Fillmore County All-Hazard Mitigation Plan

2017 Update

Fillmore County
All-Hazard Mitigation Plan
2017 Update

Adoption Date:

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Glossary of acronyms

BFE	Base Flood Elevation
CDC	Centers for Disease Control
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
CPRI	Calculated Priority Risk Index
DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DOT	Department of Transportation
EAP	Emergency Action Plan
EMV	Estimated Market Value
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance Program
FY	Fiscal Year
GIS	Geographic Information System
H1N1	Swine Flu
H5N1	Bird Flu
HAZMAT	Hazardous Materials
HAZUS-MH	Hazards-United States-Multi Hazard
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
HMA	Hazard Mitigation Assistance Program
HMGP	Hazard Mitigation Grant Program
HSEM	Division of Homeland Security and Emergency Management
MDH	Minnesota Department of Health
MNDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
NCDC	National Climactic Data Center
NFIA	National Flood Insurance Act of 1968
NFIF	National Flood Insurance Fund
NFIP	National Flood Insurance Program
NOAA	National Oceanographic and Atmospheric Administration
NRC	National Response Center
NRHP	National Register of Historic Places
PDM	Pre-Disaster Mitigation Program
PPE	Personal Protective Equipment
RNDC	Region Nine Development Commission
SARS	Severe Acute Respiratory Syndrome
USCG	Coast Guard
VIC	Voluntary Investigation and Cleanup

Section 1: Introduction

1.1 HAZARD MITIGATION

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from natural hazards and their effects[1]. Hazard mitigation activities may be implemented prior to, during, or after an event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. This definition distinguishes actions that have a long-term impact from those that are more closely associated with immediate preparedness, response, and recovery. Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage.

The U.S. Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) has made reducing hazards one of its main goals. The primary mechanism for achieving this goal is hazard mitigation planning and the subsequent implementation of resulting projects, measures, and policies to mitigate hazards.

1.2 MULTI-JURISDICTIONAL HAZARD MITIGATION PLANNING

The Fillmore County All-Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan. A multi-jurisdictional plan is jointly prepared by more than one jurisdiction or local government entity (county, city, township, etc.)[2]. Jurisdictions can benefit in several ways from a multi-jurisdictional planning process, such as:

- Enabling a comprehensive approach to the mitigation of hazards that affect multiple jurisdictions
- Allowing for economies of scale by leveraging individual capabilities and sharing costs and resources
- Avoiding duplication of efforts
- Imposing an external discipline on the process

A full list of the participating jurisdictions is provided in Figure 1-1.

Figure 1-1: Participating Jurisdictions

Jurisdictions		
Fillmore County	City of Lanesboro	City of Rushford
City of Canton	City of Mabel	City of Rushford Village
City of Chatfield	City of Ostrander	City of Spring Valley
City of Fountain	City of Peterson	City of Whalan
City of Harmony	City of Preston	City of Wykoff

1.3 LEGAL AUTHORITY & JUSTIFICATION

1.3.1 Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMA 2000), also known as Public Law 106-390, provides the legal basis for FEMA mitigation planning requirements for state, local and tribal governments as a condition of mitigation grant assistance[3]. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (which had amended the Disaster Relief Act of 1974) by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for state, local, and tribal entities to closely coordinate mitigation planning and implementation efforts. Under the DMA 2000, local plans are required to

- describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan
- establish a strategy to implement those actions

1.3.2 44 CFR §201.6

The Code of Federal Regulations Title 44 Chapter 201 Section 6, 44 CFR §201.6 addresses Local Mitigation Plans (4). This section requires that local governments seeking funding from four out of the five mitigation assistance programs must have a FEMA authorized local hazard mitigation plan. The only program that does not require a local mitigation plan is the Repetitive Flood Claims program (see 1.4.1.D.).

1.3.2.A Plan Update Requirement

The 44 CFR §201.6 also requires local jurisdictions to review and revise their plans to reflect changes in development, progress in local mitigation efforts, and changes in priorities. They must then resubmit it for approval within five years in order to maintain eligibility for mitigation project grant funding.

1.3.3 Governor's Executive Order 15-13

The Minnesota Governor's Executive Order 15-13 clarified the roles and responsibilities of state agencies in emergencies[5]. The Department of Homeland Security and Emergency Management (HSEM) was assigned overall responsibility for coordinating the development and maintenance of the All-Hazard Minnesota Emergency Operations Plan.

1.3.4 Minnesota State Statutes, Chapter 12.09

The 2011 Minnesota State Statutes Chapter 12, Section 9, Subdivision 7 dictates that the Division of Emergency Management shall develop and maintain a comprehensive hazard mitigation plan for the State, with the plan integrated into and coordinated with the hazard mitigation plans of the federal government to the fullest possible extent[6]. The division shall coordinate the preparation of hazard mitigation plans by the political subdivisions, with the plans integrated into and coordinated with the hazard mitigation plan of the State to the fullest possible extent.

1.3.5 Minnesota State Statutes, Chapter 394.21

The 2011 Minnesota State Statutes Chapter 394, Section 21, Subdivision 1 dictates that any county in the state having less than 300,000 population according to the 1950 Federal Census is authorized to carry on county planning and zoning activities for the purpose of promoting the health, safety, morals, and general welfare of the community[7].

1.4 FEDERAL HAZARD MITIGATION ASSISTANCE

FEMA's Hazard Mitigation Assistance (HMA) programs present an opportunity to reduce or eliminate the risk to human life and property from natural hazards, while simultaneously reducing reliance on federal disaster funds through hazard mitigation planning and project grant funding[8]. Under the DMA 2000, (see section 1.3.1) local jurisdictions are required to take part in the preparation and adoption of a hazard mitigation plan as a condition for receiving the non-emergency disaster assistance offered through HMA programs.

At the federal level, FEMA administers the HMA programs, for which states (the applicant) apply for funding on behalf of local jurisdictions (the sub-applicant). At the state level, in Minnesota, all HMA programs are administered by the Department of Public Safety's Division of HSEM. HSEM State Hazard Mitigation Officers oversee all aspects of the programs, including: applications for funding, management of grant awards, and state approval of local mitigation plans. The Department of Natural Resources (DNR), as the agency responsible for implementation of the National Flood Insurance Program (NFIP), is also involved in mitigation efforts.

There are five HMA programs: the Hazard Mitigation Grant Program, Pre-Disaster Mitigation, Flood Mitigation Assistance, Repetitive Flood Claims, and Severe Repetitive Loss. A summary of the

various HMA programs is provided in section 1.4.1. Each HMA program was authorized by separate legislative action, and as such, each program differs slightly in scope and intent. Projects funded through an HMA Introduction 12 program must demonstrate a positive cost-benefit ratio (e.g. the future benefits are equal to, or greater than, the cost of the project).

1.4.1 Hazard Mitigation Assistance Programs

1.4.1.A Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) is designed to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the immediate reconstruction and recovery process following a disaster. HMGP is available, when authorized under a presidential major disaster declaration, in the areas of the state requested by the governor. The amount of HMGP funding available to the applicant is based upon the estimated total federal assistance to be provided by FEMA for disaster recovery under the disaster declaration. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, (as amended the Stafford Act), Title 42 United States Code (U.S.C.) 5170c.

1.4.1.B Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) program is designed to assist states and local jurisdictions to implement a sustained pre-disaster natural hazard mitigation program to reduce the overall risk to human life and structures from future hazard events, while also reducing reliance on federal funding from future disasters. The PDM program is authorized under Section 203 of the Stafford Act, 42 U.S.C. 5133.

1.4.1.C Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program is designed to reduce or eliminate the long-term risk of flood damage to properties insured under the NFIP. The FMA program is authorized under Section 1366 of the National Flood Insurance Act of 1968, as amended NFIA, 42 U.S.C. 4104c.

1.4.2 Program Funding Sources

The National Flood Insurance Fund (NFIF) provides funding for FMA programs. The PDM and FMA programs are subject to the availability of appropriation funding, as well as any program specific directive or restriction made with respect to such funds.

1.4.3 Cost Sharing

Under the HMA programs, the total cost to implement approved mitigation activities is generally funded by a combination of federal and non-federal sources[8]. Both the federal and the non-federal shares must be eligible costs used in direct support of approved activities under grant award. Contributions of cash, third party in-kind services or materials, or any combination thereof, may be accepted as part of the non-Federal cost share. For FMA, no more than half of the non-federal contribution may be from third party in-kind contributions. In general, HMA funds may be used to pay up to 75 percent of the eligible activity costs; the remaining 25 percent of eligible activity costs are derived from non-federal resources. Exceptions to the 75/25 cost share are shown in Figure 1-2.

Figure 1-2: HMA Program Cost Share Ratios

Programs	Mitigation Activity *(Percent of Federal/Non-Federal Share)*
HMGP	75/25
PDM	75/25
PDM - sub grantee is small impoverished community	90/10
PDM - tribal grantee is small impoverished community	90/10
FMA	75/25
FMA - severe repetitive loss of property with Repetitive Loss Strategy	90/10

1.5 ELIGIBLE HAZARD MITIGATION ASSISTANCE PROJECTS

Projects eligible for HMA are described in the FY2011 Hazard Mitigation Assistance Unified Guidance[8]. This document consolidates the common requirements for all HMA programs and explains the unique elements of the programs in individual sections. Additionally, it provides assistance for federal, state, tribal, and local officials on how to apply for HMA funding for a proposed mitigation activity. Figure 1-3 is a summary of the eligible projects identified within the FY2015 HMA Unified Guidance.

Figure 1-3: Hazard Mitigation Actions by Program

Eligible Activities	HMGP	PDM	FMA
Mitigation Projects	**x**	**x**	**x**
Property Acquisition and Structure Demolition	x	x	x
Property Acquisition and Structure Relocation	x	x	x
Structure Elevation	x	x	x
Mitigation Reconstruction			
Dry Flood Proofing of Historic Residential Structures	x	x	x
Dry Flood Proofing of Non-Residential Structures	x	x	x
Generators	x	x	
Localized Flood Risk Reduction Projects	x	x	x
Non-Localized Flood Risk Reduction Projects	x	x	
Structural Retrofitting of Existing Buildings	x	x	
Non-Structural Retrofitting of Existing Buildings and Facilities	x	x	
Safe Room Construction	x	x	
Wind Retrofit for One- and Two-Family Residences	x	x	
Infrastructure Retrofit	x	x	
Soil Stabilization	x	x	
Wildfire Mitigation	x	x	
Post-Disaster Code Enforcement	x		
Advance Assistance	x		
5% Initiative Projects	x		
Miscellaneous/Other*	x	x	x
Hazard Mitigation Planning	**x**	**x**	**x**
Planning Related Activities	**x**		
Technical Assistance			**x**
Management Costs	**x**	**x**	**x**

**FEMA encourages mitigation projects that fall into the Miscellaneous/Other category to address climate change adaption and resiliency.*

1.5.1 Flood Mitigation Projects

1.5.1.A Property Acquisition & Structure Demolition

Property acquisition and structure demolition projects involve the voluntary acquisition of an existing at-risk structure and, typically, the underlying land, and conversion of the land to open space through the demolition of the structure. The property must be deed-restricted indefinitely to open space uses to restore and/or conserve the natural floodplain functions.

1.5.1.B Property Acquisition & Structure Relocation

Property acquisition and structure relocation projects involve the voluntary physical relocation of an existing structure to an area outside of a hazard-prone area and, typically, the acquisition of the underlying land. Relocation must conform to all applicable state and local regulations. The property must be deed-restricted indefinitely to open space uses to restore and/or conserve the natural floodplain functions.

1.5.1.C Structure Elevation

Structure elevation projects involve physically raising an existing structure to the Base Flood Elevation (BFE) or higher if required by FEMA or local ordinance. Structure elevation may be achieved through a variety of methods, including elevating on continuous foundation walls; elevating on open foundations, such as piles, piers, posts, or columns; and elevating on fill. Foundations must be designed to properly address all loads and be appropriately connected to the floor structure above. Utilities must be properly elevated as well.

1.5.1.D Mitigation Reconstruction

Mitigation reconstruction projects involve the construction of an improved, elevated building on the same site where an existing building and/or foundation has been partially or completely demolished or destroyed. Mitigation reconstruction is only permitted for structures outside of the regulatory floodway or coastal high hazard area as identified by the existing best available flood hazard data. Activities that result in the construction of new living space at or above the BFE will only be considered when consistent with the mitigation reconstruction requirements.

1.5.1.E Dry Flood Proofing

Dry flood proofing projects involve the application of techniques designed to keep structures dry by sealing the structure to keep floodwaters out.

1.5.1.F Minor Localized Flood Reduction Projects

Minor localized flood reduction projects aim to lessen the frequency or severity of flooding and decrease predicted flood damages, such as the installation or modification of culverts and storm water management activities (e.g. creating retention and detention basins). These projects must not duplicate the flood prevention activities of other federal agencies and may not constitute a section of a larger flood control system.

1.5.2 Flood, Earthquake, & Tornado Mitigation Projects

1.5.2.A Structural Retrofitting of Existing Buildings

Structural retrofitting of existing buildings projects involves modifications made to the structural elements of a building to reduce or eliminate the risk of future damage and to protect inhabitants. The structural elements of a building that are essential to protect in order to prevent damage include: foundations, load-bearing walls, beams, columns, building envelope, structural floors and roofs, and

the connections between these elements.

1.5.2.B Non-Structural Retrofitting of Existing Buildings & Facilities

Non-structural retrofitting of existing buildings and facilities projects involves modifications made to the non-structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants. Non-structural retrofits may include bracing of building contents to prevent earthquake damage or the elevation of heating and ventilation systems.

1.5.2.C Safe Room Construction

Safe room construction projects are designed to provide immediate life-safety protection for people in public and private structures from tornado and severe wind events. For HMA, the term "safe room" only applies to extreme wind (combined tornado and hurricane) in residential, non-residential, and community safe rooms; tornado community safe rooms; and hurricane community safe rooms. This type of project includes retrofits of existing facilities or new safe room construction projects, and applies to both single and multi-use facilities.

1.5.2.D Infrastructure Retrofit

Infrastructure retrofit projects involve measures to reduce risk to existing utility systems, roads, and bridges.

1.5.2.E Soil Stabilization

Soil stabilization projects aim to reduce risk to structures or infrastructure from erosion and landslides, including: installing geo-textiles and vegetative buffer strips, stabilizing sod, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring. These projects must not duplicate the activities of other federal agencies.

1.5.3 Wildfire Mitigation Projects

1.5.3.A Defensible Space for Wildfire

Defensible space for wildfire projects involves the creation of perimeters around homes, structures, and critical facilities through the removal or reduction of flammable vegetation.

1.5.3.B Application of Ignition-Resistant Construction

Application of ignition-resistant construction projects involve the application of ignition-resistant techniques and/or non-combustible materials on new and existing homes, structures, and critical facilities.

1.5.3.C Hazardous Fuels Reduction

Hazardous fuels reduction projects involve the removal of vegetative fuels near to the at-risk structure that, if ignited, pose significant threat to human life and property, especially critical facilities.

1.5.4 All-Natural Hazard Mitigation Projects

1.5.4.A Post-Disaster Code Enforcement

Post-disaster code enforcement projects are designed to support the post-disaster rebuilding effort by ensuring that sufficient expertise is on hand to ensure appropriate codes and standards are utilized and enforced.

1.5.4.B Five Percent Initiative Projects

Five percent initiative projects provide an opportunity to fund mitigation actions that are consistent with the goals and objectives of the State and local mitigation plans and that meet all HMGP

program requirements, but for which it may be difficult to conduct a standard BCA to prove cost effectiveness.

1.5.4.C Hazard Mitigation Planning

Mitigation plans are the foundation for effective hazard mitigation. A mitigation plan is a demonstration of the commitment to reduce risks from natural hazards and serves as a strategic guide for decision makers as they commit resources.

1.6 PRESIDENTIAL DISASTER DECLARATIONS

Since 1953, there have been twelve Presidential Disaster Declarations and one Emergency Declarations that have occurred in Fillmore County. These declarations are displayed in Figure 1-4 and Figure 1-5. During the same time period, there have been forty-eight Presidential Disaster Declarations and five Emergency Declarations in the State of Minnesota.

Figure 1-4: Fillmore Co. Major Disaster Declarations (1953-2017)[9]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance *(Individual or Public)*
DR-4290	9/24/2016	11/2/2016	Severe Storms, Flooding	Obama	Public
DR-4131	06/20/13	07/25/13	Severe Storms, Straight-line Winds, Flooding	Obama	Public
DR-1772	06/06/08	06/25/08	Severe Storms, Flooding	Bush	Public
DR-1717	08/18/07	08/23/07	Severe Storms, Flooding	Bush	Both
DR-1333	05/17/00	06/27/00	Severe Storms, Flooding, Tornadoes	Clinton	Both
DR-1225	05/15/98	06/23/98	Severe Storms, Straight-Line Winds, Tornadoes	Clinton	Public
DR-993	05/06/93	06/11/93	Flooding, Severe Storm, Tornadoes	Clinton	Both
DR-929	10/31/91	12/26/91	Ice Storm	Clinton	Public
DR-560	07/08/78	07/08/78	Severe Storms, Tornadoes, Hail, Flooding	Carter	Both
DR-446	07/13/74	07/13/74	Severe Storms, Flooding	Nixon	Both
DR-255	04/18/69	04/18/69	Flooding	Nixon	Both
DR-188	04/11/65	04/11/65	Flooding	Johnson	Both

Figure 1-5: Fillmore Co. Emergency Declarations (1953-2017)[9]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance *(Individual or Public)*
EM-3013	6/17/76	06/17/76	Drought	Ford	Public

Section 2: Prerequisites

This updated plan has been prepared in accordance with the requirements of the Disaster Mitigation Act of 2000 with the intention that it be adopted by Fillmore County and each incorporated jurisdiction subsequent to state and federal approval. The adopting resolutions and the dates of adoption are included in the appendix.

2.1 MULTI-JURISDICTIONAL PLAN ADOPTION

After HSEM and FEMA review the plan and approve it "pending local adoption", the Fillmore County All-Hazard Mitigation Planning Team will present the plan to county and city officials of each jurisdiction for adoption. Resolution adoptions are included in Appendix 9.1 of this plan.

2.2 JURISDICTIONAL PARTICIPATION

All incorporated jurisdictions participated in the review and update of the Fillmore County All-Hazard Mitigation Plan. All cities that participated in the initial 2009 plan also participated in the 2017 update, see Figure 2-1. The risk assessment and mitigation actions were reviewed and discussed at county and public community meetings. A substantial effort was made to solicit public participation as well as various public and private entities to provide input into the plan. Comments were reviewed after the meeting for incorporation into the plan. See appendices for documentation of how communities and the public were involved and incorporated into the planning process.

- Appendix 9.1 – Adopting Resolutions
- Appendix 9.2 – Statement of Interest in All Hazard Mitigation Planning
- Appendix 9.3 – Meeting Announcements
- Appendix 9.4 – Affidavits of Publication of Meeting Announcements
- Appendix 9.5 – Meeting Agendas
- Appendix 9.6 – Meeting Sign- In Sheets
- Appendix 9.7 – Survey Materials

Figure 2-1: Jurisdiction Participation

Jurisdiction Name	Hazard Identification	Risk Assessment	Mitigation Strategies	Public Participation
Fillmore County	✓	✓	✓	✓
City of Canton	✓	✓	✓	✓
City of Chatfield	✓	✓	✓	✓
City of Fountain	✓	✓	✓	✓
City of Harmony	✓	✓	✓	✓
City of Lanesboro	✓	✓	✓	✓
City of Mabel	✓	✓	✓	✓
City of Ostrander	✓	✓	✓	✓
City of Peterson	✓	✓	✓	✓
City of Preston	✓	✓	✓	✓
City of Rushford	✓	✓	✓	✓
City of Rushford Village	✓	✓	✓	✓
City of Spring Valley	✓	✓	✓	✓
City of Whalan	✓	✓	✓	✓
City of Wykoff	✓	✓	✓	✓

Section 3: Planning Process

Fillmore County Emergency Management and Region Nine Development Commission worked together to create an updated five-year All-Hazard Mitigation Plan. Fillmore County understands that the recognition of and the protection from hazards impacting the county and its residents contribute to future community and economic development.

The planning process was organized by the planning team (Figure 3-1) and consisted of the following tasks:

Task 1: Organize Resources

The County Emergency Manager, with support from Region Nine Development Commission, created a planning team to attend meetings, gather data and historical information, review drafts, and participate in mitigation brainstorming sessions.

Task 2: Risk Assessment

The planning team reviewed the hazards in the existing plan and identified which hazards to include in the update. The planning team defined each hazard profile. Each profile included a hazard definition, history of previous occurrences, a summary of the hazard's extent, location, and potential impact. The planning team then used local, state, and national resources to inventory the county's assets and estimate potential losses for each hazard.

Task 3: Develop Mitigation Strategies

The planning team met with representatives of each community to develop and prioritize mitigation strategies and action items that would reduce the costs of disaster response and recovery, protect people and infrastructure, and minimize overall disruption to the county in the event of a disaster.

Task 4: Public Involvement

The public was invited to attend a series of community meetings to discuss the draft mitigation strategies and actions. These were held at both the county level and in individual communities covered by the plan. Public notice was given for all meetings (Appendix 9.3).

3.1 STAKEHOLDER TASKFORCE

A stakeholder taskforce (Figure 3-1) was assembled to provide wider representation from the county and cities within Fillmore County. The responsibility of the stakeholder taskforce was to provide input and information throughout the planning process

Figure 3-1: Planning Team Members

Representing	Name	Position	Role
Fillmore County	Kevin Beck	Emergency Management	County Technical Expert
Fillmore County	Tom Kaase	Sheriff	County Technical Expert
Fillmore County	Brenda Pohlman	Public Health	County Technical Expert
Fillmore County	Donna Rasmussen	Soil and Water Conservation District Administrator	County Technical Expert
Fillmore County	Ronn Gregg	County Engineer	County Technical Expert
City of Canton	Charlie Warner	City Council	City Technical Expert
City of Chatfield	Dan Jaquith	Emergency Manager	City Technical Expert
City of Chatfield	Sue Kester	Ambulance Director	City Technical Expert
City of Fountain	Ronda Flattum	City Clerk-Treasurer	City Technical Expert
City of Fountain	John Hanson	City Maintenance and Chief of Fire	City Technical Expert
City of Lanesboro	Deane Benson	Ambulance Director	City Technical Expert
City of Lanesboro	Robin Krom	Mayor	City Technical Expert

Figure 3-1: Planning Team Members *(con't)*

Representing	Name	Position	Role
City of Lanesboro	Tom Smith	City Council	City Technical Expert
City of Mabel	Tim Mengis	Chief of Fire/EMT	City Technical Expert
City of Mabel	Terry Torkelson	City Council	City Technical Expert
City of Mabel	James Westby	Mayor	City Technical Expert
City of Peterson	Megan Boyum	Clerk-Treasurer	City Technical Expert
City of Peterson	Tim Hallum	Mayor	City Technical Expert
City of Preston	Blaise Sass	Police	City Technical Expert
City of Preston	Ryan Throckmorton	Ambulance/Fire	City Technical Expert
City of Rushford	James Dailey	2nd Assistant Chief of Fire	City Technical Expert
City of Rushford	Adam Eide	Chief of Police	City Technical Expert
City of Rushford	Mark Honsey	Fire/City Council	City Technical Expert
City of Rushford	Karen Rislov	Ambulance	City Technical Expert
City of Rushford	Steve Savri	Administrator	City Technical Expert
City of Rushford	Kathy Zacher	City Clerk - Treasurer	City Technical Expert
City of Rushford Village	Todd Baker	City Council	City Technical Expert
City of Spring Valley	Troy Lange	Chief of Fire	City Technical Expert
City of Spring Valley	Chris Rolli	Public Utilities Superintendent	City Technical Expert
City of Spring Valley	Bennett Schlaak	Ambulance/Gold Cross	City Technical Expert
City of Spring Valley	Stu Smith	Public Utilities Superintendent	City Technical Expert
City of Spring Valley	Deb Zimmer	Administrator	City Technical Expert
City of Spring Valley	Mike Zimmer	Emergency Management Director	City Technical Expert
City of Whalan	Rory Berekvam	Mayor	City Technical Expert
City of Wykoff	Mark Arndt	Streets Superintendent	City Technical Expert
City of Wykoff	Jordan Hutsell	Fire Department	City Technical Expert
Amherst Township	Mike Kelly	Supervisor	Township Technical Expert
Bloomfield Township	Steve Koebke	Supervisor	Township Technical Expert
Carimona Township	Arlynn Hovey	Supervisor	Township Technical Expert
Carimona Township	Linda Marzolf	Clerk	Township Technical Expert
Holt Township	Loren Berge	Supervisor	Township Technical Expert
Preston Township	Andy Bisek	Supervisor	Township Technical Expert
Newburg Township	Arlen Halverson	Maintainer	Township Technical Expert
Newburg Township	Genette Halverson	Clerk	Township Technical Expert
Preble Township	Chuck Olson	Treasurer	Township Technical Expert
Farmers Cooperative Elevator	Gordy Elliot	General Manager	Community Member
Fillmore Central Schools	Richard Keith	Superintendent	School District
Good Shepherd Lutheran Services	Kari Drinkkall	Registered Nurse	Community Member
Kingsland Public Schools	John Dols	Building and Grounds Director	School District
Rushford – Peterson Schools	Chuck Ehler	Superintendent	School District
Tri-County Electric	Steven Oian	Director of System Design	Utilities Technical Expert
	Gayland Jones		Community Member
Region Nine Development Commission	Danielle Walchuk	Regional Planner	Consultant
	Scott Reiten	Homeland Security Planner	Consultant

3.2 PUBLIC INVOLVEMENT

To solicit public input during the planning process, meetings were scheduled in 2015 as shown in Figure 3-2.

Figure 3-2: Public Meetings Held

Date		Location	Invited
August 20, 2015	Kick-off	Tri-County Electric Building, Rushford Village	Public
October 13, 2015	County Engagement	Fillmore County Courthouse, Preston	Fillmore County Department Heads and Staff
October 13, 2015	Commissioner Update	Fillmore County Courthouse, Preston	Fillmore County Commissioners
October 13, 2015	Civic Engagement	Fillmore County Office Building, Preston	Public
October 13, 2015	Civic Engagement	Fillmore County Office Building, Preston	Public
July 12, 2016	FEMA Resilience	Fillmore County Office Building, Preston	Public, Fillmore County

The risk assessment and mitigation actions were reviewed and discussed at each meeting. Comments were reviewed after the meeting for incorporation into the plan by Region Nine Development Commission staff. Information from the community meetings is available in the following appendices:

- Appendix 9.1 – Adopting Resolutions
- Appendix 9.2 – Statement of Interest in All-Hazard Mitigation Planning
- Appendix 9.3 – Meeting Announcements
- Appendix 9.4 – Affidavits of Publication of Meeting Announcements
- Appendix 9.5 – Meeting Agendas
- Appendix 9.6 – Meeting Sign-In Sheets
- Appendix 9.7 – Survey Materials

3.3 COMMUNITY INVOLVEMENT

The planning team sought participation from various representatives of county government, local city governments, and community groups to participate. Participation by the community in the mitigation planning process has many benefits, such as:

- Expert advice on technical and program issues
- Educate the public about hazards in the community
- Input from the public on potential risks
- Develop meaningful mitigation actions supported by the community
- Identify sources of funding for potential projects

3.4 REVIEW OF EXISTING PLANS, STUDIES, REPORTS & TECHNICAL INFORMATION

Information used in the preparation of this update was drawn from a variety of local, state, federal, and private resources. The existing resources used in the update process are listed in Figure 3-3 and in the bibliography.

Figure 3-3: Planning Documents Used in Planning Process

Author(s)	Year	Title	Description	Used For
Minnesota Division of Homeland Security and Emergency Management	2014, 2011, 2008	Minnesota State All-Hazard Mitigation Plan Update	Provides profile, natural resource, and hazard identification information	County profile, hazard identification, risk assessment, mitigation strategies/actions
Minnesota Department of Natural Resources-Division of Waters	1984	Fillmore County Waters and Wetlands Map	Provides natural resource information	County profile and mapping reference
Fillmore County	2006	Comprehensive Plan	Provides profile, natural resource, development, and hazard identification information	County profile, hazard identification

Section 4: County Profile

4.1 LOCATION

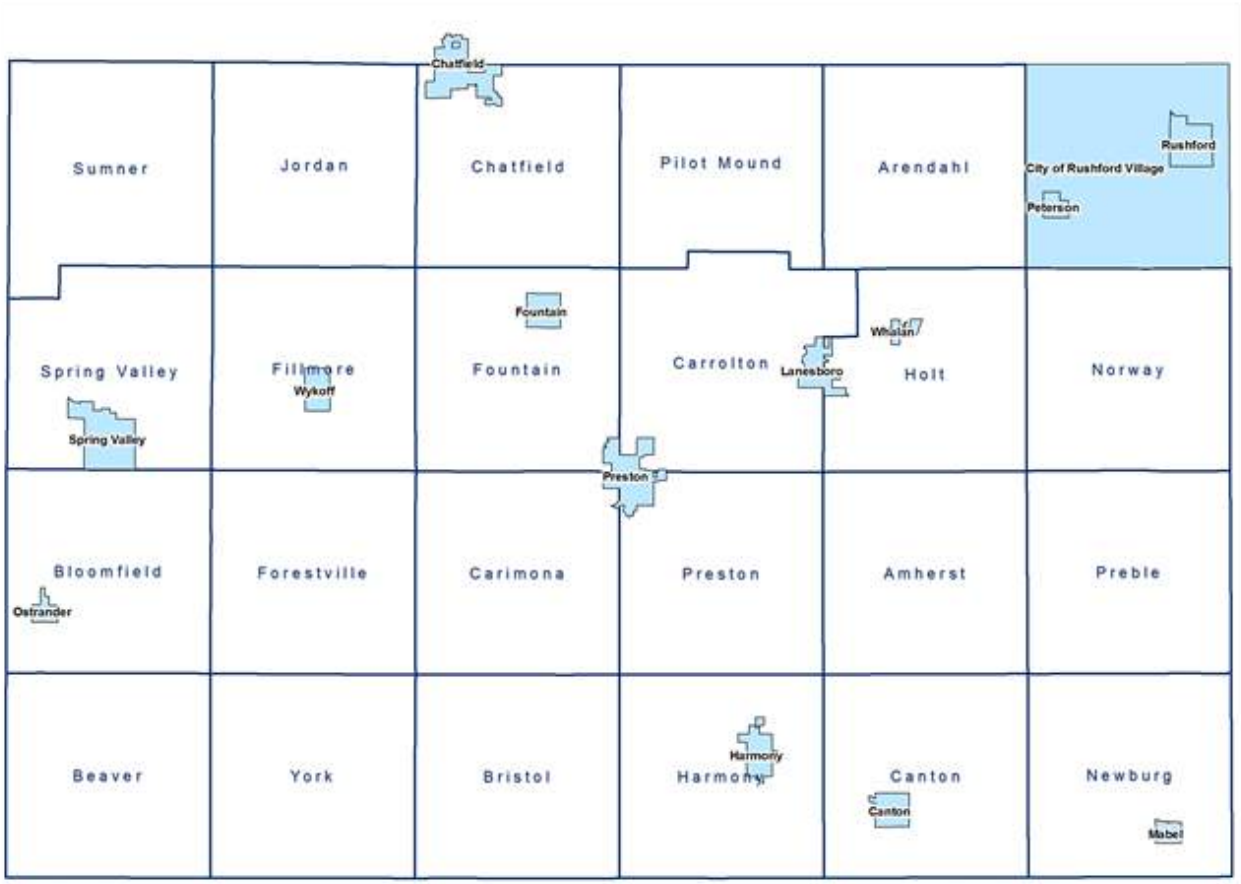
Fillmore County is located in southeastern Minnesota and is bordered by Olmsted and Winona County to the north, Houston County to the east, the State of Iowa (Howard County and Winneshiek County) to the south, and Mower County to the west (Figure 4-1). The City of Preston is centrally located and is the county seat. The county covers a total of 861.30 square miles.

Figure 4-1: General Location Map

4.2 CITIES & TOWNSHIPS

Fillmore County consists of fourteen incorporated cities and twenty three townships (Figure 4-2). The cities include: Canton, Chatfield, Fountain, Harmony, Lanesboro, Mabel, Ostrander, Peterson, Preston, Rushford Village, Rushford, Spring Valley, Whalan, and Wykoff. The townships include: Amherst, Arendahl, Beaver, Bloomfield, Bristol, Canton, Carimona, Carrolton, Chatfield, Fillmore, Forestville, Fountain, Harmony, Holt, Jordan, Newburg, Norway, Pilot Mound, Preble, Preston, Spring Valley, Summer, and York.

Figure 4-2: Local Units of Government



4.3 LANDSCAPE

Fillmore County like much of southeastern Minnesota is predominantly comprised of gently rolling plains crossed with stream valleys. The Root River, the largest river in the county, flows through the northern portion of Fillmore County east to the Mississippi River.

The geology of the county is composed of bedrock covered by 80 to 350 feet of glacial till from the last ice age[10]. Although there are dozens of soil types that can be found within the county, the bulk of the soil is comprised of Fayette silt loam (7-11% slopes) (14.4%), Fayette silt loam (2-6 percent slopes), Canisteo Clay Loam (9.0%), Tama and Downs silt loams (2-6 percent slopes) (8.3%), and Fayette silt loam (12-17 percent slopes) (5.6%). Fayette, Dubuque, and Whalan associations are the largest soil association in the county, occupying more than 40 percent of the land in the county. These soils are lightly colored, well drained to moderately well drained, and very erodible[11]. Tama, Downs, Rockton, and Dodgeville occupy the next most type of soil, covering more than 16 percent of the land[11]. These soils are darkly colored and well-drained[11].

4.4 HYDROLOGY

The county is part of two major watersheds, the Root River Watershed and the Upper Iowa River Watershed[12]. The Root River Watershed occupies 1,659 square miles in Fillmore, Mower, Olmsted, Winona, and Houston Counties, draining almost the entire county surface drainage area. The Upper Iowa River Watershed is 992 square miles covering Fillmore, Mower, Houston, Howard (IA), Winneshiek (IA), and Allamakee (IA) Counties.

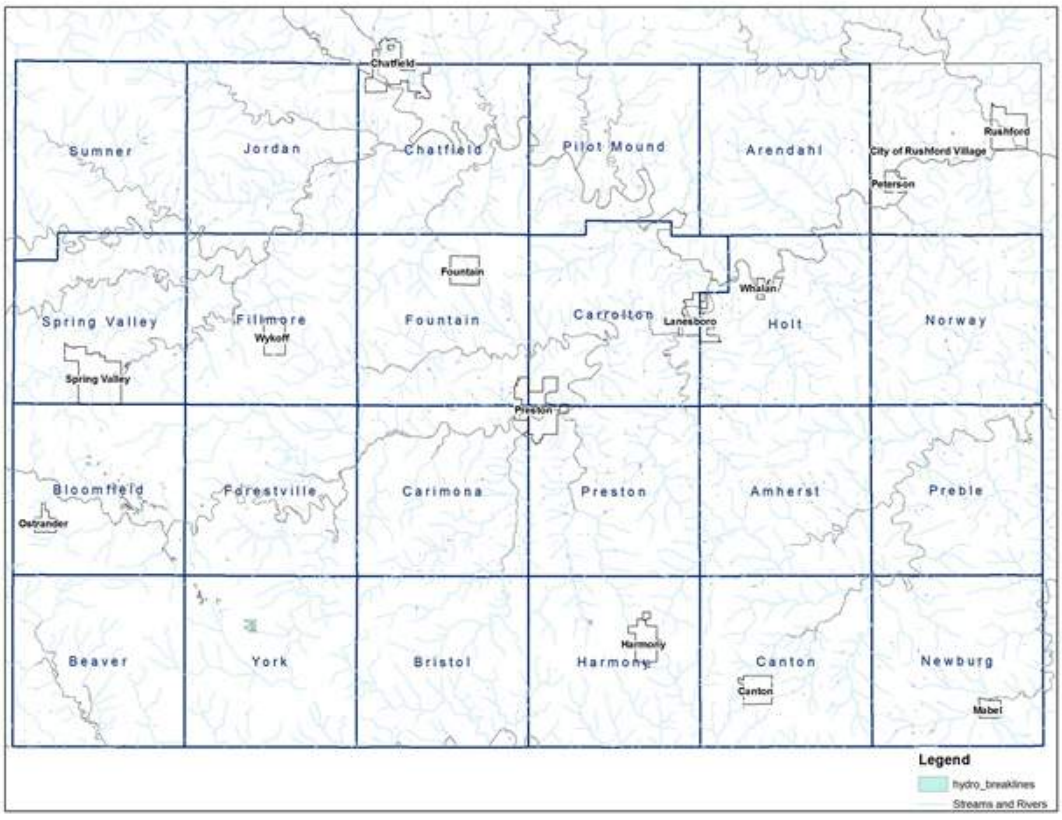
Fillmore County is part of 80 minor watersheds. The three largest named minor watersheds within the county are Riceford Creek Minor Watershed (approximately 65 square miles), Upper Iowa River (I) Watershed (approximately 44 square miles), and Upper Iowa River (II) Watershed (approximately 41 square miles).

The Root River is the longest river in Fillmore County, running generally from west to east across the entire county (119 miles). The Upper Iowa River is the second longest river in the county at 67 miles and is located along the southern border of the county. There are 2,203 miles of total streams and rivers within the county.

The county contains 19 lakes and ponds[13]. Lakes and ponds in Fillmore County are scattered among the entire county and account for 1,182 acres of total land, or about 0.21 percent. At 4.5 acres in surface area, the Lanesboro Mill Pond is the largest named lake within the county. The county contains twelve wetlands, marshes, swamps and bogs, which are evenly distributed among the entire county. The county's largest area, Leslie Helickson Detention, covers approximately seven acres of land. In total, wetlands, marshes, swamps, and bogs account for 40.5 acres of land within the county.

Fillmore County hydrologic features are identified in the Figure 4-3.

Figure 4-3: Hydrologic Features



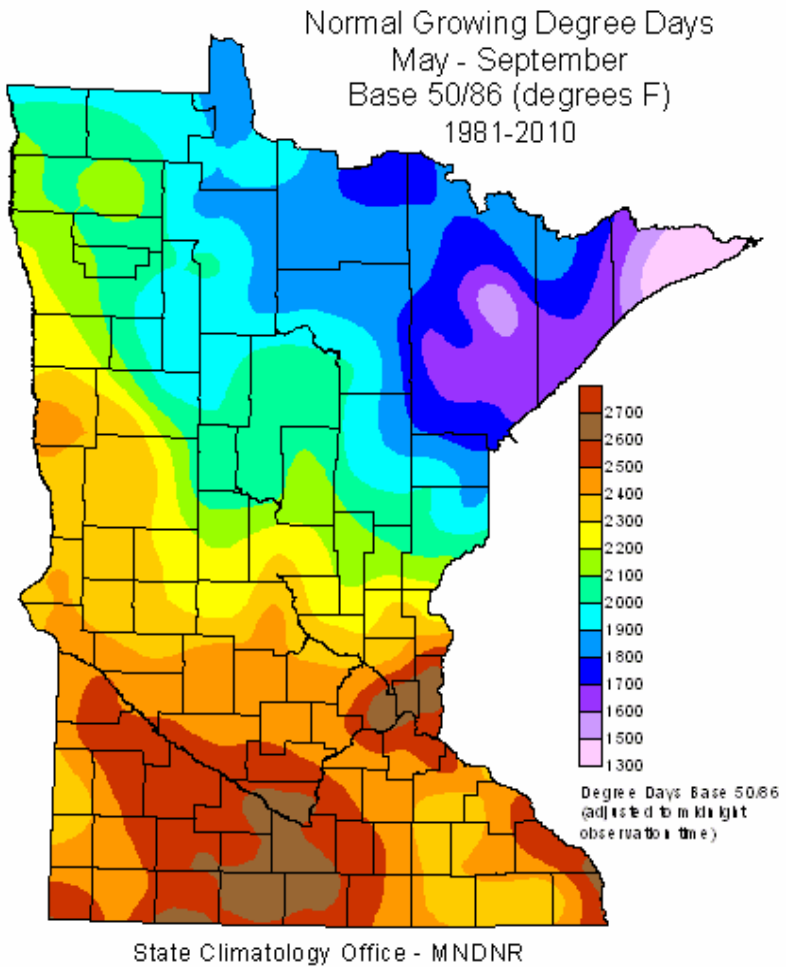
4.5 CLIMATE

Fillmore County, like the rest of Minnesota, has a predominately continental climate. The county sits in the heart of the North American land mass and lies within an area where cold, dry air from Canada battles for control of the atmosphere with warm, moist air from the Gulf of Mexico[14]. The result is a variety of extreme temperature possibilities, ranging from 101°F on July 7th, 2012 to -45°F on February 2, 1996. Daily temperatures in January average 15.3 degrees and in July average 70.8 degrees[15] with an annual average temperature of 44.6°F[15].

The typical heating season lasts from October to May. Based on information provided by the Preston Weather Station from 2010-2015, Fillmore County has an average 7,613 heating degree-days[16]. A heating degree-day is the difference between the base temperature of 65°F and the average daily temperature. One unit is accumulated for each degree the average daily temperature is below the base temperature (base temperature – average daily temperature = X heating degree days). The unit is designed to measure heating fuel costs for an area.

The growing season (with a base temperature of 32°F) lasts around 150 days. The last spring frost usually occurs in the first week of May and the first fall frost usually occurs in the last week of September. On average, the daily soil temperature normally reaches 50°F between April 15th and April 20th, this threshold is important because corn and soybeans cannot be planted until the soil temperature reaches 50°F and 55°F. Fillmore County averages 2,300-2,500 growing degree-days during normal growing degree days (May-September) (Figure 4-4). A growing degree day, like a heating degree day, is the difference between the average daily temperature and the base temperature (50°F). One unit is accumulated for each degree the average daily temperature is above the base temperature (average daily temperature – base temperature = X growing degree days). The unit is designed to measure the length of the growing season.

Figure 4-4: Growing Degree Days



The county receives an average of 32-34 inches of precipitation annually. June is typically the wettest time of year; December through February is the driest time of year. The wettest year on record is 1983, with a total of 49.15 inches of precipitation. The driest year on record is 1958, with a total of 17.74 inches of precipitation. The record for one-day maximum precipitation is 7.30 inches, which fell on July 11, 1981[15].

The average annual snowfall for the county is 44 inches. With an average of 10.9 inches, December and January are the snowiest month[15]. The snowiest season on record is the winter of 1961-1962 when a total 75.5 inches fell[15].

4.6 DEMOGRAPHY

According to the 2010 Census, the county had a total population of 20,866[17]. Fifty-eight percent of the population lives in a city. The remaining seventy-one percent lives in a township. From 2000 through 2010, the urban population grew by 2.34 percent and the rural population of the county decreased by 7.37 percent (Figure 4-5 and Figure 4-6). This pattern is reflective of national and global trends of outmigration from rural areas to larger towns and cities.

Between 2000 and 2010, the county's total population decreased by -1.21 percent (256 people). The Cities of Canton, Chatfield, Fountain, Mabel, Ostrander, Rushford, and Rushford Village all witnessed a population increase. The rate of decline varied greatly for the remaining communities, from -1.55 percent in Spring Valley to -27.42 percent in Fountain Township.

Figure 4-5: Urban Population Change[17]

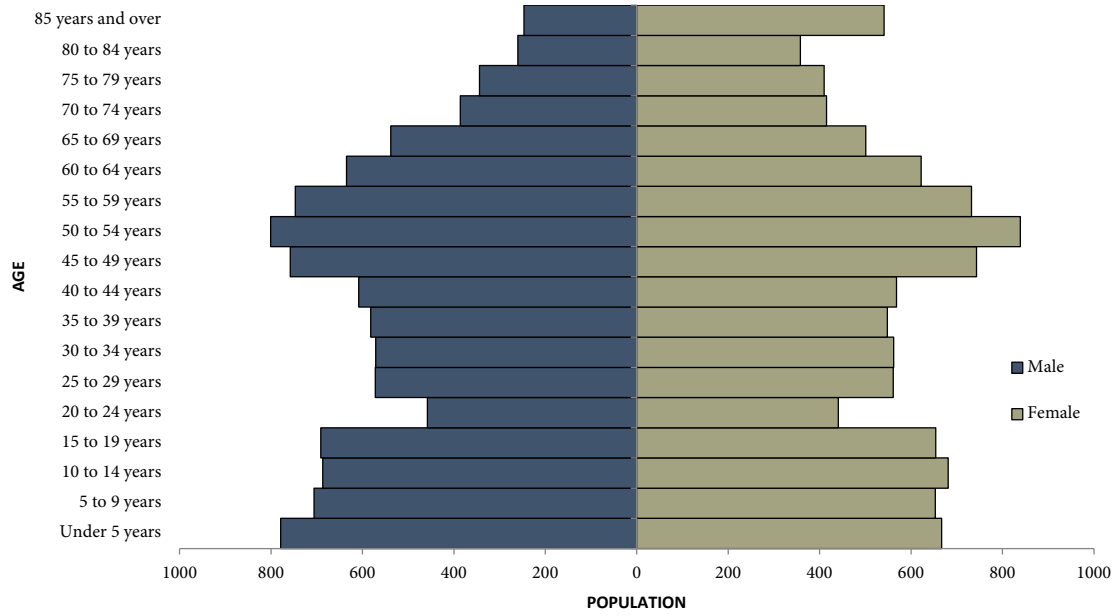
Local Jurisdiction	Type of Local Jurisdiction	Population 2000	Population 2010	Population Change	% Population Change
Canton	City	343	346	3	0.87%
Chatfield	City	1,257	1,573	316	25.14%
Fountain	City	343	410	67	19.53%
Harmony	City	1,080	1,020	-60	-5.56%
Lanesboro	City	788	754	-34	-4.31%
Mabel	City	766	780	14	1.83%
Ostrander	City	212	254	42	19.81%
Peterson	City	269	199	-70	-26.02%
Preston	City	1,426	1,325	-101	-7.08%
Rushford	City	1,696	1,731	35	2.06%
Rushford Village	City	714	807	93	13.03%
Spring Valley	City	2,518	2,479	-39	-1.55%
Whalan	City	64	63	-1	-1.56%
Wykoff	City	460	444	-16	-3.48%
TOTAL	**City**	**11,936**	**12,185**	**249**	**2.34% (Average)**

Figure 4-6: Rural Population Change[17]

Local Jurisdiction	Type of Local Jurisdiction	Population 2000	Population 2010	Population Change	% Population Change
Amherst	Township	405	378	-27	-6.67%
Arendahl	Township	333	337	4	1.20%
Beaver	Township	243	242	-1	-0.41%
Bloomfield	Township	414	353	-61	-14.73%
Bristol	Township	499	396	-103	-20.64%
Canton	Township	684	724	40	5.85%
Carimona	Township	272	296	24	8.82%
Carrolton	Township	321	314	-7	-2.18%
Fillmore	Township	485	457	-28	-5.77%
Forestville	Township	386	356	-30	-7.77%
Fountain	Township	434	315	-119	-27.42%
Harmony	Township	396	387	-9	-2.27%
Holt	Township	307	271	-36	-11.73%
Jordan	Township	412	352	-60	-14.56%
Newburg	Township	444	379	-65	-14.64%
Norway	Township	335	343	8	2.39%
Pilot Mound	Township	364	338	-26	-7.14%
Prebel	Township	272	209	-63	-23.16%
Preston	Township	374	359	-15	-4.01%
Spring Valley	Township	590	518	-72	-12.20%
Summer	Township	436	458	22	5.05%
York	Township	409	368	-41	-10.02%
TOTAL	**Township**	**8,815**	**8,150**	**-665**	**-7.37% (Average)**

Overall, the county is 49.7 percent male and 50.3 percent female. The county's population pyramid, depicted in Figure 4-7, indicates a relatively stable population. The Baby Boomer generation is present between the ages of 45 and 64. The pyramid also indicates that the cohorts of males and females age 0-19 are approximately the same size as the Baby Boomer cohort.

Figure 4-7: Population Pyramid[17]



Racially, the county is predominantly White/Caucasian. The second highest race is Asian (1.2%). The county, 95.7 percent White/Caucasian, is less racially diverse than the state, 86.5 percent White/Caucasian, and considerably less diverse than the nation, 72.4 percent White/Caucasian.

Around one percent of the county's population contains Hispanic or Latino ethnicity. Mexicans represent the largest single subset of Hispanic residents, accounting for 0.6 percent of the county's population. The remaining 99 percent of the county is Non-Hispanic or Latino.

4.7 POPULATION PROJECTIONS

The most recent population projections, released by the United States Census Bureau, indicates 47 percent of jurisdictions in Fillmore County should expect to increase by 2020. The cities of Canton (12.85%) and Wykoff (8.7%) are expected to make the most significant gain in population. The townships of Canton (11.54%) and Fillmore (7.09%) are expected to observe the largest increase in population. Declines are expected to occur in 33 percent of the local jurisdictions, most notably in the cities of Mabel (-8.1%) and Spring Valley (-4.28%).

Figure 4-8: Population Change 2010-2020[18]

City	
Name of Local Jurisdiction	Change 2010 -2020
Canton	12.85 %
Chatfield	3.02 %
Fountain	-0.25 %
Harmony	-3.26 %
Lanesboro	0.27 %
Mabel	-8.10 %
Ostrander	1.18 %
Peterson	0.51 %
Preston	-3.88 %
Rushford	2.29 %
Rushford Village	3.47 %
Spring Valley	-4.28 %
Whalan	0.00 %
Wykoff	8.70 %

Township	
Name of Local Jurisdiction	Change 2010 -2020
Amherst	0.79 %
Arendahl	0.00 %
Beaver	-0.42 %
Bloomfield	1.41 %
Bristol	0.00 %
Canton	11.54 %
Carimona	-3.24 %
Carrolton	0.00 %
Chatfield	0.00 %
Fillmore	7.09 %
Forestville	-2.99 %
Fountain	-0.32 %
Harmony	3.94 %
Holt	0.00 %
Jordan	0.85 %
Newburg	5.16 %
Norway	0.29 %
Pilot Mound	0.00 %
Preble	7.33 %
Preston	0.00 %
Spring Valley	-1.81 %
Sumner	-0.45 %
York	-0.56 %

4.8 ECONOMY

According to the Economic Census (2007), the county witnesses over $994 million in economic activity annually. The most profitable segment of the economy is manufacturing, which is responsible for more than a third (37.97%) of the county's economic activity. Agriculture (22.44%) and retail trade (17.78%) follow as profitable sectors in Fillmore County (Figure 4-9).

Figure 4-9: Economic Activity[19] [20]

Economic Segment	Economic Activity	Percent of Total
Accommodation and food services	14,499,000	1.46%
Administrative, support, waste management & remediation services	7,602,000	0.76%
Agriculture	223,107,000	22.44%
Arts, entertainment, and recreation	4,399,000	0.44%
Educational services	*	*
Health care and social assistance	44,565,000	4.48%
Information	**	*
Manufacturing	377,422,000	37.97%
Other services (except public administration)	16,024,000	1.61%
Professional, scientific, and technical services	11,059,000	1.11%
Real estate and rental and leasing	1,852,000	0.19%
Retail trade	176,767,000	17.78%
Wholesale trade	116,767,000	11.75%
Total	**$994,063,000**	**100.00%**

**Withheld to avoid disclosing data for individual companies.*
*** Unavailable*

According to the Department of Employment and Economic Development (DEED), the county had an average of 10,576 people employed, there are 6,004 jobs located in Fillmore County, with 10,576 people employed throughout the county and the surrounding area in 2014[21] [22]. The largest industries were education and health services industry with 1,607 jobs and trade, transportation, and utilities with 1,269 jobs (see Figure 4 -10).

Figure 4-10: Employment by Industry in Fillmore County[21]

Industry	Employment	Percent of Total
Natural Resources and Mining	346	5.76%
Construction	256	4.26%
Manufacturing	805	13.41%
Trade, Transportation and Utilities	1,269	21.14%
Information	72	1.20%
Financial Activities	222	3.70%
Professional and Business Services	155	2.58%
Education and Health Services	1,607	26.77%
Leisure and Hospitality	632	10.53%
Other Services	143	2.38%
Public Administration	497	8.28%
Total	**6,004**	**100.00%**

According to the Census Bureau's 2014 American Community Survey, the county has a per capita income of $24,187 and a median household income of $49,307, which is below the state's per capita income of $29,431 and median household income of $57,007[18].

The county's unemployment rate for 2015 was 4.1 percent compared to the state's average of 3.7 percent[22]. The county poverty rate was 6.5 percent for families and 10.4 percent for individuals[22]. By comparison the state poverty rate was 6.4 percent for families and 10 percent for individuals.

4.9 LAND COVER

Land cover is defined as the vegetation, structures, or other materials that cover the surface of the Earth. Land use will be defined as the economic/societal use of the land. The dominant land covers for the county are cultivated land (62.8%), forested (20%), and hay/pasture/grassland (14.2%). Developed land accounts for 2.5 percent of the county. Figure 4-11 depicts the breakdown of land cover by type within the county.

Figure 4-11: Land Cover Statistics[23]

Description	Acres	Percent
Urban and Rural Development	13,850	2.5%
Cultivated Land	346,132	62.8%
Hay/Pasture/Grassland	78,543	14.2%
Brushland	930	0.2%
Forested	110,392	20.0%
Water	1,214	0.2%
Bog/Marsh/Fen	139	0.0%
Mining	278	0.1%
Total	**551,478**	**100%**

Section 5: Risk Assessment

5.1 VULNERABILITY ASSESSMENT

The vulnerability assessment includes an inventory of critical facilities within the county and areas of special consideration. Critical facilities are broken into five categories: essential facilities, transportation systems, lifeline utilities, high potential loss facilities, and hazardous material facilities. Special considerations include: economic elements; historic, cultural, and natural resource areas; vulnerable populations; and special considerations. The inventory includes facility type and location. Where possible, an estimated replacement value was also included. Replacement values were determined using a combination of county assessor records and data provided by individual cities.

The vulnerability assessment also includes an estimate of the county's total building exposure (public and private). Building exposure includes the number of buildings/structures in the county, along with an estimate of their improved value.

5.1.1 Critical Facilities

5.1.1.A Essential Facilities

Essential facilities are vital to the health and welfare of the whole population and are especially important following hazard events. Essential facilities include: police and fire stations, emergency operations centers, medical facilities (hospitals and clinics), and schools[24] [25]. Figure 5-1 through Figure 5-3 list these individual essential facilities, their locations, and estimated replacement values, as determined by the County Assessor's Office using the most recent data available.

