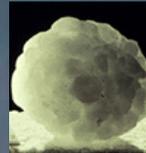


Fillmore County



Hazard



Mitigation



Plan



2008

Fillmore County All-Hazard Mitigation Plan

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Lanesboro – Bobbie Vickerman
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Harmony Fire – Bill Hanlon
Preston Fire – Jerry Olson
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I.A. AUTHORITY, VISION, AND GOALS – THE REASONS FOR THIS PLAN

I.A.I. PLANNING AUTHORITY AND GUIDANCE

This plan has been prepared in accordance with the requirements set forth by Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390, codified at 42 USC § 5121 et seq. Hazard Mitigation Planning, 44 CFR Part 201, established criteria for State and local hazard mitigation planning as authorized by DMA 2000.

Plan preparation guidance documents, as developed by the Minnesota Department of Homeland Security and Emergency Management (MN HSEM) and the Federal Emergency Management Agency, were instructive resources for establishing the planning process, assessment methods, content, and scope of this all-hazard plan.

This plan was prepared under the direction of the Fillmore County Emergency Management Director, Fillmore County Board of Commissioners, and the Fillmore County Administrator by Bonestroo Inc.

I.A.II. PLANNING VISION

Fillmore County Hazard Mitigation Vision: Fillmore County will work with surrounding communities and local emergency responders to create a proactive and results-oriented all-hazard mitigation plan that will make the county and region a safer and more sustainable place to live by protecting and enhancing the resources of the county as they relate to potential future hazards.

This plan establishes three major visions in fulfilling the requirements established through DMA 2000:

Reduce Hazard Risks and Impacts – This All-Hazard Mitigation plan assesses vulnerability of life and property to a broad range of potential natural or technological hazards, and presents a prioritized range of corresponding mitigation strategies to reduce both risks and impacts.

Build on Existing Efforts – Within Fillmore County’s boundaries, cities, the county, townships, school districts, and businesses already have been engaged in mitigation and/or response planning. The intent of this plan is to maximize these efforts by inventorying, coordinating, and building on these efforts when possible, and developing new strategies to fill any gaps identified among existing efforts. This plan incorporates information and strategies from existing emergency response plans and other relevant public documents.

Share Information and Raise Awareness – Public engagement methods used in the preparation of this plan sought input from a diverse range of stakeholders including the general public and various public, private, and non-profit sector

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representatives. One of the most commonly heard messages throughout these planning meetings and workshops is the need for clear information and ongoing communication among all stakeholders. Mitigation strategies identified in this plan address the public information and communication components in a universal manner (regardless of hazard type) and within a hazard-specific context, as applicable.

I.A.III. PLANNING GOAL

Over the past decade, Fillmore County was included in three federal disaster declarations for flooding, severe storms, tornadoes, and straight-line winds. Minnesota disasters in the decade from 1997-2007 incurred more than \$500 million in Federal Emergency Management Agency (FEMA) expenditures: The goal of this plan is to meet the requirements established by the Disaster Mitigation Act of 2000, and to eliminate or reduce vulnerability to significant or repetitive damage from one or more hazards determined to have potential in Fillmore County, Minnesota. The following table describes known FEMA expenditures from 1997 to 2007 in the State of Minnesota for flooding, severe storms, tornadoes, and straight-line winds:

Table 1 – FEMA Expenditures for Disaster Relief 1997-2007

1/07/97	Winter Storm / Ice Storm / Freeze	\$15,170,659
1/16/97	Winter Storm	\$24,772,564
4/08/97	Floods / Severe Storms	\$217,869,022
9/25/97	Floods	\$10,842,202
4/01/98	Tornadoes	\$35,531,082
6/23/98	Tornadoes	\$30,172,492
7/28/99	Floods	\$15,299,593
9/11/99	Severe Storms	\$6,833,772
6/27/00	Severe Storms	\$17,886,199
5/16/01	Floods	\$40,143,550
6/14/02	Floods / Severe Storms / Tornadoes	\$30,033,373
10/07/04	Severe Storms and Flooding	\$3,329,176
8/23/07	Severe Storms and Flooding	\$56,838,469
	Total Minnesota Expenditures	\$504,722,153

Source: <http://www.fema.gov/femaNews/disasterSearch.do>

I.A.IV. PLANNING SCOPE

This plan was prepared as a multi-jurisdictional plan to cover the jurisdiction of Fillmore County, Minnesota, and the cities and townships located within Fillmore County. Local units of government in the county were invited to participate in the planning process.

I.A.V. PLAN ADOPTION

This plan will be considered to be in effect upon its approval and adoption by the Fillmore County Board of Commissioners and its approval by the Minnesota Department of Homeland Security and Emergency Management (MN HSEM) and the Federal Emergency Management Agency (FEMA). Fillmore County’s plan is multi-jurisdictional and the County will seek resolutions of plan adoption from the following cities that chose to participate in Fillmore County’s planning effort in lieu of preparing a separate plan for their jurisdiction:

SECTION I PLAN SUMMARY

Canton
Chatfield
Fountain
Harmony
Lanesboro

Mabel
Ostrander
Peterson
Preston
Rushford

Rushford Village
Spring Valley
Whalan
Wykoff

Fillmore County’s plan also will cover all Fillmore County townships:

Amherst Township
Arendahl Township
Beaver Township
Bloomfield Township
Bristol Township
Canton Township
Chatfield Township
Carimona Township

Carrolton Township
Fillmore Township
Forestville Township
Fountain Township
Harmony Township
Holt Township
Jordan Township
Newburg Township

Norway Township
Pilot Mound Township
Preble Township
Preston Township
Spring Valley Township
Sumner Township
York Township

I.B. RELATIONSHIP TO EMERGENCY OPERATIONS PLAN

Fillmore County has prepared an Emergency Operations Plan (EOP), last updated in 2007, as part of its overall preparedness strategy. The EOP addresses response training and all aspects of response from an actual event onward. The All-Hazard Mitigation Plan is complementary to the EOP and seeks to reduce hazard risks and impacts on a pre-event basis, through:

- Structural hazard control or protection measures
- Retrofitting of facilities
- Acquisition and relocation of repetitive loss structures
- Development of mitigation standards, regulations, policies, and programs
- Review, updating, and enforcement of building codes
- Public awareness and education programs
- Development or improvement of warning systems

I.C. ORGANIZATION OF THIS PLAN

Section I is the executive summary of the Fillmore County All-Hazard Mitigation Plan. It provides the overarching vision, purpose, and regulatory context for preparing this plan. Section One also provides a brief digest of the main plan sections, as described below.

Section II characterizes Fillmore County by its physical, social, economic, and governance parameters:

Historical Setting
Schools
Climate
Public Facilities
Geology
Transportation
Topography and Soils
Utilities

Hydrology
Population and Housing
Land Cover and Land Use
Demographic Trends
Community Infrastructure
Economics and Labor
Emergency Response Resources

Section III profiles a range of potential natural and manmade hazards that could pose a threat to Fillmore County. As appropriate, selected events that could

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originate outside of the county have been included if they could jeopardize safety and stability within the county.

Section IV assesses vulnerabilities to the potential hazards based on a variety of considerations. This resulting assessment was used with other factors to identify priorities for future mitigation efforts.

Section V sets forth a series of goals, objectives, and prioritized strategies to mitigate the impacts of each hazard. This section also identifies the lead agency with primary responsibility for moving each strategy forward, timeframes, funding availability, and benchmarks to measure progress.

Section VI describes the planning process in terms of its technical, political, and public engagement components. This section also sets the course for plan implementation and updating, measuring progress, and continued engagement of the public with a stake in this plan; e.g., residents, municipal governments, county government, businesses, non-profit organizations, and schools.

Section VII identifies existing county, city, and other plans that are interrelated with this plan. As appropriate, these plans are incorporated by reference rather than replicated within this plan.

I.D. COMMUNITY PROFILE SUMMARY – SECTION II

Fillmore County is in southeastern Minnesota. It is bounded on the south by the State of Iowa, on the north by Olmsted and Winona Counties, on the west by Mower County, and on the east by Houston County. Preston, the county seat, is almost in the geographical center of the county. The county has an area of 861 square miles. It extends about 36 miles from east to west and 24 miles north from the Iowa border. The county was established March 5, 1853, and named for Millard Fillmore, President of the United States from 1850 to 1853.

As of the census of 2000, there were 21,122 people, 8,228 households, and 5,718 families residing in the county. The population density was 24 people per square mile (9/km²). There were 8,908 housing units at an average density of 10 per square mile (4/km²). Most of Fillmore County is Rural.

I.E. MAJOR HAZARDS SUMMARY – SECTION III

Natural hazards profiled by this plan include:

Severe Summer Storms	Drought
Severe Winter Storms	Karst/Subsidence
Extreme Temperatures	Wildfire
Flood	Infectious Diseases
Landslides	

Technological hazards profiled by this plan include:

Fire	Hazardous Materials
Water Supply Contamination	Dam/Levee Failure

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The following information is provided for each hazard: a general description of the hazard, its event history in the county, vulnerability considerations, possible cascading effects from a hazard event, existing plans and programs to address the hazard, and known gaps and deficiencies in these programs.

I.F. VULNERABILITY ASSESSMENT SUMMARY – SECTION IV

Section IV includes the results of a five-part assessment of hazard concerns in Fillmore County:

- 1) Description of hazards and historical occurrences (Section III). Each hazard was described and historical data was gathered on each of the hazards outlined in the State All-Hazard Mitigation Plan.
- 2) Mapping of Hazards (included in the Appendix III). Maps were created that depicted the hazards geographically. The steering committee, city representatives and the public were asked to “mark-up” the maps to show past events, concerns and other pertinent data.
- 3) Identifying the effects of hazards (Section III). Using the preceding data from steps 1 and 2, the effects of these hazards were evaluated.
- 4) County-wide hazard evaluation and prioritization (Section IV). Vulnerability was assessed on a countywide basis using the following parameters to determine an overall priority rating: frequency of occurrence, warning time, geographic extent, and likely adverse impact.
- 5) City Hazard profiling (Section IV) Community representatives also identified top hazard concerns for their individual communities from a broader range of possible incidents, including natural and man-made hazards. Almost every participating community identified severe weather incidents as their top hazard concern.

This assessment yielded the following prioritized list of hazards:

- 1) Flood
- 2) Tornado
- 3) Windstorm
- 4) Ice and Sleet
- 5) Infectious Disease
- 6) Hailstorm
- 7) Blizzard
- 8) Extreme Temperatures (Summer and Winter)
- 9) Drought
- 10) Karst / Subsidence
- 11) Water Supply Contamination
- 12) Hazardous Materials
- 13) Dam and Levee Failure
- 14) Lightning
- 15) Fire
- 16) Landslides
- 17) Terrorism
- 18) Wildfire

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I.G. MITIGATION STRATEGIES SUMMARY – SECTION V

Mitigation goals, objectives, and strategies were developed to:

- Maintain and enhance the County’s capacity to continuously make Fillmore County and the Local Jurisdictions less vulnerable to the hazards listed above.
- Build and support local capacity and commitment to continuously become less vulnerable to natural hazards.
- Improve coordination and communication with other relevant entities.
- Build on existing efforts, when possible.
- Enhance communication, information sharing, and education, when possible.

A series of goals, objectives, and strategies was developed for each of the hazards identified by the hazard identification and prioritization process. Strategies for these include a priority ranking, and identify new vs. ongoing efforts, target dates, lead agencies, funding sources, and possible benchmarks for future evaluation.

I.H. PLANNING PROCESS SUMMARY – SECTION VI

Development of this plan began in 2007 and included public engagement methods throughout the process. Planning consists of the following phases:

Fillmore County All-Hazard Mitigation Planning Process	
Phase I: Scope Planning Process and Assess Community Support	
<i>Task 1</i>	Determine planning area and process
<i>Task 2</i>	Determine community interest in mitigation planning: July 2006 <i>Contacted local Jurisdictions and Emergency management</i>
<i>Task 3</i>	Work to remove possible planning roadblocks with all affected communities July – September 2006 <i>Formalized Intra-County Emergency Management Agreement Formed Emergency Management Advisory Group (EMAG)</i>
<i>Task 4</i>	Interview and Selection a consultant to facilitate the process : February
<i>Task 5</i>	EMAG meeting to the All-Hazard Mitigation Plan process and procedures
<i>Task 6</i>	Build All-Hazard Mitigation Plan Steering Committee from members of EMAG: February 2008
Phase II: Assess Risks	
<i>Task 1</i>	Work with Communities, and Steering Committee to Identify Hazards and Priorities: Feb-March 2008 <i>EMAG Meeting, Steering Committee Meetings , Public Surveys, Public Meeting, Interviews with City and Emergency Management Staff</i>
<i>Task 2</i>	Profile Events
<i>Task 3</i>	Inventory Community Assets
<i>Task 4</i>	Estimate Losses
Phase III: Develop a Mitigation Plan	
<i>Task 1</i>	Develop Mitigation Goals and Objectives, with Community and Stakeholder Input: May - June 2008 <i>EMAG group meeting, County Planning Commission Meeting, Public Survey, Public Input Meeting, City officials and Emergency Management staff interviews.</i>
<i>Task 2</i>	Identify and Prioritize Mitigation Efforts
<i>Task 3</i>	Prepare an Implementation Strategy
<i>Task 4</i>	Document the Mitigation Plan

SECTION I PLAN SUMMARY

<i>Task 5</i>	Seek Broadly-Based Stakeholder Review and Comment on Plan Drafts: June - July, 2008 <i>Fillmore County Board of Commissioners, release full plan for review via: News releases, Send plan to adjacent counties Plan posted online, Public open houses, Plan posted in libraries Plan sent to cities and State and federal agency townships review</i>
Phase IV: Implement the Mitigation Plan	
<i>Task 1</i>	Adopt the Plan
<i>Task 2</i>	Implement Recommendations with Ongoing Public Engagement
<i>Task 3</i>	Evaluate Planning Results
<i>Task 4</i>	Revise Plan as Needed

DRAFT

SECTION II. COMMUNITY PROFILE

SECTION II. COMMUNITY PROFILE

II.A. SECTION OVERVIEW

The community profile provides a portrait of Fillmore County through its key physical and socioeconomic features, including:

- Historical Setting
- Climate
- Geology
- Topography and Soils
- Hydrology
- Land Cover and Land Use
- Community Infrastructure
- Schools
- Public Facilities
- Transportation
- Utilities
- Population and Housing
- Communities within the County
- Demographic Trends
- Economics and Labor
- Emergency Response Resources

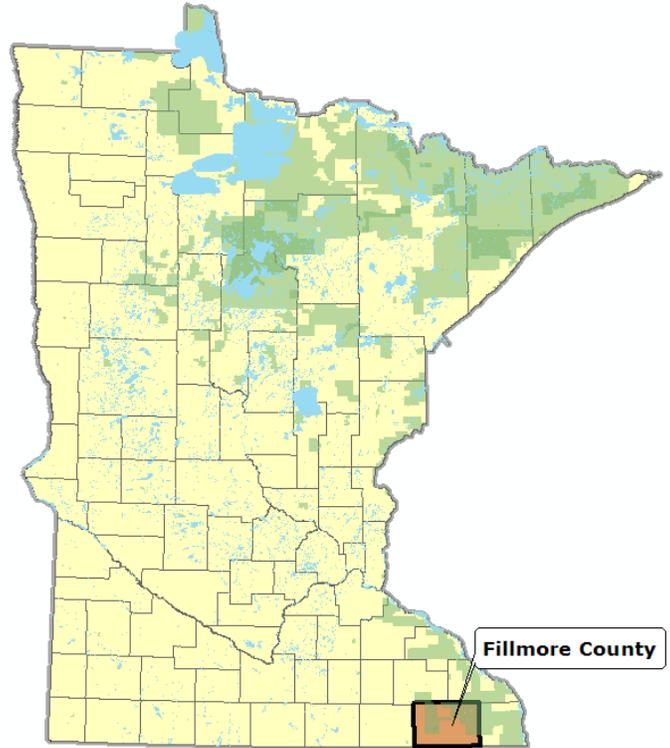


Figure 1 - Fillmore County, MN

The profile draws on available current data, studies, plans, and other documents, including:

- US Census Bureau data, 2000
- Minnesota All-Hazard Mitigation Plan
- Fillmore County EOP
- Fillmore County Soils Survey
- MN Department of Natural Resources data
- *Fillmore County Comprehensive Plan*, including
 - ___ Fillmore County Transportation Plan
 - ___ Fillmore County Environment and Natural Resources Plan
 - ___ Fillmore County Parks Plan
 - ___ Fillmore County Land Use Plan
- Fillmore County GIS map data
- Fillmore County Public Health and Minnesota Department of Health
- Watershed plans
- FEMA regulations
- Infrastructure maps (sewer, water, etc)
- Utility maps

SECTION II COMMUNITY PROFILE

The maps used for Fillmore County’s All Hazards Mitigation plan were drawn from the Fillmore County Office of Geographic Information System, Office of Planning, existing county plan documents, and the State of Minnesota, FEMA, and various other internet sources.

II.A.1. LOCATION

Fillmore County is in southeastern Minnesota (see above). It is bounded on the south by the State of Iowa, on the north by Olmsted and Winona Counties, on the west by Mower County, and on the east by Houston County. Preston, the county seat, is almost in the geographical center of the county.

II.A.2. GENERAL COUNTY OVERVIEW

The county has an area of 861 square miles. It extends about 36 miles from east to west and 24 miles north from the Iowa border. The county was established March 5, 1853, and named for Millard Fillmore, President of the United States from 1850 to 1853. With an Estimated Population of just over 21,000 as of 2005, Fillmore County is mostly rural without a city that has reached a population of 3000.

Fillmore County includes 14 incorporated Cities and 23 unincorporated townships. Chatfield is located predominantly in Fillmore County with a small portion located in Olmsted County. Figure 2 - Fillmore County Overview, maps city and township boundaries within Fillmore County.

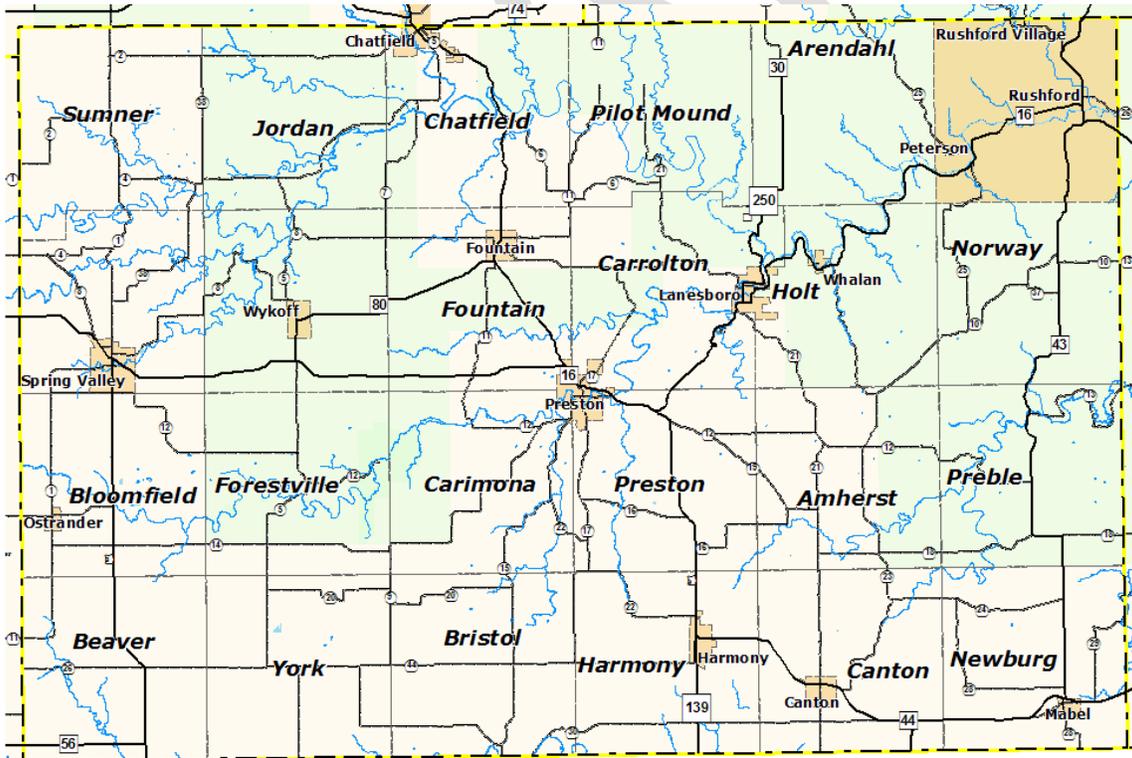


Figure 2 - Fillmore County Overview

II. B. HISTORICAL SETTING

Minnesota was organized as a territory in 1849 and by 1852, the population was estimated at 20,000. Fillmore County, named for President Millard Fillmore, was created by an act of Territorial Legislature on March 5, 1853 when it was subdivided off what had been Wabasha County. At that time, Fillmore County included all of present-day Fillmore and Houston counties, most of Winona and some of Olmsted. Later legislation creating Houston, Winona and finally Olmsted counties reduced Fillmore to its present size of 24 townships. The county seat, designated originally at Chatfield, was later moved to Carimona, with the final move to Preston in April of 1856. The townships were organized in 1858 when Minnesota became a state.

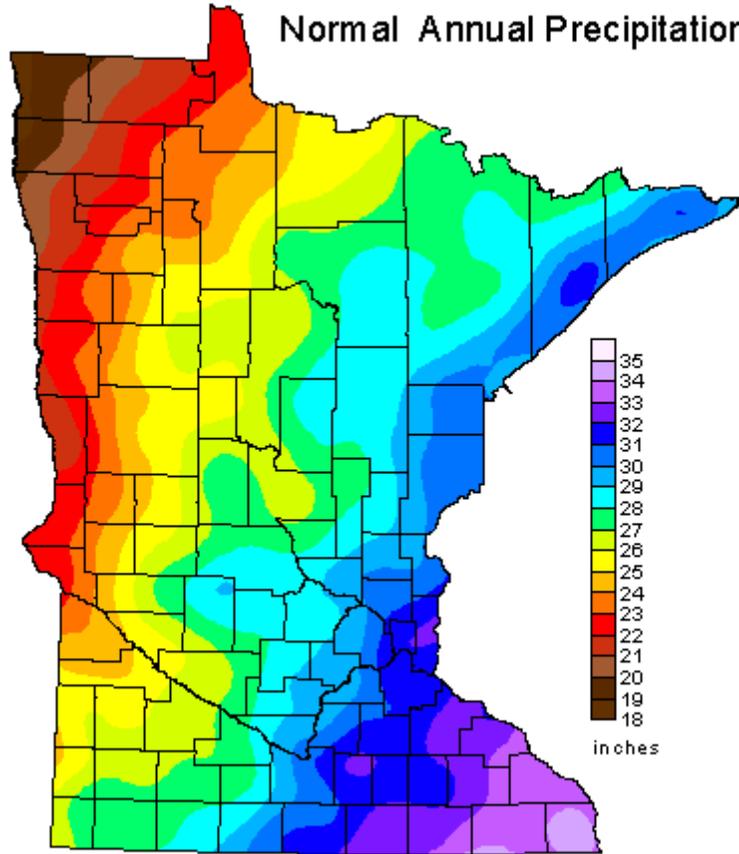
The county is part of the Driftless Area, or in its own documents, the Paleozoic plateau. This part of Minnesota was ice-free during the last ice age. The county to the east is more rugged, but Fillmore County also displays a karst topography.

II.C. PHYSICAL CHARACTERISTICS

II.C.1. CLIMATE

The climate in Fillmore County is predominantly continental, characterized by cold, dry winters and warm, sub-humid summers. Winter precipitation is primarily snow or mixed snow and rain. During the warm months, rain showers (occasionally very heavy) occur when warm moist air leaves the Gulf region and meets cooler air over the region. Fillmore County has a typical continental climate characterized by wide variations in temperature, very little winter precipitation, normally ample summer rainfall, and a general tendency to extremes. The average annual temperature is 43.7 degrees F. January, the coldest month, has an average temperature of 12.5 degrees, and July, the warmest month, has an average temperature of 71.6 degrees. The average annual precipitation is between 32 and 34 inches. June is normally the wettest month. Thunderstorms supply most of the rain in the warm months. The county is in the southeastern part of the State, where there is an average of 37 thunderstorms a year. At least one damaging rainstorm comes in summer, and tornadoes and ice storms occur occasionally. The average snowfall is 44.4 inches. The following figure depicts the average precipitation for the entire State of Minnesota:

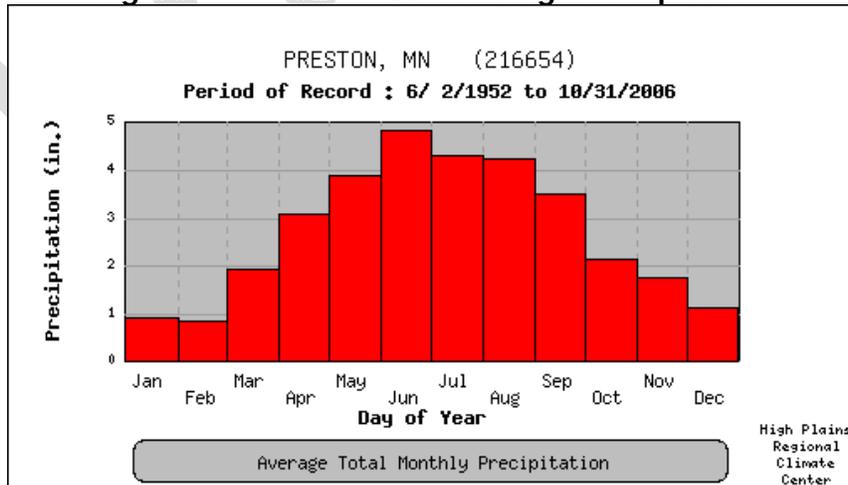
Figure 3 - Average Annual Precipitation for Minnesota
Normal Annual Precipitation



Source: State Climatology Office – DNR Waters

Although temperatures and precipitation can vary from one end of the county to the other in any given day, the weather station in Preston (Station: 216654) is used in the following tables and figures to indicate Fillmore County’s precipitation and temperature variations.

Figure 4 – 1952 – 2006 Average Precipitation



Source: <http://www.hprcc.unl.edu>

SECTION II COMMUNITY PROFILE

Table 2 - 1952 - 2007 Precipitation Summary

Station:(216654) PRESTON														
From Year=1952 To Year=2007														
	Precipitation										Total Snowfall			
	Mean	High	Year	Low	Year	1 Day Max.	>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year	
	in.	in.	-	in.	-	in.	dd/yyyy or yyyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	0.92	4.08	1963	0	1986	1.8	20/1988	6	3	0	0	9.1	33	1996
February	0.87	3.07	1971	0	1969	1.3	24/2007	5	3	0	0	7	24	1962
March	1.92	3.99	1976	0.11	1994	1.5	09/1992	8	4	1	0	8.1	26	1959
April	3.11	7.54	1999	0.62	1966	2.3	07/2006	10	7	2	1	1.7	15	1973
May	3.89	8.72	1982	0.74	1958	5.6	30/1980	12	8	3	1	0	0	1953
June	4.82	12.1	2004	0.8	1988	4.2	01/2000	11	8	3	1	0	0	1952
July	4.3	12.4	1999	0.68	1996	7.3	11/1981	10	7	3	1	0	0	1952
August	4.25	11.1	1980	0.5	2003	4.7	25/1983	10	7	3	1	0	0	1952
September	3.5	12.7	1965	0.33	1953	4.8	20/1983	9	6	2	1	0	0	1952
October	2.15	4.97	1982	0.03	1952	3	20/1982	8	5	1	0	0.1	1.8	2002
November	1.75	6.71	1991	0.06	1962	3	01/1991	7	4	1	0	3.6	19	1991
December	1.14	3.97	1982	0.21	1958	1.7	28/1982	7	3	1	0	8.5	33	2000
Annual	32.61	49.2	1983	17.7	1958	7.3	19810711	102	62	21	7	38.2	64	1959
Winter	2.92	6.34	1983	0.69	1987	1.8	19880120	18	8	1	0	24.7	45	2001
Spring	8.92	14.2	2006	2.97	1958	5.6	19800530	29	19	6	2	9.8	28	1962
Summer	13.37	23.6	1990	5.81	1964	7.3	19810711	31	21	9	4	0	0	1952
Fall	7.4	15.8	1965	1.47	1952	4.8	19830920	23	14	5	2	3.7	19	1991

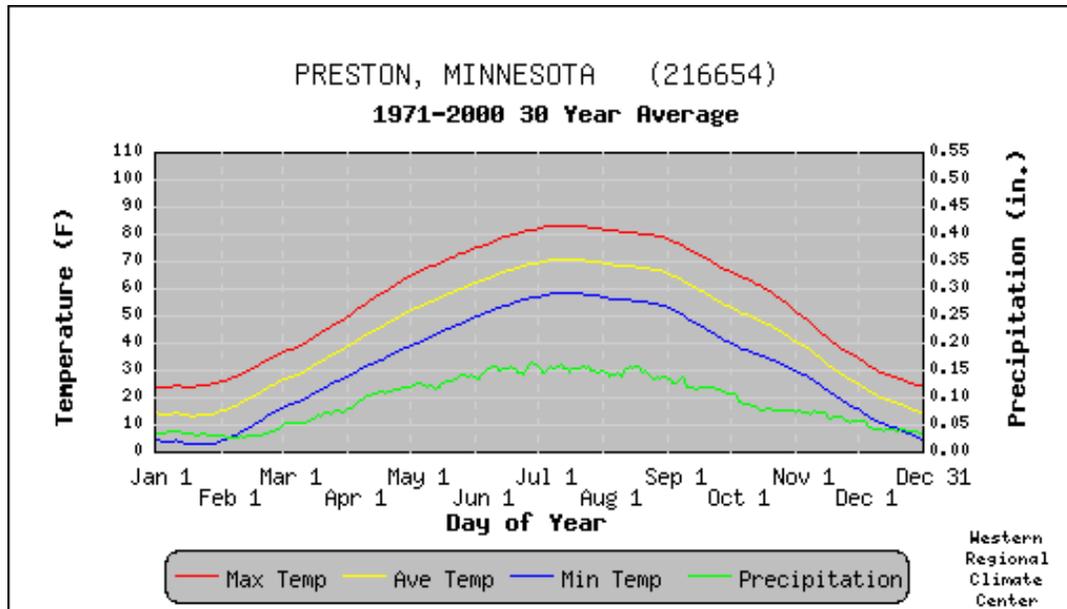
Source: <http://www.hprcc.unl.edu>

Table 3 – 1952 - 2007 Temperature Summary

Station:(216654) PRESTON															
From Year=1952 To Year=2007															
	Monthly			Daily Extremes				Monthly Extremes				Max. Temp.		Min. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32 F	<= 32 F	<= 0 F
	F	F	F	F	dd/yyyy or yyyyymmdd	F	dd/yyyy or yyyyymmdd	F	-	F	-	# Days	# Days	# Days	# Days
January	24.6	4.1	14.4	57	27/2002	-39	21/1970	28.1	2006	1.8	1977	0	21.7	30.7	12.4
February	30.3	8.8	19.6	65	17/1981	-45	03/1996	33.8	1954	9.2	1978	0	15.1	27.2	8.3
March	41.4	21	31	82	30/1986	-35	01/1962	40.6	1973	19.9	1965	0	6.2	26.2	2.1
April	57.8	34	45.7	91	21/1980	-8	06/1982	53.3	1977	39.4	1961	0	0.3	14	0
May	69.6	44	56.9	91	26/1978	18	10/1966	65.2	1977	50.8	1997	0.4	0	3.7	0
June	78.9	54	66.4	100	09/1985	31	04/1987	71.2	1991	58.7	1969	2	0	0.1	0
July	83.4	59	71	101	18/1964	35	01/1988	77.3	1955	66.4	1971	5.3	0	0	0
August	81	56	68.4	101	02/1964	30	31/1967	74.3	1995	61.6	1986	2.9	0	0	0
September	72.9	47	59.9	98	09/1955	19	29/1967	65.3	1978	54.2	1993	0.9	0	2.3	0
October	61	36	48.4	92	01/1976	8	30/1988	56.1	1956	42.3	1952	0.1	0	12.3	0
November	43.4	24	33.6	76	09/1999	-19	26/1977	46.7	2001	24.6	1985	0	5.2	23.8	1
December	29.5	11	20.2	63	03/1982	-35	19/1983	29.6	1959	5.2	1983	0	17.5	30.1	7.3
Annual	56.2	33	44.6	101	19640718	-45	19960203	48	1998	41.1	1996	11.5	66.2	170.3	31.2
Winter	28.1	7.9	18.1	65	19810217	-45	19960203	26.9	2002	9.8	1979	0	54.3	88	28
Spring	56.3	33	44.5	91	19780526	-35	19620301	52.8	1977	39.6	1996	0.4	6.6	43.9	2.2
Summer	81.1	56	68.6	101	19640718	30	19670831	72.3	1955	65.1	2004	10.2	0	0.1	0
Fall	59.1	35	47.3	98	19550909	-19	19771126	51.1	2001	42.2	1985	0.9	5.3	38.3	1

Source: <http://www.hprcc.unl.edu>

Figure 5 – 30 year Average Temperature and Precipitation



Source: <http://www.hprcc.unl.edu>

II.C.2 GEOLOGY

Southeast Minnesota, wholly included in the Driftless Area, is separated from Southwest Minnesota by the Owatonna Moraine, the eastern branch of the Bemis Moraine, a terminal moraine of the Des Moines lobe from the last Wisconsin glaciation. Ojakangas and Matsch extend the region west past the moraine to a line running north from the Iowa border between Mankato and New Ulm to the latitude of the Twin Cities, then encompassing the latter metropolis with

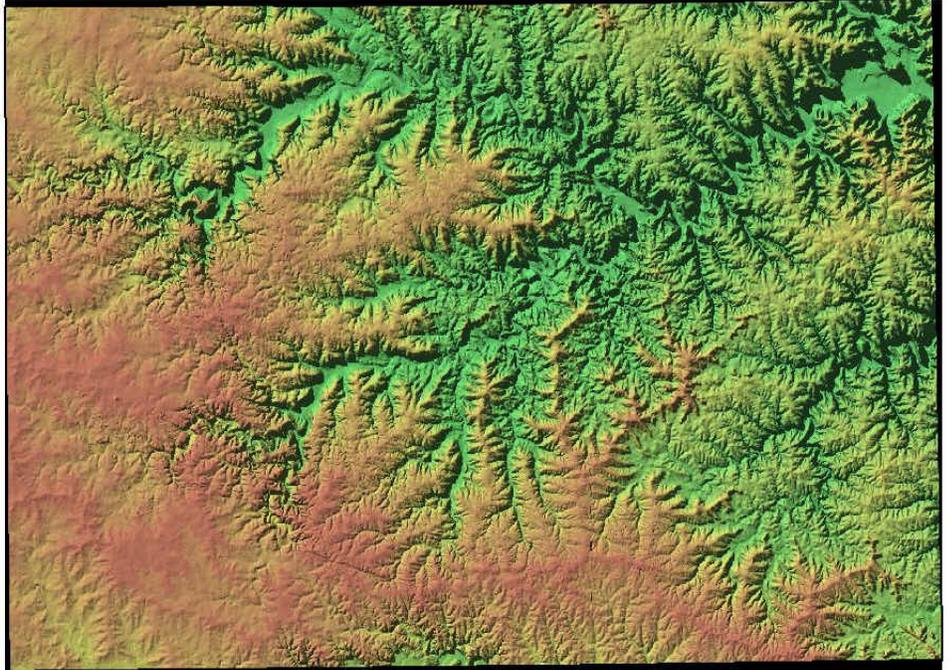


Figure 6 - Fillmore County Relief

a broad arc east to the St. Croix River. This moraine runs south from the Twin Cities in the general area of Minnesota State Highway 13 and Interstate 35. Sansome attaches this moraine to her description of West-Central Minnesota, given its similarity in glacial features to that region.

a) **Surficial Geology**

Most of Fillmore County consists of outcrops and bedrock with minimal sediment. The West third of the county has a typical glacial till thicker than 5 feet. The County is striated with Alluviums, the result of current streams and the remnants of stream deposits from the last glaciation.

b) **Bedrock Geology**

Fillmore County has abundant and widespread exposures of bedrock at the surface. The bedrock here is lower Ordovician sedimentary rocks, with limestone and dolomite especially prevalent near the surface. To the east, the area is highly dissected, where local tributaries of the Mississippi have cut deep valleys into the bedrock. It is an area of karst topography, with thin topsoils lying atop porous limestone, leading to formation of caverns and sinkholes. The last glaciation did not cover this region so there is no glacial drift to form subsoils, giving the region the name of the Driftless area.

c) **Karst**

Karst is defined by Klimchouk and Ford (2000) as “an integrated mass-transfer system in soluble rocks conduits dissolved from the rock and organized to facilitate with a permeability structure dominated by the circulation of fluid.” Karst is not just the number of sinkholes on the landscape, but the whole system, including the subsurface, all of which is shaped by the flow of water through the system.

SECTION II COMMUNITY PROFILE

Fillmore County has been called the "Karst Capital of Minnesota." With over 6000 sinkholes and 850 springs that have been mapped, the county is believed to have more karst features than the rest of Minnesota combined. Fillmore County is also home to two commercial caves: Mystery Cave, which is managed by the MN DNR, and Niagara Cave, which is privately operated. Both have formations that are among the most unique found in the Midwest and the country and are the only two commercial caves in Minnesota. Four blind valleys are known in the county: Fairview, Lefevere, York, and Cherry Grove. Numerous streams are known to be disappearing streams, including the South Branch of the Root River, which often has a dry streambed for about five miles of its length between Mystery Cave and Seven Springs during late summer and fall.

For more information on the Geology of Fillmore County refer to the Fillmore County Geologic Atlas. http://www.geo.umn.edu/mgs/county_atlas/countyatlas.htm

II.C.3 TOPOGRAPHY AND SOILS

II.C.3.A. TOPOGRAPHY AND LANDFORMS

According to the Fillmore County Soils Survey, Fillmore County is a gently rolling or rolling upland plain, deeply dissected in places by stream valleys. The direction of decreasing elevation is generally from west to east. The eastern half is characterized by a succession of narrow gently rolling or rolling divides, which are the remains of an old geologic plain (Dodgeville peneplain). Between these divides is an intricate pattern of deep valleys and ravines that have steep slopes and precipitous rocky bluffs, in many places, 50 to 500 feet high.

The Root River and its tributaries and many small intermittent streams in narrow valleys have steep rocky bluffs along their entire course. Somewhat extensive terraces, many in step formation, occupy different levels in the valleys of the Root River and its larger tributaries. Many valley slopes are steep and rocky; divides between them are comparatively smooth. The highest points on these divides have approximately the same altitude.

A relatively smooth area, originally covered by prairie grasses, is in Bristol, Harmony, Canton, and Newburg Townships in the southern part of the county. This extensive area is on the broad divides that separate the watersheds of the Root River and the Upper Iowa River. Some terraces occur adjacent to streams in the glacial drift region, particularly along the Upper Iowa River on the Iowa border.

The western half of the county is a gently rolling drift plain, only slightly dissected by streams. Within this area, however, are a few narrow, deeply cut valleys. In the extreme northwest and southwest, on the broad divides between streams, the relief is level and smooth because of the leveling and filling action of glaciers. Extensive flats and large poorly drained depressions are common.

Except for level areas in the glaciated section, the drainage of the county is branched and well developed. The county is drained almost entirely by the eastward-flowing tributaries of the Root River. Exceptions are Beaver, York, Bristol, Harmony, and Canton Townships, where a few small valleys are drained by the Upper Iowa River. Many of the tributaries originate on fairly smooth glacial drift plains in the counties to the west and north. Inside the county line, they enter narrow valleys, continue

SECTION II COMMUNITY PROFILE

through deeply cut rock valleys, converge near the main valley, and leave the county in one volume near Rushford in the northeastern corner.

The South Branch of the Root River, rising in Mower County, enters Fillmore County just north of the village of Ostrander in Bloomfield Township. In its eastward course, it crosses Forestville, Carimona, Preston, and Carrolton Townships, and it joins the Root River in Holt Township. The river flows on through Aren-dahl and Rushford Village. From Mower County to Houston County, a distance of more than 36 miles, the river descends from an elevation of slightly more than 1,200 feet to about 700 feet. Many small tributary streams are fed by springs, but surface water often drains into sinks or sinkholes and thence to underground drainage channels.

Many sinkholes, which form when the land surface collapses into subsurface voids formed in the slowly dissolving rock, occur in lines on the uplands and increase in number and size near large valleys. Most of the sinkholes occur in rural areas where their main impact is rendering land unsuitable for row-crop agriculture. Sinkholes have also resulted in the failure of farm and other types of ponds, roads, and sewage-treatment lagoons. Sinkholes act as a conduit for surface runoff to directly enter bedrock aquifers. The Minnesota DNR recognizes that sinkholes have implications for groundwater quality in the South Branch Root River, and Upper Iowa River Watershed. Underground passages connect many of these sinkholes, and in places subterranean gorges can be traced several miles by a succession of large sinkholes. Bear Creek, in Jordan Township, and Kedron Creek, in Sumner, both flow underground for several miles. Canfield Creek, south of Forestville, flows underground about 12 miles. The South Branch sinks in the northeast quarter of section 19, in Forestville Township, and flows underground, except at times of high water, to about the center of section 21.

II.C.3.B. SOILS

Soils data indicate general patterns of soil suitability and limitations for land uses, and can be used to determine flooding potential, load bearing capacities, permeability, surface drainage and percolation rates. The most prevalent soils found in Fillmore County are silty loam soils that are very erodible. A soil erosion potential map is included in the Appendix III.

II.C.4 HYDROLOGY

Fillmore County's rivers, streams and ground water are some of its most significant resources. They are vulnerable to pollution from a wide variety of human activities and or disasters. Water quality has become one of the most important environmental issues facing the county and state. Water is used for domestic and residential purposes, industry, agriculture and recreation. The health, safety and welfare of the public are directly linked to the county's water supply.

II.C.4.A GROUNDWATER

The County relies on deep aquifers for most of its community drinking water. The St. Peter-Prairie du Chien-Jordan aquifer in underlies most of the county and is the main source of ground water. The St. Peter-Prairie du Chien-Jordan aquifer is absent in parts of the Root River and South Fork Root River valleys, totaling about three percent of the county. The cities provide drinking water to their residents. Most township water is provided by individual wells. There are numerous individual drinking water systems within the County.

