near 50th St SE and County Road 1. The break transpired due to a construction company installing drain tile and excavation caused damage to an 8-inch pipeline owned by Magellan Pipeline Company LP carrying gasoline. In this case, the pipeline did not leak as it was shut down for maintenance. There have been none since.

4.15.2 PROBABILITY

Based on past events, there are approximately 8-9 reported hazardous materials events per year in Chippewa County according to County Emergency Management. These events vary in terms of severity, with most being minor in nature, but all have the potential to cause an impact or harm to people and/or the environment and interrupt transportation routes.

4.15.3 HAZARDOUS MATERIALS AND CLIMATE CHANGE

Hazardous Materials and climate change have not been shown to be related.

4.15.4 VULNERABILITY

Road, rail, aircraft, and pipeline all move hazardous materials presenting differing levels of risk. Transported products include hazardous materials passing from producers to users, between storage and use facilities as well as hazardous waste from generators going to treatment and disposal facilities.

People and property on or immediately adjacent to transportation corridors throughout the county are at higher risk than those located one mile or more from a major county corridor. Chippewa County assumes that the highest risk of an incident would be to areas in close proximity to both rail lines and major roads and from large quantities of hazardous materials moving into and out of Chippewa County. The risk of a major event is most severe in more populated western portions of the county and along state highways. According to the most recent findings at the Minnesota Department of Transportation (MnDOT), more than half of all accidents involving hazardous materials have occurred on the state roadways. Roads are a major concern in Chippewa County due to the lack of information available regarding what is traveling on the road system on a daily basis.

Transported hazardous materials on rail lines also pose a risk to Chippewa County residents. While a spill could greatly affect residents anywhere in the county, a hazardous material spill would have the most impact if it occurred within a city. The United States Department of Transportation (US DOT) considers the area within ½ mile of rail lines the *Evacuation Zone* for Oil Train Derailments. Areas within one mile of rail lines are considered to be *Potential Impact Zones* in case of an oil train fire.

The airport facility also provides further concern based on the possibility of an aircraft or site incident involving some sort of hazardous material. Chippewa County has one small municipally-run airport (Montevideo) that operates a general use facility for small businesses and pleasure uses only. The only hazardous material found at the airport is used for agricultural spraying. Aircraft are not allowed to wash out any hazardous materials and this use is seasonal only.

There are also a variety of hazardous materials stored in fixed facilities throughout the county, ranging from stored flammable liquids to radioactive materials and chemical agents. Some materials are particularly lethal even in small amounts, while others require strong concentrations with prolonged exposure periods to cause harm. Businesses housing hazardous materials are listed in the Emergency Operations Plan.

The major concern for hazardous materials events for fixed facilities is primarily in the city of Montevideo. Montevideo contains the majority of the county's population and employers.

The specific hazards created by a release are dependent on the hazardous characteristics of the material, the amount released, the location of the release, and the weather and topographic conditions in the area. Identifying specific materials and those involved in transportation can provide a more specific assessment of the vulnerability.

Facilities storing or using hazardous materials above minimum amounts have developed and filed a Risk Management Plan with the Local Emergency Planning Committee, State Emergency Response Commission and the Environmental Protection Agency. Each plan identifies significant hazards for the facility, likely release scenario for the hazards, estimated population impacted by the release, and specific steps to take in the event of a release to protect a population from harm.

Chippewa County also has a few pipelines a few pipelines that traverse the county supplies pressurized flammable liquids transmission. A liquid release in the Magellan Pipeline would put the City of Maynard at risk. The rest of the rural area is at slight risk and in the event of a leak in either the Alliance or Dome pipeline, additional personnel will be required to inform each farm place to evacuate.

Currently, over 78,000 miles of pipelines are located within the state of Minnesota. Six pipelines run throughout Chippewa County carrying liquid gasoline and natural gas are owned by CenterPoint Energy, Great Plains, Alliance Pipeline LTD, Dooley's, Magellan Pipeline Company LP, and Kinder Morgan Cochin LLP. Table 4.23 below identifies the type of commodity carried and length of pipelines by their respective owners.

Table 4.26 Chippewa County Pipelines

Operator Name	Commodity Carried	Mileage
CenterPoint Energy	Natural Gas	Unknown
Great Plains	Natural Gas	Unknown
Alliance Pipeline LTD	Natural Gas	8.2 Miles
Dooley's	Natural Gas	13.0 Miles
Magellan Pipeline Company	Gasoline Product	14.9 Miles
Kinder Morgan Cochin LLP	Gasoline Product	8.3 Miles

Source: Chippewa County, 2014

4.15.5 PROGRAM GAPS OR DEFICIENCIES

- With the presence of several heavily traveled transportation routes (State/U.S. Highways, and two railroads) there is an ever-present threat of a hazardous materials spill. In addition, there is no way to know what materials are being transported through the county at any given time.

4.16 WATER SUPPLY CONTAMINATION

Water supply contamination is the introduction of point and non-point source pollutants into public ground water and/or surface water supplies. Although minimal, water supply contamination does pose a threat in Chippewa County.

Microbiological and chemical contaminants can enter water supplies. Chemicals can leach through soils from leaking underground storage tanks, feedlots, and waste disposal sites. Human wastes and pesticides can also be carried to lakes and streams during heavy rains or snow melt.

Drinking water in Chippewa County comes from groundwater and all cities have municipal water systems. All water plants are in good working condition and undergo regular inspections by municipal employees. Individual wells provide drinking water for rural residences within Chippewa County.

4.16.1 HISTORY

There have not been any drinking water contamination events in Chippewa County.

4.16.2 PROBABILITY

The probability of a water contamination incident would be considered fairly rare as there have not been any events in the past and given the level of security and monitoring that is currently being done in each of the communities.

4.16.3 DRINKING WATER CONTAMINATION AND CLIMATE CHANGE

As a human-caused disaster, drinking water contamination is not linked to climate change.

4.16.4 VULNERABILITY

All municipalities have taken proper measures to protect their water supplies as they are a critical resource to each community. If an incident were to occur, an entire community would be affected.

4.16.5 PROGRAM GAPS AND DEFICIENCIES

- Water supplies, while mostly secure and protected, are very vulnerable to irreversible contamination, especially via private wells.