Figure 5-1: Essential Facilities – Law Enforcement and Emergency Response[24]

Facility	Location	Replacement Value
Canton Fire Department	105 S Main St., Canton	$148,500
Chatfield Ambulance Service/Fire Department/EMS Training Institute	21 2nd St. SE, Chatfield	$775,100
Chatfield Police Department	21 2nd St. SE, Chatfield	$1,116,871
Fillmore County Emergency Management	901 Houston St., Preston	$614,000
Fillmore County Sheriff's Office	901 Houston St. NW, Preston	$1,552,924
Fountain Fire/Police Department	104 Main St., Fountain	$365,000
Harmony Ambulance/Fire Department	920 Main Ave. S, Harmony	$514,400
Lanesboro Ambulance/Fire Department	104 Coffee St. W, Lanesboro	$275,825
Mabel Ambulance	Mabel	$346,300
Mabel Fire Department	109 N Elm St., Mabel	
Preston/Lanesboro Police Department	202 Parkway Ave., Lanesboro	*
Ostrander Fire Department	414 N Main St., Ostrander	$139,100
Ostrander Police Department	555 Hillcrest Dr., Ostrander	$101,200
Preston Ambulance	210 Fillmore St. W, Preston	$592,000
Preston Fire Department	217 Fillmore St. W, Preston	
Preston Police Department	210 Fillmore St. W, Preston	$945,791
Rushford Ambulance	405 S Elm St., Rushford	$415,321
Rushford Emergency Management	407 S Elm St., Rushford	
Rushfrod Fire Department	403 S. Elm St., Rushford	
Rushford Police Department	405 S Elm St., Rushford	$289,700
Spring Valley Ambulance/Fire Department	120 W Courtland St., Spring Valley	$893,400
Spring Valley Fire Department	100 Emergency Dr., Rushford	
Wykoff Fire Department/Wykoff First Responders	217 N Gold St., Wykoff	$241,500

**Unavailable*

Figure 5-2: Essential Facilities – Medical Care[24]

Facility	Location	Replacement Value
Chosen Valley Apartments	428 Jensen Ln. SE, Chatfield	$5,182,299
Chosen Valley Vet Clinic	115 Main St. S, Chatfield	*
Olmsted Medical Group	3rd St. SE, Chatfield	*
Gundersen Health System	805 Main Ave. S, Harmony	$2,140,167
Harmony Veterinary Clinic	855 Wickett Drive NW, Harmony	*
Winneshiek Medical Center-Mabel Clinic	114 Main St. S, Mabel	$108,406
Ostrander Care and Rehab	305 Minnesota St., Ostrander	$2,000,000
Fillmore County PHNS	902 Houston St. NW, Preston	$2,320,832
Olmsted Medical Center	405 Kansas St. NW, Preston	$379,100
Root River Veterinary Clinic	212 Saint Anthony Street S, Preston	*
Valley Veterinary Clinic	302 Industrial Road, Rushford	*
Winona Health - Rushford Clinic	109 Jessie St., Rushford	*
Olmsted Medical Center - Spring Valley	803 Memorial Dr., Spring Valley	$929,200
Spring Valley Care Center	800 Memorial Dr., Spring Valley	$5,722,300
Spring Valley Veterinary Clinic	817 N Broadway Street, Spring Valley	*

**Unavailable*

Figure 5-3: Essential Facilities – Schools[24 25]

Facility	Location	Replacement Value
Chatfield Elementary School	11555 Hillside Dr. SE, Chatfield	$14,339,738
Fillmore Central High School	145 Main Ave. S, Harmony	*
Root River Program	225 3rd Ave. SE, Harmony	*
Eagle Bluff Environmental Learning	28097 Goodview Dr., Lanesboro	$3,435,648
Lanesboro Public Schools	100 Kirkwood St. E, Lanesboro	$15,166,523
Mabel Canton Public Schools	316 W Fillmore, Mabel	$3,763,559
Rushford-Peterson Middle School	193 Park St., Peterson	*
Fillmore Central Elementary School	702 Chatfield Ave. NW, Preston	*
Fillmore Central School District	700 Chatfield St. NW, Preston	*
Community Education Office/Rushford-Peterson School District	102 N Mill St., Rushford	*
Rushford-Peterson High School	1000 Pine Meadows Ln., Rushford	*
Kingsland Public School District	705 N Section Ave., Spring Valley	$8,815,409
Kingsland Middle School	201 Bartlett St. W, Wykoff	*
St. John's Lutheran School	245 Line St. S, Wykoff	*

**Unavailable*

5.1.1.B Transportation Systems

Transportation systems are essential to the social and economic needs of our society. These systems also play a critical role in the response to and recovery from hazard events. Essential transportation systems include: airway, highway, railway, waterway facilities, and infrastructure. Figure 5-4 summarizes the transportation systems identified through the update process.

Figure 5-4: Transportation Systems[24 26]

Owner	Description	Location
	Canton Main Shop/Building	309 Prairie Ave. E, Canton
Fillmore County	Highway Garage	Route 1, Chatfield
Fillmore County	Highway Garage	Route 1, Cherry Grove
A to Adventures	Specialized Freight Trucking	102 E Beacon St., Lanesboro
Fillmore County	Highway Garage/ Main Shop Building	75 River St., Peterson
Fillmore County	Airport Terminal Building/Storage Building	909 Houston St. NW, Preston
Fillmore County	Highway Department Main Shop/Building	909 Houston St. NW, Preston
	Preston Main Shop/Building	727 Hwy 52 & 16 E, Preston
Rock N. R Syrup Co. Inc.	Specialized Freight Trucking	21387 CR 20, Preston
City of Rushford	Rushford Municipal Airport	32168 Airport Road, Rushford
Fillmore County	Highway Garage/Main Shop/Building	312 E Griswold St., Spring Valley
Matson Field	Airports	Township Rd. 443, Spring Valley
Rex Back Trucking	Specialized Freight Trucking	22910 Oak Hill Dr., Spring Valley
Schultz-O'Connel Inc.	Livestock Hauling	406 E Main St., Spring Valley
	Cherry Grove Main Shop/Building	15442 County Rd. 5, Spring Valley

Bridges

There are a total of 329 bridges in Fillmore County. According to the Federal Highway Administration, 37 of these bridges are structurally deficient[27]. The classification *Structurally Deficient* is used to determine eligibility for federal bridge replacement and rehabilitation funding[28]. Bridges deemed to be structurally deficient are not necessarily unsafe. A structurally deficient bridge typically needs maintenance, repair, and eventual rehabilitation or replacement to address deficiencies. To remain open to traffic, structurally deficient bridges are often posted with reduced weight limits that restrict the gross weight of vehicles using the bridges. If unsafe conditions are identified during a physical inspection, the structure will be closed.

5.1.1.C Lifeline Utility Systems

Lifeline utility systems are essential for the provision of basic services, such as heat, power, and potable water. These systems include the facilities and infrastructure related to: electric power, potable water, wastewater/stormwater, natural gas, and oil. Figure 5-5 through Figure 5-9 list the number and type of lifeline utility systems identified through the update process.

Figure 5-5: Lifeline Utility Systems – Electric Power[24 29]

Description	Location
Beaver Creek Substation	Co. Hwy 26 & 131st Ave. (10mi S)
Cherry Grove Substation	140th St. & 151st Ave. (8mi SE)
Granger Substation	Co. Hwy 15 & 140th St. (6mi W of Harmony)
Harmony Substation	U.S. Hwy 52 & 331st Ave. (1mi E of Harmony)
Henrytown Substation	166th St. & Co. Hwy 21 (4mi NE)
Peterson Substation	290th St. & MN Hwy 250 (4mi NE of Peterson)
Riceford Substation	455th Ave. & Co. Hwy 18 (6mi N)
Rushford Substation	MN Hwy 16 (1.5mi SW of Rushford)
Rushford Village Substation	MN Hwy 16, (1mi NE of Peterson)
Spring Valley Substation	Co. Hwy 8 (2.5mi NE)
People Electric Co-op	S Hwy 52
Harmony Distribution Substation	300 2nd Ave. NW, Harmony
Preston Distribution Substation	St. Paul St. SW & Crown Hill Road W, Preston

Figure 5-5: Lifeline Utility Systems – Electric Power[24 29] *(con't)*

Description	Location
North Preston Substation	Industrial Dr., Preston
Tri-County Electric Cooperative	31110 Cooperative Way, Rushford Valley
Spring Valley Power Plant	104 S Section Ave., Spring Valley
Tri-County Electric	Co. Hwy 26 & 131st Ave., Spring Valley
Interstate Power & Light Co.	150 W Tracy Rd., Spring Valley
Whalan Substation	Bench St., Whalan

Figure 5-6: Lifeline Utility Systems – Potable Water[24 30]

Owner	Description	Location
City of Chatfield	Well #2	Chatfield
	Well #3	Chatfield
City of Harmony	Well #1	2nd Ave. NW, Harmony
	Well #2	2nd Ave. NW, Harmony
	Well #3	920 2nd Ave. NE, Harmony, MN
City of Lanesboro	Well #3	Lanesboro
	Well #4	Lanesboro
City of Peterson	Well #1	Peterson
City of Preston	Preston Municipal Well #1	St. Paul St. & Cottage Grove Ave., Preston
	Well #2	Preston
	Well #3	Industrial Dr., Preston
City of Mabel	Well #3	Cherrywood Dr., Mabel
	Well #4	N Robert St., Mabel
City of Ostrander	Well #2	414 Main St., Ostrander
	Well #1	414 Main St., Ostrander
	Water Tower	Main St., Ostrander
City of Rushford	Well Houses & Water Plant	Rushford
	Water Tower & Reservoir	Rushford
City of Rushford Village	Well #2	Rushford Village
City of Spring Valley	Well #1	Smith St. Pleasant, Spring Valley, MN
	Well #2	South Broadway at South Park, Spring Valley
	Well #3	Jefferson and N Section Ave. St., Spring Valley
	Water Tower	Capelle Ct. & Mlinar Ave., Spring Valley
City of Whalan	Well #1	Holt Township, Whalan
	Block Well #2	2nd Ave., Whalan
	Block Well #3	Main St., Whalan
	Block Well #4	Oak St., Whalan
Maple Springs Campground	Well #1	21606 Co. Hwy 118, Preston
Tri-County Electric Cooperative	Well #2	31110 Cooperative Way, Rushford
Wesselink Water Association	Well #2	18229 160th St., Spring Valley

Figure 5-7: Lifeline Utility Systems – Wastewater/Stormwater[24 30]

Owner	Description	Location
City of Canton	Wastewater Treatment Plant	Canton
City of Chatfield	Wastewater Treatment Plant	90 Library Lane SW, Chatfield
City of Fountain	Wastewater Treatment Plant	Fountain
City of Lanesboro	Wastewater Treatment Plant	Lanesboro
City of Mabel	Wastewater Treatment Plant	Disposal Plant Rd., Mabel
City of Ostrander	Wastewater Treatment Plant	Ostrander
City of Peterson	Wastewater Treatment Plant	Peterson
City of Rushford	Wastewater Treatment Plant	Rushford
City of Wykoff	Wastewater Treatment Plant	320 Carimona St., Wykoff

Figure 5-8: Lifeline Utility Systems – Natural Gas [24]

Owner	Description	Location
Minnesota Energy	Gas Transmission Pipeline	Canton
Minnesota Energy	Gas Transmission Pipeline	Mabel
Minnesota Energy	Gas Transmission Pipeline	Peterson
Minnesota Energy	Gas Transmission Pipeline	E Tracy Rd., Spring Valley
Northern Natural Gas Co.	Gas Transmission Pipeline	*
AMOCO Oil Co.	Gas Transmission Pipeline	*

**Unavailable*

Figure 5-9: Lifeline Utility Systems – Oil and Gas[24]

Owner	Description	Location	Replacement Value
O & O Service Inc.	Gas Station	15237 Old Territorial Rd. NE, Chatfield	*
Kwik Trip	Gas Station	415 Main Ave. N, Harmony	$317,100
Lanesboro BP Food Shop	Gas Station	100 Sheridan W, Lanesboro	$133,400
Mabel BP	Gas Station	Hwy 44 E, Mabel	*
Northern Natural Pipeline	Pipeline	Mabel	*
Casey's General Store	Gas Station	875 Hwy 52, Preston	*
Kinder Morgan	Pipeline Transportation of Crude Oil	14514 State Hwy 16, Spring Valley	$965,700
Kruegel Gas Service	Propane Company	420 N Pleasant Ave., Spring Valley	*
Fowler's BP Shop & Car Wash	Gas Station	221 N Section Ave., Spring Valley	$128,900
Kwik Trip	Gas Station	110 State Rd. 16, Rushford	*
Pam's Corner	Gas Station	105 State Hwy 16, Rushford	*
Severson Oil Company	Heating Oil and Propane	43295 State Hwy 16, Rushford	*
Casey's General Store	Gas Station	735 N Broadway Ave., Spring Valley	*
Kwik Trip	Gas Station	640 N Broadway St., Spring Valley	$329,000

**Unavailable*

5.1.1.D High Potential Loss Facilities

High potential loss facilities are facilities that would have a potentially high loss associated with them in the event of a hazard event. Fillmore county has 53 high potential loss facilities which includes dams and levees (see Figure 5-10).

Figure 5-10: High Potential Loss Facilities[31]

Name	Type	Owner	Location
Bear Creek	Dam	Bowland, Donald	28264-28568 141st Ave., Spring Valley
Carimona Detention	Dam	Township Of Carimona & Steve Ramaker	19467 County 15, Preston
Carrolton 12 Dam	Dam	-	33630 Gaelic Rd., Lanesboro
Copeman Pond	Dam	Copeman, Lee	29887 US-52, Fountain
East Willow Creek D-2	Dam	Swcd Of Fillmore County	Co Hwy 15, Harmony
East Willow Creek Da-1	Dam	Billy Fishbaugher	Township Rd 307, Preston
East Willow Creek E-3	Dam	Mensink, John	Township Rd 318, Preston
East Willow Creek Fd-2	Dam	Scheevel, Jerry	16959 Kind Road, Preston
East Willow Creek Fd-28	Dam	Sikkink, Fay	24756 166th Street, Preston
East Willow Creek J-1	Dam	Ristau, Roger	Co Hwy 14, Preston
Fann Detention	Dam	Fann, Lorraine	28761 MN-43, Rushford
Fillmore County Road 21	Dam	County Of Fillmore	Co Hwy 21, Lanesboro
Finseth Pond	Dam	Finseth, Vernon	29701 Iris Rd., Fountain
Gehling Pond	Dam	Gehling, Ronald	Ronald Gehling Dam, Wykoff
Geoffrey Griffin	Dam	Griffin, Geoffrey	32096 Heritage Ln., Chatfield
Graves Pond	Dam	Graves, Ross	Co Hwy 15, Preston
Hanning Bros Group Pond	Dam	Hanning Bros Group	Township Rd. 300, Preston
Hatlevig-Boyum Group	Dam	Hatlevig-Boyum Group	Co Hwy 25, Peterson
Highum Pond	Dam	Highum, Roobert	42483 MN-30, Rushford Village
Horihan-Hazel Group	Dam	Horihan-Hazel Group	33680 Gaelic Rd., Lanesboro
Horihan-Herrick	Dam	Horihan, John	33630 Gaelic Rd., Lanesboro
Lagoon Park	Dam	Borgen, George	30066 MN-30, Chatfield
Lanesboro	Dam	City Of Lanesboro	Kirkwood St. W, Lanesboro
Lawstuen Pond	Dam	Lawstuen, Donald	31996 Gaelic Rd, Lanesboro
Leslie Helickson Detention	Dam	Hellicson, Leslie	Unnamed Rd., Preston
Miller Lange Pond	Dam	Miller, William	29732 146th St., Harmony
Nessrudlongellenberg Group	Dam	Rudlong, Thelmer	14597 Prairie Ln., Spring Valley
North Branch Root River	Dam	Dairyland Power Co-Op	*
Oian-Dahl Detention	Dam	Oian And Dahl	24703 433rd Ave., Rushford
Rain Pond	Dam	Rain, Tilfold	Unnamed Rd., Fountain
Rediske-Vatland Group	Dam	Rediske-Vatland Group	120th St., Canton
Rudlong Pond	Dam	Rudlong, Thelmer	14501 Prairie Ln., Spring Valley
Ruen Detention Group	Dam	Ruen, Howard	34556 220th St., Lanesboro
Ruen Pond	Dam	Ruen, Howard	Firefly Rd., Lanesboro
Sorenson Group	Dam	Sorenson Group	Grit Rd., Lanesboro
Waller Pond	Dam	Waller, Ray	25193 320th St., Chatfield
Wangen Pond	Dam	Wagen, Donald	29741 Iris Rd., Fountain
Root River/Rush Creek - West Levee - Levees A and B	Levee	City of Rushford	Ferry St, Rushford
Root River/Rush Creek - North Levee - Levee C	Levee	City of Rushford	203 N Mill St, Rushford
Root River/Rush Creek - East Levee - Levees D, E, and F	Levee	City of Rushford	327-467 E Park St, Rushford

**Unavailable*

Figure 5-11 identifies other critical facilities that were determined by the Fillmore County planning team.

Figure 5-11: Other Facilities

Name	Type	Location	Replacement Value
Harmony Foods IGA	Grocery	55 Center St. W, Harmony	*
Sterling Drug	Pharmacy	44 Main Ave., Harmony	*
Preston Foods IGA	Grocery	105 Fillmore St. W, Preston	*
Weber and Judd	Pharmacy	136 Main St. SW, Preston	*
Rushford Foods IGA	Grocery	400 S Mill St., Rushford	*
Sterling Drug	Pharmacy	115 W. Jessie St., Rushford	*
Sunshine Foods	Grocery	501 N Park Dr., Spring Valley	*
Weber and Judd	Pharmacy	501 N Park., Spring Valley	*

**Unavailable*

5.1.1.E Hazardous Material Facilities

Hazardous material facilities contain substances that are toxic and which pose a threat to human safety and the environment. These hazardous materials include: corrosives, explosives, flammable materials, radioactive materials, and toxins. The Minnesota Pollution Control Agency (MPCA) keeps a database of potentially contaminated sites and sites where pollution control permits have been issued. Figure 5-12 below depicts MPCA data for Fillmore County, including active and inactive sites. The MPCA includes a total of 698 sites; 401 that are active and 297 that are inactive.

Figure 5-12: MPCA Contaminated Sites and Environmental Permits[32]

Activity	Description	Active	Inactive
Air Permit	Issued for businesses that create air pollutants typically generated through industrial activities.	28	2
CERCLIS Site	The federal Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) is a database of sites suspected to be contaminated and are undergoing further investigation.	2	1
Construction Stormwater Permit	Issued to construction site owners/operators. Designed to prevent polluted stormwater from reaching lakes, streams, and wetlands.	83	111
Feedlot	Sites where animals are confined for feeding, breeding, or holding. Ranges from small farms to large-scale commercial operations.	914	684
Hazardous Waste (Small to Minimal Quantity Generator)	Generates less than 2,200 pounds of hazardous waste, or 2.2 pounds of acutely hazardous waste, per calendar month.	99	141
Industrial Stormwater Permit	Issued to industrial site owner/operators. Designed to prevent polluted stormwater from reaching lakes, streams and wetlands. Pollutants may include: toxic metals, oil, grease, de-icing salts, etc.	26	28
Landfill, Open or Closed	Landfills that have a small capacity and/or operate for a short period of time that are not required to obtain an individual solid waste permit. For example: yard waste composting, recycling, and energy recovery facilities.	3	2
Leak Site	Locations where a release of petroleum products has occurred from a tank system.	28	77
Tank Site	Sites with a storage tank on the premises. For example: gas stations, bus and trucking companies, factories that process sugar beets, ethanol, pulp, paper, or chemicals, etc.	98	87
Unpermitted Dump Site	Landfills that never held a valid MPCA permit. Generally these dumps existed prior to permitting requirements (pre-1967) and were old farm/municipal disposal sites.	1	19

Figure 5-12: MPCA Contaminated Sites and Environmental Permits[32] *(cont)*

Activity	Description	Active	Inactive
Voluntary Investigation & Cleanup (VIC) Site	Non-petroleum brownfield sites that are part of the VIC technical assistance program.	*	*
Wastewater Discharger	Facilities that generates or treats wastewater for discharge onto land or into water. Includes: sewage treatment plants and some manufacturers.	29	9

**Unavailable*

5.1.2 Special Considerations

5.1.2.A Economic Elements

Economic elements are the facilities that impact the welfare and stability of the local and/or regional economy. These elements include major employers and financial institutions. Figure 5-13 and Figure 5-14 list the number and type of economic elements identified through the update process.

Figure 5-13: Financial Institutions[24]

Name	Location	Replacement Value
First Southeast Bank	111 N Main St., Canton	$242,600
Root River State Bank	18 SE 3rd Street, Chatfield	$734,400
First State Bank-Fountain	101 Main St., Fountain	$4,800
First Southeast Bank	3 Main Ave. N, Harmony	$372,000
Merchants Bank	118 Parkway Ave. N, Lanesboro	$211,000
First National Bank of Mabel	101 E Newburg Ave., Mabel	$327,675
F & M Community Bank	100 Saint Anthony St. N, Preston	$30,200
Marine Credit Union	218 S Mill Street, Rushford	$334,608
Merchants Bank	101 W Jessie St., Rushford	*
Rushford State Bank	219 S Mill St., Rushford	$258,800
Home Federal Savings Bank	715 N Broadway St., Spring Valley	$594,600
First National Bank	208 N Broadway St., Spring Valley	$255,900
First State Bank of Leroy	1031 N Broadway St., Spring Valley	$772,050
Security State Bank-Lewiston	112 W Main St., Spring Valley	$678,471
Security State Bank-Lewiston	101 Gold St. S, Wykoff	$110,600

Figure 5-14: Major Employers[33]

Employer	Location	Industry	Employees	Annual Sales ($1,000)	Replacement Value
Badgersett Farm	18606 Deer Rd., Canton	Nursery, Garden Center & Farm Supply Stores	5 to 9	$1-2.5 Million	$266,000
Brenno Farms	14356 Deer Rd., Canton	Beef Cattle Ranching & Farming	5 to 9	Less Than $500,000	$801,100
Preston Dairy & Farm	601 W Hwy 52 # B, Canton	Dairy Cattle & Milk Production	10 to 19	$2.5-5 Million	$135,500
Chatfield Clinic	207 Twiford St. SW, Chatfield	Offices Of Physicians (Exc Mental Health Specs)	10 to 19	$1-2.5 Million	$353,300

Figure 5-14: Major Employers[33] *(con't)*

Employer	Location	Industry	Employees	Annual Sales ($1,000)	Replacement Value
Chatfield Public Schools	205 Union St. NE, Chatfield	Elementary & Secondary Schools	10 to 19	*	$16,686,865
Chosen Valley Care Center	1260 Winona St. SE, Chatfield	Nursing Care Facilities (Skilled Nursing Fclts)	200	3,520,000	$363,100
EZ Fabricating	9241 CR, Chatfield	Automotive Parts & Accessories Stores	5 to 9	$1-2.5 Million	$815,286
G-Cubed	14070 Hwy 52 SE, Chatfield	Surveying & Mapping (Except Geophysical) Services	10 to 19	$1-2.5 Million	*
Drury's Furniture	100 Main St., Fountain	*	*	*	$1,677,189
Los Gables	122 Highway 52 S, Fountain	Full-Service Restaurants	10 to 19	$500,000-1 Million	$135,500
Valley Design	133 South U.S. Hwy 52, Fountain	*	*	*	$2,807,865
Village Square Of Fountain	99 Main St., Fountain	Full-Service Restaurants	10 to 19	Less Than $500,000	$162,300
Budget Ride	335 Main Ave. N, Harmony	Interurban & Rural Bus Transportation	10 to 19	$1-2.5 Million	$20,000
Clara House Of Harmony	455 Main Ave. N, Harmony	Assisted Living Facilities For The Elderly	10 to 19	*	$2,005,500
Fillmore Central Schools	145 Main Ave. S, Harmony	Elementary & Secondary Schools	50-99	*	$7,217,257
First Southeast Bank	3 Main Ave. N, Harmony	Commercial Banking	10 to 19	*	$372,000
American Legion Post 40 A Corp	103 Elmwood, Lanesboro	Drinking Places Alcoholic Beverages	10 to 19	$500,000- 1 Million	$241,384
Commonweal Theatre Co	208 Parkway Ave. N, Lanesboro	Motion Picture Theaters (Except Drive-Ins)	10 to 19	$1-2.5 Million	$173,400
Root River Outfitters	101 Parkway Ave. S, Lanesboro	Boat Dealers	10 to 19	$2.5-5 Million	$86,100
Gjere Construction	43506 State Hwy 44, Mabel	Poured Concrete Foundation & Structure Contractors	10 to 19	$1-2.5 Million	$304,700
Green Lea Manor	115 N Lyndale, Mabel	Nursing Care Facilities (Skilled Nursing Fclts)	50-99	$2.5-5 Million	$3,763,996
Hwy 44 Bar & Grill	301 N Robert St., Mabel	Full-Service Restaurants	5 to 9	Less Than $500,000	$91,700
Mabel BP	Hwy 44 E, Mabel	Other Gasoline Stations	10 to 19	$5-10 Million	$339,379
Mabel Canton School	316 W Fillmore Ave., Mabel	Elementary & Secondary Schools	50-99	*	$4,281,843

**Unavailable*

Figure 5-14: Major Employers[33] *(con't)*

Employer	Location	Industry	Employees	Annual Sales ($1,000)	Replacement Value
Blown Away Salon	306 Main St., Ostrander	Beauty Salons	1 to 4	Less Than $500,000	*
C H S-Ostrander	17433 CR 1, Ostrander	Nursery, Garden Center & Farm Supply Stores	10 to 19	$1-2.5 Million	$140,100
Susie's Road House	409 Main St., Ostrander	*	*	*	$115,356
Wolf's Den	413 Main St., Ostrander	Full-Service Restaurants	5 to 9	Less Than $500,000	$14,100
Burdey's Cafe LLC	417 Mill St., Peterson	Full-Service Restaurants	5 to 9	Less Than $500,000	$39,700
Chuck's Feed	427 Mill St., Peterson	Farm Supplies Merchant Wholesalers	5 to 9	$16,028,000	$465,229
Grace Lutheran Church	40605 250th St., Peterson	Religious Organizations	10 to 19	*	$605,500
Rushford Peterson Middle School	193 Park St., Peterson	Elementary & Secondary Schools	20 to 25	*	$2,396,876
Casey's General Store	875 Hwy 52, Preston	Convenience Stores	10 to 19	$1-2.5 Million	$656,156
F & M Community Bank	100 Saint Anthony St. N, Preston	Commercial Banking	10 to 19	$5-10 Million	$30,200
Fillmore County Development	108 Fillmore Pl. SE, Preston	Other Individual & Family Services	10 to 19	Less Than $500,000	$917,253
Olmsted Medical Center	405 Kansas St. NW, Preston	Freestanding Ambulatory Surgical & Emergency Ctrs.	10 to 19	$1-2.5 Million	$254,800
Park Lane Estates Assisted Living	111 Fillmore Pl. SE, Preston	Assisted Living Facilities For The Elderly	10 to 19	*	$621,100
Dahl's Auto Works Inc.	207 S Elm St., Rushford	General Automotive Repair	10 to 19	$1-2.5 Million	$5,100
Farmers Cooperative Elevator	308 S Elm St., Rushford	Farm Supplies Merchant Wholesalers	10 to 19	$20-50 Million	$498,800
Good Shepherd Home	800 Home St., Rushford	Nursing Care Facilities (Skilled Nursing Fclts)	*	*	$262,200
Merchants Bank	101 W Jessie St, Rushford	Commercial Banking	*	*	*
Rushford Foods	400 S. Mill St., Rushford		*	*	*
Rushford – Peterson Schools	102 N Mill St., Rushford	Elementary & Secondary Schools	*	*	*
Rushford State Bank	219 S Mill St, Rushford	Commercial Banking	*	*	$258,800

**Unavailable*

Figure 5-14: Major Employers[33] *(con't)*

Employer	Location	Industry	Employees	Annual Sales ($1,000)	Replacement Value
A&W Restaurants	Hwy 16 & 63 N, Spring Valley	Full-Service Restaurants	10 to 19	$500,000-1 Million	$201,757
AMD Distribution Inc.	1021 Kasten Dr., Spring Valley	Distributing Service-Circular & Sample	5 to 11	2,245,000	$553,072
Bluff Country Newspaper Group	112 N Broadway St., Spring Valley	Newspaper Publishers	10 to 19	$1-2.5 Million	$60,400
Dairy Queen	300 N Section Ave., Spring Valley	Snack & Nonalcoholic Beverage Bars	10 to 19	Less Than $500,000	$424,451
KFI – Kappers Fabricating, Inc.	1015 Industrial Dr., Spring Valley	*	*	*	$1,818,722
Kingsland School	705 N Section Ave., Spring Valley	Elementary & Secondary Schools	10 to 100	*	$4,542,758
Marzolf Implement	1221 S Section Ave., Spring Valley	Outdoor Power Equipment Stores	10 to 19	$2.5-5 Million	$434,000
Minnesota Metals Inc	14097 State Hwy 16, Spring Valley	All Other Misc. Fabricated Metal Product Mfg.	10 to 19	$2.5-5 Million	$520,900
Olmsted Medical Center Olmsted	802 Memorial Dr., Spring Valley	Offices Of Physicians (Exc Mental Health Specs)	10 to 19	$1-2.5 Million	$7,795,137
Zeimetz Motors Inc	120 E Grant St., Spring Valley	New Car Dealers	10 to 19	$5-10 Million	$23,000
Aroma Pie Shop	618 Main St., Whalan	Full-Service Restaurants	*	*	*
Cedar Valley Resort	901 Bench St., Whalan	*	*	*	*
Doc's Auto Body & Repair	210 2nd Ave., Whalan	General Automotive Repair	1 to 4	Less Than $500,000	$94,562
Gateway Inn	118 Gold St. N # 1, Wykoff	Full-Service Restaurants	5 to 9	Less Than $500,000	$64,000
Paystation Wykoff School	201 Bartlett St. W, Wykoff	Elementary & Secondary Schools	10 to 19	*	$5,322,241
Thompson Motors	125 S Gold St., Wykoff	*	*	*	*
Wykoff Ambulance	217 Gold St. N, Wykoff	Ambulance Services	10 to 19	$500,000-1 Million	$142,347

**Unavailable*

5.1.2.B Historical, Cultural, and Natural Resource Areas

Community elements in this category are important for their historical and/or cultural significance and natural resources.

The structures within the county that are listed in Figure 5-15 are on the National Register of Historic Places.

Figure 5-15: Historic Structures[34]

Name	Address	Replacement Value
Lenora Methodist Episcopal Church	Co. Hwys 23 and 24, Canton	$89,752
Chatfield Public Library	Main St., Chatfield	$440,633
Dickson, Samuel Thompson, House	225 3rd St. SW, Chatfield	$176,726
Haven, George H., House	132 Winona St., Chatfield	$105,500
Lovell, Ellen, M., House	218 Winona St., Chatfield	$351,400
Bridge No. L4770	Twp. Rd. 213 over Mahoney Creek, Fountain	
Dayton, Daniel, House	Off Co. Hwy 17, Harmony	$1,000
Allis Barn	Co. Hwy 17, Lanesboro	*
Lanesboro Historic District	Roughly Kirkwood, Coffee and Parkway Sts., Lanesboro	*
Scanlan, Michael, House	708 Parkway S, Lanesboro	$364,200
Quickstad Farm Implement Company	Mill St., Peterson	$284,424
Fillmore County Jail and Carriage House	Houston and Preston Sts., Preston	$815,038
Forestville Townsite--Meighan Store	Co. Hwy 12, Preston	*
Milwaukee Elevator	Fillmore St. and Root River State Trl., Preston	*
Preston Brewery	412 Bluff St., Preston	*
Preston Overlook	On MN 52, Preston	*
Strong, William, House	Co. Hwy 12, Preston	*
Norway Township Stone House	Co. Hwy 10, Rushford	*
Rushford City Mill	301 Winona St., Rushford	$258,400
Rushford Wagon and Carriage Company	Elm St., Rushford	*
Southern Minnesota Depot	Elm St. and Pickle Alley, Rushford	$554,545
Walker and Valentine House	504 High St., Rushford	*
Bridge No. 5722	N Section St. over Spring Valley Cr., Spring Valley	*
Commercial House Hotel	146 S Broadway, Spring Valley	*
Parsons Block and Hall	112 S Broadway, Spring Valley	$61,800
Pietenpol, Bernard H., Workshop and Garage	Co. Hwy 5, Spring Valley	*
Spring Valley Carnegie Library	201 S Broadway, Spring Valley	*
Spring Valley Methodist Episcopal Church	221 W Courtland St., Spring Valley	$424,149
Steffens, Ephraim, House	404 N Broadway, Spring Valley	$120,300
Strong, William, House	508 N Huron Ave., Spring Valley	*
Tunnel Mill	Off Co. Hwy 1, Spring Valley	*
Bartlett, Francis H., House	135 S Gold St., Wykoff	$92,209
Wykoff Commercial Historic District	100 S Gold--123 N Gold St., Wykoff	*

There are a variety of cultural and natural resource areas within the county, along with other historical structures of value to Fillmore County. These facilities are summarized in Figure 5-16.

Figure 5-16: Cultural and Natural Resource Areas[24]

Park Name	Location	Replacement Value
Canton City Park	Canton	*
Chatfield Center for the Arts	405 S Main St., Chatfield	$5,327,205
Chatfield City Park	300 S Main St., Chatfield	*
Groen Park	3rd St., Chatfield	*
Mill Creek Park	Between Division St. & 3rd St., Chatfield	*
Fillmore County Museum	Fountain	$821,939
East Side of TH 139 Wayside Park	TH 139 & CR 30, Harmony	*
North Park	Harmony	*
Selvig Park	Harmony	*
Trailhead Park	Harmony	*
Eagle Cliff Campground	Lanesboro	$522,685
Hwy 250 Campground	Lanesboro	$84,843
Inspiration Point Wayside Park	Lanesboro	*
Minnesota's Norwegian Americans Historical Marker	Lanesboro	*
Riverview Campground	Lanesboro	$13,200
Softball Field	Lanesboro	*
Sylvan Park	202 Parkway Ave. S, Lanesboro	$75,536
Memorial Park	W Prairie Ave., Mabel	*
Sportsman Park	Mabel	*
Steam Engine Grounds	Steam Engine Park Dr., Mabel	$21,120
Tawney Wayside Park	Mabel	*
City Campground	Peterson	$22,498
Museum/Depot	Peterson	$58,777
Park	Peterson	*
Root River Bike Trail	Peterson	*
Mystery Cave Historical Marker	21071 Co. Hwy 118, Preston	*
Old Barn Resort	24461 Heron Rd., Preston	$1,217,198
Quickstad Farm Implement Company	Mill St., Preston	*
City Park	Robert St. Ostrander	$32,820
Community Center	Main St., Ostrander	$307,732
Magelssen Bluff Park	Rushford	*
Peterson Wayside Park	Rushford	*
Walker and Valentine House	504 High St., Rushford	*
Grant Street Park	Spring Valley	*
Masonic Park	CR 38, Spring Valley	$1,999
Spring Creek Park	Spring Valley	*
Spring Valley City Hall	201 S Broadway, Spring Valley	$419,590
Spring Valley Mausoleum	Spring Valley Cemetery, Spring Valley	$242,472
Tower Park	Spring Valley	$239,672
Willow Park	Spring Valley	*
Ball Field	Bench St., Whalan	*

Figure 5-16: Cultural and Natural Resource Areas[24] *(con't)*

Park Name	Location	Replacement Value
City Hall	2nd St., Whalan	*
Park	3rd Ave., Whalan	*
Town Hall/Museum	2nd St., Whalan	*
Meighen Store Historical Marker	Wykoff	*
Scanlon Michael, House	119-121 Gold St. N, Wykoff	*

**Unavailable*

5.1.2.C Vulnerable Populations

Vulnerable populations are those citizens and residents that may require special assistance after a hazard event. These populations include children, elderly, and non-English speaking persons. Figure 5-17 lists the number and type of vulnerable populations identified through the update process.

Figure 5-17: Vulnerable Populations[18 35]

Population Type	Population Number	Percent of Total Population
Children	5,065	24.3%
Elderly*	4,000	19.2%
Non-English Speakers**	1,169	5.6%

**Persons age 65 and older*
***Refers to those categorized by the U.S. Census Bureau as speaking a language other than English*

There are currently six nursing homes and eight assisted living facilities in the county. These facilities are listed in Figure 5-18 and Figure 5-19 below.

Figure 5-18: Nursing Homes[35]

Facility Name	Number of Beds	Location	Replacement Value
Chosen Valley Care Center	78	1102 Liberty St., Chatfield	$363,100
Gundersen Harmony Care Center	43	815 Main Ave. S, Harmony	$124,200
Green Lea Senior Living	51	115 N Lyndale St., Mabel	$3,763,996
Ostrander Care and Rehab	25	305 Minnesota St., Ostrander	$438,900
Good Shepherd Lutheran Home	75	800 Home St., Rushford	$262,200
Spring Valley Care Center	50	800 Memorial Dr., Spring Valley	$787,800

Figure 5-19: Assisted Living Facilities[35]

Facility Name	Location	Replacement Value
Chosen Valley Assisted Living	1260 Winona St., SE Chatfield	$6,965,624
Clara House	455 Main Ave. N, Harmony	$2,005,500
The Meadows of Mable	610 E Newburg St., Mabel	$585,600
Ostrander Assisted Living	309 Minnesota St., Ostrander	$350,000
Park Lane Estates	111 Fillmore Place SE, Preston	$621,100
Traditions of Preston	515 Washington St., Preston	$2,630,210
Bremmer Suites	803 Home St., Rushford	$79,700
Spring Valley Estates	815 Memorial Dr., Spring Valley	$193,400

5.1.3 Replacement Costs

Data from the Fillmore County Assessor's Office indicates that there are 19,577 property parcels (not including personal property parcels) in the county. Of this total, 11,022 parcels are improved. The estimated market value of all land, improved and unimproved, is slightly greater than $4.1 billion. A breakdown of the property parcels and their estimated market values is provided in Figure 5-20.

Figure 5-20: Parcel Data[36]

Total Parcels	19,577
Parcels with Improvements	11,022
Parcels with Mobile Homes	106
Parcels without Improvements	8,449
Total EMV of Parcels	$4,112,604,100
EMV* of Land Only	$3,166,983,600
EMV of Buildings Only	$945,620,500

**Estimated Market Value*

5.1.4 Future Assets & Infrastructure

Fillmore County and the participating cities will continue to utilize their respective governing policy and planning documents in order to mitigate the impact of hazards on future assets and infrastructure. State governing agencies, such as the Minnesota Department of Health, Minnesota Department of Transportation, and the Minnesota Department of Natural Resources will be contacted when appropriate.

As part of the development review process, future assets and infrastructure will be evaluated for the hazards identified in this plan in the context of the hazard's geographic location. Hazards which have no specific geographic location, as identified in the hazard profile sections of this document, will not be considered. All future assets and infrastructure will be evaluated for flooding concerns as appropriate on a case-by-case basis.

5.1.5 Land Uses & Development Trends

The geographic location of hazards, as identified in the hazard profile sections, will be considered for future land use and development trends. Content from the Fillmore County All-Hazard Mitigation Plan will be incorporated into local governing policy and planning documents as appropriate. If the local governing policy and planning documents incorporate content from this plan, the impact of hazards on land use and development should be mitigated.

Section 6: Hazard Profiles & Vulnerability

6.1 IDENTIFYING HAZARDS

6.1.1 Hazard Identification

Hazard identification is a critical component of the mitigation planning process. The 2008 Hazard Mitigation Plan identified eleven hazards. In the 2017 update, the original hazards were reconsidered and reorganized into twelve categories. The changes are depicted left-to-right in Figure 5-1. The reorganization of the hazards for the update took into consideration several documents including: FEMA's Multi-Hazard Identification and Risk Assessment (MHIRA), Minnesota State 2008 All-Hazard Mitigation Plan, Minnesota State 2011 All-Hazard Mitigation Plan Update, Minnesota State 2014 All-Hazard Mitigation Plan Update, and HSEM's River County Template. Other county hazard mitigation plans were also reviewed.

Figure 6-1: Hazards 2008 Plan vs. 2017 Update

Hazards in 2008 Plan	Hazards in 2017 Update
Winter Storms	**Severe Storms**
Blizzard	Severe Winter Storms
Snow Storm	Severe Summer Storms
Ice Storm	**Tornadoes**
Extreme Temperatures	**Extreme Temperatures**
Extreme Cold	Extreme Summer Heat
Summer Storms	Extreme Winter Cold
Extreme Heat	Drought
Tornadoes	**Flood**
Thunderstorms	**Landslides**
Windstorms	Karst/Sinkholes and Land Subsidence
Hailstorms	Cave Collapse
Flooding	**Fire**
Dam Failure	Structural Fire
Drought	Wildfire
Infectious Disease	**Human-Related**
Fire	Terrorism
Wildfire	Airplane Related Incidents
Hazardous Materials	**Hazardous Materials**
Wastewater Treatment Failure/Water Supply	Transportation of Hazardous Materials
Contamination	Fixed Facilities Containing Hazardous Materials
Terrorism	**Dam/Levee Failure**
	Essential Services Failure
	Water Supply Contamination
	Power Failure
	Wastewater Treatment Failure
	Animal Disease
	Infectious Disease
	Emerging and Re-Emerging Diseases
	Food and Water Related Diseases
	Vector-Borne Diseases

Changes from the 2008 plan include:

- Addition of severe storms with subsections titled *Severe Storms*, with *Severe Winter Storms* and *Severe Summer Storms* as subcategories
- Addition of *Tornadoes* as a main hazard
- Addition of subsections to *Extreme Temperatures: Extreme Summer Heat*, *Extreme Winter Cold*, and *Drought*
- Addition of *Landslides* as a main hazard with subsections being *Karst/Sinkholes* and *Land Subsidence* and *Cave Collapse*

- Addition of subsections to *Fire*, which includes subsections *Structural Fire* and *Wildfire*
- Addition of *Airplane Related Incidents* under the main hazard *Human-Related*
- Including subsections of *Hazardous Materials* being *Transportation of Hazardous Materials* and *Fixed Facilities Containing Hazardous Materials*
- Changing *Dam/Levee Failure* to be a main hazard
- Creation of an *Essential Services Failure Hazard*, with subsections being: *Water Supply Contamination*, *Power Failure*, and *Wastewater Treatment Failure*
- Addition of *Animal Disease* as a main hazard
- The addition of *Emerging and Re-Emerging Diseases*, *Food and Water Related Diseases*, and *Vector-Borne Diseases* as subsections of *Infectious Disease*

6.1.2 National Climatic Data Center Records

The National Climatic Data Center (NCDC)[24] provided the storm event data used in this update. It should be noted that NCDC records are estimates of damage compiled by the National Weather Service from local, state, and national sources. These estimates are often preliminary in nature. The estimates may not match the final assessment of the damage related to a specific weather event.

Since 1953, the NCDC lists 544 reported weather events having occurred in Fillmore County. The full NCDC listing is included as Appendix 9.8. The profile section includes summaries of the following hazards from the NCDC listing: dense fog, ice storms, blizzards, high wind, thunderstorm wind, strong wind, extreme cold/wind chill, cold/wind chill, heat, excessive heat, hail, lightning, tornadoes, and funnel clouds.

6.1.3 Hazard Sections

The following sections provide insight into hazards which can potentially occur within Fillmore County.

Each hazard profile contains the following sections:

- Definition and Background
- Previous Occurrences
- FEMA Declared Disasters
- Geographic Location
- Hazard Extent
- Vulnerability Analysis

6.2 SEVERE STORMS

6.2.1 Definition & Background

6.2.1.A Severe Winter Storms

Fillmore County experiences a variety of hazards resultant of winter storms. The category of severe winter storms includes: fog, ice storms, blizzards, and wind events.

Fog

Fog can be broadly defined as water droplets or ice crystals suspended in the air in such a way that they form a thick cloud, often reducing visibility to less than a quarter of a mile. The National Weather Service identifies six types of fog, four of which can impact Fillmore County. The types of fog that can impact Fillmore County include: radiation fog, advection fog, freezing fog, and evaporative or mixing fog[37].

Radiation Fog

This type of fog forms at night under clear skies and calm wind conditions. As heat absorbed by the Earth's surface during the day is released it mixes with a layer of cool moist air at the surface causing the humidity to reach 100 percent. Radiation fog can range from a few feet to over 1,000 feet in thickness. It is distinguished from other types of fog because it does not move horizontally across the ground. Radiation fog is often the densest type of fog, and therefore the most hazardous.

Advection Fog

Advection fog forms when a warm moist air mass moves horizontally across a cold surface, such as a lake. It can become extremely thick and dense like radiation fog, but is differentiated from radiation fog by its horizontal movement. Advection fogs typically form over bodies of water such as oceans, seas, or lakes and can form at any time of the day.

Freezing Fog

Freezing fog occurs when the water droplets in an existing fog cloud suddenly become "super cooled" by a freezing cold air mass. The water droplets remain in liquid form suspended in the air until they come into contact with a surface, such as a building, car, or person, at which point they instantly form ice crystals. Anything caught in a freezing fog will be coated with ice crystals.

Evaporative or Mixing Fog

An evaporative fog can occur in two ways. A steam fog occurs when a cold dry air mass descends upon a warmer moister air mass over a body of water the humidity will rise to 100 percent forming a steam-like fog. The other type of evaporative fog is known as a frontal fog. A frontal fog occurs when warm rain droplets fall into a cooler drier layer of air near the ground. As the humidity in the cooler layer of air increases to 100 percent a layer of fog forms.

Ice Storms

The term ice storm is used by the National Weather Service to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. This accumulation of ice makes walking and driving extremely dangerous. In Minnesota, an Ice Storm Warning is issued for ice accumulation of greater than 0.25 inches[38].

Blizzards

The National Weather Service defines a blizzard as a storm which contains large amounts of snow, with winds in excess of 35 miles per hour and visibilities of less than a quarter mile for at least three hours[39]. Heavy snowfall is commonly associated with blizzards. Blizzards, however, can result from blowing snow, or the movement of snow that has already fallen to the ground. The movement of snow (falling or blowing) and the decreased visibility can result in whiteout conditions. Blizzards are most dangerous when the air is dry and the snow is powdery or fluffy.

Another threat associated with blizzards is drifting snow. Snow drifts can seriously impede travel during and after a blizzard. Additionally, it is not uncommon for blizzards to be accompanied by extreme cold. For these reasons travel during a blizzard is extremely dangerous and is not recommended unless absolutely necessary.

Wind Events

A windstorm may be defined as a high wind event with either sustained wind speeds of 40 miles per hour or greater lasting for one hour, or winds of 58 miles per hour or greater for any duration of time[40]. No matter the season, wind events can occur at any time during the year. Damage from wind events can vary depending on the strength of the wind and the time of year (see Figure 6-2).

Windstorms are most commonly associated with the outflow of winds caused by a collision of a cold front into a warm air mass. To differentiate windstorm activity, the phrase straight-line winds is typically employed. Straight-line winds can result from gust front and downdraft activity. A gust front is the leading edge of rain-cooled air that clashes with warmer inflow air and is characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm[41]. A downdraft is a localized column of air that sinks rapidly towards the ground. Strong downdrafts are known as downbursts. A downburst can have wind speeds over 100 miles per hour and can leave a path of destruction hundreds of miles long. Concentrated downbursts, called microbursts, are normally less than 2.5 miles in diameter and last for only a few minutes. However, microbursts are capable of generating devastating winds with speeds up to 168 miles per hour[41].

High winds can exert positive, negative, and internal changes in air pressure. Positive air pressure (pushing walls, doors, and windows inward) and negative air pressure (pulling building components and surfaces outward) can affect the windward side of structures and objects. Changes in internal pressure can result in considerable damage to the leeward side of structures. Furthermore, debris carried by high winds can result in property damage and loss of life.

Figure 6-2: Potential Damage from High Winds[41]

Wind Speed (mph)	Potential Damage
30-44	Trees in motion. Light-weight loose objects (e.g., lawn furniture) tossed or toppled.
45-57	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). Building partially under construction may be damaged. A few loose shingles removed from houses. Carports may be uplifted; minor cosmetic damage to mobile homes and pool lanai cages.
58-74	Large limbs break; shallow rooted trees pushed over. Semi-trucks overturned. More significant damage to old/weak structures. Shingles, awnings removed from houses; damage to chimneys and antennas; mobile homes, carports incur minor structural damage; large billboard signs may be toppled.
75-89	Widespread damage to trees with trees broken/uprooted. Mobile homes may incur more significant structural damage; be pushed off foundations or overturned. Roof may be partially peeled off industrial/commercial/ warehouse buildings. Some minor roof damage to homes. Weak structures (e.g., farm buildings, airplane hangars) may be severely damaged.
90+	Many large trees broken and uprooted. Mobile homes severely damaged; moderate roof damage to homes. Roofs partially peeled off homes and buildings. Moving automobiles pushed off dry roads. Barns, sheds demolished.

Due to the deteriorating condition of many older homes, the prevalence of manufactured and modular homes, and the lack of uniform building codes for wind resistant construction, the amount of property damage and loss of life associated with windstorms is expected to increase over time. Another factor in this trend is the cost of durable construction; while it is technically possible to build a structure capable of withstanding extremely high winds, doing so is not financially possible for the vast majority of Americans. This has led many to urge for the construction of safe rooms in residential and other structures. This approach offers increased protection for a substantially lower cost. Guidelines for wind resistant structures are based on FEMA's Wind Zone rating system.

Fillmore County falls entirely within Wind Zone IV, where winds can reach speeds of 250 miles per hour.

6.2.1.B Severe Summer Storms

Fillmore County experiences a variety of hazards resultant of summer storms. The category of severe summer weather includes: fog, hail, lightning, and wind events.

Fog

Fog results from air being cooled to the point where it can no longer hold all of the water vapor it contains. A lack of wind can exacerbate and prolong fog events. A further description of fog that could affect Fillmore County is located under Extreme Winter Events.

Hail

A hailstorm is an outgrowth of severe thunderstorms and develops within a low-pressure front as warm air rises rapidly in to the upper atmosphere and is subsequently cooled leading to the formation of ice crystals. These are bounced about by high velocity updraft winds and accumulate into frozen droplets, falling as precipitation after developing enough weight[42]. Figure 6-3 depicts the process of hail formation[43]. Although hailstorms typically occur during summer months, they have been known to occur much later or earlier in the year.

Hailstones can vary in size from as small as a pea to larger than softballs. Hail is considered severe when it reaches a one inch diameter[44]. Even small hailstones can severely damage crops. Damage to siding, windows, and cars often occur once stones reach a 1.5 inch diameter. Hailstones larger than three inches will cause roof damage. Hailstones can reach speeds over 100 miles per hour. Figure 6-4 charts hail stone sizes.

Each year hail causes approximately $1 billion in damages in the United States, mostly related to agricultural losses from damaged crops.

Figure 6-3: Hail Formation

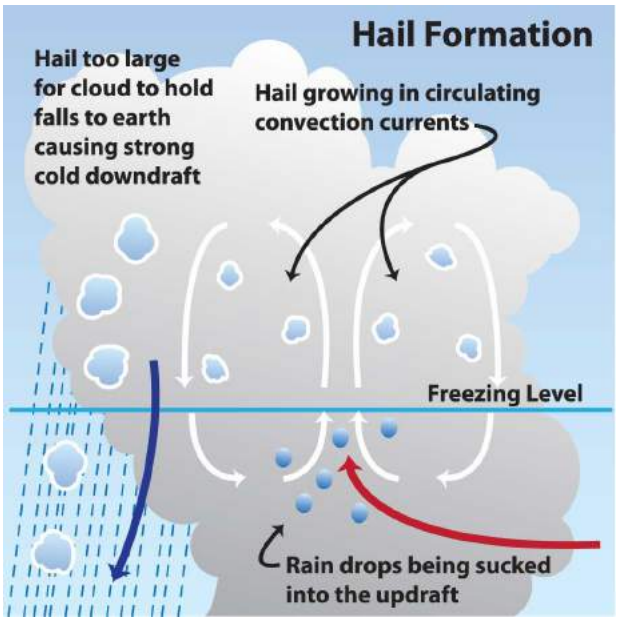


Figure 6-4: Hail Stone Size Chart

Hail Size Diameter	Size Description
0.25"	Pea
0.50""	Mothball
0.75"	Penny
0.875"	Nickel
1.00" (Severe)	Quarter
1.25"	Half-Dollar
1.50"	Walnut / Ping-Pong Ball
1.75"	Golf Ball
2.00"	Hen Egg / Lime
2.50"	Tennis Ball
2.75"	Baseball
3.00"	Teacup / Apple
4.00"	Grapefruit
4.50"	Softball Size
4.75"	CD / DVD

Lightning

Lightning is one of the oldest observed natural phenomena on Earth and is most commonly associated with strong summer thunderstorms[41]. However, lightning can result from snowstorms, hurricanes, forest fires, volcanic eruptions, and surface nuclear detonations. Lightning from thunderstorms occurs when there is a sudden movement of electrons between oppositely charged parts of a cumulonimbus cloud, or between the cloud and the ground. A series of these sudden discharges produces flashes of light, or lightning. Basically, lightning can be thought of as being similar to the electrostatic discharge a person may feel after shuffling across a carpet in socks and then touching something metallic. The National Oceanic and Atmospheric Administration approximates that in the continental United States there are an average of 20 million cloud-to-ground flashes and between 100 and 200 million cloud-to-cloud flashes annually[42].

Lightning is one of the most deadly weather related killers in the United States. Each year it kills an estimated 60 people and injures another 300. The precise number of lightning related injuries and deaths is unknown due to the suspected underreporting of lightning related casualties. The majority of these casualties are the result of inappropriate behavior during thunderstorms and people caught outdoors during recreational or sports activities[41]. Lightning can also cause significant property damage and can result in the ignition of wildfires and structural fires.

Wind Events

Windstorms can be difficult to separate from several other natural hazards. For example, high winds are a common component of hurricanes, thunderstorms, tornadoes, and even wildfires. However, windstorms can also be a significant hazard all by themselves. A windstorm may be defined as a high wind event with either sustained wind speeds of 40 miles per hour or greater lasting for one hour, or winds of 58 miles per hour or greater for any duration of time [40]. It is not unusual for wind speeds during a severe windstorm to exceed those of a hurricane and approach those of a weak to moderate tornado. For more information about wind events, see Severe Winter Storms.

6.2.2 Relationship to other Hazards

6.2.2.A Severe Winter Storms

Heavy precipitation during the winter can contribute to spring flooding and infrastructure failure. Additionally, severe winter weather can cause major disruption to lifeline utilities. For example, ice storms can knock down power lines and blizzards can impede the delivery of home heating fuels. Heavy snow can cause roof collapse. Extreme cold can hinder response and recover efforts following a major hazard event.

6.2.2.B Severe Summer Storms

Most hail damage occurs to vehicles in the form of broken glass and dents. However, hail can also cause tree falls and damage to power lines, resulting in a power failure.

Lightning is the primary cause of wildfire and can also trigger structural fires. Lightning can also contribute to infrastructure failure by damaging utility equipment. Strong winds can cause severe damage to property via fallen trees and power lines. Destruction from tornadoes can trigger secondary hazards such as ruptured gas lines, hazardous materials release, fires, and flooding.

Wind events can have similar effects to hail including damage to trees, crops, and power lines.

6.2.3 Previous Occurrences

6.2.3.A Severe Winter Storms

Fog

The National Climactic Data Center (NCDC) reports one damaging fog event in Fillmore County causing $10,000 in property damages (see Figure 6-5)[45].

Figure 6-5: Previous Dense Fog Event (NCDC)[45]

Date	Property Damage
2/2/2012	**$ 10,000**

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*
***Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

Ice Storms

NCDC reports one damaging ice storm in Fillmore County causing $10,000 in property damage (see Figure 6-6)[45].

Figure 6-6: Previous Ice Storm Event (NCDC)[45]

Date	Property Damage
1/1/2005	$ 10,000

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*

Blizzards

The NCDC reports no damaging blizzards in Fillmore County[45]. All weather events are provided in Appendix 9.8.

Wind Events

NCDC identifies 25 winter (November through June) wind events. This weather activity cost nearly $271,000 and one fatality (see Figure 6-7)[45].