SECTION II COMMUNITY PROFILE

In the northeast portion of the county, equaling approximately 28 percent of the area of Fillmore County, the Decorah-Platteville-Glenwood formations have mostly eroded, resulting in a pollution sensitivity rating of high or very high, according to the MN DNR, Division of Waters. Sensitivity ratings are based on the travel time for water-borne surface contaminants to reach the aquifer. A very high rating indicates that it may take hours to months for contaminants to reach the aquifer, while a high rating indicates that it may take weeks to years for contaminants to reach the aquifer. Portions of Chatfield, Rushford Village, Lanesboro, Preston, Whalen and Peterson are located within areas that are very highly, or highly susceptible to groundwater pollution. Towns in these sensitive areas should not be allowed to direct-discharge their wastewater.

Decorah Edge. Water flows vertically through limestone bedrock until it hits the Decorah shale layer. When water hits the shale layer it moves laterally until the shale is exposed, typically on a side hill slope. At the point where the shale layer outcrops, the water flows above ground through surface vegetation until it bypasses the shale and re-enters the bedrock through cracks or fissures. Water from many of the lesser known features eventually flows underground into deeper limestone layers to recharge deeper aquifers.

Vegetation on the Decorah Shale acts to filter contaminants in the water, much like wetlands act to remove contaminants. This phenomenon was found to be significant by the US Geologic Survey Bureau in the nearby City of Rochester, Minnesota, which is also located in a valley surrounded by outcroppings of the Decorah Shale. Building and infrastructure development of the Decorah Shale portions of hillsides pushed the City of Rochester to contract with the US Geologic Survey Bureau to conduct extensive analysis of the hydrologic characteristics and filtering abilities of vegetation along the Decorah Shale. The analysis found it would cost the city millions of dollars in water filtration each year to replace the action of the vegetation along the shale. The Decorah edge has been mapped as part of the Geologic Atlas of Fillmore County.

For more information on the Geology of Fillmore County refer to the Fillmore County Geologic Atlas. http://www.geo.umn.edu/mgs/county_atlas/countyatlas.htm

II.C.4.B WATER BODIES

Fillmore County is one of only four counties in Minnesota that do not have a natural lake. Fillmore County has very few water bodies. Most are associated with the River network and wetlands. There are three Reservoirs: Bear Creek, Mill Pond and North Branch Root River Reservoir.

II.C.4.c RIVERS

Fillmore County is dissected by many rivers and streams. The major rivers are the Root River and its tributaries: South Branch Root River, Middle Branch Root River, North Branch Root River, South Fork Root River Fork. The Upper Iowa River also extends into the very southern portion of Fillmore County.

Except for level areas in the glaciated area (SW $\frac{1}{4}$, and a portion of the NW), the drainage of the county is branched and well developed. The county is drained almost entirely by the eastward-flowing tributaries of the Root River. Exceptions are Beaver, York, Bristol, Harmony, and Canton Townships, where a few small valleys are drained by the Upper Iowa River. Many of the tributaries originate on fairly smooth

SECTION II COMMUNITY PROFILE

glacial drift plains in the counties to the west and north. Inside the county line, they enter narrow valleys, continue through deeply cut rock valleys, converge near the main valley, and leave the county in one volume near Rushford in the northeastern corner.

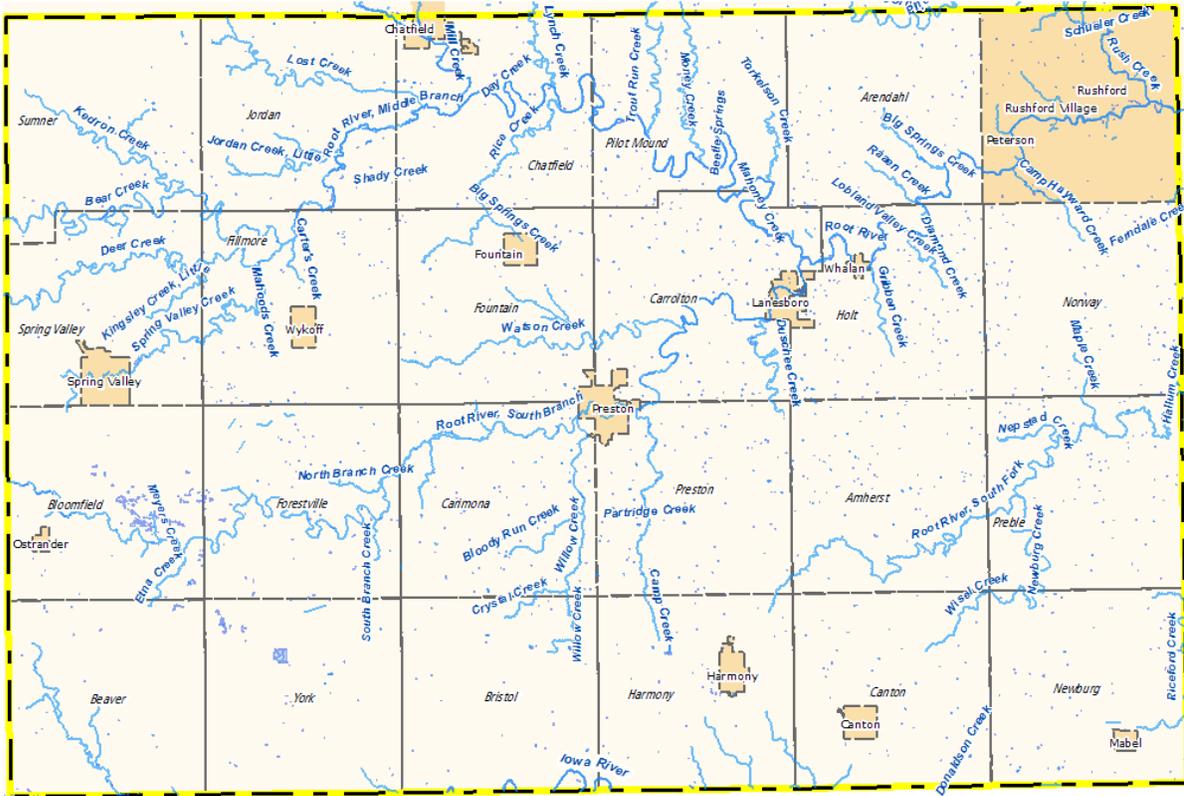
The South Branch of the Root River, rising in Mower County, enters Fillmore County just north of the village of Ostrander in Bloomfield Township. In its eastward course, it crosses Forestville, Carimona, Preston, and Carrolton Townships, and it joins the Root River in Holt Township. The river flows on through Arendahl and Rushford Village. From Mower County to Houston County, a distance of more than 36 miles, the river descends from an elevation of slightly more than 1,200 feet to about 700 feet.

Many small tributary streams are fed by springs, but surface water often drains into sinks or sinkholes and then to underground drainage channels. Sinkholes (and disappearing streams) carry surface water to underground rivers and aquifers used for drinking water. Many sinkholes occur in lines on the uplands and increase in number and size near large valleys. Underground passages connect many of them, and in places subterranean gorges can be traced several miles by a succession of large sinkholes. Bear Creek, in Jordan Township, and Kedron Creek, in Sumner, both flow underground for several miles. Canfield Creek, south of Forestville, flows underground about 12 miles. The South Branch sinks in the northeast quarter of section 19, in Forestville Township, and flows underground, except at times of high water, to about the center of section 21.

Rivers and streams in Fillmore County combine to create a broad spectrum of recreational opportunities, natural habitats and scenic views. The majority of rivers in Fillmore County are on the DNR list of trout habitats.

US Geological Survey and Minnesota Department of Natural Resources' stations monitor the main river stems and some of their tributaries to determine baseline flows, sediment loading and flood warnings. The following figure shows the major rivers in Fillmore County.

Figure 7 - Fillmore County Major Rivers



II.C.4.D WETLANDS

Wetlands boundaries are delineated from U.S. Fish and Wildlife Service National Wetland Inventory data. This includes wetlands visible on aerial photography with an area of at least 2 acres. In cases where these boundaries have changed (such as for drained wetlands), the boundaries are determined from the current photography. Wetlands in Fillmore County are small, or are included in sand pits, Quarries, or open mines. Visible Wetlands identified in the National Wetlands Inventory, constitute less than 0.1% of the County, or approximately 143 acres.

II.C.4.E WATERSHEDS

Fillmore County is divided by two watersheds; the South Branch Root River Watershed & Upper Iowa River Watershed. The South Branch Root River Watershed covers almost the entirety of Fillmore County, except for portions of Beaver, York, Bristol, Harmony and Canton Townships. The watershed contains 1660 sq mi. and includes portions of Mower, Olmsted, Winona, and Houston Counties, and drains into the Mississippi via the Root River in Hokah township, in Houston County. The Upper Iowa River Watershed contains 992 sq mi and includes portions of Mower and Houston Counties in Minnesota, and Howard, Winneshiek, and Allamakee Counties in Iowa and eventually drains into the Mississippi River.

II.C.5 LAND COVER AND USE

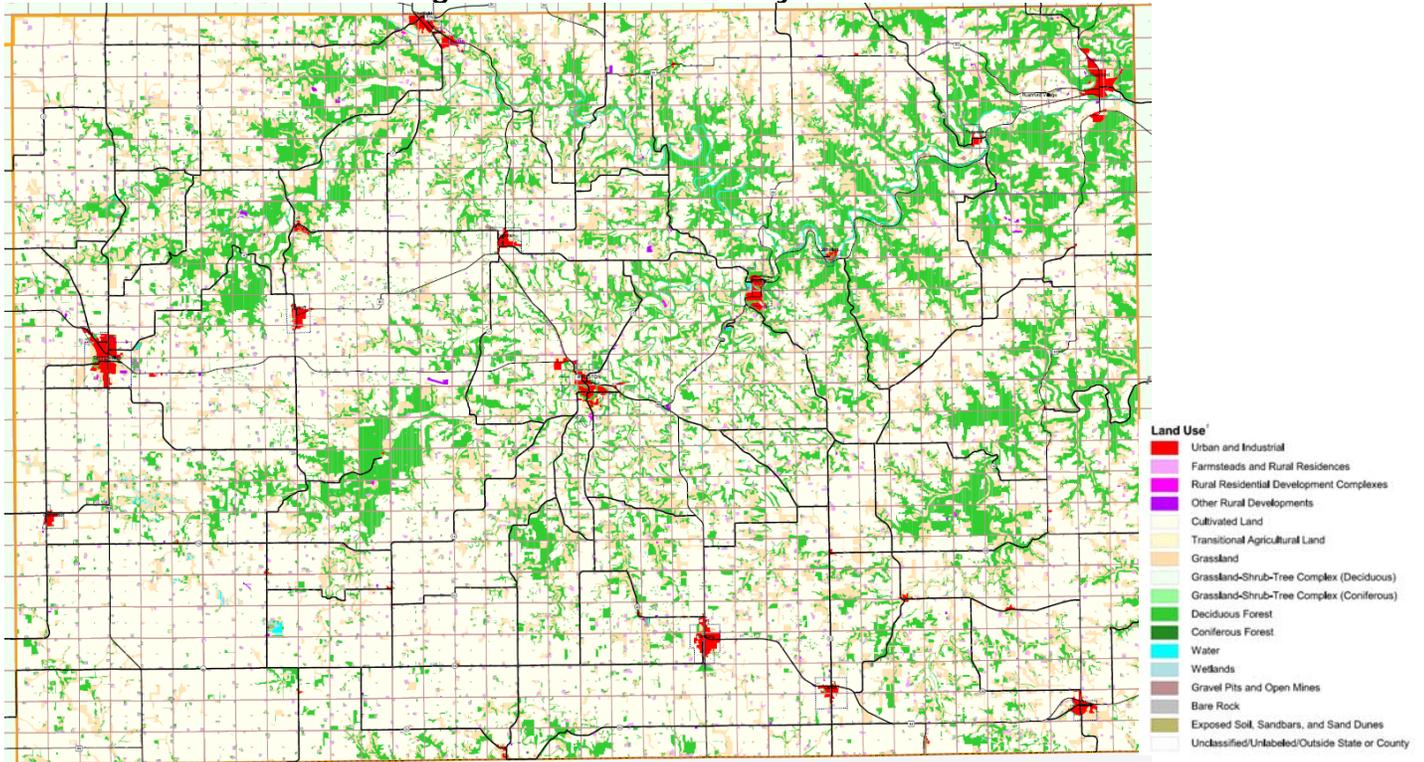
Fillmore County’s central location, in relation to larger cities like Rochester and Winona, Minnesota; LaCrosse, Wisconsin; and Decorah Iowa, along with the scenic beauty of the Root River and its tributaries and bluffs, make it an attractive place to live. Fillmore County is a predominately agricultural county, but a tourism industry based on the Root River and many other natural and cultural attractions has grown strong in recent years.

Growth and development in Fillmore County will pose many land use challenges. The balance between protection of the natural resources and character of the area and the demands for additional industrial, commercial, and residential opportunities will continue to be the driving force for any and all future planning efforts. As residential, industrial, and commercial development expands, there will be increased pressure on the County to closely examine remaining land for development. Conservation and preservation or, if and where annexation should occur will also become increasingly important.

II.C.5.A. LAND COVER

According to Land Information Management Center, Fillmore County is predominantly cultivated land, with approximately 63% or 345,000 acres designated as cultivated with an additional 14% or 78,000 acres designated as grasslands. 20% or 111,000 acres are designated as Deciduous Forest. Together, these three land types cover approximately 97% of the land in Fillmore County. Urban types of development constitute less than 2% of the land cover in Fillmore County and are concentrated in the local MCDs. A landcover map is included below, and also in the *Fillmore County Comprehensive Plan*.

Figure 8 - Fillmore County Landcover



Source: <http://mapserver.lmic.state.mn.us/landuse>

Table 4 - Fillmore County Landcover

DESCRIPTION	ACRES	% ACRES
Urban and Industrial	3932.8	0.7
Farmsteads and Rural Residences	9362.6	1.7
Rural Residential Development Complexes	104.5	<0.1
Other Rural Developments	561.5	0.1
Cultivated Land	345212	62.6
Transitional Agricultural Land	106.9	<0.1
Grassland	78391.6	14.2
Grassland-Shrub-Tree Complex (Deciduous)	938.1	0.2
Grassland-Shrub-Tree Complex (Coniferous)	0	0
Deciduous Forest	111094	20.1
Coniferous Forest	0	0
Water	1281.3	0.2
Wetlands	143.4	<0.1
Gravel Pits and Open Mines	239.2	<0.1
Bare Rock	5.3	<0.1
Exposed Soil	34.7	<0.1
Unlabeled/unclassified/Outside State or Outside County	23.4	<0.1
TOTALS	113,760	100%

Source: http://www.geo.umn.edu/mgs/county_atlas/countyatlas.htm

II.C.5.B. LAND USE

Land use can be used to determine future susceptibility to hazards by determining if proposed future developments may lie within defined hazard areas. An existing land use map for Fillmore County is included in the *Fillmore County Comprehensive Plan*.

Because the current growth rate is very slow, or declining in most of the cities in Fillmore County, there is very little planning for undeveloped land. Currently, Chatfield, Spring Valley, Fountain, Harmony, Canton, and Peterson have existing and future land use maps, or future zoning maps. Rushford and Whalen are currently in the process of completing their own. The cities of Chatfield, Fountain, Harmony, Preston, Rushford, Spring Valley, and the township of Preble are working with the County EDA on industrial, or commercial park expansions. All of the cities that have FEMA designated floodplains have ordinances restricting development inside of the floodplain. None of the cities have any future development that is planned within a floodplain boundary.

Many of the cities have karst and sinkholes within their city limits, any future development will be evaluated based on the possibility of sinkhole formation.

Because of the steep topography in much of the areas in Fillmore County, several cities have Bluff ordinances to protect the bluff lands, and future developments from erosion and landslides. The cities of Rushford, Rushford Village, Peterson, Whalan, Lanesboro, and Spring Valley all have Bluff Protection ordinances.

II.D. COMMUNITY INFRASTRUCTURE

II.D.1 SCHOOLS

The Fillmore County Public Schools include seven County School Districts, several private schools, and Amish schools with a combined total student body of 8,233. The Fillmore County School Districts are:

1. Chatfield
2. Fillmore Central (Preston, Harmony, Fountain)
3. Kingsland (Spring Valley/Wyckoff)
4. Lanesboro
5. LeRoy-Ostrander
6. Stewartville
7. Mabel-Canton
8. Rushford-Peterson

There are also other private schools in the county: Christian Heritage High School, and St. John’s Lutheran School in Wyckoff. Additionally, Fillmore County students also attend Stewartville Public School, St. Charles Public School, and Houston School District and Bluff Country Learning Options (BCLO) in Hokah, in neighboring counties. There are also a large number of Amish Schools including:

Central View	Grub Hill	Scotland	Clear View
Clear View	Lenora Valley	Stateline	Meadowbrook
Crabapple(Tem	Meadow Brook	Vail	Meadow View
porarily Closed)	Meadow Valley	Valley View	Stateline
Duescheeknob	Meadow View	Wilton Center	

Figure 9 – Public School Districts

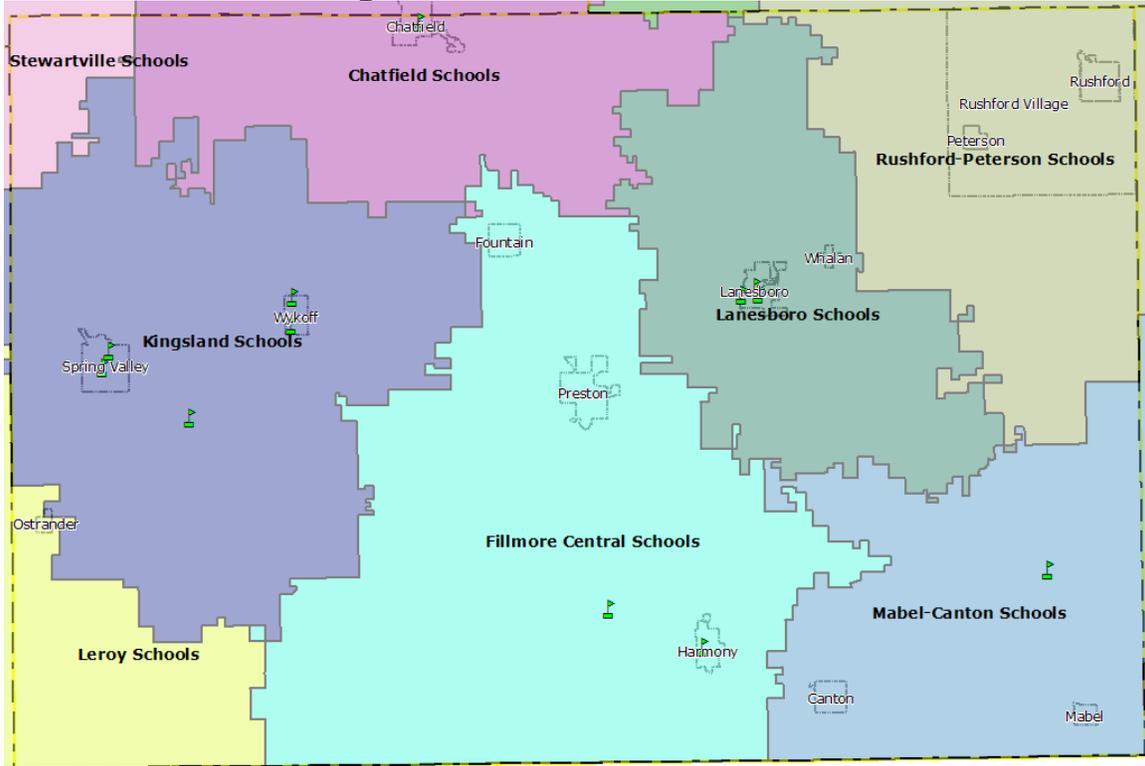


Table 5 - School Enrollment

School Enrollment by District	
School District	2006 Enrollment
Chatfield	935
Lanesboro	363
Mabel-Canton	386
Rushford-Peterson	694
Leroy-Ostrander	388
Kingsland	912
Fillmore Central	729
Total	4407

Source: www.schooltree.org

II.D.2 IMPORTANT PUBLIC FACILITIES

For this plan, important public facilities include a variety of city and county public buildings and other areas where people congregate.

II.D.2.A. COUNTY PUBLIC FACILITIES

Fillmore County owns and operates maintenance facilities, office buildings, an airport terminal, recycling facilities and a courthouse. The following table describes the County owned public facilities.

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Table 6 - County Public Facilities

Site/Building	Location	City	Replacement Cost
Courthouse	101 Fillmore Street	Preston	\$6,855,000
Jail & Sheriffs Office	901 Houston 3 NW	Preston	\$1,153,200
Engineering Office/Shop	909 Houston 3 NW	Preston	\$827,600
Highway Garage - Chatfield	Route 1, Box 50	Chatfield	\$105,200
Highway Garage - Cherry Grove	Route 1, Box 74	Cherry Grove	\$143,400
Highway Garage - Peterson	River Street	Peterson	\$145,000
Airport Terminal Building	5 miles W of Preston	Preston	\$56,700
Airport Storage Building	5 miles W of Preston	Preston	\$61,900
Highway Garage - Spring Valley	Grizwold St	Spring Valley	\$272,200
Recycling Site- Transfer Station	Hwy 52 East	Preston	\$279,000
Recycling Site- Resource Recovery	Hwy 52 East	Preston	\$539,600
Recycling Site- Compost Building	Hwy 52 East	Preston	\$1,427,300
Fillmore County Office Building	901 Houston St	Preston	\$2,530,200
Canton Highway Shop	101 S Main Street	Canton	\$390,000

Source: Fillmore County Emergency Management Director

II.D.2.B. CITY AND TOWNSHIP PUBLIC FACILITIES

Every city in Fillmore County is in the process of creating a listing of publicly owned facilities and the associated replacement values. Publicly owned facilities are included in the Hazard Maps as part of the Appendix III.

II.D.2.C. COUNTY AND STATE PARKS AND NATURAL AREAS

Fillmore County has significant natural resources that have created a booming tourism industry in the county, and is extremely important to the economic vitality of the area. There are many parks and events that attract visitors from all over Minnesota, Iowa and Wisconsin. Significant parks located in Fillmore County include:

1. Mystery Cave State Park
2. Forestville State Part
3. East Side of TH 139 Wayside Park
4. State Line Wayside Park
5. Minnesota's Norwegian Americans Historical Marker
6. Inspiration Point Wayside Park
7. Tawney Wayside Park
8. Masonic Park
9. Meighen Store Historical Marker
10. Mystery Cave Historical Marker
11. Sportsman Park
12. Preston Wayside Park

II.D.2.D. HISTORICAL RESOURCES

The County has many historical sites that bring are part of the tourism industry of Fillmore County. The County has 94 properties on the Minnesota State Historical Preservation Organization database, and 32 properties listed in the National register of Historic Places. The County includes three National Register-listed historic districts:

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- Forestville Townsite-Meighan Store (Forestville Historic District)
- Lanesboro Historic District
- Wykoff Commercial Historic District

The Fillmore County History Center, located in Fountain, maintains the County archives. There are two County Society Chapters located in Chatfield and Lanesboro. Local Historical Organizations include:

- 1877 Peterson Station Museum, Peterson, MN
- Hesper-Mabel Area Historical Society, Mabel, MN
- Preston Historical Society, Preston, MN
- Rushford Area Historical Society, Rushford, MN
- Spring Valley Community Historical Society, Spring Valley, MN
- Wykoff Area Historical Society, Wykoff, MN

II.D.2.E. EVENT AREAS

Fillmore County has several sites/events that draw visitors into the county. Below are some of the events and tourist attractions: (This is not an exhaustive list. A copy of the local visitor's brochure will be kept in the EOC for reference of upcoming events and other tourist attractions.)

1. Niagara Cave, Harmony
2. Mystery Cave, Wykoff
3. Niagara Cave, Harmony
4. Root River Bike Trail, various
5. Rushford Days
6. Gamel Dag
7. Steam Engine Days
8. Eagle Bluff Environmental Center, Lanesboro
9. Wilder Festival, Spring Valley
10. Spring Valley Tourist Information Center
11. Amish Tours, various
12. Lanesboro Buffalo Bill Days
13. Chatfield Western Days

II.D.3 TRANSPORTATION

II.D.3.A ROADS

The existing State Highway system contained inside the County limits has a total of 168 centerline miles. The County highway system (CSAH) contains approximately 409 centerline miles. Highway and bridge reconstruction and maintenance is funded through State Aid funds allocated to all 87 counties in Minnesota. These funds are based on number of lane miles, ability to pay (equity based on County taxability), vehicle registration, and money needs (what it would cost to bring all mileage up to modern rural and urban standards). The County Highway Department manages the county road system, the local roadways are the responsibility of the local jurisdictions. A Transportation map with Roads, Bridges, Airports and Trails is included in the Appendix III. The following table lists the major highways located within the County:

Table 7 - Major Highways

-  U.S. Highway 52
-  U.S. Highway 63
-  Minnesota State Highway 16
-  Minnesota State Highway 30
-  Minnesota State Highway 43
-  Minnesota State Highway 44
-  Minnesota State Highway 56
-  Minnesota State Highway 80
-  Minnesota State Highway 74
-  Minnesota State Highway 139
-  Minnesota State Highway 250

To aid in the understanding of Fillmore County’s transportation system, the function and basic characteristics of each of the types of roadways found in the County were defined in the *Fillmore County Comprehensive Plan* as follows:

Arterial Roads provide direct, relatively high speed service for longer trips and large traffic volumes. Mobility is emphasized, and access is limited. There are three arterial roads in Fillmore County; Highway 52, Highway 63, and Highway 16.

Collector Streets or Roads provide a bridge between arterials and local roads. Collector streets/roads link small towns to arterials as well as collect traffic from local roads.

Local Streets provide direct access to individual homes and farms.

Traffic Counts

Highways 52 and 63 provide the main north-south thoroughfares for the County and Highway 16 provide the main east-west thoroughfare. These thoroughfares receive a heavy amount of traffic, and much of this is truck traffic. The table below illustrates the ADT (Average Daily Traffic) for each of these highways. In each case, the traffic count increased as you got closer to each community and decreased in between communities.

Table 8 - Average Daily Traffic

Highway 52	3850
Highway 63	3120
Highway 16 (National Scenic Byway)	1600

Source: Fillmore County Comprehensive Plan

Major bridges

Information for bridges in Fillmore County was obtained through the National Bridge Inventory (NBI). There are 473 total bridges, and 283 bridges referenced in the NBI for Fillmore County. 57 bridges are located on the trunk highway system. Of the 57 bridges that are located on the trunk highway system, 8 cross major stream corridors including two intersecting the Root River, two intersecting the North Branch Root River and four intersecting the South Branch Root River.

According to the NBI, four of the bridges located on the trunk highway system are considered “structurally deficient” (has one or more structural defects that require attention), including three along TH 44, and one on TH 30. TH 250 contains 2 bridges that are considered “Functionally Obsolete” (a bridge that is no longer by

SECTION II COMMUNITY PROFILE

design functionally adequate for its task). Detailed information on all of the bridges in Fillmore County can be obtained through the NBI at: <http://nationalbridges.com/>

II.D.3.B RAILROADS

There are currently no working railroads in Fillmore County.

II.D.3.C AIRPORT/RUNWAYS

The Fillmore County Airport is located 4 miles west of Preston. The airport includes a lighted 4,000 foot asphalt paved runway, arrival/departure building, seven private hangars, a 4-unit T-hangar, two visual approach slope indicators, lighted guidance signs, a Global Positioning System (GPS) approach, a 36-inch rotating beacon, an Automated Weather Observance System (AWOS), and recently added a parallel taxiway. There is not a Fixed Base Operator on site, and no fuel is available at the airport. In March of 2003, WSB & Associates, Inc. prepared an Airport Layout Plan for the Fillmore County Airport. This report details requirements and expansion possibilities for the airport facilities. There is another airport near Rushford. It is owned by the city of Rushford. There is a fixed base operator and fuel available on site. Four other runways are also located in the County.

Table 9 - Fillmore County Airports and Airstrips

Name	Closest Location	Elevation	Lat	Long	Runway
Fillmore County Airport – (FKA) airspace upward from 700 feet above the surface within a 6.4-mile excluding airspace within Rochester, MN, Class E airspace.	Preston	1276 ft	43.676°N	92.179°W	4000 ft
Rushford Municipal Airport (55Y)	Rushford	1211 ft	43.816°N	91.830°W	3200 ft
Private Airstrips					
Flying A Airport	Chatfield	1300 ft	43.819°N	92.333°W	3000 ft
High Grove Airport Paul A. Lunde 507-765-2406	Preston	1240 ft	43.641°N	92.022°W	1500 x 100 ft
Kohlmeyer Airport	Chatfield	1306 ft	43.753°N	92.203°W	
Matson Field	Spring Valley	1365 ft	43.662°N	92.404°W	
Sellman Field	Mabel	1353 ft	43.529°N	91.833°W	

Source: <http://www.dot.state.mn.us/aero/avoffice/ops/airdir/airports.html>

The closest commercial service airport, Rochester International Airport, is located north on Hwy 63 west about 20 miles from Chatfield. The airport has two runways (concrete primary runway: 9,033 x 150 ft; concrete secondary runway: 7,300 x 150 ft). All of the property and most of the buildings are owned by the City of Rochester. The facility is operated by the Rochester Airport Company under an operating agreement with the City of Rochester. The Rochester Airport Company is a private company and a subsidiary of the Mayo Clinic of Rochester. There are approximately 64,000 flight operations per year.

II.D.3.D. TRAILS

According to the *Fillmore County Comprehensive Plan*, the County contains around 60 miles of bike trails that run through many of the most scenic areas. The trails are highlighted by two cornerstone trails; the 42 mile Root River State Trail that runs

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from Fountain to Houston, and the 18 mile Harmony – Preston Valley State Trail. These two trails are connected, and draw a large number of visitors to Fillmore County each year. These trails are highlighted by each of the communities along each trail. The trails are a tremendous asset to the county and to the local Jurisdictions. There are plans in place for new bike trail and horse trails to add to the existing trail system.

II.D.4. TELECOMMUNICATION FACILITIES

Local carrier telephone service is provided by Ace Communications, Frontier, Century Tel, Harmony Telephone, Mabel Co-op Telephone, US West, and Mediacom.

II.D.5 POWER FACILITIES

Tri-County Electric Cooperative, Peoples Cooperative Services, Alliant Energy, Spring Valley Public Utilities, and Lanesboro Public Utilities provide the County electrical power and servicing requirements.

I.D.6. PUBLIC WATER SUPPLY SYSTEMS

The County relies on deep aquifers for most of its community drinking water. The cities provide drinking water to their residents. Most township water is provided by individual wells. There are numerous individual drinking water systems within the County. Specific wells can be found at <http://mdhqua.health.state.mn.us/cwi/cwiViewer.htm> .

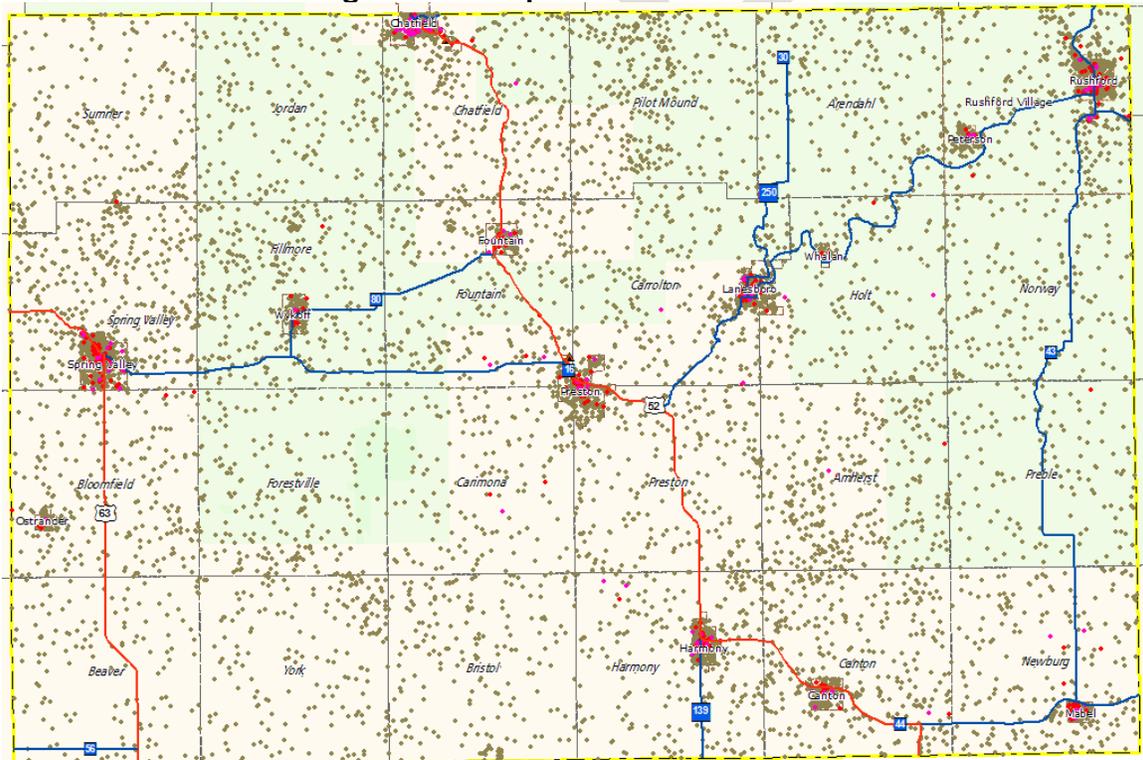
II.D.7. WASTEWATER TREATMENT SYSTEMS

The towns of Canton, Chatfield, Fountain, Harmony, Lanesboro, Mabel, Ostrander, Peterson, Preston, Rushford, Spring Valley, and Wykoff provide wastewater treatment. Most of the remaining areas of the County are without sewer lines or service, and use septic tanks or leech fields.

II.E. POPULATION

The following overview of population and housing draws from the *Fillmore County Comprehensive Plan*, as well as the U.S. Census, Minnesota State Demographer and Minnesota Departments Agriculture and Trade and Economic Development. Fillmore County regularly compiles demographics statistics for inclusion in *Comprehensive Plan* updates. Fillmore County remains a very rural county, with only 57% of the population concentrated in the fourteen MCDs. The Following map shows the distribution of the population in Fillmore County. Each dot represents a single household.

Figure 10 - Population Distribution



Source: US Census Tract Information

The following table contains a broad overview of general population statistics of Fillmore County’s demographics.

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Table 10 - General Population Statistics

<u>Census Category</u>	
	People
Population, 2005 estimate	21,368
Population, percent change, April 1, 2000 to July 1, 2005	1.2%
Population, 2000	21,122
Persons under 5 years old, percent, 2004	5.7%
Persons under 18 years old, percent, 2004	23.3%
Persons 65 years old and over, percent, 2004	18.5%
Foreign born persons, percent, 2000	0.8%
Language other than English spoken at home, pct age 5+, 2000	6.3%
High school graduates, percent of persons age 25+, 2000	81.7%
Bachelor's degree or higher, pct of persons age 25+, 2000	15.1%
Persons with a disability, age 5+, 2000	3,330
Mean travel time to work (minutes), workers age 16+, 2000	25.0
Housing units, 2004	9,441
Homeownership rate, 2000	80.9%
Housing units in multi-unit structures, percent, 2000	10.6%
Median value of owner-occupied housing units, 2000	\$74,400
Households, 2000	8,228
Persons per household, 2000	2.50
Median household income, 2003	\$39,587
Persons below poverty, percent, 2003	8.5%
Business	
Private non-farm establishments, 2003	658
Private non-farm employment, 2003	5,412
Private non-farm employment, percent change 2000-2003	-7.9%
Non-employer establishments, 2003	1,699
Manufacturer's shipments, 2002 (\$1000)	177,250
Retail sales, 2002 (\$1000)	159,737
Retail sales per capita, 2002	\$7,491
Housing units authorized by building permits, 2004	153
Occupation	
Employed civilian population 16 years and over	10,802
Management, professional, and related occupations	3,468
Service occupations	1,629
Sales and office occupations	2,335
Farming, fishing, and forestry occupations	379
Construction, extraction, and maintenance occupations	1,139
Production, transportation, and material moving occupations	1,852

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Census Category	
Industry	
Agriculture, forestry, fishing and hunting, and mining	1,401
Construction	812
Manufacturing	1,602
Wholesale trade	289
Retail trade	1,122
Transportation and warehousing, and utilities	519
Information	149
Finance, insurance, real estate, and rental and leasing	382
Professional, scientific, management, administrative, and waste management services	461
Educational, health and social services	2,543
Arts, entertainment, recreation, accommodation and food services	641
Other services (except public administration)	527
Public administration	354

Source: <http://quickfacts.census.gov/qfd/states/27/27045.html> and http://factfinder.census.gov/servlet/QTAttachment?_bm=y&-qr_name=DEC_2000_SF3_U_DP3&-ds_name=DEC_2000_SF3_U&-lang=en&-sse=on&-geo_id=05000US27045

II.E.1 POPULATION TRENDS

According to the U.S. Census, Fillmore County has seen a slow down in growth since 2000. From 1990 to 2000 the population grew by 1.7%; from 2000 to 2006 the population only increased by 0.5%. If the current trend continues over the next four years, Fillmore county will have an estimated growth of <1.0% for the period between 2000 and 2010. The State Demographers population statistics and forecasts are used to estimate growth and population fluctuations for the next 20 years. The data should be readdressed every five years to reflect the most current information. A more complete analysis of population statistics is available in the *Fillmore County Comprehensive Plan*.

According to U.S. Census statistics, the population of Fillmore County has continued to decline through the last 100 years. The population decreased by 26% from 1900 to 1990. Although the population has increased by a little over 2.0% in the last 15 years, the trend for the county has been a decrease in overall population. Only 7 cities or townships increased in population from 1970 to 2000. The largest increases were in Chatfield, Rushford and Rushford Village which are in closer proximity to the major employment centers of Rochester and Winona. Tables 13 and 14 describe the growth of Fillmore County between 1990 and 2000.

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Table 11 - Fillmore County Population by Decade

Date	Population	Population Change	Annual % Change
1900	28,238	-	-
1910	25,680	-2,558	-9.0
1920	25,330	-350	-1.4
1930	24,748	-582	-2.3
1940	25,830	1,082	4.4
1950	24,465	-1,365	-5.3
1960	23,768	-697	-2.8
1970	21,916	-1,852	-7.8
1980	21,930	14	0.0
1990	20,777	-1,153	-5.2
2000	21,122	345	1.7

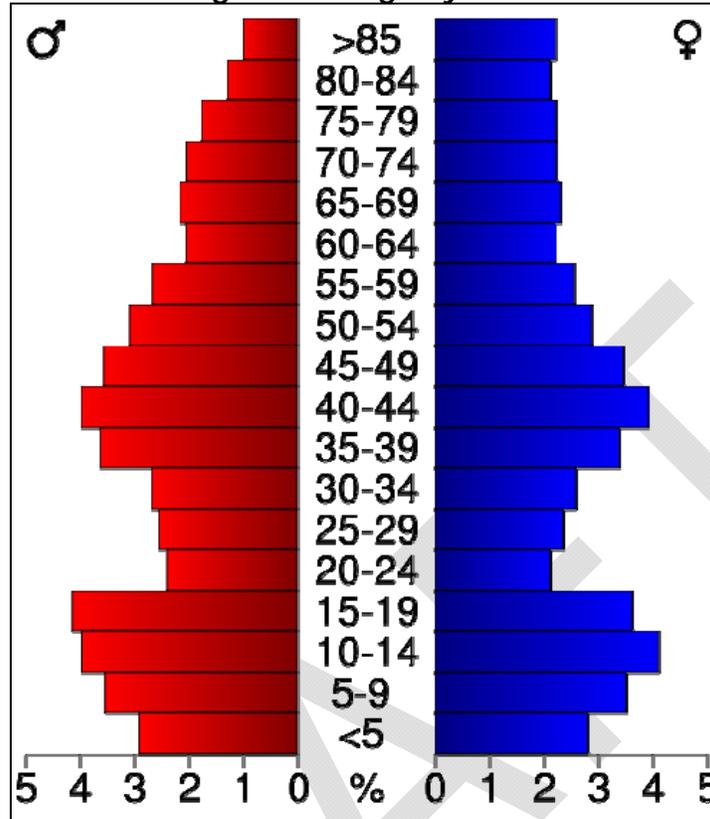
SECTION II COMMUNITY PROFILE

Table 12 - Jurisdiction Population by Decade U.S. Census

Jurisdiction	1970	1980	1990	2000	1990-2000 Population Change	
					Actual	Percent
Amherst Township	406	365	416	405	-11	-2.6
Arendahl Township	355	366	341	333	-8	-2.3
Beaver Township	318	294	239	243	4	1.7
Bloomfield Township	489	454	414	414	0	0.0
Bristol Township	530	455	385	499	114	29.6
Canton City	391	386	362	343	-19	-5.3
Canton Township	563	581	612	684	72	11.8
Carimona Township	356	358	336	272	-64	-19.0
Carrolton Township	387	377	333	321	-12	-3.6
Chatfield City	1162	1160	1250	1257	7	0.6
Chatfield Township	430	479	431	489	58	13.4
Fillmore Township	599	561	463	485	22	4.8
Forestville Township	476	478	401	386	-15	-3.7
Fountain City	347	327	327	343	16	4.9
Fountain Township	414	381	335	316	-19	-5.6
Harmony City	1130	1133	1044	1080	36	3.4
Harmony Township	419	427	468	396	-72	-15.3
Holt Township	333	309	238	307	69	29.0
Jordan Township	373	371	359	412	53	14.8
Lanesboro City	850	923	859	788	-71	-8.3
Mabel City	888	861	745	766	21	2.8
Newburg Township	560	502	482	444	-38	-7.9
Norway Township	443	418	316	335	19	6.0
Ostrander City	268	293	276	212	-64	-23.2
Peterson City	269	291	259	269	10	3.9
Pilot Mound Township	366	379	367	364	-3	-0.8
Preble Township	320	311	243	272	29	11.9
Preston City	1413	1478	1530	1426	-104	-6.8
Preston Township	374	340	341	374	33	9.7
Rushford City	1318	1478	1488	1696	208	14.0
Rushford Village City	601	688	702	714	12	1.7
Spring Valley City	2572	2616	2461	2518	57	2.3
Spring Valley Township	658	582	557	590	33	5.9
Sumner Township	497	499	454	436	-18	-4.0
Whalan City	114	119	94	64	-30	-31.9
Wykoff City	450	482	491	460	-31	-6.4
York Township	477	408	358	409	51	14.2

Median age Continues to Rise. The median age of the population has continued to rise as the “Baby Boomers” have aged. The median age has increased from 36.4 to 39.8 from 1990 to 2000 or 9% during this time frame. This increase is at the same rate as that of the State in general, although the median age is higher than the State’s 35.4 years in 2000. The Following figure shows the breakdown of Fillmore County residents by age and gender as of the 2000 census.