4.17 WASTEWATER TREATMENT SYSTEM FAILURE

Wastewater treatment and disposal is an important part of our need to protect and preserve Minnesota's water resources. Although minimal, failure of wastewater treatment systems poses a potential risk in Chippewa County. Numerous hazards can impact wastewater treatment plants, including severe flooding.

4.17.1 HISTORY

Wastewater systems typically pose higher risks of failure during the spring when melting snow and runoff can cause flooding. To date, no wastewater treatment systems have failed in Chippewa County.

4.17.2 PROBABILITY

The probability of a wastewater treatment failure event is relatively low based on the lack of past occurrences. However, those communities with older systems, may be more susceptible to failure in the near term.

4.17.3 WASTEWATER TREATMENT SYSTEM FAILURE AND CLIMATE CHANGE

With more intense rainfall events anticipated in the future, some wastewater treatment systems may be inundated with stormwater resulting from excessive inflow and infiltration. Communities should continue to monitor and upgrade their collection systems as necessary to reduce the amount of stormwater entering their wastewater systems.

4.17.4 VULNERABILITY

Those communities with aging infrastructure may be more susceptible to a potential failure event. Communities with wastewater treatment lagoons/ponds are slightly less susceptible to failure as they tend to have some excess capacity built into their ponds. There is also some vulnerability to the nearby streams' water quality and ecosystems as in a worst-case scenario, a municipality may have to bypass treatment and discharge untreated wastewater into the nearby receiving stream.

4.17.5 PROGRAM GAPS OR DEFICIENCIES

- None identified.

4.19 CIVIL DISTURBANCE/TERRORISM/CYBER ATTACK

Human-caused hazards can be intentional, criminal, malicious uses of force and violence to perpetrate disasters against people or property. They can be the result of terrorism – actions intended to intimidate or coerce a government or the civilian population to further political or social objectives – which can be either domestic or international, depending on the origin, base and objectives of the terrorist organization.

Hazards can result from the use of weapons of mass destruction, including biological, chemical, nuclear and radiological weapons; arson, incendiary, explosive and armed attacks; industrial sabotage and intentional hazardous materials releases; and cyber terrorism.

4.19.1 HISTORY

Chippewa County has no history of terrorist or individual acts designed to cause disasters against people or property. Vandalism, assaults and other criminal acts do occur, but these isolated incidents fall within the purview of local law enforcement.

School Violence. Violence in schools has become an increasingly important topic among teachers, students, and police. There is a focusing on preventing bullying, school shootings, vandalism, and overall safety. Regardless of the availability of drugs, alcohol, and weapons to youth, it appears as though school violence incidences are decreasing. This fact is demonstrated in the Minnesota Student Surveys

completed in 2016, 2019 and 2022 in Chippewa County. The vast majority of 11th grade students “strongly agree or agree” to feeling safe walking to and from school and at school.

4.19.2 PROBABILITY

Due to the rural nature of the County, it is fairly unlikely the area would be a target of any kind of civil disturbance or terrorism attack. The more probable situation would be that the county would be included in a larger geographic area impacted by a widespread attack on the electric grid or cyber networks. There is also always the slight threat of a local individual or group acting out in anger toward local elected officials or governmental agencies.

4.19.3 CIVIL DISTURBANCE/TERRORISM AND CLIMATE CHANGE

As civil disturbance/terrorism is a human caused disaster, it cannot be directly linked to climate change. However, if climate change worsens, and causes other emergency situations such as natural resource shortages, food/water shortages, etc., it is conceivable that civil disturbances may increase slightly as people get desperate.

4.19.4 VULNERABILITY

As civil disturbances and the like become increasingly more common across the country, law enforcement departments have become well trained on how to handle and respond to these situations. Anti-virus/malware software programs are also becoming increasingly more sophisticated to combat technological threats on computers and networks. Smaller communities in the county may be a little more vulnerable as they do not have the resources available to respond to these types of events and need to rely on outside agencies.

4.19.5 PROGRAM GAPS AND DEFICIENCIES

- The original design and operations of the older facilities in the county were not developed with terrorism prevention in mind.
- Chippewa County government buildings, including the county courthouse and city hall, have unrestricted pedestrian access.
- The Montevideo City Hall and the Chippewa County Courthouse do not have fire suppression systems and are not blast resistant. Montevideo had a fire detection system installed in 2000.

Chapter 5 : COUNTY MITIGATION STRATEGY

(City strategies are included in Appendix VII.)

OVERVIEW

The following tables outline the goals, objectives, and mitigation strategies for natural hazards important to Chippewa County. The goals are used as a framework for the objectives and mitigation strategies, which in turn, provide specific information on how mitigation decisions should be made. The goals, objectives, and strategies are based on the issues identified by the Local Task Force and the risk assessment in this plan. The chapter is divided into three sections; completed strategies by Chippewa County and cities, current goals, objectives, and strategies for Chippewa County and cities, and the prioritization of strategies.

DEFINITIONS

Goals are general statements. **Objectives** are action statements and start with an action verb. **Strategies** support the action of the objective.

The **Time Frame** was determined by the task force and the County Emergency Manager as an estimated timeline in which to complete the strategy. The time frame denoted as **“Recurring”** is a strategy type that does not have a specific length of time. Once the strategy has been completed, the responsible entity will re-start the strategy. The time frame denoted as **“Ongoing”** is a strategy type that occurs on a continuous or regular basis.

Responsible Entity is the entity in charge of initiating and completing the strategy identified. This was determined by the task force and County Emergency Manager as the most likely entity to complete the strategy.

The **Estimated Cost** was an educated guess of the cost of each strategy. Some strategies would not cost extra and were denoted “N/A”. Some costs were not known and denoted as “unknown” and other actions would vary depending on the size and scope of the project.

The **Funding Partner** is a potential partner for the county/city to obtain funding from in order to complete a strategy. **“Internal funding”** refers to activities occurring as part of normal budgeted activities and no external or additional funding is needed.

GENERAL MITIGATION VISION

“The county will strive to work with surrounding communities and local emergency responders to create and implement a proactive and results-oriented all-hazard mitigation plan that will make the county and region a safer and more sustainable place to live by protecting and enhancing the resources of the county as they relate to hazards that may have an impact in the future.”

