2013
HAZARD MITIGATION PLAN
St. Louis County, Minnesota
Sheriff's Office - Emergency Operations



PREFACE

The purpose of the St. Louis County Hazard Mitigation plan is to determine how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. The plan was first adopted in 2005 and was reviewed and updated in 2012 in preparation for approval by FEMA in 2012. The plan encompasses all natural, technological, and human-caused hazards rather than only focusing on one type of hazard. For the planning process, St. Louis County followed the guidelines and handbooks that FEMA has created and any resources provided by HSEM.

The hazard planning process included several steps which were undertaken simultaneously, these included: Identifying and organizing interested members of the community as well as the technical expertise required for the planning process; identifying the characteristics and potential consequences of hazards; determining our priorities; and looking at possible ways to avoid or minimize the undesired effects (mitigation projects). St. Louis County will continue to utilize the plan by implementing specific mitigation projects or changing day-to-day operations within the local government. It will also be important to conduct periodic evaluations and make revisions to the plan as needed. The plan resides with the St. Louis County Sheriff's Department, who is responsible for maintenance and updates.

ACKNOWLEDGEMENTS:

St. Louis County would like to acknowledge the following individuals for their contributions to the St. Louis County Hazard Mitigation Plan.

Hazard Mitigation Planning Team
Dave Aspie…Minnesota Power
RC. Boheim…South St. Louis County Soil and Water Conservation District
Bill Bussey…Lake Country Power
Tim Campbell…MN Office of Tourism
Scott Camps…St. Louis County Sheriff's Office/HSEM
Larry DiDomenico…U.S. Coast Guard – MSU Duluth
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Hazard Mitigation Guidance and Input
Federal Emergency Management Agency
Minnesota Division of Homeland Security and Emergency Management
Minnesota Department of Health
Minnesota Department of Natural Resources
Minnesota Department of Transportation
Minnesota Land Management Information Center
US Forest Service
St. Louis County Departments:
- Administration
-Board of Commissioners
-Environmental Services
- Land and Minerals
-Planning and Community Development
-Public Health and Human Services
-Public Works
-Sherriff's Office

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UPDATE HISTORY

March - 2013
April-2005

INFORMATION:

St. Louis County
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5735 Old Miller Trunk Hwy
Duluth, MN 55811
218-625-3966

Financial Support provided by a grant from the Federal Emergency Management Agency

PARTICIPATION

Participants in 2012 Update of Hazard Mitigation Plan

Participants included all local governments and other agencies and organizations that participated in the planning process by attending meetings and providing feedback during the planning process. Following adoption of the plan by the St. Louis County Board, each city is expected to adopt the plan. Townships are included in adoption by the county and participated in development of goals, strategies and objectives.

Cities (26)

Aurora	Chisholm	Floodwood	Iron Junction	Mountain Iron	Winton
Babbitt	Cook	Gilbert	Kinney	Orr	
Biwabik	Duluth	Hermantown	Leonidas	Proctor	
Brookston	Ely	Hibbing	McKinley	Tower	
Buhl	Eveleth	Hoyt Lakes	Meadowlands	Virginia	

Townships (75 Organized)

Alango	Canosia	Fairbanks	Kabetogama	Ness	Solway
Alborn	Cedar Valley	Fayal	Kelsey	New	Stoney Brook
Alden	Cherry	Field	Kugler	Independence	Sturgeon
Angora	Clinton	Fine Lakes	Lakewood	Normanna	Toivola
Arrowhead	Colvin	Floodwood	Lavell	North Star	Van Buren
Ault	Cotton	Fredenberg	Leiding	Northland	Vermilion Lake
Balkan	Crane Lake	French	Linden	Owens	Waasa
Bassett	Culver	Gnesen	Grove	Pequaywan	White
Beatty	Duluth	Grand Lake	Mcdavitt	Pike	Willow Valley
Biwabik	Eagles Nest	Great Scott	Meadowlands	Portage	Wuori
Breitung	Ellsburg	Greenwood	Midway	Prairie Lake	
Brevator	Elmer	Halden	Morcom	Rice Lake	
Camp Five	Embarrass	Industrial	Morse	Sandy	

Unorganized Townships

52-21	55-21	59-21	62-17	64-13	65-14	66-16	67-20	68-21	70-21
53-15	56-14	60-18	62-21	64-14	65-15	66-20	67-21	69-17	71-20
53-16	56-16	60-19	63-14	64-15	65-16	66-21	68-13	69-18	71-21
54-13	56-17	60-20	63-15	64-16	65-21	67-13	68-14	69-19	
54-14	57-14	61-12	63-17	64-17	66-12	67-14	68-15	69-20	
54-15	57-16	61-13	63-19	64-21	66-13	67-15	68-18	70-18	
55-14	58-14	61-14	63-21	65-12	66-14	67-18	68-19	70-19	
55-15	59-16	61-17	64-12	65-13	66-15	67-19	68-20	70-20	

Tribal (2)

Bois Forte Band of Chippewa
Fond du Lac Band of Lake Superior Chippewa

School Districts (18)

Cloquet	Floodwood	Virginia	Mountain	Eveleth
Lake Superior	Hermantown	Nett Lake	Iron-Buhl	Gilbert
Chisholm	Hibbing	Duluth	St. Louis	Mesabi East
Ely	Proctor		County	

Contents

Appendix A: St. Louis County Maps
Population Distribution
Parcel Ownership
Public Land Use
Private Land Use
Tribal Lands
Watersheds
Parks and Forest Areas
Emergency Response
Transportation Systems
Red Cross Shelters
Hazard Mitigation Sectors
Flood Plains

Appendix B: Communications
City, Township and Tribal Government contacts and participation
Planning Team member list and participation
Memo to Cities and Townships: Request for contact information and participation
Memo to Planning Team members: Request for contact information and participation
Memo to Community Contacts: Request for hazard event updates
E-mail text: Reminder to Community Contacts to send hazard event updates
Memo to Community Contacts and Planning Team Members: Request for review and feedback on draft plan
E-mail reminder to review plan and send feedback
E-mail reminder (second) to review plan and send feedback

Appendix C: Public Involvement Documentation
Documentation of Public Notice placement in Minnesota Legal section of Duluth News Tribune
Screen image of Public Notice on Duluth News Tribune website
Screen image of Hazard Mitigation Plan feedback request on St. Louis County homepage
Screen image of Hazard Mitigation Plan feedback request on St. Louis County Sheriff's Office – Emergency Management page
Memo to St. Louis County Board Members: Notification of Public Notice posting and process update
News Release inviting public participation
List of media contacts
News release for public meetings
Media contact list
Screen image of Duluth News Tribune website
Screen image of Northland News TV
Public meeting comment form

Appendix D: Risk Assessment Survey
E-mail text to Community Contacts and Planning Team Members: Request participation in survey
Survey question responses

Appendix E: Plan Approval and Adoption

Appendix F: Tribal Government Hazard Mitigation Plans
Boise Forte Band of Chippewa

SECTION ONE:
Introduction and Background

SECTION 1: INTRODUCTION AND BACKGROUND

1.1 Introduction

St. Louis County is vulnerable to a variety of potential natural and technological (human caused) disasters that can threaten property and life.

Natural disaster risks include drought, earthquakes, extreme temperatures, flooding, hailstorms, heavy rain, infectious disease, lighting, solar storms, thunderstorms, tornadoes, wildland fires, wind storms, and winter storms (blizzards, snow, and ice storms).

Technological disaster hazard risks include dam failure, structural fires, hazardous materials, radiological, terrorism, wastewater treatment system failure, and water supply contamination.

Although mitigation efforts will not eliminate disasters, the county strives to be as prepared as possible. Such preparation includes having a plan in place with overall goals, measurable objectives, specific strategies intended to prevent injury and loss of life, and minimize damage to property.

This Hazard Mitigation Plan represents the efforts and cooperation of local, regional, tribal, state, and federal agencies, non-profits, and private industry in St. Louis County to meet the responsibility of hazard mitigation planning. The intent of the plan is to reduce the threat of specific hazards by limiting the impact of damages and losses by implementing strategies and monitoring objectives over time.

1.1.1 Scope

Natural and technological caused hazards have been evaluated and prioritized based on findings from the research done for the 2005 plan and input from Planning Team members and Community Representatives for the 2012 update. Goal statements and objectives are clarified. Objectives are stated in measurable terms to facilitate future monitoring. Ongoing strategies are carried over from the 2005 plan and strategies are added or clarified based on feedback.

Feedback was gathered from across the county. Specific strategies will be implemented based on further evaluation of need and capacity by local entities.

1.1.2 Hazard Mitigation Definition

For the purposes of this plan, hazard mitigation is defined as any action intended to eliminate or reduce the risk to human life and property from natural and technological caused hazards. Potential types of hazard mitigation actions include:

- Structural hazard control
- Retrofitting of facilities
- Acquisition and/or relocation of structures
- Development of mitigation standards, regulations, policies, and programs
- Public awareness and education programs
- Development and/or improvement of warning systems

BENEFITS OF MITIGATION PLANNING

The benefits of hazard mitigation include:

- Save lives, prevent injuries, and protect public health
- Prevent or reduce property damage
- Reduce economic losses
- Minimize social dislocation and stress
- Reduce agricultural losses
- Maintain function of critical facilities
- Protect infrastructure from damage
- Reduce legal liability of government and public officials

1.1.3 Plan Objectives

1. Determine the extent of existing mitigation programs and policy capabilities within St. Louis County.
2. Evaluate and prioritize the hazards that may impact St. Louis County.
3. Establish and sustain cooperative efforts between local, state, and federal entities in the case of a disaster.
4. Establish strategies that can be funded and implemented at the local level.
5. Familiarize state and local officials and the general public about hazard mitigation objectives and strategies identified for St. Louis County and obtain their support.

1.2 State Mitigation Program Overview

FEMA mitigation grant programs that are administered by the State of Minnesota: the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation program (PDM), and the Flood Mitigation Assistance (FMA) program. Both HMGP and PDM are administered through the Department of Public Safety, Division of Homeland Security and Emergency Management; the FMA is administered by the Minnesota Department of Natural Resources. In order to continue to receive funding through these programs after November 2004, each local unit of government will need to have a FEMA approved hazard mitigation plan in place under the Disaster Mitigation Act of 2000.

1.2.1 Hazard Mitigation Grant Program (HMGP)

Authorized under Section 404 of the Stafford Act, the Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

Hazard Mitigation Grant Program funding is only available to states following a Presidential disaster declaration. Eligible applicants are:

- State and local governments
- Indian tribes or other tribal organizations
- Certain private non-profit organizations

Individual homeowners and businesses may not apply directly to the program; however, a community may apply on their behalf. HMGP funds may be used to fund projects that will reduce or eliminate the losses from future disasters. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight a flood.

In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage.

1.2.2 Pre-Disaster Mitigation Program (PDM)

Pre-Disaster Mitigation (PDM), as federal law and a program activity, began in 1997. Congress established a pilot program, which FEMA named "Project Impact," to test the concept of investing prior to disasters to reduce the vulnerability of communities to future disasters. P.L. 106-390, the Disaster Mitigation Act of 2000, authorized the PDM program in law as Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event.

Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds.

1.2.3 Flood Mitigation Assistance Program (FMA)

The FMA program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

FEMA provides FMA funds to assist states and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured under the National Flood Insurance Program.

Three types of FMA grants are available to states and communities:

- **Planning Grants** to prepare Flood Mitigation Plans. Only NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project grants.
- **Project Grants** to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any 10-year period since 1978.
- **Management Cost Grants** for the state to help administer the FMA program and activities. Up to ten percent (10%) of Project grants may be awarded to states for Management Cost Grants.

1.3 Floodplain Management Activities

How flood prone areas are developed and used is limited through planning, land acquisition, or regulation.

Preventive strategies that prevent damage from flooding or minimize the potential negative impact of floods are often implemented through building, zoning, planning, and/or code enforcement offices. Strategies may include:

- Planning and zoning
- Storm water management
- Open space preservation
- Drainage system maintenance
- Floodplain regulations
- Dune and beach maintenance

Property protection strategies are usually undertaken by property owners on a building-by-building or parcel basis and may include:

- Relocation
- Flood proofing
- Acquisition
- Sewer backup protection
- Building elevation insurance

Natural resource protection strategies preserve or restore natural areas or the natural functions of floodplain and watershed areas. Parks, recreation, or conservation agencies or organizations usually implement strategies such as:

- Wetlands protection
- Management using best practices
- Erosion and sediment control

Emergency services strategies are implemented during or immediately after a flood to minimize its impact. These strategies are usually the responsibility of agencies or entities described in the emergency operations plans:

- Flood warning
- Critical facilities protection
- Flood response
- Health and safety maintenance

Structural projects keep floodwaters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff and include:

- Reservoirs
- Channel modifications
- Levees
- Floodwalls
- Seawalls beach nourishment
- Diversions
- Storm sewers

Public information strategies aim to educate and advise property owners, potential property owners, and visitors about flood hazards and ways to protect people and property. Such strategies often include information about the natural and beneficial functions of local floodplains. A public information office usually implements strategies such as:

- Maps and Geographic Information System (GIS) data
- Outreach projects
- Technical assistance
- Real estate disclosure
- Environmental education

1.4 Planning Process Background

The purpose of this plan is to guide St. Louis County to reduce and minimize the human, environmental, and economic costs of disasters. This plan includes a risk assessment, a countywide vulnerability analysis, mitigation strategies, and implementation priorities. Natural and technological caused hazards are included.

1.4.1 Planning Process

For its 2005 Hazard Mitigation plan, St. Louis County used a process as laid out by the FEMA 386 Local Mitigation Planning "How To Guide "series. The St. Louis County Board adopted a resolution approving the development of a St. Louis County Hazard Mitigation Plan on April 22, 2003. St. Louis County Sheriff's Office Emergency Management staff developed, with the assistance of Arrowhead Regional Development Commission (ARDC) staff members, a work plan to guide the planning process. A planning team representing a broad range of interests for St. Louis County was developed as the core group responsible for guiding the planning process. The plan was adopted in 2005.

For the 2012 update, all local units of government, cities and townships in St. Louis County were notified of the planning process prior to the start of the project and invited to participate. Communication throughout the process was conducted by e-mail, mail, phone, and the county website. Community contacts received at least 6 communications by e-mail. Depending on need and preference, some received additional contact by USPS mail and/or by phone. Participation and response rate was excellent and significantly more than in 2005. Each communication included an invitation to contact the lead planner and Emergency Management Coordinator by phone or e-mail at any time.

The Planning Team members were selected to represent a broad range of entities. A memo was sent to the entities and/or the individuals who were likely to participate, along with a return form requesting contact information. Thirty-three individuals agreed to participate and they were kept informed of the process by e-mail. Individual team members were contacted for technical assistance as needed. For example, when updated data was needed regarding wildland fires, representatives from the US Forest Service and the MN Dept. of Natural Resources were contacted. All members were sent an e-mail request to review the draft plan, including a PDF copy of the plan. Of those, nine sent replies with suggestions, changes and additional information or replied that they had no comments.

Both community contacts and planning team members expressed concern about the amount of time and travel required to participate in the process. St. Louis County is geographically very large and driving time can be several hours for a round trip. The Work Team noted that attendance at meetings during the 2005 process was poor. It was agreed that all work would be by e-mail unless there was a compelling reason to do otherwise. Phone and USPS mail would supplement as needed.

St. Louis County has made great effort over the past five years to increase access to information, access to services and opportunities to offer feedback via our website. The geography of the county makes it challenging for residents to attend meetings in person and attendance is consistently very low. Use of technology has become extremely common in all areas of life and business and we have embraced that fact. The website was completely redesigned to be user friendly in 2011 and is now being redesigned further to be more usable with mobile devises. It is expected that, unless a face-to-face meeting is required, the trend for a preference to use online services will continue and will likely increase with residents, visitors, agencies, other local governments and businesses.

1.4.2 Planning Process Timeline

The planning process for the 2012 update was directed by staff members of the St. Louis County Sheriff's Office Emergency Management and managed by staff members of the St. Louis County Planning and Community Development Department. An internal Work Team was established to draft the plan update, collect GIS data, and gather input and feedback.

A Planning Team was established by inviting key contacts from a wide variety of agencies and governmental units. Many members of the 2005 Steering Committee

responded. A list of the Planning Team members can be found on the acknowledgement page of this plan.

Each local unit of government, including tribes, cities and townships were invited to participate in the planning process. A brief memo, attached in Appendix C describing the need for a plan update, was mailed and a form requesting contact information was enclosed, along with a return envelope. All respondents were included in the risk assessment survey and requests for review and feedback of the plan.

November 2011: St. Louis County Planning and Community Development Director and staff members meet with St. Louis County Sheriff's Office Emergency Management Staff to discuss the update of the Hazard Mitigation Plan.

December 2011: Work Team established. Work plan outlined. Team includes Planners, GIS Specialists and Sheriff's Office Emergency Management staff members.

December 2011: Memo mailed to city and township contacts to introduce the planning process and update contact list.

December 2011: Web page established on County website. Develop updated list for Planning Team members. Begin demographic updates and GIS data updates.

January 2012: Continued progress on demographic updates and GIS data.

February 2012: Memo to Planning Team members to introduce the planning process, explain member roles, and update contact list.

February 2012: Draft risk assessment survey questions.

March 2012: Finalize Planning Team member list and contacts. Finalize list of GIS needs and identify gaps. Finalize risk assessment survey questions.