Figure 6-7: Previous Wind Events (NCDC)[45]

Start Date	Deaths	Property Damage	Start Date	Deaths	Property Damage
5/29/2013	**0**	**$8,000**	**5/20/2009**	**0**	**$100**
5/19/2013	**0**	**$8,000**	4/18/2004	0	$1,250
5/24/2012	**0**	**$27,000**	4/17/2004	0	$500
5/3/2012	**0**	**$3,000**	4/7/2001	0	$1,000
4/10/2011	**0**	**$22,000**	11/10/1998	1	$200,000
			TOTAL	1	$270,850

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*
***Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

6.2.3.B Severe Summer Storms

Fog

The National Climactic Data Center (NCDC) reports zero instances of summer fog in Fillmore County[45].

Hail

NCDC records report 40 hail events with damage in Fillmore County, resulting in $192,600 in property damage and $358,500 in crop damage (see Figure 6-8). No injuries or fatalities can be attributed to hail events[45].

Figure 6-8: Previous Hail Events (NCDC)[45]

Date	Property Damage	Crop Damage	Date	Property Damage	Crop Damage
9/4/2012	**$5,000**	**$0**	8/1/2000	$21,500	$35,000
6/8/2008	$800	$3000	6/23/2000	$0	$5,000
6/7/2008	$6,000	$12,500	6/1/2000	$0	$5,000
5/31/2008	$0	$2,500	8/9/1999	$10,000	$12,000
6/7/2007	$0	$2,000	6/8/1999	$20,000	$30,000
8/24/2006	$0	$6,000	6/5/1999	$20,000	$0
5/8/2006	$2,000	$0	7/20/1998	$0	$30,000
9/13/2005	$0	$3,500	6/27/1998	$200	$30,000
8/3/2004	$0	$2,500	6/20/1998	$43,000	$140,000
6/23/2004	$0	$10,000	5/18/1998	$46,000	$0
4/17/2004	$2,000	$0	8/23/1997	$0	$27,000
7/21/2001	$1,100	$2,500	6/19/1997	$8,000	$0
6/1/2001	$2,000	$0	7/30/1994	$500	$0
5/1/2001	$4,500	$0	TOTAL	$192,600	$358,500

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*
***Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

Lightning

There is one NCDC record of a lightning event in the county which caused $18,000 of property damage (see Figure 6-9). No injuries or deaths were recorded for this event[45].

Figure 6-9: Previous Lightning Events (NCDC)[45]

Start Date	Property Damage
06/01/2000	$18,000

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*

Wind Events

NCDC records reports 38 damaging wind events resulting in over $530,000 in property damage and over $340,000 in crop damage (see Figure 6-10). No injuries or fatalities occurred for any of these events[45].

Figure 6-10: Previous Wind Events (NCDC)[45]

Start Date	Property Damage	Crop Damage	Start Date	Property Damage	Crop Damage
9/20/2014	**$2,500**	**$0**	6/23/2004	$250	$0
8/29/2014	**$2,000**	**$0**	6/11/2004	$2,450	$0
7/25/2013	**$0**	**$65,000**	8/25/2003	$0	$2,000
7/18/2012	**$13,000**	**$0**	7/4/2003	$750	$750
9/2/2011	**$2,500**	**$0**	7/30/2002	$2,000	$0
7/1/2011	**$5,000**	**$0**	7/18/2002	$1,000	$2,000
10/26/2010	**$3,000**	**$0**	8/1/2000	$2,500	$0
6/11/2010	**$1,000**	**$0**	7/9/2000	$4,250	$0
7/24/2009	**$500**	**$0**	6/13/2000	$25,000	$0
7/11/2008	$1,000	$0	7/8/1999	$2,000	$0
7/7/2008	$11,000	$0	6/6/1999	$70,000	$70,000
6/6/2008	$3,000	$0	6/27/1998	$82,000	$41,000
9/21/2007	$5,000	$5,000	6/20/1998	$163,000	$67,000
8/11/2007	$1,500	$0	6/18/1998	$17,000	$0
6/7/2007	$7,050	$0	5/30/1998	$75,000	$88,000
8/24/2006	$800	$0	8/3/1997	$10,000	$0
7/14/2006	$750	$0	6/28/1997	$1,000	$0
9/3/2005	$2,000	$0	6/22/1997	$14,000	$0
7/25/2005	$500	$0	10/30/1996	$250	$0
			TOTAL	$534,303	$340,750

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*
***Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

6.2.4 FEMA Declared Disasters

6.2.4.A Severe Winter Storms

There has been one federally declared disaster related to winter storms in Fillmore County (see Figure 6-11)[9].

Figure 6-11: Severe Winter Storms Disaster Declarations (1953-2016)[9]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
DR-929	10/31/91	12/26/91	Ice Storm	Clinton	Public

6.2.4.B Severe Summer Storms

There have been eight federally declared disaster related to summer storms in Fillmore County (see Figure 6-12)[9].

Figure 6-12: Severe Summer Storms Disaster Declarations (1953-2016)[9]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
DR-4290	**9/24/2016**	**11/2/2016**	**Severe Storms, Flooding**	**Obama**	**Public**
DR-4131	**06/20/13**	**07/25/13**	**Severe Storms, Straight-line Winds, and Flooding**	**Obama**	**Public**
DR-1772	06/06/08	06/25/08	Severe Storms and Flooding	Bush	Public
DR-1717	08/18/07	08/23/07	Severe Storms and Flooding	Bush	Both
DR-1333	05/17/00	06/27/00	Severe Storms, Flooding and Tornadoes	Clinton	Both
DR-1225	05/15/98	06/23/98	Severe Storms, Straight-Line Winds and Tornadoes	Clinton	Public
DR-993	05/06/93	06/11/93	Flooding, Severe Storm, Tornadoes	Clinton	Both
DR-560	07/08/78	07/08/78	Severe Storms, Tornadoes, Hail, Flooding	Carter	Both
DR-446	07/13/74	07/13/74	Severe Storms and Flooding	Nixon	Both

**Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

6.2.5 Geographic Location

The entire county is at risk of winter storm and summer events.

6.2.6 Hazard Extent

6.2.6.A Severe Winter Storms

The impact of the damage to local jurisdictions that may be caused by severe winter weather fluctuates depending on the timing, physical location, and magnitude of the event. Heavy snow loads can cause structural damage, particularly in areas where there are no enforced building codes or for residents living in manufactured homes. The frequency of structural fires tends to increase during heavy snow events, primarily due to utility disruptions and the use of alternative heating methods of residents.

6.2.6.B Severe Summer Storms

The impact to any jurisdiction caused by severe summer weather fluctuates depending on the timing, physical location, and magnitude of the event.

6.2.7 Vulnerability Analysis

6.2.7.A Critical Facilities

Severe Winter Storms

The greatest risk to critical facilities from severe winter weather is how the hazard can impact response times and recovery from other hazard events. If a fire, hazardous material release, or

other significant hazard occurred in the midst of a blizzard or ice storm, emergency response time would be greatly increased and the damage from the event would be much higher. Damages from blizzards range from human and livestock deaths to significant snow removal costs. Stranded drivers can make uninformed decisions, such as leaving the car to walk in conditions that put them at risk. Drivers can also be at high risk of collisions due to the blinding potential of heavy snowfall. Additionally, drivers and homeowners without emergency plans and kits are vulnerable to the life-threatening effects of heavy snow storms such as power outages, cold weather, inability to travel, communicate, obtain goods or reach their destinations.

Severe Summer Storms

All critical facilities in Fillmore County are vulnerable to the negative effects of this hazard. Some facilities however, will be more susceptible than others. Buildings without air conditioning will be especially impacted by extreme heat. Taller buildings will be more likely to be damaged by lightning than their shorter neighbors. Finally, buildings with tin roofs or that are pre-fabricated will likely suffer a disproportionate amount of damage from a hail event.

6.3 TORNADOES

6.3.1 Definition & Background

6.3.1.A Tornadoes

A tornado is essentially a rapidly rotating vortex of air that extends ground-ward from a cumulonimbus cloud[46]. Strictly speaking, a tornado is a funnel cloud until it reaches the ground. Once a funnel cloud reaches the ground it becomes a tornado. Minnesota lies within what is referred to as Tornado Alley. Tornado Alley is a tornado prone region that runs north from the Texas panhandle to Nebraska and northeast to southern Minnesota. This area is the site for the meteorological phenomenon known as the dryline, where cold, dry polar air moving south from Canada converges with warm, humid tropical air moving north from the Gulf of Mexico[41]. If the cold front is fast moving and the warm air is unstable, thunderstorms and tornadoes can result.

Although records only date back to 1950 and the methodology for reporting tornadoes has changed numerous times since then; it is estimated that approximately 1,000 tornadoes occur every year in the United States. Between 1950 and 2012 there were an average of averaging 27 tornadoes per year in Minnesota[47]. The average for 1991 to 2010, however, was 45 tornadoes per year in Minnesota[48]. The trend of increased tornado activity also holds true for much of the rest of the United States. Scientists are uncertain whether the actual numbers of tornadoes per year is increasing (perhaps due to climate change), or simply if more tornadoes are being reported each year due to advancements in technology.

In Minnesota, 89 percent of tornadoes occur from May to August and are most probable between 2:00 p.m. and 9:00 p.m.[47]. Tornadoes have historically occurred however as early as March and as late as November. Tornadoes can also occur at any time of day. This relative unpredictability makes tornadoes one of the most dangerous natural hazards in Minnesota.

The severity of damage resulting from a tornado is measured by the Fujita scale, which assigns tornadoes a numerical value based on wind speeds (see Figure 6-13).

Figure 6-13: Fujita Tornado Scale[46]

Fujita Number	Wind Speed	Estimated Width	Estimated Length	Probability 1953-1989 (Avg # per year; % per year)	Description of Potential Damage
F0 Gale	40-72 mph	6-17 yards	0.3-0.9 miles	218; 29%	Light damage: some damage to chimneys, tree branches broken, shallow-rooted trees blown over, signs damaged.
F1 Moderate	73-112 mph	18-55 yards	1-3.1 miles	301; 40%	Moderate damage: roof surfaces peeled off, mobile homes pushed off foundations or overturned, moving automobiles pushed off roads.
F2 Significant	113-157 mph	56-175 yards	3.2-9.9 miles	175; 23%	Considerable damage: roofs torn off of buildings, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted, light-object missiles generated.
F3 Severe	158-206 mph	176-566 yards	10-31 miles	43; 6%	Severe damage: roofs and walls torn from well-constructed homes, trains overturned, most trees uprooted, heavy vehicles lifted off roads and thrown.
F4 Devastating	207-260 mph	0.3-0.9 miles	32-99 miles	10; 1%	Devastating damage: well-constructed houses leveled, structures with weak foundations blown off some distance, cars thrown, large missiles generated.
F5 Incredible	261-318 mph	1-3.1 miles	100-315 miles	1; 0.002%	Incredible damage: strong frame houses lifted off foundations and carried considerable distances to disintegrate, automobile sized missiles fly through air in excess of 100 yards, and trees debarked.

6.3.2 Relationship to other Hazards

Tornadoes can trigger a variety of secondary hazards, including fires, infrastructure failure, flooding, and hazardous material release. Tornadoes can also impede the efficiently of response and recovery efforts by damaging essential facilities and infrastructure networks.

6.3.3 Previous Occurrences

6.3.3.A Tornadoes

NCDC records report 15 tornado related events, with eight resulting in over $7.8 million in property damage. One injury and twenty-two deaths can be attributed to tornadoes in Fillmore County (see Figure 6-14)[45].

Figure 6-14: Previous Tornado Events (NCDC)[45]

Start Date	Injuries	Deaths	Property Damage	Start Date	Injuries	Deaths	Property Damage
5/22/2011	**0**	**0**	**$250,000**	5/15/1968	0	0	$25,000
5/17/1982	0	0	$25,000	4/20/1968	0	0	$25,000
7/14/1977	0	10	$2,500,000	5/5/1965	0	6	$2,500,000
7/23/1973	0	0	$2,500	5/10/1953	1	6	$2,500,000
				Total	1	22	$7,827,000

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*
***Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

6.3.4 FEMA Declared Disasters

There have been four federally declared disasters specific to tornadoes in Fillmore County (see Figure 6-15)[9].

Figure 6-15: Tornado Hazard Disaster Declarations (1953-2016)[9]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance
DR-1333	05/17/00	06/27/00	Severe Storms, Flooding and Tornadoes	Clinton	Both
DR-1225	05/15/98	06/23/98	Severe Storms, Straight-Line Winds and Tornadoes	Clinton	Public
DR-993	05/06/93	06/11/93	Flooding, Severe Storm, Tornadoes	Clinton	Both
DR-560	07/08/78	07/08/78	Severe Storms, Tornadoes, Hail, Flooding	Carter	Both

6.3.5 Geographic Location

The entire county is at the same level of risk from tornadoes and funnel clouds.

6.3.6 Hazard Extent

The impact to any jurisdiction by tornadoes varies according to wind speed and the location/path of the tornado. A community hit directly by a powerful tornado can incur catastrophic destruction and loss of life. Vulnerability to injury from tornadoes decreases with adequate warnings, warning time and sheltering in a reinforced structure.

6.3.7 Vulnerability Analysis

6.3.7.A Critical Facilities

Critical facilities and all other structures are vulnerable to tornadoes. A critical facility may encounter many of the same impacts from tornadoes as any other building within the jurisdiction. These impacts will vary based on the magnitude of the tornado and durability of the structures, but can include structural failure, damaging debris (trees or limbs), roofs blown off or window broken by hail or high winds and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). Damages to structures are equally susceptible by a tornado in any given jurisdiction but vulnerability depends upon construction of the building and force of the tornado. Structures and power lines near mature trees are also vulnerable since limbs and fallen trees may cause damage. High winds may also down power lines and cause extensive outages.

6.4 Extreme Temperatures

6.4.1 Definition & Background

6.4.1.A Extreme Summer Heat

Excessive heat occurs from a combination of significantly above normal temperatures and high humidity[49]. The National Weather Service's Heat Index, shown in Figure 6-16, depicts apparent temperature. In terms of excessive heat, apparent temperature is a measure of how hot it feels when relative humidity is combined with the actual air temperature. For example, an actual temperature of 86°F and a relative humidity of 90 percent results in an apparent temperature of 105°F. The index was devised to reflect temperatures in the shade; in direct sunlight the apparent temperature may be up to 15°F higher. The effects on the human body associated with the different Heat Index categories are shown in Figure 6-17. The three National Weather Service heat alerts are shown in Figure 6-18.

Figure 6-16: National Weather Service Heat Index[50]

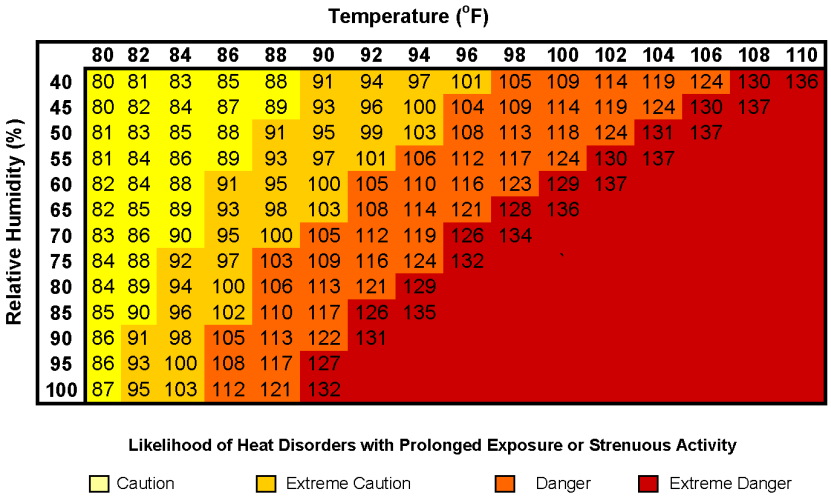


Figure 6-17: Heat Index – Effects on the Human Body[50]

Heat Index of 80° - 90°	Fatigue possible with prolonged exposure and/or physical activity.
Heat Index of 90°- 105°	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
Heat Index of 105°- 130°	Sunstroke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.
Heat Index of >130°	Heatstroke/sunstroke highly likely with continued exposure.

Figure 6-18: National Weather Service Heat Alerts[40]

Heat Advisory	Issued within 12 hours of the onset of the following conditions: heat index of at least 105°F but less than 115°F for less than three hours per day, or nighttime lows above 80°F for two consecutive days.
Excessive Heat Watch	Issued by the National Weather Service when heat indexes are in excess of 105°F during the day combined with nighttime low temperatures of 80°F or higher are forecast to occur for two consecutive days.
Excessive Heat Warning	Issued within 12 hours of the onset of the following criteria: heat index of at least 105°F for more than three hours per day for two consecutive days, or heat index more than 115°F for any period of time.

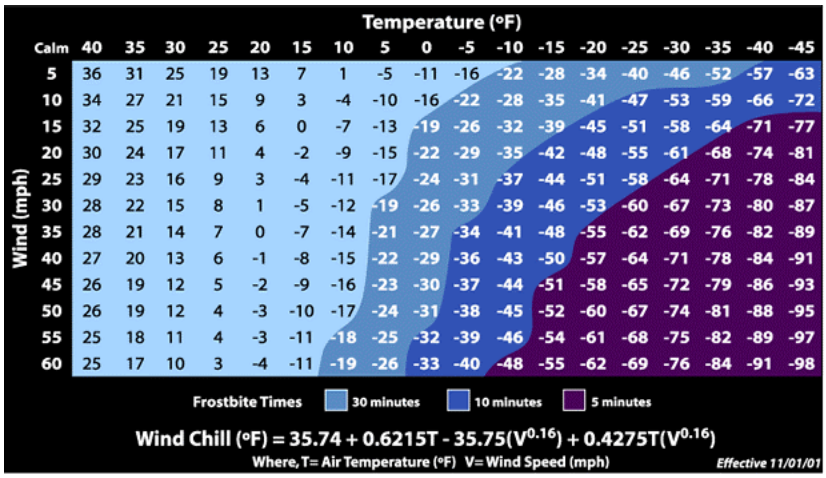
Excessive heat is the number one weather related killer in the United States, resulting in more fatalities each year than floods, lightning, tornadoes, and hurricanes combined[49]. One study found that there were 59 heat attributable deaths in the Minneapolis Metropolitan Statistical Area every year, or 2.32 deaths per 100,000 people[51]. Excessive heat can result in heat cramps, heat exhaustion, and heat stroke (sunstroke). Heat becomes deadly for animals and people when it pushes a body beyond its natural ability to cool itself – typically due to over exposure, or over exercitation. People suffering from heat stroke may have a body temperature of 106°F or higher. Elderly persons, small children, chronic invalids, those on certain medications or drugs (especially tranquilizers and anticholinergics), and persons with weight and alcohol problems are particularly susceptible to excessive heat, especially during heat waves in areas where a moderate climate usually prevails[49].

6.4.1.B Extreme Winter Cold

Extreme cold occurs from a combination of low temperatures and strong winds. The National Weather Service's Wind Chill Index, show in Figure 6-19, depicts apparent temperatures. In terms of extreme cold, apparent temperature is a measure of how cold it feels when wind speed is combined with the actual air temperature. For example, an actual air temperature of 5°F and a wind

speed of 30 miles per hour results in an apparent temperature of -19°F. At this temperature it takes approximately 30 minutes for human skin to freeze. The index assumes there is no impact from the sun (e.g. a clear night sky); in direct sunlight the apparent temperatures may be warmer[52].

Figure 6-19: National Weather Service Wind Chill Chart[52]



The Wind Chill Index has a calm wind threshold of three miles per hour; below three miles per hour conditions are considered to be calm and wind chill is not applicable. In the past, the National Weather Service's Weather Forecasting Offices had no means of issuing an alert for dangerously cold conditions with little or no wind. In 2011, the National Weather Service in Minnesota, North Dakota, and South Dakota initiated an experimental procedure whereby an Extreme Cold Warning may be issued during situations where actual temperatures reach Wind Chill Warning criteria under calm conditions[53]. In Minnesota an Extreme Cold Warning may be issued when actual air temperature reaches -30°F or lower[38].

Two of the greatest threats related to extreme cold are frostbite and hypothermia. Frostbite is damage to tissue as a result of exposure to intense cold. Frostbite typically occurs when the body cools to the point of needing to restrict blood circulation to its core in order to protect its vital organs. This results in less blood flowing to the body's extremities. Prolonged exposure can lead to severe tissue damage. The most frostbite prone areas of the body include toes, fingers, nose, and ears. Hypothermia occurs when the human body temperature drops below 95°F (normal body temperature is 98.6°F). The condition is a result of the body losing heat faster than it can produce it. Warning signs include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. Hypothermia is most likely at very cold temperatures, but it can occur even at cool temperatures (above 40°F) if a person becomes chilled from rain, sweat, or submersion in cold water[54]. Severe hypothermia can result in heart and/or respiratory failure and eventual death. Frostbite and hypothermia are not only dangerous to humans, but also pets and livestock.

6.4.1.C Drought

A drought is a complex natural hazard typically defined as a prolonged period of uncharacteristically dry weather that is severe enough to cause a serious hydrologic imbalance[55]. Droughts can be problematic to define precisely because what constitutes a deficiency in precipitation varies from region to region – drought conditions in Minnesota are very different from drought conditions in Texas. Long term regional norms in precipitation, temperature, soil moisture, stream flow and lake levels, and water consumption are compared to recent measurements in an attempt to identify and predict droughts. Additionally, the onset and termination of drought conditions can be difficult to pinpoint. Weather events like tornadoes and blizzards occur over a period of hours or days. However, a drought can last from several weeks to several decades[56].

The severity of a drought can differ wildly depending on duration, location, and intensity. Regional water supply demands also heavily influence a drought's overall environmental and economic impact. Unfortunately, droughts are often exacerbated by human activities (e.g. the overuse of water resources through agricultural, industrial, and/or residential consumption). Other weather events, such as heat waves or windstorms, can also increase the severity and impact of a drought immensely. The standard classification system for droughts is given in Figure 6-20.

Figure 6-20: Drought Classification Scheme[57]

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

Droughts can have a variety of impacts. Some are felt in a relatively short period of time, while others may take much longer to become noticeable. For example, after a few weeks without rain vegetation may begin to show signs of stress. However, it may take months for a drought's effects on groundwater to become fully evident. Conversely, vegetation may return to health shortly after a substantial rainfall, while it takes much longer for groundwater to be replenished. Short term droughts last less than six months and can have direct impacts on agriculture and other human activities (e.g. recreation and industry). Long term droughts last longer than six months, reflect a serious hydrological imbalance, and can have severe ecological, economic, and social consequences[57].

The economic impacts of droughts can be enormous. Between 1980 and 2015 there were 23 droughts in the United States that caused over $1 billion dollars in damage each[58]. Most of the damage was associated with crop and livestock losses. However, droughts also significantly impact the productivity of certain water dependent industries, such as mining and chemical manufacturing. Other industries are dependent on water to transport goods and materials (e.g. the shipping of commodities via river barges). While crop insurance helps to mitigate the impacts of droughts on the economy, the economic repercussions can last for years.

Droughts can also have considerable social impacts. In the 1930's a series of severe droughts known as the Dust Bowl decimated much of the central Great Plains. The Dust Bowl resulted in the largest migration in United States history[59]. By 1940, approximately 2.5 million refugees (25% of the regional population) had left the plains to seek work elsewhere. Most had either abandoned their farms or were evicted. The social upheaval that resulted from the Dust Bowl is a potent example of how droughts can impact the fabric of American society.

6.4.2 Relationship to other Hazards

6.4.2.A Excessive Summer Temperatures

Excessive heat can weaken immune systems and increase susceptibility to infectious disease, increase the likelihood of wildfire outbreaks, intensify the severity of drought events, and contribute to infrastructure failure. Additionally, extreme heat can hinder response and recovery efforts by causing heat related illnesses among the responders.

6.4.2.B Extreme Cold

Extreme cold temperatures alone are not likely to trigger secondary hazards, they may hinder first responders by rendering equipment such as vehicles and water lines inoperable.

6.4.2.C Drought

Droughts can increase an area's susceptibility to wildfire by increasing the amount of dry vegetative fuel. Vegetation weakened by a lack of sufficient moisture may also be more susceptible to attack by diseases and invasive species. Prolonged drought can result in the loss of vegetation, thereby increasing the risk of erosion during heavy rainfall and flood events.

6.4.3 Previous Occurrences

6.4.3.A Extreme Summer Temperatures

NCDC records show seven instances of extreme temperatures within the county, with one resulting in $44,500 in property damage (see Figure 6-21). No injuries or fatalities are related to extreme heat events in Fillmore County[45].

Figure 6-21: Previous Extreme Heat Events (NCDC)[45]

Start Date	Property Damage
7/17/2011	$44,500

**Only damaging events are listed. All weather event details are provided in Appendix 9.8.*
***Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

6.4.3.B Extreme Winter Cold

The National Climactic Data Center (NCDC) reports fifteen extreme temperature events in Fillmore County since 1951. None of these events resulted in the loss of life or property damage[45].

6.4.4.C Drought

The 2011 Minnesota All-Hazard Mitigation Plan Update and the Minnesota Climatology Working Group identified the following droughts in Figure 6-22 as having impacted the county[42].

Figure 6-22: Droughts Impacting Fillmore County[42]

Date	Location	Description
July 2003 – October 2003	Multiple, south central, southeastern and west-central Minnesota	A persistent weather pattern resulted in extremely dry weather across Minnesota. Few widespread rain events moved through the state during the interval, and precipitation totals were less than six inches across much of Minnesota. During this three month period, rainfall totals rank among the lowest on record for many areas of south central and southeastern Minnesota, and a small portion of west central Minnesota.
1987-1989	Statewide	Established new "average low precipitation" and "average high temperature" records. Farmers lost most, if not all, of the year's crop. Drought also affected power production, the forest products industry, public water supplies and fish and wildlife dependent on adequate surface water. Mississippi River flow levels threatened to drop below the Minneapolis Water Works intake pipes.
1976-1977	Statewide	Began in 1974 in parts of south-central and western MN. Most severely affected areas were the Otter Tail and Lac Qui Parle River basins. Dry conditions caused lower water levels in wells and caused record low stream flows throughout the state. Late summer forest fires broke out and conflicts arose between domestic well owners and neighboring high capacity well owners.
1931-1942	Statewide	Intensity and duration differed locally.
1911-1914	Statewide	Intensity and duration differed locally.

6.4.5 FEMA Declared Disasters

There have been no federally declared disasters specific to extreme winter temperatures or extreme summer temperatures. However, one presidentially declared emergency disaster was issued for drought on June 17, 1976 (EM–3013).

6.4.6 Geographic Location

The entire county is at risk from extreme temperatures and drought.

6.4.7 Hazard Extent

The impact to local jurisdictions caused by extreme temperatures and drought fluctuates depending on the timing, physical location, and magnitude of the event. The extent of the damage that may be caused by drought fluctuates depending on the severity and duration of the event. Extreme heat events are connected to a range of illnesses, even death and can exacerbate pre-existing chronic conditions such as cardiovascular, respiratory, liver and neurological diseases, endocrine disorders and renal disease or failure. Populations who are most vulnerable to extreme heat include persons over 65 or under five years old; living alone, without air-conditioning or residing on the topmost floor of a building.

A drought may not have a severe impact on human life due to decreased water access, however, the economic impact on farmers would be significant. A drought would also have a negative impact on the local economy due to stunting growth of agriculture crops and negative impacts on livestock.

6.4.8 Vulnerability Analysis

6.4.8.A Critical Facilities

All critical facilities in the county are vulnerable to the negative effects of extreme summer and winter temperatures and drought. However, some facilities will be more susceptible than others. Buildings without air conditioning will be especially impacted by extreme heat. Extreme cold can hinder response and recover efforts following a major hazard event. Drought itself does not pose a significant risk to critical facilities in the County. However, extreme drought can greatly enhance the risk of wildfires, insect infestation and in severe instances it may cause wells to dry up entirely.

6.5 FLOOD

6.5.1 Definition & Background

In general, flooding occurs when land is temporarily submerged due to an excess accumulation of water. According to the Federal Interagency Floodplain Management Task Force, flooding in the United States can be divided into several categories, including: riverine floods, flash floods, alluvial fan floods, ice-jam floods, dam-break floods, local drainage floods, high groundwater floods, fluctuating lake level floods, coastal floods, debris flows, and subsidence[46]. In Minnesota, the most common types of flooding are riverine, flash, and local drainage[42].

Riverine Flooding

Riverine flooding, also known as overbank or downstream flooding, is the most common type of flood. It occurs when a stream or river overflows its banks and inundates the surrounding floodplain. These floods tend to be large scale events caused by prolonged precipitation over a wide area. Floodwaters typically move and rise slowly, and remain relatively shallow. There is usually time to warn those within the flood path downstream because it takes time for the water in the tributaries to reach a major river. This type of flooding is common in spring and summer and can be compounded by rapid snow melt and/or frozen ground.

Flash Flooding

Flash flooding, also known as upstream flooding, involves a rapid surge of rising floodwaters into a normally dry area. Flash floods can also occur when the water level of a stream or creek rapidly rises above a predetermined water level. These floods tend to be localized events that begin within six hours of the causative event and typically last less than one day; flash floods do not last for two or three consecutive days[60]. The Minnesota Climatology Working Group defines flash flooding as an event in which six inches of rain or more falls within a 24 hour period[61]. Flash floods are typically caused by abnormally heavy rainfall over a small area; however, flash floods can be caused by any sudden release of large amount of water (e.g. ice dams, dam, and levee failures). In a flash flood, the floodwaters move and rise quickly, and can become dangerously deep. Due to the speed of flash flooding, there is often little to no warning time for those within the flood path. Flash floods are most common in spring and summer, but can occur at any time. Like riverine floods, flash floods can also be complicated by frozen ground.

Local Drainage Flooding

Local drainage flooding is similar to flash flooding, but is primarily the result of overwhelmed, or inadequate infrastructure. This type of flooding typically occurs away from delineated floodplains and recognized drainage channels. Rather, they are common in upstream areas that are flat and urbanized. In such areas the ground's natural ability to accommodate excess water is affected by large areas of impervious materials (e.g. parking lots, roads, sidewalks, rooftops). These impervious surfaces inhibit infiltration and increase surface runoff. When these factors are combined with heavy precipitation and inadequate facilities for storm water conveyance, a community's drainage system can become quickly overwhelmed. Excess water then begins to pond in low lying areas. These ponds then grow larger, eventually flooding the surrounding vicinity.

Between 1980 and 2015, there were 22 flood events in the United States that caused over $1 billion in damages[58]. According to the National Climatic Data Center, these events were primarily riverine floods caused by rapid snowmelt and/or heavy precipitation. Although they are relatively shallow and slow moving, riverine floods produce widespread and costly destruction. Just a few inches of floodwaters can damage homes, drown crops, and impact economic activity. On average, riverine flooding causes more than $2 billion in losses each year.

By comparison, flash floods inflict damage on a more localized scale. This tends to limit the total amount of destruction caused by any singular event. Due to the violent nature of flash floods however, the damage to the flooded area is often more severe than what may occur during a riverine flood. In areas with steep hills or deep gullies, flash floods can produce walls of water 10 to 20 feet high or higher. The destructive force of the water can roll boulders, uproot trees, topple buildings, and wash out bridges. Flash floods tend to collect and carry large quantities of debris, which increases the floodwaters' destructive potential.

Flooding is the number two weather related killer in the United States. Flooding kills an average of 71 people per year (yearly average from 2005-2014)[62]. Nearly half of all flood deaths are automobile-related[63]. Due to people mistakenly thinking they can drive their vehicles across a flooded portion of a roadway. The National Weather Service attributes these deaths to people underestimating the force and power of floodwaters; six inches of water can knock a grown person off their feet, two feet of water can wash away most automobiles. To aid in the prevention of flood related deaths, the National Weather Service issues flood watches and warnings (see Figure 6-23).

Figure 6-23: National Weather Service Flood Alerts[64]

Flash Flood/Flood Watch	Flash flooding or flooding is possible within the designated watch area.
Flash Flood/Flood Warning	Flash flooding or flooding has been reported or is imminent.
Urban/Small Stream Advisory	Flooding of small streams, streets, and low-lying areas (such as railroad underpasses and urban storm drains) is occurring.

The Root River Watershed One Watershed, One Plan is a coalition of counties, soil and water conservation districts and the Crooked Creek Watershed District within southeast Minnesota. The coalition developed the "The Root River One Watershed, One Plan." This plan focuses on implementation strategies that are aimed at achieving lasting conservation, while considering the needs, rights, and interests of the local community, residents and stakeholders. Identified in the One Watershed, One Plan are prioritized strategies that align closely with the flood strategies identified during the hazard mitigation planning process. These strategies include:

- Define areas subject to frequent flooding as the minimum riparian area to be managed on all rivers and streams.
- For public waters and public ditches, the minimum area identified as frequently flooded will be targeted for additional best management practices implementation.
- Develop a comprehensive hydrologic and hydraulic model for culvert and bridge design to determine timing and magnitude of peak discharge of existing conditions, the duration of discharge, and base flow conditions.
- Maintain public infrastructure including culverts, bridges, and drainage systems to provide drainage at the anticipated level of service to minimize flood damage to public, private, and agricultural lands both upland and downstream of the managed systems.
- Manage high peak flows from rural and urban sources using designed water retention systems, only if land use changes and best management practices can't adequately address flooding
- problems.

6.5.2 Relationship to other Hazards

Flooding is usually associated with heavy precipitation during summer storms. However, it can also be caused by unusually heavy snowfall during the winter season that then melts when spring arrives. Infrastructure failure can also cause flooding, for example a dam or artificial levee failure. Wildfires can increase the speed of flooding by removing ground vegetation that would otherwise have slowed the flow of floodwaters. The danger from flooding can be compounded when floodwaters breach facilities that contain hazardous materials. Once contaminated, the floodwaters can spread the hazardous materials over large areas. Flooding also poses a risk to groundwater by potentially contaminating wells within the flooded area.

6.5.3 Previous Occurrences

Since 1950, NCDC records show 26 damaging flood events within Fillmore County. Over $58.6 million in property damages and $5.2 million in crop damages occurred due to flooding in the county. No injuries or deaths occurred due to these flooding events (see Figure 6-24)[45].

Figure 6-24: Previous Flooding Events (NCDC)[45]

Start Date	Property Damage	Crop Damage	Start Date	Property Damage	Crop Damage
6/27/2014	**$1,000**	**$0**	6/16/2004	$7,000	$10,000
6/23/2013	**$3,500,000**	**$0**	6/8/2004	$7, 000	$15,000
5/19/2013	**$20,000**	**$0**	4/11/2001	$1,000	$0
9/23/2010	**$45,000**	**$0**	4/7/2001	$35,000	$0
6/8/2008	$2,850,000	$2,600,000	4/6/2001	$30,000	$0
6/7/2008	$750,000	$500,000	7/10/2000	$225,000	$150,000
8/21/2007	$6,000	$0	7/9/2000	$35,000	$25, 000
8/19/2007	$11,000,000	$750, 000	6/13/2000	$35,000	$20,000
8/18/2007	$38,000,000	$390,000	6/1/2000	$1,820,000	$535,000
8/14/2007	$2,000	$0	7/20/1999	$85,000	$40,000
5/8/2006	$1,500	$0	8/9/1998	$25,000	$50,000
7/25/2005	$2,500	$6,000	6/27/1998	$1,600	$2, 800
9/15/2004	$105,000	$18,500	6/20/1998	$25,000	$35,000
			TOTAL	$58,615,000	$5,247,000

**Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

History Riverine flooding has occurred 14 times since 2000 along the stream corridors throughout the County. Since 1989, Fillmore County has been included in 4 Federal Disaster declarations. With human development in the county and its extended watersheds, especially agricultural encroachment and wetland draining, the frequency and magnitude of flooding may increase. From 1994 to 2006, Fillmore County has had $2,835,757 in insurance claims from water related agricultural losses according to the Minnesota All-Hazard Mitigation Plan.

The following excerpt is from NOAA:

On August 18, 2007, heavy rain that was centered north of the county caused Rush Creek to flash flood on historic levels. In addition to Rush Creek, every other creek that leads into Rushford had tremendous accumulation that led to flood waters raging into town. The water backed up against the levees normally used to keep flood waters out from the nearby Root River and ended up flooding most of the town, including the entire downtown area. In Rushford specifically, two thirds of the town was under water at some point. About 300 people had to be rescued. 490 of the 766 homes were flooded or had damage (79 were declared structurally unsound). 58 of the 70 businesses in town were damaged impacting nearly 500 of the 600 jobs in town. A total of 4 churches and 40 apartment buildings were also impacted. Damage was widespread across the county, especially the northeast parts. Infrastructure was hit hard with numerous road closures and bridge damage. Numerous mud slides SECTION III HAZARDS All-Hazard Mitigation Plan Fillmore County, MN 72 were reported. At least 704 homes applied for FEMA assistance. A warm front lifting northward into Iowa triggered round after round of thunderstorms with excessive rainfall across southeast Minnesota during the evening and overnight hours of August 18-19. This was after rain had fallen earlier in the day. Total rainfall amounts of 10 to 15 inches were common, which produced widespread and significant flash flooding. Damage attributed to the heavy rainfall and subsequent flooding was estimated to be in the millions of dollars.

6.5.4 FEMA Declared Disasters

There have been ten federally declared disasters related to flooding in Fillmore County (see Figure 6-25)[9]. See Figure 6-26 through 6-29 for tables that include project dollar amounts related to the federal disaster declaration.

Figure 6-25: Flood Hazard Disaster Declarations (1953-2016)[9]

Declaration Number	Date of Incident	Date of Declaration	Description	President	Type of Assistance	Disaster Dollars
DR-4290	**9/24/2016**	**11/2/2016**	**Severe Storms, Flooding**	**Obama**	**Public**	**$1,084,086.64**
DR-4131	6/20/2013	7/25/2013	Severe Storms, Straight-line Winds, and Flooding	Obama	Public	$14,074,707.38
DR-1772	6/6/2008	6/25/2008	Severe Storms and Flooding	Bush	Public	$6,361,368.91
DR-1717	8/18/2007	8/23/2007	Severe Storms and Flooding	Bush	Both	$31,229,991.27
DR-1333	5/17/2000	6/27/2000	Minnesota Severe Storms, Flooding, and Tornadoes	Clinton	Both	$11,738,303.73
DR-993	5/6/1993	6/11/1993	Flooding, Severe Storm, Tornadoes	Clinton	Both	*
DR-560	7/8/1978	7/8/1978	Severe Storms, Tornadoes, Hail, Flooding	Carter	Both	*
DR-446	7/13/1974	7/13/1974	Severe Storms, Flooding	Nixon	Both	*
DR-255	4/18/1969	4/18/1969	Flooding	Nixon	Both	*
DR-188	4/11/1965	4/11/1965	Flooding	Johnson	Both	*

**Unavailable*
***Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

Figure 6-26: FEMA-133-DR-MN Severe Storms and Flooding

County	Damage Category Code	Project Amount	Total Eligible	Total Obligated	Federal Share Eligible	Federal Share Obligated	Grantee Admin	Subgrantee Admin
Fillmore	A - Debris Removal	$28,103	$28,103	$22,071	$21,077	$22,071	$150	$843
Fillmore	B - Protective Measures	$41,141	$41,141	$32,309	$30,855	$32,309	$220	$1,234
Fillmore	C - Roads & Bridges	$1,238,438	$1,238,438	$968,971	$928,829	$968,971	$6,751	$33,391
Fillmore	D - Water Control Facilities	$3,990	$3,990	$3,128	$2,993	$3,128	$16	$120
Fillmore	E - Public Buildings	$30,006	$30,006	$23,522	$22,505	$23,522	$117	$900
Fillmore	F - Public Utilities	$34,219	$34,219	$26,914	$25,664	$26,914	$223	$1,027
Fillmore	G - Recreational or Other	$18,398	$18,398	$14,445	$13,798	$14,445	$95	$552

**Dollar amounts rounded to the nearest dollar.*

Figure 6-27: FEMA-1717-DR-MN Severe Storms and Flooding

County	Damage Category Code	Project Amount	Total Eligible	Total Obligated	Federal Share Eligible	Federal Share Obligated	Grantee Admin	Subgrantee Admin
Fillmore	A - Debris Removal	$1,209,885	$1,209,885	$931,252	$907,413	$931,252	$7,002	$16,837
Fillmore	B - Protective Measures	$1,182,805	$1,182,805	$919,365	$887,104	$919,365	$8,806	$23,455
Fillmore	C - Roads & Bridges	$1,878,653	$1,878,653	$1,464,565	$1,408,990	$1,464,565	$13,472	$42,104
Fillmore	D - Water Control Facilities	$1,785	$1,785	$1,363	$1,339	$1,363	$7	$18
Fillmore	E - Public Buildings	$4,065,879	$4,065,879	$3,129,289	$3,049,409	$3,129,289	$15,589	$64,290
Fillmore	F - Public Utilities	$2,131,592	$2,131,592	$1,637,144	$1,598,694	$1,637,144	$10,143	$28,306
Fillmore	G - Recreational or Other	$202,358	$202,358	$155,161	$151,768	$155,161	$908	$2,485

**Dollar amounts rounded to the nearest dollar.*

Figure 6-28: FEMA-1772-DR-MN Severe Storms and Flooding

County	Damage Category Code	Project Amount	Total Eligible	Total Obligated	Federal Share Eligible	Federal Share Obligated	Grantee Admin	Subgrantee Admin
Fillmore	A - Debris Removal	$49,943	$49,943	$37,458	$37,458	$37,458	$0	$0
Fillmore	B - Protective Measures	$44,770	$44,770	$33,578	$33,578	$33,578	$0	$0
Fillmore	C - Roads & Bridges	$461,960	$461,960	$346,470	$346,470	$346,470	$0	$0
Fillmore	D - Water Control Facilities	$10,819	$10,819	$8,114	$8,114	$8,114	$0	$0
Fillmore	E - Public Buildings	$10,630	$10,630	$7,973	$7,973	$7,973	$0	$0
Fillmore	F - Public Utilities	$273,794	$273,794	$205,346	$205,346	$205,346	$0	$0
Fillmore	G - Recreational or Other	$59,828	$59,828	$44,871	$44,871	$44,871	$0	$0

**Dollar amounts rounded to the nearest dollar.*

Figure 6-29: FEMA-4131-DR-MN Severe Storms and Flooding

County	Damage Category Code	Project Amount	Total Eligible	Total Obligated	Federal Share Eligible	Federal Share Obligated	Grantee Admin	Subgrantee Admin
Fillmore	A - Debris Removal	$39,584	$39,584	$29,688	$29,688	$29,688	$0	$107
Fillmore	B - Protective Measures	$17,649	$17,649	$13,237	$13,237	$13,237	$0	$0
Fillmore	C - Roads & Bridges	$1,937,220	$1,937,220	$1,122,026	$1,122,026	$1,122,026	$0	$22
Fillmore	D - Water Control Facilities	$50,266	$50,266	$37,700	$37,700	$37,700	$0	$0
Fillmore	E - Public Buildings	$28,733	$28,733	$21,550	$21,550	$21,550	$0	$40
Fillmore	F - Public Utilities	$6,325	$6,325	$4,744	$4,744	$4,744	$0	$0
Fillmore	G - Recreational or Other	$79,653	$79,653	$59,740	$59,740	$59,740	$0	$159

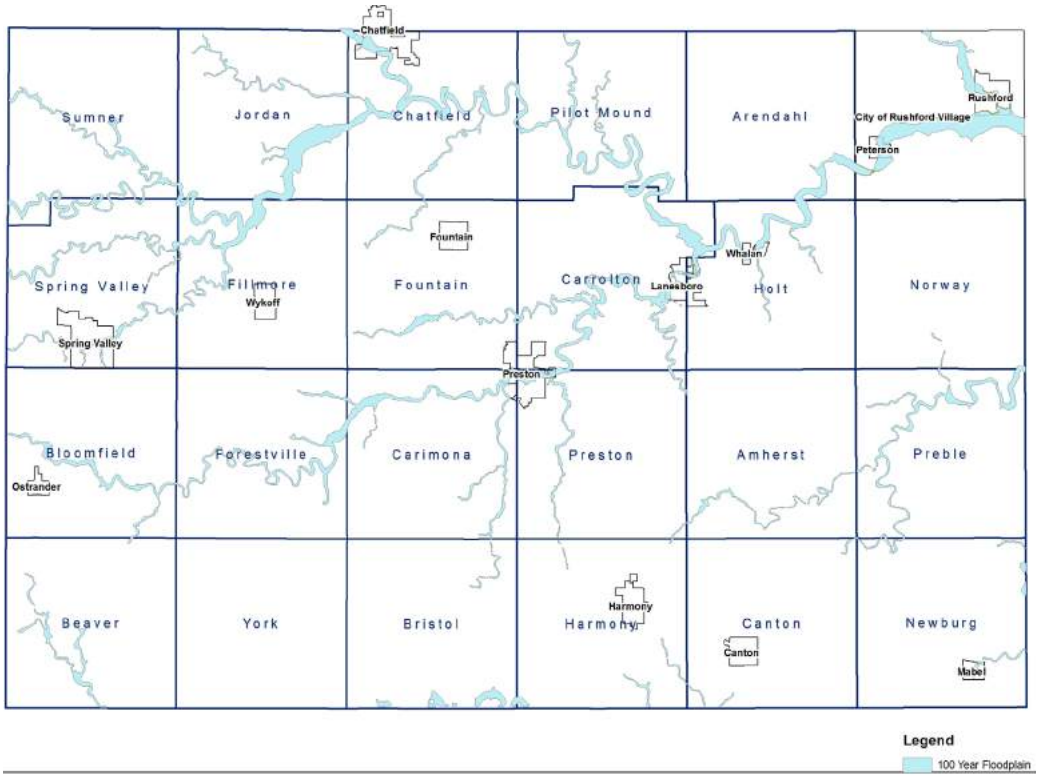
**Dollar amounts rounded to the nearest dollar.*

6.5.5 Geographic Location

The location of flooding activity is dependent on the type of flood. Sudden and extensive rainfall can create standing water in almost any location if drainage is inadequate. Figure 6-26 reveals the 100-year floodplain, which shows the communities in Fillmore County that could be affected by flooding.

See Appendix 9.8 for two depth grid maps for the communities of Peterson and Preston. These particular maps were developed for the 0.2 percent event and the one percent event. These maps were developed from Fillmore County's RiskMAP project.

Figure 6-30: 100-Year Flood Map



6.5.6 Hazard Extent

The extent of flooding impacts on local jurisdictions depend upon climate (e.g. yearly precipitation levels and likelihood of heavy rainfall events), local land use characteristics, and the size and topography of the contributing watershed. The type, magnitude and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment and flow dynamics and conditions in and along the river channel. Upstream floods, called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings and easily move large boulders or other structures. The lag time between precipitation and the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and to some extent, secure some property against damage.

6.5.7 Vulnerability Analysis

6.5.7.A Critical Facilities

Critical facilities in the county are vulnerable to the negative effects of flooding. Some facilities will be more susceptible than others, depending on where they are located and the building structure. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Urban flooding, which involves the overflow of storm drain systems, can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Overlaid on the community depth grid maps in Appendix 9.8 are the various critical facilities or areas within each community that may be impacted if a 0.2% or 500-year annual chance flood event occurred. Each map identifies various types 2of critical facilities within each community and the potential flood depth the facility would receive if a 0.2% or 500-year flood event occurred.

6.6 LANDSLIDES

6.6.1 Definition & Background

Land Subsidence and Sinkholes – Subsidence generally involves a gradual sinking but it also refers to instantaneous collapse. In southeastern Minnesota, erosion has removed most of this glacial cover and exposed the carbonate bedrock. Karst landforms is the primary natural cause of land subsidence. Karst landforms can be hazardous because of the sinkholes that form there and for the pollutants that can infiltrate the water supply.

Landslides - The USGS definition of landslides includes, a wide range of ground movement, such as rock falls, deep failure of slopes and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors:

- erosion by rivers creates over steeped slopes
- rock and soil slopes are weakened through saturation by snowmelt or heavy rains
- excess weight from accumulation of rain or snow, or from man-made structures may stress weak slopes to failure and other structures

Slope materials that become saturated with water may develop a debris flow or mud flow. The resulting slurry of rock and mud may pick up trees, houses and cars thus blocking bridges and tributaries causing flooding along its path. Landslides occur often with or after other major disasters such as extreme storm events, flooding, seismic events, and wildfire. Debris flows also may often be a part of the event that causes landslides.

6.6.1.A Cave Collapse

A cave is a feature generally formed by solution of limestone containing a natural underground room or series of rooms and passages large enough to be entered by people[65]. Cave collapses can occur naturally (e.g. erosion) or due to human interactions (e.g. mining). Fillmore County is home to two commercial caves: Mystery Cave, managed by the Minnesota Department of Natural Resources, and Niagara Cave, privately operated.

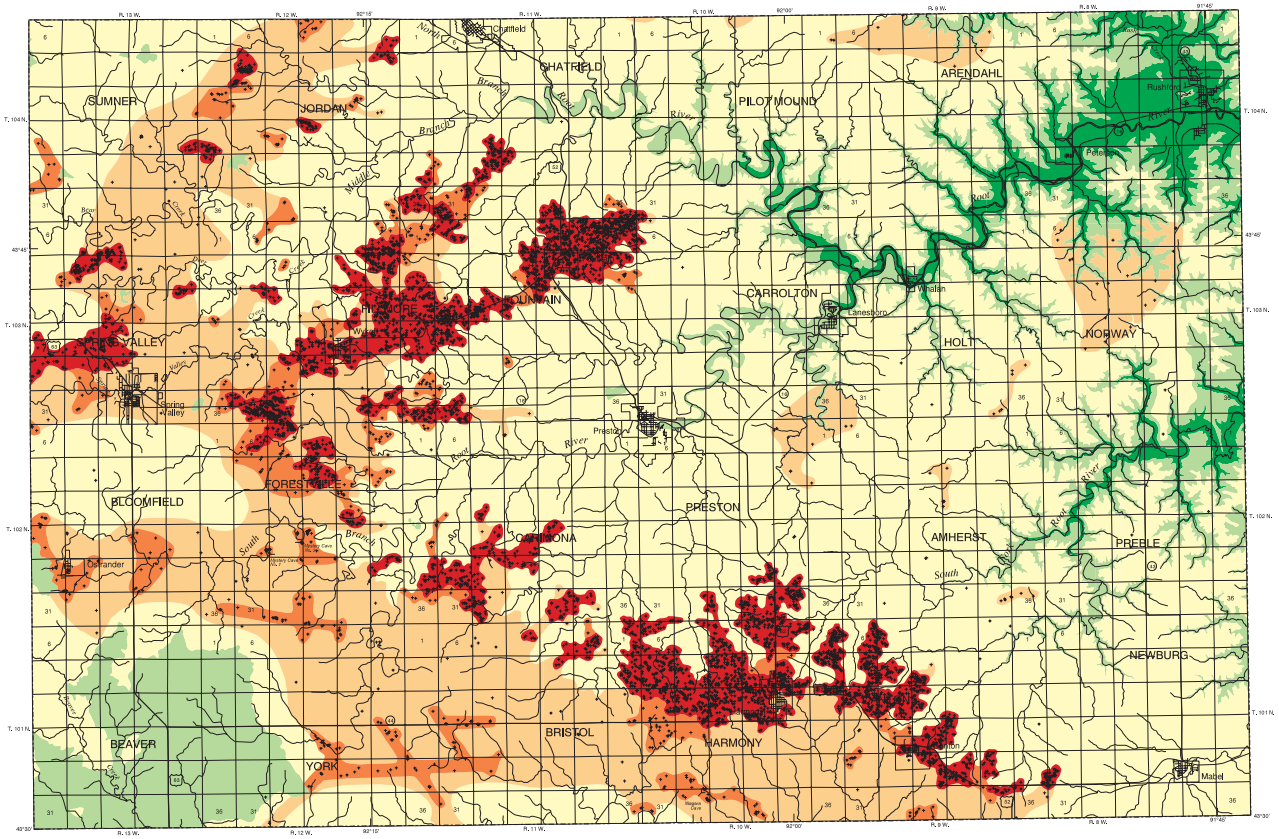
6.6.2 Relationship to other Hazards

Sinkholes, land subsidence, and cave collapses can occur for a number of reasons and could happen in concurrence or following flooding, extreme weather events, drought, or acts of terrorism. Land subsidence can cause many problems including, changes in elevation and slope of streams, canals and drains; damage to bridges, roads, railroads, storm drains, sanitary sewers, canals and levees; damage to private and public buildings; failure of well casings from forces generated by compaction; groundwater contamination due to bypassing of the soil filtration process.

6.6.3 Previous Occurrences

Fillmore County has more caves, sinkholes, and disappearing streams than all other Minnesota counties combined[66]. There have been no significant sinkhole, cave collapse, or subsidence related disaster events on record for Fillmore County. See Figure 6-31 for a sinkhole and sinkhole probability locations. Fillmore County has had occurrences of minor landslides in the recent years. On July 19, 1997 local law enforcement officials and spotters reported mudslides and water covering portions of Highway 14 caused by torrential rains. On June 8, 2004, Law enforcement officials reported water and mudslides over Highway 52 between Fountain and Preston. On August 14, 2007 mudslides were reported along Highway 52. On August 18, 2007, numerous mudslides were reported during the record breaking flood event.

Figure 6-31: Sinkhole and Sinkhole Probability[106]



6.6.4 FEMA Declared Disasters

There have been no federally declared land subsidence, sinkhole or landslide related disasters for Fillmore County.

6.6.5 Geographic Location

Land Subsidence and Sinkholes – The primary natural cause of land subsidence are karst landforms. Karst landforms develop on or in limestone, dolomite or gypsum and are characterized by the presence of features such as sinkholes, underground (or internal) drainage through solution-enlarged fractures and caves. In southeastern Minnesota erosion has removed most of the glacial cover and exposed the carbonate bedrock. In Minnesota, Fillmore County is known for its volume of karst features.

Landslides - Areas that are generally prone to landslide hazards are, on existing old landslides, on or at the base of slopes, in or at the base of minor drainage hollows, at the base or top of an old fill slope, at the base or top of a steep cut slope and developed hillsides where leach field septic systems are used. The county's transportation infrastructure is most at serious risk from landslides. All too frequently following heavy rain events the roads, highways and interstates that transect the county are closed to traffic for clean-up of soil, rock and tree debris from washouts. These on-going clean-up costs that fall to township, county and state budgets are significant.

Cave Collapes - Mystery Cave is located approximately five miles south of Wykoff. Niagara Cave is located five miles southwest of Harmony. Both of which could be susceptible to cave collapse.

6.6.6 Hazard Extent

The hazard extent and impact on local jurisdictions varies depending on the presence of infrastructure and buildings, severity of groundwater flooding, and extent of pollution. See Figures 6-32 and 6-33 for a maps illustrating the extent of karst features in southeastern Minnesota.