DEVELOPMENT OF STRATEGIES

The strategies in this plan were developed and updated by having the County's planning committee first refer to the 2015 strategies as a starting point. The committee reviewed and discussed each disaster's strategies as to whether or not they had been accomplished, remained to be completed, or if they were no longer relevant. Some strategies were slightly modified to reflect current the current situation and, in some cases, a new strategy was added. Also, as part of the discussion, the strategy timelines were reviewed and modified as necessary. Strategies were also modified to incorporate new mitigation ideas or concerns from the mitigation surveys that were sent out after the planning kick-off meeting (see Appendix I for survey results).

In addition to the Countywide strategies presented in the following pages, each city conducted a similar process with a local committee. However, in addition to reviewing the 2015 strategies and keeping the new 2023 FEMA guidelines in mind, the city strategies were significantly expanded to include at least one mitigation action for each disaster that was identified. This was done by discussing each disaster, finding out where each City may be susceptible and then considering various ways they could mitigate. Many of these strategies could be accomplished by continuing ongoing programs or carrying out practical and inexpensive projects or programs, keeping in mind the limited resources (both financial and staffing) of the local jurisdictions. City strategies and brief summaries of each disaster discussion can be found in Appendix VII.

POTENTIAL FUNDING PROGRAMS

Below is a list of potential state and federal funding programs that the County or local governments could utilize to implement mitigation strategies.

Minnesota DNR Flood Hazard Mitigation Grant Assistance Program (FHM)

The Flood Hazard Mitigation Grant Assistance Program (FHM) was created by the Minnesota Legislature in 1987 to provide technical and financial assistance to local government units for reducing the damaging effects of floods. Under this program the state can make cost-share grants to local units of government for up to 50 percent of the total cost of a project. The goal of existing regulations and programs for flood damage reduction is to minimize the threat to life and property from flooding. The efforts of local governments to enforce their zoning ordinances, to sponsor flood mitigation public improvement projects, and to acquire or relocate flood-prone buildings have significantly helped to reduce risk to lives and flood damages across the state.

FEMA Hazard Mitigation Grant Program (HMGP)

FEMA's Hazard Mitigation Grant Program provides funding to state, local, tribal and territorial governments so they can develop hazard mitigation plans and rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a presidentially declared disaster. In this program, homeowners and businesses cannot apply for a grant. However, a local community may apply for funding on their behalf. All state, local, tribal and territorial governments must develop and adopt hazard mitigation plans to receive funding for hazard mitigation project application.

Hazard mitigation includes long-term efforts to reduce risk and the potential impact of future disasters. HMGP assists communities in rebuilding in a better, stronger, and safer way to become more resilient overall. The grant program can fund a wide variety of mitigation projects including:

- Planning and Enforcement efforts including hazard mitigation planning, property acquisition, and code enforcement
- Flood protection measures using levees, floodwalls, elevating structures, reconstruction of damaged dwellings on elevated foundations, and drainage improvements
- Retrofitting to structures and utilities/infrastructure to make them more resistant to natural disasters and other hazards
- Construction of safe rooms and slope stabilization

FEMA Flood Mitigation Assistance (FMA)

Flood Mitigation Assistance is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project. FEMA requires state, local, tribal and territorial governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects.

FEMA Building Resilient Infrastructure and Communities (BRIC)

The BRIC program is a competitive annual grant program that supports local governments as they implement hazard mitigation projects to reduce the risks from disasters and natural hazards. The program is authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The BRIC program aims to categorically shift the federal focus away from reactive disaster spending and toward proactive investment in community resilience. Through BRIC, FEMA continues to invest in a variety of mitigation activities with an added focus on infrastructure projects benefitting disadvantaged communities, nature-based solutions, climate resilience and adaptation, and adopting hazard resistant building codes. As a competitive grant program, applicants can apply on a yearly basis.

The BRIC program's priorities include:

1. Incentivize natural hazard risk reduction activities that mitigate risk to public infrastructure and disadvantaged communities;
2. Incorporate nature-based solutions, including those designed to reduce carbon emissions;
3. Enhance climate resilience and adaptation;
4. Increase funding for the adoption and enforcement of the latest published editions of building codes; and

5. Encourage mitigation projects that meet multiple program priorities.

FEMA Assistance to Firefighters Grant (AFG) Program

The primary goal of the Assistance to Firefighters Grant (AFG) is to meet the firefighting and emergency response needs of fire departments and non-affiliated emergency medical service organizations.

Since 2001, AFG has helped firefighters and other first responders obtain critically needed equipment, protective gear, emergency vehicles, training and other resources necessary for protecting the public and emergency personnel from fire and related hazards.

FEMA Staffing for Adequate Fire and Emergency Response Grants (SAFER) Grant

The SAFER Grants program was created to provide funding directly to fire departments and volunteer firefighter interest organizations to help them increase or maintain the number of trained, "front line" firefighters available in their communities.

The goal of SAFER is to enhance the local fire departments' abilities to comply with staffing, response and operational standards established by the NFPA (NFPA 1710 and/or NFPA 1720).

USDA Community Facilities Program

This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings. Funding is available in the form of low-interest loans, grants or a combination thereof.

Examples of essential community facilities related to hazard mitigation include:

- Health care facilities such as hospitals, medical clinics, dental clinics, nursing homes or assisted living facilities
- Public safety services such as fire departments, police stations, police vehicles, fire trucks, public works vehicles or equipment, and warning sirens

PRIORITIZING STRATEGIES

Similar to the strategies, the prioritization was also discussed after review of the 2015 strategies. A description of how the strategies were prioritized can be found in the 2015 plan. In summary, the strategies were prioritized by considering the following criteria:

- Cost and available resources
- Length of project
- Compatibility with other plans – avoid duplication
- Available information – is enough known about the project to proceed soon?

- Impact of project or frequency of disaster and number of people benefitting

After review, the planning committee felt the 2015 priorities were still relevant for this plan as well.