March 2012: Risk Assessment Survey sent to all Community Contacts and all Planning Team members via Survey Monkey.

April 2012: Final checklist of GIS data and first review of data from Risk Assessment Survey.

June/July 2012: Analyze survey data, review, edit plan and update goals, objectives, and strategies.

August 2012: Meetings with officials and representatives from Fond du Lac Reservation and Bois Forte Reservation to assure inclusion in planning process and the goals, objectives, and strategies are included in the plan update.

August 2012: Collect data on hazard events since 2005 from cities, reservations and townships.

October 4-November 16: Send draft plan to Planning Team members and Community Contacts for review and feedback.

November 10-Decmber 3: Public Comment period announced and open, draft plan and contact information posted on website.

November 13: Board memo and draft plan to St. Louis County Commissioners informing of public comment period and expected review and adoption time line.

February 2013: News release sent to 44 media contacts inviting public participation by attending meeting, sending e-mail/fax/letter and phone. Public feedback meetings held in Ely, Duluth and Virginia were attended by 12 residents.

1.5 Assessing the State of the County

All participating local units of government and Steering Committee members received an online survey via Survey Monkey. The intent was to gather data about perceived risks of hazards and which hazards have impacted St. Louis County during the previous five years. The survey tool also collected data about what strategies should be prioritized for this plan update.

Staff members in the St. Louis County Planning and Community Development Department updated the county profile using current county plans and census information. They also developed and updated related GIS data that allows for the analysis of information and the production of maps. When appropriate, maps are included in the body of this plan document and in the appendixes. All GIS data is readily available from the St. Louis County Planning, Research and Geographical Information System (PRAGIS) team. Some data is protected for confidentiality purposes and public safety.

1.5.1 Risk Assessment

An early step in the update process was to identify which hazards most impact or is likely to impact St. Louis County. Using the current plan as a model, as well as examples from other successful plans across the country,

survey questions were developed and sent out using Survey Monkey. Survey questions and summary data are in Appendix D.

Surveys were sent to 33 members of the planning team and 66 contacts from townships and cities. The response rate was high with 54.5% surveys returned.

The questions were modeled after surveys used by other counties and designed to identify and update risks and mitigation strategies for the next five years. Open ended questions allowed respondents to provide information and suggestions in addition to the formatted survey questions.

Based on survey responses and discussions, it was agreed that risk levels are largely the same as in 2005. Depending on location and land type, the highest risk hazard is wildfire. Feedback from Planning Team members from the DNR and USFS indicate that most wildfires in St. Louis County are started by people and suggested that, while wildfire is listed in the category of natural hazards, in future plans it might be better described as human caused.

It is not known whether climate changes will have any local affects such as in precipitation levels, temperatures or vegetation. When the next plan update is done, significant time and resources are expected to be invested to conduct a more thorough and comprehensive risk assessment and analysis.

1.5.2 Setting the Course of St. Louis County

The risk assessment and analysis offered a starting point to update hazard mitigation needs. The Planning Team and community leaders provided input for hazard mitigation. Based on review comments from St. Louis County Sheriff's Office Emergency Management staff members and survey data, strategies were updated. Goal and objective statement content remains largely the same as in 2005, however, more concrete and measurable goals and objectives where established.

1.6 Public Involvement

The 2005 plan was posted on the St. Louis County website and available to the public. Following the review of the draft by Planning Team members, Community Contacts and the St. Louis County Sheriff's Office Emergency Management staff members, the draft plan was posted on the county website and open for public feedback.

In December 2012, request for public feedback was advertised in the official newspaper according to standard county requirements and an announcement was posted on the home page of the county website.

The draft plan was available on the county website as well as in hard-copy form at county offices in Duluth, Virginia and Commissioner's offices.

No comments or questions were submitted by the public.

In February 2013, three Public Meetings were held to collect ideas and suggestions. A media release announcing the meetings was sent to all 44 media contacts in the region, including newspapers, radio stations and television stations. To cover the large area of the county, meetings were held in Ely, Duluth and Virginia in order to reduce travel time and distance for participants. A total of 13 participants attended and changes were made to the draft plan based on their comments. At the same time, the draft plan was posted on the website inviting comments by e-mail, mail, phone or fax.

Documentation is in Appendix C.

St. Louis County has made great effort over the past 5 years to increase access to information, access to services and opportunities to offer feedback via our website. The geography of the county makes it challenging for residents to attend meetings in person and attendance is consistently very low. Use of technology has become extremely common in all areas of life and business and we have embraced that fact. The website was completely redesigned to be user friendly in 2011 and is now being redesigned further to be more usable with mobile devises. It is expected that, unless a face-to-face meeting is required, the trend for a preference to use online services will continue and will likely increase with residents, visitors, agencies, other local governments and businesses.

Early in the process for the next plan update, a media release will be made announcing the purpose of the plan, a review of progress to date and an invitation for ongoing public participation. It is anticipated that most comments from residents and visitors will be received electronically either by direct email or from a link on the St. Louis County website. The Work Group for the next update should recruit one or more residents to participate on the Planning Team.

The Hazard Mitigation page on the St. Louis County website will remain active. The plan will be posted and comments from the public will be welcome at any time. Contact information for Emergency Management staff members is readily available on the website. Local jurisdictions that plan and implement mitigation projects should include the public by seeking input and feedback.

1.7 Implementation

Before implementation, the draft plan must be reviewed and approved by HSEM and FEMA. This will be complete before the final plan is presented to the St. Louis County Board to adopt.

The first step in implementation of the plan is the official adoption by the St. Louis County Board. As part of the plan adoption process, the plan is available to the public and local units of government online.

Following the official adoption of the plan, city and tribal government units that have participated in the planning process and identified specific strategies for their community can adopt the plan by resolution as their own plan. Resolutions from these entities will be added to Appendix E of this document as they become available.

Local governments carry the primary responsibility to implement and coordinate the implementation of each strategy. The ability to implement each strategy depends to a great extent on available resources and staff time.

SECTION TWO:

St. Louis County Community Profile

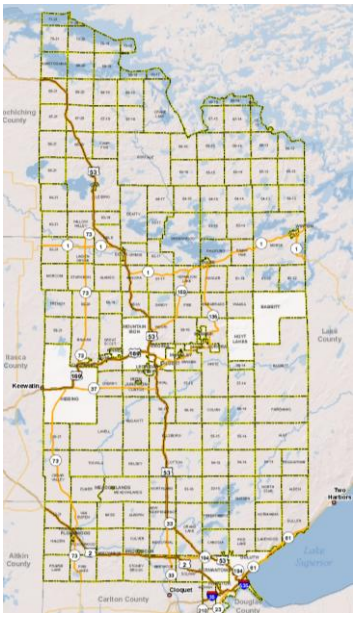
SECTION 2: COMMUNITY PROFILE

2.1 Introduction

The Community Profile includes characteristics of the community such as the physical environment, population, and the location and distribution of services. Throughout this section reference is made to maps that display some of the items discussed. Although not all maps are shown, GIS data is maintained and available from the St. Louis County Planning and Community Development Department. Most GIS data is public. Some is limited for security purposes. All GIS data is checked at least annually to assure it is as current and accurate as possible. Other hazard mitigation data is or will be integrated into the county's 911 emergency communication system where appropriate.

2.2 General County Description

Map 1: St. Louis County



St. Louis County has an area of 4,312,076 acres. The County shares its boundary on the North with Canada, on the west side with Koochiching County, Itasca County, and Aitkin County, on the east side with Lake County and on the South with Carlton County and Lake Superior.

The County's 2010 population was 200,226 which is a decline from 2000 of 302 persons. A map of Population Distribution is in Appendix A.

There are three primary population centers in the county: Duluth area; Iron Range, and Northern Lakes.

There are over 1,000 lakes in the County.

Table 2.1: Jurisdictions with 1,000 or More People
St. Louis County

St. Louis County has 31 jurisdictions with populations of 1,000 or more. UT= Unorganized Township.

Jurisdiction UT= Unorganized Township	**2010 Population**
Duluth (City)	86,265
Hibbing	16,361
Hermantown	9,414
Virginia	8,712
Chisholm	4,976
Rice Lake Township	4,095
Eveleth	3,718
Ely	3,460
Proctor	3,057
Mt. Iron	2,869
Grand Lake Township	2,779
Lakewood Township	2,190
Canosia Township	2,158
Hoyt Lakes	2,017
Solway Township	1,944
Duluth Township	1,944
Fayal Township	1,809
Gilbert	1,799
Gnesen Township	1,683
Aurora	1,682
White Township	1,547
Babbitt	1,475
Midway Township	1,399
Fredenberg Township	1,337
Makinen UT	1,310
Brevator Township	1,269
Morse Township	1,213
Sand Lake UT	1,066
Clinton Township	1,015
Buhl	1,000
St. Louis County	200,226

Source: 2010 US Census

Table 2.2: Jurisdictions Population Gains Over 1,000
St. Louis County

Of the jurisdictions with populations of 1,000 or more, 12 increased in population between 2000 and 2010.

Jurisdiction UT= Unorganized Township	**Total Gain**	**Percent Gain**
Hermantown	1,966	26.4%
Chisholm	16	0.3%
Proctor	205	7.2%
Grand Lake Township	158	6.0%
Lakewood Township	177	8.8%
Canosia Township	160	8.0%
Solway Township	102	5.5%
Duluth Township	218	12.7%
Gnesen Township	215	14.6 %
Fredenberg Township	181	15.7%
Brevator Township	43	3.5%
Buhl	17	1.7%

Source: 2010 US Census

Transient Population

The number of permanent residents does not totally reflect the actual population during certain times of year. Seasonal residents, particularly in lake areas, make up a significant portion of the population. In St. Louis County, "seasonal" refers to non-winter months. The following table shows jurisdictions with over 100 seasonal units and total housing units.

Table 2.3: 2010 Seasonal Dwelling Units by Jurisdiction with over 100 Seasonal Units
St. Louis County

Jurisdiction UT= Unorganized Township	Seasonal Dwellings	Total Housing Units
Greenwood Township	1,253	1,704
Whiteface UT	735	970
Morse Township	688	1,336
Beatty Township	574	775
Northwest County UT	479	646
Northeast County UT	422	557
French Township	369	654
Eagles Nest Township	346	481
Duluth (City)	341	38,208
Birch Lake UT	321	579
Makinen UT	307	940
Breitung Township	282	590
Leiding Township	263	470
Sand Lake UT	261	747
Ellsburg Township	250	363
Cotton Township	225	434
Gnesen Township	208	922
Portage Township	197	285
Grand Lake Township	195	1,264
Fine Lakes Township	185	247
Kabetogama Township	185	275
Pequaywan Township	184	252
Fredenberg Township	182	731
Crane Lake Township	179	217
Fayal Township	172	1,001
Colvin Township	171	328
Ault Township	163	247
North Star Township	145	231
Vermilion Lake Township	139	280
White Township	134	1,696
Biwabik Township	117	509
Alborn Township	102	289
St. Louis County	11,999	103,058

Source: 2010 US Census

Conversion of dwellings from seasonal to year-round may account for some population growth. Such conversions are most common when the dwelling is within commuting distance to work and when people retire and live full time in a home that was previously used only seasonally.

Tourism is a major contributor to the transient population in the County. There are 4,600 hotel rooms in the city of Duluth and approximately 3.5 million visitors annually. The area of the Mesabi Iron Range has 801 hotel rooms and 327 campsites. There are also approximately 140 private resorts and campgrounds in the county.

Outdoor recreation draws thousands of visitors each year during all seasons. The Voyageurs National Park, located in the northwest portion of the county, and the Boundary Waters Canoe Area Wilderness, located in the northeast part of the county, each draw thousands of visitors each year.

There are also four state parks and a major recreational area including: McCarthy Beach (Town of French), Soudan Underground Mine and Lake Vermilion (Breitung), Bearhead Lake State Park (Eagles Nest) and Iron Range Off-Highway Recreation Area (Gilbert). The Giants Ridge Recreation area in Biwabik is a golf and ski facility operated by the Iron Range Resource Board. The Spirit Mountain ski and recreation area in Duluth is operated by the Spirit Mountain Authority. The Superior National Forest, the Minnesota State Forest, and several cities provide campground facilities. Fortune Bay Resort and Casino, and Wilderness Golf Course is operated by the Boise Forte Band of Chippewa.

Throughout the county there are hundreds of miles of hiking, bicycle, snowmobile, and all terrain vehicle trails throughout the county.

The locations of all of these facilities are available in the county's GIS database.

Population Age

Median Age: The median age of St. Louis County residents is 40.8 years. The median age by jurisdiction ranges from 25.2 years at Nett Lake UT to 59.4 years at Kabetogama. Table 2.4 shows the 10 youngest jurisdictions while Table 2.5 shows the 10 oldest median ages by jurisdiction.

Table 2.4: Jurisdictions with Youngest Median Age
St. Louis County

Jurisdiction UT= Unorganized Township	Median Age
Nett Lake UT	25.2
Duluth (City)	33.6
Stoney Brook Township	37.7
Brevator Township	38.1
Alborn Township	38.9
Eveleth	39.6
Industrial Township	39.6
Hermantown	40.1
Brookston	40.3
Chisholm	40.3
St. Louis County	40.8

Source: 2010 US Census

Table 2.5: Jurisdictions with Oldest Median Age
St. Louis County

Jurisdiction UT= Unorganized Township	Median Age
Kabetogama Township	59.4
Beatty Township	58.8
Eagles Nest	58.5
Camp 5 Township	58.3
Greenwood Township	56.9
Whiteface UT	56.3
Vermilion Lake Township	56.2
NE St. Louis County UT	56.1
Birch Lake UT	56.0
Ault Township	55.8
St. Louis County	40.8

Source: 2010 US Census

Population Projections by Age Group

The state demographer projects that the population of the County will experience very little growth to the year 2035. The population in 2010 was 200,226 and the 2035 projection is 202,240.

The population, overall, is projected to become older during the time period of 2010 to 2035. Age group changes are projected to be:

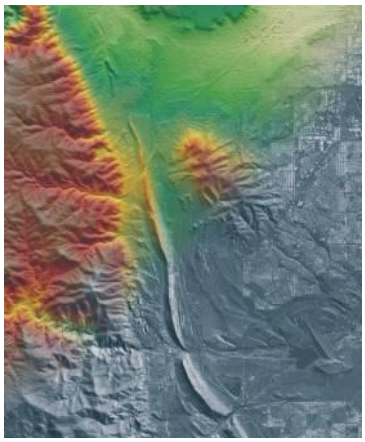
- 14 and under to decrease 2%
- 15 to 24 to decrease 21%
- 25 to 44 to decrease 3%
- 45 to 64 to decrease 13%
- 65 to 84 to increase 64%
- 85 and above to increase 55%

It is expected that over the short term, the area of largest population growth will be in the southeastern part of the county, outside of the city of Duluth.

Factors that could influence population trends include:

a. If the national economy continues to improve, there could be an increase in the number of persons residing in lake areas either as seasonal or converting their seasonal homes to year-round homes.
b. A stable taconite mining sector would result in the end of the decline for Iron Range communities.
c. The taconite mining sector could see an increased number of retirees and those workers would be replaced by younger people. If the retirees remain in the area, the overall effect could result in an increase in population.
d. Non-ferrous mining projects, particularly toward the end of this decade, could either stem the decline in population or bring in new people in the east range area.
e. Economic development activity, as well as new developments in the region, would benefit the city of Duluth as the region's economic, medical, and educational hub.

2.3 Physical Characteristics



St. Louis County is the largest county east of the Mississippi, covering 6,860 square miles, including water surfaces based on the Census Bureau data. St. Louis County is known for its natural beauty, including the Superior National Forest and Voyageur National Park, the Boundary Waters Canoe Area, five state parks and 1,040 lakes. Three of the state's drainage basins are located in St. Louis County and include:

- **Upper Mississippi Basin** (water flows west and southward) which is located in the southwest corner of the county around Prairie Lake and the Hibbing area near the Itasca County line;
- **Lake Superior Basin** (water flows east and southward) which includes the Mesabi Iron Range on the northern portion of the basin and the Duluth area;
- **Rainy River Basin** (water flows north and westward) which includes the cities of Orr, Cook, Tower and Ely, Boundary Waters Canoe Area, and the Voyageurs National Park.

Each of the basins are divided into major watersheds. The Table 2.6 describes each of these watersheds by Basin.

Table 2.6: Basins and Watersheds
St. Louis County

Basin	Major Watershed	Description
Upper Mississippi Basin	Mississippi-Grand Rapids	Mining areas west of the urban area of Hibbing and in southwest corner of the County around Prairie Lake.
Lake Superior Basin	St. Louis	This is the largest major watershed in the County. City of Duluth west of Park Point and all Mesabi Range Cities including Hibbing, Chisholm, Mt. Iron, Virginia, Biwabik, and Aurora. Includes Whiteface Reservoir. Urban and Suburban areas along Iron Range and Duluth area. The Duluth area has numerous short streams flowing from Hermantown-Proctor area into the St. Louis River. These streams have a relatively higher potential for flash floods. The city of Floodwood has experienced flooding from the three rivers within the city. Many of the streams in this watershed support cold water fisheries and are sensitive to pollution from runoff. Taconite facilities are within the watershed in the northern areas. There are extensive peat and agricultural areas in the central area including Floodwood and Meadowlands, and extensive peat lands in the Meadowlands area.
	Lake Superior South	City of Duluth east of Park Point and streams flowing into Lake Superior along the North Shore. These streams originate in Hermantown, Rice Lake, and Lakewood and flow through Duluth into Lake Superior. These streams are subject to flash flooding. Many of these streams support cold water fisheries and are sensitive to pollution from runoff.
	Cloquet	Minnesota Power Reservoir Lakes north of Duluth and areas northeast of those reservoirs. Extensive forested areas.
Rainy River Basin	Little Fork	City of Cook westward and the Side Lake area north of Hibbing. Flooding has occurred in the Cook area. Extensive agricultural and forested areas.
	Vermilion River	Cities of Tower and Orr, Pelican Lake, Lake Vermilion, Crane Lake, and western area of BWCAW. Primarily forest area except for recreational and housing developments along Lake Vermilion, Crane Lake, and other area lakes. Major resort area of the county.
	Rainy Lake	Kabetogama, Voyageurs National Park and Rainy Lake. Relatively high concentration of resorts on Kabetogama and Ash River Trail.
	Rainy River Headwaters	City of Ely, BWCAW, Echo Trail, Birch Lake. Major resort area of the county.