Southeastern Minnesota's subsurficial geology make the area's ground water supplies vulnerable to petroleum and other chemicals released from underground storage. Agricultural spills and fertilizers can quickly and unpredictably appear in the source water. As the area's limestone is dissolved by infiltrating rainwater, pathways can form, creating a fast transportation network between pollution sources and fresh water.[107] In 2001, it was cited that some people in Fillmore County had not been able to drink their water in 20 years, due to its vulnerability to pollution in the sinkhole prone area. County residents found high concentrations of nitrates in their water, in addition to E. coli, fecal coliform bacteria, and oil products. One-quarter to one-third of the Fillmore County private wells were found to have nitrates above standard, with another third containing bacteria.[108]

Figure 6-32: Map of Karst Formation

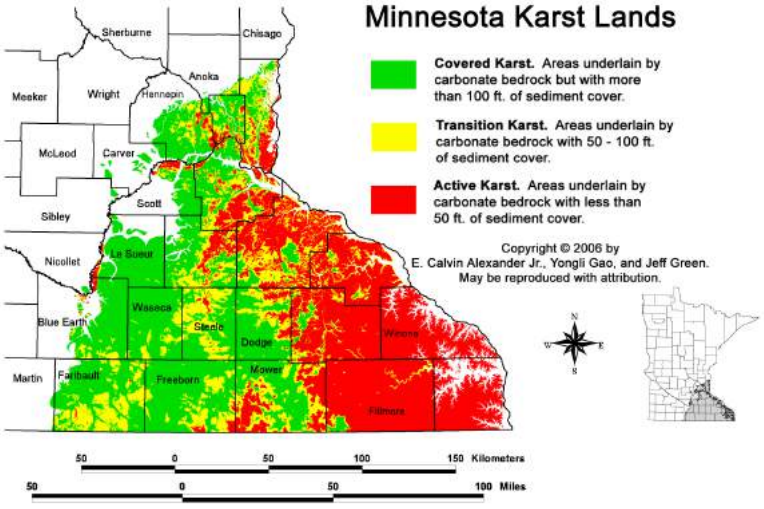
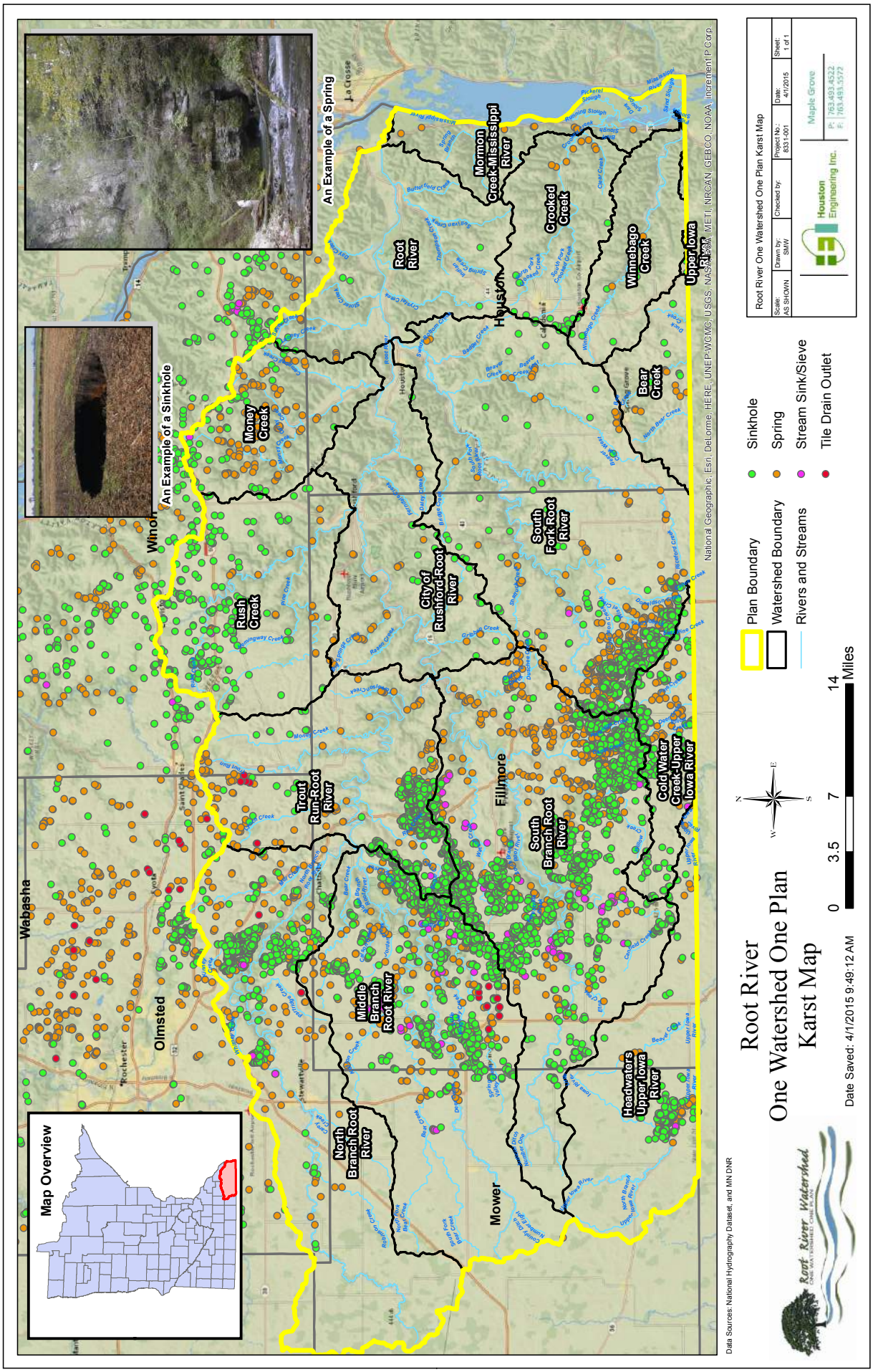


Figure 6-33: Root River One Watershed One Plan Karst Map



6.6.7 Vulnerability Analysis

6.6.7.A. Critical Facilities

Fillmore County is susceptible to sinkholes, land subsidence, and cave collapses. Region Nine Development Commission recommends Fillmore County utilize the FEMA created software Hazards USA Multi-Hazard (Hazus-MH) to conduct a landslides vulnerability analysis. The software is a disaster risk assessment tool, which HSEM has determined is an integral part of Minnesota's risk assessment process. Hazus-MH can help Fillmore County communities estimate losses resulting from hazardous materials disasters.

6.7 FIRE

6.7.1 Definition & Background

The fire hazard includes structure fires and wildfire. In 2014, there were 12,706 reported fires of all kind in Minnesota, or 29 fires for every ten thousand people.

6.7.1.A Structure Fires

A structure fire is a fire that primarily consumes elements of the built environment, such as homes, stores, or warehouses[67]. Structure fires accounted for 43.5 percent (6,332) of total fires in 2014. Residential fires are by far the most common, costly, and deadly type of structural fire. Fires in residential buildings accounted for 77 percent of all structure fires, 54 percent of total dollars lost ($119 million), and all of the fire deaths in structures in 2014[67].

The top three causes of structure fires in Minnesota are cooking (43%), heating (10%), and appliance equipment and electrical malfunction (8%). While careless smoking accounted for only two percent of structure fires, it caused 35 percent of all fire fatalities. Additionally, 27 percent of residential casualties were caused by improperly maintained or missing smoke alarms. Alcohol and/or drug use was an impairing factor in 32 percent of all fire deaths. The most deadly fires occurred between 6:00 p.m. and 6:00 a.m. (representing 70% of fire deaths) and the most deadly time of year was January through March (representing 50% of fire deaths). Residential fires are twice as likely in winter than in summer[46].

6.7.1.B Wildfire

A wildfire primarily consumes elements of the natural environment, such as grasses, shrubs, or trees. In the State Fire Marshal's Fire in Minnesota: 2014 Annual Report, wildfires are combined with dumpster/trash fires into an "other fires" category. These other fires accounted for 30 percent (3,781) of all Minnesota fires in 2014. Wildfires can occur almost anywhere in the state and during any month of the year. In Minnesota, the majority of wildfires occur during spring while vegetation is still dormant[42].

The causes of wildfires are numerous. Many wildfires occur naturally as part of an ecological cycle which provides ecosystems with a means of reducing dead vegetation, stimulating new growth, and improving habitat for wildlife[68]. However, 85 percent of all wildfires in Minnesota occur as a result of human activity. The largest causes are the burning of debris (38%) and arson (28%)[42]. Only two percent of wildfires in Minnesota are the result of lightning strikes (the primary natural cause of wildfires)[42]. Nationally, 16 percent of wildfires are caused by lightning[42].

The magnitude and behavior of wildfires are highly variable and are determined according to three main factors, the first of which is fuel. For example, wildfires in Minnesota tend to be more prevalent in the northern portion of the state than in the southern portion (both in number and destructive potential) because the dense forest vegetation in northern Minnesota provides abundant fuel for large wildfires. In southern Minnesota, the landscape is dominated by grassland and industrial

cropland. Such vegetation ignites more easily and burns more quickly than dense forest, but releases comparatively little energy. As a result, wildfires that consume grasses and crops typically pose less risk to life and property than large forest fires because they are more easily controlled. The moisture content of the fuel is also of great influence (low fuel moisture corresponds to an increased risk from fire).

Topography is the second determining factor, in which slope, aspect, and terrain all play an important role[69]. The steepness of the slope affects both the rate and direction that a fire will spread. Fires tend to move faster uphill than downhill and the steeper the slope, the faster the fire will move. Aspect refers to the direction in which the slope is oriented and can influence a wildfire in several ways. For example, south-facing slopes will normally have higher temperatures, stronger winds, a lower humidity, and lower fuel moistures – all of which increase wildfire risk. Lastly, features in the terrain impact wildfires by influencing the speed and direction of the wind. For instance, gulches effectively funnel air thereby increasing both wind speed and the rate of fire spread. Conversely, irregularities in the terrain, such as large boulders, create friction thereby producing the opposite effect.

The third and final determining factor is weather, which includes wind, temperature, and humidity[69]. The role wind plays in wildfires cannot be understated: the stronger the wind, the faster the spread of the fire. Wind essentially feeds the fire by supplying additional oxygen without which the fires could not easily spread. Wind also flattens the flames, pre-heating the fuel ahead and causing spot fires by blowing sparks and embers ahead of the main fire. In addition to wind, high temperatures help to preheat wildfire fuel as well. The temperature of the air also impacts the movement of air currents and the amount of humidity in the air. Warm air absorbs moisture and produces a lower humidity. This decreases the moisture content of fuel and increases the risk from wildfires. Precipitation too plays an important role in wildfires; drought seriously increases the possibility of wildfire.

Wildfires are normally thought of occurring in rural settings; however wildfire has the potential to impact suburban and even urban areas. The potential for property damage from wildfire has increased significantly in the last half century as exurban development has become more common. Wildfires also have the potential to severely impact regional economies, such as tourism, logging, and agriculture.

6.7.2 Relationship to other Hazards

In many situations, fires can occur as the result of other hazards, such as tornadoes, floods, or windstorms. For example, a tornado may ignite fires by rupturing natural gas distribution systems or downing power lines. Lightning is by far the most common natural cause of both structural fires and wildfires.

Fires can also contribute to the probability of another hazard occurring. For example, wildfires can strip away vegetation from hillsides, increasing the risk of severe soil erosion, landslides, and flooding. Areas recently cleared by wildfire may also be at increased risk of invasive species. Many industries utilize hazardous materials that are also flammable. Industrial structural fires therefore must be handled with great caution to avoid the compound threat of fire with the potential for hazardous material release.

In other situations, various hazards can significantly impair a fire department's ability to fight fires. For instance, a flood may restrict the movement of emergency vehicles by damaging roads and leaving debris on streets, or it may inundate an emergency facility and impair departmental operations.

6.7.3 Previous Occurrences

According to the State Fire Marshal, between 1998 and 2014 local fire departments responded to 1,461 fires in Fillmore County[70]. This number includes structural, vehicle, and wildfires. These fires resulted in over $17.5 million in damaged property and five deaths. The 17 year average calculates to approximately 86 fire runs and over $1 million in damages. Figure 6-34 depicts data on fires for the county; Figure 6-35 depicts city fire data.

Figure 6-34: County Fire Data[70]

YEAR	FILLMORE COUNTY					
	Total Fire Runs	Total Other Runs	Total Co. Dollar Loss	Fire Rate	Average Dollar Loss per Fire	Fire Deaths
2015	75	139	$1,487,015	297	$37,969	0
2014	53	119	$922,900	395	$17,901	0
2013	53	137	$854,785	444	$17,808	0
2012	90	148	$978,850	257	$11,793	0
2011	64	138	$1,035,100	368	$17,847	0
2010	88	134	$437,000	296	$6,069	0
2009	108	137	$408,200	240	$4,587	0
2008	74	154	$1,260,050	328	$19,385	1
2007	80	131	$866,400	300	$12,203	1
2006	70	129	$994,250	333	$15,535	0
2005	68	152	1,326,650	355	$22,111	0
2004	108	151	$1,784,500	229	$19,188	1
2003	130	141	$1,507,300	177	$12,666	0
2002	87	137	$1,203,350	278	$15,834	0
2001	82	148	$376,550	282	$5,021	0
2000	109	121	$1,169,650	212	$11,965	0
1999	117	114	$678,425	204	$6,651	2
1998	80	133	$2,046,050	285	$28,028	0
TOTAL	1,536	2,463	$19,337,025	5,280	$282,561	5
AVERAGE	85	137	$1,074,279	293	$15,698	0

Figure 6-35: City Fire Data[70]

YEAR	Total Fire Runs	Total Other Runs	Total Co. Dollar Loss	Total Fire Runs	Total Other Runs	Total Co. Dollar Loss
	Canton			Chatfield		
2015	5	3	$1,091,000	14	29	$63,100
2014	5	2	$0	6	26	$475,000
2013	3	7	$0	11	33	$70,010
2012	7	3	$0	13	43	$40,500
2011	6	2	$0	8	38	$298,000
2010	9	3	$0	14	40	$2,500
2009	7	1	$0	14	32	$55,000
2008	5	1	$0	8	26	$70,000
2007	1	0	$0	11	32	$0
2006	4	0	$35,600	12	36	$191,000
2005	7	1	$21,500	12	40	$198,250
2004	6	5	$24,000	24	40	$308,700
2003	3	0	$2,500	27	38	$498,750
2002	3	1	$0	17	39	$37,750
2001	2	3	$0	13	36	$50,100
2000	*	*	*	15	18	$125,200
1999	*	*	*	27	26	$439,625
1998	*	*	*	16	33	$21,850
TOTAL	73	32	$1,171,600	262	605	$2,945,335
AVERAGE	4	2	$65,089	15	34	$163,630
	Fountain			Harmony		
2015	*	*	*	6	6	$20,500
2014	1	5	$0	15	9	$178,500
2013	0	0	$0	5	8	$202,000
2012	6	5	$0	13	12	$19,500
2011	1	1	$0	9	11	$311,500
2010	2	3	$0	8	12	$25,500
2009	2	6	$0	16	14	$98,500
2008	3	7	$0	12	12	$160,000
2007	4	4	$0	13	6	$80,000
2006	1	2	$0	10	4	$116,000
2005	5	6	$0	10	7	$0
2004	8	8	$0	12	7	$0
2003	5	5	$0	11	9	$60,000
2002	7	3	$188,000	17	10	$91,500
2001	3	6	$0	18	13	$46,000
2000	6	8	$0	18	9	$453,750
1999	5	8	$0	11	8	$66,000
1998	3	7	$0	9	11	$73,000
TOTAL	62	84	$188,000	213	168	$2,002,250
AVERAGE	3	5	$10,444	12	9	$111,236

**Data not reported to State Fire Marshal*

Figure 6-35: City Fire Data[70] *(con't)*

YEAR	Total Fire Runs	Total Other Runs	Total Co. Dollar Loss	Total Fire Runs	Total Other Runs	Total Co. Dollar Loss
	Lanesboro			Mabel		
2015	0	2	$0	11	5	$144,000
2014	0	4	$0	6	5	$7,250
2013	3	5	$51,500	3	7	$51,125
2012	11	11	$20,500	4	10	$0
2011	2	6	$0	5	6	$800
2010	1	9	$0	9	6	$110,000
2009	9	7	$155,700	12	3	$13,500
2008	2	15	$150,000	7	0	$385,000
2007	6	10	$0	6	0	$217,000
2006	10	10	$78,000	3	2	$50,150
2005	7	12	$84,000	0	15	$0
2004	7	12	$299,500	7	0	$925,000
2003	10	8	$13,000	12	3	$81,900
2002	6	12	$484,300	3	0	$100,000
2001	4	12	$50,500	7	0	$4,000
2000	7	12	$4,900	9	3	$168,000
1999	16	12	$81,000	11	3	$13,100
1998	10	17	$895,350	7	3	$15,000
TOTAL	111	176	$2,368,250	122	71	$2,285,825
AVERAGE	6	10	$131,569	7	4	$126,990
	Ostrander			Preston		
2015	0	4	$0	10	13	$0
2014	0	9	$0	5	7	$0
2013	2	8	$90,000	5	4	$0
2012	2	2	$0	4	6	$300,000
2011	2	1	$0	8	10	$0
2010	*	*	*	10	6	$0
2009	*	*	*	13	8	$21,500
2008	1	0	$150,000	9	20	$147,000
2007	6	1	$125,000	10	9	$197,000
2006	2	2	$33,000	5	11	$20,000
2005	1	1	$0	10	16	$810,000
2004	4	4	$18,000	13	14	$16,000
2003	6	0	$178,300	12	12	$115,050
2002	6	3	$75,100	6	8	$32,000
2001	6	3	$1,350	9	10	$30,100
2000	3	1	$0	12	3	$68,500
1999	4	1	$8,500	*	*	*
1998	5	0	$1,700	*	*	*
TOTAL	50	36	$680,950	141	157	$1,757,150
AVERAGE	3	2	$37,831	8	9	$97,619

**Data not reported to State Fire Marshal*

Figure 6-35: City Fire Data[70] *(con't)*

YEAR	Total Fire Runs	Total Other Runs	Total Co. Dollar Loss	Total Fire Runs	Total Other Runs	Total Co. Dollar Loss
	Rushford			Spring Valley		
2015	13	29	$1,140,100	9	44	$47,500
2014	9	16	$174,350	8	30	$17,000
2013	9	31	$91,300	8	33	$107,850
2012	21	274	$0	11	20	$303,700
2011	5	27	$5,000	17	30	$419,800
2010	10	29	$98,000	18	23	$201,000
2009	11	33	$0	16	30	$64,000
2008	15	37	$50,000	9	31	$148,050
2007	10	38	$124,000	12	31	$123,400
2006	14	29	$434,000	9	33	$36,500
2005	11	36	$164,400	3	32	$46,000
2004	7	42	$0	20	19	$193,300
2003	22	35	$272,300	22	31	$285,500
2002	14	26	$236,200	8	35	$146,500
2001	3	27	$0	16	38	$194,500
2000	20	226	$0	17	37	$226,000
1999	13	25	$45,300	16	31	$24,900
1998	18	32	$915,150	11	28	$124,000
TOTAL	225	992	$3,750,100	230	556	$2,709,500
AVERAGE	13	55	$208,339	13	31	$150,528

	Wykoff		
2015	7	4	$151,600
2014	3	6	$70,800
2013	4	5	$191,000
2012	9	5	$160,000
2011	1	6	$0
2010	7	3	$0
2009	8	3	$0
2008	3	5	$0
2007	1	0	$0
2006	*	*	*
2005	*	*	*
2004	*	*	*
2003	*	*	*
2002	*	*	*
2001	1	0	$0
2000	11	0	$2,000
1999	14	0	$0
1998	1	2	$0
TOTAL	70	37	$504,600
AVERAGE	4	2	$28,033

**Data not reported to State Fire Marshal*

6.7.4 FEMA Declared Disasters

There have been no federally declared disasters specific to fire in Fillmore County[9].

6.7.5 Geographic Location

While all of Fillmore County is at risk from fire, the level of risk varies by type of fire and the location of the fire. The risk from structural fire is greater in the urban portions of the county, while the risk from wildfire is greater in the rural and natural areas. For example, farm fields and ditches are particularly susceptible to wildfires. The risk from vehicle fires is greatest in the urban areas and along major transportation routes.

The risk from fires is also influenced by location within the county and the proximity to available emergency responders and adequate water for fire suppression. In this sense, rural areas are at a disadvantage in that it will take firefighters longer to reach the fire and upon arrival they may have to rely on water from tanker trucks to suppress the fire. In this regard, rural areas may have a slightly higher level of risk.

6.7.6 Hazard Extent

The extent of the impacts to local jurisdictions that may be caused by fires depends on the type of fire. The damage that may result from structural fires depends on the design, use, and location of the structure, as well as the behavior of those people who may be living or working in the structure. Similarly, the potential for damage from wildfires depends on fuel availability, weather, and terrain. The relative lack of sufficient fuel for large wildfires limits the scope of the damage that is possible. The damage that may result from vehicle fires depends on the location of the fire and the type of vehicle. For example, the extent of damage from a motorcycle fire would be significantly less than that of a semi-trailer or large passenger bus.

6.7.7 Vulnerability Analysis

6.7.7.A Critical Facilities

Wildfire

Low risk areas include urbanized areas and open water. Medium risk areas include crop lands and wetlands. High risk areas include shrub lands and forested areas. Debris burns, arson or 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 national and state forest lands. The dangers from wildfire include the destruction of timber, property, wildlife and injury or loss of life to people living in the affected area or using the area for recreational facilities. Weather also affects the probability of wildfire and has a significant effect on its behavior. Temperature, humidity and wind affect the severity and duration of wildfires.

Structural Fire

Very low potential areas include croplands, wetlands, shrub lands, forested areas, and open water where structures are not typically found. Low potential areas include low density urban areas where up to 25 percent of the surface area is impervious. Medium potential areas include more densely settled urban areas where up to 50 percent of the surface area is impervious. High potential areas include very densely settled land that is covered up to 100 percent by impervious surfaces. NLCD data does not distinguish between types of structures present. Impervious structures include buildings, bridges, roadways, parking lots, and all other man-made objects. The extent of damage is determined by the type and quantity of device/accelerant and materials present at or near the target. The effects of structural fires are generally static other than cascading consequences, incremental structural failure, etc. Mitigation factors includes built-in fire detection and protection systems and fire-resistive construction techniques. Non-compliance with fire and building codes as well as failure to maintain existing fire protection systems can substantially increase the effectiveness of a fire weapon.

6.8 HUMAN-RELATED HAZARDS

6.8.1 Definition & Background

6.8.1.A Terrorism

Terrorism is the unlawful use of force or violence against people or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives[71]. Most terrorism events are at a national or international level. Initially, domestic or local events will be perceived as a criminal act and not immediately recognized as terrorism[71]. Hazards can result from the use of arson, armed attacks, and weapons of mass destruction, which include: biological, chemical, nuclear and radiological weapons.

Terrorism often involves areas where high numbers of civilians congregate, such as airports, train stations, hotels, shopping malls, schools, and government buildings. Terrorism can also include the deliberate sabotage of transportation systems, power plants, or industrial equipment.

6.8.1.B Airplane Related Incidents

An aviation accident is defined by the Convention on International Civil Aviation Annex 13 as an occurrence associated with the operation of an aircraft, which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, where a person is fatally or seriously injured, the aircraft sustains damage or structural failure or the aircraft is missing or is completely inaccessible[72].

An airplane crash may result from a mechanical failure, pilot error, terrorism, or deliberate sabotage and can occur at any location. Airplane crashes are most likely to occur during takeoffs and landings, especially at major airports with high traffic volume. Most airplane crashes involve a small aircraft capable of carrying only a few passengers. Statistics in 2015 show that only one in 4.5 million flights result in a crash[77].

The United States Department of Transportation, which investigates transportation-related incidents within the United States, reported that in 2013 a total of 429 people were killed in airplane crashes. Of those deaths, 387 were during general aviation (small aircraft), six deaths during taxiing, six deaths during commuter carrier, and nine deaths during United States air carrier[74].

Nonfatal airplane crashes are much more common than those involving fatalities, often involving smaller aircrafts, and occurring during takeoff and landing. The NTSB reports that between January 1st, 1966 and June 25th, 2013 there were a total of 2,969 aircraft accidents or incidents within Minnesota involving 353 fatalities, 206 serious injuries, and 321 minor injuries. Of those accidents, 46 involved registered passenger and freight air carriers resulting in 36 deaths, four serious injuries, and ten minor injuries[75].

Rochester International Airport

The Rochester International Airport (RST) is approximately twenty miles away from the nearest community in Fillmore County (Chatfield). RST is served by two air carriers who collectively offer eight flights each day to Atlanta, Chicago, and Minneapolis[76]. RST accommodates 240,000 passengers each year, providing air service to Southeast Minnesota and border regions of Iowa and Wisconsin[76].

Rochester is home to the Destination Medical Center – Mayo Clinic, the premier medical institution in the world[80]. Mayo Clinic employs 33,400 people in Rochester and draws thousands of people from the United States and around the world each year to Southeast Minnesota[77]. Therefore, increasing the usage of the RST.

6.8.2 Relationship to Other Hazards

Human-related hazards, such as airplane crashes, can be caused by other natural hazards such as winter or summer storms. Human-related hazards may trigger secondary hazards such as a HAZMAT release, flood, or infectious disease. A terrorist act may cause hazardous materials to be released into the environment. An airplane crash or terrorist act could damage critical infrastructure such as a dam, levee, or other flood protection system resulting in a flood. A terrorist act involving biological weapons could cause an infectious disease outbreak. The impact of human-related hazards may be magnified and response-time reduced by other hazards, especially those that are weather-related.

6.8.3 Previous Occurrences

There have been no previous incidents of terrorism or airplane crashes in Fillmore County.

6.8.4 FEMA Declared Disasters

There have been no federally declared disasters specific to human-related hazards[9].

6.8.5 Geographic Location

The entire county is at risk for terrorism and airplane crashes.

6.8.6 Hazard Extent

The extent of the hazard posed by terrorism can vary drastically based off the type of terrorist act. A hostage situation could involve a school or business, whereas a nuclear blast could destroy the entire county. Cascading affects and risk of an intentional human-caused disaster are highly dependent on the specific mode of attack used and asset targeted.

6.8.7 Vulnerability Analysis

6.8.7.A Critical Facilities

As discussed, the risk of terrorism to critical facilities is related to how it can impact response times and recovery from other hazard events. Given the nature of the hazard it does not pose a significant risk on its own. Fire and secondary explosions are possible with explosive attacks and fires from arson attacks, which can extend beyond the intended target. Targets could also include any building or facility that is owned, operated or utilized by any level of government, including local, county, state or federal. Other significant areas that could be targeted include schools or other areas where large groups of people congregate.

6.9 HAZARDOUS MATERIAL RELEASE

6.9.1 Definition & Background

Hazardous materials (HAZMAT) may be defined as any chemical substance that poses a short-term or long-term toxicological threat to humans and the environment[46]. HAZMAT may be a solid, gas, or liquid. The United States Environmental Protection Agency sorts HAZMAT into the following categories: toxic agents (irritants, asphyxiates, anesthetics, narcotics, sensitizers); other types of toxic agents (hepatotoxic and nephrotoxic agents, carcinogens, mutagens); hazardous waste; hazardous substances; toxic pollutants; and extremely toxic substances. HAZMAT can affect people through inhalation, ingestion, or direct contact with skin.

HAZMAT incidents are normally unintentional. However, they may potentially be the result of criminal or terrorist activity. HAZMAT release can result at a fixed location or during transportation.

6.9.1.A Transportation Related Events

Release during transportation accounts for 96.1 percent of HAZMAT incidents[47]. Of the total incidents, 81.4 percent occur as part of highway transportation and 14.7 percent occur as part of railroad transportation[46]. Seventy percent of railroad-related HAZMAT incidents occur during collisions or derailments, or as a result of leaks and defective equipment[46]. Despite the fact that total rail traffic has been increasing, the number of railroad accidents has been decreasing due to the use of improved safety measures.

6.9.1.B Fixed Events Containing Hazardous Materials

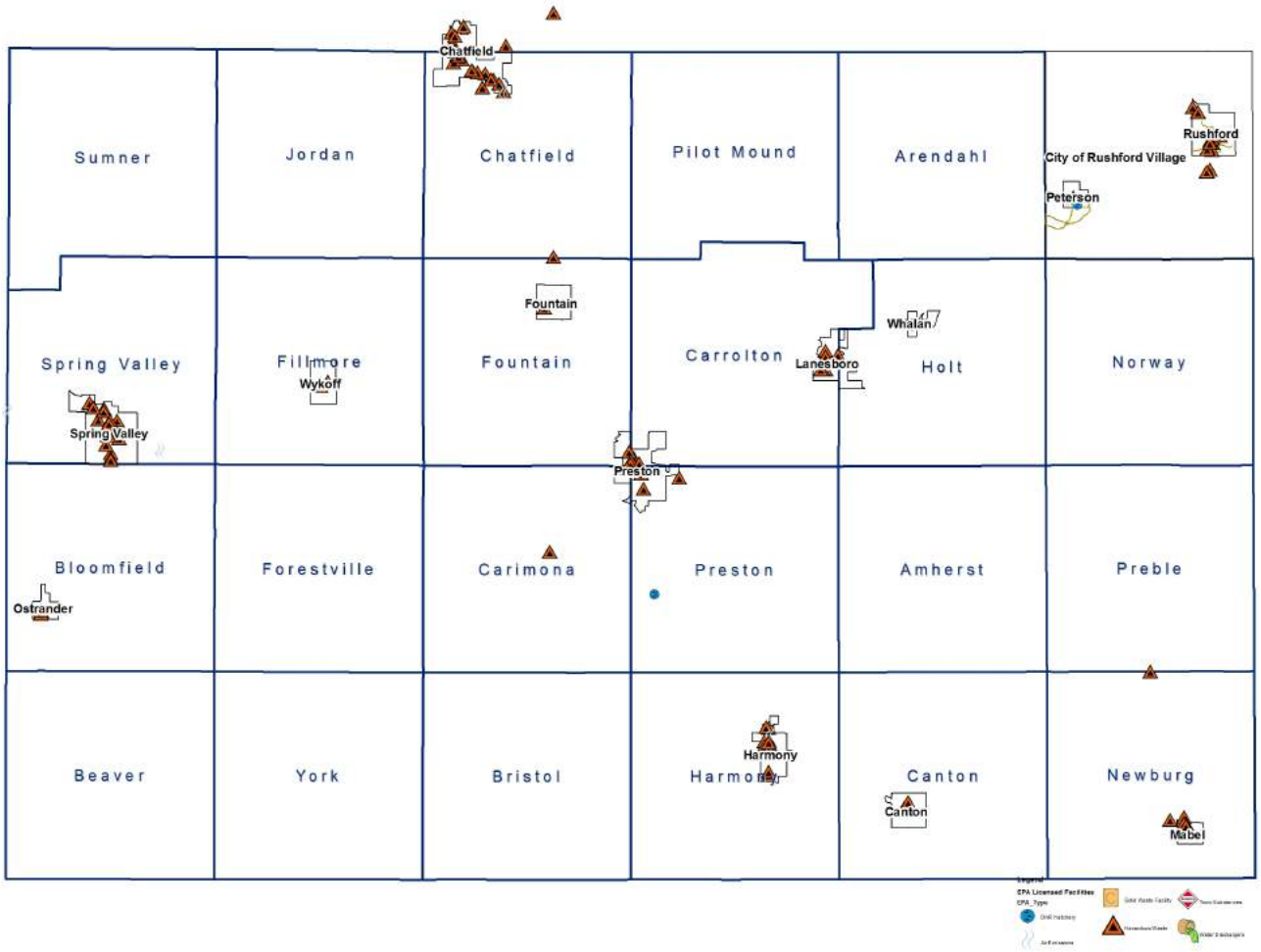
Fixed events accounts for the remaining 3.9 percent of HAZMAT incidents. HAZMAT is stored, processed, and handled at a variety of different facilities. These facilities range from small to large, including: refineries, chemical plants, storage terminals, manufacturing plants, laboratories, greenhouses, and automotive stores. The fixed-site release of HAZMAT may result from different types of leaks or equipment failures, human errors, fire-induced releases, or from natural causes (e.g. floods).

The fixed events category also includes HAZMAT release from pipelines. Despite improved standards for new pipeline construction, pipeline incidents have not declined in recent years. This is largely due to failures involving older pipelines that are suffering from erosion and age-related deterioration. Other common causes of pipeline incidents are damage from agricultural and construction activities, structural and mechanical failures, and natural hazards.

The impact of a HAZMAT incident can vary drastically, ranging from inconvenient to catastrophic. A number of variables influence the potential impact to the public and the environment, including the type of material(s) released, the amount released, the location of the release, and the circumstances surrounding the release. A small incident may force the evacuation of a portion of a specific facility; a large incident may cause the evacuation of an entire community. Likewise, a minor release may be cleaned up in a few days, while a major release may take weeks, months, years, or (in extreme and rare situations) prove impossible to decontaminate within our lifetime using existing technology.

Figure 6-36 displays hazardous material facilities throughout Fillmore County.

Figure 6-36: Hazardous Material Locations



6.9.2 Relationship to Other Hazards

Other hazards, natural and human-caused, can result in HAZMAT release. Heavy rain, snow, ice, and high winds can all potentially cause traffic accidents leading to HAZMAT release. Additionally, other hazards can impact the response to HAZMAT incidents by restricting access to release sites, damaging critical response facilities and equipment, and lowering the number of personnel available to respond. Natural hazards, such as high winds and flooding, can also increase the spread of HAZMAT following an incident.

6.9.3 Previous Occurrences

There is no record of a major hazardous material spill or accident in the county to date. Minor incidents have occurred at fixed sites and during transportation. However, these incidents have had an insignificant impact on the community at large. The likelihood of a major event is considered to be marginal, but isolated minor incidents are a constant hazard.

The U.S. Department of Transportation (DOT) keeps a record of incidents that are related to the transportation of hazardous material. Figure 6-37 depicts the 39 events that appear in the database for Fillmore County. None of the events resulted in fatalities or significant property damage.

Figure 6-37: Transportation-Related Incidents, 1972-2015[78]

Incident City	Report Number	Date of Incident	Mode of Transportation	Hazardous Class
Chatfield	I-1982080066	7/29/1982	Highway	Flammable - combustible liquid
Chatfield	I-1977020053	1/18/1977	Highway	Flammable - combustible liquid
Chatfield	I-1971120163	10/1/1971	Highway	Corrosive material
Chatfield	I-1974100640	7/28/1974	Highway	Corrosive material
Chatfield	I-1980030667	3/5/1980	Highway	Flammable - combustible liquid
Harmony	I-1995060781	5/20/1995	Highway	Flammable - combustible liquid
Harmony	I-1993020096	1/20/1993	Highway	Flammable - combustible liquid
Lanesboro	I-1990101037	10/11/1990	Highway	Combustible liquid
Lanesboro	I-1990101037	10/11/1990	Highway	Flammable - combustible liquid
Lanesboro	I-2005030983	3/4/2004	Highway	Flammable - combustible liquid
Preston	I-1991030606	2/4/1991	Highway	Nonflammable compressed gas
Rushford	I-1999060172	5/19/1999	Highway	Corrosive material
Spring Valley	I-1978020132	1/10/1978	Highway	Flammable - combustible liquid
Spring Valley	I-1972050269	5/15/1972	Highway	Flammable - combustible liquid
Spring Valley	I-1978060261	5/17/1978	Highway	Flammable - combustible liquid
Spring Valley	I-1976050381	4/23/1976	Highway	Flammable - combustible liquid
Spring Valley	I-1974120457	7/5/1974	Highway	Flammable - combustible liquid
Spring Valley	I-1978030086	1/24/1978	Highway	Corrosive material
Spring Valley	I-1976030387	2/9/1976	Highway	Flammable - combustible liquid
Spring Valley	I-1977110279	10/20/1977	Highway	Combustible liquid
Spring Valley	I-1975050317	4/21/1975	Highway	Flammable - combustible liquid
Spring Valley	I-1977020767	1/28/1977	Highway	Flammable - combustible liquid
Spring Valley	I-1977070133	6/20/1977	Highway	Flammable - combustible liquid
Spring Valley	I-1976050798	4/14/1976	Highway	Corrosive material
Spring Valley	I-1978080630	8/3/1978	Highway	Combustible liquid
Spring Valley	I-2002080934	8/14/2002	Highway	Flammable - combustible liquid
Spring Valley	I-1977070261	6/9/1977	Highway	Flammable - combustible liquid
Spring Valley	I-1977090199	8/22/1977	Highway	Flammable - combustible liquid
Spring Valley	I-1977101414	10/14/1977	Highway	Combustible liquid
Spring Valley	I-1975120418	11/18/1975	Highway	Flammable - combustible liquid
Spring Valley	I-1977010407	12/18/1976	Highway	Combustible liquid
Spring Valley	I-1976010579	11/18/1975	Highway	Flammable - combustible liquid
Spring Valley	I-1978050785	5/1/1978	Highway	Flammable - combustible liquid
Spring Valley	I-1977080788	8/2/1977	Highway	Flammable - combustible liquid
Spring Valley	I-1972030087	3/1/1972	Highway	Flammable - combustible liquid
Spring Valley	I-1973120249	12/13/1973	Highway	Flammable - combustible liquid
Spring Valley	I-1977110280	10/21/1977	Highway	Flammable - combustible liquid
Spring Valley	I-1991110165	10/23/1991	Highway	Combustible liquid
Spring Valley	I-1973110439	11/17/1973	Highway	Flammable - combustible liquid

The U.S. Coast Guard's (USCG) National Response Center (NRC) reports that between 1990 and 2016 there have been 31 fixed event HAZMAT releases within Fillmore County, eight of which have occurred within the past five years (see Figure 6-38). The NRC database does not contain information regarding deaths, injuries, or property damage resultant of HAZMAT releases.

Figure 6-38: Fixed Events, 1990-2016[79]

NRC Report #	Incident Date	Type Of Incident	Incident Cause	Location	Medium Affected	Material Name
1137999	**1/13/2016**	**Fixed**	**Operator Error**	**701 Industrial Dr. N, Preston**	**Water**	**Ethanol**
1114866	**4/27/2015**	**Fixed**	**Equipment Failure**	**11303 Hwy 53 SE, Chatfield**	**Land**	**Liquid Fertilizer**
1090690	**7/29/2014**	**Fixed**	**Dumping**	**102 N Main St., Canton**	**Land**	**Unknown Oil**
1090682	**7/30/2014**	**Fixed**	**Dumping**	**102 N Main, Canton**	**Land**	**Waste Oil, Transmission Fluid, Cleaning Solvents**
1083503	**5/21/2014**	**Mobile**	**Equipment Failure**	**South of MN State Hwy 30, Arendahl Township**	**Air**	**Ammonia, Anhydrous**
1046469	**5/8/2013**	**Mobile**	**Equipment Failure**	**110th Street and 180 Ave., York Township**	**Air**	**Ammonia, Anhydrous**
1034513	**12/31/2012**	**Storage Tank**	**Equipment Failure**	**207 Watt Street, Rushford**	**Air**	**Chlorine Gas**
1008265	**4/10/2012**	**Storage Tank**	**Equipment Failure**	**17433 CR 1, Ostrander**	**Land**	**Oil: Diesel**
967392	**2/13/2011**	**Storage Tank**	**Natural Phenomenon**	**701 Industrial Dr. N, Preston**	**Air**	**Ammonia, Anhydrous**
937026	**4/14/2010**	**Mobile**	**Operator Error**	**CR 8, Spring Valley**	**Soil**	**Farm Chemicals**
936537	**3/31/2010**	**Fixed**	**Transport Accident**	**109 S Section Ave., Spring Valley**	**Water**	**Oil: Diesel**
883733	9/13/2008	Fixed	Equipment Failure	701 Industrial Dr. N, Preston	Land	Sulfuric Acid
876194	7/3/2008	Mobile	Operator Error	Hwy 16, between Fillmore CR 8 and US Hwy 52 on Hwy 16, Lanesboro	Water	2-(2 Aminoethoxy) Ethanol
846120	8/19/2007	Mobile	Flood	The Entire Town of Rushford, Rushford	Unknown	Natural Gas
832815	4/19/2007	Storage Tank	Equipment Failure	Farm Field, Sumner Township	(N/A)	Ammonia, Anhydrous
715072	3/4/2004	Mobile	Transport Accident	Hwy 16, Lanesboro	Land	Denatured Alcohol
638616	3/5/2003	Mobile	Transport Accident	Intersection of Hwy 16 and Hwy 63 S, Spring Valley	Land	Oil: Diesel
619913	8/14/2002	Fixed	Equipment Failure	E Hwy 16, Spring Valley	Land	Oil, Fuel: No. 1 (Kerosene)
576834	8/14/2001	Unknown	Unknown Sheen	Power Plant Co. 17 Bridge, Root River, Preston	Water	Unknown Oil

**Bold indicates events that occurred after the 2008 Fillmore County Hazard Mitigation Plan.*

Figure 6-38: Fixed Events, 1990-2014[79] *(con't)*

NRC Report #	Incident Date	Type Of Incident	Incident Cause	Location	Medium Affected	Material Name
527565	4/30/2000	Mobile	Equipment Failure	Near Junction of CR 25 and 10, Rushford	Land	Fertilizer with Pesticides
492693	6/25/1999	Mobile	Transport Accident	300ft NE of CR 21, Lanesboro	Water	Oil, Fuel: No. 2-D
488805	6/25/1999	Mobile	Transport Accident	Mile Marker Unknown, Lanesboro	Land	Oil: Diesel
486468	6/6/1999	Fixed	Equipment Failure	Preston, MN	Air	Ammonia, Anhydrous
385111	4/27/1997	Mobile	Operator Error	25 SW First St., Chatfield	Air	Ammonia, Anhydrous
308310	9/21/1995	Pipeline	Unknown	204 W Center St, Rushford	Air	Natural Gas
296634	6/20/1995	Fixed	Equipment Failure	Alley/ between Main Ave and First Ave NE, Harmony	Land	Oil, Misc: Transformer("PCB"S)
293126	5/26/1995	Mobile	Equipment Failure	PO 604, Rushford	Land	Nitrogen, Liquefied
292262	5/20/1995	Mobile	Transport Accident	CR 23, Amhearst Township	Land	Gasoline: Automotive (unleaded)
204632	9/4/1993	Mobile	Transport Accident	220 St. Paul St. Preston	Air	Ammonia, Anhydrous
119796	5/30/1992	Fixed	Equipment Failure	Harmony Transmission, Harmony	Land	Oil, Misc: Transformer
43584	10/11/1990	Mobile	Transport Accident	Hwy 250, Lanesboro	Land	Gasoline: Automotive Oil, Fuel: NO. 2

6.9.4 FEMA Declared Disasters

There have been no federally declared disasters specific to hazardous material release[9].

6.9.5 Geographic Location

The entire county is, to some degree, at risk from HAZMAT release. The degree of risk varies upon location. Properties adjacent to highways, railroads, and fixed-site facilities and pipelines are at the greatest risk.

6.9.6 Hazard Extent

Transportation of Hazardous Materials

The hazard extent and impact on local jurisdictions can vary drastically depending on the toxicity of the material(s) released, the amount released, and the location of the incident.

Region Nine recommends Fillmore County utilize the FEMA created software Hazards USA Multi-Hazard (Hazus-MH) to conduct a hazardous materials vulnerability analysis. The software is a disaster risk assessment tool, which HSEM has determined is an integral part of Minnesota's risk assessment process. Hazus-MH can help Fillmore County communities estimate losses resulting from hazardous materials disasters.

Fixed Facilities Containing Hazardous Materials

The hazard extent can vary drastically depending on the toxicity of the material(s) released, the amount released, and the location of the incident. Business types that commonly use hazardous materials locally include: hospitals, schools, metal plating and finishing industries, aircraft industry, public utilities, cold storage companies, fuel industries, communications industry, chemical distributors, research facilities and high technology firms. Depending on the nature of the spill and local weather conditions, residences, businesses, hospitals, schools, nursing homes and roadways may be evacuated or closed to traffic until cleanup can be completed.

Region Nine recommends Fillmore County utilize the FEMA created software Hazards USA Multi-Hazard (Hazus-MH) to conduct a hazardous materials vulnerability analysis. The software is a disaster risk assessment tool, which HSEM has determined is an integral part of Minnesota's risk assessment process. Hazus-MH can help Fillmore County communities estimate losses resulting from hazardous materials disasters.

6.9.7 Vulnerability Analysis

6.9.7.A Critical Facilities

Region Nine recommends Fillmore County utilize the FEMA created software Hazards USA Multi-Hazard (Hazus-MH) to conduct a hazardous materials vulnerability analysis. The software is a disaster risk assessment tool, which HSEM has determined is an integral part of Minnesota's risk assessment process. Hazus-MH can help Fillmore County communities estimate losses resulting from hazardous materials disasters.

6.10 DAM/LEVEE FAILURE

6.10.1 Definition & Background

Dams may fail due to heavy flooding, inadequate design, improper operation, or a lack of maintenance. Dam failures can result in flash flooding with the possibility of significant damage to property and loss of life[80]. In order to help prevent dam failures, the Minnesota Department of Natural Resources operates its Dam Safety Program. Under this program dams are classified based on the danger to the public in the event of a failure. The DNR dam classification scheme is outlined in Figure 6-39.

Figure 6-39: Dam Classification[81]

Class	Hazard Description
I	**High Hazard** - Any loss of life or serious hazard, or damage to health, main highways, high-value industrial or commercial properties, major public utilities, or serious direct or indirect, economic loss to the public.
II	**Significant Hazard** - Possible health hazard or probable loss of high-value property, damage to secondary highways, railroads or other public utilities, or limited direct or indirect economic loss to the public other than that described in Class III.
III	**Low Hazard** - Property losses restricted mainly to rural buildings and local county and township roads which are an essential part of the rural transportation system serving the area involved.

Owners of Class I dams are required to have an Emergency Action Plan (EAP) on file with the DNR. These dams are required to be inspected annually by DNR engineers, the Army Corps of Engineers, the Natural Resource Conservation Service, the Federal Energy Regulatory Commission, or other local units of government. Class II and Class III dams are inspected less frequently. Fillmore County is home to 50 dams, which range in different classes (see Figure 6-41). All but four of these are small earthen dams. Three dams, including the Lanesboro, Dairyland Power and Lagoon Park dams, are used for power generation. Figure 6-40 displays dam locations throughout Fillmore County. There are three levees in Fillmore County ranging in length from a half mile to almost two miles (see Figure 6-42).

Figure 6-40: Dam Locations

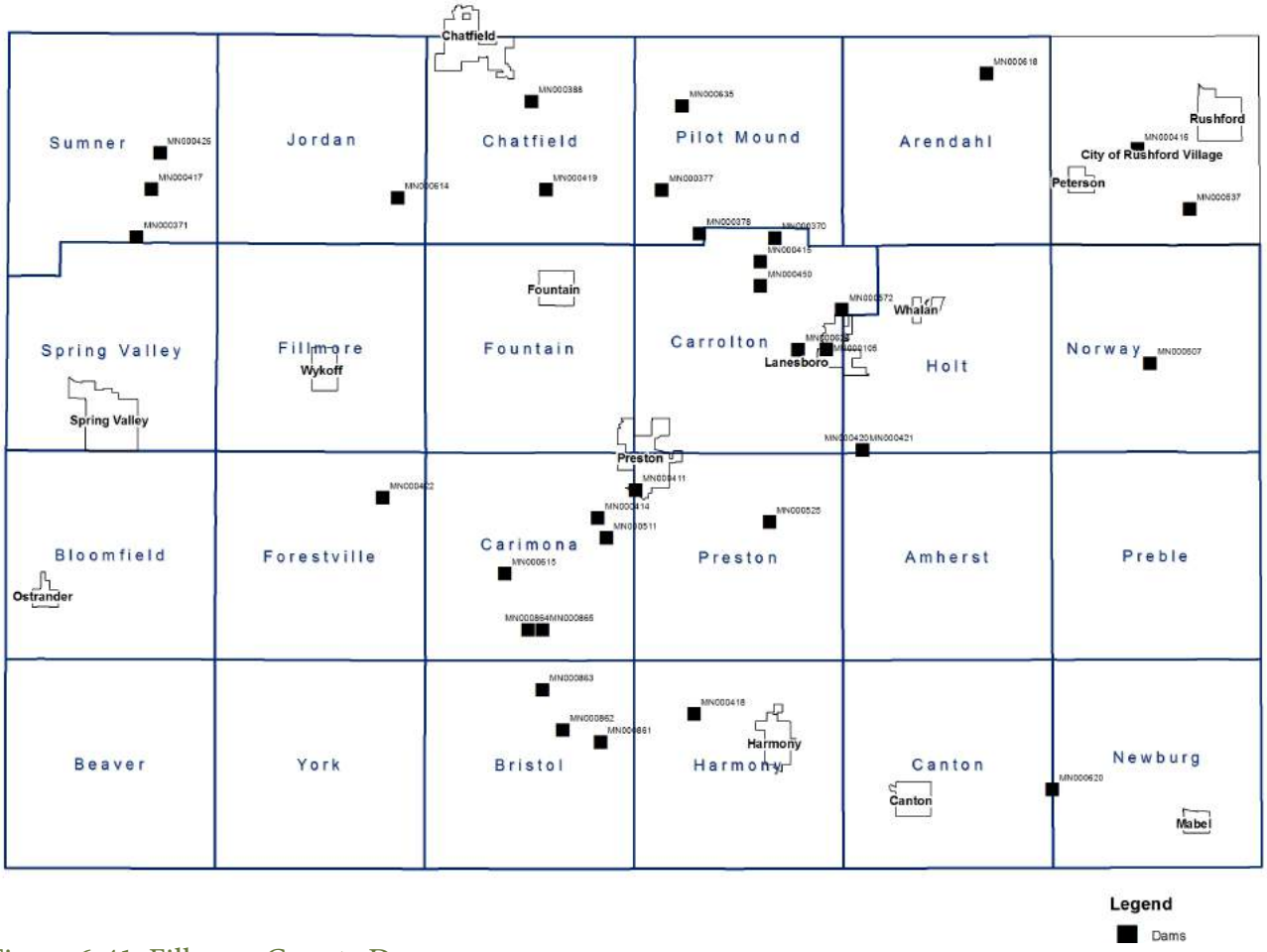


Figure 6-41: Fillmore County Dams

Dam Name	Inspection Date	Owner Type	NID Height (Ft.)	NID Storage	Primary Purpose	Dam Type
Fillmore Lake Dam	10/16/2007	Private	22	104	Recreation	Earth
Carrolton 12 Dam	8/20/2009	Private	25	30	-	Earth
Geoffrey Griffin	-	Private	36	108	-	-
Waller Pond	5/6/2008	Private	30	18	Flood Control	Earth
North Branch Root River	8/20/2009	Private	38	250	-	Gravity
Horihan-Herrick	8/20/2009	Private	36	34	Flood Control	Earth
Ruen Pond	8/18/2009	Private	29	32	Flood Control	Earth
Gehling Pond	5/3/2012	Private	28	50	Flood Control	Earth
Oian-Dahl Detention	8/18/2009	Private	26	37	Flood Control	Earth
Lagoon Park	8/18/2009	Private	15	50	-	Gravity

Figure 6-41: Fillmore County Dams *(con't)*

Dam Name	Inspection Date	Owner Type	NID Height (Ft.)	NID Storage	Primary Purpose	Dam Type
Rediske-Vatland Group	8/19/2009	Private	29	73	Flood Control	Earth
Sorenson Group	5/15/2008	Private	29	50	Flood Control	Earth
Fann Detention	8/18/2009	Private	34	23	Flood Control	Earth
Carimona Detention	5/15/2008	Private	33	54	Flood Control	Earth
Horihan-Hazel Group	9/6/2007	Private	32	38	Flood Control	Earth
Hanning Bros Group Pond	8/19/2009	Private	28	92	Flood Control	Earth
Fillmore County Road 21	5/3/2011	Local Government	31	52	Flood Control	Earth
Hatlevig-Boyum Group	5/15/2008	Private	27	55	Flood Control	Earth
East Willow Creek D-2	8/19/2009	Local Government	32	398	Flood Control	Earth
Leslie Helickson Detention	8/19/2009	Private	27	132	Flood Control	Earth
Lawstuen Pond	5/15/2008	Private	30	47	Flood Control	Earth
Miller Lange Pond	8/19/2009	Private	26	33	Debris Control	Earth
East Willow Creek Fd-28	10/28/2011	Private	30	388	Flood Control	Earth
East Willow Creek J-1	8/19/2009	Private	28	20	Flood Control	Earth
Bear Creek	-	Private	26	100	Other	Gravity
Graves Pond	8/18/2009	Private	30	21	Flood Control	Earth
East Willow Creek Da-1	10/28/2011	Local Government	40	218	Flood Control	Earth
Copeman Pond	5/6/2008	Private	26	18	Flood Control	Earth
East Willow Creek E-3	9/22/2004	Private	36	332	Flood Control	Earth
Lanesboro	5/3/2012	Local Government	34	1000	Hydroelectric	Other
Wangen Pond	8/20/2009	Private	31	50	Flood Control	Earth
Rudlong Pond	5/6/2008	Private	27	57	Flood Control	Earth
Rain Pond	8/20/2009	Private	25	20	Flood Control	Earth
Nessrudlongellenberg Group	5/6/2008	Private	35	85	Debris Control	Earth
Highum Pond	8/18/2009	Private	29	16	Flood Control	Earth
Finseth Pond	8/20/2009	Private	27	27	Flood Control	Earth
East Willow Creek Fd-2	9/22/2004	Private	37	478	Flood Control	Earth
Ruen Detention Group	8/18/2009	Private	32	155	Debris Control	Earth
Munzlinger Lake Dam	-	Private	26	42	Recreation	Earth
Kubicek Dam	6/6/2012	Private	32	420	Recreation	Earth
Stuckey Dam	6/11/2009	Private	16	83	Flood Control	Earth
Sieber Dam	6/21/2011	Private	14	121	Flood Control	Earth
Little Sandy Creek 61	8/23/2007	Local Government	46	2822	Flood Control	Earth
Dudgeon Dam	6/11/2009	Private	14	110	Other	Earth
Endorf Irrig Str	6/11/2007	Private	20	81	Irrigation	Earth
Big Sandy Creek 35-5-2	4/19/2012	Local Government	50	10538	Flood Control	Earth

Figure 6-41: Fillmore County Dams *(con't)*

Dam Name	Inspection Date	Owner Type	NID Height (Ft.)	NID Storage	Primary Purpose	Dam Type
Kassik Dam	6/16/2008	Local Government	21	283	Flood Control	Earth
Fillmore Site 1 Dam	10/28/2010	Local Government	54	1395	Flood Control	Earth
Fillmore Site 2 Dam	10/28/2010	Local Government	34	71.25	Flood Control	Earth
Fillmore Site 3 Dam	10/28/2010	Local Government	38	180	Flood Control	Earth

Figure 6-42: Fillmore County Levees

System Name	Sponsor(s)	Length (Miles)	Inspection Date	Inspection Rating
Root River/ Rush Creek - Rushford - West Levee - Levees A and B	City Of Rushford	1.85	8/3/2015	Minimally Acceptable
Root River/ Rush Creek - Rushford - North Levee - Levee C	City Of Rushford	0.56	8/3/2015	Minimally Acceptable
Root River/ Rush Creek - Rushford - East Levee - Levees D, E, and F	City Of Rushford	0.97	8/4/2015	Minimally Acceptable

6.10.2 Relationship to Other Hazards

Infrastructure failure can cause flooding, which is usually associated with heavy precipitation during summer storms or unusually heavy snowfall during the winter season, which then melts when spring arrives. Wildfires can increase the speed of flooding by removing ground vegetation that would otherwise have slowed the flow of floodwaters. The danger from flooding can be compounded when floodwaters breach facilities that contain hazardous materials. Once contaminated, the floodwaters can spread the hazardous materials over large areas. Disruptions of transportation routes along roads, bridges, railroads and by river navigation can be disrupted due to inundation and or large flow velocities. Flooding also poses a risk to groundwater by potentially contaminating wells within the flooded area.

6.10.3 Previous Occurrences

There have been no previous occurrences of dam/levee failure in Fillmore County.

6.10.4 FEMA Declared Disasters

There have been no federally declared disasters specific to dam/levee failure.

6.10.5 Geographic Location

All areas surrounding or nearby dams/levees are at risk for failure. Flooding increases the risk of failure on dams/levees.