With the addition of several new strategies at the city level to meet the new FEMA policy of having at least one mitigation action per disaster, local planning committees had several new actions to consider when prioritizing their strategies. After meeting to review and develop new strategies, UMRDC staff assigned an initial priority level of high, medium or low to each action based on the discussions that were held and also taking into account the following criteria:

- If it was something they are already doing or could be incorporated into an existing program or operation
 - High – Already doing or could easily incorporate into existing programs
 - Medium – Could be done with additional funding, but grant funding is possible, additional staff time is minimal
 - Low – Would require significant local funding and/or staff time to implement
- The cost/benefit of the proposed action, number of people/properties benefiting
 - High – benefits a lot of people/property for minimal cost
 - Medium – benefits a moderate amount of the population/properties for a moderate cost
 - Low – Benefits a limited amount of the population/properties for a high cost
- Frequency of the disaster and impact
 - High – Disaster occurs frequently and significantly impacts people and property
 - Medium – Disaster occurs infrequently and/or has moderate to minimal impact
 - Low – Disaster occurs rarely and/or has minimal impact
- Ease of implementation based on local resources (financial and staffing)
 - High – Jurisdiction has financial resources readily available, existing staff can accommodate
 - Medium – Jurisdiction does not have all of the financial resources available, but assistance is possible (grants/loans/bonding) and city staff can accommodate
 - Low – Jurisdiction does not have financial resources available and funding assistance is unlikely and/or staff is unable to accommodate additional workload or does not have ability/skills to implement

These priority levels were given to local elected officials and city staff for review prior to their City Council meetings in the months of March-April 2023. At these meetings County Emergency Management staff presented the draft strategies and hear any comments or feedback from the elected

officials, city staff and the attending public. As mentioned earlier, the local jurisdictions' strategies can be found in Appendix VII.

Table 5.1 2023 Chippewa County Prioritized Strategies (Natural Hazards)

Ranked	Hazard	Strategy	Affected Participating Jurisdiction
1	Severe Storms & Extreme Temperatures	Each city and the County Emergency Manager should continue to do periodic visits and review plan annually.	County EM, All Cities
1	Severe Storms & Extreme Temperatures	Identify funding to purchase portable generators and transfer switches to community emergency operation centers.	County, All Cities
1	Severe Storms & Extreme Temperatures	Assist with finding funding sources for and build safe shelters in all manufactured home parks, cities, city parks, county, and state parks and public golf courses. Identify a safe room for the campgrounds in cities and the greater county.	County EM, All Cities
2	Flooding	Prioritize bridges and culverts with annual flood concerns. Determine strategies to mitigate repeatedly flooded infrastructure (Ex. Replacing bridges, with clear-span bridges, replacing culverts).	County Engineer, County EM, All Cities
2	Flooding	Identify and prioritize repeat flood-impacted township roads to be improved.	County Engineer, County EM, Townships
2	Flooding	Identify structures prone to flood hazards for future buyouts.	County EM
3	Wildfire	Work with all units of government, fire departments, and schools to provide educational fire safety materials to the public.	County EM, All Cities, All Fire Departments, Schools

2023 Chippewa County Prioritized Strategies (Manmade/Technological Hazards)

Ranked	Hazard	Strategy	Affected Participating Jurisdiction
1	Hazardous Materials	Ensure that all Emergency Responders participate in Rail Car Incident Response Training.	All City Fire Departments, County
1	Hazardous Materials	Continue to participate in regional exercise that test local plans and interaction between local agencies.	County EM, All Cities, All Fire Departments
2	Civil Disturbance/ Terrorism	Schedule discussions with school leaders, hospital administrators, emergency managers, law enforcement and local units of government to address performance in response to terrorism, focusing on schools and hospitals.	County EM
3	Structure Fire	Provide public education to residents, focusing on carbon monoxide poisoning, evacuation, and smoke alarms.	County EM, All Cities, All Fire Departments
3	Structure Fire	Complete an annual inventory assessment of fire equipment, personnel, and training needs.	County EM, All fire departments

2023 Chippewa County Hazard Mitigation Goals, Objectives, and Strategies

NATURAL HAZARDS

Violent Storms and Extreme Temperatures (Includes Windstorms, Tornadoes, Hail, Extreme Heat, Extreme Cold, Lightning, Winter Storms)

Goal 1: Have safe and accessible safe rooms from violent storms.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner(s)
1. Encourage homes without basements to have a safe room where household residents may go in case of violent storms.	A. Educate contractors and homeowners on safe rooms.	Recurring	All Cities and County	\$500/city	Internal (County/cities)
	B. Assist with finding funding sources for and build safe shelters in all manufactured home parks, cities, city parks, county, and state parks and public golf courses. Identify a safe room for the campgrounds in cities and the greater county. Potential locations: <ul style="list-style-type: none"> Buffalo Lake Park (aka, County Park #1)* Upper Campground at LqP State Park* Chippewa Co. Fairgrounds* (*Priority Level 1) *New Strategies, 2023	Recurring	Cities, County, MN DNR	\$50,000-\$100,000/shelter	FEMA – (HMGP, BRIC), County, MN DNR
2. Investigate snow fences in Chippewa County.	A. Work with the landowner to continue to pile snow along the northwest perimeter of the city to serve as a temporary snow fence. *Modified in 2023	2024-25	Clara City, landowner(s)	Unknown	N/A
3. Require all new manufactured home parks to provide safe shelter for park residents either through a structure on site or a plan of evacuation to safe shelter off site.	A. Require that the safe shelter plans go through local governing unit each year for review.	Recurring	All Cities	N/A	Internal (Cities)
4. Ensure that all hospitals, schools and nursing home facilities have a severe storm plan in place to protect patients and students.	Each city and the County Emergency Manager should continue to do periodic visits and review plans annually. (*Priority Level 1)	Recurring	County Emergency Manager and facilities	N/A	Internal (County)
5. Educate residents of safe rooms in community and continue to address safe room needs in the county.	Build safe rooms as needed.	2-15 years	All Cities, County	\$100,000/shelter	FEMA – (HMGP, BRIC)