Figure 11 - Age Pyramid



Age pyramid of county residents based on [2000 U.S. census](#) data

Ethnicity. Fillmore County continues to be a very homogeneous population with 98.9% of its population being white. Language can be a significant barrier to communicating at times of emergencies. However, more than 93 percent of Fillmore County's population speaks only English at home. Most of the 6.3% of the population that speaks a language other than English at home are Amish, and speak English "very well." Only 1% say they speak English "not well."

The Amish population is a concern for the county in relation to hazard mitigation. The Amish have a higher risk of infectious disease outbreak because of the lack of immunizations, and because of their isolation, it may be harder to coordinate efforts when an emergency occurs. This group also does not practice some preventative care, or choose specific types of medical treatment due to their religious beliefs.

Population projected to increase. According to The State Demographers Office, the population of Fillmore County is expected to increase to 23,830 by 2035. However, the population will be determined by the economy of the region and the State as a whole, and by the market forces including the addition or removal of major employers to the County and the major employment areas of Rochester and Winona.

II.E.2. HOUSING

Maxfield Research Inc. was hired by the Bluff County Housing and Redevelopment authority to do a comprehensive assessment of housing needs for Fillmore County. The results of that study are included in the *Fillmore County Comprehensive Plan*. A brief overview of the study follows.

House ownership in the County is very high. According to the U.S. Census, 81% of County residents own their own housing. The Housing stock is old, with nearly 50% of all residential Housing units built prior to 1940.

Number of households increased, household size declined. Even though the population has only increased slightly since 1990, the number of housing units and number of households has increased by 5.2%, as the average household size decreased to 2.5 persons, according to the 2000 Census. The following table summarizes the County’s households.

Table 13 - General Household Breakdown

	1970	1980	1990	2000	1990-2000 Change	
					Actual	Percent
Population	21,916	21,930	20,777	21,122	345	1.66
Land Area(sq. mile)	859.00	859.00	861.20	861.25	0.05	0.01
Density (persons per sq. mile)	25.51	25.53	24.13	24.52	0.40	1.65
Housing Units	7,637	8,445	8,356	8,908	552	6.61
Households	--	7,828	7,822	8,228	406	5.19
Persons Per Household	--	2.74	2.59	2.50	-0.09	-3.53
Persons in Group Quarters	--	470	507	520	13	2.56

Source: US Census

Household characteristics have a direct impact on land use, housing needs, social services, and educational expenses. Changes in household size have a direct and proportional effect on demand exerted and types of housing necessary for communities. As household size decreases the demand for housing units will increase. The following table is a breakdown of households by family type, which shows that nearly 27% of households in Fillmore County are one person households, and 10% are single parent households. The following table describes the household composites, or the family make up for Fillmore County:

Table 14 - Households by family type

Household Composite	Households	
	Data	Pct
One person households:		
Male householder	971	11.8
Female Householder	1,215	14.8
Two or more person households:		
Family households:		
Married couple family	4,986	60.6
Other family:		
Male householder, no wife present:	233	2.8
Female householder, no husband present:	502	6.1
Non-family households:		
Male householder	207	2.5
Female householder	114	1.4
Total	8,228	100.0

Source: US Census

Most of the housing stock in Fillmore County is made up of free-standing single-family dwellings, which account for 81.8 percent of the residential structures in Fillmore County. Multi-unit or attached dwellings comprise 10.6 percent the county's housing. Manufactured homes or mobile homes accounted for 6.2 percent of housing units. The Following table illustrates the housing stock as of the 2000 US Census.

SECTION II COMMUNITY PROFILE

Table 15 - Housing Stock

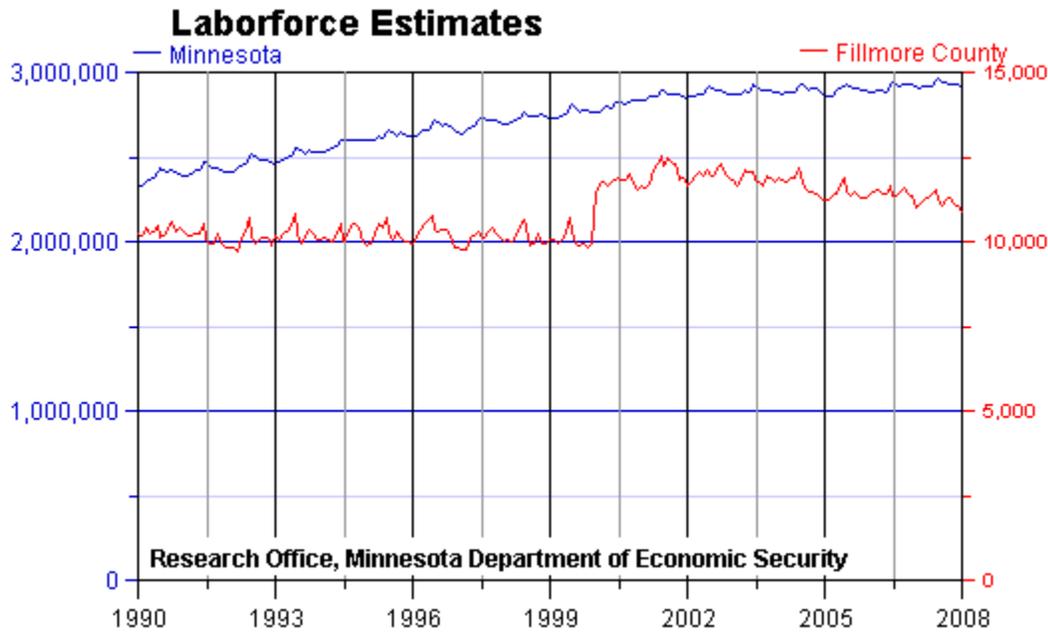
Subject	Number	Percent
Total housing units	8,908	100.0
<i>UNITS IN STRUCTURE</i>		
1-unit, detached	7,290	81.8
1-unit, attached	120	1.3
2 units	281	3.2
3 or 4 units	216	2.4
5 to 9 units	148	1.7
10 to 19 units	189	2.1
20 or more units	108	1.2
Mobile home	549	6.2
Boat, RV, van, etc.	7	0.1
<i>YEAR STRUCTURE BUILT</i>		
1999 to March 2000	124	1.4
1995 to 1998	364	4.1
1990 to 1994	339	3.8
1980 to 1989	629	7.1
1970 to 1979	1,244	14.0
1960 to 1969	624	7.0
1940 to 1959	1,315	14.8
1939 or earlier	4,269	47.9
<i>ROOMS</i>		
1 room	74	0.8
2 rooms	182	2.0
3 rooms	517	5.8
4 rooms	999	11.2
5 rooms	1,440	16.2
6 rooms	1,727	19.4
7 rooms	1,599	18.0
8 rooms	1,228	13.8
9 or more rooms	1,142	12.8
Median (rooms)	6.2	(X)

Source: <http://factfinder.census.gov>

II.F. ECONOMIC SYNOPSIS

Fillmore County’s economic atmosphere supports an agricultural base, recreation, tourism, services, retail, trade and government. The economic well being of Fillmore County is largely dependant on the employment center of Rochester, MN, and to a lesser degree, Winona, MN and Lacrosse, WI. The employment rate had been steady at around 11,000 through the 90’s with a marked increase during the 2000 – 2001 economic boom. Since then Fillmore County’s labor force has trended downward as has the region as a whole. The following Figure illustrates these trends.

Figure 12 - Labor Force Growth



Source: <http://www.deed.state.mn.us>

Industries providing employment include: Educational ,health and social services (23.5%), Manufacturing (14.8%), Agriculture, forestry, fishing and hunting, and mining (13.0%), Retail trade (10.4%). The Following Table illustrates occupation and employment Fillmore County as of the 2000 US Census.

Table 16 - Occupation and Employment

Employed civilian population 16 years and over	10,802	100.0
OCCUPATION		
Management, professional, and related occupations	3,468	32.1
Service occupations	1,629	15.1
Sales and office occupations	2,335	21.6
Farming, fishing, and forestry occupations	379	3.5
Construction, extraction, and maintenance occupations	1,139	10.5
Production, transportation, and material moving occupations	1,852	17.1
INDUSTRY		
Agriculture, forestry, fishing and hunting, and mining	1,401	13.0
Construction	812	7.5
Manufacturing	1,602	14.8
Wholesale trade	289	2.7
Retail trade	1,122	10.4
Transportation and warehousing, and utilities	519	4.8
Information	149	1.4
Finance, insurance, real estate, and rental and leasing	382	3.5
Professional, scientific, management, administrative, and waste management services	461	4.3
Educational, health and social services	2,543	23.5
Arts, entertainment, recreation, accommodation and food services	641	5.9
Other services (except public administration)	527	4.9
Public administration	354	3.3

Source: <http://factfinder.census.gov>

II.F.2. INCOME LEVELS

In 2004 Fillmore had a per capita personal income (PCPI) of \$27,982. This PCPI ranked 48th in the state and was 77 percent of the state average of \$36,163, and 85 percent of the national average of \$33,090. The 2004 PCPI reflected an increase of 7.3 percent from 2003. The 2003-2004 state change was 5.4 percent and the national change was 5.2 percent.

In 1994 the PCPI of Fillmore was \$17,234 and ranked 59th in the state. The 1994-2004 average annual growth rate of PCPI was 5.0 percent. The average annual growth rate for the state was 4.6 percent and for the nation was 4.1 percent.

Fillmore County resident's personal income has been in the lower half of the state's counties in personal income, but has been increasing in the last decade as more job opportunities in construction, manufacturing, and professional services has increased.

Poverty. Poverty is an indicator of how well or how poorly a community will be able to deal with a hazard event such as a flood. According to the US Census, In 2005 there were 2114 persons or 10% at or below the poverty level in Fillmore County. This is about 1% higher than Minnesota's poverty rate.

II.G. PUBLIC SAFETY AND EMERGENCY RESPONSE CAPABILITIES

Fillmore County has trained response personnel and equipment to cover most disaster situations. The existing facilities and equipment are intended to address local needs and also support regional needs. Fillmore County is considered a mutual aid county that provides and receives support from adjacent counties. This section summarizes medical, fire, and police services, and also discusses response equipment availability.

II.G.1 MEDICAL/NURSING HOME FACILITIES

Fillmore County has a variety of medical and care facilities throughout the county, although there are currently no hospitals located in Fillmore County. There are several hospitals within the neighboring counties that are within an hour's drive for all residents of Fillmore County. Residents can seek medical attention from St. Mary's Hospital and Olmsted Medical Center in Rochester, (40 mi. from Preston), Gundersen-Lutheran or St. Francis Hospitals in La Crosse, WI (70 mi. from Preston), Austin Medical Center in Austin, Minnesota (50 mi. from Preston), Winona Hospital, Winona, MN, and Winnesheik Memorial Hospital in Decorah, IA (40 mi. from Preston). Residents also seek medical attention from VA hospitals in Tomah, WI and MN. The following tables describe the facilities that are located within the county.

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Table 17 - Assisted Living Facilities

Name	Location
Bremmer Suites	Rushford
Chosen Valley Assisted Living	Chatfield
Heritage Grove	Harmony
Ostrander Assisted Living	Ostrander
Park Lane Estates	Preston
Spring Valley Estates	Spring Valley
The Evergreens	Spring Valley
The Meadows of Mabel	Mabel

Table 18 - Nursing Homes

Name	Location	Number of Beds
Chosen Valley Care Center	Chatfield	70
Good Shepherd Lutheran Home	Rushford	75
Green Lea Manor	Mabel	51
Harmony Community Health Care	Harmony	45
Ostrander Nursing Home	Ostrander	35
Spring Valley Care Center	Spring Valley	50

Table 19 - Medical Facilities

Name	Type	Location	Beds
Community Memorial Hospital	Hospital	Spring Valley	24
Gunderson Lutheran - Harmony Clinic	Clinic	Harmony	
Mabel Clinic	Clinic	Mabel	
Olmsted Medical Center	Clinic	Spring Valley	
Olmsted Medical Center	Clinic	Preston	
Rushford Clinic	Clinic	Rushford West	
Olmsted Medical Clinic of Chatfield	Clinic	Chatfield	

Source: Fillmore EOP & <http://www.hospital-data.com/>

II.G.2 MEDICAL EMERGENCY/FIRST RESPONDERS

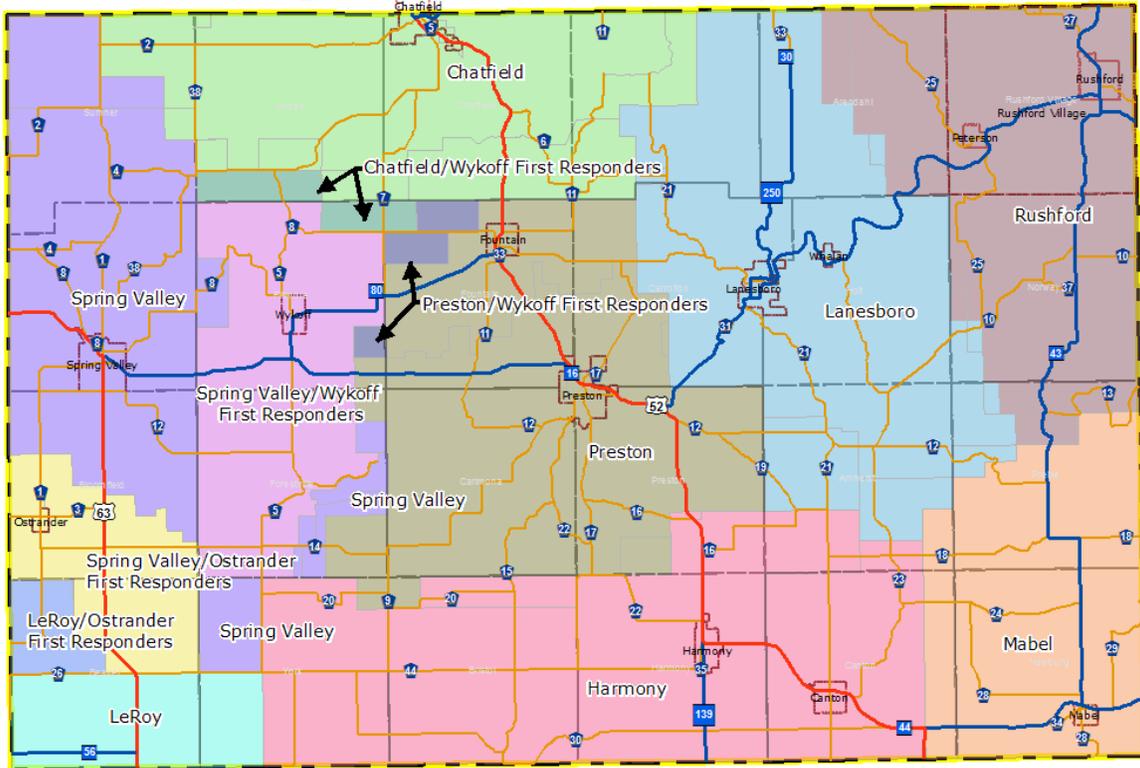
Fillmore County has been divided into 13 districts serviced by medical emergency personnel and/or First Responders in Fillmore County and is shown in the Figure below. Non- Governmental Organizations (NGOs) collaborate with first responders, governments at all levels, and other agencies and organizations providing relief services to sustain life, reduce physical and emotional distress, and promote recovery of disaster victims when assistance is not available from other sources. For example, the American Red Cross is an NGO that provides relief at the local level and also provides significant assistance to Mass Care. A description the medical emergency districts are included in the table below.

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Table 20 - Medical Emergency

Districts	EMTs	First Responders	Vehicles
Chatfield	25		2
Lanesboro	18		1
Rushford	7	13	2
Spring Valley	29		3
Spring Valley/Wyloff First Responders	"	14	
Spring Valley/Ostrander First Responders	"		
Preston	19		2
LeRoy	NA	NA	NA
LeRoy/Ostrander First Responders	"	8	
Harmony	12	2	2
Mabel		13	1

Figure 13 - Ambulance/First Responders



II.G.3 FIRE SERVICES

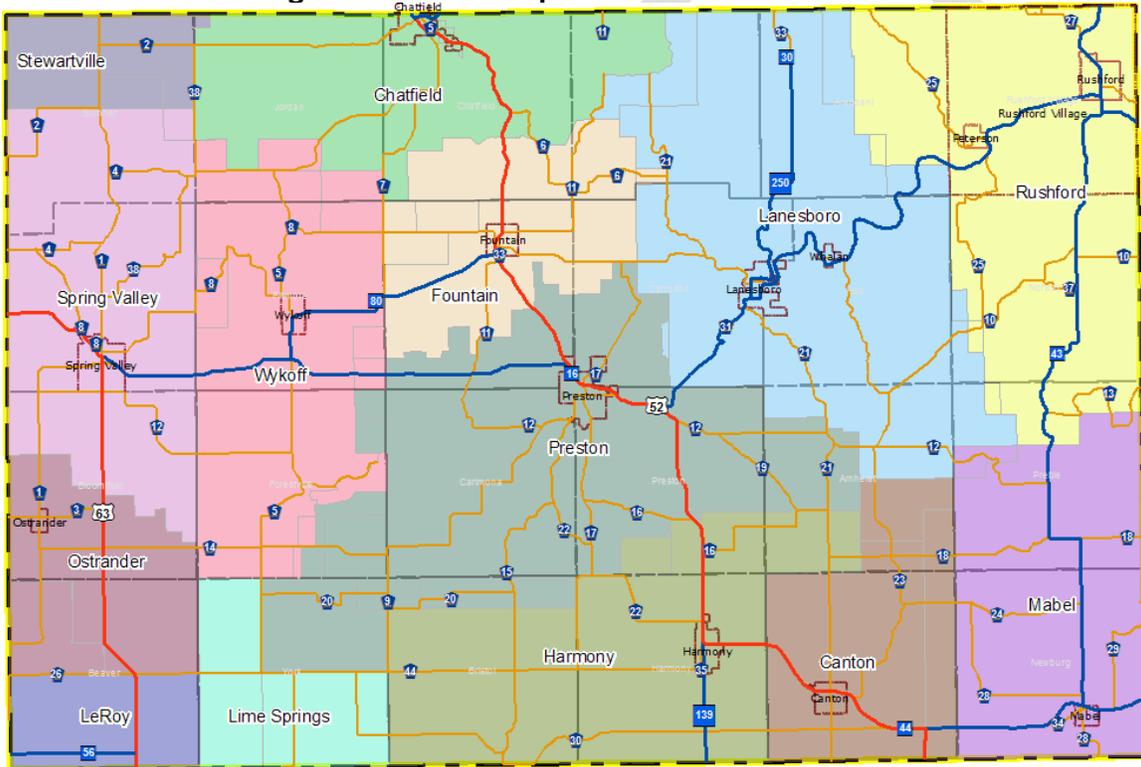
There are no full-time fire departments in Fillmore County. All fire departments are volunteer-based with responsibilities being divided into 14 response zones. The Department of Natural Resources is responsible for fire protection on state forest and park land. The DNR works closely with local fire units for protection of these lands through contracting agreements. Both the U.S. Forest Service and the DNR work closely with local fire fighters whenever danger of woodland and urban fires is elevated. Additionally, all fire departments have mutual aid agreements. The following table identifies the Fire Department personnel and vehicles and the following map shows the 14 response zones in Fillmore County.

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Table 21 - Fire Departments

Fire Departments	Volunteers	Pumpers	Tankers	Grass Fire	Rescue
Chatfield	24	2	2	1	1
Lanesboro	23	2	2		1
Rushford	30	2	3	2	1
Spring Valley	23	2	1	1	1
Wykoff	21	2	1	1	1
Fountain	20	2	2	1	
Preston	24	2	1	1	1
Ostrander	15	2	1	1	1
Harmony	26	1	1	1	1
Canton	20	2	2	1	1
Mabel	20	2	2	1	

Figure 14 - Fire Department Service Areas



II.G.4. POLICE DEPARTMENTS

There are 6 police departments located in Fillmore County. In addition to the Fillmore County Sheriff’s Office, the cities of Chatfield, Fountain, Ostrander, Preston, and Rushford staff their own departments. Lanesboro contracts with the Preston Police Department. Wykoff, Spring Valley, Harmony, Canton, and Mabel all contract with the Fillmore County Sheriff’s Department for police protection. Rushford Village, Whalan, and Peterson currently do not have any formal contracts with the Sheriff or a police department.

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Table 22 - Police Departments

Departments	Officers
County Sheriff	20
Chatfield	4
Preston	3
Fountain	1
Ostrander	1
Rushford	5

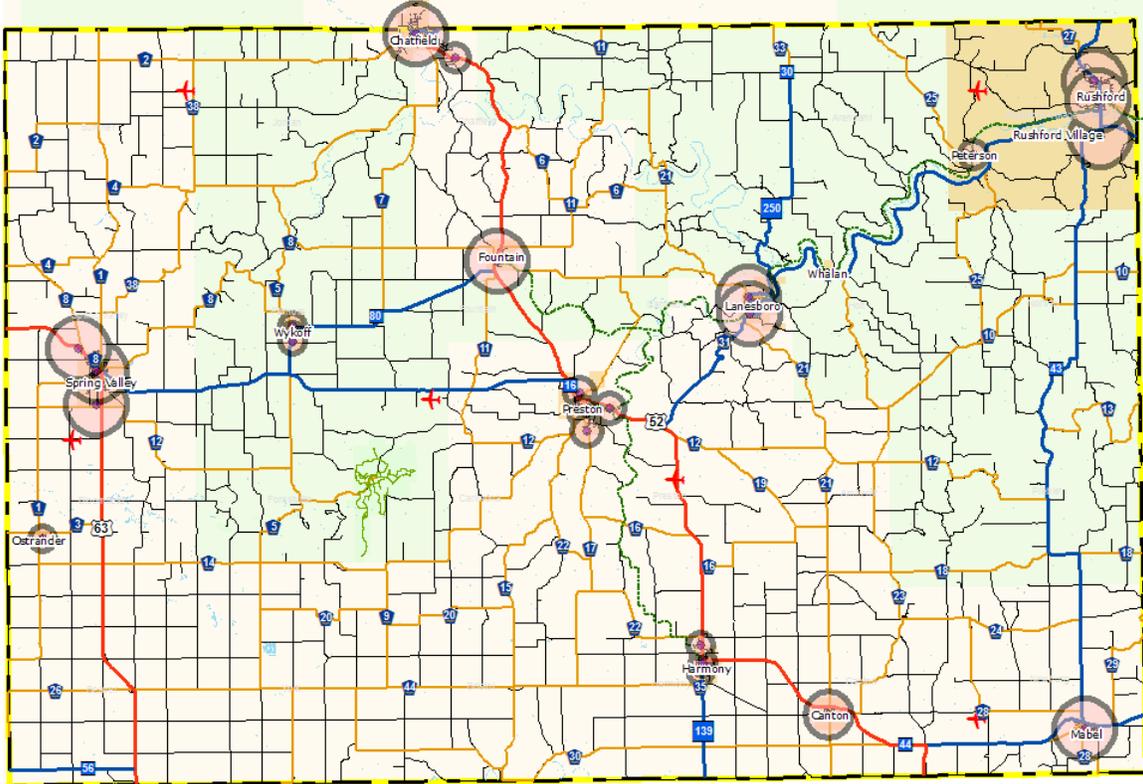
Figure 15 - Police Departments



II.G.5. EMERGENCY WARNING SYSTEMS

Fillmore County’s outdoor warning siren system is primarily used for impending severe weather, to warn people to take cover indoors. Sirens are sounded for all severe thunderstorm warnings and tornado warnings in the cities where they are in place. The Following figure shows the locations of the sirens in Fillmore County, with the approximate siren coverage areas.

Figure 16 - Fillmore County Siren Locations



NOAA Weather Radio is used for warning citizens of storm events. NOAA Weather Transmitters are located in the Cities of Rochester, MN and Decorah, IA at Frequencies of 162.475 and 162.525 respectively.

The Fillmore County EOP contains the response process and procedures that will occur in the case of emergencies.

Tornado or Severe Thunderstorm Watch

Weather conditions are such that there is a very good chance for the development of either severe thunderstorms or tornado producing thunderstorms in the watch area. The watch usually covers a large area. This information is available via NOAA Weather Radio, and local radio and television broadcasters.

Actions: Citizens are advised to:

- Monitor weather information sources and the weather itself for any changes that could endanger them. Check shelters and the equipment associated with it.
- Consider avoiding any outdoor activities.
- If in a manufactured home, travel trailer or recreational vehicle, consider moving to a shelter as the storms move into the area, before warnings are issued, especially if the storms are moving fast.

Tornado Warning: A tornado has been seen or a thunderstorm is exhibiting characteristics that would indicate the possibility of a tornado forming. This information will be available via NOAA Weather Radio, and local radio and television broadcasters. Fillmore County’s outdoor sirens will sound in target areas.

Actions: Citizens are advised to:

- If in the affected area, take shelter immediately.
- If outside and not being immediately threatened by the severe weather, move indoors quickly.
- If outside and immediately threatened, take cover by lying on the ground, preferably in a low area, safe from flying objects and flooding.
- Do not drive in the area of a tornado or severe straight-line winds. Under most circumstances, inside a vehicle is one of the most dangerous places to be during a tornado or severe thunderstorm.

Severe Thunderstorm Warning: A severe thunderstorm is associated with wind speeds of 58 miles per hour or more, hail $\frac{3}{4}$ inch in diameter or larger and heavy rain. This information will be available via NOAA Weather Radio, and local radio and television broadcasters. Fillmore County's outdoor sirens will sound in target areas.

Actions: Citizens are advised to:

- Treat this like a tornado warning. Seek shelter as recommended for a tornado.

II.G.6. EMERGENCY OPERATIONS CENTER

The Fillmore County EOC is described and presented in the EOP and is included here. Direction and control of the Fillmore County emergency response will be carried out at Fillmore County's designated Emergency Operations Center (EOC).

The EOC provides a designated command center for the County executive and senior departmental leadership in a significant emergency or disaster that will ensure the effective use and integration of all local resources, coordinate public information, and obtain additional assistance, if needed, to save lives, protect people and property. The conference room (108) located in the basement of the Fillmore County Office Building is the Emergency Operations Center for the county. The primary EOC should be operational within 1 hour of activation.

The alternate EOC is in the Courthouse Building. The alternate EOC should be operational within 4 hour of activation. The EOC Manager may establish a remote or mobile EOC as needed to respond to an emergency situation.

When activated, the EMD will activate the appropriate staff and coordinate the County's response. Overall direction, control and coordination to support community response to a disaster will be established through the EOC which will be equipped and staffed at the appropriate level for the situation.

II.G.7. HEAVY EQUIPMENT INVENTORY

Cities, the county, and private contractors all have inventories of heavy equipment that could be resources in specific response situations. Use and loan agreements are in place among many of the cities and the county.

II.G.7.A. COUNTY HIGHWAY DEPARTMENT

An inventory of all County facilities, vehicles and equipment are available at the EOC. The County will provide assistance to cities in the cases of emergency.

II.G.7.B. CITIES

Cities in Fillmore County have inventories of their heavy equipment on site. No official agreements exist as to the sharing of heavy equipment between cities. During an emergency, neighboring cities often help each other by allocating their resources to the City that needs assistance.

II.H. OTHER INFORMATION

II.H.1. FOOD/BEVERAGE HANDLERS

Food production, supply and service are essential activities in Fillmore County that are subject to disruption due to impacts from multiple hazards. In the event of a strain on supply, knowledge of the distribution system will help in mitigation planning. The State Department of Agriculture licenses and inspects food production, wholesale and retail sales of food products in Fillmore County. The Minnesota Department of Health licenses and inspects all food service establishments in the county. As of March 2008, Fillmore County had:

- 74 Retail Food Handlers
- 9 Mobile Food Handlers
- 2 Wholesale Food Handlers
- 4 Wholesale Food Processing/Manufacturers

II.H.2. CHILD DAYCARES

Young children represent a demographic group that is very vulnerable to hazards described in this document. The daytime young child population is concentrated in daycares. Some of these daycares may be located near to an identified hazard and should be considered for mitigation planning. The Minnesota Department of Human Services licenses and inspects child care centers in Fillmore County. The Fillmore County Social Service Department licenses and inspects individual family child care homes. The seven Child Care Facilities are included in the Hazard Maps included as part of Appendix III.

- 7 Child care centers with a capacity of 249
- 58 Family child care providers with a capacity of 667

Table 23 - Child Care Centers

Name	Address	City	Capacity
Good Shepherd Childcare Center	800 Home St	Rushford	69
Lanesboro Child Care Center	100 Kirkwood	Lanesboro	60
Semcac Head Start-Preston	702 Chatfield St	Preston	20
Semcac Head Start-Ostrander	204 South St.	Ostrander	20
One Block at a Time	702 Chatfield St	Preston	60
St. Paul's Lutheran Church Preschool	128 Fillmore Street SE	Chatfield	10
St. Paul's Lutheran Church Preschool	245 South Line Street	Wykoff	10

Source: <http://www2.mda.state.mn.us> and Fillmore County Social Services

II.H.3. TEMPORARY SHELTER

Temporary shelters are defined here as overnight lodging supplying beds and basic sanitary facilities and designed for stays of short duration. These shelters include permanent facilities such as motels and very short-term facilities such as those that

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might be utilized by the Red Cross for emergency shelter. Temporary shelters become important in emergencies and disasters when a significant number of persons have been displaced from their normal places of residence. Bed and Breakfast establishments may be considered as temporary shelters due to the lack of room in schools, public buildings, and lodging/hotels,. The Red Cross SE Minnesota Chapter maintains a list of facilities, capacity and other information for buildings that can be utilized in the event of a disaster. The following table describes the shelters that the American Red Cross has agreements with:

Table 24 - Red Cross Shelters

County	City	Company	Address	Zip Code	Phone	Contact	Capacity 40 Sq Ft per person
Fillmore	Chatfield	Chatfield Lutheran Church	304 Fillmore St SE	55923	507-867-9207	Rev. Eric Finsand	52
Fillmore	Chatfield	St Matthew's Episcopal Church	100 Fillmore St	55923	507-867-3253	CindyTester	50
Fillmore	Chatfield	Thurber Community Bldg	21 Second St SE	55923	507-867-4446	Sue Kester	50
Fillmore	Chatfield	St Mary's Catholic School	405 SW Twiford	55923	507-867-9322	Sheila Burk	38
Fillmore	Chatfield	St. Mary's Catholic Church	405 SW Twiford St	55923	507-867-3201	Sheila Burk	100
Fillmore	Chatfield	Calvary Baptist Church	910 Winona St	55923	507-867-7686	Randy Charlton	93
Fillmore	Chatfield	Chosen Valley Elem School	405 South Main St	55923	507-867-4521	Phil Minkkinen	1200
Fillmore	Chatfield	Chatfield Public Schools	205 Union Street	55923	507-867-4210	Phil Minkkinen	2000
Fillmore	Harmony	Fillmore Central High School	145 Main Ave So	55939	507-886-6464	Heath Olstad	663
Fillmore	Lanesboro	Lanesboro School	100 Kirkwood	55949	507-467-2229	?	400
Fillmore	Ostrander	Trinity Lutheran Church	204 South St	55961	507-657-2203	Nancy Solomonson	
Fillmore	Lanesboro	Lanesboro Community Center	202 Parkway South	55949	507-467-3722	Bobbie Torgerson	110
Fillmore	Preston	St Columban Church	408 Preston St	55965	507-765-3886	Fr. Tom Loomis	100
Fillmore	Preston	Preston United Methodist Church	212 St Anthony N, PO Box 247	55965	507-765-2503	Carolyn Westlake	59
Fillmore	Preston	Fillmore Central Elementary School	702 Chatfield St	55965	507-765-3809	Brenda Lentz	678
Fillmore	Preston	Fillmore Central Middle School	700 Chatfield St	55965	507-765-3809	Brenda Lentz	512
Mower	Racine	Racine United Methodist	401 East Main Street PO BOX 127	55967	507-378-4265	Darrel R. Clark	55
Fillmore	Rushford	Root River Community Church	303 Nanmestad Ln	55971	507-864-7074	Peter Ennis	
Fillmore	Spring Valley	Faith United Methodist	617 Maple Ln	55975	507-346-2830	Bill Rowas	
Fillmore	Spring Valley	Our Saviors Lutheran Church	805 S Broadway	55975	507-346-7251	Dennis Timmerman	33

Source: SE Chapter of American Red Cross

SECTION III. HAZARDS

SECTION III. HAZARDS FACING THE COMMUNITY

To develop effective hazard mitigation strategies, it is necessary to first describe the kinds of hazardous events most likely to occur in Fillmore County. History is not always the best predictor of future events, but can be a good indicator of what is likely to happen.

County emergency staff and All-Hazard Mitigation Steering Committee identified the following potential natural and man-made hazards to be most relevant for the purposes of this plan.

III.A. NATURAL HAZARDS

This section will outline the natural hazards identified through the risk assessments. This plan includes only the hazards that are included in the Minnesota State All-Hazard Mitigation Plan. An earthquake was not considered a likely event to affect Fillmore County and is not included in this Plan. Coastal erosion, coastal storms, tsunamis and volcanoes were also not included in this plan because there are no natural lakes, coastal boundaries, nor volcanoes located in or near Fillmore County. Expansive Soils were determined to be unlikely by the Minnesota All-Hazard Mitigation Plan and is not considered in this plan. The natural hazards included in this plan are as follows:

- Severe Winter Storms
 - Blizzard
 - Ice and Sleet
 - Heavy snow
- Severe Summer Storms
 - Lightning
 - Hail
 - Windstorm
- Tornadoes
- Extreme Temperatures
- Floods
- Sinkholes & Land Subsidence
- Landslide
- Drought
- Wildfire
- Radon Gas

III.A.1. HAZARD: SEVERE STORMS

Violent storms can occur throughout the year in Fillmore County. Violent storms are categorized as summer or winter storms, although there is no sharp end or beginning to when they might occur. Weather events are the most common kinds of hazardous incidents in Fillmore County's history.

SECTION III HAZARDS

III.A.1.A SEVERE WINTER STORMS

Fillmore County experiences three basic types of hazards associated with winter storms: blizzards, heavy snow events, and ice or sleet storms.

Winter storms vary in size and strength and include heavy snowstorms, blizzards, freezing rain, sleet, ice storms and blowing and drifting snow conditions. Extremely cold temperatures accompanied by strong winds can result in wind chills that cause bodily injury such as frostbite and death. Severe winter and ice storms can cause unusually heavy rain or snowfall, high winds, extreme cold, and ice storms throughout the continental United States.

Winter storm occurrences tend to be very disruptive to transportation and commerce. Trees, cars, roads, and other surfaces develop a coating or glaze of ice, making even small accumulations of ice extremely hazardous to motorists and pedestrians. The most prevalent impacts of heavy accumulations of ice are slippery roads and walkways that lead to vehicle and pedestrian accidents; collapsed roofs from fallen trees and limbs and heavy ice and snow loads; and felled trees, telephone poles and lines, electrical wires, and communication towers. As a result of severe ice storms, telecommunications and power can be disrupted for days. Such storms can also cause exceptionally high rainfall that persists for days, resulting in heavy flooding.

Winter storms present a serious threat to the health and safety of affected citizens and can result in significant damage to property. Heavy snow or accumulated ice can cause the structural collapse of buildings, down power lines or isolate people from assistance or services. The wind chill temperature is how cold people and animals feel when outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature. Therefore, the wind makes it feel much colder. If the temperature is 00 F and the wind is blowing at 15 mph, the wind chill is -19 F. At this wind chill temperature, exposed skin can freeze in 30 minutes.

Blizzard. Blizzards, the most violent of the winter storms, are characterized by low temperatures, usually below 20 Degrees Fahrenheit, accompanied by strong winds in excess of 35 miles per hour with enough blowing or falling snow in the air to reduce visibilities to one-quarter mile or less for an extended period of time, usually at least three hours or more. While blizzards can occur in Fillmore County from October through April, they most commonly occur from November through the end of March.

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

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

SECTION III HAZARDS

Heavy Snow or Snowstorm. In Minnesota, a heavy snow event is defined as 6 or more inches of snow in a 12-hour period, and as 8 or more inches of snow in a 24-hour period. Snow is considered heavy when visibilities drop below one-quarter mile regardless of wind speed.

History

Fillmore County usually experiences at least one occurrence of each of the above types of winter storms annually, often the same type on more than one occasion. Winter storms are nearly always large scale, frequently with statewide or region wide impact. The following table lists recent winter storms in Fillmore County.

Table 25 - Severe Winter Storms

Severe Winter Storms Fillmore County (2000 - 2007)	
Date	Description
1/19/2000	6-10 inches, Heaviest in Spring Valley
12/10/2000	6-7 inches
12/28/2000	8 inches
1/29/2001	1/4 - 1/2 inch ice
2/8/2001	1/4 - 1/2 inch ice/ 2 - 4 inches snow
2/24/2001	1/4 inch ice
3/11/2001	6 - 11 inches, heaviest in Spring Valley
3/1/2002	6 inches 15-25 mph winds
3/9/2002	Blizzard conditions - 50 mph winds
1/26/2004	6 - 8 inches heaviest in Preston
2/1/2004	6 - 13 inches
12/20/2004	6 inches
1/1/2005	1/4 - 1/2 inch ice
1/21/2005	6 - 10 inches
1/22/2005	Blizzard conditions - 50 mph winds
3/17/2005	12 -24 inches
12/13/2005	7 - 8 inches Heaviest in Highland
2/15/2006	5 - 9 inches
1/21/2007	6 inches
2/6/2007	7 inches
2/23/2007	20 - 26 inches
2/28/2007	6 - 12 inches

Source: <http://www4.ncdc.noaa.gov>

III.A.1.A.1 VULNERABILITY TO WINTER STORM EVENTS

The following table summarizes the overall vulnerability to severe winter storms. Since all jurisdictions are considered to be equally affected by winter or summer storm events, each jurisdiction will not be assessed independently. Section IV prioritizes the hazards in more detail and ranks them collectively.

SECTION III HAZARDS

Overall Vulnerability to Winter Storms	
Frequency	Highly Likely – (100% probable in next year)
Impact/Damage	Slight to Moderate
Location	County-wide
Geographic Extent	County-wide
Duration	Hours to days
Seasonal Pattern	Winter
Warning Time	3-6 hours

III.A.1.B SEVERE SUMMER STORMS

Summer storms cause several hazards affecting Fillmore County including thunderstorms, lightning, windstorms, hailstorms, tornadoes, and floods. Tornadoes and floods will be covered separately because of the severity and potential loss of life and property.

Thunderstorms. Thunderstorms are not hazards but are linked with high winds, hail, lightning, tornados and floods. Thunderstorms are the most common summer storm in Fillmore County, occurring primarily during the months of May through August, with the most severe storms most likely to occur from mid-May through mid-July. Thunderstorms are usually localized, produced by cumulonimbus clouds, always accompanied by lightning, and often having strong wind gusts, heavy rain and sometimes hail or tornadoes. Severe thunderstorms, with hail, lightning, torrential rain, and high winds, are common in Fillmore County in the spring and early summer months. A thunderstorm is considered severe if it has at least one of these characteristics:

- Hail of ¾" or greater
- Winds gusting in excess of 58 miles per hour
- Tornado

The following table lists recent severe thunderstorms that have occurred in Fillmore County.

SECTION III HAZARDS

Table 26 - Severe Thunder Storms

Severe Thunder Storms Fillmore County (2000 - 2007)		
Date	Description	Damages
6/1/2000	65 mph winds, nickel size hail	\$5,000
6/1/2000	Lightning strike	\$18,000
6/13/2000	75 mph winds. 3-5 inches rain in Spring Valley	\$25,000
6/23/2000	Nickel sized hail in Etna	\$5,000
7/9/2000	60 - 65 mph	\$5,000
8/1/2000	golf ball sized hail	\$40,000
4/5/2001	Dime/penny inch hail in Peterson	\$0
4/7/2001	60 -70 mph winds	\$16,000
5/1/2001	60 mph winds	\$5,000
6/1/2001	Quarter sized hail	\$0
7/21/2001	Quarter sized hail	\$4,000
10/25/2001	up to 60 mph winds	\$0
4/18/2002	Quarter sized hail	\$0
5/8/2002	Quarter sized hail	\$0
7/18/2002	60 mph winds	\$3,000
7/30/2002	60 - 70 mph winds	\$2,000
4/17/2004	Quarter sized hail, 60 mph winds	\$4,000
4/18/2004	60 - 70 mph winds	\$16,000
5/7/2004	Quarter sized hail	\$0
6/11/2004	60 - 65 mph winds	\$3,000
6/23/2004	80 mph winds, hail	\$10,000
8/3/2004	60 mph winds, hail	\$3,000
8/26/2004	65 mph winds, hail	\$0
3/30/2005	60 mph winds, Quarter sized hail	\$0
7/25/2005	60 - 70 mph winds, Quarter sized hail	\$1,000
9/13/2005	Quarter sized hail	\$4,000
5/8/2006	Quarter sized hail	\$2,000
7/14/2006	60 - 65 mph winds	\$1,000
8/24/2006	60 - 65 mph winds, Quarter sized hail	\$7,000
6/7/2007	60 - 70 mph winds	\$8,000
8/11/2007	60 - 65 mph winds, Quarter sized hail	\$2,000
9/21/2007	60 mph winds	\$10,000

Source: <http://www4.ncdc.noaa.gov>

Lightning. Lightning is the most frequent hazard related to severe thunderstorms and is the hazard that causes the most loss of life behind floods. Lightning balances the build-up of positive and negative electrical charges within a cloud, between two clouds, and between the cloud and the ground. When the difference between the two charges becomes great, electricity discharges in the form of lightning. Lightning typically strikes tall buildings, trees and other objects protruding from the surface. Taller objects are more likely to be struck than lower objects.

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

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The hazard posed by lightning is significantly underrated. High winds, rainfall, and a darkening cloud cover are the warning signs for possible cloud-to-ground lightning strikes. While many lightning casualties happen at the beginning of an approaching storm, more than half of lightning deaths occur after a thunderstorm has passed. The lightning threat diminishes after the last sound of thunder, but may persist for more than 30 minutes. When thunderstorms are in the area, but not overhead, the lightning threat can exist when skies are clear. Lightning has been known to strike more than 10 miles from the storm in an area with clear sky above.