6.10.6 Hazard Extent

The extent of dam/levee failure depends heavily on the size of the system, the magnitude of the failure, and the speed at which the system can be restored. Dams can fail due to either 1) water heights or flows above the capacity for which the structure was designed; or 2) deficiencies in the structure such that it cannot hold back the potential energy of the water. If a dam fails, issues of primary concern include loss of human life/injury, downstream property damage, lifeline disruption

(transportation routes and utility lines required to maintain or protect life), and environmental damage. Dams require constant monitoring and regular maintenance to insure their integrity.

6.10.7 Vulnerability Analysis

6.10.7.A Critical Facilities

Region Nine recommends Fillmore County utilize the FEMA created software Hazards USA Multi-Hazard (Hazus-MH) to conduct a dam/levee failure vulnerability analysis. The software is a disaster risk assessment tool, which HSEM has determined is an integral part of Minnesota's risk assessment process. Hazus-MH can help Fillmore County communities estimate losses resulting from dam/levee disasters.

6.11 ESSENTIAL SERVICES FAILURE

6.11.1 Definition & Background

6.11.1.A Water Supply Contamination

Water supply contamination is the introduction of pollutants into groundwater and surface water supplies. Contaminants can enter the water supply due to point and nonpoint source pollution. Point source pollution has its source in a well-defined location, such as the pipe through which a sewage treatment plant or a factory discharges waste into a body of water[82]. Nonpoint source pollution has its source over a large area. An example of nonpoint source pollution is agricultural runoff that flows into the county ditch system and leaches into the groundwater. Figure 6-43 depicts the various sources of water supply contamination. Figure 6-44 identifies locations with drinking water supply resource concerns.

Figure 6-43: Groundwater Contamination Sources[83]

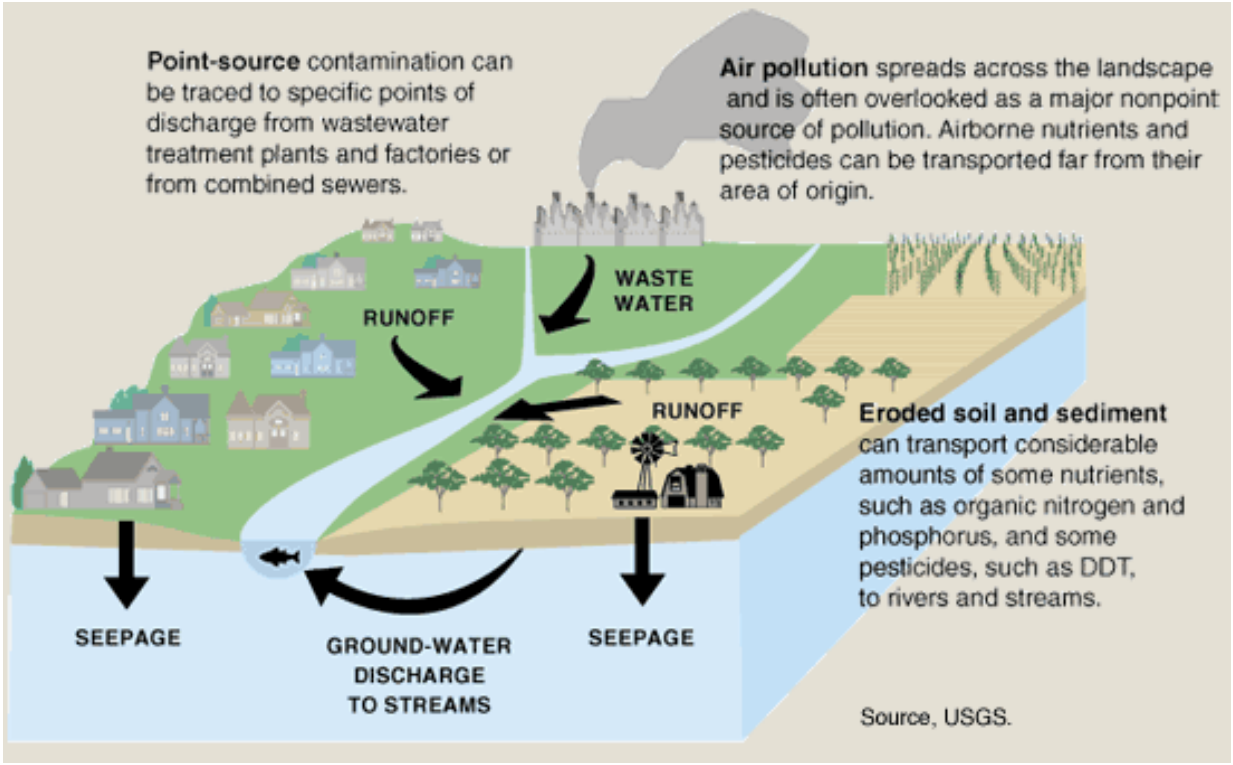
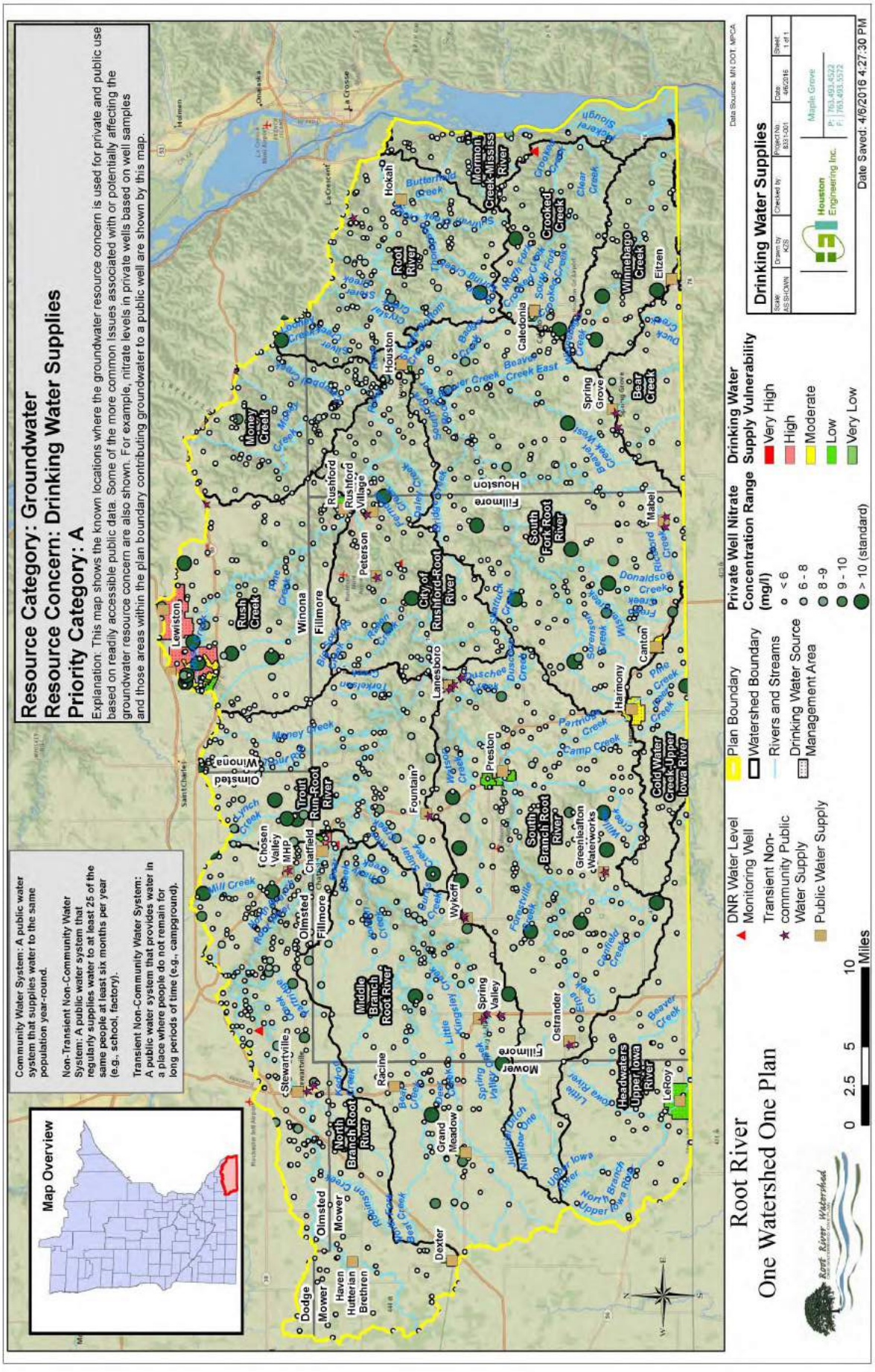


Figure 6-44: Drinking Water Supply Resource Concern Locations



Water supply contamination may result from a variety of point and nonpoint sources, including: wastewater treatment failure, agricultural runoff, industrial pollution, hazardous material releases, dam failure, and the improper disposal of household chemicals. Categories of contaminants include microbial life forms, inorganic and volatile organic compounds (VOCs), and pesticides and herbicides.

Contamination due to wastewater treatment systems failure is an ongoing concern. These systems are vital to our model of civilization, but they also pose a potential risk to public health. The improper treatment or release of untreated sewage could result in surface and groundwater pollution, as well as outbreaks of infectious disease. The scale of damage differs depending on the size of the system. For example, a failure of an individual septic system would be minor compared to the failure of a municipal treatment facility.

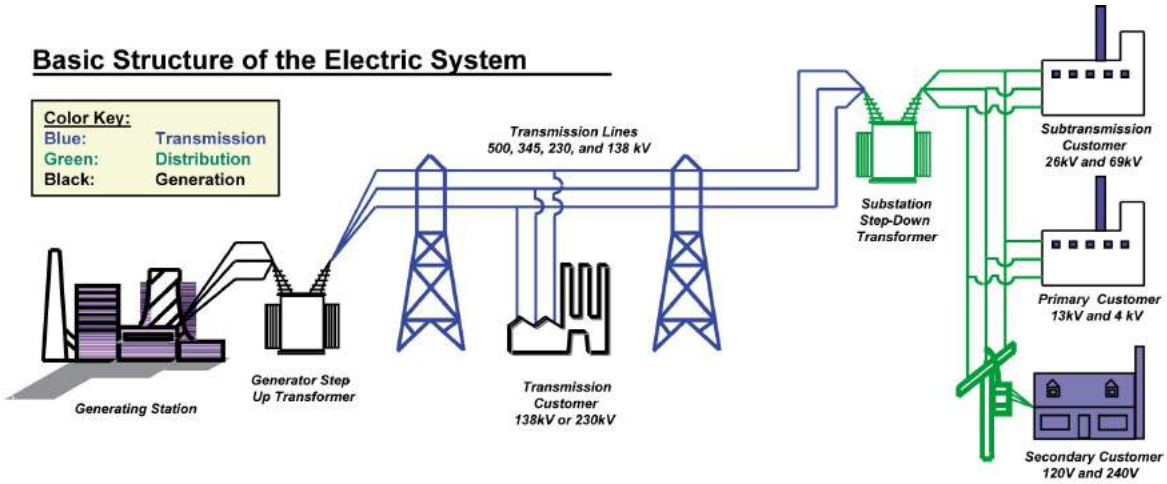
Another likely source of contamination is the application of agricultural fertilizers. Phosphorus is an essential nutrient for all plants to grow. When excess amounts enter surface water bodies they enable large algal blooms to occur. These blooms deplete the oxygen supply within the water, killing fish and other species and making the water unsafe for consumption.

Manure runoff from feedlots is also a concern. Heavy rainfall can cause feedlot sewage lagoons to overflow and contaminate nearby surface water bodies or ground water wells. Feedlot manure contains high amounts of E.coli and antibiotic drugs, which can result in infectious disease outbreaks.

6.11.1.B Power Failure

Power failure is the interruption of the flow of electricity on the electrical grid and can occur at any point from the power plant to the end-user. Power failures can be caused by a number of events, including tornadoes, hurricanes, strong winds, ice storms, lightning strikes, heavy rain, extreme cold or heat, fire, intentional attack, supply shortage, equipment failure, operator error, or other external causes. Nearly half of all power failures in the United States are a direct result of weather[84]. The remaining half is attributable to other factors listed above. Figure 6-45 illustrates the flow of power across the electrical grid from the power plant to the end-user[85].

Figure 6-45: Electric Power System Elements



Power failures can be broken down into two categories: short duration and sustained duration. Short duration failures last less than five minutes and are often caused by temporary disruptions in the flow of power through the grid. Short duration power failures rarely pose serious risk to human life or property. Sustained duration outages lasting longer than five minutes can often cause severe economic hardship and occasionally threaten lives. Sustained failures are often the result of downed power lines or other equipment failure, meaning that power cannot be restored until the damage

to the grid is repaired. A sustained outage can last anywhere from a few minutes, to a few hours, to weeks, depending on the severity of the damage to the system.

The economic costs of power failures in the United States cannot be understated, especially for firms that depend heavily on an uninterrupted flow of power. The Electric Power Research Institute (EPRI) estimates that a one-hour power outage can cost a firm anywhere from $500 to upwards of $10,000 in lost productivity, depending on the size of its operations[86]. Firms that are particularly vulnerable include those in the digital economy, those employing continuous manufacturing processes, and essential services such as mass transit, electric utilities, water treatment plants, and natural gas pipelines.

The EPRI estimates the annual cost of power outages for all U.S. businesses in 2001 was $104 billion in lost productivity and/or damaged equipment. A sharp decrease in the level of investments being made into the electrical grid by utility providers, coupled with an increase in the frequency and intensity of severe weather events in the past decade has resulted in a dramatic increase in the number of power failures. Figure 6-46 shows the average duration of power failures in the United States for any given year[86]. Figure 6-47 illustrates the rise in weather-related and non-weather related power failures in the United States since 1992[87].

Figure 6-46: Average Duration of Power Failures in the U.S.

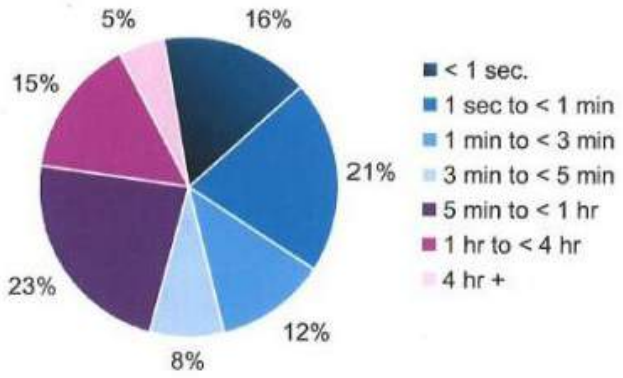
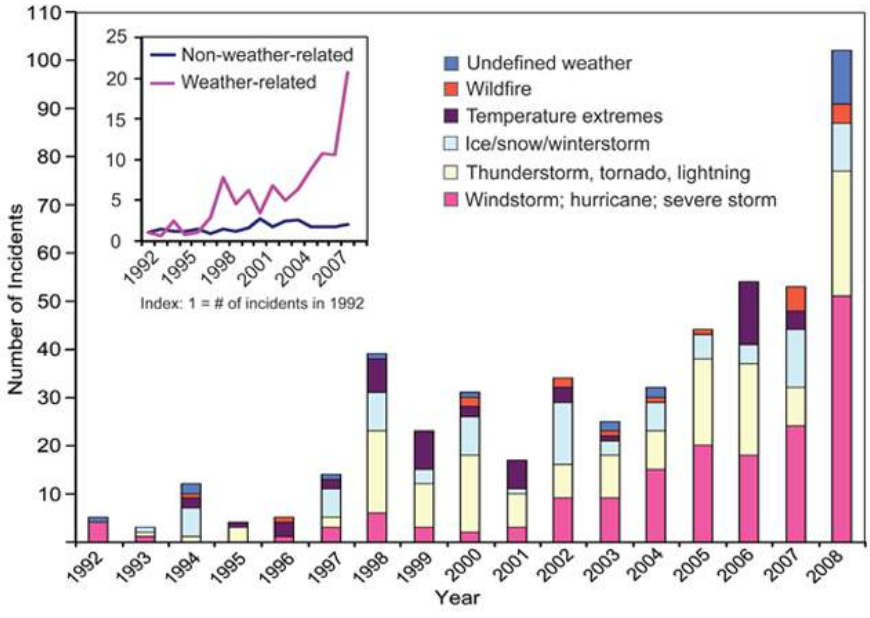


Figure 6-47: Significant U.S. Electrical Grid Disturbances, 1992-2011



6.11.1.C Wastewater Treatment Failure

Wastewater treatment systems are an essential element of human lifestyle. Municipal systems efficiently transport sewage to treatment plants, where microbes are introduced into the sewage in order to break down the volatile organic compounds (VOCs) within it. This process usually occurs in large holding tanks or sewage lagoons. Once the amount of VOCs in the sewage has been reduced to acceptable levels, it is considered safe to discharge the material into surface water bodies such as lakes and rivers, where it poses little threat to the environment. Wastewater treatment systems can fail in one of six ways: hydraulic overload, organic overload, mechanical failure, physical/structural component failure, change of use, or introduction of incompatible materials[88].

Hydraulic Overload

Hydraulic overload occurs when the amount of water entering the system exceeds the capacity of the system to process and discharge of the water. This is often attributable to leak pipes, leaky plumping fixtures, or surface water runoff into the system. The result of this is a backflow of effluent.

Organic Overload

Organic overload occurs when the level of VOCs in the waste stream is too high for the system to filter through. The waste stream becomes a thick sludge, clogging the treatment filters and causing a backflow of effluent.

Mechanical Failure

Mechanical failure is when a moving part of the treatment facility ceases to function properly, such as a pump station, float, or blower. Hydraulic and organic overloads can often be triggered by a mechanical failure in the system.

Physical/Structural Component Failure

Some examples of physical or structural component failure include a broken pipe, uneven settling of tanks and distribution boxes, or the collapse of other system components.

Change of Use

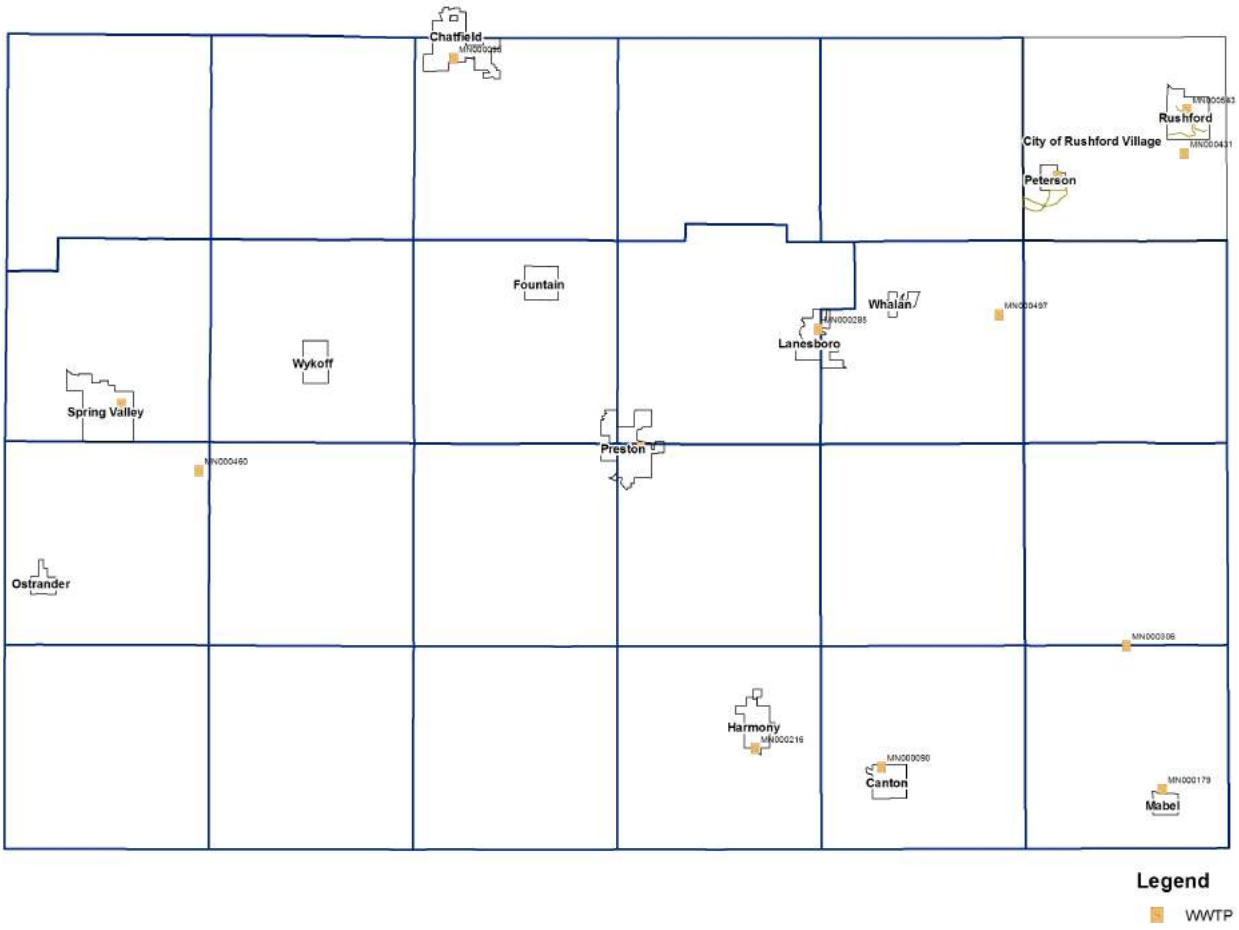
A change of use occurs when the usage patterns that a system was designed to handle are altered. For example, a system designed to support a summer vacation cabin may quickly become overtaxed if the cabin is converted to a permanent year-round residence. Alternatively, a large new subdivision or industrial land user that hooks into a small municipal system may cause that system to become overtaxed, eventually leading to a mechanical failure and/or hydraulic or organic overload.

Introduction of Incompatible Materials

The introduction of chemicals or organic compounds into the system, which disrupt the microbial treatment process can result in an organic overload. Common incompatible materials include household cleaning chemicals, lawn care chemicals, and agricultural chemicals. Industrial chemicals are also a potential source of failure.

Figure 6-48 identifies the location of wastewater treatment plants throughout Fillmore County.

Figure 6-48: Fillmore County Waste Water Treatment Plants



6.11.2 Relationship to other Hazards

6.11.2.A Water Supply Contamination

Biological pollutants can contribute to the spread of infectious diseases. Chemical pollutants can impact public health and have the potential to damage wastewater treatment infrastructure. Fire is a possible secondary hazard in the event of contamination if the substance is flammable.

6.11.2.B Power Failure

Power failure can trigger a number of other hazards depending on the duration of the failure. Short-term failures are unlikely to trigger secondary hazards, while sustained failures can trigger such hazards as a wastewater treatment system failure or disruption of transportation services.

6.11.2.C Wastewater Treatment Failure

A physical or structural component failure in the system can cause raw sewage to seep into the ground and contaminate soil or ground water. A backflow of effluent resulting from a hydraulic or organic overload can result in the release of raw sewage into city streets, rendering the area uninhabitable. This can also contribute to the spread of disease and the contamination of surface water bodies.

6.11.3 Previous Occurrences

6.11.3.A Water Supply Contamination

Fillmore County experienced water supply contamination during two separate events. In 2007, Rushford flooded and one of their wells became contaminated. The state was heavily involved in the decontamination of the well. In May 2012, the City of Lanesboro had to discharge into the Root

River after the flooding event, which threatened River closure for recreational use. Historically, when flooding has occurred in Fillmore County the Minnesota Department of Health has permitted a variance to wastewater treatment facilities to discard into the Root River.

6.11.3.B Power Failure

There have been no previous occurrences of large-scale, long-term power failure in Fillmore County.

6.11.3.C Wastewater Treatment Failure

There have been no previous occurrences of large-scale wastewater treatment failure within Fillmore County.

6.11.4 FEMA Declared Disasters

There have been no federally declared disasters specific to water supply contamination, wastewater treatment failure, or power failure[9].

6.11.5 Geographic Location

6.11.5.A Water Supply Contamination

The entire county is at risk of water supply contamination.

6.11.5.B Power Failure

Areas of the county with aboveground power lines are especially vulnerable to power failure resulting from severe weather events. Power lines with trees nearby are the most vulnerable due to the risk posed by falling trees. Even areas of the county with buried power lines, such as urban areas, are still vulnerable to power failure if aboveground transmission lines are damaged.

6.11.5.C Wastewater Treatment Failure

The entire county is at risk of wastewater treatment failure. The following communities are home of wastewater treatment facilities: Canton, Chatfield, Harmony, Lanesboro, Mabel, Peterson, Preston, Rushford, Rushford Village, Spring Valley, Bloomfield Township, Holt Township, Newburg Township and Preble Township.

6.11.6 Hazard Extent

6.11.6.A Water Supply Contamination

The extent of water supply contamination depends on the amount and type of pollutant that is introduced into the water supply, the point of entry, the speed at which it can spread, and the speed at which it can be decontaminated. A spill of toxic chemicals into a lake may impact a limited area and be easier to remediate, whereas seepage of pollutants into the groundwater supply could take decades to remediate and impact a much wider area. Residences near lakes and rivers often have wells that use shallow groundwater that is particularly at risk for contamination. Water contamination serves as a source of bacteria, viruses and parasites that can cause gastrointestinal problems or transmit contagious diseases.

6.11.6.B Power Failure

The extent and impact of a power failure on the local jurisdictions depends largely on the duration of the failure, the type of failure, and the speed at which the system can be restored. A localized lightning strike may cause a small area to lose power temporarily whereas a tornado or wind storm accompanied by downed power lines may cut power to a larger area for an extended period of time.

6.11.6.C Wastewater Treatment Failure

The extent and impact on local jurisdictions of wastewater treatment failure depends heavily on the size of the system, the magnitude of the failure, and the speed at which the system can be restored. A septic system failure may have limited impact on the county, whereas a municipal system failure could adversely impact an entire city.

6.11.7 Vulnerability Analysis

6.11.7.A Critical Facilities

Specifically related to water supply contamination, the MNDNR classifies vulnerability to groundwater contamination from surface sources and wells based off the makeup and depth of the layers of rock, till, and soil found above aquifers. Low vulnerability areas are not easily contaminated from surface land uses. Medium vulnerability areas are more susceptible to seepage of surface pollutants into groundwater aquifers. High vulnerability area can be easily contaminated by surface land use activities. It is important to note that all areas can be easily contaminated if surface pollutants are transported below ground via open wells. Land uses in areas of high vulnerability and near open wells should be restricted to activities that will not leech pollutants into the ground.

6.12 ANIMAL DISEASE

6.12.1 Definition & Background

An animal disease outbreak can be highly contagious, infectious, or economically devastating[89]. The introduction of new strains, reintroduced strains or foreign animal disease strains (introduced intentionally or accidentally) are also included[89]. Animal diseases can affect large numbers of livestock in a particular time frame, which will cause serious economic implications. Contagious animal diseases that are zoonotic (spread from animals to humans) could have serious public health concerns. Figure 6-49 identifies common zoonotic illnesses in Minnesota associated with animal contact.

Figure 6-49: Illnesses Associated with Animal Contact[90]

Zoonotic Diseases		
Bioterrorism Disease (Anthrax, Plague, Brucellosis, and Q Fever)	Blastomycosis (Blastomyces dermatitidis)	Cat Scratch Disease (Bartonella henselae)
Coccidiomycosis (Valley Fever)	Histoplasmosis (Histoplasma capsulatum)	Intestinal Illness (E.coli, Cryptosporidium parvum, Campylobacter, Salmonella)
Psittacosis (Chlamydophila psittaci, Chlamydia psittaci)	Rabies	Trichinosis (Trichinella spiralis)

6.12.2 Relationship to other Hazards

Animal disease outbreaks may occur following a major hazard event, such as drought, hazardous material releases, or water supply contamination event.

6.12.3 Previous Occurrences

Fillmore County has not seen any significant outbreaks of animal diseases in recent years. The Minnesota Board of Animal Health has been established to monitor animal health, eradicate animal diseases, and conduct emergency planning exercises. They coordinate with federal government, state government, local government, industries and livestock producers to ensure rapid response times to outbreaks and oversees management practices[91].

6.12.4 FEMA Declared Disasters

There have been no federally declared disasters specific to animal diseases[9].

6.12.5 Geographic Location

All of Fillmore County is at risk from animal diseases.

6.12.6 Hazard Extent

The hazard extent and impact to local jurisdictions varies depending on the overall health of the animal population, the specific characteristics of the disease, and the ability of modern medicine to treat and control the disease.

6.12.7 Vulnerability Analysis

6.12.7.A Critical Facilities

As discussed above, the risk of animal disease to critical facilities is related to how it can impact response times and recovery from other hazard events. Given the nature of the hazard it does not pose a significant risk on its own.

6.13 INFECTIONS DISEASE

6.13.1 Definition & Background

Infectious diseases are one of the leading causes of illness and death throughout the world. They are disorders caused by organisms (e.g. bacteria, viruses, fungi, parasites) which are transmitted from a source into a host and proceed to cause illness. Infectious diseases can be transmitted person to person, via bites from insects or animals (vector-borne diseases) by ingesting contaminated food or water (food and water related diseases), or through various other exposures in the environment[92]. Infectious diseases can affect humans, plants, or animals.

Throughout the 19th and 20th centuries, advancements in medicine and technology and improvements in hygiene and sanitation greatly decreased the threat from infectious diseases. As a result, between 1900 and 1999 the average life expectancy in the United States increased by 29 years[93]. Many diseases however, once thought to be in decline or eradicated, such as pertussis (whooping cough), tuberculosis, measles, mumps, cholera and smallpox, have re-emerged in recent decades. In addition to these resurgent diseases, recent decades have witnessed the emergence of deadly new diseases, such as HIV/AIDS, SARS, H1N1 (swine flu), H5N1 (bird flu), West Nile Virus, Mad Cow Disease, and Ebola. Important factors influencing emergence include changes in human demographics and behavior, technology and industry, economic development and land use, globalization, microbial adaptation and evolution, and the breakdown of public health measures [94]. Due to the disturbing trend of disease resurgence and emergence the complacency of the late 20th century has given way to a renewed focus on public health.

An epidemic occurs when there is a rapid outbreak of a specific disease, where the number of cases exceeds normal expectancy. If an epidemic spreads across a wide geographic area, it becomes a pandemic. Pandemics can cause, or contribute to, major societal disturbances and economic distress. The most well-known pandemic of the 20th century started in 1918. In less than two years the Spanish Flu killed between 30 and 50 million people, including 675,000 Americans[95]. Two additional global flu pandemics occurred in 1957 (Asian flu; two million dead globally; 70,000 Americans dead) and in 1968 (Hong Kong flu; 1 million dead globally; 33,000 Americans dead).

In 2005, the World Health Organization published guidance defining the six phases of a pandemic. These phases are depicted in Figure 6-50.

Figure 6-50: Six Phases of a Pandemic[96]

Inter-pandemic Period	
Phase 1	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.
Phase 2	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.
Pandemic Alert Period	
Phase 3	Human infection(s) with a new subtype but no human-to-human spread or at most rare instances of spread to a close contact.
Phase 4	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.
Phase 5	Larger cluster(s) but human-to-human spread is still localized, suggesting that the virus is becoming increasingly better adapted to humans but may not yet be fully transmissible (substantial pandemic risk).
Pandemic Period	
Phase 6	Pandemic phase: increased and sustained transmission in the general population.
Post-pandemic Period	
Return to Inter-pandemic Period (Phase 1).	

6.13.1.A Emerging and Re-emerging Diseases

According to the World Health Organization, an emerging disease is one that has appeared in a population for the first time, or that may have existed previously but is rapidly increasing in incidence or geographic range. Re-emerging infectious diseases are diseases that once were major health problems globally or in a particular country, and then declined dramatically, but are again becoming health problems for a significant proportion of the population (see Figure 6-51)[97].

Figure 6-51: Emerging and Re-emerging Diseases[98]

Emerging and Re-emerging Diseases		
Bovine Spongiform Encephalopathy and Variant Creutzfeldt-Jakob Disease	Campylobacteriosis	Chagas Disease
Cholera	Cryptococcosis	Cryptosporidiosis
Cyclosporiasis	Dengue Fever	Diphtheria
Ebola Hemorrhagic Fever	Escherichia Coli Infection	Group B Streptococcal Infection
Hantavirus Pulmonary Syndrome	Hepatitis C	Hendra Virus Infection
Histoplasmosis	HIV/AIDS	Influenza
Lassa Fever	Legionnaires' Disease (Legionellosis) and Pontiac Fever	Leptospirosis
Listeriosis	Lyme Disease	Malaria
Marburg Hemorrhagic Fever	Measles	Meningitis
Monkeypox	MRSA (Methicillin Resistant Staphylococcus Aureus)	Nipah Virus Infection
Norovirus (Formerly Norwalk Virus) Infection	Pertussis	Plague
Polio (Poliomyelitis)	Rabies	Rift Valley Fever
Rotavirus Infection	Salmonellosis	SARS (Severe Acute Respiratory Syndrome)
Shigellosis	Smallpox	Sleeping Sickness (Trypanosomiasis)
Tuberculosis	Tularemia	Valley Fever (Coccidioidomycosis)
VISA/VRSA - Vancomycin-Intermediate/ Resistant Staphylococcus Aureus	West Nile virus Infection	Yellow Fever

6.13.1.B Food and Water Related Diseases

Foodborne and waterborne illnesses are caused by consuming food or beverages that are contaminated by disease-causing microbes or pathogens[99] [100]. Foodborne and waterborne diseases can be acquired through recreational or drinking, from contact with animals or their environment, or through person-to-person contact[99]. More than 250 different food-related diseases have been identified. Most are infections, caused by a variety of bacteria, viruses, and parasites. Others are poisonings, caused by harmful toxins or chemicals that have contaminated the food (for example, poisonous mushrooms).

In the United States, the drinking water supply is normally safe. However, diseases that spread through water are still a very real problem. Private wells and community water supplies can become contaminated; usual sources of safe water may become unavailable in emergency situations; and lakes, streams, pools, or waterparks may be contaminated by humans or animals. Many of the food-related organisms can also be spread through water, though parasites cause the majority of problems. E-coli, Salmonella, Giardia, and Cryptosporidiosis, are the most prevalent food and water related diseases.

The various diseases have many different symptoms, so there is no one description of food-related illness. Since the disease causing organisms or toxins enter the body through the gastrointestinal tract; nausea, vomiting, abdominal cramps, and diarrhea are common symptoms of many of these diseases. Most of these diseases have no treatment or preventive vaccine. Regulation and inspection of food and water supplies are critical for preventing these diseases.

Figure 6-52 recognizes food and water related diseases. Some illnesses can be both a food and a water related disease.

Figure 6-52: Common Food and Water Diseases[99] [100]

Food Related Diseases:	Water Related Diseases:
Campylobacteriosis	Cryptosporidiosis
Cryptosporidiosis	Escherichia coli O157:H7 Infection
Escherichia coli O157:H7 Infection	Giardiasis
Giardiasis	Harmful Algal Blooms
Listeriosis	Legionellosis
Norovirus infection	Naegleria and Amebic Meningoencephalitis
Salmonellosis	Norovirus Infection
Scombroid fish poisoning	Shigellosis
Shigellosis	
Toxoplasmosis	
Vibrio infection	
Yersinsiosis	

6.13.1.C Vector-Borne Diseases

Vector-borne diseases are those often related to "summer bug" bites including mosquito-transmitted diseases, tick-transmitted diseases, and other pests of medical interest (most of which do not carry diseases, but they can be a substantial public health nuisance), and are detailed in Figure 6-53[101]. The two most common vector-borne diseases are West Nile Virus and LaCrosse Encephalitis.

Figure 6-53: Vector-Borne Diseases[101]

Diseases Spread by Mosquitos:	Diseases Spread by Ticks:
West Nile Virus	Lyme Disease
La Crosse Encephalitis	Human Anaplasmosis
Jamestown Canyon Virus	Babesiosis
Western Equine Encephalitis	Rocky Mountain Spotted Fever
Eastern Equine Encephalitis	Ehrlichiosis
St. Louis Encephalitis	Powassan Virus
Malaria	Southern Tick-Associated Rash Illness
Dengue	Tularemia
Chikungunya	

6.13.2 Relationship to Other Hazards

Infectious disease outbreaks may occur as primary events themselves or following a major hazard event, such as drought or water supply contamination event. Alternatively, an outbreak of infectious disease may impact a community's response to and recovery from another hazard event. For example, if a tornado was to occur during a major flu outbreak the number of available emergency responders may be much lower than normal. Additionally, medical facilities may be at capacity and unable to accommodate additional wounded persons.

6.13.3 Previous Occurrences

Fillmore County has also experienced clusters of infectious disease and has had small food and water related outbreaks. The following is a list of outbreaks that have occurred in past decades:

- Cryptosporidiosis 2016
- Hepatitis Outbreak 1989-1990
- Measles Outbreak 1989-1991
- Mumps Outbreak 2006
- Pertussis Outbreak 1993-1994, 2005, 2010
- Rubella Outbreak 1990-1991[103]

Fillmore County, however, has not seen any significant outbreaks of infectious diseases in recent years. Figure 6-54 shows the recorded incidences of infectious diseases in Fillmore County from 2005 to 2017 and Minnesota's median level of occurrence.

Figure 6-54: Infectious Disease Statistics 2005-2017[102]

Infectious Disease	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Aids				1	0	1	0	0	0	0	0
Amebiasis				0	1	0	0	0	0	0	0
Anaplasmosis	1	0	0	0	1	3	1	0	2	0	0
Bacterial Meningitis (Non-Neisseria Meningitidis)				0	0	0	1	0	1	1	0
Campylobacteriosis	4	5	16	6	11	13	7	6	9	6	3
Chlamydia	16	29	13	19	24	38	23	30	38	40	38
Cryptosporidiosis	0	1	9	4	2	5	7	7	4	7	5
E. Coli (Stec)				1	0	8	2	4	0	2	2
E. Coli O157										2	2
Giardiasis				0	2	0	3	0	1	0	0
Gonorrhea	3	0	1	5	3	6	2	1	3	2	2
Haemophilus Influenza				1	0	1	0	1	2	0	1

Figure 6-54: Infectious Disease Statistics 2005-2017[102] *(con't)*

Infectious Disease	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hepatitis A				1	0	0	0	0	0	0	0
Hepatitis B				0	1	0	0	0	0	0	0
Histoplasmosis									0	1	2
Hiv				0	1	0	0	1	0	0	0
Influenza (Hospitalizations By Season)				1	5	5	6	13	1	20	2
Legionellosis				0	0	2	0	3	0	0	1
Listeriosis				0	1	0	0	0	0	0	0
Lyme Disease	3	2	1	2	6	8	8	6	6	6	7
Mumps	0	0	0	0	0	0	0	0	1	0	0
Pertussis	3	19	0	0	2	0	3	6	1	5	1
Rabies (Animal)				1	3	0	1	1	1	1	0
Salmonellosis	4	3	2	2	4	2	5	2	1	2	3
Shigellosis				0	0	0	0	0	0	0	1
Streptococcus Group A (Invasive)				0	0	1	4	0	2	0	0
Streptococcus Group B (Invasive)				1	2	2	7	3	2	2	6
Streptococcus Pneumoniae				0	0	0	3	1	1	2	3
Streptococcus Pneumoniae (Invasive Drug Resistant)				1	1	1	0	0	0	0	
Syphilis (All Stages)				1	0	0	0	0	0	0	0
Syphilis (Late Latent)				1	0	0	0	0	0	0	0
Tuberculosis				0	1	0	0	0	0	0	0
Viral (Aseptic) Meningitis				1	0	1	3	1	3	2	0
Yersiniosis				0	0	1	0	1	0	0	0

6.13.4 FEMA Declared Disasters

There have been no federally declared disasters specific to infectious disease[9].

6.13.5 Geographic Location

The entire county is at risk from infectious diseases.

6.13.6 Hazard Extent

The hazard extent and impact on communities varies depending on the overall health of the community, the specific characteristics of the disease, and the ability of modern medicine to treat and control the disease. Despite medical breakthroughs and new technology, infectious diseases continue to pose an important public health problem. Today, the issue of emerging and re-emerging infectious diseases is at the forefront of public health concern. The very young, older adults, hospitalized and institutionalized patients are at increased risk for many infectious diseases. Changes in demographics, lifestyles, technology, land use practices, food production and distribution methods, child care practices and increasing poverty all have a role in emerging infections.

6.13.7 Vulnerability Analysis

6.13.7.A Critical Facilities

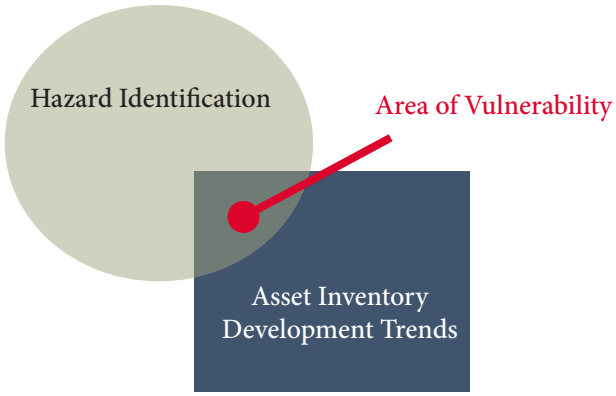
As discussed above, the risk infectious disease poses to critical facilities is related to how it can impact response times and recovery from other hazard events. Given the nature of the hazard it does not pose a significant risk on its own. A close collaboration is needed for prevention and control of infectious diseases between clinical providers, clinical laboratories, state and local health departments and federal agencies. Additionally, a need exists for continued education of industry (e.g. food producers and food-service industries), healthcare students and providers along with research to improve immunizations, diagnostic methods and therapeutic modalities.

6.14 VULNERABILITY ASSESSMENT

The Calculated Priority Risk Index (CPRI) is a tool used to assess hazards based on an indexing system that considers probability, magnitude/severity, warning time, and duration. The CPRI value is obtained by assigning varying degrees of risk to each of the four categories for each hazard, and then calculating an index value based on a weighting model. For this update, the mitigation team evaluated the updated hazards and developed new CPRI values.

The vulnerability assessment builds upon the previously developed hazard information by identifying the community assets and development trends and intersecting them with the hazard profiles to assess the potential amount of damage that could be caused by each hazard event. This concept is generally illustrated by Figure 6-55.

Figure 6-55: Conceptual Depiction of a Vulnerability Analysis



6.14.1 Definitions of CPRI Categories

6.14.1.A Probability

A guide to predict how often a random event will occur. Annual probabilities are expressed between 0.001 or less (low) up to 1 (high). An annual probability of one predict that a natural hazard will occur at least once per year.

6.14.1.B Magnitude/Severity

Indicates the impact to a community through potential fatalities, injuries, property losses, and/or losses of services. The vulnerability assessment gives information that is helpful in making this determination for each community.

6.14.1.C Warning Time

Plays a factor in the ability to prepare for a potential disaster and to warn the public. More warning time should allow for more emergency preparations and public information.

6.14.1.D Duration

Relates to the span of time local, state, and/or federal assistance will be necessary to prepare, respond, and recover from a potential disaster event.

6.14.2 CPRI Ratings

The following ratings are provided as a tool for local governments to analyze their risks. The CPRI ratings should not be construed as a precise way for determining risk. The ratings are a way to quantify and summarize the information from the risk and vulnerability assessment. Local input is also part of the rating since the ratings are done as part of the mitigation team. The CPRI ratings are coded by color in Figure 6-56 to act as one of the components to prioritize mitigation actions.

Figure 6-56: CPRI Ratings

CPRI Rating Range	Priority
3.00 – 4.00	High
2.00 – 2.99	Medium
1.00 – 1.99	Low
0.00 – 0.99	Negligible

6.14.3 Probability and Impact Rating

Ratings were determined using methodology provided by HSEM and with input from local jurisdictions. Input for the unincorporated areas was provided by the county, which was combined with input from each of the fourteen cities to create the county total CPRI rating (see Figure 6-57).

Figure 6-57: Fillmore County CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity		Warning Time / Duration	
	County	Average*	County	Average*	Warning Time	Duration
Severe Storms	3.20	3.30	2.60	2.32	< 6 – 12 hours	Less than a week
Tornadoes	2.60	2.31	3.00	2.83	< 6 hours	Up to several weeks
Extreme Temperatures	2.50	2.38	2.00	1.88	12-24 hours	Less than 24 hours
Flood	3.20	2.64	2.80	2.48	> 1 month	Up to several years
Landslides	1.80	1.58	1.70	1.47	<1 hour	Up to several weeks
Fire	2.70	2.59	2.20	2.36	<1 hour	Up to a week
Human-Related	1.90	1.34	2.00	1.49	0-24 Hours	Up to several months
Hazardous Materials	2.20	1.87	2.20	1.98	< 1 day	Up to several weeks
Dam/Levee Failure	2.70	1.58	3.00	1.68	<1 week	Up to several weeks
Essential Services Failure	1.80	1.83	1.90	2.20	<1 week	Up to a day
Animal Disease	2.40	1.46	2.50	1.64	<1 day	Up to several weeks
Infectious Disease	2.20	1.49	2.30	1.59	<1 day	Up to several weeks

**Combined average score of all participating jurisdictions including Fillmore County.*

6.14.4 Vulnerability Assessment by Jurisdiction

Each individual jurisdiction within the county was asked to rate their vulnerability to each of the hazards identified in the plan. Jurisdictions were asked to both assess the probability that a hazard might affect their jurisdiction as well as the severity or impact that the hazard could have. The overall ratings for each hazard were averaged out to give a county wide total.

Figures 6-58 through 6-72 show the rating given by each city for probability, impact and the overall county average. The scale given for probability was highly likely, likely, possibly and unlikely; while impact was rated on a scale of catastrophic, critical, limited, and negligible. Hazards highlighted in green are those that represented a lower rating than the county wide average, while those in red represent a higher rating.

Green represents a ranking that is lower than the average score of the cities in Fillmore County. The individual jurisdiction ranked the hazard to have a lower probability or impact compared to other cities (on average) within the county. Red represents a higher average score.

Figure 6-58: Fillmore County CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	County	Average of County and All Cities	County	Average of County and All Cities
Severe Storms	3.20	3.30	2.60	2.32
Tornadoes	2.60	2.31	3.00	2.83
Extreme Temperatures	2.50	2.38	2.00	1.88
Flood	3.20	2.64	2.80	2.48
Landslides	1.80	1.58	1.70	1.47
Fire	2.70	2.59	2.20	2.36
Human-Related	1.90	1.34	2.00	1.49
Hazardous Materials	2.20	1.87	2.20	1.98
Dam/Levee Failure	2.70	1.58	3.00	1.68
Essential Services Failure	1.80	1.83	1.90	2.20
Animal Disease	2.40	1.46	2.50	1.64
Infectious Disease	2.20	1.49	2.30	1.59
All Hazards	**2.43**	**2.03**	**2.35**	**1.99**

Figure 6-59: City of Canton CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Canton	Average of All Cities	Canton	Average of All Cities
Severe Storms	4.00	3.31	3.00	2.30
Tornadoes	2.00	2.29	3.00	2.82
Extreme Temperatures	3.00	2.37	3.00	1.87
Flood	3.00	2.60	2.00	2.45
Landslides	3.00	1.56	2.00	1.45
Fire	3.00	2.58	3.00	2.37
Human-Related	2.00	1.30	2.00	1.45
Hazardous Materials	2.00	1.85	2.00	1.96
Dam/Levee Failure	3.00	1.50	2.00	1.58
Essential Services Failure	3.00	1.83	2.00	2.23
Animal Disease	2.00	1.39	2.00	1.58
Infectious Disease	1.00	1.44	0.00	1.54
All Hazards	**2.58**	**2.00**	**2.17**	**1.97**

Figure 6-60: City of Chatfield CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Chatfield	Average of All Cities	Chatfield	Average of All Cities
Severe Storms	4.00	3.31	2.50	2.30
Tornadoes	2.00	2.29	3.00	2.82
Extreme Temperatures	2.00	2.37	2.00	1.87
Flood	3.00	2.60	2.00	2.45
Landslides	1.00	1.56	2.00	1.45
Fire	3.00	2.58	3.50	2.37
Human-Related	1.00	1.30	2.00	1.45
Hazardous Materials	2.00	1.85	2.00	1.96
Dam/Levee Failure	1.00	1.50	1.00	1.58
Essential Services Failure	2.00	1.83	3.00	2.23
Animal Disease	1.00	1.39	1.00	1.58
Infectious Disease	1.00	1.44	1.00	1.54
All Hazards	**1.92**	**2.00**	**2.08**	**1.97**

Figure 6-61: City of Fountain CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Fountain	Average of All Cities	Fountain	Average of All Cities
Severe Storms	3.00	3.31	2.00	2.30
Tornadoes	2.00	2.29	3.00	2.82
Extreme Temperatures	3.00	2.37	2.00	1.87
Flood	2.50	2.60	2.00	2.45
Landslides	1.50	1.56	1.50	1.45
Fire	1.50	2.58	2.50	2.37
Human-Related	1.50	1.30	1.50	1.45
Hazardous Materials	2.00	1.85	2.50	1.96
Dam/Levee Failure	1.00	1.50	1.00	1.58
Essential Services Failure	2.00	1.83	2.50	2.23
Animal Disease	1.00	1.39	1.00	1.58
Infectious Disease	1.50	1.44	2.00	1.54
All Hazards	**1.88**	**2.00**	**1.96**	**1.97**

Figure 6-62: City of Harmony CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Harmony	Average of All Cities	Harmony	Average of All Cities
Severe Storms	3.00	3.31	1.00	2.30
Tornadoes	3.00	2.29	2.00	2.82
Extreme Temperatures	3.00	2.37	2.00	1.87
Flood	1.00	2.60	1.00	2.45
Landslides	1.00	1.56	1.00	1.45
Fire	2.00	2.58	2.00	2.37
Human-Related	1.00	1.30	1.00	1.45
Hazardous Materials	2.00	1.85	2.00	1.96
Dam/Levee Failure	1.00	1.50	1.00	1.58
Essential Services Failure	1.00	1.83	1.00	2.23
Animal Disease	1.00	1.39	1.00	1.58
Infectious Disease	1.00	1.44	1.00	1.54
All Hazards	**1.67**	**2.00**	**1.33**	**1.97**

Figure 6-63: City of Lanesboro CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Lanesboro	Average of All Cities	Lanesboro	Average of All Cities
Severe Storms	4.00	3.31	2.00	2.30
Tornadoes	2.00	2.29	3.00	2.82
Extreme Temperatures	1.00	2.37	1.00	1.87
Flood	2.00	2.60	3.00	2.45
Landslides	2.00	1.56	2.00	1.45
Fire	2.00	2.58	3.00	2.37
Human-Related	1.00	1.30	2.00	1.45
Hazardous Materials	2.00	1.85	3.00	1.96
Dam/Levee Failure	2.00	1.50	3.00	1.58
Essential Services Failure	1.00	1.83	3.00	2.23
Animal Disease	1.00	1.39	2.00	1.58
Infectious Disease	1.00	1.44	2.00	1.54
All Hazards	**1.75**	**2.00**	**2.42**	**1.97**

Figure 6-64: City of Mabel CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Mabel	Average of All Cities	Mabel	Average of All Cities
Severe Storms	3.00	3.31	3.00	2.30
Tornadoes	1.00	2.29	3.00	2.82
Extreme Temperatures	1.00	2.37	1.00	1.87
Flood	4.00	2.60	3.00	2.45
Landslides	1.00	1.56	2.00	1.45
Fire	2.00	2.58	2.00	2.37
Human-Related	1.00	1.30	3.00	1.45
Hazardous Materials	1.00	1.85	2.00	1.96
Dam/Levee Failure	1.00	1.50	2.00	1.58
Essential Services Failure	2.00	1.83	3.00	2.23
Animal Disease	1.00	1.39	2.00	1.58
Infectious Disease	2.00	1.44	2.00	1.54
All Hazards	**1.67**	**2.00**	**2.33**	**1.97**

Figure 6-65: City of Ostrander CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Ostrander	Average of All Cities	Ostrander	Average of All Cities
Severe Storms	3.00	3.31	3.00	2.30
Tornadoes	2.50	2.29	3.50	2.82
Extreme Temperatures	3.50	2.37	3.00	1.87
Flood	1.00	2.60	1.50	2.45
Landslides	1.00	1.56	0.50	1.45
Fire	2.00	2.58	2.50	2.37
Human-Related	1.00	1.30	1.00	1.45
Hazardous Materials	2.00	1.85	2.50	1.96
Dam/Levee Failure	1.00	1.50	1.00	1.58
Essential Services Failure	2.50	1.83	2.00	2.23
Animal Disease	1.50	1.39	2.00	1.58
Infectious Disease	1.50	1.44	2.00	1.54
All Hazards	**1.88**	**2.00**	**2.04**	**1.97**

Figure 6-66: City of Peterson CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Peterson	Average of All Cities	Peterson	Average of All Cities
Severe Storms	3.00	3.31	0.00	2.30
Tornadoes	2.00	2.29	3.00	2.82
Extreme Temperatures	2.00	2.37	1.00	1.87
Flood	3.00	2.60	3.00	2.45
Landslides	2.00	1.56	2.00	1.45
Fire	2.00	2.58	2.00	2.37
Human-Related	1.00	1.30	1.00	1.45
Hazardous Materials	1.00	1.85	1.00	1.96
Dam/Levee Failure	3.00	1.50	3.00	1.58
Essential Services Failure	2.00	1.83	4.00	2.23
Animal Disease	1.00	1.39	1.00	1.58
Infectious Disease	1.00	1.44	1.00	1.54
All Hazards	**1.92**	**2.00**	**1.83**	**1.97**

Figure 6-67: City of Preston CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Preston	Average of All Cities	Preston	Average of All Cities
Severe Storms	4.00	3.31	3.00	2.30
Tornadoes	3.00	2.29	2.00	2.82
Extreme Temperatures	4.00	2.37	2.00	1.87
Flood	4.00	2.60	3.00	2.45
Landslides	3.00	1.56	2.00	1.45
Fire	4.00	2.58	2.00	2.37
Human-Related	1.00	1.30	0.00	1.45
Hazardous Materials	2.00	1.85	2.00	1.96
Dam/Levee Failure	1.00	1.50	2.00	1.58
Essential Services Failure	2.00	1.83	2.00	2.23
Animal Disease	2.00	1.39	2.00	1.58
Infectious Disease	2.00	1.44	2.00	1.54
All Hazards	**2.67**	**2.00**	**2.00**	**1.97**

Figure 6-68: City of Rushford CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Rushford	Average of All Cities	Rushford	Average of All Cities
Severe Storms	3.00	3.31	3.00	2.30
Tornadoes	2.00	2.29	3.00	2.82
Extreme Temperatures	2.00	2.37	2.00	1.87
Flood	2.00	2.60	3.00	2.45
Landslides	1.00	1.56	1.00	1.45
Fire	2.00	2.58	2.00	2.37
Human-Related	1.00	1.30	1.00	1.45
Hazardous Materials	2.00	1.85	2.00	1.96
Dam/Levee Failure	1.00	1.50	2.00	1.58
Essential Services Failure	1.00	1.83	2.00	2.23
Animal Disease	1.00	1.39	2.00	1.58
Infectious Disease	1.00	1.44	2.00	1.54
All Hazards	**1.58**	**2.00**	**2.08**	**1.97**

Figure 6-69: City of Rushford Village CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Rushford Village	Average of All Cities	Rushford Village	Average of All Cities
Severe Storms	4.00	3.31	3.00	2.30
Tornadoes	3.00	2.29	3.00	2.82
Extreme Temperatures	3.00	2.37	2.00	1.87
Flood	3.00	2.60	2.00	2.45
Landslides	2.00	1.56	1.00	1.45
Fire	3.00	2.58	1.00	2.37
Human-Related	2.00	1.30	1.00	1.45
Hazardous Materials	2.00	1.85	1.00	1.96
Dam/Levee Failure	2.00	1.50	2.00	1.58
Essential Services Failure	2.00	1.83	1.00	2.23
Animal Disease	2.00	1.39	1.00	1.58
Infectious Disease	2.00	1.44	1.00	1.54
All Hazards	**2.50**	**2.00**	**1.58**	**1.97**

Figure 6-70: City of Spring Valley CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Spring Valley	Average of All Cities	Spring Valley	Average of All Cities
Severe Storms	3.33	3.31	2.75	2.30
Tornadoes	2.50	2.29	3.00	2.82
Extreme Temperatures	2.67	2.37	2.17	1.87
Flood	2.83	2.60	2.83	2.45
Landslides	1.33	1.56	1.33	1.45
Fire	2.67	2.58	2.67	2.37
Human-Related	1.67	1.30	1.83	1.45
Hazardous Materials	2.83	1.85	2.50	1.96
Dam/Levee Failure	1.00	1.50	1.17	1.58
Essential Services Failure	2.08	1.83	2.67	2.23
Animal Disease	2.00	1.39	2.17	1.58
Infectious Disease	2.17	1.44	2.50	1.54
All Hazards	**2.26**	**2.00**	**2.30**	**1.97**

Figure 6-71: City of Whalan CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Whalan	Average of All Cities	Whalan	Average of All Cities
Severe Storms	2.00	3.31	2.00	2.30
Tornadoes	2.00	2.29	2.00	2.82
Extreme Temperatures	1.00	2.37	1.00	1.87
Flood	3.00	2.60	4.00	2.45
Landslides	1.00	1.56	1.00	1.45
Fire	3.00	2.58	2.00	2.37
Human-Related	1.00	1.30	1.00	1.45
Hazardous Materials	1.00	1.85	1.00	1.96
Dam/Levee Failure	2.00	1.50	0.00	1.58
Essential Services Failure	1.00	1.83	1.00	2.23
Animal Disease	1.00	1.39	1.00	1.58
Infectious Disease	1.00	1.44	1.00	1.54
All Hazards	**1.58**	**2.00**	**1.42**	**1.97**

Figure 6-72: City of Wykoff CPRI Hazard Rankings

Hazard	Probability		Magnitude / Severity	
	Wykoff	Average of All Cities	Wykoff	Average of All Cities
Severe Storms	3.00	3.31	2.00	2.30
Tornadoes	3.00	2.29	3.00	2.82
Extreme Temperatures	2.00	2.37	2.00	1.87
Flood	2.00	2.60	2.00	2.45
Landslides	1.00	1.56	1.00	1.45
Fire	4.00	2.58	3.00	2.37
Human-Related	2.00	1.30	2.00	1.45
Hazardous Materials	2.00	1.85	2.00	1.96
Dam/Levee Failure	1.00	1.50	1.00	1.58
Essential Services Failure	2.00	1.83	2.00	2.23
Animal Disease	2.00	1.39	2.00	1.58
Infectious Disease	2.00	1.44	2.00	1.54
All Hazards	**2.17**	**2.00**	**2.00**	**1.97**

Section 7: Mitigation Strategies

The goal of mitigation is to minimize the impact from hazard events on Fillmore County. This applies to property damage, loss of life, and the economic disruption that can accompany the most serious of disasters. Identifying which hazards are the most likely to adversely impact the county and quantifying the risk they pose is only part of the picture of hazard mitigation. The next step is identifying specific mitigation goals and strategies that can be pursued at the county and city levels in order to achieve the goal of disaster resistant communities.