Source: Minnesota Pollution Control Agency

Climate and Precipitation

The climate of St. Louis County is classified as a continental climate regime characterized by wide variations in temperature. Temperatures range from 100 degrees (all temperatures in Fahrenheit) in the summer to -50 degrees in the winter. The record cold temperature for all of Minnesota was -60 degrees set in Tower on February 3, 1996.

The average yearly temperature is 38 degrees. The average date of the first frost ranges from October 18 at the Duluth harbor to September 10 at Cook. The last frost date ranges from May 1 at the Duluth Harbor to June 4 at Cook.

The climate of the county, especially along the North Shore, is greatly influenced by Lake Superior. The effect of the lake results in cooler summer temperatures and warmer winter temperatures. The lake also effects winter precipitation as heavy lake effect snowfall generally occurs five to seven miles inland from Lake Superior.

Annual precipitation in St. Louis County ranges from 30 inches in the south to 28 inches in the north. The highest single day snowfall in the County was in Duluth on November 1, 1991 where 24.1 inches of snow fell in a single day with other cities records being about one foot of snow in a single day. Average annual snowfall ranges from 52.1 inches at Kabetogama to 86.7 inches in Duluth.

The National Weather Service (NWS) issues small stream flash flood guidance based on terrain and existence of urban areas due to a specific amount of rainfall. Table 2.7 shows the NWS Flash Flood Guidance amount for St. Louis County and adjacent counties.

Table 2.7: National Weather Service Flash Flood Guidance
St. Louis County

County	1 Hour rainfall	3 hour rainfall	6 hour rainfall
Aitkin	2.3	2.9	3.6
Carlton	2.4	2.8	3.1
Itasca	2.8	3.4	3.9
Koochiching	3.5	4.0	4.5
Lake	3.4	4.0	4.5
Douglas (WI)	3.3	3.8	4.3
St. Louis	3.3	3.9	4.4

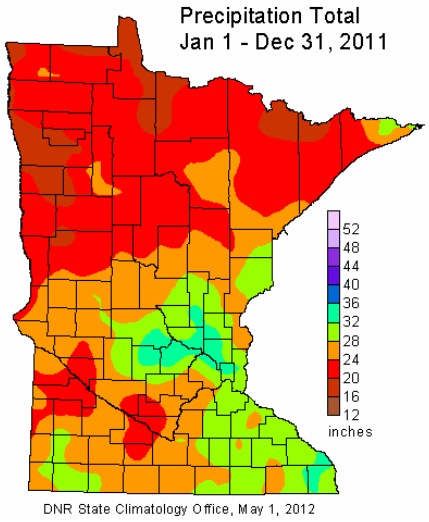
Source: National Weather Service Flash Flood Guidance

Large areas of St. Louis County experienced drought conditions from the spring of 2010 into 2012. The U.S. Drought Monitor in January 2012 showed the entire county in a moderate drought while lands to the east of the county experienced a severe drought.

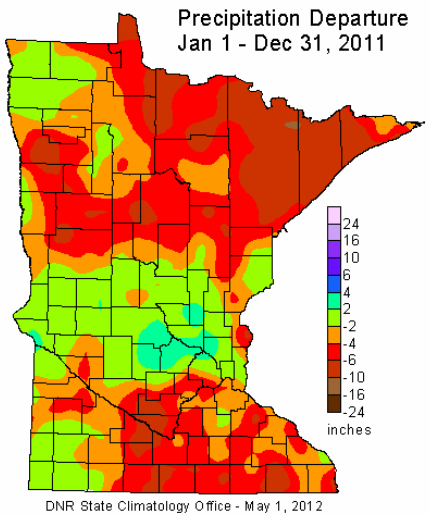
Precipitation levels increased dramatically in the spring and early summer 2012. The southern half of St. Louis County received in excess of 10 inches of rain the week of June 17 resulting in significant flash flooding and flood damage throughout the southern half of the county.

The maps below summarize precipitation data from the State Climatology Office.

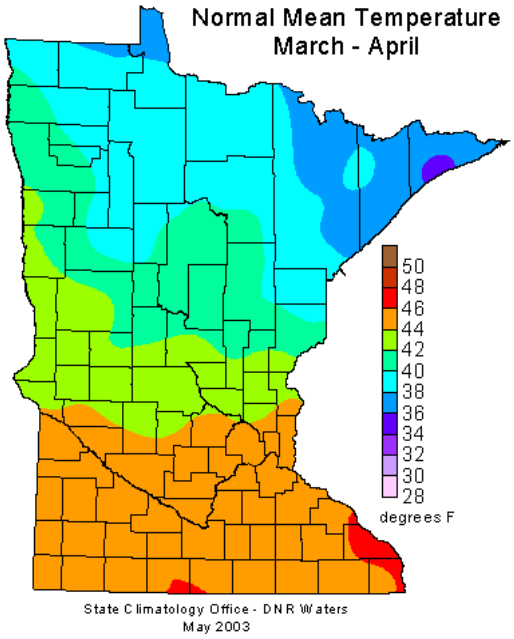
Map 2: Annual Precipitation Total
State of Minnesota

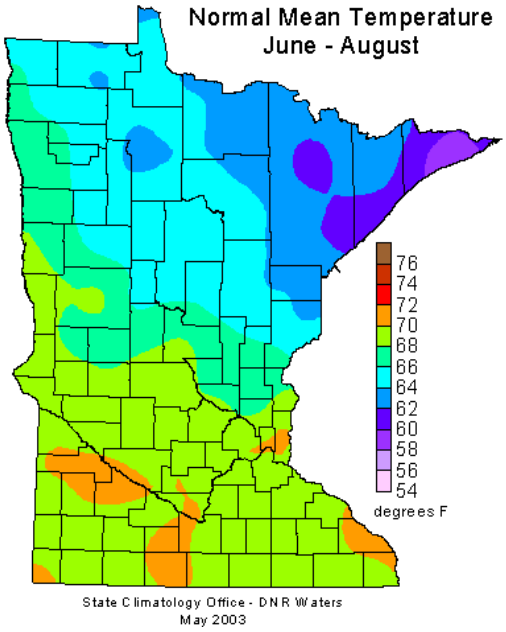


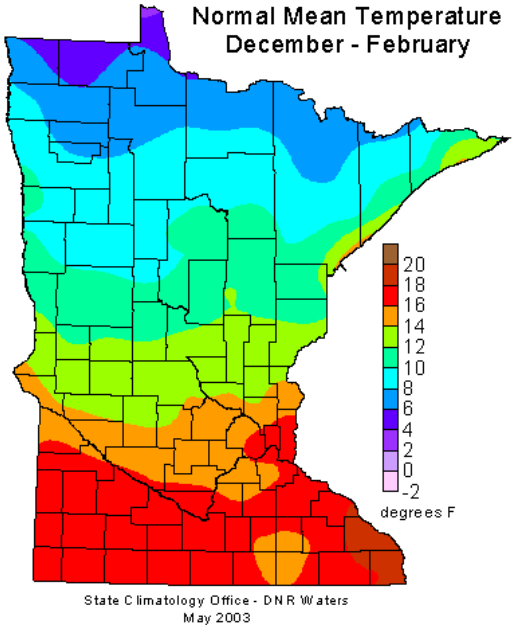
Map 3: Annual Precipitation Total- Departure from Normal
State of Minnesota

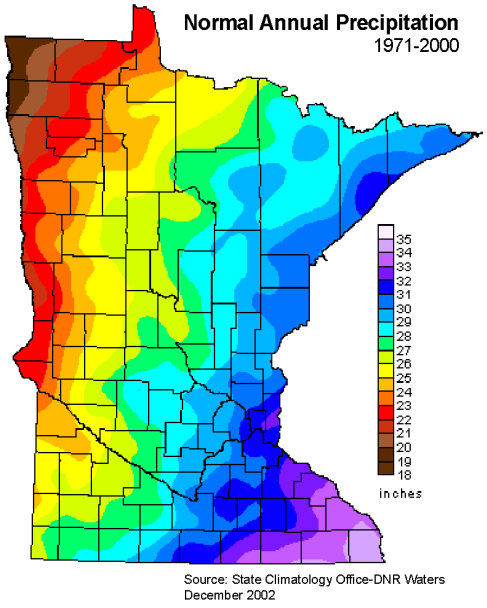


Map 4: Temperature
State of Minnesota









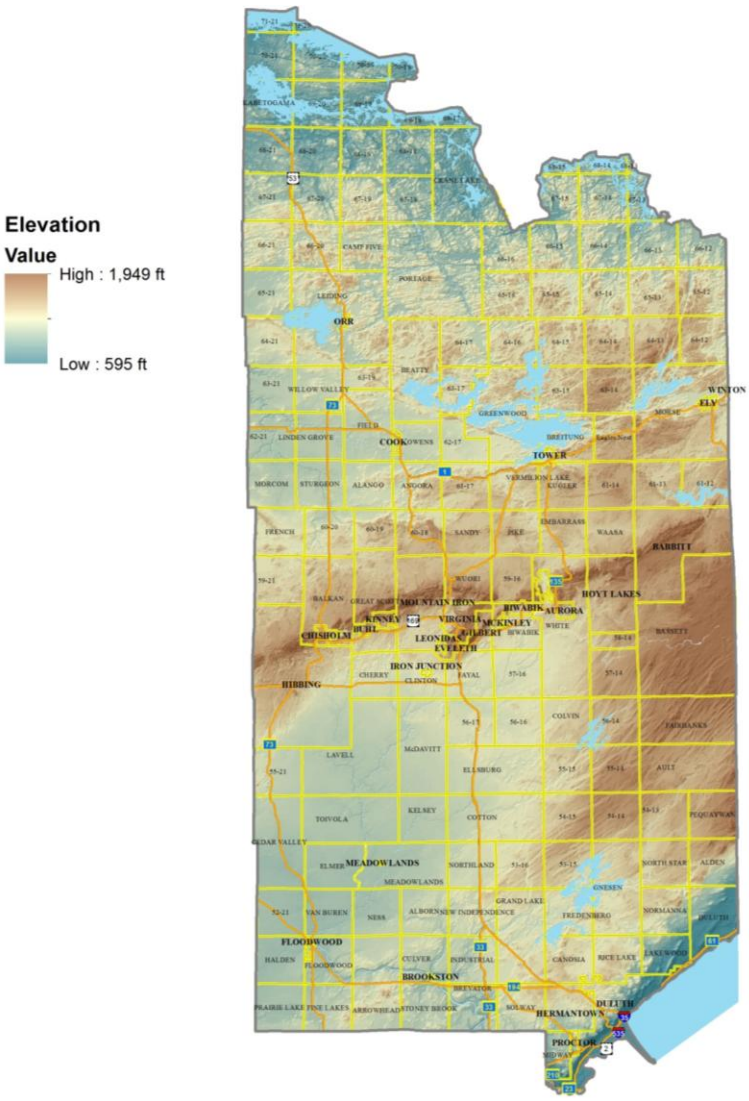
Geology/Topography

The lowest elevation point in Minnesota is in Duluth at the level of Lake Superior. It is at 602 feet above sea level with the terrain rising steeply from there to an altitude above sea level of 1,428 feet at the Duluth International Airport.

The highest elevation point in St. Louis County is Pike Mountain on the Laurentian Divide northeast of Virginia at 1,950 feet above sea level.

Map 5 shows the terrain of St. Louis County. The dark green adjacent to Lake Superior is the lowest area of the county while the dark brown area represents the highest area and is the location of the Mesabi Iron Range. The lighter green in the southwest includes a considerable area of peat lands and agricultural areas. The brown shaded area between Tower and Ely is the Vermilion Iron Range.

Map 5: Topography
St. Louis County



Source: St. Louis County

Groundwater/Geology

The groundwater resources of St. Louis County are dominated by the extensive areas in which the underlying bedrock is exposed or is less than 30 feet from the surface soils. Fully three-fourths of the county has bedrock within 30 feet of the surface. This means that groundwater is being extracted from either shallow surficial-drift aquifers or from fractures within the crystalline bedrock aquifer. The one exception is the sedimentary sandstone aquifer band beginning near Buhl and running southwest along the southern edge of the Iron Range.

Notes on St. Louis County's bedrock aquifers include:

- Much of the county is underlain by a Precambrian undifferentiated aquifer consisting of igneous and metamorphic rocks. Well depths range from 30 to 450 feet deep. The common yield is 5-25 gallons per minute (gpm) but may exceed 100 gpm. The water is usually "hard".
- Along the North Shore lies the North Shore Volcanic aquifer. Water comes from interflow sediments and joints and fractures in the basalt. Wells are typically 20-930 feet deep. Yields are low, at 5-25 gpm with some wells exceeding 100 gpm. Some areas will contain noticeable levels of salt.
- A thin band of the Biwabik Iron-Formation aquifer stretches from just east and north of Babbitt across the entire Range past the county line near Nashwauk. The aquifer is generally confined but some local areas are unconfined. Common well depths fall in the 170-600 foot range. This is the most productive source of groundwater on the Iron Range with typical yields ranging 250-750 gpm, and some exceeding 1,000 gpm. Localities will evidence hard water and large iron concentrations.
- The Mesabi, and to a lesser extent, the Vermilion Iron Range have extensive areas of mine pit lakes which formed after mining and associated pumping activity ceased. These pit lakes are primarily ground water and are the source of drinking water for several cities. There are also numerous mine tailing basins and overburden piles throughout the range.
- The lone sedimentary bedrock lies along the southern edge of the Range running from Buhl in an increasingly wider band to the western county line. Although some test holes in the Hibbing area have penetrated the Cretaceous and some bedrock wells may be open to the base of the Cretaceous, no water wells on record use the Cretaceous as a sole aquifer.
- The southwestern quarter of the county has a generally deeper depth to bedrock and is underlain by the Proterozoic aquifer. Wells range from 30-500 feet deep and yield 5-70 gpm; some will exceed 250 gpm. Quality is generally good with small levels of dissolved solids. It is commonly used in conjunction with the underlying Biwabik Iron Formation aquifer for public and industrial supplies.

Surficial-drift aquifers are exposed at the land surface while buried drift aquifers are located beneath a confining layer. Overall, one-third of Minnesota is covered by surficial-drift aquifers. Notes on both types in St. Louis County include:

- Surficial drift aquifers generally consist of sand and gravel deposits located at or near the land surface. Generally, they are unconfined aquifers. Well depths will range from 30-240 feet. Common yields will be from 100-800 gpm with some wells exceeding 2,000 gpm. Water quality is generally good but can be contaminated by nearby sources such as septic systems, feedlots, and chemical activities.
- Surficial-drift aquifers are limited in St. Louis County with the most productive areas being two small outwash plains south of Hibbing and near Keewatin. Larger, but less productive areas are found in a southwest-northeast band north of Duluth and in a series of bands north of the Iron Range.
- A low to moderate yielding buried drift aquifer is situated in a broad band across the Iron Range running from Aurora to the western county line. Commonly, well depths in this type of aquifer will range from 80-380 feet. Yields will vary from 100-600 gpm with some wells exceeding 1,500 gpm. Usually the water will be hard with large iron, sulfate and chloride concentrations being possible in some areas. Numerous mine pit lakes and tailings basins are in this area.
- Most of St. Louis County is covered with a thin to moderately deep layer of glacial till. The southwestern and far northwestern sections possess clay and silt lake deposits. All these areas generally have poor sustained yield ratings.