Cloud-to-ground lightning can kill or injure people by either direct or indirect means. The lightning current can branch off to strike a person from a tree, fence, pole, or other tall object. It is not known if all people are killed who are directly struck by the flash itself. In addition, electrical current may be conducted through the ground to a person after lightning strikes a nearby tree, antenna, or other tall object. The current also may travel through power lines, telephone lines, or plumbing pipes to a person who is in contact with an electric appliance, telephone, or plumbing fixture.

Only one lightning event has been recorded for Fillmore County, which occurred on 6/1/2000 in Mabel. This event resulted in \$18,000 property damage.

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

Hail in Minnesota ranges from pea-sized to golf ball-sized. Larger hailstones have been reported but occur much less frequently. Strong updrafts, usually associated with severe thunderstorms, are necessary within the cloud to form hail. Area coverage of individual hailstorms is highly variable and spotty because of the unstable nature of cumulonimbus clouds. While almost all areas of southern Minnesota can expect some hail during the summer months, most hail is not large enough to cause significant crop or property damage.

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Estimating Hail Size

Size	Inches in Diameter
Pea	1/4 inch
Marble/mothball	1/2 inch
Dime/Penny	3/4 inch
Nickel	7/8 inch
Quarter	1 inch
Ping-Pong Ball	1 1/2 inch
Golf Ball	1 3/4 inches
Tennis Ball	2 1/2 inches
Baseball	2 3/4 inches
Tea cup	3 inches
Grapefruit	4 inches
Softball	4 1/2 inches

Source: National Weather Service

The following table lists major hail events causing property or crop damage that have occurred in Fillmore County in the past decade.

Table 27 - Hail Events

Hail Events Fillmore County 1998 to 2008			
Date	Hail Size	Property Damages	Crop Damages
5/18/1998	1 -1.75 in.	\$46,000	0
6/20/1998	1.25-1.75 in.	\$43,000	\$140,000
6/27/1998	1.75 in.	0	\$30,000
7/20/1998	0.88 in.	0	\$30,000
6/5/1999	1 in.	\$20,000	0
6/8/1999	0.75-1 in.	\$20,000	\$30,000
8/9/1999	0.75 in.	\$10,000	\$12,000
6/1/2000	0.75 in.	0	\$5,000
6/23/2000	0.88 in.	0	\$5,000
8/1/2000	0.75-1 in.	\$22,000	\$35,000
5/1/2001	0.75-1 in.	\$5,000	0
6/1/2001	1 in.	\$2,000	0
7/21/2001	1 in.	\$1,000	\$3,000
4/17/2004	1-2 in.	\$3,000	0
6/23/2004	0.88 in.	0	\$10,000
8/3/24	0.75 in.	0	\$3,000
9/13/2005	0.88 in.	0	\$1,000
5/8/2006	0.75-1 in.	\$2,000	0
8/24/2006	0.75-0.88 in.	0	\$6,000
6/7/2007	1 in.	0	\$2,000

Source: <http://www4.ncdc.noaa.gov>

Windstorms. Windstorms can and do occur in all months of the year; however, the most severe windstorms usually occur during severe thunderstorms in the warm months. These include tornadoes and downburst or straight line winds. Wind speeds greater than 60 mph are also associated with intense winter, spring, and fall low-pressure systems. These can also inflict damage to buildings and can overturn vehicles.

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A downburst is a severe localized downdraft from a thunderstorm or a rain shower. This outflow of cool or colder air can create damaging winds at or near the surface. Winds up to 130 mph have been reported in the strongest thunderstorms. Downburst winds can cause as much damage as a small tornado and are frequently confused with tornadoes because of the extensive damage they cause. As these downburst winds spread out they are often referred to as straight-line winds. They can cause major structural and tree damage over a relatively large area.

The following table lists major wind events causing property or crop damage that have occurred in Fillmore County in the past decade. A majority of high winds were attributed to thunderstorms.

**Table 28 - High Winds
Hail Events Fillmore County 1998 to 2008**

Date	Speed	Property Damages	Crop Damages
5/30/1998	54-55 kts.	\$75,000	\$88,000
6/18/1998	54 kts.	\$17,000	0
6/20/1998	56-61 kts.	\$163,000	\$67,000
6/27/1998	61-70 kts.	\$82,000	\$41,000
11/10/1998	78 kts.	\$595,000	0
6/6/1999	51-61 kts.	\$70,000	\$70,000
7/8/1999	56 kts.	\$2,000	0
6/13/2000	65 kts.	\$25,000	0
7/9/2000	52-54 kts.	\$5,000	0
8/1/2000	55 kts.	\$3,000	0
4/7/2001	54 kts.	\$16,000	0
7/18/2002	52 kts.	\$1,000	\$2,000
7/20/2002	57 kts.	\$2,000	0
7/4/2003	53 kts.	\$1,000	\$1,000
8/25/2003	52 kts.	0	\$2,000
4/17/2004	56 kts.	\$1,000	0
4/18/2004	56 kts.	\$16,000	0
6/11/2004	56 kts.	\$3,000	0
12/12/2004	52 kts.	\$5,000	0
7/25/2005	56 kts.	\$1,000	0
9/3/2005	56 kts.	\$2,000	0
7/14/2006	53 kts.	\$1,000	0
8/24/2006	54 kts.	\$1,000	0
6/7/2007	52-61 kts.	\$8,000	0
8/11/2007	52-56 kts.	\$2,000	0
9/21/2007	52 kts.	\$5,000	\$5,000

History

Fillmore County has experienced at least one of the hazards associated with summer storms, described above, every year.

Straight-line winds and hail have caused significant property damage during the last 20 years. An estimated \$1.8 million dollars worth of damage has been attributed to these hazards since 1980.

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III.A.1.B.1 VULNERABILITY TO SUMMER STORM EVENTS

The following table summarizes the overall vulnerability to severe summer storms. Since all jurisdictions are considered to be equally affected by winter or summer storm events, each jurisdiction will not be assessed independently. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Summer Storms	
Frequency	Highly Likely – (100% probable in next year)
Impact/Damage	Slight to Moderate
Location	County-wide
Geographic Extent	County-wide
Duration	Minutes to Days
Seasonal Pattern	Summer
Warning Time	3-6 hours

III.A.1.c. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Flooding. Heavy snows and snow melt and thunder storms can cause flooding that can disrupt emergency response, transportation and communication. Violent storms of all types can cause property damage, loss of life, personal injury, disrupt transportation and communication and emergency services and threaten public health and safety and be significant threats to essential public infrastructure and services such as power, water supply systems and sanitary systems.

Landslides. Heavy snows and snow melt and thunder storms can cause landslides in areas that have steep or rugged terrain such as those that are located in much of Fillmore County. Landslides most often damage property and transportation, but can also threaten lives.

Power outages. Power outages that result from downed utility lines create safety concerns for residents where heat is not available for an extended period of time and may cause serious internal damage to the home because of burst water pipes.

Communications Failure. Power outages that result from downed utility lines and infrastructure damages can result in communications failures.

III.A.1.E. PLANS AND PROGRAMS

The Severe Storm Spotters Network. This program, sponsored by the National Weather Service (NWS), enlists the help of trained volunteers to spot severe storm conditions and report this information to the NWS. No tornado warning is given unless the storm has been spotted by someone or is confirmed by NWS radar reports. Fillmore County has trained severe weather spotters who report directly to their respective public safety warning points when severe weather is observed. Every city has trained weather spotters or uses a neighboring city’s weather spotters.

Severe Weather Warning System. Some of the cities have emergency sirens to warn residents in the event of severe summer weather. The County warning point

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alerts the 14 City warning points to activate the siren system in Fillmore County for either weather or hazardous materials incidents.

Severe Weather Shelters. Shelters are provided in some cities for residents that do not have basements, or live in areas that may be prone to damage due to severe weather.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included are processes, guidelines and strategies for dealing with severe weather emergencies.

City Emergency Operations Plans. Every city except for Fountain and Mabel have Emergency Operations Plans that outline procedures for their City to follow in response to a variety of hazards.

Radio. Station KFIL AM 1060 and FM 103.1 in Preston will broadcast all emergency management warnings for Fillmore County.

Television. Area television stations will broadcast emergency management warnings for Fillmore County including KTTC and KXLT in Rochester.

III.A.1.F. GAPS AND DEFICIENCIES

Most of Fillmore County's Power lines are above ground and are subject to ice accumulation and falling trees or limbs.

A significant number of homes in the county lack basements that would provide shelter in the event of a tornado or damaging winds from a severe thunderstorm. Moreover, in many of the nursing homes, residents are moved to an interior hall away from windows in the event of a violent storm.

The sirens in many of the cities are inadequate, and can not be heard by the entire jurisdiction. The City of Whalan currently does not have sirens in place. Only Rushford and Preston have radio controlled sirens.

Most of Fillmore County's Power lines are above ground and are subject to ice accumulation and falling trees or limbs.

There are inadequate early warning systems in place for camp sites. The campsites do not have adequate shelters in case of an extreme weather event.

Much of the housing stock in Fillmore County is old, and is susceptible to hazards because they are not kept up to current standards.

There is inadequate education of the public on what to do and where to go during a tornado or other hazard. There is very little individual and family preparedness for potential all-hazard events.

In most of the designated shelters in Fillmore County, there are no back-up generators in case of power outages.

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III.A.2 HAZARD: TORNADOES

Tornadoes are the most violent of all hazards that can affect Fillmore County. A tornado is a rapidly rotating column of air spawned from a cumulonimbus cloud. When a tornado funnel drops to the ground it can create significant damage and loss of life. Tornadoes always occur in association with thunderstorms.

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

The tornado’s path typically ranges from 250 feet to a quarter of a mile in width. Most tornadoes stay on the ground for less than five minutes. Tornadoes often move southwest to northeast, but this can vary and cannot be counted on in all cases. The speed of tornado movement varies but commonly is between 20 and 30 mph. Tornadoes generate wind speeds that are considerably higher than the speed of funnel movement. The Fujita Scale, developed in 1971, is used to estimate tornado wind speeds from the severity of on-the-ground damage.

Fujita Tornado Damage Scale		
Scale	Wind Estimate (mph)	Typical Damage
F0	<73	Light Damage: Some damage to chimneys, branches broken off trees, shallow-rooted trees blown over, signboards damaged.
F1	73-112	Moderate Damage: Peels surface off roofs, mobile homes pushed off foundations or overturned, moving autos blown off roads.
F2	113-157	Considerable Damage: Roofs torn off frame houses, mobile homes demolished, boxcars overturned, large trees snapped or uprooted, light-object missiles generated, cars lifted off ground.
F3	158-206	Severe Damage: Roofs and some walls torn off well-constructed houses; trains overturned, most trees in forest uprooted, heavy cars lifted off the ground and thrown.
F4	207-260	Devastating Damage: Well-constructed houses leveled, structures with weak foundations blown away some distance, cars thrown and large missiles generated.
F5	261-318	Incredible Damage: Strong frame houses leveled off foundations and swept away, automobile-sized missiles fly through the air in excess of 100 meters (109 yards), trees debarked, incredible phenomena occur.

History

Minnesota lies along the north edge of the region of maximum tornado occurrence in the United States. Tornado Alley, as that part of the central United States has come to be known, reaches across parts of Texas, Oklahoma, Kansas, Missouri, East Nebraska, and West Iowa. In Minnesota, tornadoes have occurred in every month from March through November. Historically and statistically, June is the month of greatest frequency. Nearly ¾ of all tornadoes in Minnesota have occurred during the months of May (16%), June (33%), and July (27%). The most probable danger period in Minnesota is late spring and early summer, between 2 p.m. and 9 p.m.; however, tornadoes can and do occur at any time of the day or night.

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Fillmore County has experienced 10 tornadoes since 1950, none have been very strong and only one affected an urban area causing damages to residential and religious structures. There has been an estimated \$7.58 million worth of damages from these events. The following table describes these tornadoes.

Table 29 - Tornadoes

Tornadoes Fillmore County (1950 - 2007)				
Date	Magnitude	Injuries	Deaths	Damage
5/10/1953	F4	6	1	\$2,500,000
5/5/1965	F3	6		\$2,500,000
4/20/1968	F1	0		\$25,000
5/15/1968	F1	0		\$25,000
7/23/1973	F0	0		\$3,000
7/14/1977	F2	10		\$2,500,000
5/17/1982	F0	0		\$2,500
6/19/1997	F0	0		\$0
6/11/2004	F0	0		\$0
6/16/2004	F0	0		\$0

Source: <http://www4.ncdc.noaa.gov>

III.A.2.A. VULNERABILITY TO TORNADOES

The following table summarizes the overall vulnerability to tornadoes. Since all jurisdictions are considered to be equally affected tornado events, each jurisdiction will not be assessed independently. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Tornadoes	
Frequency	Occasional – (Every 6 – 10 years)
Impact/Damage	Moderate to Very Severe
Location	County-wide
Geographic Extent	County-wide
Duration	Minutes to Hours
Seasonal Pattern	Spring to Fall
Warning Time	3-6 hours

III.A.2.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Hail. During a tornado, or prior to one, large hail is often produced causing damage to crops and structures.

Lightning. Lightning usually occurs during the period that precipitates a tornado.

Power Outages. Power outages that result from downed utility lines create safety concerns for residents.

Fire. Downed utility lines, destroyed fuel tanks, scattered debris, broken gas mains and other sources create a risk for fires after a tornado touchdown in residential and commercial areas.

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Water Supply Contamination. A severe tornado affecting businesses and industries that use or create hazardous materials could create the potential for contaminating the local water supply and ground water.

Communications Failure. Power outages that result from downed utility lines and infrastructure damages can result in communications failures.

Hazardous Materials. Sites that contain hazardous materials can be destroyed causing the materials to be released.

Debris. A tornado can cause a tremendous amount of debris, creating road blockages, and creating a dangerous environment for rescue and citizens.

III.A.2.C. PLANS AND PROGRAMS

The Severe Storm Spotters Network. This program, sponsored by the National Weather Service (NWS), enlists the help of trained volunteers to spot severe storm conditions and report this information to the NWS. No tornado warning is given unless the storm has been spotted by someone or is confirmed by NWS radar reports. Fillmore County and the local jurisdictions has trained severe weather spotters who report directly to their respective public safety warning points when severe weather is observed.

Severe Weather Warning System. Some of the cities have emergency sirens to warn residents in the event of severe summer weather. The County warning point alerts the 14 City warning points to activate the siren system in Fillmore County for either weather or hazardous materials incidents.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included are processes, guidelines and strategies for dealing with severe weather emergencies.

City Emergency Operations Plans. Every city except for Fountain and Mabel have Emergency Operations Plans that outline procedures for their City to follow in response to a variety of hazards.

Radio. Station KFIL AM 1060 and FM 103.1 in Preston will broadcast all emergency management warnings for Fillmore County.

Television. Area television stations will broadcast emergency management warnings for Fillmore County including KTTC and KXLT in Rochester. Also available through cable is the EAS channel located out of LaCrosse, WI.

III.A.2.D. GAPS AND DEFICIENCIES

See Gaps and Deficiencies for Severe weather.

III.A.3 HAZARD: EXTREME TEMPERATURES

Located in the center of the continent, Minnesota and Fillmore County experience the extremes of summer heat and winter cold. Summer temperatures in Fillmore County have exceeded 100° F on several occasions while winter temperatures have been as

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cold as 45° below zero. Both heat and cold pose risks for people, animals, equipment and infrastructure. Historical data for extreme temperatures in Fillmore County is presented in Table 30.

Table 30 - Extreme Temperatures

Extreme Temperatures in Fillmore County (1994-2008)			
Date	Type	Deaths	Damages
1/15/1994	Extreme Cold	1	0
7/10/1995	Heat Wave	2	2,000,000
1/31/1996	Extreme Cold	0	0
2/1/1996	Extreme Cold	0	0
1/16/1997	Extreme Windchill	0	0
7/4/1999	Excessive Heat	0	0
7/23/1999	Excessive Heat	0	0
7/28/1999	Excessive Heat	1	0
7/31/2001	Excessive Heat	0	0
8/1/2001	Excessive Heat	0	0

Source: <http://www4.ncdc.noaa.gov>

III.A.3.A EXTREME SUMMER HEAT

Extreme summer heat is the combination of very high temperatures and exceptionally humid conditions. If such conditions persist for an extended period of time, it is called a heat wave (FEMA, 1997). Heat stress can be indexed by combining the effects of temperature and humidity, as shown in the following table. The index estimates the relationship between dry bulb temperatures (at different humidity) and the skin’s resistance to heat and moisture transfer. The higher the temperature or humidity, the higher the apparent temperature. The major human risks associated with extreme heat are as follows:

- **Heatstroke:** Considered a medical emergency, heatstroke is often fatal. It occurs when the body’s responses to heat stress are insufficient to prevent a substantial rise in the body’s core temperature. While no standard diagnosis exists, a medical heatstroke condition is usually diagnosed when the body’s temperature exceeds 105°F due to environmental temperatures. Rapid cooling is necessary to prevent death, with an average fatality rate of 15 percent even with treatment.
- **Heat Exhaustion:** While much less serious than heatstroke, heat exhaustion victims may complain of dizziness, weakness, or fatigue. Body temperatures may be normal or slightly to moderately elevated. The prognosis is usually good with fluid treatment.
- **Heat Syncope:** This refers to sudden loss of consciousness and is typically associated with people exercising who are not acclimated to warm temperatures. Causes little or no harm to the individual.
- **Heat Cramps:** May occur in people unaccustomed to exercising in the heat and generally ceases to be a problem after acclimatization.

Figure 17 - Heat Index Table

		Temperature (°F)															
		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
Relative Humidity (%)	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
100	87	95	103	112	121	132											

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution
 Extreme Caution
 Danger
 Extreme Danger

Source: <http://www.weather.gov/os/heat/index.shtml>

In addition to affecting people, severe heat places significant stress on plants and animals. The effects of severe heat on agricultural products may include reduced yields and even loss of crops (Brown and Zeiher, 1997). Similarly, cows may become overheated, leading to reduced milk production and other problems. (Garcia, September 2002).

History

The average July maximum temperature in most of Fillmore County is about 85° F. July is the warmest month. On average the county experiences 19 days of 90° or higher during a summer. The all time high is 101° F, which occurred in 1995. During that week, there were five days in a row when the temperature exceeded 95° F. On average, Fillmore County can expect at least one day over 100° F about every three years.

While summers are typically warm but pleasant in Fillmore County, it is not uncommon to get extended warm spells with high dew points and temperatures in the 90s for several days in a row. Extended periods of warm, humid weather can create significant risks for people, particularly the elderly who may lack air

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conditioning or proper insulation or ventilation in their homes. Animals are also at risk during extended periods of heat and humidity.

In recent years a heat index has been developed that combines humidity and temperature to better reflect the risk of warm weather to animals and people. The index measures the apparent temperature in the shade. People exposed to the sun would experience an even higher apparent temperature. A heat index of 105 is considered dangerous. With prolonged exposure it could result in heat stroke, heat exhaustion and heat cramps. People are reminded to use extreme caution when the heat index is between 95 and 105. A heat index of 95 occurs when the temperature is 90° and the relative humidity is 50 percent. Fillmore County can expect these kinds of conditions on 8 to 10 days each summer. This is more of a problem when these conditions are present for several days in a row. This allows buildings to become hotter and hotter as the conditions persist.

According to the State Climatologist, there is some evidence that current dew points are not only higher but are occurring with greater frequency than was true in the past. If that is the case, Fillmore County residents can expect an increasing number of hours with heat indexes in the danger category. Since 1994, Fillmore County has experienced six occurrences of extreme heat according to the NOAA.

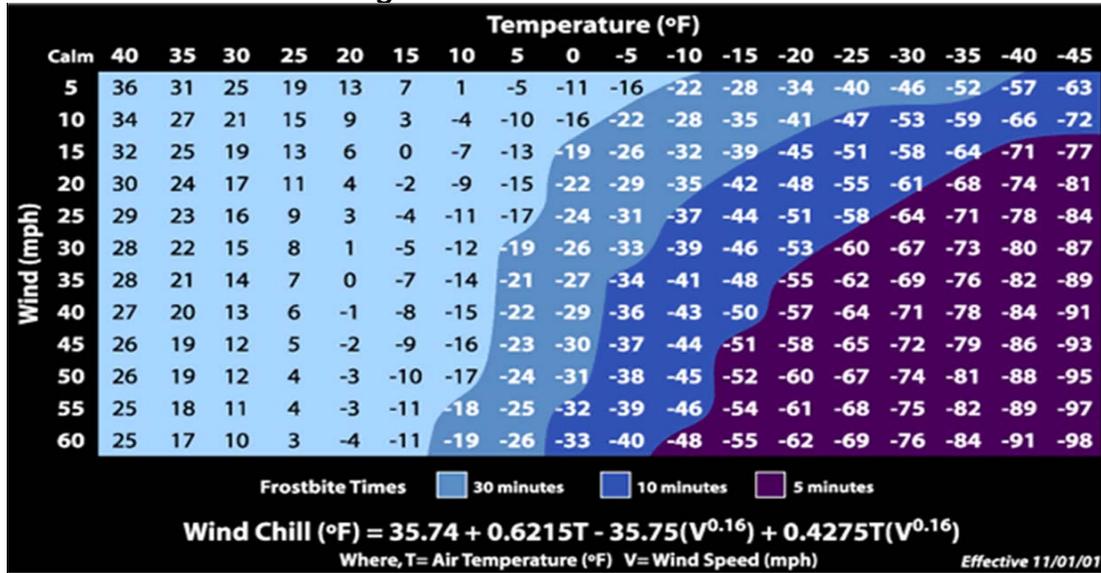
III.A.3.B EXTREME WINTER COLD

Dangerously cold weather is that which produces relatively cold temperatures with strong winds, creating low wind chills that put both people and livestock at risk. The northeastern portion of the county is most at risk from this kind of weather because of its relatively flat open character. More wooded, hilly areas of the county are less severely affected. Wind chills of minus 35° and lower can present significant risk, particularly if people are not properly clothed or protected. A 15° F below air temperature with wind speeds of 10 mile per hour creates a wind chill of 35 below zero. In the open under these conditions, frostbite can occur in minutes on exposed skin.

The National Weather Service issues a Wild Chill Advisory when wind chills of -35° are expected. A Wind Chill Warning is issued when wind chills of -50° are expected. The following chart is the National Weather Service Wind Chill Temperature Index.

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Figure 18 - Wind Chill Chart



Source: <http://www.weather.gov/os/windchill/index.shtml>

History

On average, January is the coldest month, with daytime highs of averaging 22° F and nighttime lows of 0° F. However, these averages really don't tell the whole story. Maximum temperatures in January have been as high as 66 degrees and minimums as low as 45° below in Fillmore County. The winter months on average produce 42° days of 0° F or lower. In a typical winter, Fillmore County can expect five days when the temperature gets lower than 20° below and three days when it is lower than 25° below. A 30° below reading or lower is likely every eight years. Below zero readings have occurred October through April.

III.A.3.C. VULNERABILITY TO EXTREME TEMPERATURES

The annual probability of extreme temperatures occurring is clearly quite high, although most year-to-year temperature extremes will be within normal statistical bounds. Since all jurisdictions are considered to be equally affected by extreme temperatures, each jurisdiction will not be assessed independently. The following table summarizes the overall vulnerability to extreme temperatures. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Extreme Temperatures	
Frequency	Very Likely -(near 100% probable in next year)
Impact/Damage	Slight
Location	County-wide
Geographic Extent	County-wide
Duration	Days to Weeks
Seasonal Pattern	Winter and Summer
Warning Time	More than 12 hours

III.A.3.D. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Violent storms. Temperature extremes can be associated with weather extremes, such as snowstorms and blizzards.

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Drought. Extended high temperature extremes can phase into drought.

Wildfire. Dry, hot condition can increase to risk of wildfires.

III.A.3.E. PLANS AND PROGRAMS

The following programs and projects are in addition to the ones already mentioned for violent storms:

Heat advisories. The local radio and TV media in concert with the National Weather Service issues a heat advisory when the combination of temperature and humidity create risks for people and animals. A heat index of 105 to 114 warrants a heat advisory. This occurs when air temperature reaches 95 and the relative humidity is 50 percent. An excessive heat warning is issued when the heat index reaches 115. This occurs with an air temperature of 95 degrees and relative humidity of 60 percent. An index of 115 or higher creates severe risk for both humans and animals.

Wind chill warnings. The local radio and TV media in concert with the National Weather Service issues a wind chill warning when temperatures are 30 o F or lower. Severe wind chill warnings are provided when conditions warrant and when severe risk and safety is a factor. Wind chills of 40o F below or lower frequently prompt the closing of schools to protect children, particularly in rural areas.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included are processes, guidelines and strategies for dealing with severe weather emergencies.

III.A.3.F. GAPS AND DEFICIENCIES

There is inadequate education of the public on what to do and where to go if they do not have adequate air conditioning.

III.A.4 HAZARD: FLOOD

Flooding is the accumulation of water within a water body (e.g., stream, river, lake, and reservoir) and the overflow of excess water onto adjacent floodplains. Floodplains are lowlands, adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected. Nationwide, hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories (FEMA, 1997).

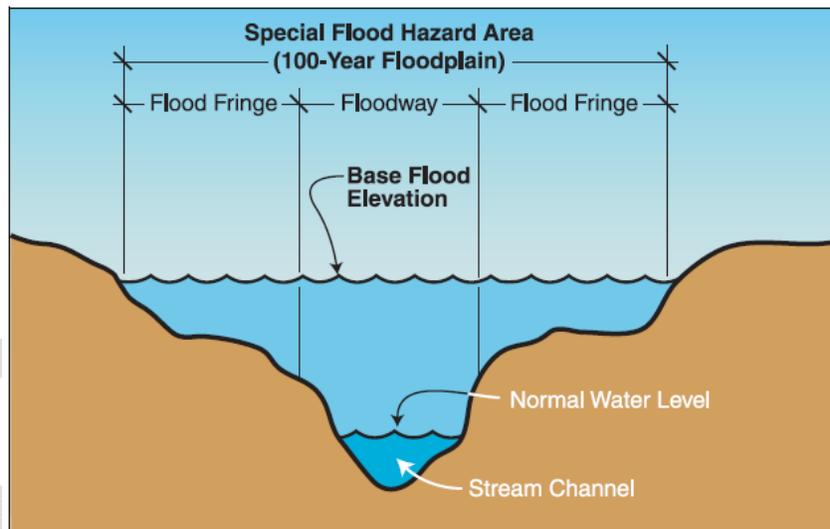
A flood is defined as an overflowing of water onto an area of land that is normally dry. For floodplain management purposes, the Federal Emergency Management Agency uses the following definition of "100-year flood." The term "100-year flood" is misleading. It is not a flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1 percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within a special flood hazard area shown on a map has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage.

There are a number of categories of floods in the U.S., including the following:

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- Riverine flooding, including overflow from a river channel, flash floods, alluvial fan floods, ice-jam floods, and dam break floods
- Local drainage or high groundwater levels
- Fluctuating lake levels
- Coastal flooding, including storm surges
- Debris flow
- Subsidence

The most common type of flooding event in Fillmore County is riverine flooding, also known as overbank flooding. Riverine floodplains range from narrow, confined channels in the steep valleys of hilly regions, to wide, flat areas in plains. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. In steep valleys, flooding is usually rapid and deep, but of short duration, while flooding in flat areas is typically slow, relatively shallow, and may last for long periods of time. The cause of flooding in large rivers is typically prolonged periods of rainfall from weather systems covering large areas. These systems may saturate the ground and overload the rivers and reservoirs in numerous smaller basins that drain into larger rivers. Localized weather systems (i.e., thunderstorms), may cause intense rainfall over smaller areas, leading to flooding in smaller rivers and streams. Annual spring floods, due to the melting of snowpack, may affect both large and small rivers and areas.



Source: FEMA, August 2001

While there is no sharp distinction between riverine floods, flash floods, ice jam floods, and dam-break floods, these types of floods are widely recognized and may be helpful in considering the range of flood risk and appropriate responses:

Flash flood is a term in wide use by experts and the general population, but there is no single definition or clear means of distinguishing flash floods from other riverine floods. Flash floods involve a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes the tearing out of trees, undermining of buildings and bridges, and scouring new channels. The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and

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artificial flood storage areas, and configuration of the streambed and floodplain. Dam failure and ice jams may also lead to flash flooding. Urban areas are increasingly subject to flash flooding due to the removal of vegetation, covering of ground cover with impermeable surfaces, and construction of drainage systems. Local flash flooding can be very destructive along the hilly terrain and narrow valleys of Fillmore County; however, flash flooding can occur within any river corridor in Fillmore County.

A type of flooding that does not result directly from overflowing lakes and streams but must be addressed is flooding that result from inadequate infrastructure, e.g., inadequate storm sewers and storm drainage systems. In Minnesota, floods resulting from inadequate infrastructure are often upstream and away from traditionally delineated floodplain areas that are subject to local land-use regulations. Therefore, this type of flooding has not typically been mapped by NFIP, and NFIP only requires local governments to impose land use regulations in a mapped floodplain. The NFIP standard flood insurance policy, however, often pays claims for flood losses in these areas with inadequate infrastructure.

Local drainage floods may occur outside of recognized drainage channels or delineated floodplains due to a combination of locally heavy precipitation, a lack of infiltration, inadequate facilities for drainage and stormwater conveyance, and increased surface runoff. Such events frequently occur in flat areas, particularly during winter and spring in areas with frozen ground, and also in urbanized areas with large impermeable surfaces. High groundwater flooding is a seasonal occurrence in some areas, but may occur in other areas after prolonged periods of above-average precipitation. Losses associated with local drainage are most significant when they occur with other hazards described in this document, such as widespread flooding and thunderstorms; therefore, they are not analyzed as a distinct hazard.

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.

The following excerpts are from the NOAA:

On May 31, 2000, during the night, and into the morning hours of June 1, three to six inches of rain fell causing widespread flash flooding. The flood is described in further detail below.

“In the early morning hours of June 1, 2000, nearly five inches of rain fell in Southeastern Minnesota, specifically in the Fillmore County area. The deluge of rain caused flash flooding over the entire county, rivaling the conditions last encountered in 1942.

In Spring Valley, emergency services personnel scrambled to erect a 12 thousand sandbag wall to contain the rising Spring Valley Creek. Despite the quick mobilization, 25 homes were evacuated, 3 of those by boat. Over 100 residents were evacuated and placed in temporary shelters overnight. Seventeen business places were damaged to some extent, resulting in hundreds of thousands of dollars in lost revenue. Since June 1, Flash Flood Warnings have been issued twice on Spring Valley Creek, none of which equaled the magnitude of the initial flood. The fast moving wall

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of water went down as rapidly as it went up, leaving a wake of flooded basements, lost business revenue and a feeling of despair by many residents, both in and out of the flood area.

The numbers from cities like Mabel are staggering. Ten residents were evacuated and 75 basements in a community of 745 were flooded; and at least two of these basements have major damage. It will take several weeks to dry out the walls, appliances and personal belongings. Many businesses were affected, including massive destruction to a floral shop that will likely not survive.

Every city in Fillmore County suffered some damage, regardless of whether they lived on a river or stream. The torrential rains on a saturated ground resulted in rapid runoff, flooding fields, washing away roads and rendering bridge structures unsafe. Fillmore County businesses that are closed in June include a 48 unit campground near Preston and a canoe rental shop. The impact, during a very short business season, is tremendous when the compounded loss of revenue to adjacent communities is also considered. Total Fillmore County tourism revenue for lodging and resort businesses in 1995 was nearly \$1.5 million and with an impact of 10-15% loss as estimated by local Southern Minnesota Tourism Association officials, this will be irreplaceable revenue and is significant.

Some of the city dollar figures include: Chatfield - 45 thousand, Canton - 58 thousand, Fountain - 19 thousand, Harmony - 107 thousand, Lanesboro -191 thousand, Mabel -165 thousand, Preston - 91 thousand and Spring Valley - 746 thousand.

Fillmore Township appeared to be the hardest hit rural area, recording nearly 1 million dollars in damage, 900 thousand of which is for destroyed bridges. Within the last few years, Fillmore County has risen to the ranks of one of the top tourist attractions in Minnesota. The flood has torn up portions of the State bicycle trail which attracts thousands of visitors each weekend. This resulted in cancellation of motel and Bed and Breakfast reservations. These lost dollars will never be recovered."

After 3 to 4 inches of rain hit the area during the early morning of July 9, 2000 similar amounts in the early morning hours of July 10 caused extensive flash flooding, especially in Spring Valley. 50 residents of a nursing home had to be evacuated due to rapidly rising flood waters. In a separate incident, two individuals had to be rescued when they tried to cross a flooded area on foot. Low spots in fields became swollen rivers, flattening acres and acres of corn.

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

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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. Fillmore, Houston, Olmsted, Wabasha and Winona counties were declared federal disaster areas.

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.

Flooding occurs regularly along tributaries and streams outside of the designated 100 year floodplain.

The following table describes the flood events that have occurred in Fillmore County since 2000:

Table 31 - Floods in Fillmore County
Floods Fillmore County (2000 - 2007)

Date	Description	Damages
6/1/2000	Flash flooding; 3-6 inches rain, Spring Valley hardest hit*	\$575,000
6/13/2000	Flooding; 3-6 inches rain, Spring Valley hardest hit*	\$55,000
7/9/2000	Flash flooding; 3-6 inches rain, Spring Valley hardest hit*	\$70,000
7/10/2000	Flooding; 3-6 inches rain, Spring Valley hardest hit*	\$775,000
4/6/2001	Flooding; rain and snow melt, Spring Valley hardest hit*	\$110,000
4/11/2001	Flash flooding; 2.5 inches with saturated ground*	\$1,000
6/8/2004	Flash flooding; 3 - 6 inches, mudslides between Fountain & Preston	\$25,000
6/16/2004	Flash flooding; 4 inches in 2 hours	\$17,000
9/15/2004	Flash flooding/Flooding; 4 inches	\$1,265,000
7/25/2005	Flash flooding; 5 - 6 inches, Harmony and Preston	\$8,500
5/8/2006	Flash flooding; 2 - 3 inches in 2 hours, Preston	\$1,500
8/14/2007	Flash flooding; Chatfield, mudslides on Hwy 52	\$2,000
8/18/2007	Flooding/Flash flooding; Rushford/Rushford Village hardest hit, Countywide damages*	\$38,390,000
8/21/2007	Flash flooding; 1" per hr and saturated soils, Preston	\$6,000

**Federal Disaster Declaration*

Source: <http://www4.ncdc.noaa.gov>

III.A.4.A. VULNERABILITY TO FLOODING

Floodplain mapping for this plan was done through digitizing FEMA FIRM Maps. There are currently many gaps in the data. In the fall of 2008 FEMA should be done completing the updates to the Fillmore County FIRM Maps. At that time, some of the information in this plan should be updated to reflect those updates. Mapping of the floodplains for each jurisdiction are included as part of Appendix III.

Fillmore County's 100-year floodplains encompass 22,909 acres, with most of the acres located in the rural portions of the county. However, floodplains have been

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delineated for 9 cities in Fillmore County. The following table describes the land within the 100 year floodplain in Fillmore County.

Table 32 - Land within 100-year floodplains

Community	Acres within Community	Floodplain Acres	Percentage of Community
Unincorporated Areas	≈524,387	19,135	4%
Chatfield	1,239	192*	16%*
Lanesboro	971	154	16%
Peterson	317	152	48%
Preston	1,521	275	18%
Rushford	1,072	243	23%
Rushford Village	≈19,731	2,404	12%
Spring Valley	1,605	208	13%
Whalan	197	84	42%
Mabel	308	62	20%

*Acres do not include area outside of Fillmore County

Sources: Fillmore County GIS, traced FEMA FIRM maps

The following table summarizes the overall vulnerability to flooding for Fillmore County as a whole. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Flooding	
Frequency	Likely – (Every 2 to 5 years)
Impact/Damage	Slight to Very Severe
Location	Floodplains/Riverine areas & areas with inadequate storm water capacity
Geographic Extent	County-wide
Duration	Hours to Weeks
Seasonal Pattern	Spring through Fall
Warning Time	3 – 6 hours

III.A.4.B. EFFECT ON STRUCTURES – INDUSTRIAL/COMMERCIAL, RESIDENTIAL AND PUBLIC FACILITIES -COUNTYWIDE

Flooding in Fillmore County affects numerous assets, including housing, commercial structures and public infrastructure, and impacts future growth. Each jurisdiction identified critical facilities and structures within their boundaries as well as specific sites that have been flooded in the past.

The tables illustrate a simple method used to quickly map a hazard. Specifically, the GIS application included selecting all parcels that touched a FEMA Specific Flood Hazard Area. This selection was made without reference to known 100-year floodplain elevations and not analyzed in relation to GIS contour information. Individual records of property are available through the particular governmental authority that administers the local National Flood Insurance Program. The specific location and elevation of the 100-year floodplain elevation would need to be field verified on a parcel by parcel basis to accurately determine the precise number of

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structures located within the 100 year floodplain boundary. Many of the structures located inside of the floodplain may have been elevated and may have FEMA Elevation Certificates indicating that they are elevated above the regulatory floodplain.

The values associated with buildings, land and taxes are taken from the County Assessor's Office database for 2008. Tables 21-28 illustrate the results of a general data query. This GIS analysis is broad and not site specific. Currently only Chatfield, Lanesboro, Peterson, Preston, Rushford, Rushford Village, Spring Valley, Whalan and Mabel have floodplain boundaries delineated by FEMA.

Table 33 - Fillmore County

Type	Parcels	Land Value	Building Value
Actively Engaged	16	\$2,947,500	\$77,800
AG SON/DAU-MOTH/FATH	12	\$1,322,200	\$303,000
Agricultural	1327	\$182,334,300	\$38,844,900
Commercial	11	\$282,600	\$513,200
Eagle Bluff Environmental	1	\$30,000	\$85,000
Church Service Prpty	5	\$30,000	\$120,600
Pilot Mound Lutheran Church	1	\$35,000	\$48,400
County Other	6	\$130,700	\$321,600
Mun LEnfrc/Fire/Adm	1	\$13,100	\$28,200
Municipal Other	7	\$38,445	\$0
Public Hunting Grounds	14	\$751,674	\$0
Public Burying Grnds	1	\$2,607	\$0
Qualify Golf Course	5	\$261,800	\$52,900
Residential 1 UNIT	12	\$337,900	\$260,300
Residential 1-3 UNITS	37	\$670,300	\$31,900
Residential/AG	1	\$52,800	\$92,300
Residential	243	\$12,098,000	\$17,953,900
Residential Seasonal	188	\$9,816,400	\$1,658,400
State Acquired	133	\$5,296,500	\$117,200
State Administered	3	\$59,631	\$0
State Public Prpty	2	\$161,700	\$59,500
Timberlands	35	\$1,109,600	\$0
TOTALS	2061	\$217,782,757	\$60,569,100

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Table 34 - City of Lanesboro

Type	Parcels	Land Value	Building Value
Residential - 4 or more Units	1	\$40,800	\$440,500
Agricultural	26	\$2,100,100	\$842,700
Commercial	37	\$775,400	\$1,914,800
Commercial Seasonal Recreation	3	\$73,100	\$377,300
Heimbygda Lodge 376	2	\$5,600	\$18,800
Lanesboro United Methodist Church	4	\$38,500	\$300,900
City Shop	2	\$61,800	\$117,200
Community Center	1	\$33,800	\$526,100
Fire Hall	1	\$72,000	\$190,400
Municipal Other	8	\$67,400	\$84,400
Parks & Rec	10	\$70,000	\$74,200
WWTP	1	\$38,000	\$20,600
Reservoir	1	\$140,600	\$82,500
Lanesboro Public School/Daycare Center	7	\$275,100	\$9,504,800
Residential 1 Unit	19	\$394,000	\$843,900
Residential 1-3 UNITS	1	\$10,000	\$0
Residential	29	\$581,100	\$1,682,900
Seasonal Recreation Residential	7	\$126,600	\$243,300
State Land	6	\$72,600	\$0
TOTAL		\$4,976,500	\$17,265,300

Table 35 - City of Peterson

Type	Parcels	Land Value	Building Value
Agricultural	11	\$682,100	\$122,700
Commercial	5	\$13,100	\$38,600
Commercial Seasonal	1	\$33,700	\$137,300
WWTP	1	\$35,000	\$62,300
Public	2	\$1,500	\$0
Park	2	\$19,100	\$21,300
Municipal Pub Service	4	\$42,600	\$114,800
Public School	2	\$65,500	\$1,101,500
Residential 1 UNIT	2	\$10,000	\$82,000
Residential 1-3 UNITS	3	\$11,700	\$900
Residential	51	\$521,700	\$3,501,200
Residential Seasonal	4	\$34,100	\$157,800
TOTAL		\$1,470,100	\$5,340,400

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Table 36 - City of Preston

Type	Parcels	Land Value	Building Value
Agricultural	12	\$1,105,400	\$613,600
Commercial	56	\$459,800	\$2,824,200
United Methodist Church	2	\$28,800	\$428,700
Fillmore County AGR Society	1	\$96,000	\$309,100
County Service Property	3	\$18,600	\$419,900
County Other	5	\$40,300	\$702,900
DNR Lands	6	\$96,900	\$0
Municipal Other	36	\$169,400	\$0
Municipal Pub Service	1	\$40,400	\$222,300
WWTP	2	\$20,800	\$225,000
Residential - 1 UNIT	29	\$257,400	\$1,049,500
Residential 1-3 UNITS	15	\$58,900	\$90,500
Residential 4 OR MORE UNITS	6	\$112,800	\$1,895,200
Residential	126	\$1,730,500	\$7,041,700
Seasonal Rec. Residential	5	\$192,200	\$156,800
State Lands	14	\$202,200	\$0
TOTAL	319	\$4,630,400	\$15,979,400

Table 37 - City of Rushford

Type	Parcels	Land Value	Building Value
AG SON/DAU-MOTH/FATH	1	\$16,200	\$0
Agricultural	13	\$395,600	\$45,400
Commercial	6	\$83,400	\$453,600
Root River Comm Church	1	\$23,200	\$613,000
Municipal Other	24	\$267,300	\$0
Public Burying Grnds	1	\$5,610	\$0
Public Schools	6	\$75,900	\$0
Residential 1 UNIT	5	\$22,800	\$64,500
Residential 1-3 UNITS	5	\$92,300	\$0
Residential	33	\$610,400	\$2,045,200
State Public Prpty	2	\$15,972	\$0
TOTALS	97	\$1,608,682	\$3,221,700

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Table 38 - City of Rushford Village

Type	Parcels	Land Value	Building Value
AG SON/DAU-MOTH/FATH	2	\$172,400	\$80,200
Agricultural	86	\$8,317,500	\$757,900
Commercial	12	\$160,000	\$971,500
Public Utility	1	\$3,500	\$17,200
Public Schools	3	\$204,200	\$0
Residential 1 UNIT	7	\$99,000	\$93,400
Residential/AG	1	\$31,500	\$98,300
Residential	38	\$860,000	\$2,542,500
Residential Seasonal	5	\$444,000	\$0
State Land	16	\$234,726	\$0
State Public Property	3	\$3,300	\$0
TOTALS	174	\$10,530,126	\$4,561,000

Table 39 - City of Chatfield

Type	Parcels	Land Value	Building Value
Agricultural	9	\$714,300	\$145,400
Commercial	1	\$7,500	\$4,400
Chatfield Brass Band	2	\$39,000	\$166,600
Municipal Other	4	\$701,000	\$0
WWTP	1	\$58,600	\$2,664,700
Residential (4 OR MORE UNITS)	1	\$36,000	\$90,000
Residential	33	\$920,600	\$2,832,500
Seasonal Residential	1	\$3,300	\$0
State Public Prpty	1	\$4,000	\$0
TOTALS	53	\$2,484,300	\$5,903,600

Table 40 - City of Spring Valley

Type	Parcels	Land Value	Building Value
Agricultural	21	\$1,830,300	\$130,500
Commercial	67	\$278,600	\$1,491,000
Church Lot	1	\$21,300	\$0
First Baptist Church	2	\$44,000	\$212,700
Assemblies of God Church	2	\$109,500	\$664,200
EXEMPT MISC	4	\$4,521	\$0
Municipal Other	35	\$329,100	\$994,700
Police & Fire	7	\$60,300	\$434,000
Residential 1 UNIT	8	\$101,000	\$289,300
Residential 1-3 UNITS	6	\$16,100	\$44,400
Residential 4 OR MORE UNITS	1	\$16,400	\$44,600
Residential - 4D 4 OR MORE UNITS	3	\$100,200	\$1,665,000
Residential	51	\$1,072,400	\$3,120,500
State Public Property	5	\$13,200	\$0
Tax Forfeit	1	\$2,500	\$0
TOTALS	214	\$3,999,421	\$9,090,900

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Table 41 - City of Whalan

Type	Parcels	Land Value	Building Value
Agricultural	11	\$1,130,000	\$3,253,000
Commercial	5	\$58,500	\$123,100
Commercial Seasonal	4	\$68,300	\$100,600
Whalan Lutheran Ladies Aid	1	\$9,000	\$63,200
EXEMPT MISC	1	\$7,352	\$0
Municipal Other	7	\$25,000	\$3,500
Municipal Pub Service	1	\$21,000	\$36,600
Residential 1 UNIT	4	\$62,400	\$133,300
Residential 1-3 UNITS	9	\$88,500	\$30,400
Residential	38	\$540,700	\$1,691,900
Residential Seasonal	11	\$123,800	\$550,700
State Acquired	11	\$99,000	\$0
TOTALS	103	\$2,233,552	\$5,986,300

Table 42 - City of Mabel

Type	Parcels	Land Value	Building Value
Actively Engaged	2	\$254,400	\$0
Agricultural	3	\$438,700	\$40,300
Commercial	6	\$34,000	\$40,800
Charitable Institute	1	\$20,000	\$54,100
St. Olaf Catholic Church	1	\$25,500	\$336,700
Municipal Other	5	\$57,200	\$6,900
Municipal Pub Service	1	\$37,200	\$224,500
Public Schools	2	\$183,300	\$1,654,400
Residential 1 UNIT	3	\$15,400	\$55,600
Residential 1-3 UNITS	2	\$14,700	\$20,700
Residential	27	\$344,100	\$1,683,300
TOTAL	53	\$1,424,500	\$4,117,300

Infrastructure. Fillmore County has several bridges, dams and roads that are located within the floodplain. The County has proposed to do an inventory of County road drainage infrastructure features, including bridges and culverts, to determine which sites have the greatest potential for temporary flood reduction.