7.1 COMMUNITY CAPABILITY ASSESSMENT

The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to decreasing damages. Since the previous plan, there have been several instances where the local jurisdictions have implemented mitigation actions into local processes and procedures. All of the mitigation actions, whether they were a policy, regulation, procedure, program, or project, their results have improved the safety of those that live within Fillmore County. Some of these actions include ARMER radio system, and CodeRED.

Within the first responder community, Fillmore County has upgraded to the ARMER radio system. This upgrade provides an improved communications system within each department to first responders and for those in neighboring communities.

There have been updates to the current siren system due to the new ARMER radio system. The county has added an alert notification system called CodeRED. Fillmore County now has the ability to communicate with all residents on where to go for assistance during a disaster. Along with the notification system, Fillmore County has also added the CodeRED weather notification system. This ensures residents are notified during the time of a tornado, flooding, severe thunderstorm warning, and winter storm warning. This system is location specific so residents know the information they receive is relevant to them and allows them time to protect their families and themselves. These projects and initiatives have helped increase safety during the time of a disaster.

The capability assessment also provides an evaluation of capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within each community in Fillmore County.

7.1.1 National Food Insurance Program (NFIP)

Fillmore County and the Cities of Chatfield, Harmony, Lanesboro, Mabel, Peterson, Preston, Rushford, Rushford Village, Spring Valley, and Whalan participate in the National Flood Insurance Program. The Cities of Canton, Fountain, Ostrander, and Wykoff do not participate in the program. The communities of Preston, Spring Valley and Mabel indicated that they have Repetitive Loss properties in their communities. Repetitive loss structures are those structures which have sustained damages on two or more separate occasions within a ten-year time span for which the cost of repairs at the time of the flood meets or exceeds 25 percent of the market value of the structure before the damage occurred.

The City of Mabel indicated that they have a one block area that has had repetitive losses to structures. Two of homes in the area were considered for buy-out, and one of the homes was purchased.

The City of Spring Valley indicated that are 13 sites that are considered to have repetitive loss structures. These sites contain eight residences and four commercial and one church building. Three of the residences have been purchased as part of their buyout program.

Preston is currently in the process of identifying repetitive loss structures within the city limits.

Since 2006, Fillmore County has had eight property acquisitions completed in order to mitigate repetitive flood loss. Figure 7-1 shows the city and amount paid in order to acquisition the repetitive loss properties.

Figure 7-1: FEMA Hazard Mitigation Grant Program - Property Acquisitions

City	Disaster Number	Project Title	Project Number	Date Closed	Structure Type	Damage Category	Actual Amount Paid
Preston	1830	City of Preston buyout	0012	03/19/2013	Single Family	50 - 99%	$39,400
Preston	1717	City of Preston Substantial Damage Acquisition/ Demolition	0021	04/07/2011	Single Family	50 - 99%	$31,300
Mabel	1333	City of Mabel - Acquisition	0013	12/22/2008	Non-residential - Private	0 - 49%	$33,500
Spring Valley	1333	City of Spring Valley - Acquisition	0003	02/16/2006	Non-residential - Private	0 - 49%	$19,600
Spring Valley	1333	City of Spring Valley - Acquisition	0003	02/16/2006	Non-residential - Private	0 - 49%	$40,000
Spring Valley	1333	City of Spring Valley - Acquisition	0003	02/16/2006	Single Family	0 - 49%	$149,800
Spring Valley	1333	City of Spring Valley - Acquisition	0003	02/16/2006	Single Family	50 - 99%	$83,200
Spring Valley	1333	City of Spring Valley - Acquisition	0003	02/16/2006	Single Family	0 - 49%	$40,700

There are FEMA Mapped High Risk Areas within the county, as well as within Chatfield, Lanesboro, Mabel, Ostrander, Peterson, Preston, Rushford, Rushford Village, Spring Valley, and Whalan. The latest Flood Insurance Rate Map (FIRM) that was completed for the county was in 1987[102]. There are no plans to produce Digital Flood Information Rate Maps for Fillmore County. The county and participating cities will continue to enforce the floodplain ordinances.

Given most individuals in the county do not live within a high risk flooding area, it is unsurprising that there is limited participation in the NFIP. As of November 2015, there were a total of 187 policies in force in the county, insuring a total of $38,340,600[104]. Figure 7-2 identifies each community and the date each participant joined the NFIP.

Figure 7-2: Additional Information on Communities Participating in the NFIP[105]

Community	Participation	Initial FIRM	Current Eff. Map Date	Entry Date
Fillmore County	Yes	09/18/87	09/18/87(M)	09/18/87
City of Canton	No	N/A	N/A	N/A
City of Chatfield	Yes	08/02/82	08/02/82	08/02/82
City of Fountain	No	N/A	N/A	N/A
City of Harmony	Yes	Unknown	Unknown	04/17/09(E)
City of Lanesboro	Yes	09/02/81	09/02/81	09/02/81
City of Mabel	Yes	03/02/81	03/02/81	03/02/81
City of Ostrander	No	N/A	N/A	N/A
City of Peterson	Yes	05/05/81	05/05/81	05/05/81
City of Preston	Yes	08/01/79	11/02/94	08/01/79
City of Rushford	Yes	05/23/80	05/23/80(M)	05/23/80
City of Rushford Village	Yes	09/04/87	09/04/87(M)	05/24/93
City of Spring Valley	Yes	09/02/81	09/02/81	09/02/81
City of Whalan	Yes	03/02/81	03/02/81	03/02/81
City of Wykoff	No	N/A	N/A	N/A

7.1.2 Plans and Ordinances

Fillmore County and the fourteen communities it contains have a variety of plans and ordinances currently in place that work towards mitigating hazards.

Figure 7-3, 7-4, and 7-5 lists some of the plans.

Figure 7-3: Existing Plans for Fillmore County Communities

	Fillmore County	City of Canton	City of Chatfield	City of Fountain	City of Harmony	City of Lanesboro	City of Mabel	City of Ostrander	City of St. Peterson	City of Preston	City of Rushford	City of Rushford Village	City of Spring Valley	City of Whalan	City of Wykoff
Comprehensive Plan	X	X	X						X	X	X	X	X	X	
General Land Use Plan	X	X	X				X				X	X	X		X
Sustainability Plan												X			
Capital Improvements Plan			X			X				X	X	X	X		X
Redevelopment Plan												X			
Post-Disaster Redevelopment / Recovery Plan	X											X			
Regional Development Plan														X	
Watershed Protection / Enhancement Plan		X								X	X				
Open Space Plan													X		
Flood Mitigation Plan		X			X	X					X	X	X		
College Campus Plan															
Comprehensive Emergency Management Plan	X				X						X	X	X	X	
Evacuation Plan	X					X							X		

Figure 7-4: Existing Codes, Regulations, and Procedures for Fillmore County Communities

	Fillmore County	City of Canton	City of Chatfield	City of Fountain	City of Harmony	City of Lanesboro	City of Mabel	City of Ostrander	City of St. Peterson	City of Preston	City of Rushford	City of Rushford Village	City of Spring Valley	City of Whalan	City of Wykoff
Zoning Ordinance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Subdivision Regulations	X		X	X	X					X	X	X	X	X	
Building Code / Permitting	X	X	X			X			X		X	X	X	X	
Landscape Code												X		X	
Solid Waste and Hazardous Materials Waste Regulations		X	X			X				X		X		X	
Property Deed Restrictions	X									X					
Tree Protection Ordinance		X				X	X			X	X				
Site Plan Review	X		X						X	X	X	X	X		
Architectural / Design Review															
Storm Water Management		X	X						X	X	X	X			
Soil Erosion Ordinance	X	X							X	X	X	X			
Floodplain Ordinance															

Figure 7-5: Existing Programs for Fillmore County Communities

	Fillmore County	City of Canton	City of Chatfield	City of Fountain	City of Harmony	City of Lanesboro	City of Mabel	City of Ostrander	City of St. Peterson	City of Preston	City of Rushford	City of Rushford Village	City of Spring Valley	City of Whalan	City of Wykoff
Historic Preservation Program			X			X						X			
Construction / Retrofit Program															
Transportation Improvement / Retrofit Program	X														
School District Facilities Program							X		X				X		
Environmentally Sensitive Purchase / Protection Program															
Long-Range Recreation Facilities Program													X		
Economic Development Authority	X		X		X	X	X		X	X	X	X	X		
Land Buyout Program										X			X		
Downtown Redevelopment Authority													X		
Local and/or Regional Evacuation Program															
Firewise or other Fire Mitigation Program															
Fire Rescue Long-Range Program									X						
Mutual Aid Agreement	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Temporary Animal Relocation Program															

7.2 MITIGATION GOALS

Section 6.0 of this plan identified hazards that are a risk to Fillmore County. The original goals and objectives from the 2008 Hazard Mitigation Plan have been completely revised and updated in order to mirror those found in the State of Minnesota All-Hazard Mitigation Plan (see Figure 7-6). This will allow the two plans to work together and assist the State of Minnesota in developing strategies that will better reflect local conditions.

The goals and objectives are categorized by the six mitigation measure categories from the FEMA State and Local Mitigation Planning How to Guides. These are:

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school age and adult education programs.
- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

Figure 7-6: Hazard Mitigation Goals, Strategies, and Objectives

Goal 1 – Tornado: Reduce deaths, injuries, property loss, and economic disruption due to tornadoes.	
Mitigation Strategy	**Objectives**
Prevention	Adoption of ordinances and legislation, acquisition and use of equipment, planning, conducting technical training, studies, and retrofit or construction of safe rooms will be used to prevent or reduce risks to lives, property, and economic activity from tornadoes.
Property Protection	Constructing safe rooms and storm shelters, and retrofits will be used to prevent or reduce risks to property from tornadoes.
Public Education and Awareness:	Warning systems, IPAWS, public education, and access to information will be used to raise public awareness of risks from tornadoes in order to prevent or reduce those risks.
Emergency Services	Warning systems, technological improvements, responder training, planning, emergency response services, and acquisition and use of equipment will provide emergency services to prevent or reduce risks from tornadoes.
Structural Improvements	Construction of storm shelter and safe rooms and maintenance of other structural projects will be used to prevent or reduce risks from tornadoes.

Figure 7-6: Hazard Mitigation Goals, Strategies, and Objectives *(con't)*

Goal 2 – Flooding: Reduce deaths, injuries, property loss and economic disruption due to all types of flooding (riverine, flash flooding)	
Mitigation Strategy	**Objectives**
Prevention	Planning, technical studies, training, adoption of ordinances and legislation, acquisition and use of equipment, establishing shelters, and encouraging participation in NFIP and CRS will be used to prevent or reduce risks to lives and property from flooding.
Property Protection	Acquisition, repair, or retrofitting of property and acquisition and use of equipment will be used to prevent or reduce risks to property from flooding.
Public Education and Awareness	Public education and access to information will be used to raise public awareness of risks from flooding in order to prevent or reduce those risks.
Natural Resource Protection	Stream corridor protection projects and restoration and soil erosion control projects will be used to prevent or reduce risks and increase the protection of natural resources from flooding.
Emergency Services	Technological improvements, warning systems, responder training, emergency response services, acquisition and use of equipment, and planning will provide emergency services to prevent or reduce the risks to lives and property from flooding.
Structural Improvements	Construction and maintenance of drains, sewer drainage and separation projects, floodwalls, dams, culverts, levees, roads, bridges, and general flood protection projects will be used to prevent or reduce damages from flooding, loss of services to critical equipment, and the risks they pose to lives, property, and the natural environment.
Goal 3 – Landslide: Reduce deaths, injuries, property loss, and economic disruption due to (hillside, coastal, bluff: caused primarily by oversaturation of soil).	
Mitigation Strategy	**Objectives**
Prevention	Planning, technical studies, land use plans, adoption of setback ordinances, buyout or relocation of properties and adoption of building codes will be used to prevent or reduce risks from landslides.
Public Education and Awareness	Public education and access to information will be used to raise public awareness of risks from flooding in order to prevent or reduce those risks.
Emergency Services	Planning to implement emergency services will be used to prevent or reduce risks from landslides.

The hazards in Figure 7-7 were not found in the State All-Hazard Mitigation Plan and were developed by the Fillmore County planning team.

Figure 7-7: Hazard Mitigation Goals, Strategies, and Objectives for Other Hazards

Goal 4 – Severe Storms: Reduce deaths, injuries, property loss, and economic disruption due to severe winter and summer storms.	
Mitigation Strategy	**Objectives**
Prevention	Acquisition and use of equipment, adoption and enforcement of ordinances and legislation, planning, and technical studies will be used to prevent or reduce risk to the protection of lives, property, and economic activity from the risks from severe winter and summer storms.
Property Protection	Acquisition and use of equipment and vegetation management will be used to prevent or reduce risks to property from the risks from severe winter and summer storms.
Public Education and Awareness	Public education, warning systems, access to information, and outreach projects will be used to raise public awareness of the risks from severe winter and summer storms in order to reduce those risks.
Emergency Services	Acquisition and use of equipment, emergency response services, warning systems, technological improvements, planning, and responder training will provide emergency services to prevent or reduce risks from severe winter and summer storms.
Structural Improvements	Structural projects will be implemented and maintained to prevent or reduce risks from severe winter and summer storms.
Goal 5 – Extreme Temperatures: Reduce deaths, injuries, property loss, and economic disruption due to extreme temperatures.	
Mitigation Strategy	**Objectives**
Prevention	Acquisition and use of equipment, adoption and enforcement of ordinances and legislation, planning, and technical studies will be used to prevent or reduce risk to the protection of lives, property, and economic activity from the risks from extreme temperatures.
Property Protection	Acquisition and use of equipment and vegetation management will be used to prevent or reduce risks to property from the risks from extreme temperatures.
Public Education and Awareness	Public education, warning systems, access to information, and outreach projects will be used to raise public awareness of the risks from extreme temperatures in order to reduce those risks.
Emergency Services	Acquisition and use of equipment, emergency response services, warning systems, technological improvements, planning, and responder training will provide emergency services to prevent or reduce risks from extreme temperatures.
Structural Improvements	Structural projects will be implemented and maintained to prevent or reduce risks from extreme temperatures.
Goal 6 – Fires: Reduce deaths, injuries, property loss and economic disruption due to structural and wildfires.	
Mitigation Strategy	**Objectives**
Prevention	Planning, technical studies, training, adoption of ordinances and legislation and acquisition and use of equipment will be used to prevent or reduce risks to lives and property from fires.
Property Protection	Adopt state fire codes and inspect structure per local ordinance.
Public Education and Awareness	Public education and access to information will be used to raise public awareness of risks from fires in order to prevent or reduce those risks.
Emergency Services	Technological improvements, warning systems, responder training, emergency response services, acquisition and use of equipment, and planning will provide emergency services to prevent or reduce the risks to lives and property from fires.

Figure 7-7: Hazard Mitigation Goals, Strategies, and Objectives for Other Hazards *(con't)*

Goal 7 – Terrorism: Ensure Fillmore County public facilities are prepared for a threat and that first responder personnel are prepared in how to respond to such a threat.	
Mitigation Strategy	**Objectives**
Property Protection	Ensure public facilities in the county have appropriate security measures in place to reduce their risk.
Public Education and Awareness	Ensure appropriate communication measures are in place to effectively communicate with the public in the event of a threatening situation.
Emergency Services	Ensure first responders have appropriate training to deal with a wide variety of threats (terrorism and airplane crashes).
Goal 8 – Hazardous Materials: Limit property damage, loss of life, economic loss, and disruptions in commercial and industrial activities due to a hazardous material release.	
Mitigation Strategy	**Objectives**
Prevention	Proper regulations and licensing will be utilized to reduce the risk from hazardous materials.
Property Protection	Outfit structures with warning measures and protective features to mitigate the damages from the release of hazardous materials.
Public Education and Awareness	Increase public awareness of what to do in the event of a hazardous material release and the hazardous material risk present in the community.
Emergency Services	Increase capability of community fire departments and first responder's capability to respond to release incidents.
Goal 9 – Dam/Levee Failure: Limit loss of life, economic loss, and disruptions in residential, commercial and industrial activities due to dam/levee failure	
Mitigation Strategy	**Objectives**
Prevention	Planning, technical studies, and inspections will be used to prevent or reduce risks from dam/levee failure.
Property Protection	Ensure public facilities in the county have appropriate security measures in place to reduce their risk to dam/levee failure.
Public Education and Awareness	Increase public education and awareness of what to do in the event of any e dam/levee failure.
Emergency Services	Planning, responders training, warning systems, emergency response services, technological improvements, and acquisition and use of equipment will provide emergency services to prevent or reduce risks from dam/levee failure.
Goal 10 – Essential Services Failure: Limit loss of life, economic loss, and disruptions in residential, commercial and industrial activities due to water supply contamination, power failure, and wastewater treatment failure.	
Mitigation Strategy	**Objectives**
Prevention	Planning, technical studies, and inspections will be used to prevent or reduce risks from essential services failures.
Property Protection	Ensure public facilities in the county have appropriate security measures in place to reduce their risk to essential services failures.
Public Education and Awareness	Increase public education and awareness of what to do in the event of any essential services failures.
Emergency Services	Planning, responders training, warning systems, emergency response services, technological improvements, and acquisition and use of equipment will provide emergency services to prevent or reduce risks from essential services failures.

Figure 7-7: Hazard Mitigation Goals, Strategies, and Objectives for Other Hazards *(con't)*

Goal 11 – Animal Disease: Limit loss of life, economic loss, and disruptions in commercial and industrial activities due to an animal disease outbreak.	
Mitigation Strategy	**Objectives**
Prevention	Proper regulations and licensing will be utilized to reduce the risk from animal disease.
Public Education and Awareness	Increase public awareness of what to do in the event of an animal disease outbreak.
Emergency Services	Increase capability of community response personnel to effectively respond to an animal disease outbreak.
Goal 12 – Infectious Disease: Limit loss of life, economic loss, and disruptions in commercial and industrial activities due to an infectious disease outbreak.	
Mitigation Strategy	**Objectives**
Prevention	Proper regulations and licensing will be utilized to reduce the risk from infectious disease.
Public Education and Awareness	Increase public awareness of what to do in the event of an infectious disease outbreak.
Emergency Services	Increase capability of community response personnel to effectively respond to an infectious disease outbreak.

7.3 HAZARD MITIGATION ACTIONS

Individual communities in Fillmore County, as well as key stakeholders at the county level, were approached to evaluate the current actions listed in the existing plan as well as to suggest and develop new actions for the 2017 update. See Appendix 9.10 for a table that includes the status of previous jurisdictional hazard mitigation actions that were in the previous 2008 plan.

The two main factors that stakeholders were asked to evaluate were cost and funding. A benefit cost analysis was completed for the individual actions. The participants in the community meetings were asked to rank the actions in terms of funding availability and cost to complete. These rankings were combined with the rankings for the severity and probability of the hazards addressed and resulted in a priority score. Figure 7-8 details the specific rationale behind each rating.

Figure 7-8: Mitigation Action Ranking Rubric

Cost	Funding
3 = Less than $5,000	3 = Existing funding sources; Available staff time
2 = $5,000 to $25,000	2 = Identified potential funding sources and staff time
1 = More than $25,000	1 = No identified funding sources or staff time
Probability	**Severity**
4 = Highly Likely	4 = Catastrophic
3 = Likely	3 = Critical
2 = Possible	2 = Limited
1 = Unlikely	1 = Negligible

Figure 7-8 was designed so that in all categories (cost, funding, probability, and magnitude) higher numbers represent a higher priority for the plan. These four categories were then combined into a composite score for each hazard, with an example shown in Figure 7-9.

Figure 7-9: Example Hazard Score

Jurisdiction	Mitigation Action	Hazard	Priority / Status	Cost	Funding	Probability	Magnitude	Composite Score
All Townships	Purchase and supply portable electric generators for township use	All Hazards	Medium/ New	1	1	2.32	2.33	6.65

The composite score was utilized to create a priority rank for each hazard, as shown in Figure 7-10. In this way, even though a comprehensive benefit cost analysis was not completed for each individual mitigation action, the rankings present in the plan a strong consideration by all jurisdictions involved of cost, benefit, and the potential impact the action would have on a community.

Figure 7-10: Mitigation Action Priority Ranking

Score	Priority
6-7	Low
7-8	Medium
>8	High

In addition, actions were categorized into three main areas:

- New – Actions new to this update
- In Progress – Actions that are currently being worked on
- Ongoing – Actions that require ongoing maintenance and involvement

Figure 7-11 shows which mitigation strategy is utilized by each action.

Figure 7-11: Mitigation Strategy Legend

Strategy	Code
Prevention	P
Property Protection	PP
Public Education	PE
Natural Resources Protection	NR
Emergency Services	ES
Structural Improvements	SI

The following subsections outline the mitigation actions that have been identified as priorities at the county, city, and township levels. The first step towards mitigation action implementation is to complete a prioritization analysis of the actions. Different planning factors can help with the prioritization and analysis processes. STAPLE(E), created by FEMA, is an acronym for a set of criteria that can help participants consider several factors in the analysis and prioritization processes.

S – Social: Is the hazard mitigation strategy socially acceptable?
T – Technical: Is the proposed action technically feasible, and cost effective, and does it provide the appropriate level of protection?
A – Administrative: Does the community have the capability to implement the action and is the lead agency capable of carrying out oversight of the project?
P – Political: Is the hazard mitigation action politically acceptable?
L – Legal: Does the community have the authority to implement the proposed action?
E – Economic: Do the economic base, projected growth and opportunity costs justify the hazard mitigation project?
E – Environmental: Does the proposed action meet statutory considerations and public desire for sustainable and environmentally healthy communities?

The mitigation actions include those taken by county staff, as well as those undertaken by city and township boards across the county. Each action listed identifies a department that is responsible for implementation. Actions that are identified as county-wide indicate that this is a project with no sole departmental oversight, but rather a number of departments and entities throughout the county are responsible for its implementation. A list of county departments involved in hazard mitigation activities and their contact information is listed in Figure 7-12. County specific mitigation actions are listed in Figures 7-13 through 7-26.

To support in the collection and tracking of local hazard mitigation actions, FEMA has developed a national web-based collection tool known as the Mitigation Action Tracker. The tool can serve as a single source to capture and organize mitigation actions at any stage from proposed actions to funded projects. For more information on the Mitigation Action Tracker or to register, visit https://mat.msc.fema.gov/About.aspx.

Figure 7-12: County Departments Involved in Hazard Mitigation

Department	Contact
County Administration	(507) 765-4566
Human Services/Public Health	(507) 765-3898
Emergency Management	(507) 765-3874
Land Management & Zoning	(507) 765-3325
County Sheriff	(507) 765-3874
Assessor's Office	(507) 765-3868
Recorder's Office	(507) 765-3852
County Highway Department	(507) 765-3854

The complete cost/benefit analysis of jurisdictional hazard mitigation actions can be found in Appendix 9.9.

Figure 7-13: Fillmore County Mitigation Actions

Jurisdiction	Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
All Cities	Create a staff transition plan to ensure that knowledge and expertise of existing staff is carried on to successors	All Hazards	P	High	Administration
All Cities	Train all fire department personnel and other first responders in proper hazardous material procedures	Hazardous Materials	PE, ES	Medium	Fire
All Cities	Ensure infrastructure and procedures are in place to provide adequate warning of severe weather events to residents	All Hazards	PE, ES, SI	Medium	Administration
All Townships	Create a staff transition plan to ensure that knowledge and expertise of existing staff is carried on to successors	All Hazards	P	Medium	Administration/ Public Works
Fillmore County	Increase and strengthen internet access for emergency communication	All Hazards	ES, PEA	Medium	Administration
Fillmore County	Purchase portable heating and cooling equipment	All Hazards	PP, ES	Medium	Emergency Services
Fillmore County	Purchase crowd control signage	All Hazards	ES	Medium	Emergency Services
Fillmore County	Purchase new digital camera with GPS capabilities	All Hazards	ES	Medium	Emergency Services
Fillmore County	Partner with local communities to purchase 800 MHz radios for all fire departments in the county	Fire	ES	High	Emergency Services
Fillmore County	Additional tower enhancements to ARMER system in some locations to reduce dead zones	All Hazards	ES	High	Emergency Services
Fillmore County	Update/Reconstruct Lanesboro Dam in partnership with local and state entities	Flood	NR, SP	High	Public Works
Fillmore County	Purchase back-up generator for county emergency operations center	All Hazards	ES	Medium	Emergency Services
Fillmore County	Update and increase security for all county facilities	All Hazards	PP	Medium	Administration
Fillmore County	Re-construct and update the sheriff's office and jail	All Hazards	PP	Medium	Administration/ Emergency Services
Fillmore County	Strategically place river gauges throughout county to monitor water levels	Flood	NR	Medium	Public Works
Fillmore County	Construct catch dams in the Willow Creek Watershed	Flood	SP	Medium	Public Works
Fillmore County	Update or reconstruct dams near Mabel and Spring Valley	Flood	SP	Medium	Public Works
Fillmore County	Purchase bulldozer	Land Subsidence	ES	Medium	Public Works
Fillmore County	Purchase trailer for transporting emergency response supplies and equipment	All Hazards	ES	Medium	Public Works/ Emergency Services

Figure 7-13: Fillmore County Mitigation Actions *(con't)*

Jurisdiction	Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Fillmore County	Provide education, outreach and assistance to county residents regarding individual, family and workplace preparedness planning	All Hazards	PEA	Medium	Administration/ Public Health
Fillmore County	Work with community organizations and volunteers to establish family assistance center and sheltering plans	All Hazards	PEA, ES	Medium	Administration/ Public Health
Fillmore County	Implement public information and warning strategies related to internet, social media, print and emergency alert systems	All Hazards	PEA, ES	Medium	Administrative, Public Health, Emergency Services
Fillmore County	Identify shelters and family reception centers and acquire site use agreements	All Hazards	ES	Medium	Administration/ Public Health
Fillmore County	Identify new mass dispensing sites and acquire site use agreements	All Hazards	ES	Medium	Administration/ Emergency Services
Fillmore County	Purchase weather station for dispatch and hand anemometers for law enforcement	All Hazards	ES	Medium	Emergency Services
Fillmore County	Work with GIS to enhance mapping layers available to respond to emergencies. These layers will include child care settings, schools, at-risk populations, etc.	All Hazards	ES	Medium	Administration/ Information Technology/ Public Health
Fillmore County	Implement flood infrastructure improvements through effective measures identified in the SWCD One Plan. Measure may include installing-grassed waterways, redesigned bridges, appropriately sized culverts and ditches, retention structures, storm water systems, tiling, upload storage, natural plantings, ponds, wetlands, diversion channels, buffers, no-till technologies and landslide prevention measures	Flood	NR	High	Administration/ Emergency Services/Public Works
Fillmore County	Add additional security measures to all county public buildings.	Human - Related	P	Medium	Administration/ Emergency Services
Fillmore County	Construct 2,000-acre feed storage upstream of the City Mabel	Flood	PP	Medium	Public Works
Fillmore County	Purchase proper protective equipment for staff responding to all-hazards emergencies	All Hazards	ES	Medium	Administration/ Emergency Services

Figure 7-14: City of Canton Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Replace and increase storm water system capacity	Summer/ Winter Storms/Flood	P, PP, NR, ES, SI	High	Public Works
Construct new fire station	Fire	PP, NR, ES	High	Fire
Purchase backhoe	Summer/Winter Storms	SI	High	Public Works
Update sewer plant	Flood/Land Subsidence	P, SI	Medium	Public Works
Purchase back-up generator	All Hazards	P	Medium	Public Works
Purchase 800 MHz radios	All Hazards	ES	Medium	Fire
Reconstruct hill sediment on 120th St.	Flood/Sinkhole	SI	High	Public Works
Purchase tractor, mower and grader - debris removal	Land Subsidence	PP, ES	Medium	Public Works
Construct various culverts (25-30) along 341st Ave.	Flood	SI	High	Public Works
Purchase back-up generator for water tower	All Hazards	P	Medium	Public Works
Purchase portable light towers	All Hazards	SI	Medium	Public Works/ Emergency Services

Figure 7-15: City of Chatfield Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Purchase new pump truck	Fire	ES, SI	High	Emergency Services

Figure 7-16: City of Fountain Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Purchase new 800 MHz radios	All Hazards	ES	High	Administration/ Emergency Services
Construct storm shelters	All Hazards	PP	Medium	Emergency Services
Widen Hwy 52	Flood	SI	High	Public Works

Figure 7-17: City of Harmony Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Pond restoration to remove sediment buildup	Flood	NR	High	Public Works
Construct lift station and well generator	Flood	SI	Medium	Public Works
Purchase back-up generator for school	All Hazards	P, SI	Medium	Public Works
Purchase back-up generator for water tower	All Hazards	P, SI	Medium	Public Works
Purchase portable light towers	All Hazards	ES	Medium	Public Works/ Emergency Services
Purchase an all-terrain vehicle for emergency response	All Hazards	ES	Medium	Emergency Services

Figure 7-18: City of Lanesboro Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Update/reconstruct Lanesboro Dam in partnership with local and state entities	Flood	P, PP, SI	High	Public Works
Install additional sirens	All Hazards	ES, SI	High	Public Works/ Emergency Services
Construct an Emergency Management Command Center	All Hazards	ES	Medium	Emergency Services
Purchase back-up light towers	All Hazards	ES	Medium	Public Works/ Emergency Services
Purchase back-up generator	All Hazards	P	Medium	Public Works
Purchase back-up water pump	Flood	P	Medium	Public Works

Figure 7-19: City of Mabel Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Re-direct moving water surrounding community - flood control	Flood	PP, NR, SI	High	Administration/ Public Works
Remove homes located in floodplain	Flood	P, PP	Medium	Administration/ Public Works
Purchase back-up generator for water tower	All Hazards	P	Medium	Public Works
Replace siren system and join county siren system	All Hazards	ES, SI	Medium	Public Works/ Emergency Services
Purchase portable light towers	All Hazards	ES	Medium	Public Works/ Emergency Services
Purchase barricades, signs, lights for road closures	All Hazards	ES	Medium	Public Works
Construct shed for disaster response equipment	All Hazards	P, PP	Medium	Public Works/ Emergency Services
Purchase snow plow	Summer/Winter Storms	P, ES	Medium	Public Works
Purchase ice and snow control shed to cover rock, sand, and salt	Summer/Winter Storms	PP	Medium	Public Works

Figure 7-20: City of Ostrander Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Purchase back-up light towers	All Hazards	ES	High	Public Works/ Emergency Services
Construct new well for water access	Essential Services Failure	SI	High	Public Works
Purchase additional sirens	All Hazards	P, ES	High	Public Works/ Emergency Services
Purchase new firetruck	Fire	P, PP, NR, ES	Medium	Emergency Services
Purchase new 800 MHz radios	All Hazards	ES	High	Administration/ Emergency Services
Construct a natural wind break	Summer/Winter Storms	P, PP, NR	High	Public Works
Upgrade IT security for law enforcement	Terrorism	P, ES	Medium	Administration/IT/ Emergency Services

Figure 7-21: City of Peterson Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Construct an emergency storm center	All Hazards	P	High	Administration/ Emergency Services
Purchase additional sirens	All Hazards	ES	High	Public Works/ Emergency Services
Purchase new gate/valve for storm sewer	Flood	P, SI	High	Public Works
Construct storm shelter on campground	All Hazards	PP	Medium	Public Works/ Emergency Services
Purchase large spill kits	Hazardous Materials	P, ES	Medium	Fire
Obtain dike certification	Flood	P, NR, ES	Medium	Public Works
Construct community storm shelter	All Hazards	P	Medium	Public Works/ Emergency Services
Purchase back-up generator for sewer plant	All Hazards	P	Medium	Public Works
Purchase new snow plow	Summer/Winter Storms	P, ES	Medium	Public Works
Bury electrical lines in community	All Hazards	P, SI	Medium	Public Works

Figure 7-22: City of Preston Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Purchase back-up generator	All Hazards	P	Medium	Public Works
Purchase back-up generator for school	All Hazards	P, ES	Medium	Public Works
Purchase back-up generator for water tower	All Hazards	P, ES	Medium	Public Works
Purchase portable light towers	All Hazards	ES	Medium	Public Works/ Emergency Services
Purchase an all-terrain vehicle for emergency response	All Hazards	ES	Medium	Emergency Services
Construct storm shelter for local campground	All Hazards	P, ES	Medium	Administration/ Emergency Services
Construct storm shelter for local mobile home park	All Hazards	P, ES	Medium	Administration/ Emergency Services

Figure 7-23: City of Rushford Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Purchase back-up generator for Magelssen Bluff	All Hazards	P, ES	Medium	Public Works
Purchase large spill kits	Hazardous Materials	P, ES	Medium	Fire
Purchase high water alarm	Flood	P, PP, NR, ES	Medium	Public Works
Purchase crowd control signage	All Hazards	PE	Medium	Emergency Services
Construct community shelter in new fire department building	All Hazards	P, ES	Medium	Fire/Administration
Increase stormwater capacity	Flood	SI	Medium	Public Works
Increase wastewater treatment facility capacity	Flood	SI	Medium	Public Works
Purchase new snow blower	Summer/Winter Storms	P, ES	Medium	Public Works
Purchase back-up generators for fire hall	All Hazards	P, ES	Medium	Fire
Purchase snow truck	Summer/Winter Storms	ES	Medium	Public Works
Purchase additional 800 MHz radios	All Hazards	ES	High	Emergency Services
Purchase additional water pumps (2 - 6 inches)	Flood	P, PP	High	Public Works
Purchase additional light towers and back-up generators	All Hazards	P, ES	Medium	Public Works/ Emergency Services
Construct a safe room in new school	Fire	P	Medium	Administration/ Emergency Services

Figure 7-24: City of Rushford Village Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Develop a drought emergency plan	Summer Storms	P, PE	Medium	Administration/ Planning
Provide a safe room/building for campers during storms	All Hazards	P, ES	Medium	Administration/ Emergency Services

Figure 7-25: City of Spring Valley Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Construct a community storm shelter	All Hazards	P	High	Administration/ Emergency Services
Install additional sirens	All Hazards	P, ES	High	Administration/ Emergency Services
Construct smaller culverts a mile west of Spring Valley	Flood	SI	Medium	Public Works
Purchase backup generators for school and ambulance station	All Hazards	P, ES	Medium	Administration/ Public Works
Purchase new personal protective equipment	Hazardous Materials	SI	Medium	Emergency Services
Upgrade IT security for law enforcement	Terrorism	P, ES	Medium	Administration/IT/ Emergency Services
Continued hazardous materials training for emergency services	Hazardous Materials	ES	Medium	Emergency Services
Construct a safe room and a security system with a lockdown feature	All Hazards	P, ES	Medium	Administration/ Emergency Services
Removal of Repetitive Loss properties: two residential homes and one business	Flood	P	High	Administration/ Public Works
Purchase an all-terrain vehicle to increase access on difficult terrain	Fire	ES	Medium	Emergency Services
Update/re-build fire station with shelter options	Fire	P, SI	Medium	Emergency Services
Purchase new ariel fire truck and replace pumper	Fire	P, ES	Medium	Emergency Services

Figure 7-26: City of Whalan Mitigation Actions

Mitigation Action	Hazard	Mitigation Types	Priority	Implementation
Re-construct larger dike around community for flood mitigation	Flood	P, SI	High	Public Works
Bury electrical lines in community	All Hazards	P, SI	Medium	Public Works
Acquire safe locations/shelters for tourists/trail users to access	All Hazards	P	Medium	Public Works/ Administration
Purchase back-up generator for community	All Hazards	P, ES	Medium	Public Works/ Emergency Services

Section 8: Plan Maintenance

8.1 MONITORING, EVALUATING, & UPDATING THE PLAN

Over the course of the next five-year cycle the Fillmore County Emergency Management Department will monitor and review the current plan content and make revisions and amendments as needed. The emergency management director will be responsible for maintaining contact with the stakeholder taskforce and responding to questions that may arise about plan specifics.

The County Emergency Management Department will hold an annual review meeting of the stakeholder taskforce. In addition to taskforce notification, this meeting will be posted publicly. At this meeting, members will discuss in more detail the development of mitigating hazards, action steps that have been taken over the 12-month period, and specific ways the current plan is succeeding or falling short. Initial ideas will be included in a progress report to review and revise criteria of mitigating hazards, which would be forwarded back to all jurisdictions within the county.

In addition to the annual review meeting, other meetings will be convened as needed or in response to funding opportunities that can provide resources for mitigation activities. The stakeholder taskforce will monitor mitigation actions throughout the county and help coordinate any local partnerships to strengthen communication and cooperation across the communities.

Each entity's regulating authorities will consider adoption of plan revisions made at the review meeting. Cities will have reviews and conduct revisions with their planning commissions and city council. The Fillmore County Emergency Management Director and Administrator (or equivalent staff position) would forward plan revisions to appropriate departments (e.g., Public Works, Sheriffs and Public Health). Ultimately, the county board will consider final revisions to the plan.

Applicable plans, such as zoning ordinances, lakeshore ordinances, building codes, staff development plans, waste water treatment policies, comprehensive plans, floodplain ordinances, capital improvement plans, and budgets, will be amended to incorporate related changes. These amendments will be handled by local government entities (city council, planning commissions) at the city level. Fillmore County officials, as well as city-level officials within the county, will be responsible for the integration of this All-Hazard Mitigation Plan into other applicable plans or planning mechanisms that they may already maintain or may be currently undertaking.

Additionally, the stakeholder taskforce will be reconvened for a special meeting in the event of a major disaster or significant development in a particular hazard in Fillmore County. This meeting will determine if the plan needs to be updated immediately in order to take advantage of grant opportunities that may arise due to the new circumstances. If so, an amendment to the plan will be drafted at the meeting and distributed to the appropriate parties for adoption immediately.

Fillmore County Emergency Management Department will begin seeking funding prior to 2020 for the next five-year update to be completed by Region Nine Development Commission or in house.

8.2 IMPLEMENTATION THROUGH EXISTING PROGRAMS

The recommended actions and mitigation strategies detailed in this plan will be incorporated into the individual planning documents of the appropriate departments and communities at the county and city level. In the course of regularly scheduled updates to zoning plans and ordinances the county and cities will consult with the Hazard Mitigation Plan and see if their existing practices are in line with what has been determined to be the best way to reduce the risk and damage from hazards.

Each participating community will work with Fillmore County's Emergency Manager and other entities that can aid in the implementation of mitigation actions. There are several implementation tools that are available to help mitigate future hazards. See following for a list of suggestions; however, there still needs to be review and discussion amongst stakeholders to ensure the proper tool is selected and implemented successfully.

Education - Education of residents has been identified as one of the most effective mitigation strategies. Activities will be planned to educate, train and exercise individuals, businesses, community members and first responders, through events such as severe weather week and winter awareness week.

Capital Investment - Capital investments such as fire and ambulance equipment, sprinkler systems and dry hydrants are tools that can limit risks impacts of natural and man-made hazards.

Data Collection and Needs Assessments - Data collection and needs assessments can aid in gaining a better understanding of threats and allow planning for mitigation strategies accordingly. As resources are limited for this part of the planning process, additional data collection is likely to be an ongoing activity as resources become available.

Coordination - Responsibilities for mitigation strategies run across various county departments, local fire and ambulance departments, city and township governments, and host of state and federal agencies. Ongoing coordination is an important tool to ensure resources are used efficiently. The mitigation plan review process can function as a tool to have an ongoing discussion of roles, responsibilities and opportunities for coordination.

Regional Cooperation - Counties and public safety services providers throughout the southeast region of Minnesota often share similar challenges and concerns. In some cases a regional approach may be warranted as a mitigation strategy in order to save resources. Organizations such as Region V Emergency Management and HSEM through the regional program coordinator can offer tools and resources to assist in these cooperative efforts.

Regulation - Regulation is an important factor for land use, access to structures and the protection of water resources and public health. Fillmore County and its cities have planning and zoning departments which provide local regulations for adopting and enforcing building codes and standards. The regulations are also aligned with state and federal standards.

8.3 CONTINUED PUBLIC INVOLVEMENT

Ensuring that the public is actively involved has been a priority of the planning process and this focus will continue after the plan is finalized and put into use. The full plan will be available in digital form both on the Fillmore County Emergency Management website. Education events held for specific hazards throughout the county will make mention of the plan and inform the public of its purpose. Public notice will be given for all annual review meetings and stakeholder taskforce members will be encouraged to bring interested parties with them to these meetings. By continuing to engage communities, partner organizations and the public will only increase transparency, strengthen partnerships and build local buy-in.

Section 9: Appendices

9.1 ADOPTING RESOLUTIONS

Appendices

Appendices

9.2 STATEMENT OF INTEREST IN ALL-HAZARD MITIGATION PLANNING

Fillmore County's Hazard Mitigation Plan Update Kickoff Meeting

For:	**Fillmore County Hazard Mitigation Steering Committee**
By:	**Kevin Beck, Emergency Management Director** **and** **Scott Reiten, Region Nine Development Commission** **Danielle Walchuk, Region Nine Development Commission**
Re:	**Fillmore County Hazard Mitigation Plan Update Kickoff Meeting**
Date:	**Thursday, August 20th, 2015**
Time:	**6:00 p.m. to 7:30 p.m.**
Place:	**Tri-County Electric Cooperative Office; 31110 Cooperative Way, Rushford, MN 55971**

Fillmore County is in the process of updating their Hazard Mitigation Plan (HMP) and is requesting your participation in a meeting to learn about the planning process and to review the County's 2008 hazards.

What is Mitigation Planning?
Hazard Mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards. The purpose of mitigation planning is to identify policies and actions that can be implemented over the long term to reduce risk and future losses. Mitigation Plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. The planning process is as important as the plan itself. It creates a framework for risk-based decision making to reduce damages to lives, property, and the economy from future disasters.

Why should I attend?
Public involvement builds support and ensures a strong base for future mitigation activities. The value of public involvement lies in sharing responsibility with those who will strongly influence the success or failure of mitigation efforts. Involving a broad cross-section of interested individuals and organizations is a way of collecting good ideas and suggestions and ensuring that the community will view hazard mitigation as relevant to their needs.

Any questions please contact Kevin Beck Fillmore County's Emergency Management Director — phone: 507-765-3874
or
Scott Reiten, Region Nine Development Commission — phone: 507-389-8880

FILLMORE COUNTY EMERGENCY MANAGEMENT

R9 REGION NINE DEVELOPMENT COMMISSION

MAKING FILLMORE COUNTY A SAFER PLACE BY REDUCING THE IMPACT OF DISASTERS ON PEOPLE, PROPERTY, AND THE ECONOMY

Fillmore County
Hazard Mitigation Plan Update
Community Meetings

Tuesday, October 13, 2015
1:00 PM or 6:00 PM

Fillmore County Office Building,
902 Houston Street NW
Lower Level Room 108
Preston, MN 55965

26%

of Fillmore County residents report having been affected by a disaster.

FEMA requires that government units update Hazard Mitigation Plans every five years in order to be eligible for mitigation project funds.

37%

of Fillmore County residents have an individual or family emergency kit of supplies.

Over the next six months, Fillmore County will be hosting a series of three meetings with community members from the areas of education, health, safety, government and business to revise the Hazard Mitigation Plan.

- The kick-off meeting will explain why hazard mitigation is important and involve selecting the hazards that should be addressed in the Hazard Mitigation Plan (August 20 from 6 to 7:30 PM).
- The second and third meeting will focus upon goals, strategies, and projects that can be conducted to prevent or mitigate these hazards. Follow-up documentation will be requested for any community not present at one of these two meetings. (October 13 from 1 to 2:30 PM or 6 to 7:30 PM).

For more information contact:
Fillmore County Emergency Manager Kevin Beck at 507-765-3874 or kbeck@co.fillmore.mn.us
Scott Reiten of the Region Nine Development Commission at 507-389-8880

Bluff Country Reader 507-346-7365
112 N Broadway Ave. | PO Box 112
Spring Valley, MN 55975

AFFIDAVIT OF PUBLICATION

[FORM Rev. 6/15]

STATE OF MINNESOTA)
) ss.
COUNTY OF FILLMORE)

Janis Miller, being first duly sworn, on oath states as follows:

1. I am the publisher's designated agent for the *Bluff Country Reader*. I have personal knowledge of the facts stated in this affidavit, which is made pursuant to Minnesota Statutes §331A.07.

2. The newspaper has complied with all of the requirements to constitute a qualified newspaper under Minnesota law, including those requirements found in Minnesota Statutes §331A.02.

3. The dates of the month and the year and day of the week upon which the public notice Hazard Mitigation plan update attached/copied below was published in the newspaper are as follows:

Starting Monday, September 21, 2015
Ending Monday, October 5. 2015

4. The publisher's lowest classified rate paid by commercial users for comparable space, as determined pursuant to § 331A.06, is as follows: $10.60 per column inch.

5. Mortgage Foreclosure Notices. Pursuant to Minnesota Statutes §580.033 relating to the publication of mortgage foreclosure notices: The newspaper's known office of issue is located in Fillmore County. The newspaper complies with the conditions described in §580.033, subd. 1, clause (1) or (2). If the newspaper's known office of issue is located in a county adjoining the county where the mortgaged premises or some part of the mortgaged premises described in the notice are located, a substantial portion of the newspaper's circulation is in the latter county.

FURTHER YOUR AFFIANT SAITH NOT.

Janis Miller
[Signature]

Subscribed and sworn to before me on
this 22 day of September 2015.

DAVID A. PHILLIPS
Notary Public-Minnesota
My Commission Expires Jan 31, 2020

Notary Public

NOTICE OF PUBLIC HEARINGS
Fillmore County Hazard Mitigation Plan Update

NOTICE IS HEREBY GIVEN that the Fillmore County Emergency Management Office, County of Fillmore MN and Region 9 Development Commission will be hosting two public community hearings. The community hearings will be held on **Tuesday, October 13, 2015 from 1:00-2:30 pm or 6:00-7:30 pm at the Fillmore County Office Building, Conference Room 108, 902 Houston Street NW, Preston MN.** All communities and townships in Fillmore County are invited to assess community risks and discuss and update the Fillmore County All Hazard Mitigation Plan. Public involvement in hazard mitigation issues and decision-making are important elements in the development of the Fillmore County All Hazard Mitigation Plan. Attendees will be encouraged to review and comment on the current plan and the proposed mitigation strategies.

All interested parties are encouraged to attend one of the hearings and provide comments either orally or in writing on community risks and the current plan. If you are unable to attend the public hearings, you may submit written comments to the Fillmore County Emergency Management, Hazard Mitigation Plan Update, c/o Kevin Beck, 901 Houston Street NW, Preston, MN 55965 prior to the hearing. The full version of the 2008 Hazard Mitigation Plan is available for review at the Fillmore County Sheriff's Office.

Questions regarding the proposed Fillmore County All Hazard Mitigation Plan can be directed to Fillmore County Emergency Management Director Kevin Beck at 507-765-3874 or Scott Reiten, Region 9 Development at 507-389-8880.

Dated this September 17, 2015
Kevin Beck,
Fillmore County Emergency Management Director
9/21, 9/28, 10/5

Bluff Country Reader **507-346-7365**
112 N Broadway Ave. | PO Box 112
Spring Valley, MN 55975

AFFIDAVIT OF PUBLICATION

[*FORM Rev. 6/15*]

STATE OF MINNESOTA)
) ss.
COUNTY OF FILLMORE)

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FURTHER YOUR AFFIANT SAITH NOT.

Janis Miller
[*Signature*]

Subscribed and sworn to before me on
this 2nd day of October 2015.

Notary Public

DAVID A. PHILLIPS
Notary Public-Minnesota
My Commission Expires Jan 31, 2020

NOTICE OF PUBLIC HEARINGS
Fillmore County Hazard Mitigation Plan Update

NOTICE IS HEREBY GIVEN that the Fillmore County Emergency Management Office, County of Fillmore MN and Region 9 Development Commission will be hosting two public community hearings. The community hearings will be held on **Tuesday, October 13, 2015 from 1:00-2:30 pm or 6:00-7:30 pm at the Fillmore County Office Building, Conference Room 108, 902 Houston Street NW, Preston MN.** All communities and townships in Fillmore County are invited to assess community risks and discuss and update the Fillmore County All Hazard Mitigation Plan. Public involvement in hazard mitigation issues and decision-making are important elements in the development of the Fillmore County All Hazard Mitigation Plan. Attendees will be encouraged to review and comment on the current plan and the proposed mitigation strategies.