Wetlands

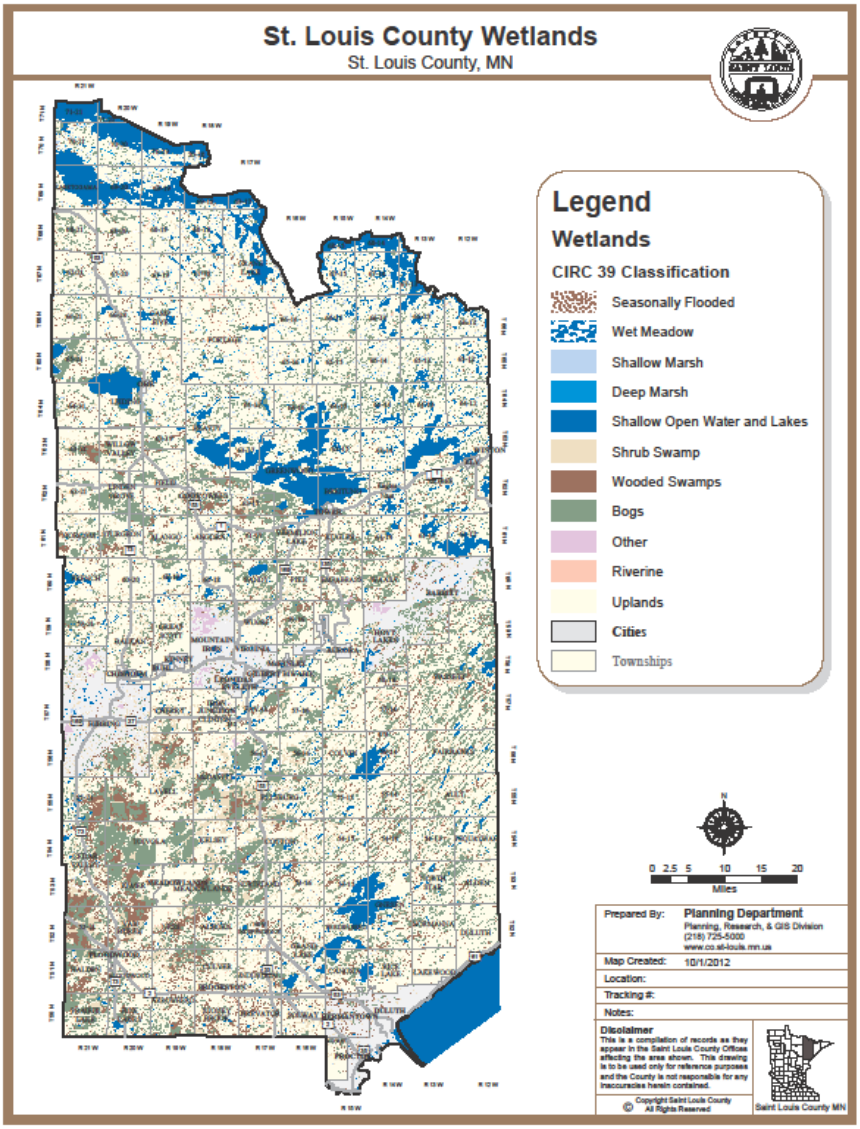
St. Louis County is estimated to have 31 percent of its total area (1,109,903 acres) in wetlands. The most common wetland type in the County is Type 8 (bog) with an estimated 822,817 acres followed by Type 6 (Shrub Swamp) with an estimated 274,204 acres. The least common wetlands are Type One (Seasonally Flooded) with 2,934 acres and Type 4 (Deep Marsh) with 9,975 acres.

The Minnesota Board of Water and Soil Resources recognize that St. Louis County has more than 80% of its original pre-settlement wetlands. Based on National Wetland Inventory Maps, it is estimated that slightly under one-third of the county is wetland. Bogs and shrub swamps are the most common type of wetland in the county.

The towns with the highest percentage of wetlands are located in the area west of Highway #53 and south of the area from Hibbing to Fayal and this is the area of highest concentration of bogs and shrub swamps.

The County maintains GIS data for wetlands.

Map 6: Wetlands
St. Louis County



Source: St. Louis County

Land Use and Ownership

Land characteristics vary greatly throughout St. Louis County. Maps of Parcel Ownership, Public Land Use, Private Land Use and Tribal Lands in Appendix A provide an overview of the land cover in St. Louis County. The majority of the county population lives in the City of Duluth, the adjacent cities of Hermantown and Proctor and the surrounding townships. The next greatest population concentration is in the Iron Range communities, including Hibbing, Chisholm, Mountain Iron, Virginia, Eveleth, and Hoyt Lakes.

St. Louis County has a large number (over 1,000) of lakes with significant development on them. This includes year-round homes, seasonal cabins and resorts. There are large areas in St. Louis County that have very low-density development and are primarily used for forestry, wildlife habitat and recreation.

St. Louis County has an area of 6,906 square miles excluding the coastal area of Lake Superior and St. Louis Bay (Duluth Harbor) based upon GIS analysis. Public lands consist of 56.1% of the land area, private land is 37.5% and water is 6.4% of the total area. The county's public lands include: Voyageurs National Park, Boundary Waters Canoe Area Wilderness, Superior National Forest, four state parks and off road vehicle park, Giants Ridge Recreation area, state forests, and tax forfeited lands. Table 2.8 shows the square miles of public lands by type.

Table 2.8: Public Land Classification
St. Louis County

Public Land Classification	Square Miles
County Tax Forfeited (State of MN)	1,456.5
Federal Forest Lands	1,375.5
State Forest Lands	882.0
Municipal Property	89.3
Other Public-Auxiliary Forest	19.3
County Fee Land	15.6
State Public	11.7
Public Hospitals, Colleges, K-12, Cemeteries	7.5
Federal Public	2.5
Total	3,859.9

Source: St. Louis County GIS file Parcel Data

Private ownership consists of 2,586.5 square miles of land. Private lands are concentrated in southeast St. Louis County around Duluth, Mesabi and Vermilion Iron Range, around lakes, and in small service related communities scattered throughout the county. Table 2.9 shows the area of land uses according to the county parcel tax layer.

Table 2.9: Privately Owned Property Classification
St. Louis County

Land Classification	Square Miles	Percent of Private
Private Forest	1,353.1	52.3
Residential	737.1	28.5
Agricultural	174.8	6.7
Industrial	125.1	4.8
Mining	82.9	3.2
Indian Reservation & Lands	42.9	1.6
Communications & Utilities	29.1	1.1
Commercial	20.5	1
Transportation	14.2	.5
Civic and Institutional	6.8	.25
Total	2,586.5	100%

Source: St. Louis County GIS File Parcel Data

County land use patterns have the following characteristics:

1. **Agricultural areas** are concentrated in the Meadowlands and Floodwood area, the Cook area west and southwest ward to the Itasca County line and the Cherry area eastward through Fayal and south to Palo, Markham, and Zim.
2. **Private forest areas** are adjacent to the agricultural areas, public forests, around mining areas, and near lake areas.
3. **Public forest lands** are primarily located in the northern third of the County and west of Highway #53 south of the Iron Range.
4. **Active mining areas** stretch from Hibbing on the west to Babbitt on the east.
5. **The Iron Range, the Duluth area,** and many lakes have considerable residential development.
6. **Industrial development** is located in community industrial parks, taconite facilities across the Iron Range, and Duluth harbor area as well as other scattered areas throughout the county.

Part of the Fond du Lac Indian Reservation is located in St. Louis County. This is located west and south of the St. Louis River in the Brookston, Stony Brook, and Arrowhead area. Part of Bois Forte is located in St. Louis County. These are the Nett Lake Village on Nett Lake, the Indian Point neighborhood on Pelican Lake near Orr and the Vermilion Reservation on Lake Vermilion near Tower.

Forests, Parks and Recreation Areas

The forests and parks of St. Louis County provide timber resources, commercial peat, and wide range of recreational facilities. This varies from the wilderness in the BWCA portion of the Superior National Forest to off road and snowmobile use, significant wildlife habitat, and scientific purposes.

Public land ownership within the County consists of 56.1% of the total county area. The forest areas are not completely public lands, with farms, private forests, residential, and hunting lands often found within the boundaries of the public forests.

The three largest components of public ownership are:

- County Tax Forfeit - 1,456 square miles
- Federal Forest - 1,375 square mile
- State Forest - 882 square miles

Table 2.10 lists the forest, parks, and recreational areas in the county and the Parks and Forest Areas map in Appendix A shows the location of those uses.

Table 2.10: Parks and Forests
St. Louis County

Federal Forests, Wilderness and Parks	State Forest	County Forests	State Parks and Recreation area	Scientific & Natural Areas
Superior	Kabetogama	Floodwood	Soudan Underground Mine	Big Island
Voyageurs	Sturgeon	Arrowhead	McCarthy Beach	Burntside Islands
Boundary Waters Canoe Area Wilderness	Lake Jeanette	Fine Lakes	Bear Head Lake	Lost Lake Peatland
	Burntside	Lake Upham	Lake Vermilion	Eagles Nest Island No. 4
	Bear Island	Central Lakes	Iron Range Off-Road Vehicle Park	Purvis-Lake Ober Foundation
	Cloquet Valley	Island Lake	Giants Ridge Recreation Area	Wawina Peatland
	Whiteface River	Whiteface		Moose Mountain
	Fond du Lac	Lake Vermilion		
	Savanna	Sturgeon Lake		
		Pelican Lake		

Source: St. Louis County

2.4 Community Services and Infrastructure

Community services include health care and public safety. Community infrastructure includes power utilities, water and sewer facilities, and the transportation network.

Health Care

St. Louis County has an extensive network of hospitals, clinics, nursing homes, hospice services, and assisted living facilities. While many of these facilities are concentrated in the major cities, there are many in the smaller cities and towns.

There are eight hospitals in the county. The largest are located in Duluth, Hibbing and Virginia. Three of the eight have nursing homes at the facility. Table 2.11 lists the hospitals and number of beds.

GIS data for all facilities is maintained by St. Louis County.

Table 2.11: Hospitals
St. Louis County

Name and phone	Address	City	Phone (218)	Hospital Beds	Infant Bassinets
*Cook Community Hospital	10 Southeast Fifth Street	Cook	666-5945	14	2
Ely Bloomenson Community Hospital	328 West Conan Street	Ely	365-3271	25	3
Essentia Health Miller Dwan	502 East Second Street	Duluth	727-8762	165	0
Essentia Health St. Mary's Medical	407 East Third Street	Duluth	786-4000	380	46
*Northern Pines Medical Center	5211 Highway 110	Aurora	229-2211	16	4
St. Luke's Hospital	915 East First Street	Duluth	249-5555	267	18
Fairview University Central Mesabi	750 East 34th Street	Hibbing	262-4881	175	16
*Virginia Regional Medical Center	901 Ninth Street North	Virginia	742-3405 742-3410	83	6

*Also has nursing home beds
Source: State Health Department License information
Note: Number of Beds based on state licensed capacity not federally certified beds.

Clinics and Hospice

There are 37 general purpose medical clinics within St. Louis County. Hospice services are provided in hospitals, nursing homes, assisted living, and private residences.

There is one hospice house in the county with a capacity of 12 beds and it is located in Duluth.

GIS data for all facilities is maintained by St. Louis County.

Nursing Homes and Boarding Care Facilities

There are 17 nursing homes and 1 boarding care facility in St. Louis County. The total number of licensed beds is 1,421. The facilities range in size from 24 to 170 beds.

The Minnesota Long Term Care (LTC) Preparedness Toolkit was developed to assist with emergency preparedness planning for this specialized healthcare population. St. Louis County uses this toolkit as needed.

GIS data for all facilities is maintained by St. Louis County.

Assisted Living and Housing With Services

Assisted Living facilities, along with other housing with services facilities have greatly changed housing for residents over the age of 55 and residents who have disabilities. County-wide there is a capacity for 4,102 persons in 70 assisted living facilities. Facilities range in size from 6 to 170 person maximum capacity.

There are 12 facilities classified as housing with services in the county. They range in capacity size from 6 to 288 persons maximum capacity. The county-wide maximum capacity is 1,092 persons.

GIS data for all facilities is maintained by St. Louis County.

2.5 Public Services

Water Treatment

There are 384 public water supplies, of various capacity, within St. Louis County according to the Minnesota Department of Health. Some are relatively small, for example, those that serve businesses in rural areas. The largest system is the city of Duluth system which also provides water for Proctor, Hermantown and adjacent townships. This system has a pumping capacity of 34 million gallons per day with average demand of 22 million gallons. The water source is Lake Superior.

On the Iron Range many communities obtain their water supply from mine pit lakes, for example the city of Aurora obtains its water from the St. James pit and its water treatment plant has a pumping capacity of 1.15 million gallons per day with average demand of 200,000 gallons per day.

GIS data for all facilities is maintained by St. Louis County.

Waste Water Treatment

There are 31 Waste Water Treatment Plants (WWTP) licensed by the MPCA in St. Louis County. Most of the facilities are in good condition or have upgrades in process. A new plant is under construction in Chisholm which will serve Chisholm, Buhl and Kinney. This plant will be operational in 2013. Table 2.12 lists the plants and the design capacity.

Table 2.12: Water Treatment Plants
St. Louis County

Facility Name WWTP= Waste Water Treatment Plant	**Facility Location**	**Facility Design Flow** (in million gallons per day (MGD))
Aurora WWTP	Aurora	0.91
Babbitt WWTP	Babbitt	0.65
Babbitt WWTP	Babbitt	0.5
Biwabik WWTP	Biwabik	0.212
Buhl Kinney WWTP	Buhl	0.193
Chisholm WWTP	Chisholm	1.19
Cook WWTP	Cook	0.184
Crane Lake WWTP	Crane Lake	0.05239
Ely WWTP	Ely	
Ely WWTP	Ely	1.5
Eveleth WWTP	Eveleth	0.7
Eveleth WWTP	Eveleth	1
Floodwood WWTP	Floodwood	0.1056
Gilbert WWTP	Gilbert	0.691
Hibbing Public Utilities WWTP	Hibbing	0.03
Hibbing WWTP South Plant	Hibbing	4.5
Hoyt Lakes WWTP	Hoyt Lakes	0.68
Iron Junction WWTP	Iron	0.01
ISD 2142 Pre-Kindergarten to Grade 12 N School	Cook	0.0085

ISD 2142 Pre-Kindergarten to Grade 12 S School	Canyon	0.0085
Kettle Falls Hotel & Guest Villas	Ray	0.01
McKinley WWTP	McKinley	0.0286
Meadowlands WWTP	Meadowlands	0.024
Mountain Iron WWTP	Mountain Iron	0.55
Nelson's Resort Inc	Crane Lake	0.0077
Orr WWTP	Orr	0.0993
Tower/Breitung WWTP	Soudan	0.172
US Steel - Minntac WWTP	Mountain Iron	0.06
Virginia WWTP	Virginia	4.3
Winton WWTP	Winton	0.0242
Western Lake Superior Sanitary District WWTP	Duluth	48.4

Source: Minnesota Pollution Control Agency (MPCA)

2.6 Public Safety Providers/Services

An Emergency Response map in Appendix A provides an overview of the distribution of public safety services throughout the County. Below is a brief description the various services located within the county.

GIS data is maintained by St. Louis County for public safety facilities.

Law Enforcement

There are 16 locally controlled law enforcement organizations that operate at three administrative levels in the county. The St. Louis County Sheriff's Department is administered at the County level and some cities contract with the county for law enforcement services. The Babbitt, Chisholm, Duluth, Ely, Eveleth, Floodwood, Gilbert, Hermantown, Hibbing, Hoyt Lakes, Proctor, and Virginia Police Departments are administered at the city level. The City of Biwabik contracts with the Gilbert Police Department for services. The Nett Lake Reservation and Fond du Lac Reservation Police Departments are administered at the reservation level.

The location of police stations can be found on the Emergency Response Map in Appendix A. GIS data is maintained by St. Louis County.

Fire Protection

The locations of fire stations can be found on the Emergency Response Map in Appendix A. GIS data is maintained by St. Louis County.

Ambulance Service

The location of the ambulance stations and districts can be found on the Emergency Response Map in Appendix A. GIS data is maintained by St. Louis County.

2.7 Transportation Infrastructure

The transportation system of St. Louis County accommodates all modes on its local roads, highways, airports, transit, railroads, waterways, and trails. The system serves residential, industrial, commercial, and tourism needs. The Transportation Systems map in Appendix A shows an overview of the county's transportation infrastructure. GIS data is maintained by St. Louis County.

Roads and Highways

There are multiple layers of road jurisdictions within St. Louis County. These range from local city streets to interstate highways. Other road types include township roads, county roads, county state-aid highways, forest roads, and Indian reservation roads. In total, there are 5,943.95 miles of roadway in St. Louis County. The breakdown of mileage by jurisdiction type is shown in Table 2.13.

Table 2.13: Road Jurisdictions
St. Louis County

Road Type	Mileage
County Roads	1,616.69
County State-aid Highways	1,390.83
Township Roads	976.73
Municipal Streets	754.77
U.S. and State Highways	632.76
Forest Roads	230.03
Municipal State-aid Streets	201.49
Forest Roads (State & National)	89.55
Interstate Highway	31.75
Ramps	19.35
TOTAL	**5,943.95**

Source: St. Louis County

There are two interstate highways in St. Louis County; interstate highways I-35 and I-53 with a total 31.75 miles. Interstate I-35 begins in Duluth and runs south to Texas. Interstate I-53 includes the Blatnik Bridge connecting Duluth to Superior, Wisconsin. In Minnesota, interstate highways are operated and maintained by the Minnesota Department of Transportation (MnDOT).

There are nine trunk highways within St. Louis County. Table 2.14 summarizes highway data.

There are three bridges between Duluth and Wisconsin: Blatnik, Bong and Oliver. The Oliver Bridge is in the Fond du Lac area of Duluth and carries 2,300 vehicles.