Goal 2: Improve severe storm warning system for all county residents.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Ensure that emergency management personnel, county sheriff, city police and emergency response persons are notified as soon as possible in the event of a severe storm.	A. Continue current programs and plans that are in place and periodically review the effectiveness of these plans.	Recurring	County EM, County Sheriff	N/A	Internal (County)
2. Assess adequacy of existing civil defense sirens and emergency operations centers.	A. Review countywide siren needs annually. Look for funding to provide new or improved warning systems as necessary.	Recurring	County EM	\$17,000/ Siren	USDA - Community Facilities Program
	B. Identify funding to purchase portable generators and transfer switches to community emergency operation centers. (*Priority Level 1)	2-3 years	Watson	\$6,500	FEMA – (HMGP, BRIC)
3. Ensure that all communities and rural areas of the county have immediate access to severe weather warnings and communications.	A. Encourage residents to sign up for CodeRED emergency notifications. *Modified Strategy, 2023	Recurring	County EM	\$500	Internal (County)
4. Continue to train storm spotters.	A. Work with programs in place and periodically evaluate their effectiveness.	Every 2 years	County Emergency Manager, NWS	N/A	Internal (County)
5. Ensure emergency communications system is working *New Objective, 2023	A. Conduct monthly test of 800MHz radio system (ARMER) to verify operability. *New Strategy, 2023	Monthly	County EM, City/County Emergency department	N/A	Internal (County)

Goal 3: Protect people and infrastructure from the impacts of severe weather.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Prevent prolonged power outages due to wind and ice storms. *Revised Objective, 2023	A. Work with utility companies to assess the safest placement of utility lines.	Recurring	County, All Cities, MN Valley Cooperative Light & Power, Xcel	N/A	Internal (County EM, cities)
	B. Underground burial of power lines where feasible.	Recurring	County, All Cities, MN Valley Cooperative Light & Power, Xcel	Will vary	FEMA – (HMGP, BRIC), USDA Rural Utilities Service,

	C. Upgrade aging powerlines where needed. *New Strategy, 2023	Ongoing	MN Valley Cooperative Light & Power	Will vary on size of project	Utility provider(s)
	D. Test poles for rotting/weaking and replace as needed. *New Strategy, 2023	Ongoing	MN Valley Cooperative Light & Power	Will vary on size of project	Utility provider(s)

Flooding

Goal 1: Eliminate nonconforming structures in the identified 100-year floodplain.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Enforce current zoning ordinances that provide for the amortization and elimination of existing nonconforming private structures and uses in identified 100-year floodplains.	A. Work with the state and federal government to provide funding to remove nonconforming structures (residences, businesses) from the floodplains.	Recurring	Montevideo, County EM	Unknown	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)
2. Buy out willing sellers of their structures in the 100-year floodplain including businesses in Montevideo.	A. Work with the state and federal government to provide funding to acquire and remove nonconforming structures in the Flood A and Flood B Zones.	Recurring	Montevideo	Unknown	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)
3. Relocate existing businesses still operating within 1% floodplain. *Modified Objective, 2023	A. Work with the state and federal government to secure funding to relocate this nonconforming use.	As funding is available	County, City of Montevideo	\$350,000	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)

Goal 2: Improve the safety and security of Wastewater Treatment Plants/lift stations.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Protect Maynard's Wastewater Treatment Plant	A. Build a berm along Hawk Creek.	2 years	Maynard	Unknown	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)

Goal 3: Minimize the flooding along Hawk Creek.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Work with the City of Willmar to keep ice out of Clara City and Maynard.	A. The cities of Clara City and Maynard should participate in dialogue with the Hawk Creek Watershed Project, the City of Willmar and the MPCA. Investigate the diversion of water to Grass Lake especially during flooding. Consider seeking state or federal funding.	Recurring	Clara City, Maynard, Willmar, Hawk Creek Watershed Project	\$20,000	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)
2. Protect residences in Maynard from flooding.	A. Build a berm along Hawk Creek.	2 years	City of Maynard	Unknown	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)
3. Protect the Maynard Lutheran Cemetery from flooding.	A. Build a berm along Hawk Creek to protect the cemetery from flood events.	2 years	Maynard Lutheran Church, City of Maynard	Unknown	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)

Goal 4: Improve the safety and security of flood prone areas throughout Chippewa County.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Establish a plan of action to address flood emergencies.	A. Identify resources both local and outside of the community that are needed and contract for this assistance.	Recurring	City staff of Clara City, Maynard, Milan, Montevideo, Watson, County EM	N/A	Internal (cities)
2. Identify flood concerns in Chippewa County Townships	A. Prioritize bridges and culverts with annual flood concerns. Determine strategies to mitigate repeatedly flooded infrastructure (ex. replacing bridges with clear-span bridges, replacing culverts). (*Priority Level 2)	2 years	County Engineer, Townships	N/A	Internal (County, townships)
	B. Identify and prioritize repeat flood-impacted township roads to be improved. (*Priority Level 2)	2 years	County Engineer, Townships	N/A	Internal (County, townships)

Goal 5: Ensure continued compliance with NFIP standards for participating communities.

Below are strategies that Chippewa County and the three NFIP-participating communities have committed to in order to continue with NFIP compliance.

Chippewa County Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps. ([Currently working with them.](#))
2. Work with the MN DNR to review and update the Floodplain Management Ordinance as required.
3. Work with the MN DNR on all development applications in identified Flood Hazard Areas.
4. Discourage zoning variances in Flood Hazard Areas.
5. Encourage all property owners in Flood Hazard Areas to purchase flood insurance.

Clara City Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps. ([Currently working with them.](#))
2. Work with the MN DNR on a new Flood Plain Ordinance.
3. Discourage development in “flood-prone” areas.

Mayard Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps. ([Currently working with them.](#))
2. Work with the MN DNR NFIP Coordinator or Floodplain and Shoreland Planner to adopt a new Flood Plain Ordinance.
3. Discourage development in “flood-prone” areas.

Montevideo Strategies to Continue NFIP Compliance:

1. Work with the MN DNR and FEMA to modernize floodplain maps. ([Currently working with them.](#))
2. Work with the MN DNR to review and update the Floodplain Management Ordinance as required.
3. Work with the MN DNR on all development applications in identified Flood Hazard Areas.
4. Discourage zoning variances in Flood Hazard Areas.
5. Encourage all property owners in Flood Hazard Areas to purchase flood insurance.
6. Continue to comply with Community Rating System requirements.