Manufactured Homes/Mobile Home Parks. Each City was asked to indicate if there are mobile home parks, or manufactured home parks located within the floodplain. There are currently no such parks located within a floodplain in any jurisdiction. In Rushford, their mobile home park was destroyed during the 2007 flood.

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III.A.4.c. REPETITIVE LOSS STRUCTURES

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.

Each City was asked to identify structures that meet the definition as described above. Preston, Spring Valley, and Mabel indicated that they have repetitive loss structures. Repetitive loss structures are included in the hazard location maps included in the Appendix III.

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 8 residences and 4 commercial and 1 church building. Three of the residences have been purchased as part of their buy-out program.

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

III.A.4.c. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Floods can cause many cascading effects. Fire can break out as a result of dysfunctional electrical goods. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies.

Fire. Fire can occur due to infrastructure compromise of electrical and natural gas systems.

Hazardous Materials. Hazardous material releases can occur due to improper storage of materials in floodplains.

Infectious Disease. Infectious disease outbreaks are possible during prolonged flood events where floodwaters compromise areas sensitive to disease vectors. Flood water contains bacteria and viruses from soil, organic debris, and sewage systems along with fertilizers, pesticides, and other chemical contaminants.

Water Supply Contamination. Wastewater treatment plant failure can occur if facilities are not adequately protected from flooding or protection is compromised. Water supplies can become contaminated by the untreated wastes. Sewer back-up, and flood waters can contaminate wells through well cap or vent.

Transportation Disruption. Disruptions of transportation routes along roads, bridges, railroads and by river navigation can be disrupted due to inundation and/or substantial flow velocities.

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Power Outages. Power outages can occur if portions of the electrical grid are compromised by flood waters.

Landslides. Although landslides are usually attributed to rain events, washouts caused by flooding can create the potential for slope failure.

Communications Failure. Power outages that result from downed utility lines and infrastructure damages can result in communications failures.

III.A.4.D. PLANS AND PROGRAMS

State Floodplain Management Act. In 1969, the Minnesota Legislature enacted the State Floodplain Management Act (Minnesota Statutes, Chapter 103F). This Act stresses the need for a comprehensive approach to solving flood problems by emphasizing nonstructural measures, such as floodplain zoning regulations, flood insurance, flood-proofing, and flood warning and response planning. By law, Minnesota's flood prone communities are required to:

- 1) adopt floodplain management regulations when adequate technical information is available to identify floodplain areas; and
- 2) enroll and maintain eligibility in the National Flood Insurance Program (NFIP) so that the people of Minnesota may insure themselves from future losses through the purchase of flood insurance.

In 1987, the Floodplain Management Act was amended to establish a state cost-sharing grant program to help local government units plan for and implement flood hazard mitigation measures. The Department of Natural Resources (DNR) is the state agency with overall responsibility for implementation of the State Flood Plain Management Act.

County Zoning Ordinance. Fillmore County has, as a part of their zoning ordinance, a designated floodplain district that applies to all lands designated as flood plain within the jurisdiction of Fillmore County. The purpose of the Floodplain District "is to maintain the county's eligibility in the National Flood Insurance Program and to minimize potential losses due to periodic flooding including loss of life, loss of property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare."

Also included in Fillmore County's zoning ordinance are Shoreland District, Stormwater Management and Bluffland Areas ordinances that are meant to protect waterways and blufflands from soil erosion, enhance the quality of surface waters, and provide for the wise use of waters and related land uses.

Soil Erosion Control Ordinance. The purposes of the Fillmore County Soil Erosion Control Ordinance "are to encourage and guide the agricultural use of land in accordance with its capacities and to:

1. Control erosion caused by land-disturbing activities associated with all agricultural uses of land to rates no greater than soil loss tolerances;
2. Protect wetlands, rivers, streams, and ditches from excessive sedimentation resulting from land-disturbing activities associated with agricultural use of land;

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3. Abate and minimize impacts of excessive sedimentation to adjoining lands; and
4. Ensure proper maintenance of agricultural erosion control practices.”

City Ordinances. Several cities, including Chatfield, Spring Valley, Harmony, Peterson, Preston, Whalen, Mabel, Lanesboro, Preston, and Chatfield also have flood plain districts and/or floodplain ordinances and erosion control ordinances to protect property and the flood corridors from damages due to flooding. The City of Preston has created a “Green Plan” that focuses on acquisition of properties within the 100 year flood plain, and developing park areas between the river and the built environment. All of the cities that have FEMA designated floodplains have ordinances restricting development inside of the floodplain. None of the cities have any future development that is planned within a floodplain boundary.

Army Corps of Engineers. The Army Corps of Engineers is currently evaluating the Levee system in Rushford to determine if the Levee system is adequate to mitigate future flooding in Rushford.

FEMA Elevation Certificates. Rushford Village, Peterson, Whalan, Preston, Ostrander, Canton and Mabel all require FEMA Flood Elevation Certificates be obtained by developers. Lanesboro indicates that it uses FEMA FIRM maps to determine if a structure is properly elevated.

Department of Natural Resources (DNR), Division of Waters. The Minnesota Department of Natural Resources, Divisions of Waters has an advanced flood forecast and warning system. In addition, the DNR provides technical floodplain assistance through their local area hydrologists.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. During the course of a flood event in Fillmore County, the Emergency Management Coordinator works with local officials to ensure public health and safety and maintain transportation routes. Included are processes, guidelines and strategies for dealing with flood emergencies.

City Emergency Operations Plans. Every city except for Fountain, Preston and Mabel has Emergency Operations Plans that outline procedures for their City to follow in response to a variety of hazards.

National Flood Insurance Program (NFIP). In 1968, Congress created the National Flood Insurance Program in response to the rising costs of taxpayer funded disaster relief. The Federal Emergency Management Agency (FEMA), Mitigation Division manages the NFIP, and oversees the floodplain management components of the program, with state coordination through the Minnesota Department of Resources, Waters Division.

Participation in the NFIP is based on an agreement between local communities and the Federal Government that states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

Fillmore County, as well as Chatfield, Lanesboro, Mabel, Peterson, Preston, Rushford, Rushford Village, Spring Valley and Whalan are all participants in the National Flood

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Program. Harmony applied for participation in the NFIP in 2008. The following table lists the status of the cities in Fillmore County:

Table 43 - NFIP Status

City	NFIP Status
Canton, City	Not Applied
Chatfield, City	Participant
Fountain, City	Not Applied
Harmony, City	Applied
Lanesboro, City	Participant
Mabel, City	Participant
Ostrander, City	Not Applied
Peterson, City	Participant
Preston, City	Participant
Rushford Village, City	Participant
Rushford, City	Participant
Spring Valley, City	Participant
Whalan, City	Participant
Wykoff, City	Not Applied

FEMA Mitigation Grant Programs. FEMA's Mitigation Grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages. Currently, FEMA administers the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance (FMA) program, and the Pre-Disaster Mitigation (PDM) program, the Repetitive Flood Claims (RFC) program, and the Severe Repetitive Loss (SRL) program. The two new grant programs, RFC and SRL, are designed to reduce or eliminate the long-term risk of flooding to NFIP-insured structures, and thereby reduce the number of claims paid from the National Flood Insurance Fund (NFIF).

National Weather Service. The National Weather Service provides many storm prediction and flood monitoring applications. Fillmore County entered into a Cooperating Technical Partnership with the Federal Emergency Management Agency (FEMA) to modernize the Flood Insurance Rate Maps and accompanying Flood Insurance Study to a countywide digital format.

Severe Weather Warning System. Some of the cities have emergency sirens to warn residents in the event of severe summer weather. The County warning point alerts the 14 City warning points to activate the siren system in Fillmore County for either weather or hazardous materials incidents.

Severe Weather Shelters. Shelters are provided in some cities for residents that do not have basements, or live in areas that may be prone to damage due to severe weather.

Management and Restoration of Natural Plant Communities on State Trails - 1999-01 biennium. This Department of Natural Resources' project will enhance the ecological value of these recreation corridors and, thereby, contribute to the sustainability of the native landscape, heighten the quality of the recreation experience and foster environmental stewardship and education. In Fillmore County, Eco-Tech of Cannon Falls was awarded the contract to seed four acres of trail rights-

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of-way along the Harmony-Preston Valley State Trail with native grasses and forbs. The project was completed in November of 1999.

Buy Out Programs. Several cities including Spring Valley, Preston, and Mabel have started “buy out” programs to purchase homes and businesses that are located in the floodplain and have been repeatedly affected by flooding.

Erosion Control Cost-Share Grants - 1991-93 biennium. This program aids in the funding of conservation costs for soil erosion control and the protection of water quality. Lead agency: Board of Water and Soil Resources.

Radio. Station KFIL AM 1060 and FM 103.1 in Preston will broadcast all emergency management warnings for Fillmore County.

Television. Area television stations will broadcast emergency management warnings for Fillmore County including KTTC and KXLT in Rochester. Also available through cable is the EAS channel located out of LaCrosse, WI.

NRCS Spring Valley Creek Watershed Report. After the flooding in 2000, Spring Valley contacted the NRCS to determine if Spring Valley could obtain assistance through the Watershed Protection and Protection Act (PL-566). The study outlines several alternatives for flood prevention including:

- Flood proofing of selected flood-prone properties
- Installing 3 floodwater retarding dams
- Flood proofing selected properties and installing a floodway
- Installing dikes, floodwalls and a floodway
- Installing dikes, floodwalls and a floodway and installing a roadside flood storage site

III.A.4.E. GAPS AND DEFICIENCIES

There are many residences and business that are located within the floodplain throughout the County that are routinely affected by flooding. As state and federal funds become available, staff will work with willing sellers to purchase floodplain structures.

The County is addressing the obsolescence of the flood insurance rate maps and accompanying Flood Insurance Studies through a Cooperative Technical Partnership with the Federal Emergency Management Agency to modernize the FIRMS and FIS to a digital, countywide format. The digital flood insurance rate maps, (DFIRMS) flood insurance study and accompanying internet based floodplain analysis applications will increase the efficiency and accuracy of floodplain programs countywide. Currently, local tributaries have not been included in 100 year flood mapping.

Much of the housing stock in Fillmore County is old, and is susceptible to hazards because they are not kept up to current standards. The foundations in many of the residences are made of rock or other materials that are susceptible to “washing out” during a flood.

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Flash flooding of the tributaries occurs regularly and is more likely to occur than flooding of the Root River. Many of the area's tributaries have very little vegetation that protects its banks from erosion or to slow the flow of water.

Many of the culverts in the county are not sized appropriately. Often the culverts are too large, with very little retention, sending waters too quickly down stream. There are also structures, such as bridges, that impede the flow of water.

Many of the areas CRP lands are going into production creating the possibility for increased erosion and flood damage.

Currently, there is no governing body to address the watershed in Fillmore County.

Some of the cities do not have designated emergency evacuation routes.

III.A.5 HAZARD: LANDSLIDE

Landslides are the downward and outward movement of slopes. The term refers to various kinds of events, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and earth flows. Landslides may include any combination of natural rock, soil, or artificial fill, and are classified by the type of movement and the type of material. The types of movement are slides, flows, lateral spreads, and falls and topples (FEMA, 1997).

Below is a brief discussion of the various types of landslide movements. A combination of two or more landslide movements is referred to as a complex movement.

- **Slides** are downward displacements along one or more failure surfaces of soil or rock. The material may be a single intact mass or a number of pieces. The sliding may be rotational (turning about a point) or translational (movement roughly parallel to the failure surface).
- **Flows** are a form of rapid mass movement by loose soils, rocks, and organic matter, together with air and water that form slurry flowing rapidly downhill. Flows are distinguished from slides by high water content and velocities that resemble those of viscous liquids.
- **Lateral spreads** are large movements of rock, fine-grained soils (i.e., quick clays), or granular soils, distributed laterally. Liquefaction may occur in loose, granular soils, and can occur spontaneously due to changes in pore-water pressure or due to earthquake vibrations.
- **Falls and topples** are masses of rocks or material that detach from a steep slope or cliff that free-fall, roll, or bounce. Movements typically are rapid to extremely rapid. Earthquakes commonly trigger rock falls.

Almost any steep or rugged terrain is susceptible to landslides under the right conditions. The most hazardous areas are steep slopes on ridges, hill, and mountains; incised stream channels; and slopes excavated for buildings and roads. Slide potentials are enhanced where slopes are destabilized by construction or river erosion. Road cuts and other altered or excavated areas are particularly susceptible to landslides and debris flows. Rainfall and seismic shaking by earthquakes or blasting can trigger landslides.

Debris flows (also referred to as mudslides) generally occur during intense rainfall on water saturated soil. They usually start on steep hillsides as soil slumps or slides that

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liquefy and accelerate to speeds as great as 35 miles per hour. Multiple debris flows may merge, gain volume, and travel long distances from their source, making areas down slope particularly hazardous. Surface runoff channels along roadways and below culverts are common sites of debris flows and other landslides (USGS, 2000).

Landslides often occur together with other major natural disasters, such as the following, thereby exacerbating relief and reconstruction efforts:

- Floods and landslides are closely related and both involve precipitation, runoff, and ground saturation that may be the result of severe thunderstorms or tropical storms.
- Landslides into a reservoir may indirectly compromise dam safety or a landslide may even affect the dam itself.
- Wildfires may remove vegetation from hillsides, significantly increasing runoff and landslide potential.

History

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.

III.A.5.A. VULNERABILITY TO LANDSLIDES

Much of Fillmore County is rolling hills and bluffs containing slopes in excess of 28%. These slopes combined with soils that are susceptible to erosion, and fractured bedrock can result in mudslides and falls and topples when heavy rains occur. Mapping of steep slopes for each jurisdiction is included in the Appendix III. The following table summarizes the overall vulnerability to landslides. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Landslides	
Frequency	Unlikely -(Every 11 - 25 years)
Impact/Damage	Slight
Location	Steep slopes with erosive soils or rock outcrops on steep slopes
Geographic Extent	County-wide
Duration	Minutes
Seasonal Pattern	Spring through Fall
Warning Time	none

III.A.5.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Transportation Disruption. Disruptions of transportation routes along roads, bridges, railroads and by river navigation can be disrupted due to road blockages.

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III.A.5.C. PLANS AND PROGRAMS

County Zoning Ordinance. The County Zoning ordinance contains a Blufflands Areas ordinance that is meant to protect the area's blufflands from erosion through vegetative removal and grading restrictions. Also included in the performance standards for the Shoreland District are setbacks and other requirements meant to protect structures and the bluffs from erosion.

Blufflands Landscape - 1995-97 biennium. The blufflands in southeast Minnesota are rich with natural, scenic, cultural, historical and biological resources but they are increasingly threatened by population growth. The Department of Natural Resources is working with area communities to protect these resources while encouraging economic growth. The plan might include creating training manuals and landowner guides, changing local zoning regulations, establishing easements and buying key parcels of land to protect the blufflands. In Fillmore County, a management framework was developed for the scenic and biological resources of the Mississippi Valley blufflands landscape and to foster integrated decisions and public commitment to protection. Lead agency: Department of Natural Resources.

City Ordinances. The cities of Preston, Rushford, Rushford Village, Peterson, Whalan, Lanesboro, and Canton have an ordinance or verbiage in their zoning ordinance to prevent uncontrolled erosion, mud slides and runoff of surface waters likely to damage adjacent lands and properties, and to impose certain restrictions to prevent such consequences.

SWCD & NRCS. Both the SWCD and NRCS address soil erosion prevention in their goals and projects for Fillmore County.

III.A.5.D. GAPS AND DEFICIENCIES

There are many residences and buildings that are located along the bluffs in the county. Some of these structures may be vulnerable to land slides if the slopes and soils above them are susceptible.

Many of the cities do not have bluff lands ordinances, or erosion control ordinances to protect structures from landslides.

There is currently no study in place that would determine the susceptibility of an area to landslides

III.A.6 HAZARD: KARST/SINKHOLES & LAND SUBSIDENCE

Sinkholes are closed depressions that form by the solution of the underlying soluble bedrock and function as connections between surface and ground waters. Sinkholes are intermediate in size between larger karst features such as blind valleys and smaller karst features such as solution pits. In Fillmore County, sinkholes range from less than 3 feet to more than 100 feet in diameter and from 1 foot to about 60 feet in depth. The majority of them are 10 to 40 feet in diameter and 5 to 40 feet deep. Sinkholes are circular or elliptical with walls that range from nearly vertical through cone and bowl shapes to shallow dish-like shapes. In Fillmore County, sinkholes occur in all of the bedrock units between the Cedar Valley Group and the Jordan Sandstone.

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There are three types of potential problems associated with the existence or formation of sinkholes: subsidence, flooding, and pollution. The term subsidence commonly involves a gradual sinking, but it also refers to an instantaneous or catastrophic collapse. In Fillmore County, limestone and dolostone underlie most of the County. In southeastern Minnesota, carbonate rocks from the Cedar Valley Group down through the bottom of the Prairie du Chien Group, contain caves and other karst features. Because most of Minnesota is buried beneath a thick cover of glacial sediments, the karst landscape may not be apparent. In parts of Fillmore County, erosion has removed most of this glacial cover and exposed the carbonate bedrock. Counties known for karst features include parts of Fillmore, Rice, Dodge, and Mower, and most of Goodhue, Olmstead, Winona, Wabasha, Houston, and Fillmore. Fillmore County has more caves, sinkholes, and disappearing streams than all other Minnesota counties combined.

The change in the local environment affecting the soil mass causing subsidence and sinkholes collapse is called "triggering mechanism". Water is the main factor affecting the local environment that causes subsidence. The main triggering mechanisms for subsidence are:

- Water level decline
- Changes in groundwater flow,
- Increased loading, and
- Deterioration (abandoned coalmines)

Water level decline can happen naturally or be human induced. Main factors in water decline are:

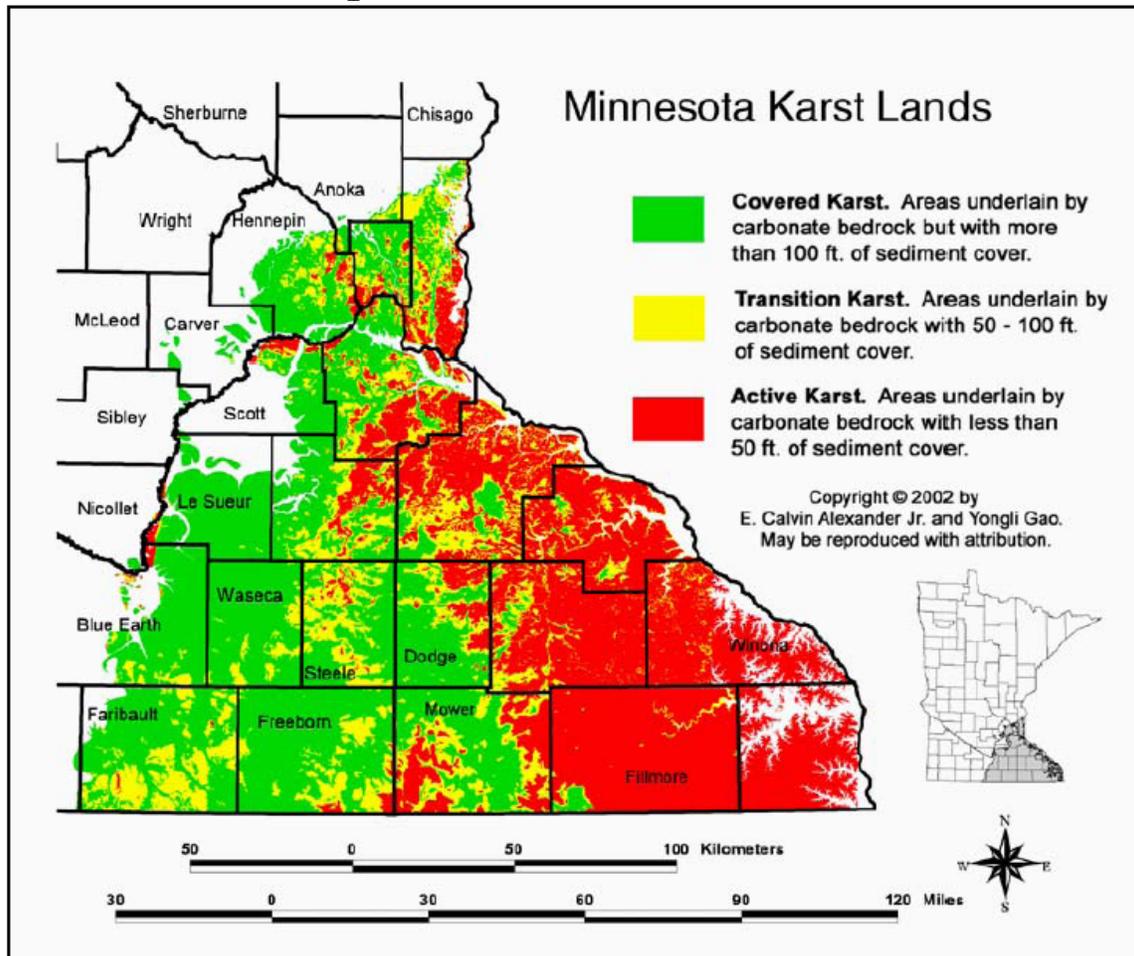
- Pumping of water from wells,
- Localized drainage from construction,
- Dewatering, and
- Drought

Changes in the groundwater flow include an increase in the velocity of groundwater movement, increase in the frequency of water table fluctuations, and increased or reduced recharge.

Increased loading causes pressure in the soil leading to failure of underground cavities and spaces. Vibrations caused by an earthquake, vibrating machinery and blasting, can cause structural collapse followed by surface settlement.

In Fillmore County, the primary natural causes of land subsidence are karst landforms. Karst landforms develop on or in limestone, dolomite, or gypsum by dissolution and are characterized by the presence of features such as sinkholes, underground (or internal) drainage through solution-enlarged fractures (joints), and caves. Karst landforms can be hazardous because of the sinkholes that form there and for the ease with which pollutants can infiltrate into the water supply. The following figure shows the Karst features in southeastern Minnesota.

Figure 19 - Minnesota Karst Lands



Source: University of Minnesota, Minnesota Geological Survey

History

Fillmore County has been called the “Karst Capital of Minnesota.” With over 6000 sinkholes and 850 springs that have been mapped, the county is believed to have more karst features than the rest of southeast Minnesota combined.

Many sinkholes, which form when the land surface collapses into subsurface voids formed in the slowly dissolving rock, occur in lines on the uplands and increase in number and size near large valleys. Most of the sinkholes occur in rural areas where their main impact is rendering land unsuitable for row-crop agriculture.

Sinkholes and other karst features create complex interconnections between surface water and ground water. Thin soils overlying fractured carbonate bedrock and sinkholes that bypass the soil filtration process allow contaminants to enter ground water with relative ease. Once in the subsurface, contaminants can move quickly with ground water through the enlarged conduits in a karst system potentially affecting drinking water wells which draw water from surficial karst aquifers.

In Minnesota, three of the area’s 22 municipal sewage lagoons have collapsed due to the Karst geology in the region, the latest in 1992 according to Dr. George Huppert, Professor of Geology and Earth Science at the University of Wisconsin-LaCrosse.

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Also, according to Dr. Huppert, there are 990 feedlots in Fillmore County and approximately 20 percent of them are within 1,000 feet of a known sinkhole.

For over a century, many of Fillmore County’s sink holes were improperly but routinely used for the disposal of wastes. In the last fifteen years, public education efforts by a wide variety of individuals and organizations and an effective mix of community involvement and legal processes have significantly and visibly reduced the incidence of waste disposal in sinkholes.

Any facility may be structurally damaged if a sinkhole opens under or adjacent to it. Home owners have experienced economic losses from sinkholes collapsing near or under house foundations, roads, or sewer lines. Water retention structures, such as lagoons and ponds, are highly susceptible to sinkhole collapse (Aley and others, 1972). A number of ponds in Fillmore County have failed due to sinkhole formation. Animal-waste storage facilities in Fillmore County and municipal waste treatment facilities elsewhere in southeastern Minnesota (Alexander and others, 1993) have been damaged when sink holes developed catastrophically.

III.A.6.A. VULNERABILITY TO SINKHOLES & LAND SUBSIDENCE

Mapping of sinkholes and springs for each jurisdiction is included in Appendix III. The following table summarizes the overall vulnerability to sinkholes & land subsidence. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Sinkholes & Land Subsidence	
Frequency	Likely - (>10% but <100% probable in next year, or at least one chance in 10 years)
Impact/Damage	Moderate
Location	County-wide
Geographic Extent	County-wide
Duration	None
Seasonal Pattern	none
Warning Time	none

III.A.6.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Sinkholes and land subsidence can have many cascading effects depending on where they occur. Land subsidence can cause many problems including: (1) changes in elevation and slope of streams, canals, and drains; (2) damage to bridges, roads, railroads, storm drains, sanitary sewers, canals, and levees; (3) damage to private and public buildings; (4) failure of well casings from forces generated by compaction of fine-grained materials in aquifer systems; and (4) groundwater contamination due to the bypassing of the soil filtration process.

III.A.6.B.1 RADON GAS

Radon is a naturally occurring odorless, tasteless, colorless radioactive gas, which is produced by the decay of uranium and radium in the soil. Uranium is present in rocks such as granite, shale, phosphate, and pitchblende. Uranium breaks down into radium, which then decays into radon. Radon gas is in soil, air, and water in varying amounts. Radon can enter your home from the surrounding soil and accumulate in living areas, especially during the winter months, when homes are sealed and

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insulated against the cold. Radon typically accumulates in basements and other areas that are in direct contact with the soil.

Exposure to radon over an extended period of time can increase your long-term risk of developing lung cancer. Radon is the second-leading cause of lung cancer deaths nationwide. The Environmental Protection Agency (EPA) has estimated that 20,000 people a year die of lung cancer caused by radon. Radon in the air is inhaled into the lungs, where it undergoes radioactive decay causing damage to DNA in lung tissues. If lung tissue is unable to repair DNA correctly, the damage may result in lung cancer. Individuals who smoke and have high radon levels in their homes are at even higher risk for developing radon-induced lung cancer.

Nationally, one in fifteen homes (6.7%) is estimated to have high radon levels. In Minnesota, one out of every three (33.3%) homes has high radon levels. Of the homes tested in Fillmore County, 50% of them have radon levels greater than 4 pCi/L. Radon is measured in picocuries per liter (pCi/L), a measurement of radioactivity. The EPA, U.S. Surgeon General’s Office, and the Minnesota Department of Health recommend that homes be tested and if the radon level is over 4 pCi/L it should be fixed. The following table depicts Fillmore County average Radon concentrations by township:

Sampled October 1, 2003 to July 9, 2008 (N = 1,068)

SUMNER (n = 3) 17.3 pCi/L	JORDAN (n = 10) 8.4 pCi/L	CHATFIELD (n = 28) 6.6 pCi/L	PILOT MOUND (n = 16) 8.9 pCi/L	ARENDAHL (n = 35) 10.4 pCi/L	RUSHFORD VILLAGE (n = 158) 3.4 pCi/L
SPRING VALLEY (n = 97) 9.5 pCi/L	FILLMORE (n = 43) 6.2 pCi/L	FOUNTAIN (n = 43) 7.8 pCi/L	CARROLTON (n = 111) 8.4 pCi/L	HOLT (n = 45) 3.5 pCi/L	NORWAY (n = 22) 4.3 pCi/L
BLOOMFIELD (n = 64) 5.1 pCi/L	FORESTVILLE (n = 35) 19.4 pCi/L	CARIMONA (n = 18) 12.5 pCi/L	PRESTON (n = 79) 7.3 pCi/L	AMHERST (n = 14) 8.8 pCi/L	PREBLE (n = 7) 8.6 pCi/L
BEAVER (n = 19) 3.4 pCi/L	YORK (n = 13) 6.4 pCi/L	BRISTOL (n = 17) 5.0 pCi/L	HARMONY (n = 64) 5.6 pCi/L	CANTON (n = 54) 8.0 pCi/L	NEWBERG (n = 73) 5.3 pCi/L

III.A.5.c. PLANS AND PROGRAMS

Mapping. The Karst area, along with over 6000 Sinkholes and springs, has been mapped as part of the Geologic Atlas Series of Fillmore County. Sinkhole probability, has also been mapped as part of the project.

Manure lagoons. In Minnesota's karst geology, dairy manure lagoons are permitted as long as there are no more than four sinkholes within 1,000 feet and the bedrock is

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more than 10 feet down. In addition, feed lots may not be built within 300 feet of any sinkhole. Hog manure pits must be lined with cement.

Minnesota PCA. The Minnesota PCA conducted research and prepared a report on Karst areas in Minnesota, and outlined procedures for remediation of petroleum spills in those areas. http://www.pca.state.mn.us/programs/lust_p.html

Karst Education for Southeastern Minnesota - 1999-01 biennium. A unique feature of southeastern Minnesota's landscape is its "karst topography" - landscape resulting from the interaction of water and limestone-based bedrock. This rock is very porous, making area groundwater supplies particularly susceptible to contamination. The Southeast Minnesota Water Resources Board used this grant to develop teacher workshops, educational materials and a traveling exhibit that demonstrate the connections between land use and ground water contamination. The exhibit "Karst - A Special Landscape that Needs Special Care" is housed at Lanesboro's Eagle Bluff Environmental Learning Center between visits to other locations.

Local Initiatives Grants Program - 1999-01 biennium. Appropriations from the Trust Fund for this project allowed the Department of Natural Resources to fund the Natural and Scenic Area Grants program, the Conservation Partners Grants program and the Environmental Partnerships Grants program during the biennium. More than 140 different projects across the state were approved for matching grants from July of 1999 through June of 2001.

In Fillmore County, grants were received by the City of Wykoff for the construction of a storm-water treatment system for the Meisner sinkhole and by the Mower Soil and Water Conservation District to continue testing water from the Upper Iowa River for turbidity, atrazine, membrane fecal coliform, nitrates and ammonia.

South Branch Root River Watershed Project. The South Branch Root River Watershed Project had its beginnings in 1998 when a \$61,500 Clean Water Partnership grant from the MN Pollution Control Agency was awarded to the project to do a Phase I Diagnostic Study. The Phase I study included:

- water quality monitoring,
- collecting land use information, and
- conducting karst studies (dye traces to delineate the boundaries of the areas contributing water to springs, water quality monitoring of springs, and seismic investigations to detect buried sinkholes and underground caverns).

That study concluded in 2002, and the information was used to develop an implementation plan to address the sources of water pollution.

Radon testing. Residents are encouraged to have their homes tested for Radon gas.

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III.A.5.D. GAPS AND DEFICIENCIES

Many of the County's sinkholes are as of yet unmapped.

Manure lagoons should also be mapped and the area surrounding them should be checked for sinkhole susceptibility.

Testing for Radon gas is currently not required nor are there any requirements in state or local building codes that specify construction to resist radon gas from entering homes.

III.A.7 DROUGHT

Drought is a normal part of virtually every climate on the planet, including areas of both high and low normal rainfall. Drought is the result of a natural decline in the expected precipitation over an extended period of time, typically one or more seasons in length. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity (FEMA, 1997). Drought is a complex natural hazard which is reflected in the following four definitions commonly used to describe it:

- **Meteorological drought** is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- **Hydrological drought** is related to the effects of precipitation shortfalls on streamflows and reservoir, lake, and groundwater levels.
- **Agricultural drought** is defined principally in terms of soil moisture deficiencies relative to water demands of plant life, usually crops.
- **Socioeconomic drought** associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. They may also be called a water management drought.

A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. Due to its multi-dimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering of effects of an event after its apparent end. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast with other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by many governments. Droughts may cause a shortage of water for human and industrial consumption, hydroelectric power, recreation, and navigation. Water quality may also decline and the number and severity of wildfires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and higher unemployment.

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History

Fillmore County experienced drought conditions that affected crops in the late 1980's and the 1930's. Minor agricultural drought occurs every couple of years resulting in at least some crop failure in parts of the county.

Drought is not confined to any particular portion of Fillmore County but severe drought is uncommon, although Fillmore County has experienced prolonged periods without rainfall. The most severe in climatic records occurred during the 1930s. None so prolonged has been experienced since.

Fillmore County agriculture, that sector of its economy most susceptible to drought, has never experienced a total crop failure.

Individual shallow wells have occasionally failed, requiring the affected parties to re-drill to reliable aquifers. To date, no other activities, areas, or infrastructure, including public water supply, have been affected by drought in the county.

III.A.7.A. VULNERABILITY TO DROUGHT

The future incidence of drought is highly unpredictable, and may also be localized, making it difficult to determine probability with any accuracy. Interpreting what is "too dry" or what is "too long" is difficult. What we do know is that when a serious hydrologic imbalance occurs in Minnesota, soil moisture reserves, groundwater supplies, lake levels, and stream flows are negatively influenced. Water-dependent industries including agriculture, public utilities, forestry, and tourism are profoundly affected. Because long-term (months/years) climate variations are unpredictable, drought is largely unpredictable. The County's agricultural areas are most at risk from drought conditions.

Since all jurisdictions are considered to be equally affected by drought, each jurisdiction will not be assessed independently. The following table summarizes the overall vulnerability to drought. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Drought	
Frequency	Occasional – (between 1-10% probable in next year, or at least one chance in 100 years)
Impact/Damage	Slight to Moderate
Location	County-wide
Geographic Extent	County-wide
Duration	Weeks to Years
Seasonal Pattern	All year
Warning Time	none

III.A.7.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Extreme drought has not been experienced in Fillmore County, but the effects of extreme drought can be catastrophic, impacting economic and environmental resources including:

- Death of livestock

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- Reduced crop yields
- Wildfires
- Shortages of water for industrial users
- Desertification
- Dust storms, when drought hits an area suffering from desertification and erosion
- Malnutrition, dehydration and related diseases
- Famine due to lack of water for irrigation
- Social unrest
- Mass migration, resulting in internal displacement and international refugees
- War over natural resources, including water and food
- Reduced electricity production due to insufficient available coolant

III.A.7.C. PLANS AND PROGRAMS

Watering Restrictions. The municipalities in Fillmore County may have ordinances in place that allow them to enforce watering restrictions and bans.

III.A.7.D. GAPS AND DEFICIENCIES

Fillmore County has no estimates of annual recharge rates or the capacities of the aquifer.

Water conservation provisions and use restrictions in times of drought are not included in county or city ordinances.

III.A.8 HAZARD: WILDFIRE

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may fill the area for miles around. Wildfires can be human-caused through acts such as arson or campfires, or can be caused by natural events such as lightning. Wildfires can be categorized into four types:

- **Wildland fires** occur mainly in areas under federal control, such as national forests and parks, and are fueled primarily by natural vegetation.
- **Interface or intermix fires** occur in areas where both vegetation and structures provide fuel. These are also referred to as urban-wildland interface fires.
- **Firestorms** occur during extreme weather (e.g., high temperatures, low humidity, and high winds) with such intensity that fire suppression is virtually impossible. These events typically burn until the conditions change or the fuel is exhausted.
- **Prescribed fires** and prescribed natural fires are intentionally set or natural fires that are allowed to burn for beneficial purposes.

The following factors contribute significantly to wildfire behavior:

- **Topography:** As slope increases, that is the divergence of the terrain from horizontal, the rate of wildfire spread increases. South facing slopes are also subject to greater solar radiation, making them drier and thereby intensifying wildfire behavior. However, ridgetops may mark the end of wildfire spread, since fire spreads more slowly or may even be unable to spread downhill.
- **Fuel:** Weight and volume are the two methods of classifying fuel, with volume also referred to as fuel loading (measured in tons of vegetative material per

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acre). Each fuel is assigned a burn index (the estimated amount of potential energy released during a fire), an estimate of the effort required to contain a wildfire, and an expected flame length. The fuel's continuity is also an important factor, both horizontally and vertically.

- **Weather:** The most variable factor affecting wildfire behavior is weather. Important weather variables are temperature, humidity, wind, and lightning. Weather events ranging in scale from localized thunderstorms to large fronts can have major effects on wildfire occurrence and behavior. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildfire activity. By contrast, cooling and higher humidity often signals reduced wildfire occurrence and easier containment.

If not promptly controlled, wildfires may grow into an emergency or disaster. Even small fires can threaten lives, resources, and destroy improved properties. It is also important to note that in addition to affecting people, wildfires may severely affect livestock and pets. Such events may require the emergency watering/feeding, shelter, evacuation, and even burying of animals.

The indirect effects of wildfires can also be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams thereby enhancing flood potential, harming aquatic life and degrading water quality. Lands stripped of vegetation are also subject to increased landslide hazards.

Forest fires and wildfires can occur at any time of day and during any month of the year. The season length and peak months may vary appreciably from year to year. Land use, vegetation, amount of combustible materials present, and weather conditions such as wind, low humidity, and lack of precipitation are the chief factors determining the number of fires and acreage burned. Generally, fires are more likely when vegetation is dry from a winter with little snow and/or a spring and summer with sparse rainfall.

Forest fires and wildfires are capable of causing significant injury, death, and damage to property. According to landcover maps, much of Fillmore County is covered with woods and grasses. The potential for property damage from fire increases each year as more recreational properties are developed on wooded land and increased numbers of people use these areas. Fires can extensively impact the economy of an affected area, especially the logging, recreation and tourism industries, upon which Fillmore depends. Major direct costs associated with forest fires or wildfires are the salvage and removal of downed timber and debris and the restoration of the burned area. If burned-out woodlands and grasslands are not replanted quickly to prevent widespread soil erosion, then landslides, mudflows, and floods could result, compounding the damage.

History

The county has large areas covered by Forest and grasslands that have the potential for wildfire. According to the State DNR, since 1997 an average of 5 fires a year, accounting for approximately 117 acres of woodlands, have been burned as a result of some type of wildland or prescribed fire. There has not been an instance of a major wildfire in Fillmore County.

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III.A.8.A. VULNERABILITY TO WILDFIRE

Like most weather-related phenomena, wildfire probability cannot be accurately predicted in the short-term. It is reasonable to assume that wildfire incidence will remain stable over the long-term, bearing in mind that weather patterns (in particular periods of drought and very low humidity); fuel load, insect infestations and human behavior can all greatly influence near-term probabilities.

Since all jurisdictions are considered to be equally affected wildfires, each jurisdiction will not be assessed independently. The following table summarizes the overall vulnerability to wildfire. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Wildfire	
Frequency	Seldom – (less than 1% chance in 100 years)
Impact/Damage	Slight
Location	Forested and grassland areas
Geographic Extent	County-wide
Duration	Hours to Days
Seasonal Pattern	Spring to Fall
Warning Time	none

III.A.8.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

The indirect effects of wildfires can also be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways, and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams thereby enhancing flood potential, harming aquatic life and degrading water quality. Lands stripped of vegetation are also subject to increased landslide hazards.

Forest fires and wildfires are capable of causing significant injury, death, and damage to property. Fires can extensively impact the economy of an affected area, especially the logging, recreation and tourism industries, upon which cities in Fillmore County depend. Major direct costs associated with forest fires or wildfires are the salvage and removal of downed timber and debris and the restoration of the burned area. If burned-out woodlands and grasslands are not replanted quickly to prevent widespread soil erosion, then landslides, mudflows, and floods could result, compounding the damage.