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Dated this September 17, 2015
Kevin Beck,
Fillmore County Emergency Management Director
9/21, 9/28, 10/5

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. ◆ Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Steering Committee Meeting
Fillmore County Hazard Mitigation Plan Update
6:00 P.M. Thursday, August 20th, 2015
Tri-County Electric Cooperative Office, Rushford, MN

AGENDA

1. Welcome and Introductions (Kevin Beck)
2. Hazard Mitigation Presentation (Region Nine Team)
    a. What is hazard mitigation and hazard mitigation planning
    b. What is included in a Hazard Mitigation Plan
    c. Reasons for hazard mitigation
    d. Steering Committee's role in the planning process
    e. Community meeting discussion
    f. Contact information
3. Risk Assessment (Region Nine Team)
    a. Hazard Identification
        i. Handout - hazard definitions
        ii. Review potential 2013 hazards for the plan update
4. Fillmore's Hazard Mitigation Plan Timeline and Closing Remarks (Kevin Beck)

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. ◆ Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Fillmore County Meeting
Fillmore County Hazard Mitigation Plan Update
Tuesday, October 13th, 2015

AGENDA

1. Welcome and Introductions (Kevin Beck)

2. Hazard Mitigation Presentation (Danielle Walchuk and Scott Reiten)
    a. Terminology
    b. Why Mitigate Hazards?
    c. Plan Background
    d. Contact Information

3. Community Group Activity
    a. Community Existing Plans and Policies
    b. National Flood Insurance Program
    c. Essential Facilities (handout)
    d. Hazard Rankings (handout)
    e. Mitigation Strategies Discussion (handout)

4. Fillmore's Hazard Mitigation Plan Timeline and Closing Remarks (Kevin Beck)

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. ◆ Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Fillmore Community Meeting
Fillmore County Hazard Mitigation Plan Update
1:00 P.M. Tuesday, October 13th, 2015
Fillmore County Office Building

AGENDA

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    b. National Flood Insurance Program
    c. Essential Facilities (handout)
    d. Hazard Rankings (handout)
    e. Mitigation Strategies Discussion (handout)

4. Fillmore's Hazard Mitigation Plan Timeline and Closing Remarks (Kevin Beck)

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. ◆ Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Fillmore Community Meeting
Fillmore County Hazard Mitigation Plan Update
6\:00 P.M. Tuesday, October 13th, 2015
Fillmore County Office Building

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1. Welcome and Introductions (Kevin Beck)

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    e. Mitigation Strategies Discussion (handout)

4. Fillmore's Hazard Mitigation Plan Timeline and Closing Remarks (Kevin Beck)

Fillmore County Hazard Mitigation
Plan Kick-Off Meeting

Name	Entity	Title
Arlynn Hovey	Carimona Twnsp	Supervisor
Email	Address	Phone
	Preston MN	507-765-3396

Name	Entity	Title
Linda Marzolf	Carimona Twp.	Clerk
Email	Address	Phone
	19492 Co 15 Preston MN	507-765-2435

Name	Entity	Title
Deane Benson	Lanesboro Fire Dept + Ambulance	Ambulance Director
Email	Address	Phone
drbens@hotmail.com		507-208-3164

Name	Entity	Title
Mike Kelly	Amherst Township	Supervisor
Email	Address	Phone
MKelly Racing@ Gmail.Com	20139 401st Ave Lanesboro Mn	507-421-7177

Name	Entity	Title
LOREN BERGE	HOLT TWNSHP	SUPERVISOR
Email	Address	Phone
STARPEPPLER@HOTMAIL.COM	255992 EVENING DRIVE	507-875-2537

Name	Entity	Title
Deb Zimmer	City of Spring Valley	Admin
Email	Address	Phone
debzimmer@springvalley~~o~~govoffice.com	201 S. Broadway SV	507 346-7367

Name	Entity	Title
John Hanson	Fountain Fire Dept + City of Fountain	Chief + City maintence
Email	Address	Phone
hanson012@yahoo.com	104 main St	507-272-8419

Name	Entity	Title
ROBIN KROM	City of LANESBORO	MAYOR
Email	Address	Phone
RW KROM@ACEGROUP.CC	201 RIDGEVIEW LN LANESBORO	507-993-2029

Fillmore County Hazard Mitigation Plan Kick-Off Meeting

Name	Entity	Title
Charlie Warner	City of Canton	Councilman
Email	**Address**	**Phone**
CWarner@bluffcountryNews.com	Box 163 Canton	507-459-9618
Name	**Entity**	**Title**
Adam G Eide	City of Rushford	Chief of Police
Email	**Address**	**Phone**
rpachief@acegroup.cc	Box 430 Rushford	507 864-7073
Name	**Entity**	**Title**
Sue Kester	Chatfield Ambulance	Director
Email	**Address**	**Phone**
skester@ci.chatfield.mn.us	21 Second St SE Chatfield	507-867-4446
Name	**Entity**	**Title**
GAYLAND JONES		
Email	**Address**	**Phone**
Leeisthegreatest@gmail.com	180 Hwy 52 East	507-440-9945
Name	**Entity**	**Title**
Ryan Throckmorton	Preston Ambulance / Fire	Director
Email	**Address**	**Phone**
rthrockmorton@prestonmn.org	210 Fillmore St W Preston	507-765-2153
Name	**Entity**	**Title**
Steven Oian	Tri-County Electric	Direct of System Design
Email	**Address**	**Phone**
soian@tec.coop	31110 Cooperative Way	507-864-7783
Name	**Entity**	**Title**
Mike Zimmer	Spring Valley	E.M. Dir
Email	**Address**	**Phone**
Zimmermike2000@yahoo.com		507-273-4906
Name	**Entity**	**Title**
Tom SMITH	Lanesboro City Council	
Email	**Address**	**Phone**
TJSMITH15@Hotmail.com	809 Auburn Ave S Lanesboro	507-467-2505

Fillmore County Hazard Mitigation Plan Kick-Off Meeting

Name	Entity	Title
John Dols	Kingsland Public Schools	Building + Grounds Director
Email	**Address**	**Phone**
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Name	Entity	Title
Brenda Pohlman	Fillmore County Public Health	Public Health
Email	**Address**	**Phone**
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Name	Entity	Title
Stu Smith	SV Public Utility	Utilities Supt
Email	**Address**	**Phone**
SVutil@SpringValleyutility.com	104 S Section Spring Valley	507-346-7622

Name	Entity	Title
Chris Rolli	SV Public utility	(( ))
Email	**Address**	**Phone**
~~SVutil~~ SVline@SpringValleyutility.com		

Name	Entity	Title
DAN JAQUITH	city OF CHATFIELD	EMERGENCY MANAGER
Email	**Address**	**Phone**
MASTERSPY21@G.MAIL.COM	21 2ND AVE	507-259-0627

Name	Entity	Title
James Dailey	Rushford Fire	2nd Assist Chief
Email	**Address**	**Phone**
DaileyJames@Hotmail.com	604 N. 1st Rushford, MN	507-450-1703

Name	Entity	Title
Bonda Flattum	City of Fountain	City Clerk-Treas
Email	**Address**	**Phone**
cityoffountain@frontiernet.net	104 Main Street	507-268-4923

Name	Entity	Title
Megan Boyum	City of Peterson	Clerk/Treas
Email	**Address**	**Phone**
petersoncity@gmail.com	PO Box 67	507-875-2222

Fillmore County Hazard Mitigation
Plan Kick-Off Meeting

Name	Entity	Title
Richard Keith	Fillmore Central School,	Supt
Email	**Address**	**Phone**
richard.keith@isd2198.k12.mn.us	700 Chatfield St. Preston 55965	507 765 3845
Name	**Entity**	**Title**
Todd Baker	City of Rushford Village	Council
Email	**Address**	**Phone**
Tbaker1961@hotmail.com	30312 So Sherwood Rushford, mn	507-429-7331
Name	**Entity**	**Title**
James Westby	City of Mabel	Mayor
Email	**Address**	**Phone**
	South Main	507-206-9242
Name	**Entity**	**Title**
Andy Bisek	Preston Twnship	Sup
Email	**Address**	**Phone**
BISEK@Live.com	21179 US 52, Preston	507-272-4865
Name	**Entity**	**Title**
Mark Arndt	City Wykoff	Streets
Email	**Address**	**Phone**
Wykoff3@Arvig.net	Wykoff	507-352-4011
Name	**Entity**	**Title**
Jordan Hutsell	Wykoff Fire Dept	Fireman
Email	**Address**	**Phone**
~~Chuck Ehler~~ wade.baker88@gmail.com ~~Rushford~~		507 352-4011
Name	**Entity**	**Title**
Chuck Ehler	Rushford-Peterson School	Supt
Email	**Address**	**Phone**
cehler@r-pschools.com	102 N. Mill St. PO. 627	507-458-4724
Name	**Entity**	**Title**
Tom Kaase	Fillmore County	Sheriff
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tkaase@co.fillmore.mn.us	901 Houston St NW, Preston MN 55965	507-765-3874

Fillmore County Hazard Mitigation
Plan Kick-Off Meeting

Name	Entity	Title
Bennett Schlaak	Spring Valley Amb./Gold Cross	Team Captain
Email	**Address**	**Phone**
SpringValleyambulance@ychoo.com		507 923-1551
Name	**Entity**	**Title**
Blaise Sass	Preston PD	Sgt.
Email	**Address**	**Phone**
bsass@prestonmn.org	210 West Fillmore	(507) 765-2153
Name	**Entity**	**Title**
Terry Torkelson	Mabel City of	Council
Email	**Address**	**Phone**
		563-419-7913
Name	**Entity**	**Title**
Mark Honsey	Rushford FD + City	Council
Email	**Address**	**Phone**
		507-429-6577
Name	**Entity**	**Title**
Arlen Halverson	Newburg	maintainer
Email	**Address**	**Phone**
Name	**Entity**	**Title**
Genette Halverson	Newburg	Clerk
Email	**Address**	**Phone**
Name	**Entity**	**Title**
Kevin Beck	Fillmore County E.M.	Director
Email	**Address**	**Phone**
Kbeck@co.fillmore.MN.us	901 Houston St NW Preston MN 55965	507.765-3874
Name	**Entity**	**Title**
Email	**Address**	**Phone**

Fillmore County Hazard Mitigation
Plan Kick-Off Meeting

Name	Entity	Title
Karen Resla	Rushford Ambulance	EMT-B
Email	**Address**	**Phone**
kcrislov@hotmail.com	21730 Deer Ridge Dr. Houston, MN	507-459-9457
Name	**Entity**	**Title**
Tim Hallum	MAYOR OF PETERSON MN	
Email	**Address**	**Phone**
	130 PROSPECT ST Peterson MN 55962	507 875-2556
Name	**Entity**	**Title**
Kari Drinkall	Good Shepherd Lutheran Services	RN
Email	**Address**	**Phone**
Kdrinkall@goodshepherdrushford.org	POBox 747 Rushford, MN	507-864-7714
Name	**Entity**	**Title**
Kathy Zacher	City of Rushford	City Clerk / Treas.
Email	**Address**	**Phone**
cityka3@acegroup.cc	PO Box 430 Rushford	507 864-2414
Name	**Entity**	**Title**
Chuck Olson		Preble Twp
Email	**Address**	**Phone**
chuck.a.faye.@yahoo.com.		507 493 5014
Name	**Entity**	**Title**
Steve Savri	City of Rushford	Administrator
Email	**Address**	**Phone**
rushford@acegroup.cc	P.O. Box 430 Rushford MN	507-864-2667
Name	**Entity**	**Title**
Gordy Elliott	Farmers Coop Elevator	G. M.
Email	**Address**	**Phone**
elliott.g@fce.coop	Rushford	507-864-7733
Name	**Entity**	**Title**
Email	**Address**	**Phone**

18 + 32 = 50

Fillmore County Hazard Mitigation Plan Kick-Off Meeting

Name	Entity	Title
Rory Berekvam	522 New St Whalan Minn	Mayor
Email	Address	Phone
		467-2663
Name	Entity	Title
Steve Koebke	BLOOMFIELD TWNSHP	SUPERVISOR
Email	Address	Phone
		507-259-8499
Name	Entity	Title
Troy Lange	Spring Valley Fire Dept	Chief
Email	Address	Phone
langetroy@hotmail.com		507 951 3583
Name	Entity	Title
Tim Mengis	MABEL FIRE/MABEL AMB	FIRE CHIEF/EMT
Email	Address	Phone
mengisfuneralhome@mchsi.coop		507-273-5879
Name	Entity	Title
Email	Address	Phone
Name	Entity	Title
Email	Address	Phone
Name	Entity	Title
Email	Address	Phone
Name	Entity	Title
Email	Address	Phone

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. ◆ Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Fillmore County Meeting
Fillmore County Hazard Mitigation Plan Update
8:00 A.M. Tuesday, October 13th, 2015

SIGN IN SHEET

Name:	Title:	E-mail:
Bobbie Vickerman	Coordinator	bvickerman@co.fillmore.mn.us
Cindy Blagsvedt	County Assessor	cblagsvedt@co.fillmore.mn.us
Jason Marquardt	CVSO (Veterans)	jmarquardt@co.fillmore.mn.us
RON GREGG	COUNTY ENGINEER	rgregg@co.fillmore.mn.us
Brett Corson	County Atty	bcorson@co.fillmore.mn.us
Jon Martin	Sol'd Waste Administrator	jmartin@co.fillmore.mn.us
MARC PRESTBY	COMMISSIONER	MPRESTBY@CO.FILLMORE.MN.US
Duane Bakke	commissioner	dbakke@co.fillmore.mn.us
Terry Schultz	Building Maintenance Supervisor	tschultz@co.fillmore.mn.us
Shirl Boelter	Auditor/Treasurer	sboelter@co.fillmore.mn.us
Jeff Brand	County Surveyor	jbrand@co.fillmore.mn.us
Tom Kaase	Sheriff	tkaase@co.fillmore.mn.us
Crista Adkins	Interim Zoning Administrator	cadkins@co.fillmore.mn.us
Neva Beier	Social Services Mgr	nbeier@co.fillmore.mn.us
DAVE Kiehne	Recorder	dkiehne@co.fillmore.mn.us
Kristina Kehn	HR	KKehn@co.fillmore.mn.us
Lantha Stevens	Director of Nursing/PH	lstevens@co.fillmore.mn.us

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. • Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Fillmore Community Meeting
Fillmore County Hazard Mitigation Plan Update
1:00 P.M. Tuesday, October 13th, 2015
Fillmore County Office Building

SIGN IN SHEET

Name/Title:	Community:	E-mail:
Bob Carlson	Carlson	
Deb Zimmer Admin	Spring Valley	debzimmer@springvalleygovoffice.com
John Dols	Kingsland Public Schools Spring Valley EM	dols.john@kingsland2137.org
LOREN BERGE	HOLT TOWNSHIP	STARPEEPER@HOTMAIL.COM
Brian Miner	Ostrander	bminer514@hotmail.com
Ryan Throckmorton	Preston	rthrockmorton@prestonmn.org
Jerome Illg	Harmony	cityoffice@harmony.mn.us
Stuart Marean	Harmony	marcmalc@harmonytel.net
Steve Oian	Tri-County Electric	soian@tec.coop
Chad Chaffee	Tri-County Elec	cchaffee@tec.coop
Steve Koebke	BLOOMFIELD	KOEBKE.STEVEN@COMCAST.EDU
Dan Graskamp	Fountain Twp	graskamp@charter.net
John Clarey	SpringValley Amb	springvalleyambulance@yahoo

Name/Title:	Community:	E-mail:
Robert Mieran	City of Mabel	mabelmn@mabeltel.coop
Lolly Mllander	City of Canton	Cantmoa@yahoo.com
Karen Larson	City of Mabel	mabelcity@mabeltel.coop
Mike Kelly	Harmony Township	MKelly Rock@6mail.com
Brenda Flatten/Clerk	Fountain	CityofFountain@frontiernet.net
Donna Rasmussen	Fillmore SWCD	donna.rasmussen@fillmoreswcd.org
Steve Smith	SV Public Utilities	SVsuper@SpringValleyUtility.com
Chuck Fuller	K-12 Schools	chuckehler@k-12schools.com
Jeff Blackburn	Preston/Lanesboro	bsess@prestonmn.org
Brenda Pohlman MPH	FC Public Health	bpohlman@co.fillmore.mn.us
Chris Hyrkas Clerk	Ostrander	osterk@ucegroup.com
Kevin Beck	Fillmore County	kbeck@co.fillmore.mn.us
Geoff Elliott	Rushford	Elliott.g@fce.coop
Gert Mahr	MDH	gert.mahr@state.mn.us
Joe Young/Clerk	Chatfield	jyoung@ci.chatfield.mn.us

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. ◆ Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Fillmore Community Meeting
Fillmore County Hazard Mitigation Plan Update
1:00 P.M. Tuesday, October 13th, 2015
Fillmore County Office Building

SIGN IN SHEET

Name/Title:	Community:	E-mail:
James Westby	Mabel	
Joe Hoffman	Preston	
Brad Kelly	Preble Township	
John Hanson	City of Fountain	
Richard Keith	Preston-Fillmore Central	
	Spring Valley	
Michelle Peterson	Lanesboro	
	Lanesboro	
Krista Berger	La Crosse	
	Amherst	

FILLMORE COUNTY
EMERGENCY MANAGEMENT
901 Houston Street, N.W. • Preston, MN 56093

Kevin Beck
Director
Phone: 507.765.3874
kbeck@co.fillmore.mn.us

Fillmore Community Meeting
Fillmore County Hazard Mitigation Plan Update
6:00 P.M. Tuesday, October 13th, 2015
Fillmore County Office Building

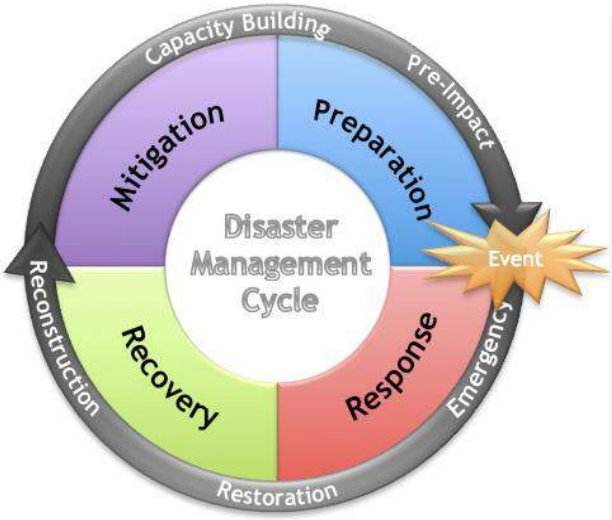
SIGN IN SHEET

Name/Title:	Community:	E-mail:
Fay Garness	Canton	garness@acegroup.cc
Dave Lombard	Rushford	dlombardrfd@hotmail.com
James Daly	Rushford Fire	DaileyJames@hotmail.com
Arlynn Hovey	Carimona	
Troy Lange	Spring Valley	kansetroy@hotmail.com
Chris Gudmundson	Holt	holt-fillmore@juno.com
Megan Boyum	Peterson	petersoncity@gmail.com
Arlen Halverson	Newburg Township	
Genette Halverson	" "	arlenh@mabeltel.coop
Richard Johnson	Norway Township	Richardjra@acegroup.cc
Andy Bisek	Preston Township	Bisek@LIVE.com
Brenda Pohlman	FC Public Health	bpohlman@co.fillmore.mn.us
Kevin Beck	Fillmore County	kbeck@co.fillmore.mn.us

What is Hazard Mitigation?

Hazard Mitigation isn't exactly a phrase that gets thrown around a lot in day to day conversation, but for the Emergency Management community, it's become a very important concept. The formal, FEMA-approved definition states that hazard mitigation is "any sustained action taken to reduce or eliminate long-term risk to life and property from natural hazards." In short, hazard mitigation's focus is on preventing the negative impacts from hazards before they happen. It can be a little easier to wrap your head around what this means by looking at how mitigation fits into the disaster management cycle.

- ***Response*** is the short-term, emergency actions taken to address the immediate impacts of a hazard. These actions should be covered by the Emergency Operations Plan.
- ***Recovery*** is the longer-term process of restoring the community back to normal or pre-disaster conditions. This includes rebuilding infrastructure, clearing debris, and resorting damaged areas.



- ***Mitigation*** activities are actions that will prevent, reduce or eliminate losses. Mitigation can reduce or eliminate the need for an emergency response and greatly decrease recovery.
- ***Preparation*** activities are the emergency plans, training, drills, and exercises that individuals, communities and first responders do to get ready for an emergency.

The Fillmore County Plan

The Fillmore County Hazard Mitigation Plan is being developed by Fillmore County with assistance from Region Nine Development Commission. The majority of the background research and mapping has been completed and we are now at a stage where we want to hear input from the individual communities covered by the plan. This is a critical step that allows us to write the plan so that it reflects the specific needs of each community, rather than simply presenting a high-level analysis of the county as a whole. The main items we will be looking to cover today include:

- ☒ Ranking the probability and impact of the hazards that threaten your community
- ☒ Cataloging existing hazard mitigation resources
- ☒ Developing mitigation actions that your community can undertake to reduce the threat of the hazards
- ☒ Analyzing the benefits and costs of these actions

Hazard Rankings

Jurisdiction Name:_____

Hazard	Probability	Magnitude/Severity
	How likely is this hazard to occur?	*What impact will it have?*
Severe Storms	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Tornadoes	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Extreme Temperatures	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Flood	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Landslides	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Fire	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Terrorism	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Hazardous Materials	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Dam/Levee Failure	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Essential Services Failure	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Animal Disease Outbreak	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic
Infectious Disease	Unlikely / Possible / Likely / Highly Likely	Negligible / Limited / Critical / Catastrophic

Probability	**Unlikely**	**Possible**
	• Extremely rare with no documented history of occurrences or events.	• Rare occurrences with at least one documented or anecdotal historic event.
	Likely	**Highly Likely**
	• Occasional occurrences with at least two or more documented historic events.	• Frequent events with a well documented history of occurrence.
Magnitude/ Severity	**Negligible**	**Limited**
	• 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.	• Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). • Injuries or illnesses do not resulting 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.
	Critical	**Catastrophic**
	• 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.	• 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.

Mitigation Action Categories

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.
  Examples: planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.

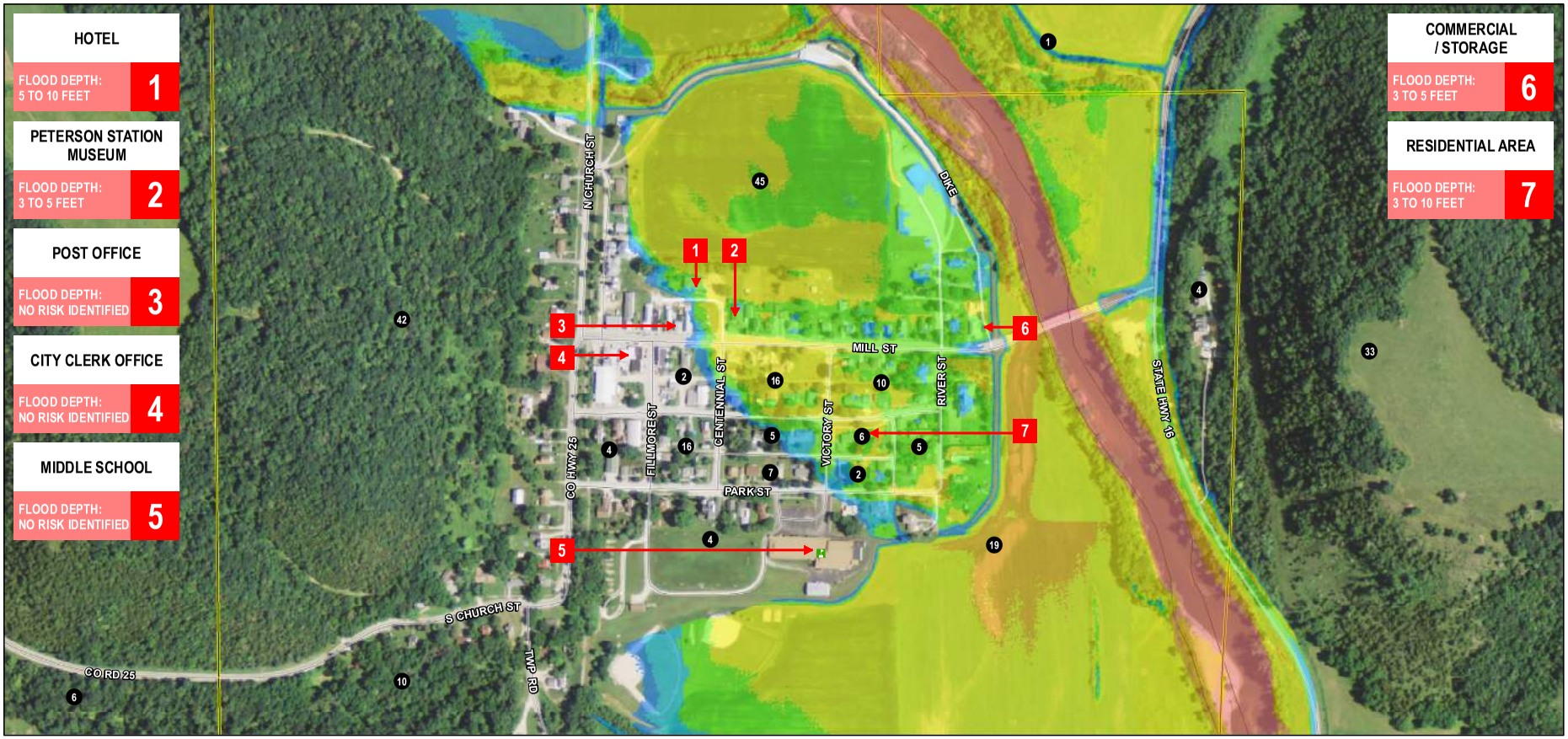
- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area.
  Examples: acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.

- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. *Examples: outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.*

- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems.
  Examples: sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event.
  Examples: warning systems, emergency response services, and protection of critical facilities.

- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard.
  Examples: dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.



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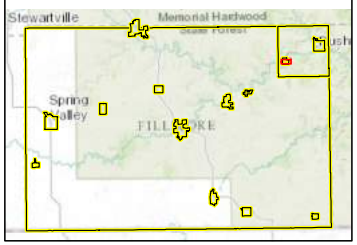


FLOOD HAZARD AREA

ABOUT DATA

About This Map:
The flood depth (in feet) during a 0.2 percent annual chance flood event.

Special Note:
The depth grid that was produced for this area was created using newer topography than what was used to create the effective flood hazard boundaries and may not match the effective boundary in all areas

Base Map:
Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

MAP SYMBOLOGY

Depth (feet)

> 0	Lower Risk
> 1.5	
> 3	
> 5	
> 10	
> 15	Higher Risk

Critical Facilities

- School
- Health Care Facility
- Fire Station
- Police Station
- Emergency Center

Census Block Population

0 250 500
Feet

N

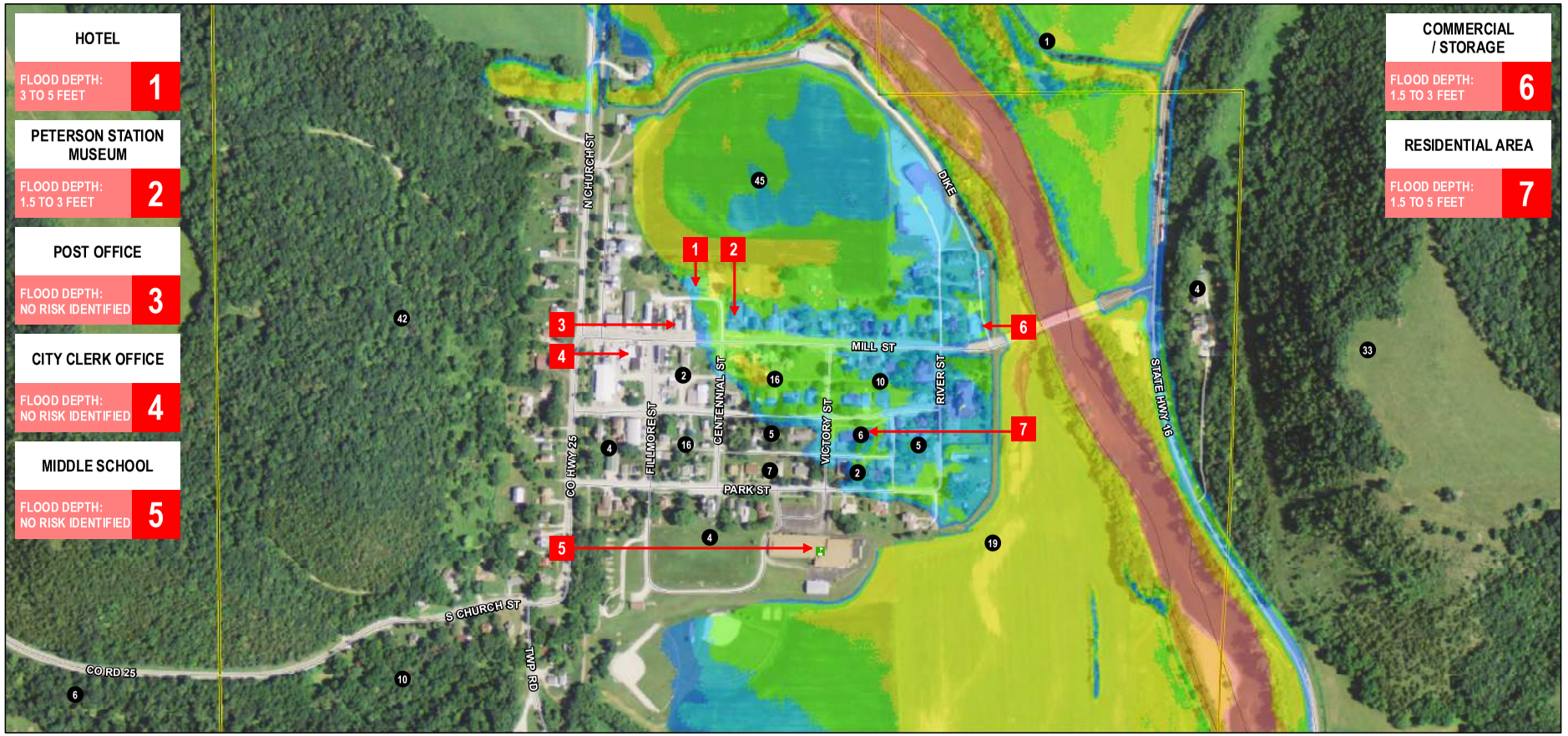
NATIONAL FLOOD INSURANCE PROGRAM

Depth (ft) - 0.2 Percent

PETERSON, CITY OF

FEMA RiskMAP Increasing Resilience Together | STARR

AUGUST 2015



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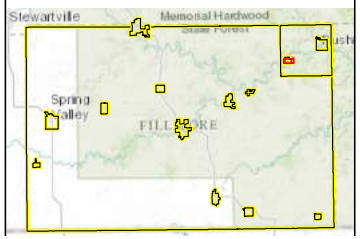

FLOOD HAZARD AREA

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MAP SYMBOLOGY

Depth (feet)

- > 0
- > 1.5
- > 3
- > 5
- > 10
- > 15

Lower Risk

Higher Risk

Critical Facilities

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- Fire Station
- Police Station
- Emergency Center

Census Block Population

0 250 500

Feet

N

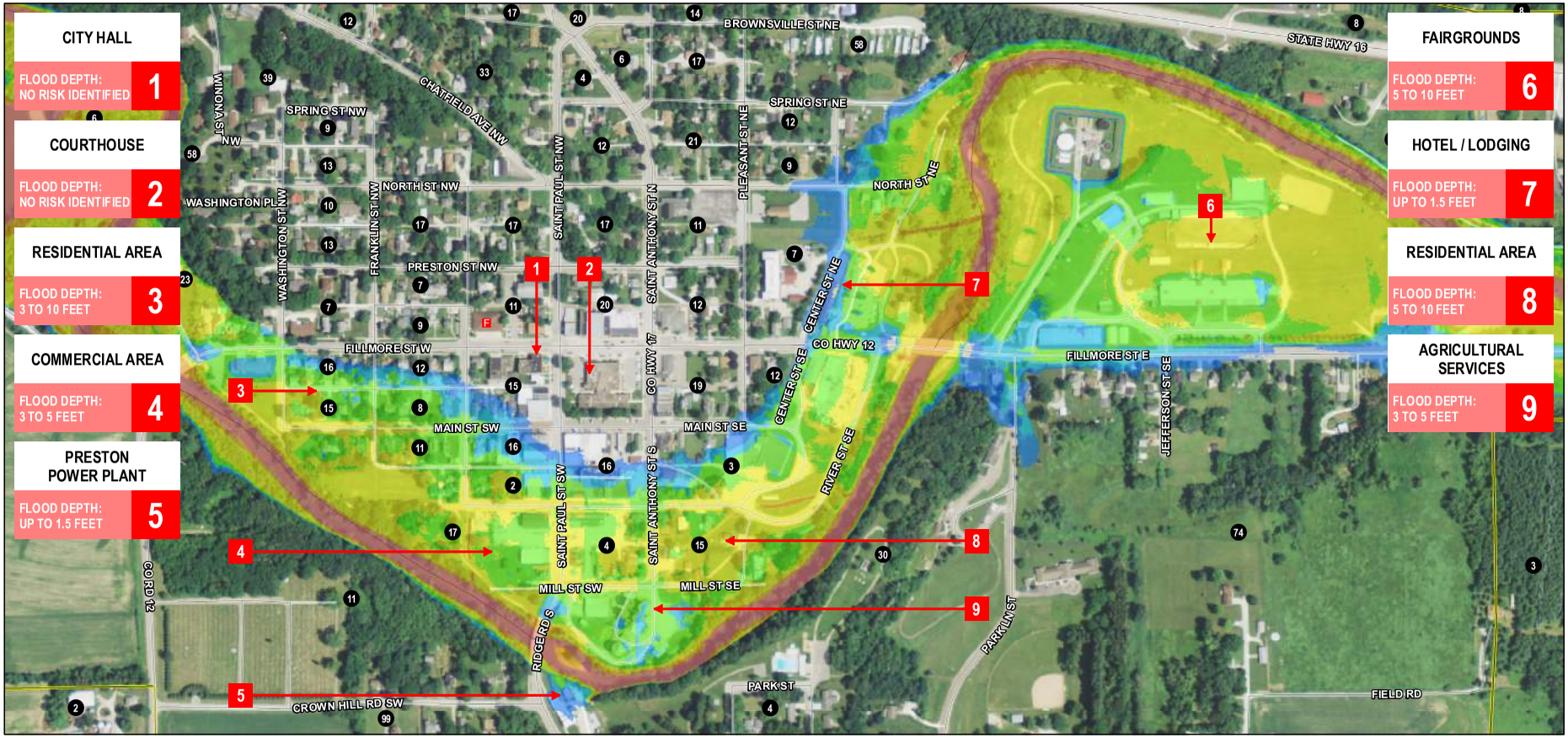
NATIONAL FLOOD INSURANCE PROGRAM

Depth (ft) - 1 Percent

PETERSON, CITY OF

FEMA RiskMAP Increasing Resilience Together STARR

AUGUST 2015



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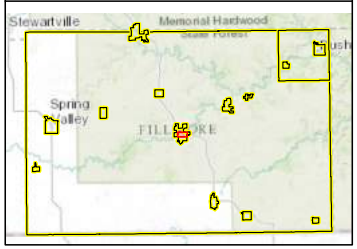
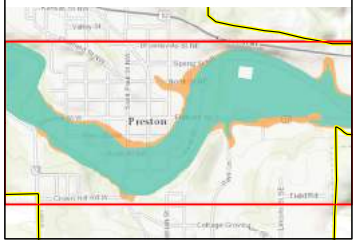


FLOOD HAZARD AREA



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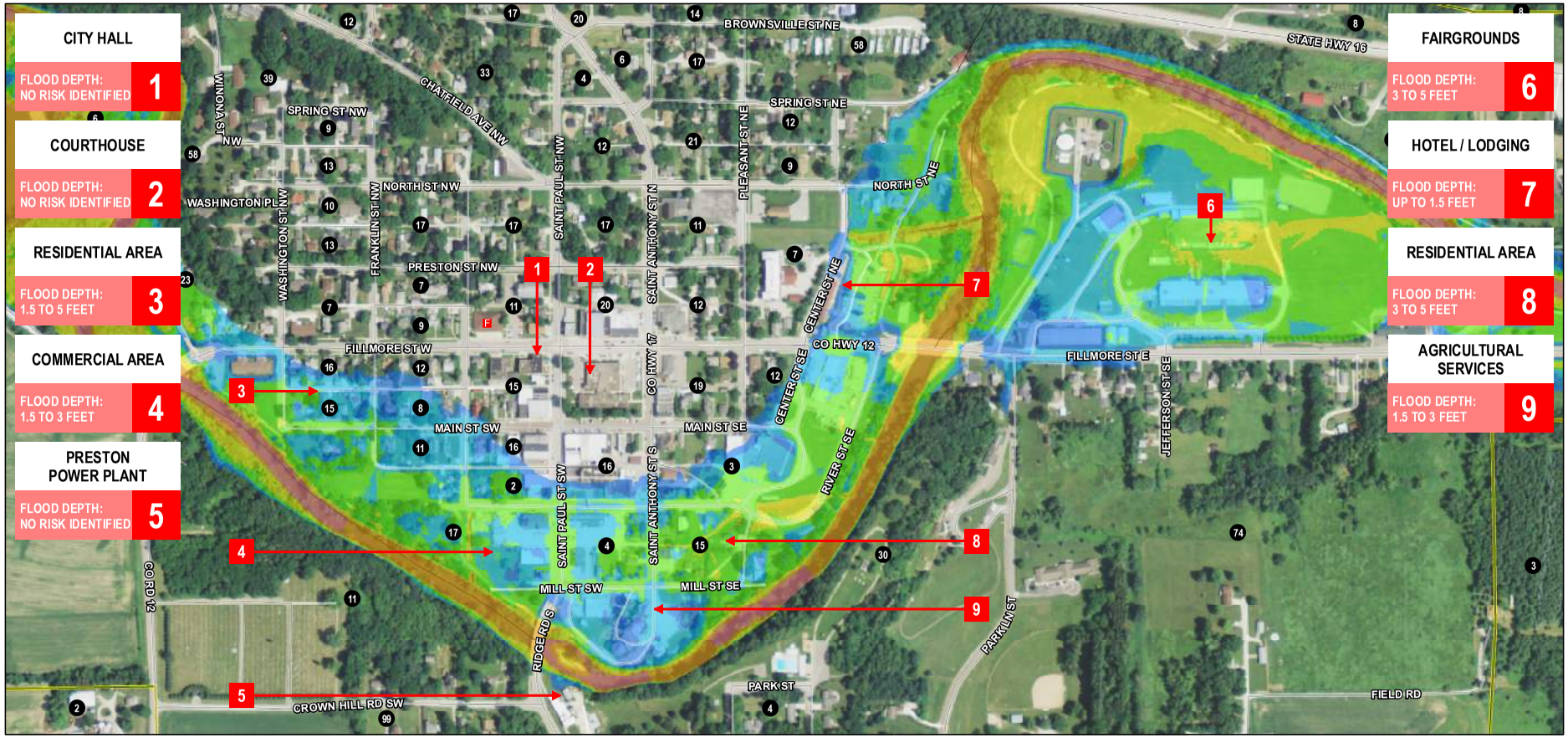
NATIONAL FLOOD INSURANCE PROGRAM

Depth (ft) - 0.2 Percent

PRESTON, CITY OF

FEMA RiskMAP Increasing Resilience Together | STARR

AUGUST 2015



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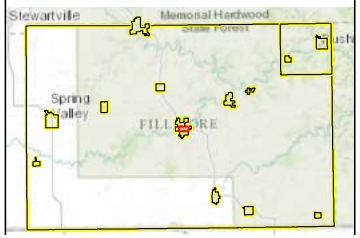

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0 250 500
Feet

NATIONAL FLOOD INSURANCE PROGRAM

Depth (ft) - 1 Percent

PRESTON, CITY OF

FEMA RiskMAP Increasing Resilience Together | STARR

AUGUST 2015

9.9 NCDC DATA (UNEDITED)[25]

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
4/9/2015	Hail	0	0	$0	$0
4/9/2015	Hail	0	0	$0	$0
1/8/2015	Blizzard	0	0	$0	$0
1/7/2015	Extreme Cold/Wind Chill	0	0	$0	$0
12/20/2014	Freezing Fog	0	0	$5,000	$0
9/20/2014	Hail	0	0	$0	$0
9/20/2014	Thunderstorm Wind	0	0	$2,000	$0
9/20/2014	Hail	0	0	$0	$0
9/20/2014	Thunderstorm Wind	0	0	$500	$0
8/29/2014	Thunderstorm Wind	0	0	$2,000	$0
8/25/2014	Hail	0	0	$0	$0
7/7/2014	Hail	0	0	$0	$0
6/27/2014	Flash Flood	0	0	$1,000	$0
4/12/2014	Hail	0	0	$0	$0
2/20/2014	Blizzard	0	0	$0	$0
1/27/2014	Extreme Cold/Wind Chill	0	0	$0	$0
1/26/2014	Blizzard	0	0	$0	$0
1/5/2014	Extreme Cold/Wind Chill	0	0	$0	$0
7/25/2013	Hail	0	0	$0	$0
7/25/2013	Thunderstorm Wind	0	0	$0	$65,000
7/25/2013	Hail	0	0	$0	$0
7/22/2013	Hail	0	0	$0	$0
7/22/2013	Hail	0	0	$0	$0
7/22/2013	Hail	0	0	$0	$0
7/22/2013	Hail	0	0	$0	$0
7/22/2013	Hail	0	0	$0	$0
6/23/2013	Flood	0	0	$0	$0
6/23/2013	Flood	0	0	$0	$0
6/23/2013	Flash Flood	0	0	$3,500,000	$0
6/12/2013	Hail	0	0	$0	$0
5/31/2013	Thunderstorm Wind	0	0	$0	$0
5/29/2013	Thunderstorm Wind	0	0	$2,000	$0
5/29/2013	Thunderstorm Wind	0	0	$0	$0
5/29/2013	Thunderstorm Wind	0	0	$6,000	$0
5/20/2013	Flood	0	0	$0	$0
5/19/2013	Flash Flood	0	0	$20,000	$0
5/19/2013	Thunderstorm Wind	0	0	$8,000	$0
4/9/2013	Hail	0	0	$0	$0
4/9/2013	Hail	0	0	$0	$0
4/9/2013	Hail	0	0	$0	$0
4/9/2013	Hail	0	0	$0	$0
4/9/2013	Hail	0	0	$0	$0
4/9/2013	Hail	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
4/1/2013	Drought	0	0	$0	$0
3/10/2013	Winter Storm	0	0	$0	$0
3/1/2013	Drought	0	0	$0	$0
2/21/2013	Winter Storm	0	0	$0	$0
2/1/2013	Drought	0	0	$0	$0
1/27/2013	Winter Storm	0	0	$0	$0
1/1/2013	Drought	0	0	$0	$0
12/19/2012	Winter Storm	0	0	$0	$0
12/1/2012	Drought	0	0	$0	$0
11/1/2012	Drought	0	0	$0	$0
10/1/2012	Drought	0	0	$0	$0
9/4/2012	Hail	0	0	$5,000	$0
9/4/2012	Hail	0	0	$0	$0
9/1/2012	Drought	0	0	$0	$0
8/1/2012	Drought	0	0	$0	$0
7/18/2012	Thunderstorm Wind	0	0	$13,000	$0
7/17/2012	Drought	0	0	$0	$0
7/2/2012	Heat	0	0	$0	$0
5/24/2012	Thunderstorm Wind	0	0	$0	$0
5/24/2012	Thunderstorm Wind	0	0	$2,000	$0
5/24/2012	Thunderstorm Wind	0	0	$25,000	$0
5/3/2012	Thunderstorm Wind	0	0	$1,000	$0
5/3/2012	Thunderstorm Wind	0	0	$2,000	$0
2/2/2012	Dense Fog	0	0	$10,000	$0
9/2/2011	Thunderstorm Wind	0	0	$500	$0
9/2/2011	Thunderstorm Wind	0	0	$2,000	$0
7/17/2011	Excessive Heat	0	0	$44,500	$0
7/1/2011	Thunderstorm Wind	0	0	$0	$0
7/1/2011	Thunderstorm Wind	0	0	$5,000	$0
5/22/2011	Tornado	0	0	$250,000	$0
4/10/2011	Thunderstorm Wind	0	0	$22,000	$0
4/10/2011	Hail	0	0	$0	$0
2/20/2011	Winter Storm	0	0	$0	$0
2/11/2011	Winter Weather	0	0	$8,000	$0
12/31/2010	Winter Weather	0	0	$0	$0
12/29/2010	Dense Fog	0	0	$0	$0
12/20/2010	Winter Storm	0	0	$0	$0
12/11/2010	Blizzard	0	0	$0	$0
12/11/2010	Winter Storm	0	0	$0	$0
11/24/2010	Winter Weather	0	0	$0	$0
10/26/2010	High Wind	0	0	$3,000	$0
9/23/2010	Flood	0	0	$45,000	$0
9/15/2010	Hail	0	0	$0	$0
9/15/2010	Hail	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
9/15/2010	Hail	0	0	$0	$0
8/13/2010	Flood	0	0	$0	$0
6/21/2010	Hail	0	0	$0	$0
6/17/2010	Thunderstorm Wind	0	0	$0	$0
6/11/2010	Strong Wind	0	0	$1,000	$0
3/8/2010	Dense Fog	0	0	$0	$0
2/7/2010	Winter Storm	0	0	$0	$0
1/28/2010	Cold/Wind Chill	0	0	$0	$0
1/25/2010	Winter Weather	0	0	$0	$0
1/21/2010	Winter Weather	0	0	$0	$0
1/1/2010	Extreme Cold/Wind Chill	0	0	$0	$0
12/23/2009	Winter Storm	0	0	$0	$0
12/10/2009	Cold/Wind Chill	0	0	$0	$0
12/8/2009	Blizzard	0	0	$0	$0
7/24/2009	Thunderstorm Wind	0	0	$500	$0
7/7/2009	Hail	0	0	$0	$0
5/20/2009	Strong Wind	0	0	$100	$0
4/24/2009	Hail	0	0	$0	$0
2/26/2009	Winter Storm	0	0	$0	$0
1/14/2009	Extreme Cold/Wind Chill	0	0	$0	$0
1/12/2009	Winter Storm	0	0	$0	$0
1/3/2009	Winter Weather	0	0	$0	$0
12/21/2008	Cold/Wind Chill	0	0	$0	$0
12/20/2008	Winter Storm	0	0	$0	$0
12/19/2008	Winter Storm	0	0	$0	$0
12/14/2008	Cold/Wind Chill	0	0	$0	$0
12/8/2008	Winter Storm	0	0	$0	$0
7/31/2008	Thunderstorm Wind	0	0	$0	$0
7/15/2008	Hail	0	0	$0	$0
7/11/2008	Thunderstorm Wind	0	0	$1,000	$0
7/11/2008	Thunderstorm Wind	0	0	$0	$0
7/7/2008	Thunderstorm Wind	0	0	$6,000	$0
7/7/2008	Thunderstorm Wind	0	0	$5,000	$0
6/8/2008	Flood	0	0	$750,000	$800,000
6/8/2008	Flood	0	0	$2,100,000	$1,800,000
6/8/2008	Hail	0	0	$800	$3000
6/7/2008	Flash Flood	0	0	$750,000	$500,000
6/7/2008	Hail	0	0	$5,000	$10,000
6/7/2008	Hail	0	0	$1,000	$2,500
6/7/2008	Hail	0	0	$0	$0
6/7/2008	Hail	0	0	$0	$0
6/7/2008	Hail	0	0	$0	$0
6/7/2008	Thunderstorm Wind	0	0	$0	$0
6/6/2008	Thunderstorm Wind	0	0	$1,500	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
6/6/2008	Thunderstorm Wind	0	0	$1,000	$0
6/6/2008	Thunderstorm Wind	0	0	$0	$0
6/6/2008	Thunderstorm Wind	0	0	$500	$0
5/31/2008	Hail	0	0	$0	$0
5/31/2008	Hail	0	0	$0	$2,500
2/10/2008	Extreme Cold/Wind Chill	0	0	$0	$0
1/29/2008	Extreme Cold/Wind Chill	0	0	$0	$0
1/29/2008	Winter Storm	0	0	$0	$0
12/1/2007	Winter Storm	0	0	$0	$0
9/21/2007	Hail	0	0	$0	$0
9/21/2007	Thunderstorm Wind	0	0	$5,000	$5,000
8/21/2007	Flash Flood	0	0	$6,000	$0
8/19/2007	Flood	0	0	$11,000,000	$750,000
8/18/2007	Flash Flood	0	0	$38,000,000	$390,000
8/14/2007	Flash Flood	0	0	$2,000	$0
8/11/2007	Thunderstorm Wind	0	0	$0	$0
8/11/2007	Thunderstorm Wind	0	0	$1,500	$0
8/11/2007	Hail	0	0	$0	$0
7/26/2007	Thunderstorm Wind	0	0	$0	$0
7/16/2007	Hail	0	0	$0	$0
7/16/2007	Hail	0	0	$0	$0
7/16/2007	Hail	0	0	$0	$0
7/16/2007	Hail	0	0	$0	$0
6/21/2007	Hail	0	0	$0	$0
6/7/2007	Thunderstorm Wind	0	0	$750	$0
6/7/2007	Thunderstorm Wind	0	0	$5,000	$0
6/7/2007	Thunderstorm Wind	0	0	$800	$0
6/7/2007	Hail	0	0	$0	$2,000
6/7/2007	Thunderstorm Wind	0	0	$500	$0
4/10/2007	Winter Storm	0	0	$0	$0
3/1/2007	Winter Storm	0	0	$0	$0
2/28/2007	Winter Storm	0	0	$0	$0
2/24/2007	Blizzard	0	0	$0	$0
2/23/2007	Winter Storm	0	0	$0	$0
2/2/2007	Extreme Cold/Wind Chill	0	0	$0	$0
8/24/2006	Hail	0	0	$0	$0
8/24/2006	Hail	0	0	$0	$2,000
8/24/2006	Thunderstorm Wind	0	0	$800	$0
8/24/2006	Hail	0	0	$0	$4,000
7/19/2006	Hail	0	0	$0	$0
7/14/2006	Thunderstorm Wind	0	0	$750	$0
6/14/2006	Hail	0	0	$0	$0
5/8/2006	Flash Flood	0	0	$1,500	$0
5/8/2006	Hail	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
5/8/2006	Hail	0	0	$0	$0
5/8/2006	Hail	0	0	$0	$0
5/8/2006	Hail	0	0	$0	$0
5/8/2006	Hail	0	0	$1,000	$0
5/8/2006	Hail	0	0	$0	$0
5/8/2006	Hail	0	0	$1,000	$0
5/8/2006	Hail	0	0	$0	$0
2/15/2006	Winter Storm	0	0	$0	$0
11/12/2005	High Wind	0	0	$0	$0
9/13/2005	Hail	0	0	$0	$2,500
9/13/2005	Hail	0	0	$0	$1,000
9/3/2005	Thunderstorm Wind	0	0	$2,000	$0
7/25/2005	Thunderstorm Wind	0	0	$500	$0
7/25/2005	Flash Flood	0	0	$2,500	$6,000
5/26/2005	Hail	0	0	$0	$0
3/30/2005	Hail	0	0	$0	$0
3/17/2005	Winter Storm	0	0	$0	$0
1/22/2005	Blizzard	0	0	$0	$0
1/21/2005	Winter Storm	0	0	$0	$0
1/1/2005	Ice Storm	0	0	$0	$0
12/20/2004	Winter Storm	0	0	$0	$0
12/12/2004	High Wind	0	0	$0	$0
9/15/2004	Flood	0	0	$100,000	$10,000
9/15/2004	Flash Flood	0	0	$5,000	$8,500
8/26/2004	Hail	0	0	$0	$0
8/26/2004	Hail	0	0	$0	$0
8/26/2004	Hail	0	0	$0	$0
8/3/2004	Hail	0	0	$0	$2500
6/23/2004	Hail	0	0	$0	$10,000
6/23/2004	Thunderstorm Wind	0	0	$250	$0
6/16/2004	Flash Flood	0	0	$7,000	$10,000
6/16/2004	Tornado	0	0	$0	$0
6/16/2004	Funnel Cloud	0	0	$0	$0
6/11/2004	Thunderstorm Wind	0	0	$1,200	$0
6/11/2004	Thunderstorm Wind	0	0	$750	$0
6/11/2004	Thunderstorm Wind	0	0	$500	$0
6/11/2004	Tornado	0	0	$0	$0
6/9/2004	Flash Flood	0	0	$0	$0
6/8/2004	Flash Flood	0	0	$7,000	$15,000
5/21/2004	Hail	0	0	$0	$0
5/8/2004	Hail	0	0	$0	$0
5/8/2004	Hail	0	0	$0	$0
5/8/2004	Hail	0	0	$0	$0
5/7/2004	Hail	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
4/18/2004	High Wind	0	0	$1,250	$0
4/17/2004	Hail	0	0	$0	$0
4/17/2004	Hail	0	0	$1,500	$0
4/17/2004	Thunderstorm Wind	0	0	$500	$0
4/17/2004	Hail	0	0	$500	$0
2/1/2004	Winter Storm	0	0	$0	$0
1/26/2004	Winter Storm	0	0	$0	$0
8/25/2003	Thunderstorm Wind	0	0	$0	$2,000
7/4/2003	Thunderstorm Wind	0	0	$750	$750
4/7/2003	Winter Storm	0	0	$0	$0
7/30/2002	Thunderstorm Wind	0	0	$2,000	$0
7/18/2002	Thunderstorm Wind	0	0	$1,000	$2,000
6/26/2002	Funnel Cloud	0	0	$0	$0
5/8/2002	Hail	0	0	$0	$0
4/18/2002	Hail	0	0	$0	$0
4/18/2002	Hail	0	0	$0	$0
3/9/2002	Blizzard	0	0	$0	$0
3/1/2002	Winter Storm	0	0	$0	$0
10/25/2001	High Wind	0	0	$0	$0
8/1/2001	Heat	0	0	$0	$0
7/31/2001	Heat	0	0	$0	$0
7/21/2001	Hail	0	0	$700	$2,500
7/21/2001	Hail	0	0	$400	$0
6/18/2001	Funnel Cloud	0	0	$0	$0
6/18/2001	Thunderstorm Wind	0	0	$0	$0
6/1/2001	Hail	0	0	$0	$0
6/1/2001	Hail	0	0	$0	$0
6/1/2001	Hail	0	0	$0	$0
6/1/2001	Hail	0	0	$2,000	$0
5/1/2001	Hail	0	0	$4,500	$0
5/1/2001	Hail	0	0	$0	$0
4/11/2001	Flash Flood	0	0	$1,000	$0
4/7/2001	Flood	0	0	$35,000	$0
4/7/2001	High Wind	0	0	$1,000	$0
4/6/2001	Flash Flood	0	0	$30,000	$0
4/6/2001	Hail	0	0	$0	$0
4/5/2001	Hail	0	0	$0	$0
3/11/2001	Winter Storm	0	0	$0	$0
2/24/2001	Ice Storm	0	0	$0	$0
2/8/2001	Winter Storm	0	0	$0	$0
1/29/2001	Ice Storm	0	0	$0	$0
12/28/2000	Winter Storm	0	0	$0	$0
12/18/2000	Winter Storm	0	0	$0	$0
12/10/2000	Winter Storm	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
8/26/2000	Thunderstorm Wind	0	0	$0	$0
8/26/2000	Thunderstorm Wind	0	0	$0	$0
8/1/2000	Thunderstorm Wind	0	0	$2,500	$0
8/1/2000	Hail	0	0	$18,000	$25,000
8/1/2000	Hail	0	0	$3,500	$10,000
7/10/2000	Flood	0	0	$75,000	$150,000
7/10/2000	Flash Flood	0	0	$150,000	$100,000
7/9/2000	Flash Flood	0	0	$35,000	$25,000
7/9/2000	Thunderstorm Wind	0	0	$1,000	$0
7/9/2000	Thunderstorm Wind	0	0	$2,500	$0
7/9/2000	Thunderstorm Wind	0	0	$750	$0
6/23/2000	Hail	0	0	$0	$5,000
6/13/2000	Flash Flood	0	0	$35,000	$20,000
6/13/2000	Thunderstorm Wind	0	0	$15,000	$0
6/13/2000	Thunderstorm Wind	0	0	$10,000	$0
6/1/2000	Lightning	0	0	$18,000	$0
6/1/2000	Hail	0	0	$0	$5,000
6/1/2000	Flood	0	0	$20,000	$35,000
6/1/2000	Flash Flood	0	0	$1,800,000	$500000
1/19/2000	Winter Storm	0	0	$0	$0
8/9/1999	Hail	0	0	$10,000	$12,000
7/28/1999	Heat	0	0	$0	$0
7/23/1999	Heat	0	0	$0	$0
7/20/1999	Flash Flood	0	0	$85,000	$40,000
7/8/1999	Thunderstorm Wind	0	0	$2,000	$0
7/4/1999	Heat	0	0	$0	$0
6/8/1999	Hail	0	0	$0	$30,000
6/8/1999	Hail	0	0	$20,000	$0
6/8/1999	Hail	0	0	$0	$0
6/6/1999	Thunderstorm Wind	0	0	$15,000	$0
6/6/1999	Thunderstorm Wind	0	0	$0	$40,000
6/6/1999	Thunderstorm Wind	0	0	$25,000	$0
6/6/1999	Thunderstorm Wind	0	0	$30,000	$0
6/6/1999	Thunderstorm Wind	0	0	$0	$30,000
6/5/1999	Hail	0	0	$20,000	$0
6/5/1999	Hail	0	0	$0	$0
3/8/1999	Winter Storm	0	0	$0	$0
2/11/1999	Winter Storm	0	0	$0	$0
1/1/1999	Winter Storm	0	0	$0	$0
11/10/1998	High Wind	1	0	$200,000	$0
8/9/1998	Flash Flood	0	0	$25,000	$50,000
7/20/1998	Hail	0	0	$0	$30,000
7/18/1998	Thunderstorm Wind	0	0	$0	$0
6/27/1998	Thunderstorm Wind	0	0	$18,000	$5,000