Table 2.14: Trunk Highway Volume 2009
St. Louis County

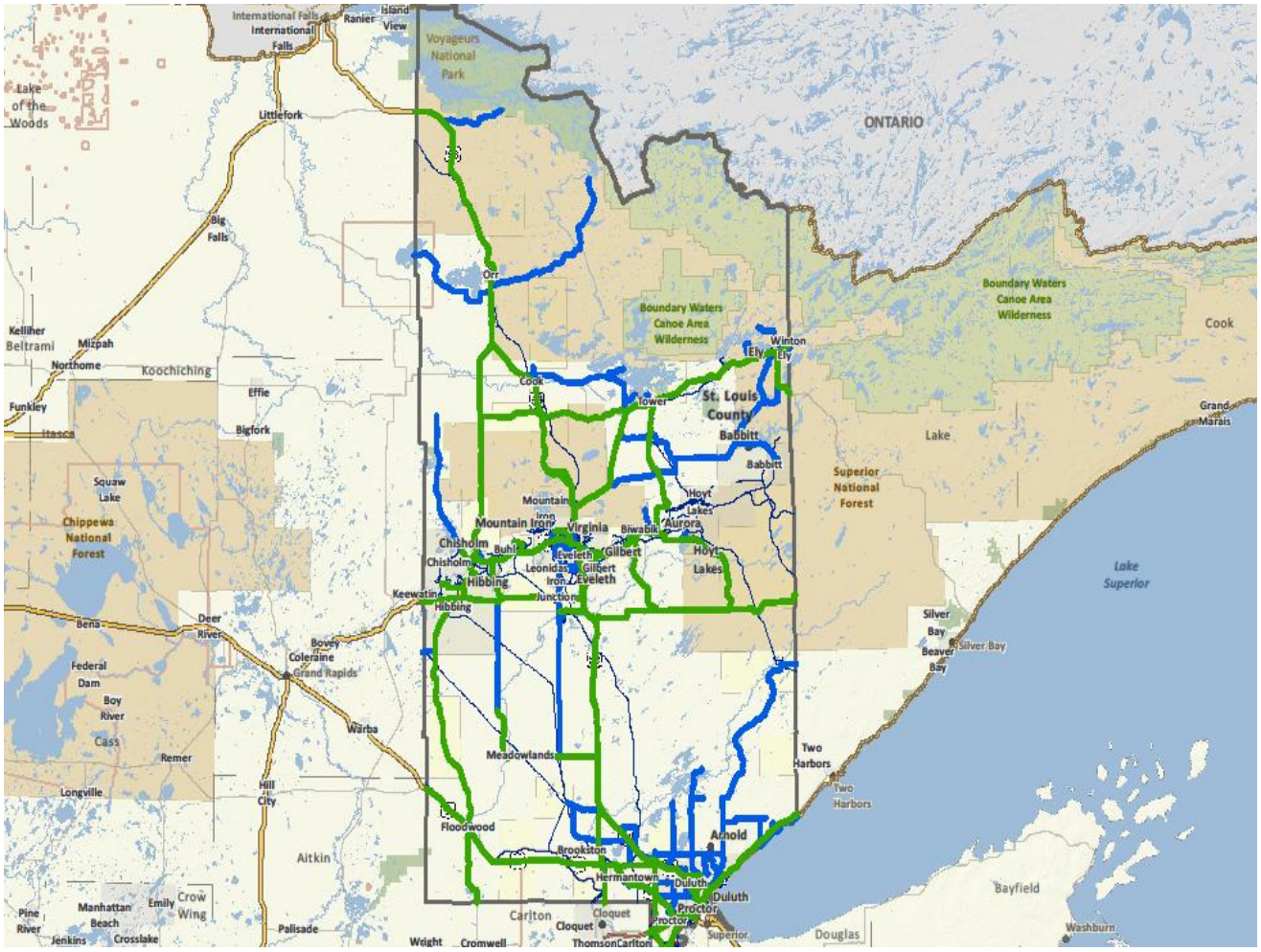
Trunk Highway	Cities Served	Highest AADT*	HCADT**
Trunk Highway 2	Floodwood, Proctor	17,100 (Bong Bridge between I-35 and Superior WI)	510 (near I-35)
Trunk Highway 73	Floodwood, Hibbing, Chisholm	7,000 (Chisholm)	435 (Chisholm)
Trunk Highway 53	International Falls, Orr, Cook, Virginia, Eveleth, Cotton, Twig, Hermantown, Duluth	25,500 (Duluth)	1,400 (West Duluth)
Trunk Highway 33	Independence, Grand Lake	5,500 (near Carlton County line)	175 (south of Hwy #7)
Trunk Highway 194	Duluth	24,900 (Mesabi Avenue Duluth)	365 (Duluth Heights)
Trunk Highway 169	Hibbing, Chisholm, Buhl, Mountain Iron, Virginia, Tower	15,700 (Hibbing)	880 (Hibbing)
Trunk Highway 37	Iron Junction, Cherry, Gilbert	6,700 (Hibbing)	690 (near Hibbing)
Trunk Highway 1	Cook, Tower, Soudan, Ely	4,150 (near Tower with Hwy 169)	165 (downtown tower)
Trunk Highway 135	McKinley, Biwabik, Aurora	8,600 (east of Hwy 53)	175 (east of Hwy 53)
Interstate I-35	Midway, Proctor, Duluth	59,000 (east of Blatnik Bridge)	2,600 (east of Blatnik Bridge)
I-535	Blatnik Bridge	29,500	660
Trunk Highway 61	Duluth to Two Harbors	21,200 At I-35 (Duluth)	1,350 at I-35 Duluth
Trunk Highway 23	West Duluth	15,200 (near intersection with I-35)	630 (near intersection with I-35)
Trunk Highway 210	Carlton County line Duluth	235(Fond du Lac area Duluth)	5 (Fond du Lac area Duluth)
TH 835B, 837a, 953a	Virginia City highways	7,900 Virgiinia	720 (Virginia)

Source: Minnesota Department of Transportation traffic volume data
*AADT Annual Average Daily Traffic
**HCADT Heavy Commercial Annual Average Daily Traffic

Road Weight Limits

Map 8 shows the ten and nine ton roads in St. Louis County. The Green lines are the ten ton roads and include both state and county highways. The nine ton roads are designated during spring weight limits. When the roads are not under spring road restrictions, all county and unorganized roads that are not ten ton roads revert to nine ton road weight restrictions.

Map 7: Road Weight Limits
St. Louis County



Source: St. Louis County

Railroads

There are seven railroad lines in St. Louis County. These are the Duluth Missabe and Iron Range (DMIR) Railroad now owned by Canadian National (CN), North Shore Mining (NSM) Railroad, the Burlington Northern-Santa Fe (BNSF) Railroad, the Duluth, Winnipeg, and Pacific (DWP)Railroad now owned by the Canadian National (CN) Railroad, St. Louis and Lake County (SLLC) Railroad, the Soo Line and the COD Excursion. In total, there are 529.69 miles of track in St. Louis County. Table 2.15 shows the mileage breakdown by railroad line.

Table 2.15: Railroad Track Mileage
St. Louis County

Railroad	Track Miles
DMIR (CN)	194.62
NSM	22.90
BNSF	120.93
DWP (CN)	125.35
SLLC	18.40
Soo	4.09
COD Excursion	8.10
LTV Mining	35.3
TOTAL	**529.69**

Source: MN Dept. of Transportation

- **Duluth Missabe & Iron Range (DMIR Now CN)**
  One of the largest railroad lines in St. Louis County is the Duluth, Missabe, and Iron Range (DMIR) line. The DMIR is now owned by CN. The DMIR is the main arterial for the transportation of taconite pellets from the Iron Range to the port cities of Duluth and Two Harbors. The DMIR consists of two primary lines. The first is the western line, or Missabe, which connects the iron ore mines to the ore docks in Duluth. The eastern line, called the Iron Range, connects the mines to the loading docks in Two Harbors. The main cargoes found on the DMIR include taconite pellets, limestone, coal, and other miscellaneous freight. The eastern Iron Range line sees an average of approximately 12 trains a day, while the western Missabe Range line averages 13 trains per day. For both portions of the DMIR line, the track speed limit is 35 miles per hour.

- **Northshore Mining**
  The Northshore mining line exists primarily within the borders of Lake County, with some track in St. Louis County. The main function of this line is to carry iron ore to the port of Silver Bay where it is processed into taconite pellets and loaded onto ships. This line sees approximately 14 trains per day and has a track speed limit of 40 miles per hour. There are five crossings on the NSM line, one of which is signalized.

- **Burlington Northern-Santa Fe**
  There are 120.93 miles of BNSF rail within St. Louis County. BNSF Railway is one of North America's leading freight transportation companies operating on 32,000 route miles of track in 28 states and two Canadian provinces. Within St. Louis County, BNSF tracks follow the St. Louis River from the south end of the county into Floodwood where they parallel US Highway 2 to the western edge of the county. Along this route, BNSF transports grain to the Twin Ports for export. At Brookston, the tracks head north to the iron range where the railroad transports primarily iron ore products. BNSF also operates within the city of Duluth serving a number of waterfront industries. BNSF operates approximately 8 trains and five yard jobs daily serving local industries within St Louis County.

- **Duluth, Winnipeg, and Pacific Railroad (CN)**
  The DWP line runs between the ports of Duluth and Superior and Ranier, Minnesota on the Canadian border while passing through Carlton, St. Louis, and Koochiching Counties. These tracks are now owned by CN. This track has an average volume of approximately 16 trains per day and a speed limit of 49 miles per hour. There are 125.40 miles within the borders of St. Louis County, 24.43 miles of track in Koochiching County, and 5.43 miles in Carlton County. Trains using the DWP line typically carry timber related products. In addition, the DWP line also carries grain, steel, fertilizers, potash, and occasionally motor vehicles.

- **St. Louis and Lake County Railroad**
  The St. Louis and Lake County Railroad runs up the north shore of Lake Superior between Duluth and Two Harbors. St. Louis County contains 18.40 miles of the line while 11.53 miles are in Lake County. In the past, the DMIR Railroad used this track for transporting taconite pellets and stone between Duluth and Two Harbors. The current user of the track is the North Shore Scenic Railroad out of Duluth. The SLLC line sees about two trains per day and has a track speed of 35 miles per hour.

- **SOO and COD Excursion**
  Soo line is in the Duluth Harbor area and the COD excursion line is in West Duluth
- **LTV Mining**
  The LTV line is not active but the tracks remain place and the line has not been abandoned. The LTV line in St. Louis County is 35.30 miles long before entering Lake County. Polymet mining intends to use this line as well as construct additional tracks in the area of the mine and the plant. The LTV line is now owned by Canadian National (CN).

Air Transportation

There are nine airports in St. Louis County. Each airport is briefly described below:

- **Range Regional (Chisholm-Hibbing) Airport**
  Located four miles east of Hibbing on Trunk Highway 37. The longest runway at the airport is paved and extends 6,758 feet. The second runway extends 3,096 feet. The facility is at an elevation of 1,353 feet and provides passenger service. The airport supports the MN DNR Aerial Fire Suppression Operations and supports Life Link III medical helicopter operations. Airport building/hangar utilization for supply storage and distribution in the case of a large scale incident is available. There is a sea plane base at Carey Lake.

- **The Duluth International Airport**
  This is the main unit in the Northeast Minnesota Regional Airport System. The airport is designated as a primary facility with daily commercial service. This facility serves as a resource for the Air National Guard fighter planes. Companies using the airport include: Delta Airline, United Airline, Allegiant Air, Monaco Air, the United Postal Service, Federal Express, United States Postal Service, AAR Aircraft Services, Inc, and Cirrus Design Corporation. Lake Superior College has an Aviation Campus located at the airport. The longest runway is 10,162 feet. The second runway length is 5,718 feet. Customs service is available. A new airport terminal is under construction. The facility is at an elevation of 1,428 feet.

- **Duluth Sky Harbor Airport**
  Sky Harbor airport is administered by the Duluth Airport Authority and is located at the end of Park Point. The paved runway extends 3,050 feet. The facility is at an elevation of 610 feet. The seaplane base is adjacent to the runway on Superior Bay.

- **Ely Municipal Airport**
  Serves Ely and St Louis County and is owned by the City of Ely. The paved runway at the airport extends approximately 5600 feet. The facility is at an elevation of 1455 feet located four miles from Ely. The airport provides seasonal commercial service and largely serves tourists visiting the Boundary Waters Canoe Area Wilderness (BWCAW).

- **Eveleth-Virginia Airport**
  Owned and operated by the cities of Eveleth and Virginia. The longest runway at the airport is paved and extends approximately 4,694 feet. The facility is at an elevation of 1,378 feet located about 3 miles outside of Eveleth. The airport also serves as a seaplane port on Ely Lake.

- **Orr Regional Airport**
  Serves the City of Orr and St Louis County and is owned by the City of Orr. The paved runway at the airport extends 4,001 feet. The facility is at an elevation of 1,311 feet approximately three miles west of Orr. The airport is classified as an intermediate and general aviation facility.

- **Cook Municipal Airport**
  Located approximately 12 miles west of the City of Cook. The paved runway at the airport extends 4,000 feet. The facility has an elevation of 1,327 feet and is rated as a general aviation airport. The facility is open year round.

- **Scotts Seaplane Base**
  Seaplane base located on the southwest corner of Crane Lake located near the Canadian border. Customs service is available. The elevation is 1,119 feet.

- **Tower Municipal Airport**
  Located north of the city of Tower on Lake Vermilion. Elevation is 1,369 feet. The paved runway is 3,400 feet in length. The seaplane base is located adjacent to the airport. Tower is classified as an Intermediate airport.

Water Ports

The Port of Duluth is the one major port located within St. Louis County. Duluth/Superior is the furthest inland port of the Great Lakes and marks the end of the St. Lawrence Seaway system. The port contains nearly 49 miles of shoreline and contains approximately 19 square miles of water.

The direct job impact according to a 2011 report on the economic impact of the port is 2,985 jobs. The 2010 direct business revenue was $1.5 billion. In 2011, there were 894 vessel arrivals, down from 991 the previous year. The average number of vessels from 2000 to 2009 was 1,078.

The Twin Ports primarily exports cargo, but does see a wide range of imported shipments. With iron ore docks, coal docks, grain elevators, and specialized cargo facilities lining the industrial waterfronts of both Duluth and Superior, the port serves shippers and receivers throughout the U.S. Midwest and the Great Plains. It also has some customers in Canada's western provinces.

The port averages about 40 million metric tons of cargo in a navigation season that usually begins in late March and continues until mid-January. Duluth-Superior is by far the largest port on the Great Lakes and is one of the premier bulk cargo ports in North America.

Coal followed by iron ore accounts for most of the export tonnage. Grain amounts to between five to ten percent of outbound cargo. There are inbound shipments of limestone, salt, cement, energy related project cargo, and general cargo.

There is also occasional cruise ship visits to the port. Shipping to and from the Port of Duluth is by rail and truck. The major facilities at the port listed by the Port Authority include:

- Ore Docks
- 1 Coal transshipment terminal
- 10 bulk terminals
- 7 grain elevators (55 million bushel capacity)
- 1 general cargo terminal distribution hub
- 1 fueling depot
- 1 Shipyard with 2 dry docks

Transit Systems

Duluth

The Duluth Transit Authority (DTA) is a large urban transit system with 71 buses. The transit system operates approximately 22 regular routes in Duluth, Proctor, and Superior, Wisconsin. The DTA also operates special services for tourists during the summer months; the Port Town Trolley circulates between downtown Duluth and the Canal Park waterfront. The transit system operates Sunday through Saturday from 4:30 A.M. to 12:45 A.M. Ridership for the DTA in 2011 was 3,264,469.

The Duluth STRIDE is a dial-a-ride service, which operates six small buses throughout the Twin Ports. To meet requirements of the Americans with Disabilities Act, STRIDE provides curb-to-curb service to disabled riders who cannot access lift-equipped regular route buses. The Duluth STRIDE operates Sunday through Saturday from 4:30 A.M. to 12:45 A.M. The Duluth STRIDE is operated and managed by a private contractor, Transit Special Services, Inc. The DTA provides and maintains the vehicles. A special STRIDE Advisory Committee advises the DTA Board of Directors on service issues and policy matters. Ridership for STRIDE in 2011 was 25,285 people.

Hibbing

Hibbing Area Transit is a small urban transit system which operates four medium class buses within the City of Hibbing, including Kelly Lake. The transit system operates route deviation and dial-a-ride services Monday through Friday 6 a.m. to 7 p.m., Saturday 9 a.m. to 3 p.m. and Sunday 9 a.m. to 2 p.m. The City of Hibbing Finance Department manages the system, with daily operations being handled by a private contractor. In 2011, Hibbing Area Transit had a ridership of 55,052.

AEOA and Dial-a-Ride

Arrowhead Transit is a rural public transit system providing coordinated public transit service to the residents within eight counties of northeast Minnesota. Those counties are Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, Pine and St. Louis (excluding the cities of Duluth and Hibbing). The Arrowhead

Economic Opportunity Agency (AEOA), a private non-profit agency, operates the transit system.

Arrowhead Transit is the largest rural transit system in the state with a fleet of 81 buses, 17 Class 400 and 64 Class 500. Ridership was approximately 558,325 riders in 2011.

The transit system provides route deviation and dial-a-ride service on weekdays from 5:00 A.M. to 7:00 P.M., with some exceptions. Dial-A-Ride service is provided in the cities of Aitkin, Cloquet, Grand Marais, Grand Rapids, International Falls, Two Harbors, Pine City, Virginia, Ely and Floodwood.

Power Facilities

St. Louis County is supplied by four electric companies including Minnesota Power, Cooperative Light and Power, Lake Country Power and Northstar. Municipal facilities include Hibbing Public Utilities and Virginia Public Utilities.

GIS data is maintained by St. Louis County.

Broadband Infrastructure

Wireless communications and broadband access has become increasingly important to report emergency situations as well as agencies to communicate to residents and visitors. The 2011 Broadband Service Inventory from Connect Minnesota indicates that the trunk highway system throughout the county has mobile wireless access although there are spots where coverage can be weak.