Flooding and erosion. Major wildfires can completely destroy ground cover, which can cause heavy erosion and loss of all vegetation. If heavy rains follow a major fire, flash floods, landslides and mudflows can occur, since vegetation is essential in deterring flooding during heavy rainfalls or spring runoff.

Hazardous materials. Major wildfires that reach storage or transportation facilities can cause explosion or rupture of storage structures with releases of hazardous materials.

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III.A.8.C. PLANS AND PROGRAMS

Zoning. The city zoning departments, which include the city building inspector, regulates the development of new housing. The departments also are in charge of enforcing safety restrictions including setbacks, lot coverage, depth and structure height. In addition, the Unified Building Code sets standards for roofing. The city building inspector is responsible for inspecting residential structures, while the fire marshal inspects commercial structures for potential fire hazards.

DNR information and training. DNR maintains current statewide map information on seasonal wildfire risks. Firefighters in Fillmore County are encouraged to participate in annual wildfire training classes offered by the Minnesota Department of Natural Resources-Forestry Department. The DNR also works with firefighters in promoting their Fire smart program, which is a fire prevention program involving local public schools.

State land management. The DNR operates and regulates the Forestville/Mystery Cave State Park which is within Fillmore County and manages the Minnesota Memorial Hardwood State Forest, an expansive natural area within Fillmore County. The DNR has established procedures to address wildfires within these areas.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included are processes, guidelines and strategies for dealing with emergencies.

III.A.8.D. GAPS AND DEFICIENCIES

There has not been a recent countywide assessment of areas with significant wildfire potential, particularly those with proximity to urban areas.

There is an opportunity to review mutual aid agreements for wildfire provisions among county firefighters.

III.A.9 HAZARD: INFECTIOUS DISEASE

Infectious diseases have the potential to affect any form of life. Some infectious diseases that were thought to have been eradicated have re-emerged. New strains of some infectious diseases, such as the flu, present seasonal threats to the populace and require continuous monitoring. Widespread epidemics are almost non-existent in the United States. An "epidemic" is defined as a disease that occurs suddenly in numbers clearly in excess of normal expectancy, especially infectious diseases, but is applied also to any disease, injury, or other health-related event occurring in such outbreaks. If an epidemic event were to occur, deaths could be in the many hundreds of thousands across the nation. If the health of the general public is perceived to be threatened on a large scale, riots or states of lawlessness are a possibility.

In the years following World War II, life-threatening bacterial diseases such as tuberculosis and typhoid fever were cured by antibiotics. Dreaded diseases such as polio, whooping cough, and diphtheria could be conquered through vaccination. Thus, it became possible to imagine a world without infectious diseases. We now

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know that such optimism was premature. New strains of influenza have greater resistance to antibiotics. Many new infectious diseases, such as Acquired Immunodeficiency Syndrome [AIDS], are constantly emerging. In 1997, an avian strain of influenza (H5N1) that had never before attacked humans began to kill previously healthy people in Hong Kong. This crisis raised the specter of an influenza pandemic similar to the one that killed 20 million people in 1918. Although no cases of animal or human illness have been identified in the U.S., the avian H5N1 influenza virus is spreading rapidly in birds and animals in other parts of the world. Such examples remind us that we are barely one step ahead of the microbes and underscores our need for a strong and vigilant public health system.

III.A.9.A. EMERGING AND RE-EMERGING DISEASES

Tuberculosis

Tuberculosis (TB) is caused by *Mycobacterium tuberculosis* bacteria and is spread from person-to-person through the air. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys or the spine. TB bacteria enter the air when a person with TB of the lungs or throat coughs or sneezes. When a person inhales air that contains TB bacteria, he or she may become infected. People with TB infection do not feel sick and do not have any symptoms. However, they may develop TB disease at some time in the future. The general symptoms of TB include feeling sick or weak, weight loss, fever and night sweats. The symptoms of TB of the lungs include coughing, chest pain, and coughing up blood. Other symptoms depend on the part of the body that is affected. TB infection is usually treated with 9 months of one antibiotic, and TB disease is generally treated with multiple antibiotics for a period of 6 months or longer.

Much of the tuberculosis occurring in Fillmore County and elsewhere in Minnesota is in foreign-born persons from areas of the world where TB is common. Proper screening of newly-arrived foreign-born persons and others with risk of tuberculosis, along with appropriate treatment, is crucial for TB control.

Individual cases of TB are investigated to identify contacts and possible source of infection. Contacts are screened for evidence of TB infection or disease using a concentric circle approach. Screening results determine the scope of the investigation. Infected contacts are encouraged to receive treatment to prevent development of TB, and those found to have TB disease are treated and are also investigated.

Influenza

Influenza (flu) is caused by viruses that attack the respiratory tract (nose, throat and lungs). It spreads via droplets produced by coughing and sneezing. It usually spreads from person-to-person, though occasionally people become infected by touching something with virus on it and then touching their mouth or nose. Influenza disease usually comes on suddenly and may include: fever (usually high), headache, extreme tiredness, dry cough, sore throat, runny or stuffy nose, and muscle aches. It can cause mild to severe illness, and at times can lead to death.

Types A and B influenza viruses cause epidemics of disease almost every winter. In the United States, these epidemics cause illness in 10 to 20 percent of the population and are associated with an average of 20,000 deaths and 114,000 hospitalizations per year. Annual influenza vaccination can prevent illness from A and B influenza. Each winter's flu vaccine is formulated to protect against the A and B strains that are

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expected to be circulating that season. It takes several months for manufacturers to produce the vaccine, which is prepared using hens' eggs. Some influenza strains can be treated with antiviral medications.

Influenza A viruses are found in many different animals, including wild birds, ducks, chickens, pigs, whales, horses, and seals, while influenza B viruses circulate widely only among humans. Wild birds are the primary natural reservoir for all subtypes of influenza A viruses and are thought to be the source of influenza A viruses in all other animals. Most flu viruses cause little or no illness in birds; however, the range of symptoms in birds varies greatly depending on the particular virus strain. Infection with certain avian influenza A viruses can cause widespread disease and death among some species of wild birds and domestic fowl. While it is unusual for people to be infected with flu viruses directly from animals, sporadic human infections and outbreaks caused by some avian influenza A viruses have been reported.

Pigs are susceptible to avian, human, and swine influenza viruses and may become infected with flu viruses from different species at the same time. If this happens, it is possible for the genes of the viruses to mix and create a new influenza virus. If the resulting new virus is able to infect humans, people would have little or no immune protection against it. If the virus could be transmitted easily from person-to-person, an influenza pandemic could occur. Control of pandemic influenza would rely on mass dispensing of antiviral medication (if effective against the strain) and vaccine (once it is developed and manufactured). Since the entire population would need medications and/or vaccine, health officials would prioritize based on the epidemiology of the disease and the need to maintain essential services.

Severe Acute Respiratory Syndrome (SARS)

Severe acute respiratory syndrome (SARS) is a viral respiratory illness. SARS generally begins with a high fever, and other symptoms may include headache, an overall feeling of discomfort, and body aches. Some people also have mild respiratory symptoms, and about 10-20 percent have diarrhea. After 2 to 7 days, SARS patients may develop a dry cough. Most patients develop pneumonia. There is no specific treatment for SARS.

SARS seems to spread primarily through close person-to-person contact. The SARS virus is thought to be transmitted most readily by respiratory droplets produced when an infected person coughs or sneezes. The virus can also spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eyes. In addition, it is possible that the SARS virus might spread more broadly through the air or by other ways that are not now known.

SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained. The most recent human cases of SARS were reported in China in April 2004 in an outbreak resulting from laboratory-acquired infections. Public health organizations monitor the SARS situation globally.

Outbreaks of SARS are controlled by isolating ill persons, identifying their contacts, and placing those contacts in quarantine for the length of the incubation period. If the contacts develop illness during this time, they are placed in

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isolation; if they remain healthy, they are released from quarantine.

Smallpox

Smallpox is caused by the variola virus and is spread from person-to-person, generally by direct and fairly prolonged face-to-face contact. Smallpox also can be spread through direct contact with infected bodily fluids or contaminated objects such as bedding or clothing. Rarely, smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses, and trains. Humans are the only natural hosts, and smallpox is not known to be transmitted by insects or animals. Historically, smallpox has an overall fatality rate of about 30 percent; though some forms of it are nearly always fatal. There is no specific treatment for smallpox, and the only prevention is vaccination.

Smallpox outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally-occurring case in the world was in Somalia in 1977. After the disease was eliminated from the world, routine vaccination against smallpox among the general public was stopped. However, smallpox is considered a Category A disease, and it has been thrust to the forefront of public concern and fear. In Minnesota, some local public health departments and hospitals participated in a targeted smallpox vaccination program in 2003.

A single case of smallpox is considered a public health emergency. Smallpox is controlled by isolating ill persons, identifying their contacts, vaccinating contacts, and placing contacts in quarantine for the length of the incubation period. If the contacts develop illness during this time, they are placed in isolation; if they remain healthy, they are released from quarantine.

Anthrax

Anthrax is caused by spores produced by *Bacillus anthracis* bacteria. There are three types of anthrax, skin (cutaneous), lungs (inhalation), and digestive (gastrointestinal). The symptoms of anthrax depend on the type of the disease:

Cutaneous: The first symptom is a small sore that develops into a blister. The blister then develops into a skin ulcer with a black area in the center. The sore, blister, and ulcer do not hurt.

Gastrointestinal: The first symptoms are nausea, loss of appetite, bloody diarrhea, and fever, followed by severe stomach pain.

Inhalation: The first symptoms are like cold or flu symptoms and can include a sore throat, mild fever and muscle aches. Later symptoms include cough, chest discomfort, shortness of breath, tiredness and muscle aches.

Humans can become infected with anthrax by handling products from infected animals, by breathing in anthrax spores from infected animal products (like wool), or by eating undercooked meat from infected animals. Anthrax is classified as a Category A agent and can be used as a bioterrorism weapon. This happened in the United States in 2001. Anthrax was deliberately spread through the postal system by sending letters with powder containing anthrax.

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Anthrax is not known to spread from person-to-person. It can be treated with antibiotics. There is a vaccine to prevent anthrax, but it is not yet available for the general public. Anyone who may be exposed to anthrax, including certain members of the U.S. armed forces, laboratory workers, and workers who may enter or re-enter contaminated areas, may get the vaccine. In the event of an attack using anthrax as a weapon, exposed persons are vaccinated and are given antibiotics.

Pneumonic Plague

Plague is caused by *Yersinia pestis* bacteria. These bacteria are found in rodents and their fleas in many areas of the world, including the United States. Pneumonic plague is one of several forms of plague. It occurs by breathing in the bacteria in respiratory droplets that are produced by persons (or animals) with pneumonic plague. Plague is considered a Category A agent, because infection can occur by inhaling aerosolized bacteria released in a bioterrorism attack.

With pneumonic plague, the first signs of illness are fever, headache, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. The pneumonia progresses for 2 to 4 days and may cause respiratory failure and shock. Without early treatment, patients may die. To reduce the chance of death, appropriate antibiotics must be given within 24 hours of first symptoms. Plague vaccine is not currently available for use in the United States. In the event of an attack using plague as a weapon, exposed persons are given antibiotics.

Tularemia

Tularemia is caused by *Francisella tularensis* bacteria. These bacteria are found in animals (especially rodents, rabbits, and hares) in the United States. People can develop tularemia by being bitten by an infected tick, deerfly, or other insect; handling infected animal carcasses; eating or drinking contaminated food or water; or breathing in the bacteria. Tularemia is considered a Category A agent, and infection can occur by inhaling aerosolized bacteria released in a bioterrorism attack. Tularemia is not known to be spread from person-to-person.

The symptoms of tularemia include sudden fever, chills, headache, diarrhea, muscle aches, joint pain, dry cough, and progressive weakness. Some people develop pneumonia, with chest pain and bloody sputum. They may have trouble breathing and even stop breathing. Other symptoms depend on how a person was exposed to the bacteria and can include sores on the skin or mouth, swollen and painful lymph glands, swollen and painful eyes, and a sore throat.

People who have been exposed to tularemia bacteria should be treated as soon as possible, because the disease can be fatal if it is not treated promptly with the proper antibiotics. In the event of an attack using tularemia as a weapon, exposed persons are given antibiotics.

Viral Hemorrhagic Fevers

Viral hemorrhagic fevers (VHFs) are a group of Category A illnesses that are caused by several families of viruses. Examples are Marburg, Ebola, and Lassa. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many cause severe, life-threatening disease. Specific symptoms vary by the type of VHF, but initial symptoms often include fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. Patients with severe VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or

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ears. Severely ill patients may also show shock, nervous system malfunction, coma, delirium, and seizures. Some types of VHF are associated with renal (kidney) failure. Patients receive supportive therapy, but generally there is no other treatment or established cure for VHFs.

These viruses are carried by rodents or are spread by ticks or mosquitoes. Humans can become infected through mosquito or tick bites; crushing a tick; or contact with urine, fecal matter, saliva, or other body excretions from infected rodents. Sometimes other animals may become infected, and humans can become infected when they care for or slaughter those animals. Some VHF viruses can spread from person-to-person. This can occur directly, through close contact with infected people or their body fluids. It can also occur indirectly, through contact with objects contaminated with infected body fluids (for example, contaminated syringes and needles).

Because each virus is associated with a particular host, the virus and the disease it causes usually occur only where the host species live. A person could become infected in an area where the virus occurs naturally and then travel elsewhere and infect other people at the subsequent location. Occasionally a person becomes infected by a host that has been exported from its native habitat.

Individual cases and outbreaks of viral hemorrhagic fever are primarily controlled by isolating ill persons, identifying their contacts, and placing those contacts in quarantine or under monitoring for the length of the incubation period. If the contacts develop illness during this time, they are placed in isolation; if they remain healthy, they are released from quarantine/monitoring.

Pertussis (Whooping Cough)

Pertussis, also known as whooping cough, is a highly contagious disease caused by the bacterium *Bordetella pertussis*; it derived its name from the characteristic severe hacking cough followed by intake of breath that sounds like "whoop"; a similar, milder disease is caused by *B. parapertussis*. Although many medical sources describe the whoop as "high-pitched", this is generally the case with infected babies and children only, not adults.

Worldwide, there are 30–50 million pertussis cases and about 300,000 deaths per year. Despite generally high coverage with the DTP and DTaP vaccines, pertussis is one of the leading causes of vaccine-preventable deaths world-wide. Most deaths occur in young infants who are either unvaccinated or incompletely vaccinated; three doses of the vaccine are necessary for complete protection against pertussis. Ninety percent of all cases occur in the developing world. Children tend to catch it more than adults.

After a two day incubation period, pertussis in infants and young children is characterized initially by mild respiratory infection symptoms such as coughing, sneezing, and runny nose (catarrhal stage). After one to two weeks, the cough changes character, with an increase of coughing followed by an inspiratory "whooping" sound (paroxysmal stage). Coughing fits may be followed by vomiting due to the sheer violence of the fit. In severe cases, the vomiting induced by coughing fits can lead to malnutrition and dehydration. The fits that do occur on their own can also be triggered by yawning, stretching, laughing, or yelling. Coughing fits gradually diminish over one to two months during the convalescent stage. Other

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complications of the disease include pneumonia, encephalitis, pulmonary hypertension, and secondary bacterial superinfection.

Because neither vaccination nor infection confers long-term immunity, infection of adolescents and adults is also common. Most adults and adolescents who become infected with *Bordetella pertussis* have been vaccinated or infected years previously. When there is residual immunity from previous infection or immunization, symptoms may be milder, such as a prolonged cough without the other classic symptoms of pertussis. Nevertheless, infected adults and adolescents can transmit the bacteria to susceptible individuals.

Treatment with an effective antibiotic (erythromycin or azithromycin) shortens the infectious period but does not generally alter the outcome of the disease; however, when treatment is initiated during the catarrhal stage, symptoms may be less severe. Three macrolides, erythromycin, azithromycin and clarithromycin are used in the U.S. for treatment of pertussis; trimethoprim-sulfamethoxazole is generally used when a macrolide is ineffective or is contraindicated. Close contacts who receive appropriate antibiotics (chemoprophylaxis) during the 7–21 day incubation period may be protected from developing symptomatic disease. Close contacts are defined as anyone coming into contact with the respiratory secretions of an infected person in the 21 days before or after the infected person's cough began.

Measles, Mumps & Rubella

Measles, also known as 'rougeole' in French, is a disease caused by a virus, specifically a paramyxovirus of the genus *Morbillivirus*.

Measles

Measles is spread through respiration (contact with fluids from an infected person's nose and mouth, either directly or through aerosol transmission), and is highly contagious—90% of people without immunity sharing a house with an infected person will catch it[citation needed]. Airborne precautions should be taken for all suspected cases of measles.

The incubation period usually lasts for 4–12 days (during which there are no symptoms). Infected people remain contagious from the appearance of the first symptoms until 3–5 days after the rash appears.

Reports of measles go as far back to at least 600 B.C. In roughly the last 150 years, measles has been estimated to have killed about 200 million people worldwide. In 1954, the virus causing the disease was isolated from an 11-year old boy from the US, David Edmonston, and adapted and propagated on chick embryo tissue culture. To date, 21 strains of the measles virus have been identified.

Mumps

Mumps or epidemic parotitis is a viral disease of the human species. The word "mumps" originally meant "to mumble", and came to be applied to the disease because of the side effects it causes. Prior to the development of vaccination and the introduction of a vaccine, it was a common childhood disease worldwide, and is still a significant threat to health in the third world.[1]

Painful swelling of the salivary glands (classically the parotid gland) is the most typical presentation. Painful testicular swelling and rash may also occur. While symptoms are generally not severe in children, the symptoms in teenagers and

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adults can be more severe and complications such as infertility or subfertility are relatively common, although still rare in absolute terms. The disease is generally self-limited, running its course before receding, with no specific treatment apart from controlling the symptoms with painkillers.

Rubella, commonly known as German measles, is a disease caused by Rubella virus. The name is derived from the Latin, meaning little red. Rubella is also known as German measles because the disease was first described by German physicians in the mid-eighteenth century. This disease is often mild and attacks often pass unnoticed. The disease can last one to five days. Children recover more quickly than adults. Infection of the mother by Rubella virus during pregnancy can be serious; if the mother is infected within the first 20 weeks of pregnancy, the child may be born with congenital rubella syndrome (CRS), which entails a range of serious incurable illnesses. Spontaneous abortion occurs in up to 20% of cases.

Rubella

Rubella is a common childhood infection usually with minimal systemic upset although transient arthropathy may occur in adults. Serious complications are very rare. If it were not for the effects of transplacental infection on the developing foetus, rubella is a relatively trivial infection.

Acquired, (i.e. not congenital), rubella is transmitted via airborne droplet emission from the upper respiratory tract of active cases. The virus may also be present in the urine, faeces and on the skin. There is no carrier state: the reservoir exists entirely in active human cases. The disease has an incubation period of 2 to 3 weeks.

In most people the virus is rapidly eliminated. However, it may persist for some months post partum in infants surviving the CRS. These children were an important source of infection to other infants and, more importantly, pregnant female contacts.

The MMR vaccine is a mixture of three live attenuated viruses, administered via injection for immunization against measles, mumps and rubella. It is generally administered to children around the age of one year, with a second dose before starting school (i.e. age 4/5). The second dose is not a booster; it is a dose to produce immunity in the small number of persons (2-5%) who fail to develop measles immunity after the first dose. In the United States, the vaccine was licensed in 1963 and the second dose was introduced in the mid 1990s. It is widely used around the world; since introduction of its earliest versions in the 1970s, over 500 million doses have been used in over 60 countries. As with all vaccinations, long-term effects and efficacy are subject to continuing study.

Pathogenic fungi

Pathogenic fungi are fungi that cause disease in humans or other organisms. The study of pathogenic fungi is referred to as medical mycology. Although fungi are eukaryotic organisms many pathogenic fungi are also microorganisms.

Candida

Candida species are important human pathogens that are best known for causing opportunist infections in immunocompromised hosts (eg transplant patients, AIDS sufferers, cancer patients). Infections are difficult to treat and can be very serious: 30-40% of systemic infections result in death. The sequencing of the genome of *C. albicans* and those of several other medically-relevant Candida species has provided

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a major impetus for *Candida* comparative and functional genomic analyses. These studies are aiding the development of sensitive diagnostic strategies and novel antifungal therapies.

Aspergillus

Some *Aspergillus* species are pathogenic and can cause serious disease in humans and animals. The most common pathogenic species are *Aspergillus fumigatus* and *Aspergillus flavus*. *Aspergillus flavus* produces aflatoxin which is both a toxin and a carcinogen and which can potentially contaminate foods such as nuts. *Aspergillus fumigatus* and *Aspergillus clavatus* can cause allergic disease. Some *Aspergillus* spp. cause disease on grain crops, especially maize, and synthesize mycotoxins including aflatoxin. Aspergillosis is the group of diseases caused by *Aspergillus*. The symptoms include fever, cough, chest pain or breathlessness. Usually, only patients with weakened immune systems or with other lung conditions are susceptible.

Cryptococcus

Cryptococcus neoformans can cause a severe form of meningitis and meningo-encephalitis in patients with HIV infection and AIDS. The majority of *Cryptococcus* species live in the soil and do not cause disease in humans. *Cryptococcus neoformans* is the major human and animal pathogen. *Cryptococcus laurentii* and *Cryptococcus albidus* have been known to occasionally cause moderate-to-severe disease in human patients with compromised immunity. *Cryptococcus gattii* is endemic to tropical parts of the continent of Africa and Australia and can cause disease in non-immunocompromised people.

Histoplasma

Histoplasma capsulatum can cause histoplasmosis in humans, dogs and cats. The fungus is most prevalent in the Americas, India and southeastern Asia. It is endemic in certain areas of the United States. Infection is usually due to inhaling contaminated air.

Pneumocystis

Pneumocystis jirovecii can cause a form of a form of pneumonia in people with weakened immune systems, such as premature children, the elderly, and AIDS patients.

Stachybotrys

Stachybotrys chartarum or "black mold" can cause respiratory damage and severe headaches. It frequently occurs in houses in regions that are chronically damp.

Drug resistance

Treatment with antifungal drugs often results in the appearance of resistant strains of fungi. Various mechanisms leading to resistance have been described. For example, a number of resistant clinical isolates over express genes encoding drug efflux pumps. Recent advances in molecular biology have allowed the study of the phenomenon of multi-drug resistance on a genome-wide scale. DNA microarrays are being used to study the expression profiling of pathogenic fungi and proteomics is aiding research in the development of resistance to various antifungal drugs.

III.A.9.B. FOOD AND WATER RELATED DISEASES

Food-related disease is caused by consuming contaminated foods or beverages. Contamination may occur during growth, processing, preparation, or serving. More than 250 different food-related diseases have been described. 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). 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.

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.

Since many of the food- and water-related organisms can be acquired through recreational or drinking water, from contact with animals or their environment, or through person-to-person spread, investigation into specific cases is necessary for identifying the cause and controlling the spread of the disease. Depending on the situation, control measures could involve removing contaminated food from stores, chlorinating a swimming pool, treating a private or municipal water supply, or closing a childcare center.

Most of these diseases have no treatment or preventive vaccine. Regulation and inspection of food and water supplies are critical for preventing these diseases. Public and food service worker education on hygiene and proper food handling, storage, and preparation practices are also critical to the prevention and control of these diseases.

Hepatitis A

Hepatitis A is viral disease that can cause fever, malaise, anorexia, nausea, and abdominal discomfort, followed by jaundice. The disease ranges in severity from no symptoms, to a mild illness lasting 1-2 weeks, to a severely disabling disease lasting several months.

Hepatitis A is spread by contact with fecal material from an infected person. This can occur directly; through exposure to contaminated water, ice, or shellfish harvested from sewage-contaminated water; or from foods that are contaminated during growth, processing, preparation, or serving.

Outbreaks of hepatitis A associated with contaminated foods or infectious food service employees can occur. Outbreaks are controlled by identifying exposed persons and providing them with immune globulin and/or hepatitis A vaccine.

III.A.9.c. VECTOR-BORNE DISEASES

West Nile Virus

West Nile virus (WNV) is a mosquito-transmitted virus that can cause encephalitis (inflammation of the brain) in some people. Historically, this virus circulated between mosquitoes and birds in Africa and Europe. However, in 1999, an outbreak of WNV encephalitis was reported in New York City. Since then the virus has spread to 47 states and the District of Columbia. WNV was first found in Minnesota in July 2002 and has been detected in mosquitoes, birds, humans, horses, and some other animals and is now considered endemic in some areas. In Fillmore County, Amish horses have been significantly affected by the west nile virus.

Prevention of WNV disease involves public education on personal protection against mosquito bites. Control of WNV disease requires identifying areas with infected mosquitoes and eliminating them.

LaCrosse Encephalitis

LaCrosse (LAC) encephalitis is a viral illness that is transmitted to people through the bite of an infected mosquito. The type of mosquito that spreads LaCrosse infection breeds in old tires, artificial containers, and areas in trees that hold water. Most people infected with this virus have either no symptoms, or a mild flu-like illness. A small percentage of people (especially children) may develop encephalitis. Approximately 1-3% of these encephalitis cases are fatal, and another 15% of patients have long-term nervous system problems. Most of the severe cases start with headache, fever, nausea, and lethargy. The illness may rapidly progress into disorientation, seizures, and coma. There is no treatment for the illness other than supportive care until the illness is over.

In Minnesota, cases of LAC encephalitis have been found in 19 southeastern counties from the Twin Cities to the Iowa border. Fillmore County is one of the endemic counties. Three to 13 cases are reported each year in Minnesota.

Prevention of LAC disease involves public education on personal protection against mosquito bites and elimination of mosquito breeding sites. Control of LAC disease requires identifying areas with infected mosquitoes, eliminating the mosquitoes, and eliminating breeding habitat (including waste tire dumps).

History

Minnesota has not had an infectious disease outbreak that has reached epidemic proportions in decades. Fillmore County has experienced clusters of infectious disease and has had small food and water related outbreaks.

Fillmore County's entire population is susceptible to exposure to infectious diseases. Only those who are immune as a result of vaccination or prior infection or who are receiving preventive treatment as a result of a known or anticipated exposure will be protected against an infectious disease. The following is a list of outbreaks that have occurred in recent decades:

- Hepatitis Outbreak 1989-1990
- Measles Outbreak 1989-1991
- Rubella Outbreak 1990-1991

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Pertussis Outbreak 1993-1994
Pertussis Outbreak 2005
Mumps Outbreak 2006

III.A.9.D. VULNERABILITY TO INFECTIOUS DISEASE

Fillmore County has a large Amish population that have a higher risk of infectious disease outbreak because of the lack of immunizations. This has the possibility of spreading to the community at large. Since all jurisdictions are considered to be equally affected by infectious disease, each jurisdiction will not be assessed independently. The following table summarizes the overall vulnerability to infectious disease. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Infectious Disease	
Frequency	Likely - (every 2 to 5 years)
Impact/Damage	Slight to Very Severe
Location	Localized to Countywide
Geographic Extent	County-wide
Duration	Weeks to Months
Seasonal Pattern	None
Warning Time	None

III.A.9.E. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Associated with another disaster. Infectious disease outbreaks can occur as primary events themselves, or they may be secondary events to another disaster or emergency such as a terrorist attack, biological accident, or natural hazard event.

Impact on infrastructure and economy. Infectious diseases generally have little or no effect on physical property. However, infectious disease outbreaks pose significant threats to the healthcare system and to the human infrastructure responsible for critical community services, due to widespread absenteeism in the workforce. Examples of such services and personnel include healthcare workers and workers in the public safety, utility, transportation, and food service industries. A negative impact on the economy could occur if a widespread outbreak occurred and businesses were forced to shut down for an extended period of time. Severe effects could occur with events that cover multiple or widespread areas.

Riots. If an epidemic event or threat of an epidemic were to occur, deaths, fear, and misinformation could trigger large-scale panic, riots, and lawlessness.

III.A.9.F. PLANS AND PROGRAMS

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included is a public health annex that provides guidelines and strategies for dealing with infectious disease outbreaks.

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City Emergency Operations Plans. Every city except for Fountain and Mabel have Emergency Operations Plans that outline procedures for their City to follow in response to a variety of hazards.

Radio. Station KFIL AM 1060 and FM 103.1 in Preston will broadcast all emergency management warnings for Fillmore County.

Television. Area television stations will broadcast emergency management warnings for Fillmore County including KTTC and KXLT in Rochester. Also available through cable is the EAS channel located out of LaCrosse, WI.

Cooperation with state health department (MDH). The Fillmore County Public Health Department (Public Health) works collaboratively with the Minnesota Department of Health to address reportable infectious diseases that are listed in Chapter 4605.7040 Disease and Reports and to plan for public health emergencies. Public Health also supports the MDH with food-borne outbreaks.

Vaccination program. The Fillmore County Public Health Department offers a variety of vaccinations for children and adults. The department participates in the Minnesota Vaccines for Children program to provide low-cost vaccinations for children with financial need. The following is a list of mass dispensing clinics held in Fillmore County:

- Influenza annually administered
- Polio 2005
- Tetanus 2007-2008
- Hepatitis A, Hepatitis B, & Tetanus 2007
- Smallpox

III.A.9.G. GAPS AND DEFICIENCIES

Communication from the State Public Health Department has been slow or in many cases non-existent when there has been an infectious disease reported. Health Alerts have also been inadequate during hazard events such as flooding.

Fillmore County is on the border of Iowa and Minnesota. Partnerships and collaboration with bordering counties and states that provide health and medical care proves to be challenging.

Some people are choosing to delay or forego immunizations. Many in the Amish community remain without immunizations. Amish may or may not refuse based upon beliefs. Some of the Amish have gone to Canada, which use different regulations, to get their immunization shots. Education of the public on the need for immunizations may need to be increased.

Fillmore County does not have a major hospital, the facilities are all satellite offices. In the case of an epidemic, Mayo Clinic may pull all personnel from the satellite offices to the hub in Rochester. All residents in Fillmore County are then supposed to be bussed to Rochester.

III.B. HUMAN CAUSED/TECHNOLOGICAL HAZARDS

This section will outline the human caused or technological hazards identified through the risk assessments. Radiological and Domestic Terrorism were not considered likely events to affect Fillmore County and are not included in this Plan. The human caused hazards are as follows:

- Fire
- Hazardous Materials
- Dam & Levee Failure
- Water Supply Contamination

III.B.1. HAZARD: FIRES

This section addresses fires to property that is not considered a wildfire. The two types of property fires are classified as:

1. Structure Fires
 - Residential single family dwellings, apartments, manufactured homes, hotels, motels.
 - Public and Mercantile: stores, restaurants, grocery stores, institutions, churches, public facilities, education.
 - Industrial, Manufacturing, Other Buildings: basic industry, manufacturing, storage, residential garages, vacant buildings, unknown.
2. Vehicle Fires
 - Mobile Property: aircraft, automobiles, trucks, trains, buses, boats.

Fires have many causes: careless smoking, cooking, or campfires, arson, improper building wiring, industrial mishaps, and instances such as train derailments or transportation collisions.

History

Most of the fires in Fillmore County are residential structure fires, although fires within a commercial or industrial building have occurred.

Fires have occurred throughout the entire county. However, fires are more probable in the cities due to the density and number of both residential and commercial structures. Cooking, electrical failure and chimney fires cause most residential fires in Fillmore County. Commercial and industrial structures are also vulnerable.

III.B.1.A. VULNERABILITY TO FIRE

The following table summarizes the overall vulnerability to fire. Since all jurisdictions are considered to be equally affected fire, each jurisdiction will not be assessed independently. Section IV prioritizes the hazards in more detail and ranks them collectively.

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Overall Vulnerability to Fire	
Frequency	Very Likely -(100% probable in next year)
Impact/Damage	Slight to Very Severe
Location	Localized to structures
Geographic Extent	County-wide
Duration	Minutes to Hours
Seasonal Pattern	None
Warning Time	None

III.A.9.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Service disruptions. Major fires can completely destroy structures, including essential public facilities, and utilities like electric and gas lines can be damaged and even destroyed.

Health risks. Destruction or damage to essential infrastructure such as water and wastewater facilities can cause public health risk.

Hazardous materials. Structures containing hazardous materials pose an additional risk during fire.

III.A.9.C. PLANS AND PROGRAMS

Local fire departments have the primary response role for structural fires. Each department is responsible for fires within their district boundaries. However, they often work together on larger fires.

Fire educational services. The fire departments in Fillmore County provide many educational services to county residents, including:

- Business inspections
- Woodstove inspections
- Fire safety education presentations at schools, churches, civic groups and the county fair
- CPR training
- Coordination of education programs with other agencies, hospitals and schools
- Education on fire prevention to businesses within the business district
- Chimney inspections
- Youth education at schools
- Fire prevention week
- Booth at the fair

Zoning. The city zoning departments control development of new construction, including the enforcement of safety restrictions like setbacks, coverage, depth, and structure height requirements. The city building inspectors are responsible for all new construction.

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State training. Firefighters in Fillmore County participate in mandatory fire fighting training classes offered by the state.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included are processes, guidelines and strategies for dealing with fire emergencies.

City Emergency Operations Plans. Every city except for Fountain and Mabel have Emergency Operations Plans that outline procedures for their City to follow in response to a variety of hazards.

III.A.9.D. GAPS AND DEFICIENCIES

Snow removal around commercial and industrial buildings has caused problems in the past. Snow should be removed sooner after large storms. City ordinances should be reviewed for language that prohibits snow piles from interfering with traffic.

The county and cities should explore additional opportunities for fire safety education for citizens.

Currently, some local roads and alleys are not adequate to handle fire trucks. Those roads should be identified and widened in the future to provide adequate protection to every property in the county.

Fillmore County and many Fillmore County cities have not adopted the state building code.

III.B.2 HAZARD: HAZARDOUS MATERIALS

Hazardous materials are chemical substances, which if released or misused can pose a threat to the environment or health of a community. These chemicals are used in industry, agriculture, medicine, research and consumer goods throughout Fillmore County. Hazardous materials come in the form of explosives, flammable and combustible substances, corrosives, poisons and radioactive materials.

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

III.B.2.A. TRANSPORTATION OF HAZARDOUS MATERIALS

Roads, rails, aircraft, and pipelines all convey hazardous materials, with each presenting differing levels of risk of unwanted release of the hazardous materials. Transported products include hazardous materials moving from producers to users, moving between storage and use facilities, and hazardous waste moving from generators to treatment and disposal facilities.

The road system in Fillmore County provides a network to transport both hazardous and non-hazardous material throughout the region and between local communities.

SECTION III HAZARDS

Risks of hazardous materials event vary, based on the classification of the road and its proximity to people and property. According to the most recent findings at the Minnesota Department of Transportation, more than half of all accidents involving hazardous materials have occurred on the state roadways. Roads are a major concern in Fillmore County, due to the lack of information available regarding what is traveling on the road system on a daily basis.

Fillmore County’s pipeline systems provide for transmission of natural gas, crude oils, and refined products (gasoline, jet fuels) to local and remote users through several transmission pipeline routes. Product release from any of these lines could create significant hazards.

III.B.2.B. FIXED FACILITIES CONTAINING HAZARDOUS MATERIALS

A variety of hazardous materials exists in fixed facilities throughout Fillmore County. There are 162 sites that report to the EPA or another State or Federal agency that generate, transport, treat, store or dispose of hazardous materials.

History

University of Minnesota karst expert Calvin Alexander says he knows of two major gas spills in Fillmore County. The gas pollution may not be getting any worse, but it isn't going away either. Fertilizer is still being spread on the fields, but local officials are asking farmers to use it sparingly. The residents of Fillmore County could dig deeper wells, but it's expensive, and many complain it doesn't taste good. So the affected people have little choice in the near future but to continue drinking bottled water. The following table describes the events from 1995 – 2006:

Fixed facility Events		Transportation Events		All Events		
Events	Victim Events	Events	Victim Events	Evacuation Events	Events with Victims	Total Events
16	2	8	0	1	2	24

Source: <http://www.health.state.mn.us/divs/eh/hazardous/surv/hseesrpt9506.pdf>

On July 8, 2008 a tanker truck carrying ethanol overturned spilling 4000 gallons of ethanol into the root river.

III.B.2.C. VULNERABILITY TO HAZARDOUS MATERIALS

Since all jurisdictions are considered to be equally affected by hazardous materials, each jurisdiction will not be assessed independently. Mapping of EPA licensed facilities for each jurisdiction are included in Appendix III. Section IV prioritizes the hazards in more detail and ranks them collectively. The following table summarizes the overall vulnerability to hazardous materials.

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Overall Vulnerability to Hazardous Materials	
Frequency	Likely -(Every 2 to 5 years)
Impact/Damage	Slight to Very Severe
Location	Along transportation routes and Hazardous Waste Facilities
Geographic Extent	50% to Most of the County
Duration	Minutes to Hours
Seasonal Pattern	None
Warning Time	None

III.B.2.D. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Water Supply Contamination. A spill or release of hazardous materials could effect the surrounding area’s water supply.

Fire. A spill or release of hazardous materials could create the potential for fire and explosions, and poses a risk to emergency responders.

III.B.2.E. PLANS AND PROGRAMS

Fillmore County works directly with the Minnesota Pollution Control Agency and Minnesota Department of Health to address needs for responding to and mitigating the impacts of a hazardous event.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for dealing with hazardous material accidents, spills or releases.

Training of emergency personnel. All county and local emergency response personnel are trained to at least the minimum Hazardous Materials Awareness level. All first responder groups conduct the required Occupational Health and Safety Administration training on a yearly basis.

City Emergency Operations Plans. Every city except for Fountain and Mabel have Emergency Operations Plans that outline procedures for their City to follow in response to a variety of hazards.

Radio. Station KFIL AM 1060 and FM 103.1 in Preston will broadcast all emergency management warnings for Fillmore County.

Television. Area television stations will broadcast emergency management warnings for Fillmore County including KTTC and KXLT in Rochester. Also available through cable is the EAS channel located out of LaCrosse, WI.

III.B.2.F. GAPS AND DEFICIENCIES

Kits for chemical exposure (CHEMPAK) are only distributed to hospitals to be used by EMS personnel. These kits have to be used within 30 minutes, and the closest hospital is Mayo Clinic.

Fillmore County should seek opportunities to coordinate more effectively with local cities and adjoining counties in dealing with hazardous material events.

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Knowledge about hazardous materials transported through Fillmore County is incomplete.

III.B.3 HAZARD: DAM AND LEVEE FAILURE

A “dam” is an artificial barrier that has the ability to impound water, wastewater, or any liquid borne material for the purpose of storage or the control of water. A levee is a type of dam that runs along the banks of a river or canal. Levees reinforce the banks and help prevent flooding. By confining the flow, levees can also increase the speed of the water. Levees are usually constructed of dirt.

Dams and Levees can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam.
- Deliberate acts of sabotage
- Structural failure of materials used in dam construction.
- Movement and/or failure of the foundation supporting the dam.
- Settlement and cracking of concrete of embankment dams.
- Piping and internal erosion of soil in embankment dams.
- Inadequate maintenance and upkeep.

History

There are 34 dams located within Fillmore County. All but two of these are small earthen dams. Three dams, including the Lanesboro, Dairyland Power, and Lagoon Park dams are used for power generation.

In 1984, a portion of the earthen powerhouse canal dike in Lanesboro washed out without warning. Work had been done on the dike several months before.

III.B.3.A. VULNERABILITY TO DAM OR LEVEE FAILURE

Mapping of dams and levees for each jurisdiction are included in the Appendix III. The following table summarizes the overall vulnerability to dam or levee failure. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Dam or Levee Failure	
Frequency	Very Unlikely
Impact/Damage	Slight
Location	Dams or Levees
Geographic Extent	Individual Cities or Townships
Duration	Minutes to Hours
Seasonal Pattern	None
Warning Time	None

III.B.3.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Fire. Fire can occur due to infrastructure compromise of electrical and natural gas systems.

Hazardous Materials. Hazardous material releases can occur due to improper storage of materials in floodplains.

Infectious Disease. Infectious disease outbreaks are possible during prolonged flood events where floodwaters compromise areas sensitive to disease vectors.

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Wastewater Treatment Plant Failure. Wastewater treatment plant failure can occur if facilities are not adequately protected from flooding or protection is compromised.

Transportation Disruption. Disruptions of transportation routes along roads, bridges, railroads, and by river navigation can be disrupted due inundation and/or substantial flow velocities.

Power Outages. Power outages can occur if portions of the electrical grid are compromised by floodwaters.

Flood. Areas that are near to dams and levees that fail could potentially flood.

III.B.3.c. PLANS AND PROGRAMS

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included are processes, guidelines and strategies for dealing with emergencies.

III.B.3.d. GAPS AND DEFICIENCIES

The effects of a dam or levee failure are currently unknown. The flooding potential in a case of dam failure should be explored.

III.B.4 HAZARD: WATER SUPPLY CONTAMINATION

The hazards come in the form of contamination, current industry and EPA Superfund projects, runoff with oil and other chemicals from paved surfaces, traces of pharmaceuticals found in waterways, topsoil washed from farm fields and construction sites, and wastewater that was not thoroughly treated.

The County relies on deep aquifers for most of its community drinking water. The St. Peter-Prairie du Chien-Jordan aquifer underlies most of the county and is the main source of ground water.

History

The visible effects of erosion and runoff, i.e. rills and gullies in fields and construction sites, turbid streams and rivers, silt-covered stream beds, and even muddy well water, have raised awareness of this problem among all segments of the county's population. Concerns are not limited to erosion on agricultural lands, although 80% of the land in Fillmore County is in farmland, and 77% of the farmland is cropland, according to the USDA National Agricultural Statistics Service. Increased development in both rural and urban areas emphasizes the need for erosion control whenever the natural land cover is disturbed. Runoff into sinkholes and contaminants transported in losing and disappearing streams compound these concerns because of the potential impacts to ground water and springs.

Fillmore County has experienced a large number of reported cases of E-Coli, Giardia and cryptosporidium from citizens in Fillmore County. Although many instances are directly related to the large number of individuals using the streams and rivers for recreation, the health department feels that many cases involve contaminated shallow wells, failing septic systems and feedlots.

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A variety of hazardous materials exists in fixed facilities throughout Fillmore County. There are 162 sites that report to the EPA or another State or Federal agency that generate, transport, treat, store or dispose of hazardous materials. Any of the sites have the potential contaminate the water supply if a spill occurs.