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
6/27/1998	Thunderstorm Wind	0	0	$8,000	$3,000
6/27/1998	Flood	0	0	$1,600	$2,800
6/27/1998	Thunderstorm Wind	0	0	$20,000	$20,000
6/27/1998	Thunderstorm Wind	0	0	$18,000	$3,000
6/27/1998	Thunderstorm Wind	0	0	$18,000	$10,000
6/27/1998	Hail	0	0	$200	$30,000
6/20/1998	Flash Flood	0	0	$25,000	$35,000
6/20/1998	Thunderstorm Wind	0	0	$50,000	$22,000
6/20/1998	Thunderstorm Wind	0	0	$45,000	$25,000
6/20/1998	Thunderstorm Wind	0	0	$50,000	$0
6/20/1998	Hail	0	0	$0	$45,000
6/20/1998	Hail	0	0	$25,000	$30,000
6/20/1998	Hail	0	0	$18,000	$40,000
6/20/1998	Thunderstorm Wind	0	0	$5,000	$20,000
6/20/1998	Thunderstorm Wind	0	0	$13,000	$0
6/20/1998	Hail	0	0	$0	$25000
6/18/1998	Thunderstorm Wind	0	0	$17000	$0
5/30/1998	Thunderstorm Wind	0	0	$25,000	$30,000
5/30/1998	Thunderstorm Wind	0	0	$35,000	$30,000
5/30/1998	Thunderstorm Wind	0	0	$15,000	$28,000
5/18/1998	Hail	0	0	$28,000	$0
5/18/1998	Hail	0	0	$18,000	$0
5/15/1998	Thunderstorm Wind	0	0	$0	$0
1/4/1998	Ice Storm	0	0	$10,000	$0
8/23/1997	Hail	0	0	$0	$15,000
8/23/1997	Hail	0	0	$0	$12,000
8/3/1997	Thunderstorm Wind	0	0	$10,000	$0
7/20/1997	Funnel Cloud	0	0	$0	$0
7/19/1997	Flood	0	0	$0	$0
6/28/1997	Thunderstorm Wind	0	0	$1,000	$0
6/22/1997	Thunderstorm Wind	0	0	$8,000	$0
6/22/1997	Thunderstorm Wind	0	0	$0	$0
6/22/1997	Thunderstorm Wind	0	0	$6,000	$0
6/22/1997	Thunderstorm Wind	0	0	$0	$0
6/19/1997	Tornado	0	0	$0	$0
6/19/1997	Hail	0	0	$0	$0
6/19/1997	Hail	0	0	$0	$0
6/19/1997	Hail	0	0	$8,000	$0
6/19/1997	Hail	0	0	$0	$0
6/5/1997	Hail	0	0	$0	$0
3/12/1997	Winter Storm	0	0	$0	$0
2/4/1997	Winter Storm	0	0	$0	$0
1/16/1997	Cold/Wind Chill	0	0	$0	$0
1/15/1997	Winter Storm	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
11/20/1996	Winter Storm	0	0	$0	$0
10/30/1996	High Wind	0	0	$2,500	$0
2/10/1996	High Wind	0	0	$0	$0
2/1/1996	Cold/Wind Chill	0	0	$0	$0
1/31/1996	Cold/Wind Chill	0	0	$0	$0
1/28/1996	Blizzard	0	0	$0	$0
1/26/1996	Blizzard	0	0	$0	$0
7/27/1995	Thunderstorm Wind	0	0	$0	$0
7/27/1995	Thunderstorm Wind	0	0	$0	$0
6/22/1995	Hail	0	0	$0	$0
5/16/1995	Hail	0	0	$0	$0
7/30/1994	Hail	0	0	$500	$0
8/9/1993	Thunderstorm Wind	0	0	$0	$0
9/16/1992	Thunderstorm Wind	0	0	$0	$0
6/23/1992	Hail	0	0	$0	$0
5/16/1992	Thunderstorm Wind	0	0	$0	$0
7/7/1991	Thunderstorm Wind	0	0	$0	$0
8/9/1990	Hail	0	0	$0	$0
8/2/1990	Thunderstorm Wind	0	0	$0	$0
8/4/1989	Hail	0	0	$0	$0
8/3/1988	Thunderstorm Wind	0	0	$0	$0
3/24/1988	Thunderstorm Wind	0	0	$0	$0
7/27/1986	Hail	0	0	$0	$0
5/29/1985	Thunderstorm Wind	0	0	$0	$0
10/16/1984	Thunderstorm Wind	0	0	$0	$0
7/14/1984	Thunderstorm Wind	0	0	$0	$0
4/27/1984	Thunderstorm Wind	0	0	$0	$0
5/17/1982	Tornado	0	0	$25,000	$0
5/23/1981	Thunderstorm Wind	0	0	$0	$0
9/20/1980	Thunderstorm Wind	0	0	$0	$0
9/19/1980	Hail	0	0	$0	$0
8/7/1980	Thunderstorm Wind	0	0	$0	$0
7/19/1980	Hail	0	0	$0	$0
7/19/1980	Thunderstorm Wind	0	0	$0	$0
7/12/1980	Hail	0	0	$0	$0
6/18/1980	Hail	0	0	$0	$0
5/30/1980	Hail	0	0	$0	$0
8/4/1979	Thunderstorm Wind	0	0	$0	$0
6/19/1979	Thunderstorm Wind	0	0	$0	$0
6/30/1978	Hail	0	0	$0	$0
6/16/1978	Hail	0	0	$0	$0
4/17/1978	Thunderstorm Wind	0	0	$0	$0
7/14/1977	Tornado	10	0	$2,500,000	$0
7/14/1977	Hail	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
6/13/1976	Thunderstorm Wind	0	0	$0	$0
6/12/1976	Thunderstorm Wind	0	0	$0	$0
6/12/1976	Thunderstorm Wind	0	0	$0	$0
6/21/1975	Thunderstorm Wind	0	0	$0	$0
6/20/1974	Hail	0	0	$0	$0
6/20/1974	Thunderstorm Wind	0	0	$0	$0
6/20/1974	Thunderstorm Wind	0	0	$0	$0
6/20/1974	Hail	0	0	$0	$0
5/21/1974	Hail	0	0	$0	$0
7/23/1973	Tornado	0	0	$2,500	$0
7/18/1973	Hail	0	0	$0	$0
6/26/1969	Thunderstorm Wind	0	0	$0	$0
5/15/1968	Tornado	0	0	$25,000	$0
4/20/1968	Tornado	0	0	$25,000	$0
6/20/1966	Hail	0	0	$0	$0
7/15/1965	Hail	0	0	$0	$0
5/5/1965	Tornado	6	0	$2,500,000	$0
5/4/1964	Hail	0	0	$0	$0
5/10/1953	Tornado	6	1	$2,500,000	$0
5/18/1998	Hail	0	0	$0	$0
5/15/1998	Hail	0	0	$0	$0
1/4/1998	Blizzard	0	0	$0	$0
8/23/1997	Extreme Cold/Wind Chill	0	0	$0	$0
8/23/1997	Freezing Fog	0	0	$5,000	$0
8/3/1997	Hail	0	0	$0	$0
7/20/1997	Thunderstorm Wind	0	0	$2,000	$0
7/19/1997	Hail	0	0	$0	$0
6/28/1997	Thunderstorm Wind	0	0	$500	$0
6/22/1997	Thunderstorm Wind	0	0	$2,000	$0
6/22/1997	Hail	0	0	$0	$0
6/22/1997	Hail	0	0	$0	$0
6/22/1997	Flash Flood	0	0	$1,000	$0
6/19/1997	Hail	0	0	$0	$0
6/19/1997	Blizzard	0	0	$0	$0
6/19/1997	Extreme Cold/Wind Chill	0	0	$0	$0
6/19/1997	Blizzard	0	0	$0	$0
6/19/1997	Extreme Cold/Wind Chill	0	0	$0	$0
6/5/1997	Hail	0	0	$0	$0
3/12/1997	Thunderstorm Wind	0	0	$0	$65,000
2/4/1997	Hail	0	0	$0	$0
1/16/1997	Hail	0	0	$0	$0
1/15/1997	Hail	0	0	$0	$0
11/20/1996	Hail	0	0	$0	$0
10/30/1996	Hail	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
2/10/1996	Hail	0	0	$0	$0
2/1/1996	Flood	0	0	$0	$0
1/31/1996	Flood	0	0	$0	$0
1/28/1996	Flash Flood	0	0	$3,500,000	$0
1/26/1996	Hail	0	0	$0	$0
7/27/1995	Thunderstorm Wind	0	0	$0	$0
7/27/1995	Thunderstorm Wind	0	0	$2,000	$0
6/22/1995	Thunderstorm Wind	0	0	$0	$0
5/16/1995	Thunderstorm Wind	0	0	$6,000	$0
7/30/1994	Flood	0	0	$0	$0
8/9/1993	Flash Flood	0	0	$20,000	$0
9/16/1992	Thunderstorm Wind	0	0	$8,000	$0
6/23/1992	Hail	0	0	$0	$0
5/16/1992	Hail	0	0	$0	$0
7/7/1991	Hail	0	0	$0	$0
8/9/1990	Hail	0	0	$0	$0
8/2/1990	Hail	0	0	$0	$0
8/4/1989	Hail	0	0	$0	$0
8/3/1988	Drought	0	0	$0	$0
3/24/1988	Winter Storm	0	0	$0	$0
7/27/1986	Drought	0	0	$0	$0
5/29/1985	Winter Storm	0	0	$0	$0
10/16/1984	Drought	0	0	$0	$0
7/14/1984	Winter Storm	0	0	$0	$0
4/27/1984	Drought	0	0	$0	$0
5/17/1982	Winter Storm	0	0	$0	$0
5/23/1981	Drought	0	0	$0	$0
9/20/1980	Drought	0	0	$0	$0
9/19/1980	Drought	0	0	$0	$0
8/7/1980	Hail	0	0	$5,000	$0
7/19/1980	Hail	0	0	$0	$0
7/19/1980	Drought	0	0	$0	$0
7/12/1980	Drought	0	0	$0	$0
6/18/1980	Thunderstorm Wind	0	0	$13,000	$0
5/30/1980	Drought	0	0	$0	$0
8/4/1979	Heat	0	0	$0	$0
6/19/1979	Thunderstorm Wind	0	0	$0	$0
6/30/1978	Thunderstorm Wind	0	0	$2,000	$0
6/16/1978	Thunderstorm Wind	0	0	$25,000	$0
4/17/1978	Thunderstorm Wind	0	0	$1,000	$0
7/14/1977	Thunderstorm Wind	0	0	$2,000	$0
7/14/1977	Dense Fog	0	0	$10,000	$0
6/13/1976	Thunderstorm Wind	0	0	$500	$0
6/12/1976	Thunderstorm Wind	0	0	$2,000	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
6/12/1976	Excessive Heat	0	0	$44,500	$0
6/21/1975	Thunderstorm Wind	0	0	$0	$0
6/20/1974	Thunderstorm Wind	0	0	$5,000	$0
6/20/1974	Tornado	0	0	$250,000	$0
6/20/1974	Thunderstorm Wind	0	0	$22,000	$0
6/20/1974	Hail	0	0	$0	$0
5/21/1974	Winter Storm	0	0	$0	$0
7/23/1973	Winter Weather	0	0	$8,000	$0
7/18/1973	Winter Weather	0	0	$0	$0
6/26/1969	Dense Fog	0	0	$0	$0
5/15/1968	Winter Storm	0	0	$0	$0
4/20/1968	Blizzard	0	0	$0	$0
6/20/1966	Winter Storm	0	0	$0	$0
7/15/1965	Winter Weather	0	0	$0	$0
5/5/1965	High Wind	0	0	$3,000	$0
5/4/1964	Flood	0	0	$45,000	$0
5/10/1953	Hail	0	0	$0	$0
8/4/1989	Hail	0	0	$0	$0
8/3/1988	Hail	0	0	$0	$0
3/24/1988	Flood	0	0	$0	$0
7/27/1986	Hail	0	0	$0	$0
5/29/1985	Thunderstorm Wind	0	0	$0	$0
10/16/1984	Strong Wind	0	0	$1,000	$0
7/14/1984	Dense Fog	0	0	$0	$0
4/27/1984	Winter Storm	0	0	$0	$0
5/17/1982	Cold/Wind Chill	0	0	$0	$0
5/23/1981	Winter Weather	0	0	$0	$0
9/20/1980	Winter Weather	0	0	$0	$0
9/19/1980	Extreme Cold/Wind Chill	0	0	$0	$0
8/7/1980	Winter Storm	0	0	$0	$0
7/19/1980	Cold/Wind Chill	0	0	$0	$0
7/19/1980	Blizzard	0	0	$0	$0
7/12/1980	Thunderstorm Wind	0	0	$500	$0
6/18/1980	Hail	0	0	$0	$0
5/30/1980	Strong Wind	0	0	$100	$0
8/4/1979	Hail	0	0	$0	$0
6/19/1979	Winter Storm	0	0	$0	$0
6/30/1978	Extreme Cold/Wind Chill	0	0	$0	$0
6/16/1978	Winter Storm	0	0	$0	$0
4/17/1978	Winter Weather	0	0	$0	$0
7/14/1977	Cold/Wind Chill	0	0	$0	$0
7/14/1977	Winter Storm	0	0	$0	$0
6/13/1976	Winter Storm	0	0	$0	$0
6/12/1976	Cold/Wind Chill	0	0	$0	$0

Start Date	Type	Injuries	Deaths	Property Damage	Crop Damage
6/12/1976	Winter Storm	0	0	$0	$0
6/21/1975	Thunderstorm Wind	0	0	$0	$0
6/20/1974	Hail	0	0	$0	$0
6/20/1974	Thunderstorm Wind	0	0	$1,000	$0
6/20/1974	Thunderstorm Wind	0	0	$0	$0
6/20/1974	Thunderstorm Wind	0	0	$6,000	$0
5/21/1974	Thunderstorm Wind	0	0	$5,000	$0
7/23/1973	Flood	0	0	$750,000	$800,000
7/18/1973	Flood	0	0	$2,100,000	$1,800,000
6/26/1969	Hail	0	0	$800	$3,000
5/15/1968	Flash Flood	0	0	$750,000	$500,000
4/20/1968	Hail	0	0	$5,000	$10,000
6/20/1966	Hail	0	0	$1,000	$2,500
7/15/1965	Hail	0	0	$0	$0
5/5/1965	Hail	0	0	$0	$0
5/4/1964	Hail	0	0	$0	$0
5/10/1953	Thunderstorm Wind	0	0	$0	$0
	TOTAL	**23**	**1**	**$67,537,850**	**$5,946,550**

Jurisdiction	Mitigation Action	Hazard	Mitigation Types	Priority / Status	Implementation	Cost	Funding	Probability	Magnitude	Composite Score
All Cities	Create a staff transition plan to ensure that knowledge and expertise of existing staff is carried on to successors	All Hazards	P	High/ Ongoing	Administration	3	2	2.00	1.97	8.97
All Cities	Train all fire department personnel and other first responders in proper hazardous material procedures	Hazardous Materials	PE, ES	Medium/ Ongoing	Fire	2	2	1.85	1.96	7.81
All Cities	Ensure infrastructure and procedures are in place to provide adequate warning of severe weather events to residents	All Hazards	PE, ES, SI	Medium/ Ongoing	Administration	1	2	2.00	1.97	6.97
All Townships	Create a staff transition plan to ensure that knowledge and expertise of existing staff is carried on to successors	All Hazards	P	Medium/ Ongoing	Administration/ Public Works	3	2	2.43	2.35	9.78
Canton	Replace and increase storm water system capacity	Summer and Winter Storms/ Flood	P, PP, NR, ES, SI	High/ Ongoing	Public Works	1	1	4.00	3.00	9.00
Fillmore County	Increase and strengthen internet access for emergency communication	All Hazards		Medium/ Ongoing	Administration	1	1	2.43	2.35	6.78
Fillmore County	Purchase portable heating and cooling equipment	All Hazards		Medium/ Ongoing	Emergency Services	3	1	2.43	2.35	8.78
Fillmore County	Purchase crowd control signage	All Hazards		Medium/ Ongoing	Emergency Services	3	1	2.43	2.35	8.78
Fillmore County	Purchase new digital camera with GPS capabilities	All Hazards		Medium/ Ongoing	Emergency Services	3	1	2.43	2.35	8.78
Fillmore County	Partner with local communities to purchase 800 MHz radios for all fire departments in the county	Fire		High/ Ongoing	Emergency Services	1	1	2.70	2.20	6.90

Fillmore County	Additional tower enhancements to ARMER system in some locations to reduce dead zones	All Hazards		High/ Ongoing	Emergency Services	1	1	2.43	2.35	6.78
Fillmore County	Update/Reconstruct Lanesboro Dam in partnership with local and state entities	Flood		High/ Ongoing	Public Works	1	1	3.20	2.80	8.00
Fillmore County	Purchase back-up generator for county emergency operations center	All Hazards		Medium/ Ongoing	Emergency Services	2	1	2.43	2.35	7.78
Fillmore County	Update and increase security for all county facilities	All Hazards		Medium/ Ongoing	Administration	2	1	2.43	2.35	7.78
Fillmore County	Re-construct and update the sheriff's office and jail	All Hazards		Medium/ Ongoing	Administration/ Emergency Services	1	1	2.43	2.35	6.78
Fillmore County	Strategically place river gauges throughout county to monitor water levels	Flood		Medium/ Ongoing	Public Works	2	1	3.20	2.80	9.00
Fillmore County	Construct catch dams in the Willow Creek Watershed	Flood		Medium/ Ongoing	Public Works	1	1	3.20	2.80	8.00
Fillmore County	Update or reconstruct dams near Mabel and Spring Valley	Flood		Medium/ Ongoing	Public Works	1	1	3.20	2.80	8.00
Fillmore County	Purchase bulldozer	Land Subsidence		Medium/ Ongoing	Public Works	1	1	1.80	1.70	5.50
Fillmore County	Purchase trailer for transporting emergency response supplies and equipment	All Hazards		Medium/ Ongoing	Public Works/ Emergency Services	2	1	2.43	2.35	7.78
Fillmore County	Provide education, outreach and assistance to county residents regarding individual, family and workplace preparedness planning	All Hazards		Medium/ Ongoing	Administration/ Public Health	3	1	2.43	2.35	8.78
Fillmore County	Work with community organizations and volunteers to establish family assistance center and sheltering plans	All Hazards		Medium/ Ongoing	Administration/ Public Health	3	1	2.43	2.35	8.78

Jurisdiction	Mitigation Action	Hazard	Mitigation Types	Priority / Status	Implementation	Cost	Funding	Probability	Magnitude	Composite Score
Fillmore County	Implement public information and warning strategies related to internet, social media, print and emergency alert systems	All Hazards		Medium/ Ongoing	Administrative, Public Health, Emergency Services	2	1	2.43	2.35	7.78
Fillmore County	Identify shelters and family reception centers and acquire site use agreements	All Hazards		Medium/ Ongoing	Administration/ Public Health	3	1	2.43	2.35	8.78
Fillmore County	Identify new mass dispensing sites and acquire site use agreements	All Hazards		Medium/ Ongoing	Administration/ Emergency Services	3	1	2.43	2.35	8.78
Fillmore County	Purchase weather station for dispatch and hand anemometers for law enforcement	All Hazards		Medium/ Ongoing	Emergency Services	2	1	2.43	2.35	7.78
Fillmore County	Work with GIS to enhance mapping layers available to respond to emergencies. These layers will include child care settings, schools, at-risk populations, etc.	All Hazards		Medium/ Ongoing	Administration/ Information Technology/ Public Health	3	1	2.43	2.35	8.78
Fillmore County	Implement flood infrastructure improvements through effective measures identified in the SWCD One Plan. Measure may include installing- grassed waterways, redesigned bridges, appropriately sized culverts and ditches, retention structures, storm water systems, tiling, upload storage, natural plantings, ponds, wetlands, diversion channels, buffers, no-till technologies and landslide prevention measures	Flood		High/ Ongoing	Administration/ Emergency Services/Public Works	1	1	3.20	2.80	8.00
Fillmore County	Add additional security measures to all county public buildings.	Human - Related		Medium/ Ongoing	Administration/ Emergency Services	1	1	1.90	2.00	5.90

Fillmore County	Construct 2,000-acre feed storage upstream of the City Mabel	Flood		Medium/ Ongoing	Public Works	1	2	3.20	2.80	9.00
Fillmore County	Purchase proper protective equipment for staff responding to all-hazards emergencies	All Hazards		Medium/ Ongoing	Administration/ Emergency Services	2	1	2.43	2.35	7.78
Canton	Construct new fire station	Fire	PP, NR, ES	High/ Ongoing	Fire	1	1	3.00	3.00	8.00
Canton	Purchase backhoe	Summer/ Winter Storms	SI	High/ Ongoing	Public Works	1	1	4.00	3.00	9.00
Canton	Update sewer plant	Flood/ Land Subsidence	P, SI	Medium/ Ongoing	Public Works	1	1	3.00	2.00	7.00
Canton	Purchase back-up generator	All Hazards	P	Medium/ Ongoing	Public Works	2	1	2.58	2.17	7.75
Canton	Purchase 800 MHz radios	All Hazards	ES	Medium/ Ongoing	Fire	2	1	2.58	2.17	7.75
Canton	Reconstruct hill sediment on 120th St.	Flood/ Sinkhole	SI	High/ Ongoing	Public Works	1	1	3.00	2.00	7.00
Canton	Purchase tractor, mower and grader - debris removal	Land Subsidence	PP, ES	Medium/ Ongoing	Public Works	1	1	3.00	2.00	7.00
Canton	Construct various culverts (25-30) along 341st Ave.	Flood	SI	High/ Ongoing	Public Works	1	1	3.00	2.00	7.00
Canton	Purchase back-up generator for water tower	All Hazards	P	Medium/ Ongoing	Public Works	2	1	2.58	2.17	7.75
Canton	Purchase portable light towers	All Hazards	SI	Medium/ Ongoing	Public Works/ Emergency Services	2	1	2.58	2.17	7.75
Chatfield	Purchase new pump truck	Fire	ES, SI	High/ Ongoing	Emergency Services	1	1	3.00	3.50	8.50
Fountain	Purchase new 800 MHz radios	All Hazards	ES	High/ Ongoing	Administration/ Emergency Services	2	1	1.88	1.96	6.84
Fountain	Construct storm shelters	All Hazards	PP	Medium/ Ongoing	Emergency Services	1	1	1.88	1.96	5.84

Jurisdiction	Mitigation Action	Hazard	Mitigation Types	Priority / Status	Implementation	Cost	Funding	Probability	Magnitude	Composite Score
Fountain	Widen Hwy 52	Flood	SI	High/ Ongoing	Public Works	1	1	2.50	2.00	6.50
Harmony	Pond restoration to remove sediment buildup	Flood	NR	High/ Ongoing	Public Works	2	1	1.00	1.00	5.00
Harmony	Construct lift station and well generator	Flood	SI	Medium/ Ongoing	Public Works	1	1	1.00	1.00	4.00
Harmony	Purchase back-up generator for school	All Hazards	P, SI	Medium/ Ongoing	Public Works	2	1	1.67	1.33	6.00
Harmony	Purchase back-up generator for water tower	All Hazards	P, SI	Medium/ Ongoing	Public Works	2	1	1.67	1.33	6.00
Harmony	Purchase portable light towers	All Hazards	ES	Medium/ Ongoing	Public Works/ Emergency Services	2	1	1.67	1.33	6.00
Harmony	Purchase an all-terrain vehicle for emergency response	All Hazards	ES	Medium/ Ongoing	Emergency Services	2	1	1.67	1.33	6.00
Lanesboro	Update/reconstruct Lanesboro Dam in partnership with local and state entities	Flood	P, PP, SI	High/ Ongoing	Public Works	1	1	2.00	3.00	7.00
Lanesboro	Install additional sirens	All Hazards	ES, SI	High/ Ongoing	Public Works/ Emergency Services	2	1	1.75	2.42	7.17
Lanesboro	Construct an Emergency Management Command Center	All Hazards	ES	Medium/ Ongoing	Emergency Services	1	1	1.75	2.42	6.17
Lanesboro	Purchase back-up light towers	All Hazards	ES	Medium/ Ongoing	Public Works/ Emergency Services	2	1	1.75	2.42	7.17
Lanesboro	Purchase back-up generator	All Hazards	P	Medium/ Ongoing	Public Works	2	1	1.75	2.42	7.17
Lanesboro	Purchase back-up water pump	Flood	P	Medium/ Ongoing	Public Works	3	1	2.00	3.00	9.00
Mabel	Re-direct moving water surrounding community - flood control	Flood	PP, NR, SI	High/ Ongoing	Administration/ Public Works	1	1	4.00	3.00	9.00

Mabel	Remove homes located in floodplain	Flood	P, PP	Medium/ Ongoing	Administration/ Public Works	1	1	4.00	3.00	9.00
Mabel	Purchase back-up generator for water tower	All Hazards	P	Medium/ Ongoing	Public Works	2	1	1.67	2.33	7.00
Mabel	Replace siren system and join county siren system	All Hazards	ES, SI	Medium/ Ongoing	Public Works/ Emergency Services	2	1	1.67	2.33	7.00
Mabel	Purchase portable light towers	All Hazards	ES	Medium/ Ongoing	Public Works/ Emergency Services	2	1	1.67	2.33	7.00
Mabel	Purchase barricades, signs, lights for road closures	All Hazards	ES	Medium/ Ongoing	Public Works	3	1	1.67	2.33	7.00
Mabel	Construct shed for disaster response equipment	All Hazards	P, PP	Medium/ Ongoing	Public Works/ Emergency Services	2	1	1.67	2.33	7.00
Mabel	Purchase snow plow	Summer/ Winter Storms	P, ES	Medium/ Ongoing	Public Works	1	1	3.00	3.00	8.00
Mabel	Purchase ice and snow control shed to cover rock, sand, and salt	Summer/ Winter Storms	PP	Medium/ Ongoing	Public Works	2	1	3.00	3.00	9.00
Ostrander	Purchase back-up light towers	All Hazards	ES	High/ Ongoing	Public Works/ Emergency Services	2	1	1.88	2.04	6.92
Ostrander	Construct new well for water access	Essential Services Failure	SI	High/ Ongoing	Public Works	1	1	2.50	2.00	6.50
Ostrander	Purchase additional sirens	All Hazards	P, ES	High/ Ongoing	Public Works/ Emergency Services	1	1	1.88	2.04	5.92
Ostrander	Purchase new firetruck	Fire	P, PP, NR, ES	Medium/ Ongoing	Emergency Services	1	1	2.00	2.50	6.50
Ostrander	Purchase new 800 MHz radios	All Hazards	ES	High/ Ongoing	Administration/ Emergency Services	2	1	1.88	2.04	6.92

Jurisdiction	Mitigation Action	Hazard	Mitigation Types	Priority / Status	Implementation	Cost	Funding	Probability	Magnitude	Composite Score
Ostrander	Construct a natural wind break	Summer/ Winter Storms	P, PP, NR	High/ Ongoing	Public Works	1	1	3.00	3.00	8.00
Ostrander	Upgrade IT security for law enforcement	Terrorism	P, ES	Medium/ Ongoing	Administration/ IT/Emergency Services	2	1	1.00	1.00	5.00
Peterson	Construct an emergency storm center	All Hazards	P	High/ Ongoing	Administration/ Emergency Services	1	1	2.67	2.00	6.67
Peterson	Purchase additional sirens	All Hazards	ES	High/ Ongoing	Public Works/ Emergency Services	1	1	2.67	2.00	6.67
Peterson	Purchase new gate/valve for storm sewer	Flood	P, SI	High/ Ongoing	Public Works	2	1	3.00	3.00	9.00
Peterson	Construct storm shelter on campground	All Hazards	PP	Medium/ Ongoing	Public Works/ Emergency Services	2	1	2.67	2.00	7.67
Peterson	Purchase large spill kits	Hazardous Materials	P, ES	Medium/ Ongoing	Fire	2	1	1.00	1.00	5.00
Peterson	Obtain dike certification	Flood	P, NR, ES	Medium/ Ongoing	Public Works	3	1	3.00	3.00	10.00
Peterson	Construct community storm shelter	All Hazards	P	Medium/ Ongoing	Public Works/ Emergency Services	2	1	2.67	2.00	7.67
Peterson	Purchase back-up generator for sewer plant	All Hazards	P	Medium/ Ongoing	Public Works	2	1	2.67	2.00	7.67
Peterson	Purchase new snow plow	Summer/ Winter Storms	P, ES	Medium/ Ongoing	Public Works	1	1	3.00	0.00	5.00
Peterson	Bury electrical lines in community	All Hazards	P, SI	Medium/ Ongoing	Public Works	1	1	2.67	2.00	6.67
Preston	Purchase back-up generator	All Hazards	P	Medium/ Ongoing	Public Works	2	1	2.67	2.00	7.67

Preston	Purchase back-up generator for school	All Hazards	P, ES	Medium/ Ongoing	Public Works	2	1	2.67	2.00	7.67
Preston	Purchase back-up generator for water tower	All Hazards	P, ES	Medium/ Ongoing	Public Works	2	1	2.67	2.00	7.67
Preston	Purchase portable light towers	All Hazards	ES	Medium/ Ongoing	Public Works/ Emergency Services	2	1	2.67	2.00	7.67
Preston	Purchase an all-terrain vehicle for emergency response	All Hazards	ES	Medium/ Ongoing	Emergency Services	2	1	2.67	2.00	7.67
Preston	Construct storm shelter for local campground	All Hazards	P, ES	Medium/ Ongoing	Administration/ Emergency Services	1	1	2.67	2.00	6.67
Preston	Construct storm shelter for local mobile home park	All Hazards	P, ES	Medium/ Ongoing	Administration/ Emergency Services	1	1	2.67	2.00	6.67
Rushford	Purchase back-up generator for Magelssen Bluff	All Hazards	P, ES	Medium/ Ongoing	Public Works	2	1	1.58	2.08	6.66
Rushford	Purchase large spill kits	Hazardous Materials	P, ES	Medium/ Ongoing	Fire	2	1	2.00	2.00	7.00
Rushford	Purchase high water alarm	Flood	P, PP, NR, ES	Medium/ Ongoing	Public Works	3	1	2.00	3.00	9.00
Rushford	Purchase crowd control signage	All Hazards	PE	Medium/ Ongoing	Emergency Services	3	1	1.58	2.08	7.66
Rushford	Construct community shelter in a new fire department building	All Hazards	P, ES	Medium/ Ongoing	Fire/ Administration	1	1	1.58	2.08	5.66
Rushford	Increase stormwater capacity	Flood	SI	Medium/ Ongoing	Public Works	1	1	2.00	3.00	7.00
Rushford	Increase wastewater treatment facility capacity	Flood	SI	Medium/ Ongoing	Public Works	1	1	2.00	3.00	7.00
Rushford	Purchase new snow blower	Summer/ Winter Storms	P, ES	Medium/ Ongoing	Public Works	3	1	3.00	3.00	10.00
Rushford	Purchase back-up generators for fire hall	All Hazards	P, ES	Medium/ Ongoing	Fire	2	1	1.58	2.08	6.66

Jurisdiction	Mitigation Action	Hazard	Mitigation Types	Priority / Status	Implementation	Cost	Funding	Probability	Magnitude	Composite Score
Rushford	Purchase snow truck	Summer/ Winter Storms	ES	Medium/ Ongoing	Public Works	1	1	3.00	3.00	8.00
Rushford	Purchase additional 800 MHz radios	All Hazards	ES	High/ Ongoing	Emergency Services	2	1	1.58	2.08	6.66
Rushford	Purchase additional water pumps (2-6 inches)	Flood	P, PP	High/ Ongoing	Public Works	3	1	2.00	3.00	9.00
Rushford	Purchase additional light towers and back-up generators	All Hazards	P, ES	Medium/ Ongoing	Public Works/ Emergency Services	2	1	1.58	2.08	6.66
Rushford	Construct a safe room in new school	Fire	P	Medium/ Ongoing	Administration/ Emergency Services	1	2	2.00	2.00	7.00
Rushford Village	Develop a drought emergency plan	Summer Storms	P, PE	Medium/ Ongoing	Administration/ Planning	2	1	4.00	3.00	10.00
Rushford Village	Provide a safe room/building for campers during storms	All Hazards	P, ES	Medium/ Ongoing	Administration/ Emergency Services	1	1	2.50	1.58	6.08
Spring Valley	Construct a community storm shelter	All Hazards	P	High/ Ongoing	Administration/ Emergency Services	2	1	2.26	2.30	7.56
Spring Valley	Install additional sirens	All Hazards	P, ES	High/ Ongoing	Administration/ Emergency Services	2	1	2.26	2.30	7.56
Spring Valley	Construct smaller culverts a mile west of Spring Valley	Flood	SI	Medium/ Ongoing	Public Works	1	1	2.83	2.83	7.66
Spring Valley	Purchase backup generators for school and ambulance station	All Hazards	P, ES	Medium/ Ongoing	Administration/ Public Works	2	1	2.26	2.30	7.56
Spring Valley	Purchase new personal protective equipment	Hazardous Materials	SI	Medium/ Ongoing	Emergency Services	2	1	2.83	2.50	8.33
Spring Valley	Upgrade IT security for law enforcement	Terrorism	P, ES	Medium/ Ongoing	Administration/ IT/Emergency Services	2	1	1.67	1.83	6.50

Spring Valley	Continued hazardous materials training for emergency services	Hazardous Materials	ES	Medium/ Ongoing	Emergency Services	2	1	2.83	2.50	8.33
Spring Valley	Construct a safe room and a security system with a lockdown feature	All Hazards	P, ES	Medium/ Ongoing	Administration/ Emergency Services	1	1	2.26	2.30	6.56
Spring Valley	Removal of Repetitive Loss properties: two residential homes and one business	Flood	P	High/ Ongoing	Administration/ Public Works	1	1	2.83	2.83	7.66
Spring Valley	Purchase an all-terrain vehicle to increase access on difficult terrain	Fire	ES	Medium/ Ongoing	Emergency Services	2	1	2.67	2.67	8.34
Spring Valley	Update/re-build fire station with shelter options	Fire	P, SI	Medium/ Ongoing	Emergency Services	1	1	2.67	2.67	7.34
Spring Valley	Purchase new ariel fire truck and replace pumper	Fire	P, ES	Medium/ Ongoing	Emergency Services	1	1	2.67	2.67	7.34
Whalan	Re-construct larger dike around community for flood mitigation	Flood	P, SI	High/ Ongoing	Public Works	1	1	3.00	4.00	9.00
Whalan	Bury electrical lines in community	All Hazards	P, SI	Medium/ Ongoing	Public Works	1	1	1.58	1.42	5.00
Whalan	Acquire safe locations/shelters for tourists/trail users to access	All Hazards	P	Medium/ Ongoing	Public Works/ Administration	1	1	1.58	1.42	5.00
Whalan	Purchase back-up generator for community	All Hazards	P, ES	Medium/ Ongoing	Public Works/ Emergency Services	1	1	1.58	1.42	5.00

2008 Action	Included in 2017 Update	Status	Progress
Strategies: Communication and Education			
Design/implement a comprehensive campaign of community education on disaster preparedness, including: strategies for communications without power, outdoor warning sirens, maintenance of weather alert radios, severe weather awareness week, design / construction methods to mitigate building damage, protection from lightning, protection from flash flooding and sewer backups, evacuation routes and disaster recovery plans (businesses and family).	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Design and implement a web page on the Fillmore County website that includes information relating to hazards, links to resources, and information on emergency preparedness, and promote its use.			
Promote the use of NOAA weather radios for early warning and post event information in public facilities, schools, and for vulnerable populations.			
Examine alternative methods and technology to allow direct notification of citizens in the event of an emergency and implement the most feasible option. Potential systems include City-Watch, Code Red, Reverse 911, and possible Federal system under plan to update EAS.			
Strategies: Public Health			
Use state and federal resources to continue to build and improve public health emergency response capacity in the county.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Review and update the public health emergency response operations plan related to all hazard events on an annual basis.			
Maintain public health resources, up-to-date website information and/or links to sources of reliable hazard information, plans, and agreements associated with a coordinated environmental hazard response.			
Investigate and evaluate human health risk. Mitigate and control environmental exposures associated with all hazard events to people through development of public health and capacity in collaboration with state and local agencies, all public health impacts.			
Utilize GIS technology and database management to identify vulnerable populations in the community and update as needed.			
Maintain an up-to-date Health Alert Network (HAN) system to keep clinics, hospitals, other health care providers, public safety agencies, schools, local governments, etc. informed of urgent public health emergency events.			
Collaborate with local partners especially Fillmore County Social Services and the American Red Cross to coordinate emergency and temporary shelter for displaced residents.			
Research public health authority in disaster and emergency situations e.g. quarantine, shelter hygiene, public sanitation, and immunization.			

Strategies: Extreme Weather | Goal 1: Shelter	
Create a multi-jurisdictional task force (county, cities, townships, others) to coordinate the implementation of strategies to reduce the impact of violent storms and extreme temperatures.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Encourage mutual aid and awareness among school districts on auxiliary power generator availability.	
Develop a safe shelter plan for publicly-owned facilities including shelters, shelter capacity, evacuation routes, and transportation.	
Identify and map community shelters that could be used by residents that need a safe shelter and identify evacuation routes for residents that must seek safe shelter off-site.	
Assess all publicly-owned facilities in county with regard to storm safety procedures including safe shelter	
Determine if additional shelters are needed for "at-risk" populations and construct them.	
Emergency management directors in each city to stockpile canned food and water for long-lived storm events.	
Inform all residents and visitors of safe shelter locations through media campaigns, maps, websites, newsletters and other sources.	
Identify a list of local vendors of mobile power generators and explore opportunities for Good-Samaritan agreements or mutual aid agreements.	
Communicate and coordinate with city and county planning agencies regarding the development of standard requirements for safe shelters in dwellings without basements.	
Explore opportunities to incorporate safe shelter requirements for commercial facilities into city building and permitting codes.	
Consider requiring campgrounds to have an evacuation and emergency shelter plan in place.	
Maintain communications with voluntary agencies regarding shelters.	
Assess storm shelter readiness and availability for special populations including the Amish.	
Strategies: Extreme Weather | Goal 2: Warning	
Create a multi-jurisdictional task force (county, cities, townships, others) to coordinate the implementation of strategies to reduce the impact of violent storms and extreme temperatures.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Inventory and assess adequacy of the city's outdoor warning system equipment and replace malfunctioning or old warning sirens.	
Discuss with city emergency managers options to ensure that mobile home parks, campgrounds, and other high risk areas receive early notification and implement best strategy.	
Increase education for campers in local campgrounds on the local hazard potential.	

2008 Action	Included in 2017 Update	Status	Progress
Improve citizens' understanding of the available communications from the National Weather Service (NWS) for notification of severe weather watches and warnings.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Identify vulnerable populations subject to extreme temperatures, develop a plan to lessen the impact of extreme temperatures and implement the plan.			
Develop a communications plan to notify vulnerable populations to take steps to protect their health.			
Assess and upgrade county/city warning system as necessary.			
Evaluate the use of private subscription based weather alert services and purchase if cost effective.			
Evaluate other automated weather alert systems and purchase if cost effective.			
Encourage more volunteers to become active in the severe storm spotters network and communications network (RACES).			
Promote the use of weather radios and purchase additional radios especially for special populations.			
Improve access to real-time weather data such as temperature, wind speed, direction and storm conditions for emergency personnel.			
Advertise and encourage participation in the FEMA Nationwide Cell Phone Alert System once activated.			
Provide critical facilities including schools, and nursing homes in the county access to severe weather notification and observation.			
Purchase hand-held weather meters for county emergency personnel.			
Identify ways to increase access to emergency information for campgrounds, cities and townships and provide the information in a timely manner.			
Increase access to emergency information to campgrounds, cities and townships.			
Strategies: Extreme Weather | Goal 3: Protect People/Public Infrastructure			
Enhance communications with public safety officials, county/city/township transportation departments and Minnesota Department of Transportation to limit travel on major transportation routes during hazardous driving conditions.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Continue to maintain cooperative arrangements with cities and townships to make the most efficient and effective use of road maintenance equipment.			
Work with cities to develop and/or enforce restrictions on planting large or rapidly-growing trees near power lines.			
Work with local power companies to inform residents of the importance of keeping power lines clear of branches or other items that can damage lines.			
Evaluate the readiness of all publicly owned buildings for preventing damage from lightning strikes (evaluate building codes for grounding requirements).			

Communicate strategies to individual homeowners and commercial property owners for preventing damage from lightning strikes.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Evaluate installation of lightning indicator and alert systems for outdoor public venues, such as the Fillmore County Fairgrounds or Fillmore County/City Park System.	
Encourage the planting of windbreaks to serve as a "living snow fence" to help prevent blizzard conditions.	
Evaluate burying of existing power lines.	
Continue to enforce the tie-down requirements for mobile homes.	
Strategies: Flood | Goal 1: 100-year Flood Risk Strategies	
Complete countywide FEMA floodplain restudy.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Adopt or amend city and county shoreland/floodplain ordinances to recognize new Flood Insurance Study.	
Review current floodplain zoning ordinances for noncompliance with state and federal regulations with respect to nonconforming structures.	
Encourage cities to adopt a legally enforceable amendment to their zoning ordinances with respect to nonconforming structures.	
Encourage city and county participation in FEMA Community Rating System program. Townships coordinate with county zoning manager on floodplain permit review.	
Strategies: Flood | Goal 2: Mitigate flood prone structures	
Complete a countywide flood mitigation plan that includes the identification of flood prone and repetitive loss structures and identification of flood mitigation projects.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Identify, relocate, flood proof or tear down all repetitive loss structures and critical facilities.	
Encourage continued compliance with the NFIP.	
Adopt new floodplain elevations and information once available and inform the public of these new flood plain boundaries.	
Identify and improve roads and streets that are repeatedly flooded and washed away with improvements that include modifying and raising roads/streets, providing improved drainage and storm water removal, rip rapping where needed and creating buffers and vegetation strips.	
Review the county flood plain ordinance and update as needed.	
Cities should adopt or update floodplain ordinances as needed.	
Strategies: Flood | Goal 3: Flood Preparation	
Ensure an adequate number of sand bags and sand is on hand for flood prone structures in the county.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Develop a plan for preparing and distributing sandbags when needed.	

2008 Action	Included in 2017 Update	Status	Progress
Encourage continued compliance with the NFIP and encourage non-participating cities and townships to apply.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Educate the public on practices and programs that assist in diminishing the effects of flooding.			
Purchase needed flood equipment including pumps and generators.			
Periodically review and update the county's EOP to address strategies in this plan and other flood issues in the county.			
Require that all LP tanks and other hazardous material tanks be anchored or tied down.			
Increase coordination and communication with HAM radio operators.			
Evaluate the locations and numbers of stream monitoring stations throughout the County, and coordinate and/or purchase additional monitoring equipment if necessary.			
Strategies: Flood | Goal 4: Infrastructure improvements to prevent flooding			
Address storm water and drainage management issues to effectively manage high volume runoff: • Develop and implement storm water management plans. • Encourage and explain the benefits of residue management, best management practices and grassed waterways regarding reduced runoff.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Upgrade, redesign or replace culverts and bridges for improved drainage and flow to prevent washouts and flooding: • Conduct an inventory of existing culverts and their respective drainage areas. • Involve road authorities in development of culvert sizing criteria. • Redesign bridges that contribute to flooding by improving the flow of water and ice under/through the bridge.			
Coordinate with bordering counties and DNR or other agencies to have a storm water management plan completed for the watershed.			
Develop a GIS layer for public drainage systems showing watershed boundaries, open ditches, tile lines, etc.			
Analyze the ditch systems in the county and surrounding counties and make ditch improvements where needed.			
Encourage and complete flood flow reduction projects within the county and in surrounding counties and watersheds.			
Reduce countywide flood damage to agricultural land, rural or urban development, and infrastructure by protecting against significant runoff events.			
Identify and complete flood protection and prevention projects for cities.			
Examine minimizing flooding impacts, by increased upland storage to reduce the overall volume of water transported by the ditch system and implement where feasible.			

The effect of drainage and channel improvements on downstream flooding conditions is a complicated issue that requires site-specific analysis and appropriate mitigation measures. Reduce flood flows within and downstream of the watershed (county) to reduce damages to public and private property, municipal services and agricultural land: • Provide/construct additional flood storage, impoundment or flood flow reduction sites throughout the entire watershed (county). • Stop or mitigate activities that would otherwise increase peak flow downstream. • Develop an inventory of potential flood impoundment and flood flow reduction sites. • Consider the implementation of a USACE Feasibility Study for a multiple purpose project that reduces flood damages	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Coordinate water flow and retention projects with neighboring counties and area watersheds.	
Prevent damage from critical flood events while enhancing base flows: • Define, restore and/or create hydrologic areas that are critical for contributing to or sustaining base flows. • Restore wetlands in critical areas in ways that augment base flows.	
Study the possibility of creating flood diversion channels and determine the proper location for such channels and implement where appropriate.	
Consider environmental enhancement for all flood control projects.	
Target flood prone areas with sandy soils and encourage no-till or low-till farming practices and conservation programs such as CRP on those lands to help reduce runoff.	
Educate farmers and citizens about the benefits of "buffer plantings" along river corridors.	
Examine the benefits of creating a Watershed District for Fillmore County and the surrounding areas and create if feasible.	
Study areas that have continual basement flooding and determine the appropriate mitigation strategies including but not limited to: • Drain tile to adjacent rivers • Draw-down and flood attenuation areas • Culvert bladders or backflow prevention devices in culverts • Re-grading drainage ditches to flow away from residential areas • Implement appropriate actions	
Strategies: Landslides | Goal 1: Reduce or prevent the impacts of Landslides	
Adopt or update bluff land ordinances as needed.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Inform and educate the citizenry on flood insurance to cover the effects of landslides.	
Educate residents about the role vegetation plays in preventing landslides.	
Study the susceptibility for landslides near roads and structures, and use mitigation measures such as slope stabilization where feasible.	

2008 Action	Included in 2017 Update	Status	Progress
Strategies: Karst/Sinkholes & Land Subsidence | Goal 1: Reduce or prevent the impacts of Landslides			
Create overlay districts, land use regulations, or Karst-related ordinances to protect the area's Karst.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Require geotechnical studies for all development underlain by limestone bedrock.			
Continue to update mapping of sinkholes, springs springsheds and other Karst features.			
Increase awareness and education on Karst/sinkholes in schools and in the public at large.			
Strategies: Karst/Sinkholes & Land Subsidence | Goal 2: Reduce the threat of long term exposure to radon gas in homes			
Develop a systematic information and education program that provides useful and factual information to the public about radon gas exposure and testing.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Require new homes be built with radon reduction requirements as part of the zoning or building code, and require radon testing for a property transaction.			
Strategies: Drought | Goal 1: Monitor Supply and demand of groundwater			
Investigate and establish methods of banking water for emergencies.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Establish a comprehensive and ongoing water monitoring program. Coordinate efforts of monitoring the public water supply with the DNR and MDH.			
Establish/identify monitoring in each of the county's major aquifers at appropriate locations and establish an ongoing program to monitor aquifer levels and water quality. Coordinate data with SWCD test wells.			
Water conservation provisions and use restrictions in times of drought included in county and city ordinances.			
Semi-annual or annual water consumption by various major consumers monitored for the potential impact to the aquifer.			
Estimate the annual recharge rates or the capacities of the various aquifers in the county.			
Investigate increasing public education campaigns on water conservation and funding for campaigns.			
Educate the public on water saving tips during times of dry weather or drought conditions.			
Encourage water conservation through use of low-pressure irrigation systems to conserve groundwater in the county.			
Evaluate and implement the objectives and strategies outlined in the Fillmore County Comprehensive Water Management Plan.			
Strategies: Wildfires | Goal 1: Prevent Wildfires			
Work with the Minnesota DNR to include prescribed burning on all county lands and parks.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Create a wildfire susceptibility model to determine areas which are more prone to wildfires.			
Provide educational material to all campers entering local parks and campgrounds.			

Increase fire risk awareness in campgrounds with updated signs that display the potential risk of wildfires (high, medium, low).	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Enforce the use of fire rings at all campgrounds.	
Encourage campgrounds to remove debris and dead vegetation around camping areas on an annual basis.	
Encourage campgrounds to thin the tree canopy surrounding camping areas to minimize chances of wildfires from spreading.	
Require burning permits for large fires.	
Strategies: Wildfires | Goal 2: Minimize damage from wildfire	
Amend zoning regulations to include vegetation restrictions or buffers around homes in or near forested areas.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Review the need to alter the county building regulations to include restrictions on home construction materials.	
Undertake an assessment of wildfire risks and associated prevention measures.	
Firefighters need to receive proper training to fight wildfires.	
Organized and regular communications between the DNR, U.S. Fish and Wildlife Service and local fire departments on fighting wildfires.	
Educate the public on wildfire dangers and prevention of wildfires during dry seasons.	
Educate the public on wildfire dangers and prevention of wildfires during dry seasons.	
Minimize impact of wildfire in residential areas by creating firebreaks between structures and areas with wildfire fuel.	
Assess the need and construct additional dry hydrants as needed.	
Strategies: Infectious Disease | Goal 1: Reduce the threat of Infectious Disease	
Develop a systematic information and education program that provides useful and factual information to the public about infectious diseases and vaccinations.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Continue to work with local media to disseminate information about infectious diseases and prevention.	
Develop a systematic information and/or links to other sources of reliable information about infectious diseases and prevention.	
Develop, maintain and update materials, plans and agreements for addressing infectious disease.	
Continue providing and Increase funding for socio/economically challenged populations for vaccinations.	

2008 Action	Included in 2017 Update	Status	Progress
Ensure availability of proper equipment/supplies (drugs and medication) to address infectious disease outbreaks. (isolation, quarantine, and mass dispensing)	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Utilize state, federal and local resources to prevent and control infectious disease in the county.			
Provide information on the recognition, testing, treating, and reporting of infectious diseases to healthcare providers in clinics, and other healthcare settings.			
Work with clinics and hospitals to improve infectious disease reporting.			
Continue to work with local/regional hospitals and clinics in developing plans and roles in infectious disease response, including quarantine.			
Continue to develop a human quarantine plan collaborating with state, regional, and local partners including Emergency Management Directors.			
On an annual basis, review and update the Public Health Emergency Response Operations Plan that outlines procedures for dealing with infectious diseases.			
Work closely with MDH, CDC, and regional public health partners to plan the receipt and dispensing of the Strategic National Stockpile.			
Increase the public health work force for emergencies by enrolling and training volunteers through the Minnesota Responds – Medical Reserve Corp or CERT programs.			
Investigate free recycling or reduce fees for recycling tires to reduce abandoned tires a mosquito breeding ground.			
Strategies: Fire | Goal 1: Protect Structures from fire			
Evaluate ordinances requiring prompt removal of snow around commercial and industrial buildings in order to insure access for fire and other emergency equipment with cities and townships.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Supply all cities and townships with contact information for maintenance personnel.			
Strategies: Fire | Goal 2: Public Education			
Increase public education through more school visits, and a county-wide program to increase education in schools. Provide school programs to youth, focusing on stoves, smoke detectors, fire safety and evacuation.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Increase education on fire safety through the local cable channel and through radio.			
Increase education on fire safety through the local cable channel and through radio.			
Strategies: Hazmat | Goal 1: Information Building and Sharing Strategies			
Work with township, city, state, federal agencies and private industries to share information on types and locations of hazardous material that have the potential to affect the county and region.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Continue to develop new capabilities to predict the direction and velocity of groundwater flow, surface water runoff, and windborne transport; to integrate these results in the county GIS system; and to share these results with appropriate users.			

Continue to use city and county Geographic Information Systems (GIS) to map and update locations of fixed facilities using hazardous materials/waste and associated transportation corridors in a timely manner.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Develop a local education campaign to educate citizens about the various hazardous materials/waste that are in the county.	
Increase coordination with State Duty Officer (SDO) for highway spills.	
Create a mutual aid agreement between all police departments countywide.	
Create a mutual aid agreement between all police departments countywide.	
Create a detailed road closure plan in the case of hazardous materials spills.	
Strategies: Hazmat | Goal 1: Information Building and Sharing Strategies	
Evaluate and recommend speed reductions along routes used to transport hazardous materials where there is a potential for roll-overs.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Strategies: Hazmat | Goal 2: Policy and Planning	
Review and update the county policies and environmental plans that address hazardous material/waste storage and transportation in Fillmore County.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Review and update the County Emergency Operations Plans for dealing with a hazardous material/ waste incident, including nuclear materials/waste.	
Develop and distribute debris management guidelines.	
Review and update plans and policies to contend with methamphetamine labs in the county.	
Coordinate and facilitate discussion between the cities and the County on policies related to hazardous materials/waste storage and transportation.	
Strategies: Hazmat | Goal 3: Preparedness and Equipment	
Assess the need for proper personal protection equipment to respond to hazardous material disasters and purchase as needed.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Incorporate the use of the National Incident Management System for all hazard materials incidents that may occur in the county	
Participate in regional exercises that test local plans and interaction between local agencies.	
Analyze the possibility of using a warning system for hazardous material events.	
Design and implement hazardous material scenarios for practice exercise and to create community awareness (consistent with National Planning Scenarios).	

2008 Action	Included in 2017 Update	Status	Progress
Strategies: Hazmat | Goal 3: Preparedness and Equipment			
Encourage attendance/ training to at least the Hazardous Materials Awareness and Weapons of Mass Destruction (CBRNE) level training for the ten Office of Domestic Preparedness disciplines as appropriate.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Continue to expand the use of mutual aid agreements and memoranda of understanding to improve response coordination between local, state, and federal agencies and appropriate private sectors.			
Discuss with countywide Emergency Management Advisory Group the possibility of designating hazardous materials/waste transportation routes and requiring hazmat handlers to use designated routes.			
Strategies: Dam & Levee Failure | Goal 1: Maintain structural integrity of Dams & Levees			
Encourage adequate funding to repair and maintain dams, levees, and other similar water retention structures.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Examine the purchase of Automated Warning Systems that includes rain gauges to monitor stream levels, and Dam level gauges to monitor water levels.			
Strategies: Water Supply Contamination | Goal 1: Quality Protection			
Continue to regulate well construction, sealing, and the annual registration of monitoring and remedial wells.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.		
Continue to enforce Minnesota Rules Chapter 7020 and inspect feedlots regularly, enforcing violations.			
Provide a well-testing service for private well owners.			
Review well disclosure documents for the purpose of sealing private wells within city limits at property sale.			
Evaluate and follow goals and actions outlined in the Fillmore County Water Management Plan.			
Enforce disclosures of wells that are on properties that are foreclosed; especially within city limits.			
Continue to work with the SWCD to enforce Minnesota Rules Chapter 7080 for all newly installed septic systems.			
Enforce well water quality standards at the time of property sale.			
Regulate new well construction and old well sealing through a permitting process that includes inspection and compliance.			
Enforce septic system construction standards at the time of inspections during property sale or bedroom addition.			
Administer a septic system maintenance program that requires that every system is pumped or inspected every three years.			
Educate floodplain well owners about protecting drinking water wells from flooding.			

Encourage the adoption and/or review of Wellhead Protection Plans for all jurisdictions.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Explore the use of the SE MN Wastewater Initiative for financial assistance to help residents with non-compliant ISTS.	
Encourage the clean-up of sinkhole dumps and research funding sources to clean up these sites.	
Increase awareness and education on sinkholes in schools and in the public at large.	
Have more "Free Recycle" days in Fillmore County.	
Strategies: Water Supply Contamination | Goal 2: Contaminated Water Resident Protection	
Identify sources for obtaining bottled water for unincorporated areas of the county, including bottled water distributors and local grocery stores.	Fillmore County has chosen not to revisit the 2008 mitigation actions. They have elected to create new actions for 2016 that are more relevant and actionable.
Create procedures to facilitate well testing and disinfection in case of contamination.	
Establish procedures to assist cities and the State Health Department in public notification and coordination in the event of a municipal well contamination incident.	
Communicate risk of water contamination to residents downstream of a wastewater treatment plant in case of flood or other plant problem.	
Provide well disinfection brochures to potentially impacted well owners.	
Provide education materials on monitoring private wells.	
Encourage local jurisdictions to evaluate and test their ability to isolate contaminants in their water distribution systems.	
Strategies: Water Supply Contamination	
Goal 3: Supply Protection Strategies	
Maintain and review copies of Wellhead Protection Plans as they are developed by Public Water Supply Well owners and submitted to the Minnesota Department of Health.	
Encourage and assist communities in developing groundwater protection plans.	
Encourage cities to enhance security of their wells, reservoirs, and treatment facilities.	
Encourage the building of berms around sinkholes to protect livestock and prevent contamination due to runoff.	

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