Erosion

Goal 1: Minimize property damage and reduce economic impacts of erosion.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Limit the potential loss of property and economic impact from river and ravine erosion, landslides, and slope failure.	A. Support demolition and/or relocation of dwellings and infrastructure to prevent loss of property due to erosion, landslides, or slope failure	Recurring	County Emergency Manager	Will vary	FEMA (HMGP, BRIC, FMA); MN DNR (FDR)

2. Educate the public on possible effects of erosion, landslides, and slope failure.	A. Increase public awareness and knowledge on erosion landslides, and slope failure, targeting individuals and businesses located in high-risk areas.	Recurring	County Emergency Manager, County Zoning	N/A	Internal (County, cities)
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Drought

Goal 1: Monitor the county's ground water supplies and demands.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Monitor levels of aquifers.	A. Continue and expand the monitoring of ground water levels in order to control consumption during a drought.	Recurring	County and All Cities	N/A	County, SWCD, DNR Hydrologist

Goal 2: Adopt a wellhead protection ordinance.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Coordinate with and encourage cities within the county to keep wellhead protection ordinances/plans up to date. *Modified Objective, 2023	A. Implement wellhead protection ordinances/plans.	2-10 years	County and All Cities	N/A	Internal (County, cities)

Wildfire

Goal 1: Prevent Wildfires					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Minimize the amount of natural fuel in areas prone to fire damage.	A. Work with the Minnesota DNR to include prescribed burning on all county lands and parks. Work with FSA to educate landowners about cost share funding available for controlled burns on CRP and CREP lands. Provide regulations in conservation plantings that consider controlled burns in the future.	Recurring	County SWCD, FSA, DNR	N/A	Internal (SWCD, DNR, FSA)

2. Provide education to the public about wildfire prevention.	A. Work with the FSA office to provide education to landowners. Some landowners may not realize that burning is allowed and beneficial.	Recurring	County SWCD, FSA	N/A	Internal (SWCD, FSA)
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Goal 2: Minimize structure loss from wildfire.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Have access to additional firefighters other than those already in the county for large wildfires.	A. Create a contract between DNR and local fire departments to organize response to large wildfires. This contract should address the entities responsible for wildfires on state and federal-owned land and who pays expenses.	Recurring	Clara City, Maynard, Milan, Montevideo, DNR	N/A	Internal (cities, DNR)

Goal 3: Increase available resources related to wildfire prevention and response *(*New goal, Goal 3 in 2015 plan was left blank.)*

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Provide education to the public about wildfire prevention.	A. Work with local units of government, fire departments and schools to provide educational fire safety materials to the public. (*Priority Level 3)	Recurring	Clara City, Maynard, Milan, Montevideo	N/A	Internal (City FDs)
2. Promote training programs between the DNR and local firefighters.	A. Encourage DNR to give training locally.	Recurring	Clara City, Maynard, Milan, Montevideo, DNR	N/A	Internal (cities)
3. Increase access to equipment suitable to fighting wildfires.	A. Work with DNR to provide more equipment for local fire departments. Look for grants for additional equipment if necessary. • UTV replacement for Maynard FD* (*New Strategy, 2023)	Recurring	Clara City, Maynard, Milan, Montevideo	Varies according to FD	USDA - Community Wildfire Defense; FEMA - Asst. to Firefighters Grant Program

Dam Failure

Goal 1: Prevent structure from cracking or breaking.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Ensure dam structures are maintained and functioning properly.	A. Coordinate dam inspections with the DNR and Army Corps of Engineers and County departments.	Recurring	DNR, ACOE, County Sheriff, County Highway Department	N/A	Internal (County)

Goal 2: Provide safety to residents

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Minimize development within floodplains.	A. Enforce floodplain ordinances.	Recurring	County Land & Resource Management, Maynard, Montevideo	N/A	Internal (County)

MANMADE & TECHNOLOGICAL HAZARDS

Infectious Disease

Goal 1: Reduce the threat of infectious diseases through education and awareness.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Support and maintain programs that keep the county healthy and safe from infectious diseases.	A. Continue to support Countryside Public Health programs.	Recurring	Countryside Public Health & County	N/A	Internal (County, CSPH)
	B. Work to make sure mass transportation and mobile community can address infectious disease outbreak.	Recurring	Countryside Public Health, Prairie Five Rides	N/A	Internal (CSPH, P5 Rides)
	C. Work with State of Minnesota on Quarantine/Isolation plan.	Recurring	Countryside Public Health	N/A	Internal (CSPH)
2. Educate the public.	A. Get uniform, accurate and up-to-date information out to the public through the risk communication service.	Recurring	Countryside Public Health	N/A	Internal (CSPH)
	B. Continued cooperation with Emergency Manager, Countryside Public Health and hospitals and clinic staff.	Recurring	Countryside Public Health, County Emergency Manager, Hospital and Clinic Staff	N/A	Internal (County, CSPH, Hospital, clinics)
3. Ensure all community members receive updated public health and emergency information.	A. Partner with ECHO Minnesota to provide public health and emergency information in the languages of all immigrants and refugees.	Recurring	Countryside Public Health, County Emergency Manager, Hospital and Clinic Staff	N/A	Internal (County, CSPH, Hospital, clinics)
	B. Adapt to early warning systems that become available. *New Strategy, 2023	Recurring	Countryside Public Health, County Emergency Manager, Hospital and Clinic Staff	N/A	Internal (County, CSPH, Hospital, clinics)
Goal 2: Improve the effectiveness and quality of the various efforts addressing infectious diseases that have the potential to impact the county.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Maintain and update material, plans, and agreements for addressing infectious diseases.	A. Maintain partnerships and good communication networks to address potential disease outbreak situations/public health emergencies *Modified Strategy, 2023	Recurring	Countryside Public Health, County Emergency Manager, Hospital and Clinic Staff, MN Dept. of Health	N/A	Internal (County, CSPH, Hospital, clinics, MN DPH)