About 53% of the county's population is served by community public water supplies. Approximately 4000 wells are included under the well inventory with 104 within the FEMA floodplain. Much of the county is susceptible to ground water pollution. Well water test results from the county over the past 25 years show elevated nitrate levels and/or coliform bacteria present in a significant percentage of the samples. Both have serious health implications plus indicate the potential for the presence of other harmful contaminants. A key first step in addressing these issues is to test the water for contamination so those consuming it are aware of any problems. Once a problem is identified, steps can be taken to remediate the pollution sources or to find an alternative water supply. Pollution prevention measures will be encouraged. Inadequately treated human sewage is a source of fecal coliform bacteria and excess nutrients in streams and ground water. All but two of the 14 cities in the county have municipal wastewater treatment facilities that are regulated by the MN Pollution Control Agency. The county is delegated enforcement of Chapter 7080 rules for individual sewage treatment systems (ISTS). Only about one-third of the ISTS in the county have been issued an ISTS permit since 1995. The remaining two-thirds pose a potential water pollution risk over the next ten years. Fillmore County's ISTS Pilot Program to inventory and upgrade all ISTS that are defined as imminent threats to public health by 2008 is expected to correct 300 to 500 systems. Financial assistance through this type of program and low-interest loans will help to increase the number of systems that are brought into compliance.

Sinkholes and other karst features create complex interconnections between surface water and ground water. Thin soils overlying fractured carbonate bedrock and sinkholes that bypass the soil filtration process allow contaminants to enter ground water with relative ease. Once in the subsurface, contaminants can move quickly with ground water through the enlarged conduits in a karst system potentially affecting drinking water wells which draw water from surficial karst aquifers.

Pesticide and fertilizer over application and mismanagement increase the risk of these compounds contaminating streams and ground water. Nitrate contamination of drinking water is common in wells that draw water from surficial bedrock aquifers. Atrazine and other pesticides are found at low levels in both ground water and streams all year round. Spikes in concentrations of atrazine, metolachlor (Dual), and acetochlor (Harness) are seen in early summer runoff oftentimes exceeding stream water quality standards. Alachlor (Lasso), which has not been used in the last decade, is found frequently at low concentrations in springs.

Calvin Alexander, a geology professor at the University of Minnesota, who has studied karst extensively, says one-quarter to one-third of all private wells in Fillmore County have nitrates above standard and another third contain bacteria. Another concern is petroleum by-products.

Some 50 years ago, Amoco built a petroleum storage facility. In the years since, a karst aquifer near the facility - now owned by BP Amoco - has become completely contaminated. Some, but not all, old and shallow wells are at risk according to the Minnesota Department of Health.

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University of Minnesota karst expert Calvin Alexander says he knows of two major gas spills in Fillmore County. The gas pollution may not be getting any worse, but it isn't going away either. Fertilizer is still being spread on the fields, but local officials are asking farmers to use it sparingly. The residents of Fillmore County could dig deeper wells, but it's expensive, and many complain it doesn't taste good. So the people of Fillmore County have little choice in the near future but to continue drinking bottled water.

III.B.4.A. VULNERABILITY TO WATER SUPPLY CONTAMINATION

The following table summarizes the overall vulnerability to water supply contamination. Since all jurisdictions are considered to be equally affected by water supply contamination, each jurisdiction will not be assessed independently. Section IV prioritizes the hazards in more detail and ranks them collectively.

Overall Vulnerability to Water Supply Contamination	
Frequency	Very Likely - (100% probable in next year)
Impact/Damage	Slight to Moderate
Location	Wells
Geographic Extent	Localized to Countywide
Duration	Years
Seasonal Pattern	None
Warning Time	3-6 Hours

III.B.4.B. RELATIONSHIP TO OTHER HAZARDS-CASCADING EFFECTS

Karst. Because Fillmore County is almost entirely located within a karst area, the water supply is very susceptible to contamination, and in many areas have the potential to quickly spread.

Infectious Disease. Private wells and community water supplies can become contaminated by human and animal waste, or and lakes, streams, pools, or water parks may be contaminated by humans or animals.

Hazardous Materials. A spill or release of hazardous materials could effect the surrounding area's water supply.

Floods. Wastewater treatment plant failure can occur if facilities are not adequately protected from flooding or protection is compromised. Water supplies can become contaminated by the untreated wastes. Sewer back-up, and flood waters can contaminate wells through well cap or vent.

III.B.4.C. PLANS AND PROGRAMS

Water Management Plan. Fillmore County's first Comprehensive Local Water Management Plan was approved by the MN Board of Water and Soil Resources (BWSR) on March 28, 1990, and adopted by the Fillmore County Board of Commissioners on December 11, 1990, following about two years of development by a committee of local residents and county and state agency staff. In January, 1991, the county hired a halftime Water Plan Coordinator to coordinate implementation of

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the plan. In 1995, the water plan underwent a five-year revision and update which was approved by the BWSR on January 24, 1996. A second update was completed in 2000 which was approved by the BWSR on December 13, 2000. This update of the water plan will be effective for ten years from January, 2006 to December, 2015. The plan will be reviewed and amended as needed in 2010.

In 2001, the Fillmore Soil and Water Conservation District (SWCD) Board of Supervisors adopted the Local Water Management Plan as the SWCD's Comprehensive Plan. This broadens the scope of the SWCD's mission and reduces the duplication of developing two plans that essentially addressed many of the same land and water resource concerns.

The purpose of the local water management plan is the protection of water resources in the county from point and nonpoint sources of pollution. Coordination of these protection efforts between the various local, state, and local agencies and organizations reduces duplication and eliminates gaps in implementation strategies aimed at a common goal of water protection. The Water Plan Committee will continue to meet regularly to guide implementation programs and projects with the Citizens' Advisory Committee acting as liaison to the community at large to assure a broader perspective of water issues.

The water plan meets the requirements set forth in M.S. 103B.311subd.4 as follows:

1. The plan covers the entire county.
2. The plan addresses problems in the context of watershed units and ground water systems.
3. The plan is based upon principles of sound hydrologic management of water, effective environmental protection, and efficient management.
4. The plan is consistent with local water management plans prepared by counties and watershed management organizations wholly or partially within a single watershed unit or ground water system.
5. The plan duration is for ten years with review and amendment to the plan as necessary in five years.

Southeast Minnesota Water Resources Board. Fillmore County is a member of the Southeast Minnesota Water Resources Board (formerly the Zumbro/Root River Joint Powers Board) with nine other counties. Two county commissioners serve on the Board, which meets every other month. The mission of the Board is to "help sustain the quality of life in the ten counties of southeastern Minnesota by improving and protecting the water resources through the coordination of local water planning efforts." Priorities for regional projects are based on water quality issues that are common to the karst region and to the watersheds in the region and are identified as priorities in each county's water management plan.

BALMM. Fillmore County is an active participant in the Basin Alliance for the Lower Mississippi in Minnesota (BALMM). BALMM is a locally led coalition of land and water resource agencies formed to coordinate efforts to protect and improve water quality

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in the basin. Projects initiated in the last five years through BALMM are aimed at reducing fecal coliform bacteria in surface water (which also benefits ground water) and increasing permanent vegetative cover on the landscape to reduce soil erosion and runoff.

Efforts to increase the number of acres in permanent vegetation are encouraged by programs such as the Conservation Reserve Enhancement Program (CREP) and the Conservation Security Program (CSP) which bring in federal funds that help achieve water plan goals. Other incentives for innovative practices that increase water infiltration and reduce runoff will be pursued as opportunities arise. Watershed-based efforts with other agencies and organizations are most effective in addressing water quality concerns identified through the TMDL process or other monitoring of individual streams.

Wellhead Protection Plan. About 53% of the county's population is served by community public water supplies. These public water suppliers are developing Wellhead Protection Plans that identify the land area in the contribution area of the well and the best management practices (BMPs) needed to reduce the risk of pollution entering ground water in those areas. Monitoring efforts will continue in cooperation with other agencies to monitor trends. BMPs must be adopted to keep these compounds out of streams and ground water.

Sealing Abandoned Wells - 1991-93 biennium. Nine wells were sealed in Fillmore County through this grant program matching state and county funds. Lead agency: Board of Water and Soil Resources.

South Branch Root River Watershed Project. The South Branch Root River Watershed Project had its beginnings in 1998 when a \$61,500 Clean Water Partnership grant from the MN Pollution Control Agency was awarded to the project to do a Phase I Diagnostic Study. The Phase I study included:

- water quality monitoring,
- collecting land use information, and
- conducting karst studies (dye traces to delineate the boundaries of the areas contributing water to springs, water quality monitoring of springs, and seismic investigations to detect buried sinkholes and underground caverns).

That study concluded in 2002, and the information was used to develop an implementation plan to address the sources of water pollution.

In 2004, the project was awarded a 319 Implementation Grant for \$299,420 as well as Clean Water Partnership Loan funds of \$300,000 for upgrading septic systems and milkhouse waste systems. Implementation began in 2005 with funding for several landowner financial assistance programs to encourage adoption of Best Management Practices (BMPs) aimed at reducing bacteria and sediment in the river and its tributaries.

SECTION III HAZARDS

County Geologic Atlas and Groundwater Sensitivity Mapping - 1991-93 biennium. This project resulted in expanded production of county geologic atlases, expanded groundwater sensitivity mapping and creation of a new Atlas Service office. In Fillmore County, the project led to the production of a county geologic atlas. Lead agency: Minnesota Geological Survey.

Emergency Operations Plan. The Fillmore County Emergency Operations Plan outlines procedures for the County in response to a variety of hazards. Included are processes, guidelines and strategies for dealing with emergencies.

Fillmore County Zoning Ordinance. The Fillmore County Zoning Ordinance provides a Sinkhole Dumping Abatement subdivision that prohibits dumping in sinkholes and ravines in the County.

III.B.4.D. GAPS AND DEFICIENCIES

Extensive dye traces have not been done for many areas, therefore, if there is a spill or other contamination, there is currently no way to determine where it goes. Many private wells may become contaminated after a flood event. Disinfection of those wells is often left undone.

All of the existing wells in each of the cities have not been inventoried, and a wellhead protection plan has not been implemented.

SECTION IV. RISK ASSESSMENT

SECTION IV. RISK ASSESSMENT

Section IV includes the results of a five-part assessment of hazard concerns in Fillmore County:

- 1) Description of hazards and historical occurrences (Section III). Each hazard was described and historical data was gathered on each of the hazards outlined in the State All-Hazard Mitigation Plan.
- 2) Mapping of Hazards (included in Appendix III). Maps were created that depicted the hazards geographically. The steering committee, city representatives and the public were asked to “mark-up” the maps to show past events, concerns and other pertinent data.
- 3) Identifying the effects of hazards (Section III). Using the preceding data from steps 1 and 2, the effects of these hazards were evaluated.
- 4) County-wide hazard evaluation and prioritization (Section IV). Vulnerability was assessed on a countywide basis using the following parameters to determine an overall priority rating: frequency of occurrence, warning time, geographic extent, and likely adverse impact.
- 5) City Hazard profiling (Section IV) Community representatives also identified top hazard concerns for their individual communities from a broader range of possible incidents, including natural and man-made hazards. Every participating community identified severe weather incidents or flooding as their top hazard concerns.

This assessment yielded the following prioritized list of hazards:

- 1) Flood
- 2) Tornado
- 3) Windstorm
- 4) Ice and Sleet
- 5) Infectious Disease
- 6) Hailstorm
- 7) Blizzard
- 8) Extreme Temperatures (Summer and Winter)
- 9) Drought
- 10) Karst / Subsidence
- 11) Water Supply Contamination
- 12) Hazardous Materials
- 13) Dam and Levee Failure
- 14) Lightning
- 15) Fire
- 16) Landslides
- 17) Terrorism
- 18) Wildfire

IV.A.1 HAZARD IDENTIFICATION

The Steering committee evaluated the identified hazards and historical information from the previous chapter, and used the State’s *Hazard Mitigation Planning Worksheet 1* to identify and prioritize hazards for the County as a whole. The following criteria were used to identify and prioritize the hazards for the County:

Likelihood of Event/Frequency

- 5 = nearly every year (near 100% probability)
- 4 = every 2 to 5 years (20-50% probability)
- 3 = every 6 to 10 years (40-10% probability)
- 2 = every 11 to 25 years (0.25-9% probability)
- 1 = every 26 to 100 years (less than 0.25% probability)
- 0 = has not occurred or very unlikely

Spatial Extent (Area of impact)

- 5 = Entire County
- 4 = 50% to most of the County
- 3 = Individual Cities or Townships
- 2 = Small area such as a neighborhood
- 1 = localized such as an individual property
- 0 = No Impacted areas

Impact/Damage (Potential Damage)

- 5 = Very severe destruction *and/or* high potential loss of life
- 4 = Severe Damage to property *and/or* moderate potential loss of life
- 3 = Moderate damage to property *and/or* slight chance of loss of life
- 2 = Slight damage to property *and/or* slight chance of loss of life
- 1 = Little chance of damage to property or loss of life
- 0 = Insignificant or doesn’t apply

Floods were ranked the highest, followed by tornado, windstorms and ice and sleet storms. The hazard ranking was done by using the following formula: (Frequency + Spatial Extent) x Impact = Hazard Rank. The following table describes the results:

SECTION IV RISK ASSESSMENT

Table 44 - Countywide hazard identification ranking

HAZARD	Likelihood of Event/Frequency	Spatial Extent	Impact/ Damage	Hazard Rank/Index
Flood	4	5	5	45
Tornado	3	5	4	32
Windstorm	5	5	3	30
Ice and Sleet	5	5	3	30
Infectious Disease	4	5	3	27
Hailstorm	5	5	2	20
Blizzard	5	5	2	20
Extreme Temperatures (Summer and Winter)	4	5	2	18
Drought	4	5	2	18
Karst / Subsidence	5	4	2	18
Water Supply Contamination	5	4	2	18
Hazardous Materials	4	2	3	18
Lightning	5	1	3	18
Dam and Levee Failure	1	3	3	12
Fire	5	1	2	12
Landslides	2	4	1	6
Terrorism	1	3	1	4
Wildfire	1	1	1	2
Earthquakes	0	0	0	0
Solar Storm	0	0	0	0
Radiological	0	0	0	0

In addition to the Steering Committee’s identification, the local and county emergency managers identified and prioritized risks related to hazard events, and included a more detailed assessment of some of the hazards identified in the State Hazard Mitigation Plan. The following criteria were used to identify and prioritize these risks:

Frequency

- 5 – Yearly
- 4 - Every 5 years
- 3 – Every 10 years
- 2 – Every 25 years
- 1 – Every 50 years
- 0 – Not in last 100 years

Area of impact

- 5 – Entire County
- 4 - Most of County
- 3 – Half of County
- 2 – Township/City
- 1 – Small area
- 0 –A few plats

SECTION IV RISK ASSESSMENT

Magnitude

- 5 – Complete destruction
- 4 – Severe impact to operations/ damage to structures
- 3 – Major impact to operations/ severe external damage, minor internal
- 2 – Moderate impact
- 1 – Minor impact
- 0 – Insignificant

911 system interruption followed by communications failures were considered to be at the greatest risk during or after a hazard event. The results are described in the table below:

Table 45 - Risks associated with hazards

Hazard / Threat Assessment	Frequency	Area of Impact	Magnitude	Total
911 System Interruption	4	5	4	36
Power Failure/Interruption	5	2	4	28
Communication Failure	5	4	3	27
Hazardous Material Release	4	4	3	24
Information Systems Failure	5	2	3	21
Heat/Natural Gas Interruption	5	2	3	21
Food Supply Crisis/ Contamination	5	5	2	20
Radiological Explosion/Release	0	4	4	16
Radiological Threat	0	4	4	16
Sewer Infrastructure Failure	4	1	3	15
Hazardous Material/Chemical Attack	0	4	3	12
Violence School/Workplace	3	2	2	10
Civil Disturbance	3	2	1	5
Multi-vehicle/Aircraft Crash	4	0	1	4
Bomb Threat	2	2	1	2
Bomb Explosion	0	1	1	1

City staff were interviewed to assess their concern over the various hazards identified in the plan. Every city identified severe weather hazards (including tornados) or flooding as there number 1 or number 2 concerns for their City.

SECTION IV RISK ASSESSMENT

Table 46 - City's Highest Concern

Jurisdiction	Highest Concern
Canton City	Extreme Weather/Tornado
Chatfield City	Extreme Weather/Tornado
Fountain City	Extreme Weather/Tornado
Harmony City	Extreme Weather/Tornado
Lanesboro City	Flood
Mabel City	Flood
Ostrander City	Extreme Weather/Tornado
Peterson City	Flood
Preston City	Extreme Weather/Tornado
Rushford City	Flood
Rushford Village City	Flood
Spring Valley City	Flood
Whalan City	Flood
Wykoff City	Extreme Weather/Tornado

A public survey was posted online as well as distributed at various council meetings and to individuals. The survey respondents were asked to identify the hazards that affect their community and to what degree they are concerned about the hazards facing the community. The results are not a statistically valid representation of the entire community because the sampling method was not representative of the entire population.

28% of the respondents indicated that they are “extremely concerned” about hazards facing the community, while 61% responded that they were somewhat concerned.

The respondents indicated that they perceived the threat posed by high winds and tornados was the greatest risk to the communities, followed by flooding. The results are in line with the results from the Steering Committee risk assessments. The following tables describe the results:

Table 47 - Public's #1 Concern

Highest Threat	Total
Tornado/Wind Storm	26
Flood	21
Dam Failure	3
Severe Winter Storms	2
Lightning	2
Hazardous Materials	2
Pipeline Failure	1
Hail	1
Drought	1

SECTION IV RISK ASSESSMENT

Table 48 - Public's #1 & #2 Concerns

Highest Threat	Highest Threat 2	Total
Tornado/Wind Storm	Severe Winter Storms	17
Flood	Tornado/Wind Storm	13
Flood	Landslides	2
Hazardous Materials	Tornado/Wind Storm	2
Lightning	Hail	2
Tornado/Wind Storm	Lightning	2
Tornado/Wind Storm	Erosion	2
Dam Failure	Flood	1
Dam Failure	Lightning	1
Dam Failure	Terrorism	1
Drought	Tornado/Wind Storm	1
Flood	Erosion	1
Flood	Hail	1
Flood	Hazardous Materials	1
Tornado/Wind Storm	Terrorism	1
Hail	Erosion	1
Flood	Severe Winter Storms	1
Tornado/Wind Storm	Tornado/Wind Storm	1
Tornado/Wind Storm	Flood	1
Pipeline Failure	Flood	1
Severe Winter Storms	Severe Winter Storms	1
Severe Winter Storms	Tornado/Wind Storm	1
Tornado/Wind Storm	Drought	1
Flood	Lightning	1

IV.A.2 PRIORITIZED HAZARDS

Public officials are most concerned about the impact of severe, large-scale weather events such as tornadoes, straight-line winds, and torrential rains resulting in flooding. They are also very concerned about the loss of the ability to communicate with each other, and to the community as a whole during and after a hazard event.

Section V. outlines the goals, objectives and mitigation strategies that the County and City officials have developed for mitigating future hazard events.

SECTION V. GOALS, OBJECTIVES & STRATEGIES

SECTION V. GOALS, OBJECTIVES & STRATEGIES

Chapter III, Hazards Facing the Community, documented how ten hazards have affected Fillmore County and assessed the risks these hazards pose to the county's people and physical assets. It also noted plans and programs Fillmore County currently has to address these hazards and the gaps and deficiencies in them. Chapter IV assesses Fillmore County's vulnerabilities to these hazards and sets priorities for mitigation as perceived by city and county officials in Fillmore County.

This chapter outlines how the county intends to address gaps and deficiencies, through a series of goals, objectives, and strategies developed for each hazard. The goals represent the broadest level of desired outcome and are broken down into more defined target objectives. For each objective, one or more strategies are listed as specific "action steps." Strategies are presented in table format with information on implementation priority (based on effectiveness, costs, ease of implementation, funding availability, and political/social acceptance), whether the effort is new or ongoing, a target date for implementation, the lead agency responsible for coordinating actions identified in the strategy, funding availability, and a benchmark to measure implementation progress. Each strategy will be implemented with support of the County Board and affected City Councils. A majority of action steps are intended to be County-wide efforts. Several specific action steps that apply mainly to only a few cities in the County are identified in the "Participating Jurisdictions" column.

The Fillmore County strategy is based upon the strategy outlined in the Minnesota State All-Hazard Mitigation Plan:

The goals and objectives guided development of the mitigation activities in this plan, and they will provide a vision for hazard mitigation and disaster resistance throughout the Fillmore County. The following goals are long-term general guidelines to establish and direct hazard mitigation and loss reduction measures.

General Goals of Mitigation Plan and Program

1. Maintain and enhance the County's capacity to continuously make Fillmore County less vulnerable to all hazards.
2. Build and support local capacity and commitment to continuously become less vulnerable to natural hazards.
3. Improve coordination and communication with other relevant entities.
4. Increase public understanding, support, and demand for hazard mitigation,

The overriding strategy is to reduce loss of life and damages to property from all hazards. Mitigation actions in the mitigation strategy may fall under one or more of the following six broad 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 include:

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- Planning and zoning
- Building codes
- Capital improvement programs
- Open space preservation
- Storm water management regulations

Property Protection – Actions that involve the modification of existing buildings or structures to protect them from a hazard area.

Examples include:

- Acquisition
- Elevation
- Relocation
- Structural retrofits
- Storm shutters
- 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:

- Education, outreach projects and publications
- Real estate disclosure
- Hazard information centers
- School-age and adult education programs

Natural Resource Protection – Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include:

- Sediment and erosion control
- Stream corridor restoration
- Watershed management
- Forest and vegetation management
- Wetland restoration and preservation

Emergency Services – Actions that protect people and property during and immediately after a disaster or hazard event. Services include:

- Warning and communication systems
- Emergency response services
- Protection of critical facilities

Structural Improvements - Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include:

- Dams
- Levees

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- Floodwalls
- Retaining walls
- Channel modifications
- Storm sewers
- Safe rooms
- Shelters

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V.A. OVERARCHING GOALS

V.A. OVERARCHING GOALS APPLICABLE TO MOST HAZARDS:

Goals and objectives were developed to address two areas of concern in any or all hazards, namely communication and public health.

V.A.1. COMMUNICATION AND EDUCATION GOALS

Goal 1: Increase public awareness of hazard mitigation opportunities within the community and what individuals and the public and private sectors can do.

Objectives:

- Identify hazard mitigation information needs in the community.
- Develop and communicate hazard preparedness resource information.
- Increase early warning and notification capacity in Fillmore County.

Strategies: Communication and Education	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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).	County-wide	High	Ongoing	Ongoing	Emergency Management (EM)	Partially Funded	Campaign designed, materials developed and distributed.
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.	County-wide	Medium	New	2008	EM	Not Currently Funded	Webpage created, updated continuously.
Promote the use of NOAA weather radios for early warning and post event information in public facilities, schools, and for vulnerable populations.	County-wide	High	Ongoing	Ongoing	EM	Partially Funded	Information distributed.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Communication and Education	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-wide	Medium	New	2010	EM	Not Currently Funded	Research, evaluation completed.

V.A.2. PUBLIC HEALTH GOALS

Goal 1: Assure effective and coordinated public health response to promote health and prevent /control injury, disease, and death.

Objectives:

- Build emergency response capacity within the Fillmore County Public Health Department by continuing to implement emergency preparedness planning; public health related emergency exercises and emergency response training.
- The Fillmore County Public Health Department will collaborate with State and local partner agencies to prevent, detect, and control public health impacts from all hazard events.
- The Fillmore County Public Health Department in collaboration with local and State partners will quickly identify persons who are vulnerable to all hazard events, as well as persons who have been affected by this hazard.
- The Fillmore County Public Health and Social Services Department will cooperate and collaborate with partners in the health sector to ensure that primary health; public health, mental health and social services are implemented as necessary during a response to all hazard event.
- The Fillmore County Public Health Department will provide health protection education related to all hazard events to citizens and response partners.
- The Fillmore County Public Health Department will provide and support the environmental health role in evaluating, mitigating and controlling environmental exposures resulting from all hazard events hazards.

Strategies: Public Health	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Use state and federal resources to continue to build and improve public health emergency response capacity in the county.	County-wide	High	Ongoing	Ongoing	Fillmore County Public Health (Public Health)	Partially Funded	Capacity improved. CDC funding continued.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Public Health	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Review and update the public health emergency response operations plan related to all hazard events on an annual basis.	County-wide	High	Ongoing	Ongoing	Public Health	Partially Funded	Plan updated annually.
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.		High	Ongoing	Ongoing	Public Health	Partially Funded	Updated info made available.
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.		High	Ongoing	Ongoing	Public Health	Partially Funded	Response capacity maintained, continued collaboration.
Utilize GIS technology and database management to identify vulnerable populations in the community and update as needed.		Medium	New	Ongoing	Public Health	Partially Funded	System / info developed and kept current.
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.		High	Ongoing	Ongoing	Public Health	Partially Funded	System kept current and expanded timely notifications.
Collaborate with local partners especially Fillmore County Social Services and the American Red Cross to coordinate emergency and temporary shelter for displaced residents.		High	Ongoing	Ongoing	Public Health	Partially Funded	Collaborative effort formed.
Research public health authority in disaster and emergency situations e.g. quarantine, shelter hygiene, public sanitation, and immunization.		High	Ongoing	Ongoing	Public Health	Partially Funded	Evaluation completed.

V.B. GOALS FOR NATURAL HAZARDS

V.B.1 HAZARD: EXTREME WEATHER (SUMMER AND WINTER STORMS, EXTREME TEMPERATURES, TORNADO)

V.B.1.a Goal 1: Encourage safe and accessible shelter for all residents in the event of violent storms and extreme weather conditions.

Objectives:

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- Ensure all new residential structures (apartments, condos, single family and town home) developments and redevelopments without basements have a safe shelter incorporated into the design of the home or provide for common shelters.
- Require all manufactured home parks to provide safe shelter for residents through a structure on site or plan evacuation to safe shelter.
- Ensure that all special population care facilities including schools and nursing home facilities have a severe storm shelter plan.
- Ensure that publicly-owned buildings provide safe shelter locations.
- Explore opportunities to incorporate shelter requirements into commercial facilities.

Strategies: Extreme Weather Goal 1: Shelter	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding/Cost	Evaluation
<i>* 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.</i>	County-wide	High	Ongoing	Ongoing	Emergency Management (EM)	Partially Funded	Task force created and operating.
Encourage mutual aid and awareness among school districts on auxiliary power generator availability.		High	New	Ongoing	EM	Not Currently Funded	Information made available.
Develop a safe shelter plan for publicly-owned facilities including shelters, shelter capacity, evacuation routes, and transportation.		High	New	2010	EM	Not Currently Funded	Plan developed.
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.		High	New	2009	EM/ GIS Dept	Not Currently Funded	Shelters Identified, Information made available.
Assess all publicly-owned facilities in county with regard to storm safety procedures including safe shelter		Medium	New	2009	EM	Not Currently Funded	Evaluation
Determine if additional shelters are needed for "at-risk" populations and construct them.		High	New	2010	EM	Not Currently Funded	Construct Shelters.
Emergency Management Directors in each city to stockpile canned food and water for long-lived storm events		Medium	New	Ongoing	EM	Not Currently Funded	Stockpiles created
Inform all residents and visitors of safe shelter locations through media campaigns, maps, websites, newsletters and other sources.		High	New	2009	EM	Not Currently Funded	Assessment completed.
Identify a list of local vendors of mobile power generators and explore opportunities for good-Samaritan agreements or mutual aid agreements.		High	New	2009	EM	Not Currently Funded	Assessment completed.

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Strategies: Extreme Weather Goal 1: Shelter	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding/Cost	Evaluation
Communicate and coordinate with city and county planning agencies regarding the development of standard requirements for safe shelters in dwellings without basements.	County-wide	High	New	Ongoing	EM	Not Currently Funded	Assessment completed.
Explore opportunities to incorporate safe shelter requirements for commercial facilities into city building and permitting codes.		Low	New	Ongoing	EM	Not Currently Funded	Study completed.
Consider requiring campgrounds to have an evacuation and emergency shelter plan in place.		Low	New	2009	EM	Not Currently Funded	Study completed.
Maintain communications with voluntary agencies regarding shelters.		High	New	Ongoing	EM	Partially Funded	Information shared
Assess storm shelter readiness and availability for special populations including the Amish.		Low	New	Ongoing	EM	Not Currently Funded	Assessment completed

*** Participants include all townships and cities, including the fourteen cities adopting this plan. All participants identified severe storms as their #1 or #2 hazard concern (Section IV).**

Principal Contact: Fillmore County Emergency Management Director

Cooperating Partners: City Emergency Managers, city and county planning departments, townships, National Weather Service, County GIS, county law enforcement, Fillmore County Highway Department.

V.B.1.b Goal 2: Improve severe storm warning systems, infrastructure, education and training for quicker and more efficient notification of county residents.

Objectives:

- Ensure that emergency management personnel, county sheriff, and emergency response persons are notified of severe storms.
- Ensure adequacy of outdoor warning system.
- Improve access to real-time weather data.
- Improve citizen access to severe weather warnings.

Strategies: Extreme Weather Goal 2: Warning	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
* Create a multi-jurisdictional task force (county, cities, townships, others) to coordinate the implementation of strategies to reduce the impact of		High	Ongoing	Ongoing	Emergency Management (EM)	Currently Funded	Task force created and operating.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Extreme Weather Goal 2: Warning	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
<i>violent storms and extreme temperatures.</i>	County-wide						
<i>* Inventory and assess adequacy of the city's outdoor warning system equipment and replace malfunctioning or old warning sirens.</i>		High	Ongoing	Ongoing	EM	Partially Funded	Assessment completed.
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.		High	New	2010	EM	Not Currently Funded	Options identified and implement best strategy
Increase education for campers in local campgrounds on the local hazard potential.		High	New	2010	EM	Not Funded	Information made available.
Improve citizens' understanding of the available communications from the National Weather Service (NWS) for notification of severe weather watches and warnings.		Medium	Ongoing	Ongoing	EM	Partially Funded	Information made available.
Identify vulnerable populations subject to extreme temperatures, develop a plan to lessen the impact of extreme temperatures and implement the plan.		Medium	New	Ongoing	EM	Not Funded	Assessment completed. Plan implemented.
Develop a communications plan to notify vulnerable populations to take steps to protect their health.		High	New	Aug 2012	EM	Not Funded	Plan completed.
Assess and upgrade county/city warning system as necessary.		High	Ongoing	2009 and ongoing	EM	Not Funded-possible funding from NWS or HSEM	Warning system up to date and functioning.
Evaluate the use of private subscription-based weather alert services and purchase if cost effective.		Low	New	Jun 2009	EM	Partially funded	Assessment completed.
Evaluate other automated weather alert systems and purchase if cost effective.		High	New	Jun 2010	EM	Not Funded	Assessment completed.

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Strategies: Extreme Weather Goal 2: Warning	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Encourage more volunteers to become active in the severe storm spotters network and communications network (RACES).	County-wide	Medium	New	Ongoing	EM	Partially funded	Information made available.
Promote the use of weather radios and purchase additional radios especially for special populations.		Medium	Ongoing	Ongoing	EM	Not Funded-possible funding from NWS or HSEM	Provide Information, Purchase equipment.
Improve access to real-time weather data such as temperature, wind speed, direction and storm conditions for emergency personnel.		Medium	New	Ongoing	EM	Not Funded-possible funding from NWS or HSEM	Assess equipment and purchase/maintain.
Advertise and encourage participation in the FEMA Nationwide Cell Phone Alert System once activated.		Medium	New	Ongoing	EM	Not Funded	Press releases sent.
Provide critical facilities including schools, and nursing homes in the county access to severe weather notification and observation.		High	Ongoing	Jun 2013	EM	Partial Funding from NWS	Information made available.
Purchase hand-held weather meters for county emergency personnel.		High	New	Dec 2010	EM	Not Funded	Equipment purchased.
Identify ways to increase access to emergency information for campgrounds, cities and townships and provide the information in a timely manner.		High	New	Sep 2010	EM	Not Funded	Assessment completed.
Increase access to emergency information to campgrounds, cities and townships.		High	New	Ongoing	EM	Currently Partially Funded from HSEM Grant	Information made available.

*** Participants include all townships and cities, including fourteen cities adopting this plan. All participants identified severe storms as their #1 or #2 concern (Section IV).**

Principal Contact: Fillmore County Emergency Management Director

Cooperating Partners: City Emergency Managers, city and county planning departments, townships, National Weather Service, County GIS, county law enforcement, Ham Radio Operators (RACES), Fillmore County Highway Department.

V.B.1.c. Violent Storms/Extreme Temperatures Goal 3: Protect People and Public Infrastructure

SECTION V GOALS, OBJECTIVES & STRATEGIES

Objectives:

- Limit storm damage to local electrical distribution lines.
- Limit personal injuries and property damage caused by travel on state and major county highways during adverse weather conditions.
- Ensure the most efficient and effective use of City and County road maintenance equipment
- Ensure all county property owners are aware of methods used to protect structures from lightning strikes.

Strategies: Extreme Weather Goal 3: Protect People /Public Infrastructure	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-wide	High	Ongoing	Ongoing	Emergency Management (EM)	Not funded	Communication procedures established.
<i>* Continue to maintain cooperative arrangements with cities and townships to make the most efficient and effective use of road maintenance equipment.</i>		High	Ongoing	Ongoing	EM	Partially Funded	Maintain efforts.
Work with cities to develop and/or enforce restrictions on planting large or rapidly-growing trees near power lines.		Low	New	Ongoing	Zoning and Planning	Not funded	Restrictions enforced.
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.		Low	New	Ongoing	Zoning and Planning	Partially Funded by power companies	Restrictions enforced.
Evaluate the readiness of all publicly owned buildings for preventing damage from lightning strikes (evaluate building codes for grounding requirements).		High	New	2011	Zoning and Planning	Not Funded	Assessment completed.
Communicate strategies to individual homeowners and commercial property owners for preventing damage from lightning strikes.		Low	New	Ongoing	EM	Not Funded	Information made available.
Evaluate installation of lightning indicator and alert systems for outdoor public venues, such as the Fillmore County Fairgrounds or Fillmore County/City Park System.		Low	New	2012	EM	Not Funded	Assessment completed.
Encourage the planting of windbreaks to serve as a "living snow fence" to help prevent blizzard conditions.		Medium	New	Ongoing	SWCD	Not Funded	Requirements communicated

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Extreme Weather Goal 3: Protect People /Public Infrastructure	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Evaluate burying of existing power lines.	County-wide	Medium	New	Ongoing	Zoning and Planning	Funding	Evaluation
Evaluate burying of existing power lines.		Medium	New		Zoning and Planning	Partially Funded	Ordinances enforced.
Continue to enforce the tie-down requirements for mobile homes.		High	New	Ongoing	Zoning and Planning	Not Funded	Ordinances enforced.

** Participants include all townships and cities, including fourteen cities adopting this plan. All participants identified severe storms as their #1 or #2 concern (Section IV).*

Principal Contact: Fillmore County Emergency Management Director

Cooperating Partners: City Emergency Managers, city and county planning departments, townships, National Weather Service, County GIS, county law enforcement, Fillmore County Highway Department.

V.B.2. HAZARD: FLOOD

V.B.2.a. Flood Goal 1: Ensure that 100-year flood risks are addressed by all county jurisdictions in their land use, land use planning and management.

Objectives:

- Ensure floodplain-zoning ordinances are in compliance with state and federal regulations with respect to nonconforming structures.

Strategies: Flood Goal 1: 100-year Flood Risk Strategies	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Complete countywide FEMA floodplain restudy.	County-wide	High	Ongoing	Ongoing	FEMA	Funded, FEMA	Study completed.
Adopt or amend city and county shoreland/floodplain ordinances to recognize new Flood Insurance Study.		High	New	2009	Zoning and Planning	Not Funded	Ordinances amended.
Review current floodplain zoning ordinances for non-compliance with state and federal regulations with respect to nonconforming structures.		Medium	Ongoing	2009 and ongoing	Zoning and Planning	Not Funded	Review completed.
Encourage cities to adopt a legally enforceable amendment to their zoning ordinances with respect to nonconforming structures.		Medium	New	2009 and ongoing	Zoning and Planning	Not Funded	Information made available.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Flood Goal 1: 100-year Flood Risk Strategies	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Encourage city and county participation in FEMA Community Rating System program. <i>*Townships coordinate with County Zoning Manager on floodplain permit review.</i>	County-wide	Medium	New	Ongoing	Zoning and Planning	Not Funded	Information made available.

** All rural townships with floodplain participate. Township officers identified flooding as their #1 or #2 concern (Section IV).*

Principal Contact: Fillmore County Zoning Department

Cooperating Partners: City Emergency Managers, city and county planning departments, city councils, city administrators, township officials, MN Department of Natural Resources, FEMA.

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SECTION V GOALS, OBJECTIVES & STRATEGIES

V.B.2.b. Flood Goal 2: Identify and mitigate flood prone structures and infrastructure in the county.

Objectives:

- Ensure floodplain-zoning ordinances are in compliance with state and federal regulations with respect to nonconforming structures.
- Remove or mitigate structures and facilities that are within the 100 year floodplain.

Strategies: Flood Goal 2: Mitigate flood prone structures	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Complete a countywide flood mitigation plan that includes the identification of flood prone and repetitive loss structures and identification of flood mitigation projects.	County-Wide	High	Ongoing	2009 and ongoing	Emergency Management (EM)	Partially funded	Plan completed.
Identify, relocate, flood proof or tear down all repetitive loss structures and critical facilities.	Spring Valley, Preston, Lanesboro, Whalan, Peterson, Mabel, and Rushford	Medium	Ongoing	2009 and ongoing	Zoning and Planning	Partially funded	Assessment completed, structures mitigated.
Encourage continued compliance with the NFIP.	County-Wide	Medium	Ongoing	Ongoing	Zoning and Planning	Partially Funded	Review completed.
Adopt new floodplain elevations and information once available and inform the public of these new flood plain boundaries.	County-Wide	High	New	2009 and ongoing	Zoning and Planning	Not Currently Funded	Information made available.
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.	County-Wide	Medium	New	2010 and ongoing	Zoning and Planning	Partially funded	Information made available.
Review the county flood plain ordinance and update as needed.	County-Wide	High	Ongoing	Ongoing	Zoning and Planning	Not Currently Funded	Review completed.
Cities should adopt or update floodplain ordinances as needed.	County-Wide	Low	Ongoing	2009 and ongoing	Zoning and Planning	Not Currently Funded	Ordinances updated

Principal Contact: Fillmore County Zoning Department

Cooperating Partners: County Emergency Management Director, City Emergency Managers, city and county planning departments, city

SECTION V GOALS, OBJECTIVES & STRATEGIES

councils, city administrators, township officials, MN Department of Natural Resources, FEMA.

V.B.2.c. Flood Goal 3: Improve the readiness of the county in the event of flooding.

Objectives:

- Ensure that the county and local jurisdictions are prepared for potential flooding.
- Ensure that there is adequate warning of rising waters throughout the river and stream network.

Strategies: Flood Goal 3: Flood Preparation	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Ensure an adequate number of sand bags and sand is on hand for flood prone structures in the county.	Spring Valley, Preston, Lanesboro, Whalan, Peterson, Mabel, and Rushford	High	Ongoing	2008 and ongoing	Emergency Management (EM)	Not Currently Funded	Study completed.
Develop a plan for preparing and distributing sandbags when needed.	Spring Valley, Preston, Lanesboro, Whalan, Peterson, Mabel, and Rushford	High	New	2008 and ongoing	EM	Not Currently Funded	Plan completed.
Encourage continued compliance with the NFIP and encourage non-participating cities and townships to apply.	County-Wide	Medium	Ongoing	2009 and ongoing	EM	Partially funded	Review completed/ information distributed.
Educate the public on practices and programs that assist in diminishing the effects of flooding.	County-Wide	High	New		EM	Not Funded	Information made available.
Purchase needed flood equipment including pumps and generators.	Spring Valley, Preston, Lanesboro, Whalan, Peterson, Mabel, and Rushford	Low	New	Ongoing	EM	Not Funded	Purchased equipment.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Flood Goal 3: Flood Preparation	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Periodically review and update the county's EOP to address strategies in this plan and other flood issues in the county.	County-Wide	Medium	Ongoing	Ongoing	EM	Partially Funded	Plan completed.
Require that all LP tanks and other hazardous material tanks be anchored or tied down.	County-Wide	High	New	2010	Zoning and Planning	Partially Funded	Ordinances updated.
Increase coordination and communication with HAM radio operators.	County-Wide	High	New	2008 and ongoing	EM	Not Funded	Information made available.
Evaluate the locations and numbers of stream monitoring stations throughout the County, and coordinate and/or purchase additional monitoring equipment if necessary.	County-Wide	High	New	2008	EM	Not Funded	Information made available.

Principal Contact: Fillmore County Emergency Management Director

Cooperating Partners: City Emergency Managers, city and county planning departments, city councils, city administrators, township officials, HAM Radio Operators, MN Department of Natural Resources, NWS Lacrosse, and FEMA.

V.B.2.c. Flood Goal 4: Improve water drainage, flow, retention and storage to prevent flooding.

Objectives:

- Improve the existing infrastructure that affects water flow throughout the County.

Strategies: Flood Goal 4: Infrastructure improvements to prevent flooding	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-wide	High	New	2012	SWCD	Not Funded	Information made available. Plans implemented.
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		Medium	Ongoing	2012	SWCD	Partially Funded	Study completed, changes made.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Flood Goal 4: Infrastructure improvements to prevent flooding	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-wide	Medium	New	2011	SWCD	Not Funded	Evaluation completed
Develop a GIS layer for public drainage systems showing watershed boundaries, open ditches, tile lines, etc.		Low	New	2011	GIS Dept	Not Funded	Information made available.
Analyze the ditch systems in the county and surrounding counties and make ditch improvements where needed.		Low	New	2012	Highway Dept. (HD)	Not Funded	Review completed.
Encourage and complete flood flow reduction projects within the county and in surrounding counties and watersheds.		Medium	Ongoing	2012	HD	Not Funded	Projects identified & completed
Reduce countywide flood damage to agricultural land, rural or urban development, and infrastructure by protecting against significant runoff events.		Medium	Ongoing		SWCD		Identify areas and complete projects
Identify and complete flood protection and prevention projects for cities.		High	Ongoing	Ongoing	EM	Not Funded	Identification completed.
Examine minimizing flooding impacts, by increased upland storage to reduce the overall volume of water transported by the ditch system and implement where feasible.		Low	New	2012	HD	Not Funded	Study completed and implemented.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Flood Goal 4: Infrastructure improvements to prevent flooding	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
<p>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:</p> <ul style="list-style-type: none"> - 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 	County-wide	Medium	New	2012	SWCD	Not Funded	Inventories completed, flows reduced.
Coordinate water flow and retention projects with neighboring counties and area watersheds.		Medium	New	2013	Zoning and Planning	Not Funded	Information made available.
<p>Prevent damage from critical flood events while enhancing base flows:</p> <ul style="list-style-type: none"> - 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. 		Medium	New	Ongoing	SWCD	Partial Funding	Damage prevented
Study the possibility of creating flood diversion channels and determine the proper location for such channels and implement where appropriate.		Medium	New	2011	SWCD	Not Funded	Study completed and implemented.
Consider environmental enhancement for all flood control projects.		High	New	Ongoing	Zoning and Planning	Partially Funded	Information made available.
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.		High	New	Ongoing	SWCD	Not Funded	Flood prone areas identified, Information made available.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Flood Goal 4: Infrastructure improvements to prevent flooding	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Educate farmers and citizens about the benefits of "buffer plantings" along river corridors.	County-wide	High	New	Ongoing	MN Extension	Partially Funded	Information made available.
Examine the benefits of creating a Watershed District for Fillmore County and the surrounding areas and create if feasible.		High	New	Ongoing	Zoning and Planning	Partially Funded	Analysis completed.
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		High	New	2009	Zoning and Planning	Partially Funded	Analysis completed; mitigation measures implemented

Principal Contact: Fillmore County Emergency Management Director

Cooperating Partners: City Emergency Managers, city and county planning departments, city councils, city administrators, township officials, MN Department of Natural Resources, FEMA.