The following areas in the inventory have no service:

- Nett Lake outside of the village
- Buyck and the Echo Trail to the Fenske Lake area
- Brimson area east of the Whiteface outside the immediate Brimson and Rollins area
- Southeast of Babbitt near the Lake County line

The Northeast Service Cooperative Middle Mile project is underway and when completed in 2012 will improve broad band access through most of St. Louis County.

2.8 Socio-Economic Profile

Economy

The number of employed persons has remained between 93,000 and 95,000 since the year 2000. Table 2.16 shows employment numbers by industry group.

Table 2.16: Average Employment by Major Industry
St. Louis County

Industry	2000	2010
Education and Health Services	25,668	32,837
Trade, Transportation and Utilities	20,653	17,054
Leisure and Hospitality	11,032	11,148
Professional/Business Services	6,494	7,022
Public Administration	6,170	5,680
Financial Activities	3,834	4,338
Manufacturing	6,389	4,110
Construction	4,130	3,558
Natural Resources and Mining	4,882	2,992
Other Services	3,293	
All Industries	**95,068**	**93,300**

Source: Minnesota Department of Economic Security Research and Statistics Office.

Characteristics of industry employment are as follows:

- Natural Resources and Mining is concentrated around the Iron Range mining and taconite facilities. This is an area of potential future growth in the East Iron Range area if the non-ferrous mining industry grows over the next ten years. Others in this category are employed in the logging industry throughout rural St. Louis County. This number has declined in recent years due to the effects on forest products due to the national economy.
- The Transportation sector is dominated by activity around the port of Duluth and rail centers in Proctor and on the Iron Range.
- Education and Health Services is centered in Duluth, Hibbing, Virginia, and Ely.
- Leisure and Hospitality jobs are about half in Duluth and half concentrated in the lake area.

Table 2.17 shows the 2010 employment numbers by the five most populace cities in the county. A total of 84% of all employment in the county is located in these five cities.

Table 2.17: Employment
St. Louis County

City	2010 Employment	Percent of County wide employment
Duluth	58,123	62.3%
Hibbing	8,535	9.1%
Virginia	6,862	7.3%
Hermantown	3,636	3.9%
Chisholm	1,323	1.4%
Total St. Louis County	93,300	100%

Source: Minnesota Department of Economic Security Research and Statistics Office

Socio Economic

St. Louis County has the following characteristics in 2010:

- English is spoken "less than very well" by 0.9% of the population.
- 12.7% of the civilian non-institutionalized population was considered disabled with the 65 year old and older group having a disabled population of 33.6% or 10,359 persons.
- Mean travel time to work was 20 minutes.
- 11.1% of families population was below the poverty level, which is 17.9% of total population.
- Median household income was $41,801.
- The unemployment rate was 9.8%
- Households are heated by utility gas/45.4%, LP gas/13.3%, electricity/17.3% and oil/14.3%.
- A total of 8,778 households have no personal vehicle available.
- 8.8% of the population had no health insurance coverage.

Emergency Shelters

The American Red Cross has identified emergency shelters in St. Louis County. The shelters are located throughout the county in relationship to the concentration of population. It is unclear what will happen to shelters such as Albrook School, Duluth Central High School and Cook School when they are closed and the sites sold.

Table 2.18 shows the address and capacity of the shelters. Capacity shown is Emergency Evacuation/Overnight. Locations are shown on the Red Cross Shelter map in Appendix A.

Table 2.18: Emergency Shelters
St. Louis County

Site	Address	Capacity Evacuation/Overnight
Albrook School (ISD 2142)	7427 Seville Road Saginaw, MN 55779	388/194
Arrowhead Fire Department	9797 Hwy 2 Brookston, MN 55711	100/50
Aurora Community/Senior Center	15 West 1st Avenue North Aurora, MN 55705	50/0
Babbitt School (ISD 2142)	30 South Drive Babbitt, MN 55706	836/418
Bay View School (ISD704)	8708 Vinland St. Duluth, MN 55810	900/0
Central Lakes Fire Department	7562 Murphy Lake Road Eveleth, MN 55734	0/0
Cherry School (ISD 2142)	3943 Tamminen Road IRON, MN 55751	3824/1912
Church Of Christ	4801 Cooke St. Duluth, MN 55804	11/0
College of St. Scholastica	1200 Kenwood Ave Duluth, MN 55811	3070/0
Congdon Park Elementary School (ISD 709)	3116 East Superior Street Duluth, MN 55812	345/0
Cook School	306 E Vermillion Blvd Cook, MN 55723	315/0
Denfeld High School (ISD 709)	4405 West 4th St. Duluth, MN 55807	1331/0
Duluth Airport Authority	4701 Grinden Dr Duluth, MN 55811	725/0
Duluth Entertainment and Convention Center (DECC)	350 Harbor Drive Duluth, MN 55802	N/A
East High School (ISD 709)	2900 E 4th St. Duluth, MN 55812	1001/0
Ely Public Schools (ISD 696)	600 E. Harvey St. Ely, MN 55731	2000/0
Floodwood School District	115 West Fourth Avenue Floodwood, MN 55736	615/0
French Township Hall	7548 HWY 5 Side Lake, MN 55781	100/50
Grant Elementary School (ISD 709)	1027 North 8th Avenue East Duluth, MN 55805	3225/0
Hibbing Community College	1515 East 25th Street Hibbing, MN 55746	1300/0
Hillside United Methodist Church	1801 Piedmont Ave Duluth, MN 55811	84/42

Homecroft Elementary School (ISD 709)	4784 Howard Gnesen Road Duluth, MN 55803	1200/0
Lakewood Elementary School (ISD 709)	5207 North Tischer Road Duluth, MN 55804	1250/0
Laura MacArthur Elementary School (ISD 709)	727 North Central Avenue Duluth, MN 55807	1500/0
Lester Park Elementary School (ISD 709)	315 North 54th Avenue East Duluth, MN 55804	1000/0
Lincoln Park Elementary School (ISD 709)	2424 West 5th street Duluth, MN 55806	852/0
Lowell Elementary School (ISD 709)	2000 Rice Lake Road Duluth, MN 55811	2000/0
Mesabi East School (ISD 2711)	601 N 1st St W Aurora, MN 55705	750/0
Mesabi Range Community College	1001 Chestnut Street W Virginia, MN 55792	10/10
Nettleton Elementary School (ISD 709)	108 East 6th Street Duluth, MN 55805	1000/0
Ordean Middle School (ISD 709) - INACTIVE	301 N 40th Ave. E. Duluth, MN 55804	1000/0
Pequaywan Fire Department	8369 Pequaywan Lake Road Duluth, MN 55803	10/10
Piedmont Elementary School (ISD 709) - INACTIVE	2827 Chambersburg Avenue Duluth, MN 55811	2395/0
Pike Lake School (ISD 704)	5682 Martin Rd. Duluth, MN 55811	1250/0
Proctor City Hall	100 Pionk Drive Duluth, MN 55810	925/0
Proctor Community Center	100 Pionk Drive Duluth, MN 55810	100/50
Proctor Public Schools	various Proctor, MN 55810	10/10
Rockridge Elementary School (ISD 709)	4849 Ivanhoe Street Duluth, MN 55804	1533/0
Roosevelt Elementary School	411 5th Ave S Virginia, MN 55792	750/375
Stowe Elementary School (ISD 709)	715 101st Avenue West Duluth, MN 55808	1750/0
Tower School (ISD 2142)	415 N Second Street Tower, MN 55790	3631/0
Town of Fayal	4375 Shady Lane Eveleth, MN 55734	71/35
University of MN-Duluth	1049 University Drive Duluth, MN 55812	17500/0
Vermilion Community College	1900 E. Camp St. Ely, MN 55731	1084/0
Virginia High School	411 5th Ave S Virginia, MN 55792	1410/705
Virginia Public Schools - INACTIVE	6th Avenue Technical Building B Virginia, MN 55792	1000/0

Source: American Red Cross Northland Chapter, Duluth, Minnesota, Updates from City and Township contacts

Childcare and Children Residential Facilities

In St. Louis County, there are 66 large childcare and children residential facilities that are licensed by the State. Childcare facilities in private homes are not included in this number. The capacity of these licensed facilities range from 6 to 143. They include facilities for infants, toddlers, preschool, and school age.

The County maintains GIS data for these facilities with information on facility type and capacity.

Correctional Facilities

There are eight correctional facilities in St. Louis County.

Juvenile facilities include:

- Arrowhead Juvenile Center in Duluth
- Woodland Hills in Duluth
- Kids Peace Mesabi Academy in Buhl

Adult facilities include:

- Federal Prison Camp in Hermantown
- St. Louis County Jail in Duluth
- 72 hour holding facilities in Hibbing
- 72 hour holding facilities in Virginia
- Northeast Regional Corrections in the Town of Grand Lake

The County maintains GIS data on these facilities.

Student Housing

There are four communities in St. Louis County with on campus, student residential structures such as dormitories and student-only apartments. The communities where they are located and the 2010 U.S Census shows:

- Duluth - 3,929
- Ely - 165
- Virginia - 89
- Hibbing - 76

Numbers do not include students residing in off campus housing.

SECTION THREE:

Hazards Facing St. Louis County

SECTION 3: HAZARDS FACING ST. LOUIS COUNTY

3.1 Natural Hazards

3.1.2 Drought

A drought refers to an extended period of deficient rainfall relative to the statistical mean for a region. Drought can be defined according to meteorological, hydrological, socioeconomic, and agricultural criteria. Meteorological drought is qualified by any significant deficit of precipitation. Hydrological drought is manifest in noticeably reduced river and stream flow and critically low groundwater tables. The term agricultural drought indicates an extended dry period that results in crop stress and harvest reduction. Socioeconomic drought refers to the situation that occurs when water shortages begin to effect people and their lives. It associates economic good with the elements of meteorological, agricultural, and hydrological drought. It is different than the other definitions in the fact that this drought is based on the process of supply and demand. Many economic goods (e.g., water, food grains, fish, hydroelectric power) have their supplies greatly dependent on the weather. Due to natural variations in climate, some years have high supplies of water, but other years the supply is very low.

A socioeconomic drought takes place when the supply of an economic good cannot meet the demand for that product, and the cause of this shortfall is weather-related (water supply). Droughts in St. Louis County are of particular concern because of the potential for forest fires as well as the impacts lower lake levels have on recreation. Drought also impacts residents and businesses who have individual wells.

History

Droughts have impacted the St. Louis County area during different periods over the last century. Notable drought periods were 1987-1989, 1976-1977, 1954-1961, and 1934. The winters of 2002 and 2003 had record low snowfalls. This had an impact on the lake levels and increased fire danger. A socio-economic concern relating to a drought situation is that of water frontage property owners on the Minnesota Power Hydro reservoirs. Low water levels decrease the access some residents have to the reservoirs.

Drought conditions have existed in large portions of St. Louis County from the spring of 2010 going into 2012. The U.S. Drought Monitor in January 2012 shows the entire county in a moderate drought while lands to the east of the county are experiencing a severe drought. The U.S Geological survey reports that stream discharge is very low in northeast Minnesota. Lake Superior water level is down 13 inches from the long term seasonal average. No area of the County in 2011 experienced excess of normal precipitation and from April through November 2011 the Ely area was at 60% of normal precipitation. Most of central and northern St. Louis County was at 70% of normal during this time period. Snowfall for the winter of 2012 was below normal.

Plans and Programs in Place

The St. Louis County Water Plan describes both surface and groundwater quantities and quality. It further addresses the county's water needs and concerns.

Relationship to Other Hazards-Cascading Effects

Wildfires: A drought situation can significantly increase the risks of wildfire.

Program Gaps or Deficiencies

No program gaps or deficiencies were identified.

Table 3.1: Drought Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
October 2006 – October 2007	Drought Conditions	St. Louis County	0	0	0	NOAA	Extreme drought, trend of below normal rain and snowfall. Stream and river levels very low. Water level of Lake Superior fell to a record low for August in 2007.
April – May 2010	Drought Conditions	South St. Louis County	0	0	0	NOAA	Precipitation totals only 10-25 % of normal.
Sept 2011 – December 2012	Drought Conditions	North St. Louis County	0	0	0	NOAA	Rain and snowfall deficits.

Source: NOAA National Climatic Data Center

3.1.3 Earthquake

An earthquake is defined as a shaking or trembling of the crust of the earth by underground volcanic forces or by breaking and shifting of rock beneath the surface. St. Louis County is located in an area with a zero percent Peak Ground Acceleration rating.

Relationship to Other Hazards-Cascading Effects

N/A

Plans and Programs in Place

None needed.

Program Gaps or Deficiencies

No program gaps or deficiencies have been identified.

Table 3.2: Earthquake Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No major earthquake has been documented for St. Louis County.							

Source: St. Louis County

3.1.4 Extreme Temperatures (Summer and Winter)

NOAA's National Climatic Data Center is the source of the following weather information for St. Louis County. Data for communities in the Southeast (Duluth), Southwest (Floodwood) Northwest (Kabetogama) and Northeast (Tower) were selected as those locations provide information on the diverse areas of the County. The site at Kabetogama appears to be a data collection site that was established later than the year 2000. The other sites have information for over a 100 year time period.

Summer Heat

Extended periods of high temperatures is less common in St. Louis County than elsewhere in the state. However, the trend since 1900 has been an increase in average and high temperatures with northern Minnesota warming on average 2.1 degrees and the high temperature warming by 1.2 degrees according to the State Climate Office. The warmer temperatures increase the severity of drought and of wildfires. Table 3.3 shows some highest maximum temperatures on record.

High temperatures induce heat stress when more heat is absorbed into the body than can be dissipated out. Heat illness such as prickly heat, fainting from heat exhaustion, or heat cramps are visible signs of unbearable heat.

In the most severe cases, the body temperature control system breaks down altogether and body temperature rises rapidly. This is a heat stroke, which can be fatal. The National Weather Service (NWS) issues a heat advisory when, during a 24-hour period, the Heat Index ranges from 105-114 degrees during the day, and remains at or above 80 degrees at night.

Summer temperatures in St. Louis County rarely reach the point where a heat advisory is warranted. Summer temperatures inland from Lake Superior can reach 80 to 90 degrees Fahrenheit for periods of time. However, extremely hot summer temperatures typically do not last for long periods of time. In August 2001, temperatures remained high for a period of time resulting in five reported heat related deaths. No injuries or deaths related to heat were recorded between January 2006 and August 2012.

The primary population of concern is the elderly. Because their bodies do not send as strong a signal to respond to heat, these residents are more vulnerable to heat stroke and may not consume proper amounts of fluid or dress in light clothing. Another vulnerable group is younger residents engaged in athletic activities.

Because of generally mild summer temperatures, air conditioning in private residences is not as common in Northeastern Minnesota as it is in other parts of the state and country. This may exacerbate heat related problems at relatively lower temperatures than areas where air conditioning is common.

Table 3.3:
Years of Notable High Temperatures Degrees Fahrenheit
St. Louis County

Year	Duluth	Floodwood	Kabetogama	Tower
1900				98
1901	98			101
1936	106			
1983	99			
1988	97	99		98
1990		94		
1995				97
1997				
2003			97	
2005			93	
2006	97	97	94	98
2007			94	

Source: NOAA online Weather Data July 2012

Table 3.4: Extreme Heat Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No major extreme heat events have been documented for St. Louis County since 2006							

Source: NOAA online Weather Data July 2012

Winter Cold

Extreme cold is a common winter event throughout all areas of the county. There can be extended cold periods where the temperature does not rise above zero degrees Fahrenheit. The lowest temperature record in Minnesota was set in Tower in 1996 when it was -60 degrees. The Duluth area tends to be slightly warmer due to the influence of Lake Superior. Table 3.5 shows some lowest temperatures on record.

Below zero temperatures occur almost every winter for a period of time. The winter of 2002-2003 was one of the driest winters on record. Limited snow cover combined with long cold spells of sub-zero temperatures impacted a large number of septic systems and water pipes due to frost that went deeper than normal throughout St. Louis County. Two incidents of extreme cold and wind chills are recorded in 2008, 2 in 2009 and one in 2010. One related death is recorded in 2009.

The National Weather Service (NWS) issues a wind chill warning when wide spread wind chills of 60 degrees below zero or lower with winds greater than 10 M.P.H are expected.

In St. Louis County cold winter weather can have severe or fatal impacts. Hypothermia occurs when core body temperature drops below 96 degrees Fahrenheit (F). Anyone who is exposed to severe cold without enough protection can develop hypothermia. Frostbite occurs when skin tissue and blood vessels are damaged from exposure to temperatures below 32 degrees F.

Winter weather in St. Louis County can be especially dangerous for seniors, persons with disabilities and outdoor workers. Record temperature lows and arctic-like wind chill factors can cause cold-related illness such as frostbite and hypothermia, which can be deadly.

Table 3.5: **Years of Notable Low Temperatures Degrees Fahrenheit**
St. Louis County

Year	Duluth	Floodwood	Kabetogama	Tower
1904	-37			
1912	-36			
1935	-38			
1965	-38			
1966	-37			
1972	-39			
1975	-38			
1982	-38			-52
1983				-52
1996	-39	-50		-60
1997		-44		-52
2004			-37	
2005		-47	- 46	
2008			-37	
2009			-41	
2011			-38	

Source: NOAA online Weather Data July 2012

Relationship to Other Hazards-Cascading Effects

Wildland Fire: Dry, hot conditions increase wildfire risks. Extreme cold directly impacts fire fighting, making fire suppression much more difficult and increases risks and hardships to fire fighters and increases the likelihood of equipment damage.