Structural Fire

Goal 1: Protect structures from fire.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Provide residents with adequate knowledge of fire safety.	A. Continue fire education programs.	Recurring	All Fire Departments, Schools	<\$500	Internal (FDs)
2. Ensure fire departments have adequate staff, communication equipment, and firefighting equipment to save lives and protect property.	A. Complete an annual inventory assessment of equipment, personnel, and training needs. (*Priority Level 3)	Annually	All Fire Departments	N/A	Internal (FDs)
3. Provide adequate and timely fire protection for all cities in Chippewa County.	A. Improve efficiency of emergency response boundaries in rural areas for local departments. *New Strategy, 2023	Within next 5 years	County EM, Townships	N/A	Internal (County, townships)
4. Provide adequate fire protection for large rural structures and facilities *New Objective, 2023	A. Identify large facilities such as crop and livestock producers or rural manufacturers (Grain drying, dairies, animal confinements, etc.) *New Strategy, 2023	Within next 5 years	All Fire Departments	N/A	Internal (FDs)
	B. Identify nearest water supply and available capacities. *New Strategy, 2023				
	C. Work with property owner(s) to develop plan for fire response in event of emergency. *New Strategy, 2023				

Goal 2: Provide safety to residents					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Educate the public about fire safety.	A. Provide public education to residents, focusing on carbon monoxide poisoning, evacuation and smoke alarms. (*Priority Level 3)	Recurring	All City Fire Departments	<\$500	Internal (FDs)

Hazardous Materials

Goal 1: Provide useful and factual information about hazardous materials located in the county.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Support policies and programs that assist in creating factual and timely information about hazardous material in the county.	A. Continue current programs and periodically evaluate their effectiveness.	Recurring	Emergency Manager, All City Fire Departments	N/A	Internal (County, FDs)
2. Make sure emergency personnel have hazardous material location information.	A. Continue to use 911 systems which distribute information to emergency personnel.	Recurring	All City Fire Departments	N/A	Internal (FDs)
3. Educate the public about hazardous materials.	A. Provide public education to residents on hazardous materials and proper disposal.	Recurring	County Land & Resource Management	>\$500	Internal (County L&RM)
4. Periodically inventory and map hazardous material sites in the county.	A. Provide educational material to businesses that use hazardous material.	Recurring	County Emergency Manager	>\$500	Internal (County EM)
5. Work with County and cities to address awareness of dangerous drug use. *Modified Objective, 2023	A. Educate the public on the slogan, "if you see something, say something." *Modified Strategy, 2023	Recurring	County Emergency Manager	N/A	Internal (County EM)

Goal 2: Continue the effective efforts addressing hazardous material that may impact the county.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Maintain and update information, plans, and agreements for addressing hazardous material.	A. Review and update the Chippewa County Emergency Operations Plan outlining procedures dealing with hazardous material on an annual basis.	Recurring	County Emergency Manager	\$20,000	FEMA – EMPG; MN HSEM - HMEP
	B. Continue to expand the use of mutual aid agreements and memoranda of understandings to improve coordination between state, local and federal agencies and appropriate private sectors.	Recurring	County Emergency Manager, area emergency response departments	N/A	Internal (County EM)

Goal 3: Improve overall preparedness and equipment for handling hazardous events.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Adopt new technology and obtain training to improve the county's ability to respond to a disaster.	A. Need proper personal protection equipment to respond to hazardous materials disasters for Fire Departments, Law Enforcement, and Ambulance/EMT Departments as applicable to each city.	2 years	County and all Cities	\$5,000	FEMA - AFG
	B. Continue to participate in regional exercises that test local plans and interaction between local agencies. (*Priority Level 1)	Recurring	County and all Cities	\$4,000/year	Internal (County EM), HSEM, FEMA Region 5
	C. Continued training in the use of the Nation Incident Management System for all hazard materials incidents that may occur in the county.	Recurring	County EM	\$3,500	FEMA - AFG
	D. Ensure that all Emergency Responders participate in Rail Car Incident Response Training. (*Priority Level 1)	Recurring	County Emergency Manager, All City Fire Departments	N/A	Internal (County EM)
	E. Encourage that emergency responder groups, fire department, and emergency managers are trained to at least the Hazardous Materials Awareness level.	Recurring	County EM, FDs, emergency response departments	\$4,000	Internal (County EM) HSEM, FEMA Region 5

	F. Ensure that the first responder groups conduct the required terrorism and hazardous materials training and maintains current records on all completed training.	Recurring	County EM, first responder departments	N/A	Internal (County EM)
	G. Create Standard Operating Procedures for how to handle hazardous events.	5 years	County EM	N/A	Internal (County EM)

Water Supply Contamination

Goal 1: Protect the quality of the county's ground water resources.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Reduce contamination from feedlots.	A. Continue to monitor and regulate locations of feedlots.	Recurring	County Land & Resource Management	N/A	Internal (County L&RM)
2. Reduce contamination into private wells.	A. Provide educational materials on testing private wells.	Recurring	County Land & Resource Management, Countryside Public Health	N/A	Internal (County L&RM)
3. Minimize contamination of ground water from unused or abandoned wells.	A. Continue the abandoned well sealing program within the county.	Recurring	County Land & Resource Management, County SWCD	N/A	Internal (County L&RM, SWCD)

Goal 2: Focus on efforts in areas more prone to ground water contamination.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Implement the wellhead protection program for the county.	A. Keep implementation of wellhead protection a top priority in the county.	Recurring	Cities, County Land & Resource Management	N/A	Internal (County L&RM)

Wastewater Treatment Facility Failure

Goal 1: Protect the quality of the county's ground water resources.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Ensure that all public facilities are working properly.	A. Continue updating sanitary sewer systems and securing funding to make these updates.	Recurring	All cities	Will vary	USDA - Community Facilities; MN PFA – Clean Water SRF

Civil Disturbance /Terrorism

Goal 1: Protect critical infrastructure.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Install security measures at city water treatment plants.	A. Install alarms on buildings.	3-4 years	Clara City, Maynard, Montevideo	\$300-500 each	Internal (Cities)

Goal 2: Reduce risk to critical government facilities.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Increase the level of security using landscape design, vehicle barriers and separation of public and private functions.	A. Continue to review landscape design to improve security of current structures and develop appropriate design for new structures.	As needed	All Cities, County Sheriff's Dept., County EM	Will vary	Internal (County, cities)

Goal 3: Increase security at major public gathering places.					
OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Increase level of security with restricted access points, increased surveillance, and lighting.	A. Continued review of facilities and make changes as needed.	Recurring	Montevideo, County Sheriff's Dept.	Will vary	Internal (County EM/ Sheriff's Office)
*Modified Objective, 2023					

Goal 4: Decrease vulnerability of regional and state resources in the county.