V.B.3. HAZARD: LANDSLIDES

Besides the Goals, Objectives and Strategies listed under *Flooding*, the following Goals, Objectives and Strategies are included:

V.B.3.a. Landslides Goal 1: Reduce or prevent the impacts of landslides.

Objectives:

- Create or update land use regulations
- Determine the susceptibility of landslides
- Educate the citizenry on measures to protect themselves from the effects of landslides.

Strategies: Landslides Goal 1: Reduce or prevent the impacts of Landslides	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Adopt or update bluff land ordinances as needed.	Rushford, Peterson, Whalan,	High	Ongoing	2009 and Ongoing	Zoning and Planning	Partially Funded	Ordinances adopted or updated.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Landslides Goal 1: Reduce or prevent the impacts of Landslides	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
	Lanesboro, and Preston						
Inform and educate the citizenry on flood insurance to cover the affects of landslides.	Rushford, Peterson, Whalan, Lanesboro, and Preston	Medium	New	Ongoing	Zoning and Planning	Partially Funded	Information made available.
Educate residents about the role vegetation plays in preventing landslides.	Rushford, Peterson, Whalan, Lanesboro, and Preston	Medium	Ongoing	Ongoing	EM	Not Funded	Information made available.
Study the susceptibility for landslides near roads and structures, and use mitigation measures such as slope stabilization where feasible.	Rushford, Peterson, Whalan, Lanesboro, and Preston	High	New	Ongoing	Zoning and Planning	Partially Funded	Assessment Completed, measures taken.

Principal Contact: Fillmore County Emergency Management Director

Cooperating Partners: City Emergency Managers, city and county planning departments, city councils, city administrators, township officials, MN Department of Natural Resources, FEMA.

V.B.4. HAZARD: KARST/SINKHOLES & LAND SUBSIDENCE

Besides the Goals, Objectives and Strategies listed under *Water Supply Contamination*, the following Goals, Objectives and Strategies are included:

V.B.4.a. Karst/Sinkholes & Land Subsidence Goal 1: Protect residents from the impacts of sinkhole formation.

Objectives:

- Create or update land use regulations
- Restrict development in sinkhole prone areas
- Determine areas of greatest potential for sinkholes
- Increase education efforts on Karst/Sinkholes

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Karst/Sinkholes & Land Subsidence Goal 1: Reduce or prevent the impacts of Landslides	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Create overlay districts, land use regulations, or Karst-related ordinances to protect the area's Karst.	County-wide	High	Ongoing	Ongoing	Zoning and Planning	Partially Funded	Ordinances amended.
Require geotechnical studies for all development underlain by limestone bedrock.		Low	New	Unknown	Zoning and Planning	Not Funded	Ordinances amended.
Continue to update mapping of sinkholes, springs springsheds and other Karst features.		Medium	Ongoing	Ongoing	Zoning and Planning/GIS Dept	Partially Funded	Include new data points continuously
Increase awareness and education on Karst/sinkholes in schools and in the public at large.		High	New	Ongoing	EM	Not Funded	Information made available.

Principal Contact: Fillmore County Emergency Management Director

Cooperating Partners: City Emergency Managers, city and county planning departments, city councils, city administrators, township officials, MN Department of Natural Resources, FEMA.

V.B.4.b. Karst/Sinkholes & Land Subsidence Goal 2: Reduce the threat of long term exposure to radon gas in homes.

Objectives:

- Increase awareness of radon gas as a threat to health.
- Reduce residents exposure to radon gas

Strategy: Karst/Sinkholes & Land Subsidence Goal 2: Reduce the threat of long term exposure to radon gas in homes.	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Develop a systematic information and education program that provides useful and factual information to the public about radon gas exposure and testing.	County-wide	Medium	Ongoing	Ongoing	Public Health	Not Funded	Information made available continuously.
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.	County-wide	Medium	New	2013	Public Health	Not Funded	Zoning ordinance or building code amended.

Principal Contact: Fillmore County Public Health Department

Cooperating Partners: Minnesota Department of Health, health care providers, local Emergency Management Directors.

SECTION V GOALS, OBJECTIVES & STRATEGIES

V.B.5. HAZARD: DROUGHT

V.B.5.a. Drought Goal 1: Monitor the county’s groundwater supplies and demands.

Objectives:

- Ensure the continued supply of water for crops, drinking water and environment.

Strategies: Drought Goal 1: Monitor Supply and demand of groundwater	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Investigate and establish methods of banking water for emergencies.	County-wide	Low	New	2010	EM	Not Funded	Methods established.
Establish a comprehensive and ongoing water-monitoring program. Coordinate efforts of monitoring the public water supply with the DNR and MDH.		High	Ongoing	Ongoing	SWCD	Partially Funded	Evaluation
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.		Low	New	Unknown	SWCD	Not Funded	Information made available continuously.
Water conservation provisions and use restrictions in times of drought included in county and city ordinances.		Low	New	Unknown	SWCD	Not Funded	Ordinances updated.
Semi-annual or annual water consumption by various major consumers monitored for the potential impact to the aquifer.	County-wide	Low	New	Unknown	DNR	Not Funded	Ordinances updated.
Estimate the annual recharge rates or the capacities of the various aquifers in the county.		High	New	Unknown	DNR	Not Funded	Study completed.
Investigate increasing public education campaigns on water conservation and funding for campaigns.		Medium	New	2010	EM	Partially Funded	Investigations completed.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Drought Goal 1: Monitor Supply and demand of groundwater	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Educate the public on water saving tips during times of dry weather or drought conditions.		Medium	New	Ongoing	EM	Not Funded	Information made available continuously.
Encourage water conservation through use of low-pressure irrigation systems to conserve groundwater in the county.		Low	New	Ongoing	EM	Partially Funded	Information made available continuously.
Evaluate and implement the objectives and strategies outlined in the Fillmore County Comprehensive Water Management Plan.		High	Ongoing	Ongoing	SWCD	Partially Funded	Plans reviewed, projects identified.

Principal Contact: Fillmore Soil and Water District **Cooperating Partners:** County Emergency Management, Fillmore County Public Health, Fillmore County Zoning, MN Departments of Health and Natural Resources, Minnesota Geologic Survey.

V.B.6. HAZARD: WILDFIRES

V.B.6.a. Wildfires Goal 1: Prevent Wildfires.

Objectives:

- Minimize the amount of fuel in areas prone to fire damage.
- Minimize wildfire risks within Minnesota Memorial Hardwood State Forest.
- Provide education to the public about wildfire prevention.

Strategies: Wildfires Goal 1: Prevent Wildfires	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Work with the Minnesota DNR to include prescribed burning on all county lands and parks.		Medium	Ongoing	Ongoing	Fillmore County Sheriff Dept (Law Enforcement)	Not Funded	Information made available continuously.
Create a wildfire susceptibility model to determine areas which are more prone to wildfires.		Medium	New	2013	GIS Dept	Not Funded	Information made available continuously.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Wildfires Goal 1: Prevent Wildfires	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Provide educational material to all campers entering local parks and campgrounds.	County-wide	Medium	New	2013	Fire Departments	Not Funded	Information made available continuously.
Increase fire risk awareness in campgrounds with updated signs that display the potential risk of wildfires (high, medium, low).		Medium	New	2013	EM	Not Funded	Signs constructed.
Enforce the use of fire rings at all campgrounds.		Medium	Ongoing	Ongoing	Law Enforcement/ DNR	Not Funded	Enforce continuously.
Encourage campgrounds to remove debris and dead vegetation around camping areas on an annual basis.		High	Ongoing	Ongoing	DNR	Not Funded	Debris removed continuously.
Encourage campgrounds to thin the tree canopy surrounding camping areas to minimize chances of wildfires from spreading.		Medium	New	Ongoing	Law Enforcement	Not Funded	Trees pruned continuously.
Require burning permits for large fires.		High	Ongoing	Ongoing	Zoning and Planning	Partially Funded	Permits enforced.

Principal Contact: Fillmore County Sheriff

Cooperating Partners: County Emergency Management, City Emergency Managers, city fire and police departments, city councils, city administrators, township officials, MN Department of Natural Resources

V.B.6.b. Wildfires Goal 2: Minimize damage caused by wildfires.

Objectives:

- Have access to additional firefighters other than those already in Fillmore County for large wildfires.
- Minimize impact of wildfire in residential areas

Strategies: Wildfires Goal 2: Minimize Damage from wildfire	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Wildfires Goal 2: Minimize Damage from wildfire	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Amend zoning regulations to include vegetation restrictions or buffers around homes in or near forested areas.	County-wide	Low	New	2010	Zoning and Planning	Not Funded	Ordinances amended.
Review the need to alter the county building regulations to include restrictions on home construction materials.		Low	New	2012	Zoning and Planning	Not Funded	Ordinances amended.
Undertake an assessment of wildfire risks and associated prevention measures.		Low	New	Unknown	EM	Not Funded	Information made available
Firefighters need to receive proper training to fight wildfires.		Medium	Ongoing	Ongoing	EM	Partially Funded	Inventory completed.
Organized and regular communications between the DNR, U.S. Fish and Wildlife Service and local fire departments on fighting wildfires.		Medium	Ongoing	Ongoing	EM	Partially Funded	Inventory completed.
Educate the public on wildfire dangers and prevention of wildfires during dry seasons.		Medium	Ongoing	Ongoing	EM	Partially Funded	Increased communication efforts.
Educate the public on wildfire dangers and prevention of wildfires during dry seasons.		Low	New	Unknown	EM	Not Funded	Firebreaks constructed.
Minimize impact of wildfire in residential areas by creating firebreaks between structures and areas with wildfire fuel.		Low	New	2013	Law Enforcement	Not Funded	Assessment completed.
Assess the need and construct additional dry hydrants as needed.		Low	New	Ongoing	Fire Departments	Not Funded	Assessment completed. Hydrants installed

Principal Contact: Fillmore County Sheriff

Cooperating Partners: County Emergency Management, County Zoning Department, City planning departments, City Emergency Managers, city fire and police departments, city councils, city administrators, township officials, MN Department of Natural Resources

SECTION V GOALS, OBJECTIVES & STRATEGIES

V.B.7. HAZARD: INFECTIOUS DISEASE:

V.B.7.a. Infectious Disease Goal 1: Reduce the threat of infectious diseases through education, training and preparedness.

Objectives:

- Collaborate with partner agencies to prevent, detect, and control infectious diseases.
- Develop and maintain resources, materials, plans, and agreements that address coordinated infectious disease response.
- Educate the public through disease information designed to prevent and control disease transmission.

Strategy: Infectious Disease Goal 1: Reduce the threat of Infectious Disease	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Develop a systematic information and education program that provides useful and factual information to the public about infectious diseases and vaccinations.	County-wide	Medium	Ongoing	Ongoing	Public Health	Partially Funded	Information made available continuously.
Continue to work with local media to disseminate information about infectious diseases and prevention.		Medium	New	Ongoing	Public Health	Partially Funded	Information made available continuously.
Develop a systematic information and/or links to other sources of reliable information about infectious diseases and prevention.		Medium	New	Ongoing	Public Health	Partially Funded	Information made available continuously.
Develop, maintain and update materials, plans and agreements for addressing infectious disease.		High	Ongoing	Ongoing	Public Health	Partially Funded	Information made available continuously.
Continue providing and Increase funding for socio/economically challenged populations for vaccinations.		Medium	New	Ongoing	Public Health	Partially Funded	Funds made available.
Ensure availability of proper equipment/supplies (drugs and medication) to address infectious disease outbreaks. (isolation, quarantine, and mass dispensing)		High	New	2011	Public Health	Partially Funded	Equipment and supplies purchased.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategy: Infectious Disease Goal 1: Reduce the threat of Infectious Disease	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Utilize state, federal and local resources to prevent and control infectious disease in the county.	County-wide	High	Ongoing	Ongoing	Public Health	Partially Funded	Training completed continuously.
Provide information on the recognition, testing, treating, and reporting of infectious diseases to healthcare providers in clinics, and other healthcare settings.		High	Ongoing	Ongoing	Public Health	Partially Funded	Information made available continuously.
Work with clinics and hospitals to improve infectious disease reporting.		Medium	Ongoing	Ongoing	Public Health	Partially Funded	Information made available continuously.
Work with clinics, hospitals to improve infectious disease reporting.		Medium	Ongoing	Ongoing	Public Health	Partially Funded through MDH	Information made available continuously.
Continue to work with local/regional hospitals and clinics in developing plans and roles in infectious disease response, including quarantine.		Medium	Ongoing	Ongoing	Public Health	Partially Funded	Plan completed and updated
Continue to develop a human quarantine plan collaborating with state, regional, and local partners including Emergency Management Directors.		Medium	Ongoing	Ongoing	Public Health	Partially Funded	Plan completed and updated
On an annual basis, review and update the Public Health Emergency Response Operations Plan that outlines procedures for dealing with infectious diseases.		High	Ongoing	Ongoing	Public Health	Currently Funded	Plan completed and updated
Work closely with MDH, CDC, and regional public health partners to plan the receipt and dispensing of the Strategic National Stockpile.		Medium	Ongoing	Ongoing	Public Health	Partially Funded	Plan completed and updated.
Increase the public health work force for emergencies by enrolling and training volunteers through the Minnesota Responds – Medical Reserve Corp or CERT programs.	County-wide	High	New	2013	Public Health	Not Funded	Workforce increased
Investigate free recycling or reduce fees for recycling tires to reduce abandoned tires a mosquito breeding ground.		Medium	New	2013	FC Solid Waste	Not Funded	Investigation completed.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Principal Contact: Fillmore County Public Health Department

Cooperating Partners: Minnesota Department of Health, health care providers, hospitals and clinics, county school systems, nursing homes, local Emergency Management Directors.

V.C. GOALS FOR HUMAN CAUSED/TECHNOLOGICAL HAZARDS

V.C.1. HAZARD: FIRE:

V.C.1.a Fire Goal 1: Protect Structures from Fire

Objectives:

- Improve prevention and response efforts county-wide.

Strategies: Fire Goal 1: Protect Structures from fire	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-wide	Low	New	2013	Zoning and Planning	Not Funded	Ordinances updated.
Supply all cities and townships with contact information for maintenance personnel.		High	New	Ongoing	HD	Partially Funded	Study completed.

Principal Contact: Fillmore County Sheriff

Cooperating Partners: County Emergency Management, City Emergency Managers, city fire and police departments, city councils, city administrators, township officials, MN Department of Natural Resources.

V.C.1.b Fire Goal 2: Work toward an educated and informed public

Objectives:

- Educate county residents on measures they can take to reduce risks to life and property.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Fire Goal 2: Public Education	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-wide	High	Ongoing	Ongoing	Fire Departments	Not Funded	Increased school visits and information.
Increase education on fire safety through the local cable channel and through radio.		High	New	Ongoing	Fire Departments	Not Funded	Increased school visits and information.
Increase education on fire safety through the local cable channel and through radio.		High	New	Ongoing	Fire Departments	Not Funded	Information made available continuously.

** Participants include all cities, including fourteen cities adopting this plan.*

Principal Contact: Fire Departments

Cooperating Partners: County Emergency Management, City Emergency Managers, city fire and police departments, city councils, city administrators, township officials, MN Department of Natural Resources

V.C.2. HAZARD: HAZARDOUS MATERIALS/WASTE

V.C.2.a. Hazardous Materials/Waste Goal 1: Work to ensure that emergency personnel and other potentially affected parties are informed about hazardous materials/waste located in and transported through Fillmore County.

Objectives:

- Support policies and programs that assist in creating factual and timely information about hazardous materials/waste stored in or transported through Fillmore County.
- Ensure new technologies are used to improve the county’s ability to respond to a disaster.
- Support policies aimed at reducing hazardous waste spills on transportation routes

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Hazmat Goal 1: Information Building and Sharing Strategies	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-Wide	High	Ongoing	Ongoing	EM	Partial Funding	Information made available.
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.	County-Wide	High	New	Ongoing	SWCD	Not Funded	Information made available. New software/hardware purchased
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.	County-Wide	High	New	Ongoing	Law Enforcement	Not Funded	Information updated regularly.
Develop a local education campaign to educate citizens about the various hazardous materials/waste that are in the county.	County-Wide	Low	New	Ongoing	EM	Not Funded	Information made available.
Increase coordination with State Duty Officer(SDO) for highway spills.	County-Wide	Low	New	Ongoing	Law Enforcement	Partially Funded	SDO called as appropriate
Create a mutual aid agreement between all police departments countywide.	County-Wide	High	Ongoing	Ongoing	Law Enforcement	Partially Funded	Mutual aid agreements in place.
Create a mutual aid agreement between all police departments countywide.	County-Wide	High	New	Ongoing	Law Enforcement	Partially Funded	Mutual aid agreements in place.
Create a detailed road closure plan in the case of hazardous materials spills.	Chatfield, Preston, Harmony, Canton, Mabel, Lanesboro, Rushford, and Fountain	Low	New	2012	Law Enforcement	Not Funded	Plans created.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Hazmat Goal 1: Information Building and Sharing Strategies	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Evaluate and recommend speed reductions along routes used to transport hazardous materials where there is a potential for roll-overs.	Chatfield, Preston, Harmony, Canton, Mabel, Lanesboro, Rushford, and Fountain	High	New	2010	Highway Department/ Mn/DOT	Not Funded	Speed limits decreased.

Principal Contact: Fillmore County Emergency Management

Cooperating Partners: County Sheriff, City police and fire departments, MN Pollution Control Agency, city/public safety agencies, county public safety agencies and county GIS staff.

V.C.2.b. Hazardous Materials/Waste Goal 2: Improve the effectiveness and quality of the various policies and planning efforts addressing hazardous materials/waste that may affect Fillmore County

Objectives:

- Improve the effectiveness of plans and agreements addressing hazardous materials and hazardous wastes
- Ensure that Fillmore County jurisdictions are prepared to respond to a hazardous material incident.

Strategies: Hazmat Goal 2: Policy and Planning	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Review and update the County policies and environmental plans that address hazardous material/waste storage and transportation in Fillmore County.	County-wide	High	Ongoing	Ongoing	EM	Partially Funded	Assessment and update completed.
Review and update the County Emergency Operations Plans for dealing with a hazardous material/waste incident, including nuclear materials/waste.		High	Ongoing	Ongoing	EM	Currently Funded	Assessment and update completed.
Develop and distribute debris management guidelines.		High	Ongoing	Ongoing	EM	Partially Funded	Guidelines complete, available.
Review and update plans and policies to contend with methamphetamine labs in the county.		Medium	New	Ongoing	Law Enforcement/ Public Health	Partially Funded	Assessment and update completed.

SECTION V GOALS, OBJECTIVES & STRATEGIES

* Coordinate and facilitate discussion between the cities and the County on policies related to hazardous materials/waste storage and transportation.	County-wide	Medium	New	Ongoing	EM	Partially Funded	Policy discussion initiated.
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*** Participants include all fourteen cities adopting this plan.**

Principal Contact: Fillmore County Emergency Management **Cooperating Partners:** MN Homeland Security and Emergency Management, Mn/DOT, MN Pollution Control Agency, city and county public safety agencies, and county GIS staff.

V.C.2.c. Hazardous Materials/Waste Goal 3: Improve overall preparedness and equipment for handling hazardous materials/waste events

Objectives:

- Ensure emergency responders are prepared and have the necessary equipment and ability to respond to a hazardous materials event.

Strategies: Hazmat Goal 3: Preparedness and Equipment	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Assess the need for proper personal protection equipment to respond to hazardous material disasters and purchase as needed.	County-wide	High	Ongoing	Ongoing	EM	Partially Funded	Assessment completed and equipment purchased
* Incorporate the use of the National Incident Management System for all hazard materials incidents that may occur in the county		High	Ongoing	Ongoing	EM	Partially Funded	System adopted.
Participate in regional exercises that test local plans and interaction between local agencies.		High	Ongoing	Ongoing	Law Enforcement	Partially Funded	Assessment completed.
Analyze the possibility of using a warning system for hazardous material events.		Medium	New	2013	EM	Not Funded	Information made available.
Design and implement hazardous material scenarios for practice exercise and to create community awareness (consistent with National Planning Scenarios).		High	Ongoing	2012	Law Enforcement	Partially Funded	Exercises conducted annually.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Hazmat Goal 3: Preparedness and Equipment	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
<i>* 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.</i>	County-wide	Low	New	Ongoing	EM	Not Funded	Information made available.
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.		High	Ongoing	Ongoing	EM	Currently Funded	Participation expanded.
Discuss with countywide Emergency Management Advisory Group the possibility of designating hazardous materials/waste transportation routes and requiring hazmat handlers to use designated routes.		High	Ongoing	2010	EM	Partially Funded	Discussion initiated.

** Participants include all fourteen cities adopting this plan.*

Principal Contact: County Emergency Management Director **Cooperating Partners:** MN Homeland Security and Emergency Management, MN Pollution Control Agency, city and county public safety agencies, and county GIS staff.

V.C.3. HAZARD: DAM & LEVEE FAILURE

V.C.3.a. Dam & Levee Failure Goal 1: Maintain continued structural integrity and flood prevention properties of dams and levees located in Fillmore County.

Objectives:

- Ensure dams and levees are maintained and functioning properly.

Strategies: Dam & Levee Failure Goal 1: Maintain structural integrity of Dams & Levees	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Encourage adequate funding to repair and maintain dams levees, and other similar water retention structures.	Lanesboro	High	Ongoing	Ongoing	EM	Not Funded	Structures maintained.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Examine the purchase of Automated Warning Systems that includes rain gauges to monitor stream levels, and Dam level gauges to monitor water levels.	Lanesboro	Medium	New	2010	EM	Not Funded	Evaluation completed.
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Principal Contact: Fillmore County Emergency Management

Cooperating Partners: Fillmore County Public Works, local public safety agencies, City Emergency Managers and county sheriffs.

V.C.4. HAZARD: WATER SUPPLY CONTAMINATION

V.C.4.a. Water Supply Contamination Goal 1: Protect the Quality of Fillmore County's Ground Water

Objectives:

- Work with relevant jurisdictions to reduce contamination from municipal wastewater treatment plants.
- Reduce contamination from feedlots and agricultural chemicals.
- Reduce contamination of private wells.
- Minimize contamination of ground water from unused or abandoned wells.

Strategies: Water Supply Contamination Goal 1: Quality Protection	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Continue to regulate well construction, sealing, and the annual registration of monitoring and remedial wells.	County-wide	Medium	Ongoing	Ongoing	Zoning and Planning	Partially Funded	Ongoing program operation.
Continue to enforce Minnesota Rules Chapter 7020 and inspect feedlots regularly, enforcing violations.		Medium	Ongoing	Ongoing	Zoning and Planning	Currently Funded	Ongoing program operation.
Provide a well-testing service for private well owners.		Medium	Ongoing	Ongoing	Zoning and Planning, SWCD, Public Health, MDH	Currently Funded	Ongoing program operation.
Review well disclosure documents for the purpose of sealing private wells within city limits at property sale.		Medium	Ongoing	Ongoing	Zoning and Planning	Not Funded	Ongoing program operation.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Water Supply Contamination Goal 1: Quality Protection	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Evaluate and follow goals and actions outlined in the Fillmore County Water Management Plan.	County-wide	High	Ongoing	Ongoing	SWCD	Partially Funded	Ongoing program operation.
Enforce disclosures of wells that are on properties that are foreclosed; especially within city limits.		Medium	Ongoing	2011 and Ongoing	Zoning and Planning	Not Funded	Ongoing program operation.
Continue to work with the SWCD to enforce Minnesota Rules Chapter 7080 for all newly installed septic systems.		High	Ongoing	Ongoing	Zoning and Planning	Currently Funded	Ongoing program operation.
Enforce well water quality standards at the time of property sale.		Medium	Ongoing	Ongoing	Zoning and Planning	Partially Funded	Ongoing program operation.
Regulate new well construction and old well sealing through a permitting process that includes inspection and compliance.		High	Ongoing	2012 and Ongoing	Zoning and Planning	Not Funded	Ongoing program operation.
Enforce septic system construction standards at the time of inspections during property sale or bedroom addition.		Medium	Ongoing	Ongoing	Zoning and Planning	Not Funded	Ongoing program operation.
Administer a septic system maintenance program that requires that every system is pumped or inspected every three years.		Medium	New	Ongoing	Zoning and Planning	Not Funded	Evaluation
Educate floodplain well owners about protecting drinking water wells from flooding.		Low	New	Ongoing	SWCD	Not Funded	Information provided.
Encourage the adoption and/or review of Wellhead Protection Plans for all jurisdictions.		Low	Ongoing	Ongoing	EM	Not Funded	Plans reviewed or adopted
Explore the use of the SE MN Wastewater Initiative for financial assistance to help residents with non-compliant ISTS.		Low	New	2011	SWCD	Partially Funded	Information made available.
Encourage the clean-up of sinkhole dumps and research funding sources to clean up these sites.		High	Ongoing	Ongoing	SWCD	Not Funded	Information made available continuously.
Increase awareness and education on sinkholes in schools and in the public at large.		High	Ongoing	Ongoing	Public Health	Not Funded	Information made available to schools.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Water Supply Contamination Goal 1: Quality Protection	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Have more "Free Recycle" days in Fillmore County.	County-wide	High	New	2012	FC Solid Waste	Not Funded	Recycle days increased.

Principal Contact: Fillmore County Zoning Department **Cooperating Partners:** cities, townships, Fillmore County Emergency Management and Office of GIS, Fillmore County Public Health, Fillmore County SWCD, watershed management organizations, Minnesota Department of Health, and Minnesota Pollution Control Agency.

V.C.4.b. Water Supply Goal 2: Protect Fillmore County Residents from Contaminated Ground Water.

Objectives:

- Provide adequate drinking water in the event of acute local ground water contamination.

Strategies: Water Supply Contamination Goal 2: Contaminated Water Resident Protection	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Identify sources for obtaining bottled water for unincorporated areas of the county, including bottled water distributors and local grocery stores.	County-wide	Medium	New	2010	EM	Partially Funded	Assessment completed.
Create procedures to facilitate well testing and disinfection in case of contamination.		Medium	Ongoing	2009	Public Health	Partially Funded	Ongoing program operation.
Establish procedures to assist cities and the State Health Department in public notification and coordination in the event of a municipal well contamination incident.		Medium	Ongoing	2010	Public Health	Partially Funded	Coordination plan complete.
Communicate risk of water contamination to residents downstream of a wastewater treatment plant in case of flood or other plant problem.		High	Ongoing	Ongoing	Public Health	Partially Funded	Information made available.
Provide well disinfection brochures to potentially impacted well owners.		High	New	Ongoing	Public Health	Not Funded	Information made available.
Provide education materials on monitoring private wells.		High	New	Ongoing	Public Health	Not Funded	Information made available.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Strategies: Water Supply Contamination Goal 2: Contaminated Water Resident Protection	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
Encourage local jurisdictions to evaluate and test their ability to isolate contaminants in their water distribution systems.	County-wide	Medium	New	Ongoing	Public Health	Partially Funded	Assessment completed.

Principal Contact: Fillmore County Emergency Management **Cooperating Partners:** cities, townships, Fillmore County Zoning Department and Office of GIS, Fillmore County Public Health, Fillmore County SWCD, watershed management organizations, Minnesota Department of Health, and Minnesota Pollution Control Agency.

V.C.4.c. Water Supply Contamination Goal 3: Protect Drinking Water Supplies

Objectives:

- Minimize the contamination of Drinking Water Supply.

Strategies:

Water Supply Contamination Goal 3: Supply Protection Strategies	Participating Jurisdictions	Priority	New / Ongoing	Target Date	Lead Agency	Funding	Evaluation
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.	County-wide	Medium	Ongoing	Ongoing	Public Health	Partially Funded	Plans reviewed and maintained.
Encourage and assist communities in developing groundwater protection plans.		High	New	Ongoing	SWCD	Partially Funded	Information, assistance made available.
Encourage cities to enhance security of their wells, reservoirs, and treatment facilities.		Medium	New	Ongoing	Law Enforcement	Partially Funded	Information made available.
Encourage the building of berms around sinkholes to protect livestock and prevent contamination due to runoff.		Low	New	Ongoing	EM	Not Funded	Information made available.

SECTION V GOALS, OBJECTIVES & STRATEGIES

Principal Contact: Fillmore County Emergency Management **Cooperating Partners:** cities, townships, Fillmore County Zoning Department and Office of GIS, Fillmore County Public Health, Fillmore County SWCD, watershed management organizations, Minnesota Department of Health, and Minnesota Pollution Control Agency.

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SECTION VI. PLANNING PROCESS

SECTION VI. PLANNING PROCESS

VI.A.1 PLANNING APPROACH

Fillmore County initiated development of this plan in 2007 and structured planning along a four-phase technical process. Public engagement methods were incorporated throughout the technical planning process, as indicated in italics in the table below:

Fillmore County All-Hazard Mitigation Planning Process	
Phase I: Scope Planning Process and Assess Community Support	
<i>Task 1</i>	Determine planning area and process
<i>Task 2</i>	Determine community interest in mitigation planning: July 2006 <i>Contacted local Jurisdictions and Emergency management</i>
<i>Task 3</i>	Work to remove possible planning roadblocks with all affected communities July – September 2006 <i>Formalized Intra-County Emergency Management Agreement Formed Emergency Management Advisory Group (EMAG)</i>
<i>Task 4</i>	Interview and Selection a consultant to facilitate the process : February
<i>Task 5</i>	EMAG meeting to present the All-Hazard Mitigation Plan process and procedures
<i>Task 6</i>	Build All-Hazard Mitigation Plan Steering Committee from members of EMAG: February
Phase II: Assess Risks	
<i>Task 1</i>	Work with Communities, and Steering Committee to Identify Hazards and Priorities: Feb-March <i>EMAG Meeting, Steering Committee Meetings, Public Surveys, Public Meeting, Interviews with City and Emergency Management Staff</i>
<i>Task 2</i>	Profile Events
<i>Task 3</i>	Inventory Community Assets
<i>Task 4</i>	Estimate Losses
Phase III: Develop a Mitigation Plan	
<i>Task 1</i>	Develop Mitigation Goals and Objectives, with Community and Stakeholder Input: May - June 2008 <i>EMAG group meeting, County Planning Commission Meeting, Public Survey, Public Input Meeting, City officials and Emergency Management staff interviews.</i>
<i>Task 2</i>	Identify and Prioritize Mitigation Efforts
<i>Task 3</i>	Prepare an Implementation Strategy
<i>Task 4</i>	Document the Mitigation Plan
<i>Task 5</i>	Seek Broadly-Based Stakeholder Review and Comment on Plan Drafts: June - July, 2008 <i>Fillmore County Board of Commissioners, release full plan for review via: News releases Send plan to adjacent counties Plan posted online Public open houses Plan posted in libraries Plan sent to cities and State and federal agency townships review</i>
Phase IV: Implement the Mitigation Plan	
<i>Task 1</i>	Adopt the Plan
<i>Task 2</i>	Implement Recommendations with Ongoing Public Engagement
<i>Task 3</i>	Evaluate Planning Results
<i>Task 4</i>	Revise Plan as Needed

SECTION VI PLANNING PROCESS

The primary planning team included Bonestroo Inc., and county, city, township and state staff including:

County Commissioner – Randy Dahl
County Emergency Management – Deb Teske
County Sheriff – John O’Donnell, Daryl Jensen
County Public Health Preparedness – Brenda Pohlman
City Staff:

Rushford - Windy Block, Sam Stensgard
Rushford Village – Judy Graham
Canton, Peterson, Whalan - Lolly Melander
Lanesboro – Bobbie Vickerman
Spring Valley – Deb Zimmer
Chatfield - Sue Kester
Chatfield – Vicki Sample

City Fire/EMS Departments:

Harmony Fire – Bill Hanlon
Preston Fire – Jerry Olson
Preston Ambulance -Dave Keene
Rushford Ambulance – Julie Ziebell
Rushford Fire – Brad Erikson

Townships in Fillmore County:

Holt – Robert Knutson
Newburg – Leann Howard
Chatfield – Lowell Meeker
Norway – Mike Oian, Michael Gjere
Pilot Mound – Vern Crowson
Carimona – Linda Marzolf
Preble – Brad Kelly

Fillmore County Soil and Water Conservation District – Donna Rasmussen

Fillmore County School District Representative – Myrna Luehmann

DNR – John Kelly

MN HSEM – Craig Strand, Jennifer Nelson

FSA – Tammy Martin

The cities of Ostrander and Wykoff were also contacted by phone for input regarding the Hazard Mitigation Plan.

The planning team met on a regular basis to provide input in all phases of plan development, and to review the plans progress. A larger group of individuals from various county, municipal, townships, agencies, and local businesses were invited to attend EMAG group meetings to discuss input to the plan.

VI.A.2 PUBLIC PARTICIPATION

Public participation elements were included in each phase of the planning process, beginning with interest assessment in the start-up phase of planning, followed by hazard risk identification with emergency responders from local communities. Extensive outreach among a broader range of publics (local communities, schools, businesses, non-profit organizations, citizens) was an integral element in developing mitigation goals, objectives, and strategies. A public web page was developed with a brief survey to measure the level of concern for specific hazards and determine

SECTION VI PLANNING PROCESS

acceptability of broad categories of mitigation strategies. Formal public review of the draft plan involved an integrated outreach strategy to post the draft online and in county libraries, hold open houses, and provide review draft copies to stakeholders.

Appendix II includes a complete list of public outreach activities and selected materials.

The following table includes a list of the participants that are involved in the EMAG group:

Organization	Name
Norway Township	Dave Lombard
Sheriff's Office	Jack O'Donnell
Rushford EMS	Julie Ziebell
Canton Township.	Norman Nordsving
Pilot Mound Township.	Roy Erickson
Canton & Whalan Cities	Lolly Melander
Preston Good Samaritan Center	John Langemo
Good Shepherd, Rushford	Dennis Reiman
Rushford City	Jim Robertson
City Commissioner	Randy Dahl
Fillmore Central Schools	Myrna Luehmann
Carimona Township	Linda Marzolf
Sumner Township	Carole Gunderson
MN HSEM	Craig Strand
SEMN Red Cross	Brenda Ziebell
Public Health	Sharon Serfling
Public Health	Brenda Pohlman
Preble Township	Brad Kelly
Harmony FD/EM	Dean Brunsvold
MN DNR	John Kelly
Chatfield EMS	Sue Kester
EMT/Coroner	Ed Hallisy
Mabel Nursing Home	Julie Vettleson
Gunderen Lutheran Clinic	Diana Nelson, PA-C
City of Rushford Village	Judy Graham
City of Rushford Village	Gordon Johnson
Tri County Electric	Mike Ebner
Rushford Fire	Kenny Highum
FC Highway	John Grindeland
Red Cross	Dave Peterson
Red Cross	Paul Baker
Holt Twsp	Robert Knutson
Mabel EMS	Neil Folstad
FC Commissioner	Randy Dahl
Spring Valley	Jeff Kappers
Green Lea Manor	Julie Vettleson
York Township	Fred Scheevel
Fountain Police	Tom Mosher
Pro Corn	Chris Hanson
Olmsted Medical Center	Beth Stumm
Forestville/ Mystery Cave State Park	Jeff Branden

SECTION VI PLANNING PROCESS

VI.A.3 PLAN ADOPTION

This plan will be considered to be in effect upon its approval and adoption by the Fillmore County Board of Commissioners and its approval by the Minnesota Department of Homeland Security and Emergency Management (MN HSEM) and the Federal Emergency Management Agency (FEMA). Fillmore County’s plan is multi-jurisdictional and the County will seek resolutions of plan adoption from the following cities that chose to participate in Fillmore County’s planning effort in lieu of preparing a separate plan for their jurisdiction:

Canton	Mabel	Rushford Village
Chatfield	Ostrander	Spring Valley
Fountain	Peterson	Whalan
Harmony	Preston	Wykoff
Lanesboro	Rushford	

Fillmore County’s plan also will cover all Fillmore County townships:

Amherst Township	Carrolton Township	Norway Township
Arendahl Township	Fillmore Township	Pilot Mound Township
Beaver Township	Forestville Township	Preble Township
Bloomfield Township	Fountain Township	Preston Township
Bristol Township	Harmony Township	Spring Valley Township
Canton Township	Holt Township	Sumner Township
Chatfield Township	Jordan Township	York Township
Carimona Township	Newburg Township	

VI.A.4 PLAN IMPLEMENTATION

Fillmore County’s Emergency Management Director will work with municipalities and implementation partners to develop detailed implementation strategies, identify required and available resources, assign specific staff roles and responsibilities, and initiate work on each mitigation strategy. Work on the individual strategies will proceed according to their plan priority ranking, available funding, and more detailed cost-benefit analyses. Adopting jurisdictions will be responsible for implementing specific plan elements, as indicated in the plan, and determined through future coordination discussions. As appropriate, adopting jurisdictions will update other existing related plans to reflect elements and strategies of this plan. Refer to Section VII for a listing of related County and City Plans.

VI.A.5 PLAN EVALUATION

Each mitigation strategy includes a baseline metric for monitoring implementation progress. Additional, more detailed metrics will be developed, as needed, for more complex initiatives. On at least an annual basis, Fillmore County’s Emergency Management Director will work with municipalities and implementation partners to evaluate progress for each mitigation strategy and will compile summary progress reports. This collaborative implementation approach will also provide a forum for identifying additional mitigation needs.

VI.A.6 PLAN UPDATING

Fillmore County’s Emergency Management Director will review the plan every five years and will maintain progress reports of all mitigation projects and will include summary information from these reports in plan updates. Newly identified mitigation needs will be addressed through the development of additional goals, objectives, or strategies, as applicable. If changes in implementation priority are deemed necessary, the rationale will be documented.

Revisions and updates will be distributed for review and approval to the Fillmore County Emergency Management Advisory Group (EMAG), municipalities, and implementation partners. Plan revisions will be made available through the Fillmore County Emergency Preparedness website for general public review and comment during the plan updating process. Public comment on revisions and updates also will be solicited through a comprehensive public outreach strategy (new releases, open houses, posters, brochures, partnerships). Public outreach efforts for the plan updates will further use these opportunities to provide ongoing public education on hazard preparedness.

The reviewed and updated plan will be submitted to the Fillmore County Board of Commissioners, MN HSEM and to FEMA for approval every five years.

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SECTION VII. RELATED PLANS

SECTION VII. RELATED PLANS, REPORTS, AND TECHNICAL INFORMATION

The following Plans and Programs were referenced in the in the preparation of the Fillmore County All-Hazard Mitigation Plan, with information incorporated as deemed appropriate.

VII.A. STATE AND FEDERAL DATA, REPORTS AND PLANS

US Census Bureau data, 2000, 2003
MN Department of Natural Resources data on water and land cover
MN Department of Natural Resources - Fillmore County Geologic Atlas
Federal Emergency Management Agency regulations and guidance
Minnesota Association of Soil and Water Conservation Districts
MN Department of Homeland Security and Emergency Management forms and documents
2008 DRAFT Minnesota State All-Hazard Mitigation Plan
Various Minnesota Administrative Rules including chapters 4410, 7020, 7050, 4720 and 4725

VII.B. COUNTY/REGIONAL PLANS, ORDINANCES, DATA

Fillmore County Comprehensive Plan
Fillmore County Zoning Ordinance, including the following overlay districts:
 Flood Plain District
 Scenic Trail District
 Shoreland District
 Blufflands
 Decorah Shale
Fillmore County Local Water Management Plan
Fillmore County Soil and Water Conservation District - South Branch Root River Watershed Project
Fillmore County SWCD Local Water Management Plan
Fillmore County Soil Erosion Control Ordinance
Fillmore County Park Ordinance
Fillmore County Emergency Operations Plan
Fillmore County GIS
Spring Valley Creek Watershed Study, 2002
Fillmore County 2000 Flood Damage Assessment

SECTION VII RELATED PLANS

VII.C. MUNICIPAL PLANS

The following table lists city plans that have a relationship to the hazards and mitigation strategies discussed in this plan. Excerpts or references to these plans were included in this plan or were discussed during interviews with the individual jurisdictions during the plan’s preparation.

City	Comprehensive Plan	Building Codes	Bluff Ordinance	Drainage/Erosion Control Ordinance	Emergency Operations Plan	Floodplain/Flood Damage Prevention Ordinance	Shorelands Ordinance	Stomwater Management Plan
Chatfield	Yes	State Codes	No	No	Yes	yes	No	No
Rushford	No	State Codes	Yes	In Works	Yes	In Works	In Works	No
Rushford Village	No	State Codes	Yes	MPCA guidelines	Yes	Yes	Yes	No
Peterson	Yes	State Codes	Yes	Yes	Yes	Yes	No	No
Fountain	No	State Codes	No	No	No	No	No	No
Whalan	Yes	State Codes	Yes	Yes	Yes	Yes	No	No
Lanesboro	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Preston	Yes	State Codes	In Works	No	None	Yes	Yes	No
Wykoff	Yes	State Codes	No	No	Yes	No	No	No
Spring Valley	Yes	State Codes	No	No	Yes	Yes	No	No
Ostrander	Yes	State Codes	No	No	Yes	No	No	No
Harmony	Yes	State Codes	No	No	Yes	Yes	No	No
Canton	Yes	State Codes	Yes	Yes	Yes	Yes	No	No
Mabel	No	State Codes	No	No	No	Yes	No	No