Public Health: Frozen septic systems can lead to an increased release of untreated wastewater to environment.

Plans and Programs in Place

St. Louis County Emergency management is briefed at regional emergency management meetings regarding updates to NOAA related items. The discussion may include new equipment, warning and notification features such as IPAWS, Emergency Alert System (EAS) updates, proposed changes to terminology such as watches/warnings and advisories, the Strom Ready program and Skywarn Training availability.

School Closings: All schools have a school closing policy and protocol in place if temperatures create a hazardous situation.

Heat Advisories NWS: The NWS issues heat advisories when, during a 24-hour period, the Heat Index ranges from 105-114 degrees during the day, and remains at or above 80 degrees at night.

Wind Chill Warnings NWS: The NWS issues wind chill warnings when conditions are such that skin tissue may freeze within a short period of exposure time.

Program Gaps and Deficiencies

High Temperatures: More education would be beneficial to inform residents, particularly the elderly and those engaging in strenuous physical activities, of the dangers of heat stroke.

School Closing Days: School districts determine a set number of days for school closings each academic year. If a school runs out of school closing days during a particularly severe winter, a situation may be created where children could be at risk if school is not closed.

Table 3.6: **Extreme Cold**
St. Louis County

Date	Location	Cost	Deaths	Injuries	Source	Notes
Feb 2-3, 2007	St. Louis County	0	0	0	NOAA	Extreme cold temperatures with lows of -30. Winds 10-20 mph with wind chills of -40 t0 -50. Some closed schools and stress on electric grid.
Jan 19, 2008	North St. Louis County	0	0	0	NOAA	Bitter cold in teens and 20s with wind chills as low as -40.
Jan 29, 2008	North St. Louis County	0	0	0	NOAA	Wind chills of -40 to -55.Many schools closed.
Dec 15, 2008	St. Louis County	0	0	0	NOAA	Bitter cold temperatures. Wind chills of -40 to -52.
Jan 13-16, 2009	St. Louis County	0	0	0	NOAA	Low temperatures of -30 to -40 with 90-100 consecutive hours below zero. Wind chills of -40 to -50. Most schools and outdoor recreation closed.
Jan 1, 2010	South St. Louis County	0	0	0	NOAA	Dangerously cold wind chills of -40 to -50.
Jan 19, 2012	North St. Louis County	0	0	0	NOAA	Wind gusts to 30 mph and wind chills of -40 to -50.

Source: NOAA National Climatic Data Center

3.1.5 Flooding

The National Weather Service makes a distinction between a flood and a flash flood. The definitions are:

Flood – An overflow of water onto normally dry land. The inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream or drainage ditch. Ponding of water at or near the point where the rain fell. Flooding is a longer term event than flash flooding and may last days or weeks.

Flash flood – A flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through river beds, urban streets or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur even if no rain has fallen, for instance, after a levee or dam has failed or after a sudden release of water by a debris or ice jam.

Snow melts from heavy snows and rain from slow moving thunderstorms can cause localized flooding which can impact property and infrastructure such as roads. Often this flooding is not related to structures being located in flood plains but a result of storm water management or limited capacity of the soil to absorb water due to frost in the ground in early spring resulting in flooded basements.

Some flooding in St. Louis County is usually a result of small-scale flash floods resulting from slow moving thunderstorms and during the spring as a result of snowmelt and ice dams aggravated by increased surface run-off due to frost in the ground which does not allow the soil to absorb moisture.

Another type of flooding results from poor infrastructure. For example, inadequate sewer and storm water management systems such as ditches and culverts.

Finally, rising lake levels can cause flooding. This type of flooding is caused by a long-term, above average precipitation trend in landlocked basins with a poor lake outlet. This type of flooding occurs over a period of months or years and is not caused by a single event.

Note: Additional June 2012 Flooding details are in the heavy rain section.

Flooding Concerns for St. Louis County

Lack of snow and continuous freezing can result in localized flooding in and outside the channels of local streams. Each spring, some locations in the area of Fond du Lac in West Duluth along Water Street may flood due to normal spring flows in the St. Louis River. Records indicate that the duration of flooding can last several days due to rising waters of the St. Louis River and Mission Creek. There can also be spotty flooding each spring where culverts need to be unplugged and storm sewers need to be replaced.

The North Shore of Lake Superior and Minnesota Point have been periodically damaged due to high lake levels and storm generated waves from Nor'easters. The damage is mostly loss of shore land from erosion along the entire shoreline of Lake Superior.

Flood damage in some urban areas is generally from storm water runoff. Flooding as a result of beaver dams is a concern in some of the rural areas. Flood damage includes flooding of residences, businesses, industries, transportation facilities, utilities, water supply and sanitary systems, and storm water conduits. Risk of injury or death is also related to flood events.

Lake flooding sometimes occurs along the shores of Lake Kabetogama, the Whiteface River, the St. Louis River and Lake Esquagamah. Most of these floods are directly related to heavy rainfall over a short period of time. Further, rain events that occur during spring melt can

combine with frozen soils that prevents infiltration and exacerbates flooding.

The City of Cook lies in a low area close to the Littlefork River. In December 2001, FEMA prepared a new floodplain map for the City of Cook which, in effect, lowers the level of the flood plain within the city limits. Owners of older houses within the boundaries of the floodplain within the City of Cook will not be required to do anything to those properties. Any new construction will need certification from an engineer or surveyor that the first floor of the structure is at a minimum elevation.

The City of Floodwood has some of its city proper within the mapped floodplain. The Floodwood River enters the St. Louis River on the east side of the city. Just downstream, the Savannah River enters the St. Louis River. Ice jams at the confluences can contribute to flooding events.

Most of the flooding in the City of Hibbing is not within mapped floodplain. Runoff and storm water management systems have caused flooding. The City of Hibbing has done a number of sewer rehabilitation projects since the mid-1970s dealing with storm water and wastewater upgrades.

Most flooding in Virginia and Mountain Iron is not within mapped floodplain. Mostly runoff and storm water management systems have caused flooding.

Most of the flooding in the City of Chisholm is not within mapped floodplain. Mostly runoff and storm water management systems have caused flooding.

Table 3.7: Flood Events 1996-2012
St. Louis County

Location	Year	Type	Description
Duluth	1996	Flash Flood	Heavy thunderstorm rains caused the closure of several highways in the Duluth area, including State Highway 61, 11 miles northeast of Duluth, which was covered with 8 inches of water. The Northshore Scenic Railroad tracks just northeast of Duluth were washed out. Other city streets, county roads, and rural driveways suffered washouts, and the city of Duluth experienced sewer overflows. A total of 2.33 inches of rain fell at Duluth International Airport, setting a new record for the date.
Floodwood and Duluth area	1997	Flood	Rapid melting of a snowpack with above normal water content and heavy rain caused flooding across parts of northeastern Minnesota. Rising water on the Floodwood River affected mainly the community of Floodwood in southern St. Louis County. High water flooded 10 to 20 homes and businesses, and two highways had standing water, nearly closing one of them. Sandbagging of roads and structures was carried out. An estimated $135,800 in public, private, and retail damage occurred in Floodwood, with about $25,000 in road and bridge damage in Duluth and Lakewood Township. Federal disaster aid was granted.
Duluth to Two Harbors	1997	Flash Flood	A band of heavy rain developed from downtown Duluth to just north of Two Harbors. Nearly five and a half inches of rain fell in Duluth's Lakeside neighborhood earlier in the day. The steep hillside in Duluth helped create torrents of water that closed many streets, forced up manhole covers, and overwhelmed sanitary sewers. The rushing water washed out railroad tracks and ripped the asphalt right off the roads. Many roads and driveways along State Highway 61 between Duluth and Two Harbors were either washed out or had standing water through the evening.
Southern Two-thirds of County	1999	Flash Flood	Heavy rain from thunderstorms forming and moving repeatedly across the same areas produced flash flooding from Itasca county across the southern two-thirds of St. Louis County, into the Arrowhead region of northeastern Minnesota. Many highways and hundreds of basements on the Iron Range and the North Shore were flooded. The tracks of several railroads were washed out. Duluth Doppler radar gave rainfall estimates around 6 inches. In St. Louis County, road damage alone amounted to about $800,000. Cook County had $850,000 in damage, with $250,000 in Lake County, and $850,000 in Itasca County. The heavy rain also caused low oxygen levels in some area rivers, resulting in the death of thousands of fish.
Virginia area	2002	Flash Flood	Numerous roads across the Iron Range were washed out due to very heavy rain of 5 to 8 inches.
Southeast St. Louis County	2002	Flood	The St. Louis River at Scanlon crested at 11.8 feet, 1.3 feet above flood stage, causing minimal damage.
Duluth	2002	Flood	Minor flooding of the Fond du Lac neighborhood of Duluth was due to water being released from the Thomson Dam, located upstream.
Northwest St. Louis County	2007	Flash Flood	Thunderstorms near Lake Vermillion produced flash flooding during the morning of May 21st. National Weather Service Doppler radar estimated 4 to 6 inches of rain fell in 3 hours, and a report of 1.5 inches in 1 hour was received. Water was reported covering Kabetogama Road as well as area parking lots in Gheen.

Duluth	2007	Flood	Portions of Mall Drive and Maple Grove Road were flooded and closed after Miller Creek overflowed its banks during the evening of October 18. The flood waters receded during the early morning hours of October 19. The St. Louis County sheriff also reported flooded basements and culverts in many areas across Duluth. An intense area of low pressure brought heavy rains to portions of northeast Minnesota on October 18 through the morning hours of October 19. Rainfall amounts of 2 to 5 inches resulted in widespread street and basement flooding in portions of Cook, Lake, St. Louis, and Pine counties.
Kabetogama	2010	Flash Flood	Water was covering some roads in Kabetogama. Slowly moving thunderstorms produced some flash flooding.
Hibbing	2010	Flash Flood	Thunderstorms caused many streets in Hibbing to be inundated with water.
West Duluth	2010	Flash Flood	Portions of Grand Avenue near the Smithville, Riverside, and Morgan Park areas of West Duluth were closed due to high water. Some cars became partially submerged and stalled due to 2.5 to 3 feet of water covering 88th Avenue West in Morgan Park. Nearly 4.5 inches of rain fell in West Duluth between 10:00 pm and 12:20 am CDT. A few thunderstorms became severe, producing damaging winds in the Brainerd Lakes region and some flash flooding in West Duluth.
Sturgeon	2011	Flash Flood	Water was running over County Highway 22 about 1.5 miles west of Highway 73. Low pressure over central Minnesota brought tropical moisture into northeast Minnesota. A cold front, over Saskatchewan that morning, triggered slow moving thunderstorms with heavy rain. Rainfall of 2 to 4 inches overnight and through the day was common. There were reports of an inch an hour rainfall.
East Duluth	2011	Flood	A stationary front remained across central Minnesota and central Wisconsin early August 1st. Weak low pressure moved eastward along the front, bringing tropical moisture as it crossed the upper St Croix Valley early August 2nd, triggering severe thunderstorms with very heavy rain through August 2. A 13 year old boy died of drowning after jumping into the swollen Amity Creek.
Southern St. Louis County	2012	Flood and Flash Flood	Locally high amounts of rain in the 8-10 inch range were reported throughout Duluth neighborhoods and along the North Shore of Lake Superior during the period of June 19-20. Numerous roads were washed out. A state of emergency was declared in Duluth, Hermantown, Cloquet, Barnum, Moose Lake and Superior, WI. The steep terrain and numerous creeks and rivers played a significant role in the devastating damage and flooding that occurred in the Duluth community. The Fond du Lac and West Spirit Mountain neighborhood of Duluth and Thomson Township in Carlton County were evacuated.

Source: NOAA National Climatic Data Center

The National Flood Insurance Program (NFIP) is in effect throughout most of St. Louis County. Flood plain identification and mapping, including any local requests for map updates or data, is a function of the Planning and Community Development Department GIS Specialists. The County itself administers the program outside of cities and the seven towns that administer their own zoning ordinance. The most populace community with flood plain and does not participate in the program is the Town of Duluth with a 2010 population of 1,941. The city of Tower with a population of 500 is the largest city that has a mapped flood area and does not participate in the flood insurance program. The following six cities and towns have mapped high flood risk areas but do not participate in the Flood Insurance program:

- Brookston
- Duluth Township
- Iron Junction
- Orr
- Tower
- Winton

Table 3.8 provides information on flood hazard's by community. This information was provided by the Minnesota Department of Natural Resources and is current in December 2011.

Table 3.8: National Flood Insurance Program (NFIP) Participation
St. Louis County

Community Name	2010 Population	Participating in National Flood Insurance Program (NFIP)?	No. Policies	Total Claims Since 1978	Total Paid Since 1978
Aurora	1,682	Participating in NFIP	0	0	0
Babbitt	1,475	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0

Biwabik	969	Participating in NFIP	2	0	0
Brookston	141	NOT Participating in NFIP (Have FEMA Mapped High Flood Risk Areas)	0	0	0
Buhl	1,000	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0
Canosia Township	2,158	Participating in NFIP	1	0	0
Chisholm	4,976	NOT Participating in NFIP (No Mapped High Flood Risk Areas)			
Cook	574	Participating in NFIP	20	6	8,220
Duluth	86,265	Participating in NFIP	111	52	111,175
Duluth Township	1,941	NOT Participating in NFIP (Have FEMA Mapped High Flood Risk Areas)	0	0	0
Ely	3,460	Participating in NFIP	2	0	0
Eveleth	3,718	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0
Fayal Township	1,809	Participating in NFIP	1	0	0
Floodwood	528	Participating in NFIP	7	18	41,206
Gilbert	1,799	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0
Gnesen Township	1,683	Participating in NFIP	5	0	0
Greenwood Twp	939	Participating in NFIP	28	0	0
Hermantown	9,414	Participating in NFIP	10	2	4,076
Hibbing	16,361	Participating in NFIP	8	3	2,481
Hoyt Lakes	2,017	Participating in NFIP	0	0	0
Iron Junction	86	NOT Participating in NFIP (Have FEMA Mapped High Flood Risk Areas)	0	0	0
Kinney	169	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0
Lakewood Twp	2,190	Participating in NFIP	2	0	0
Leonidas	52	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0
McKinley	128	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0
Meadowlands	134	NOT Participating in NFIP (No Mapped High Flood Risk Areas)	0	0	0
Midway Township	1,399	Participating in NFIP	1	1	11,978
Mountain Iron	2,869	Participating in NFIP	0	0	0
Orr	267	City Council approved a resolution to prepare a NFIP; currently being developed. (Have FEMA Mapped High Flood Risk Areas)	0	0	0
Proctor	3,057	Participating in NFIP	4	0	0
Rice Lake Township	4,095	Participating in NFIP	2	1	1,626
Saint Louis County	200,226	Participating in NFIP	123	23	80,959
Tower	500	NOT Participating in NFIP (Have FEMA Mapped High Flood Risk Areas)	0	0	0
Virginia	8,712	Participating in NFIP	2	0	0
Winton	172	NOT Participating in NFIP (Have FEMA Mapped High Flood Risk Areas)	0	0	0

Source: Federal Emergency Management Agency (FEMA), MN Dept. of Natural Resources Waters Division

Plans and Programs in Place

The County Resource Manual is updated annually regarding flood-fighting resources such as sand bags.

Floodplain and Shoreland Management: Zoning and flood plain ordinances regulate development and setbacks on shoreline and include the state floodplain and shoreland standards. These programs set minimum standards for local units of government that regulate development within shoreland and floodplain areas.

North Shore Management Plan: This plan provides the framework and minimum guidelines for effective management of Erosion Hazard Areas along the shoreline of Lake Superior as well as regulates setbacks from Lake Superior. This plan does not include the City of Duluth.

Coastal Barrier Resource System: The City of Duluth has a Coastal Barrier Resource System in place for the Lake Superior portion of Park Point.

Road Drainage: Public works staff at the township, county and city level work on culvert and ditch maintenance to prevent road flooding.

Duluth National Pollutant Discharge Elimination System (NPDES) Storm Water Management Permit: Actions related to this permit will improve storm water management for Duluth over time. The city focuses its storm water management within the watersheds of major streams.

Flood Mitigation Assistance (FMA): This program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 410c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

Repetitive Flood Claims (RFC): This program is authorized by Section 1323 of the NFIA, 42 U.S.C. 4030, with the goal of reducing flood damages to individual properties for which one or more claim payments for losses have been made under flood insurance coverage and that will result in the greatest savings to the National Flood Insurance Fund in the shortest period of time.

Severe Repetitive Loss (SRL): This program is authorized by Section 1361A of the NFIA, 42 U.S.C. 4102a, with the goal of reducing flood damages to residential properties that have experienced severe repetitive losses under flood insurance coverage and that will result in the greatest amount of savings to the NFIF in the shortest period of time.

Program Gaps or Deficiencies

Surface Water Run-off Management: The State has developed a Coastal Non-point Pollution Control Program under the guidance of NOAA and the EPA. This program found that the state lacks watershed wide implementation of management measures to control post development runoff from development on lands outside the shoreland and floodplain zone. Controlling post development runoff, both peak flow and volume, throughout the entire watershed needs to be implemented in order to further reduce the risk of damage to property from flooding. Development up-hill from Duluth can have impacts downstream. There is currently no regional plan in place that looks in a comprehensive way at how future development patterns may impact storm water related flooding.