OBJECTIVES	STRATEGIES	Time Frame	Responsible Entity	Estimated Cost	Funding Partner
1. Work with state and federal agencies engaged in the statewide domestic preparedness strategy to identify further options for the county.	A. Schedule discussions with school leaders, hospital administrators, emergency managers, law enforcement and local units of government to address performance in response to terrorism, focusing on schools and hospitals. (*Priority Level 2)	Recurring	County Emergency Manager, County Sheriff's Dept.	\$5,000	Internal (County EM)

Chapter 6 : PLAN IMPLEMENTATION & MAINTENANCE

The Chippewa County All-Hazard Mitigation Plan is intended to serve as a guide for dealing with the impact of both current and future hazards for all county people and institutions. It is not a static document but must be modified to reflect changing conditions if it is to be an effective plan. The goals, objectives, and mitigation strategies will serve as the action plan. Even though individual strategies have a responsible party assigned to it to ensure implementation; overall responsibility, oversight and general monitoring of the action plan has been assigned to the Chippewa County Emergency Manager. It will be their responsibility to gather a Local Task Force to update the All-Hazard Mitigation Plan on a routine basis. Every two years, the County Emergency Manager will call a meeting to review the plan, mitigation strategies and the estimated costs attached to each strategy. All participating parties of the original Local Task Force and cities will be invited to this meeting. Responsible parties will report on the status of their projects. Committee responsibility will be to evaluate the plan to determine whether:

- Goals and objectives are relevant.
- Risks have changed.
- Resources are adequate or appropriate.
- The plan as written has implementation problems or issues.
- Strategies have happened as expected.
- Partners participating in the plan need to change (new and old).
- Strategies are effective.
- Any changes have taken place that may affect priorities.
- Any strategies should be changed.

In addition to the information generated at the Local Task Force meetings, the County Emergency Manager will also annually evaluate the All-Hazard Mitigation Plan and update the plan in the event of a hazardous occurrence. Two-year updates are due on the anniversary of the plan approval date.

After the second update meeting (four years will have passed), the Chippewa County Emergency Manager will finalize a new Local Task Force to begin the required five-year update process. This will be accomplished in coordination with cities and the entire All-Hazard Mitigation Plan shall be updated and submitted to FEMA for approval (within five years of plan adoption). These revisions will include public participation by requiring a public hearing and published notice, in addition to multiple Local Task Force meetings to make detailed updates to the plan.

Public participation for updates is as critical as in the initial plan. Public participation methods that were used in the initial writing will be duplicated for future update processes – direct mailing list of interested parties, public meetings, press releases, questionnaires, and resolutions of participation and involvement. Additional methods of getting public input and involvement are encouraged such as placing copies of the plan in the Chippewa County Emergency Manager's Office and city offices, in addition to placing the plan on the Chippewa County and UMRDC websites. Further, cities will be encouraged to place a notice on their websites stating the plan is available for review at the city offices.

Notifications of these methods could be placed in chamber newsletters, the UMRDC newsletter and newspapers. Committee responsibilities will be the same as with updates.

Chapter 5 focuses on mitigation strategies for natural hazards and man-made/technological hazards. Appendix VII focuses on city-specific mitigation strategies for both natural and manmade/technological hazards. The All-Hazard Mitigation Plan proposes a number of strategies, some of which will require outside funding in order to implement. If outside funding is not available, the strategy will be set aside until sources of funding can be identified. In these situations, Chippewa County and its cities will consider other funding options such as the county's/cities' general funds, bonding and other sources. Based on the availability of funds and the risk assessment of that hazard, the county will determine which strategies should be continued and which should be set aside. Consequently, the action plan and the risk assessment serves as a guide to spending priorities but will be adjusted annually to reflect current needs and financial resources.

This last step requires an evaluation of the strategies identified in the goals and policies framework, selecting preferred strategies based on the risk assessment, prioritizing the strategy list, identifying the entity responsible for carrying out the strategy, and the timeframe and costs of strategy completion. Chippewa County and cities have incorporated the preferred strategies including identification of the responsible party to implement, the timeframe and the cost of the activity with the goals and policies framework.

This plan will be integrated into other Chippewa County plans such as the County Comprehensive Plan, County Water Plan, County Transportation Plan, and the Emergency Operations Plan. Chapter 1 will serve as an executive summary to the All-Hazard Mitigation Plan and be attached to those plans as necessary. The County Board and Emergency Manager will encourage cities to implement their city-specific mitigation strategies in their comprehensive plans, land use regulations, zoning ordinances, capital improvement plans and/or building codes by including mitigation strategies in their plans as listed in Table 6.1. Further, as each land use mechanism is updated, mitigation strategies will be evaluated to determine whether they can implement or include them at that time. This evaluation will consist of basic cost-benefit analyses, much like what was used to create the mitigation strategies.

Table 6.1 Chippewa County & Cities - Local Planning Mechanisms

Planning Mechanisms	Jurisdictions
Comprehensive Plan	Chippewa County, Clara City, Maynard, Milan, Montevideo
Emergency Operations Plan	Chippewa County
Local Water Management Plan	Chippewa County
Watershed Plan	Chippewa County
Zoning Ordinance	Chippewa County, Clara City, Maynard, Milan, Montevideo, Watson
Building Code	Chippewa County, Milan, Maynard, Montevideo
Floodplain Ordinance	Chippewa County, Clara City, Montevideo, Maynard
Shoreland Ordinance	Chippewa County

Many of these plans or policies can help implement the goals, objectives, and strategies in Chippewa County's All-Hazard Mitigation Plan. The Chippewa County Emergency Manager is responsible for meeting with each city within the County two times throughout the next five years. During these meetings, the Emergency Manager will review all Local Planning Mechanisms and collaborate with the cities to ensure the All-Hazard Mitigation Plan becomes as integrated into local plans as possible. As adopted versions of Chippewa County's All-Hazard Mitigation Plan will be available at all city offices, during these meetings the Emergency Manager will solicit and collect any public comments relevant to the plan and make a record for the upcoming update process to be discussed at a Local Task Force meeting. These Local Planning Mechanisms are meant to work cooperatively together in order to ensure the health, safety, and welfare of Chippewa County and its cities.