Repetitive Loss Structures: St. Louis County has 7 repetitive loss properties listed by the MN DNR. These are located in Duluth (2) Floodwood (2) Proctor (1) and Saginaw (2). Of these, one is a business and the rest are residences. Four of the 7 are insured.

Road Infrastructure: Costs related to culvert replacement to prevent road flooding is a problem for some of the townships that have a small tax-base.

Erosion Hazard Mapping: There is an ongoing need to improve the Erosion Area Hazard mapping on Lake Superior.

Stream Gauging and Flood Mapping: There is an ongoing need to improve the stream gauging program and associated flood hazard mapping

Sample Pictures of June 2012 Flooding Event (Also see Heavy Rainfall Section 3.1.7)












3.1.6 Hailstorms

Hailstorms are a product of severe thunderstorms. Hail is formed when strong updrafts within the storm carry water droplets above the level of freezing temperatures where they remain suspended and continue to grow larger, until their weight can no longer be supported by the winds.

Hailstorms can occur throughout the year; however, the months of maximum hailstorm frequency are May through August. Although hailstorms rarely cause injury or loss of life, they can cause significant damage to property. For example, cars, roofs and vegetation can be damaged. On average, northeastern Minnesota is subject to a hailstorm only once a year.

Hailstones can vary in size, depending on the strength of the updraft. The National Weather Service (NWS) uses the following descriptions when estimating hail sizes: pea size is ¼-inch, marble size is ½-inch, dime size is ¾-inch, quarter size is 1-inch, golf ball size is 1 ¾-inch, and baseball size is 2 ¾-inches. Individuals who serve as volunteer "storm spotters" for the NWS are located throughout the state, and are instructed to report dime size hail (¾-inch) or greater.

Relationship to Other Hazards-Cascading Effects

Because hail is frequently associated with heavy rain, cascading effects are similar. See section 3.1.7.

Plans and Programs in Place

Because hail is frequently associated with heavy rain, cascading effects are similar. See section 3.1.7.

Program Gaps or Deficiencies

Because hail is frequently associated with heavy rain, cascading effects are similar. See section 3.1.7.

Table 3.9: Hailstorm Events
St. Louis County

Date	Location	Cost	Deaths	Injuries	Notes
05/14/2007	St. Louis County	$700,000	0	0	Widespread large hail fell from northwest of Duluth in the Twig, Caribou Lake and Pike Lake areas and in Duluth, east of the Piedmont Heights neighborhood. The hail dented cars and damaged roofs of houses. Total damage was roughly estimated at $700,000.
06/07/2007	Hibbing, Orr	N/A	0	0	Widespread severe thunderstorms developed in the afternoon and continued into early evening, producing large hail and damaging winds.
08/27/2007	Floodwood	N/A	0	0	Widespread hail damage in the Big Sandy Lake area of Aitkin County, damaging cars, boats, roofs and sidings of homes. Minor crop damage.
09/21-2007	Zim	N/A	0	0	Strong straight line winds that downed numerous trees and branches. Some minor structural damage was observed in Pine City and along County Road 7 just west of town. There was also minor damage to fences, outbuildings, and two baseball fields at Pine City High School.
06/20/2008	Buyck	N/A	0	0	A thunderstorm moved through northern St. Louis County producing large hail.
07/09/2008	Babbitt	N/A	0	0	Quarter sized hail was reported along Highway 21, mainly between Babbitt and Ely, with some minor accumulation.

07/11/2008	Kabetogama, Buyck	N/A	0	0	Many reports of wind damage and hail were noted. Many trees downed were over one foot in diameter, and some as large as two feet in diameter.
07/14/2008	Meadowlands	N/A	0	0	Strong to severe thunderstorms.
08/28/2008	St. Louis County	N/A	0	0	Scattered strong to severe thunderstorms over much of northeast Minnesota. At least one storm became a supercell. The storms produced large hail and a few damaging wind gusts.
09/26/2008	St. Louis County	N/A	0	0	Strong to severe thunderstorms to develop across northeastern Minnesota. Hail was the primary threat with the storms, though there were some reports of wind damage as well.
04/22/2009	Brookston	N/A	0	0	Storms rapidly developed over northeast Minnesota. The storms were good hail producers, with most of the hail under one inch.
05/05/2009	South St. Louis County	N/A	0	0	Several strong to severe thunderstorms developed across northeast Minnesota, due to a strong shortwave trough and cold air aloft. The hail fell at Park Point.
05/29/2009	Buhl	N/A	0	0	Dime to quarter size hail fell.
05/29/2009	Kirk	N/A	0	0	A shortwave trough set off strong to occasional severe thunderstorms. The strongest of the storms were located in the Iron Range. The hail fell in Cherry, MN.
07/22/2009	Cotton	N/A	0	0	Some thunderstorms developed across northeast Minnesota, one of which produced some large hail.
05/24/2010	Soudan	N/A	0	0	Most of the hail was one inch in diameter. Damage to vehicles and skylights were reported. Trees were stripped of their leaves.
06/17/2010	Meadowbrook	N/A	0	0	The hail fell near Meadow Brook, or 10 miles east of Togo.
06/24/2010	St. Louis County	N/A	0	0	Thunderstorms developed across northeast Minnesota during the late afternoon, persisting into the early evening hours. Some of the storms became severe, producing large hail and damaging winds.
07/27/2010	Proctor	N/A	0	0	Thunderstorms, some severe.
04/10/2011	Gheen	N/A	0	0	Small cluster of thunderstorms moved across parts of northeast Minnesota, producing some severe hail and wind gusts.
05/10/2011	Eveleth, Hopper	N/A	0	0	Scattered thunderstorms developed later in the evening in parts of the Iron Range and Arrowhead, producing hail. Hail was measured to be 13-20mm in diameter, or 0.51 to 0.79 inches in diameter. The hail lasted about 3 minutes.
05/28/2011	New Duluth	N/A	0	0	Thunderstorms mainly produced marginally severe hail and wind for a brief time in the early to mid afternoon.
06/07/2011	St. Louis County	N/A	0	0	A few severe thunderstorms. Hail fell for five minutes.
07/30/2011	Virginia	N/A	0	0	Locally intense thunderstorms.

08/08/2011	St. Louis County	N/A	0	0	Vigorous thunderstorms with hail.
09/12/2011	South St. Louis County	N/A	0	0	Thunderstorms; many in the Duluth area. Most reports involved significant hail.
10/12/2011	Hermantown	N/A	0	0	Thunderstorms produced many hail events. Most of the hail was pea size.
05/03/2012	Pequaywan Lake	N/A	0	0	Reports of down-burst winds and some hail.
05/28/2012	South St. Louis County	N/A	0	0	Severe convective weather and some rainfall reports of as much as 3 to 4 inches.
06/14/2012	Ely	N/A	0	0	Hail and damaging thunderstorm winds.
06/19/2012	St. Louis County	N/A	0	0	The huge thunderstorm complex also produced areas of hail, flash flooding and locally damaging wind. A Presidential Disaster Declaration was announced for Cook, Lake, St. Louis, and Aitkin counties.

Source: NOAA National Climatic Data Center

3.1.7 Heavy Rainfall

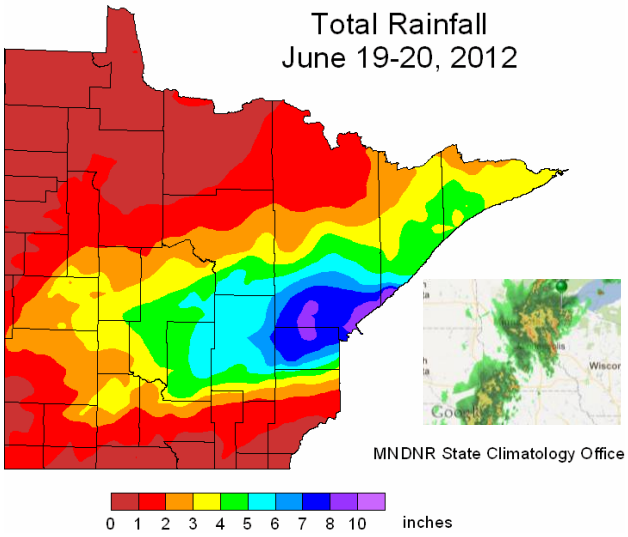
Heavy Rainfall is relatively common during the spring and summer months. NOAA is the source of weather information for St. Louis County below. Data for communities in the Southeast (Duluth), Southwest (Floodwood) Northwest (Kabetogama) and Northeast (Tower) were selected as those locations provide information on the diverse areas of the County. The site at Kabetogama appears to be a data collection site that was established later than the year 2000. The other sites have information for over a 100 year time period. The June 19-20, 2012 set six new precipitation records including greatest two-day precipitation of 7.25 inches and greatest 24-hour precipitation of 6.9 inches. Heavy rainfall is not an uncommon event throughout St. Louis County and can be hazardous due to local geography, shallow soils and related weather effects. According to the Minnesota Pollution Control Agency, with climate change there is a likelihood of increased incidents of these types of events. Table 3.10 shows data of some notable heavy rain events.

Table 3.10: **Years of Notable Heavy Rain Events (inches of rain in a 24 hour period)**
St. Louis County

Year	Duluth	Floodwood	Kabetogama	Tower
1901	3.58			
1907		3.75		
1908		2.67		
1909	5.2			
1926				4.0
1931				4.62
1932				3.53
1947				4.64
1972	3.77			
1974	3.40			
1987		4.5		
1990		6.15		
1991	3.57			3.71
1993				3.97
1995				4.0
1999		2.95	3.08	
2002		3.93		
2003		3.10		
2004			2.40, 2.45, 2.49, 2.80	
2005			2.43, 3.09	
2007				8.7
2008			2.45	
2010	3.93	2.69	2.73, 3.05	
2011		4.39		
2012	10.0	6.61		

Source: NOAA online Weather Data July 2012

Map 8: Total Rainfall, Flooding Event June 19-20, 2012
Minnesota



Source: State of Minnesota DNR Climatology Office

June 19 and 20, 2012 saw a significant flash flood event in the southern half of St. Louis County which resulted in a Presidential Disaster Declaration. Initial assessments show over $100 million in damages across St. Louis County. No severe injuries or deaths were reported. The National Weather Service summarized the events of the storm as follows:

In the week leading up to the flooding rains of June 19th-20th, parts of northeast Minnesota had received 2-4 inches of rain as

numerous storm systems moved across the area. This helped to saturate the soil which primed the Duluth area for runoff in the extreme rain event that we received. On Tuesday, June 19th a cold front that had move through the previous day began to return north as a warm front, setting up stationary just south of Duluth. This front helped provide continuous lift for thunderstorms that developed over east central Minnesota tracking northeast into the Duluth area, the north shore of Lake Superior and into northwestern Wisconsin. The official rainfall in Duluth on the 19th was 4.14 inches. The thunderstorms finally ended when a strong cold front moved through Wednesday afternoon June 20th, but not before dumping another 3.11" at the airport. The official Duluth total rainfall for the event was 7.25". Duluth International Airport broke several rainfall records during this flooding event. Locally high amounts in the 8-10 inch range were reported throughout Duluth neighborhoods and along the North Shore of Lake Superior.

A swath of impressive rainfall amounts ranging from 5-10 inches fell over much of the NWS Duluth area of responsibility during the period of June 19th-20th. Numerous roads were washed out from the deluge of rain from Carlton County through the Duluth metro area and into Douglas County and Bayfield County in Wisconsin.

A state of emergency was declared in Duluth, Hermantown, Cloquet, Barnum, Moose Lake and Superior, WI.

The steep terrain, and numerous creeks and rivers, played a significant role in the devastating damage and flooding that occurred in the Duluth community. The Fond Du Lac and West Spirit Mountain neighborhoods of Duluth and Thomson Township in Carlton County were evacuated.

Relationship to Other Hazards-Cascading Effects

Flash Flooding: Snow melt from heavy snows and rain from slow moving thunderstorms can cause localized flooding which can impact property and infrastructure. Often this flooding is not related to structures being located in flood plains but a result of storm water management or limited capacity of the soil to absorb water due to frost in the ground in early spring resulting in flooded basements.

Road closures present issues for emergency response. Flooded roads may limit access to certain routes and may require alternative routes or detours.

Public Health: Public health can be impacted as a result of wastewater spills resulting from flooding or power failures.

Water Main Breaks: Surges in water pressure as a result of water pumps starting after power outages can lead to water main breaks.

Human Safety: The Superior National Forest, Boundary Waters Canoe Area Wilderness (BWCAW) and Voyageur's National Park attract residents and visitors for backcountry and wilderness recreation. Much of the area people use for recreation is remote and a significant portion does not allow motorized activity unless the United States Forest Service gives special permission in case of a life-threatening emergency. Response to accidents as a result of summer and winter storm events can be challenging. For example, the 1999 windstorm created a situation where a large number of campers were trapped or slowed in their travel for a period of time due to a large number of trails and canoe portages not being passable.

Plans and Programs in Place

The Severe Storm Spotter Network: The National Weather Service offers training to Sky-Warn volunteers, emergency staff, and school bus drivers on a yearly basis on how to recognize and report severe weather.

National Weather Service Storm Ready Program: This program provides education on storm readiness to the general population.

Severe Weather and Wildfire Radio Warning System: This system has been expanded after the July 4, 1999 storm. The range of coverage has been expanded to include the majority of the Boundary Waters Wilderness Area. Area wide weather information is available through NOAA weather radio broadcasts and includes marine warning broadcasts.

Highway Treatment: Both the County and MnDOT have high capacity to provide pavement treatment to maintain safe driving conditions in the case of freezing rain during cold months.

School Closing: All schools have policy and protocol in place to close, delay school opening, or release students early if driving conditions are unsafe or temperatures are dangerous.

Warning Sirens in Place for Incorporated Communities: Sirens are in place in most communities to give residents advance warning that a severe storm is approaching to seek shelter.

Storm Shelters: The listing of storm shelters and protocols for shelters was reviewed in February, 2013 at a meeting

of Virginia area Emergency Management, Fire Chiefs, Police Chiefs, the Red Cross and the St. Louis County Public Health and Human Services Department.

Program Gaps and Deficiencies Related to Heavy Rain

Power Lines: Power lines above ground are subject to damage as a result of ice and windstorms. Some underground lines are subject to damage by flooding.

Warning Systems: Warning systems need to be part of a complete package of media in order to reach a broad audience:

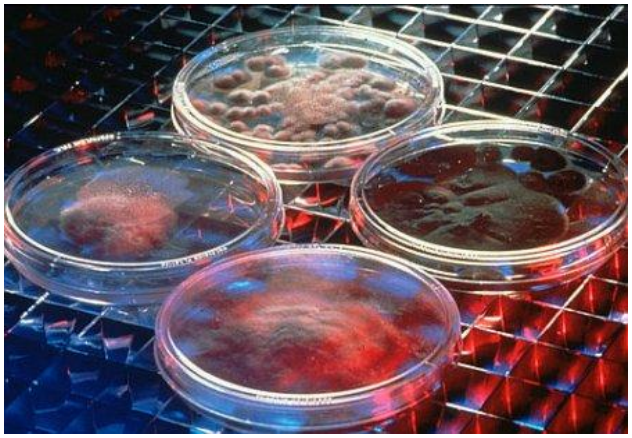
- Radio and TV Warning Broadcast Systems: Radio and TV warning broadcast systems are only effective when residents are tuned in to local stations. In some cases residents using satellite dishes for TV reception do not receive local networks and therefore will not receive local weather emergency information.
- NOAA Weather Radio: NOAA Weather Radio is the most reliable source of information on weather emergencies. Ongoing education is needed on the importance of having and using weather radio information.
- Warning Sirens: Warning sirens are in place in most incorporated communities. However, it is not clear how functional many of these systems are. A number of communities have identified problems such as lack of power redundancy or operational difficulties. There is some concern that some warning sirens may not be heard from indoor homes or buildings. Warning sirens are not always effective in rural areas with low-density development.
- Tree Management: Tree management along roads can prevent access problems and power outages when downed in an emergency situation. This can be costly for the local road jurisdictions. Right of way clearing can cost up to $5,000 /mile.
- Cell Phone Towers: Emergency response personnel and city staff members rely heavily on the use of cell phones during storms, floods and other emergencies. Towers need to be adequately protected from potential damage or loss.
- Storm Shelters: Storm shelters are an identified need in some areas and communities. Information on storm shelter locations needs to be updated and publicized regularly. Appropriately designated shelters could be pre-wired to allow use of back-up power from a generator. Sharing a mobile generator would be more cost effective than each shelter having its own.

Table 3.11: **Heavy Rain Events**
St. Louis County

Date	Location	Cost	Deaths	Injuries	Notes
06/27/2011	St. Louis County	N/A	0	0	Rainfall of 2 to 4 inches overnight and through the day was common. There were reports of an inch an hour rainfall.
08/02/2011	St. Louis County	N/A	0	0	Reported rainfall was between 2.08 and 4.12 inches at various locations.
08/05/2011	St. Louis County	N/A	0	0	Rainfall was between 0.95 and 2.35 inches at various locations.
08/08/2011	Duluth	N/A	0	0	Vigorous thunderstorm with water up to the edge of the curb at Old Becks Road at Gary Street.
06/19-20/2012	South St. Louis County	N/A	0	0	See detailed description above.

Source: NOAA National Climatic Data Center

3.1.8 Infectious Diseases



In the years following World War II, many life threatening infectious diseases were cured using antibiotics and further prevented the spreading of infectious disease through vaccination. However, new diseases continue to emerge. New strains of influenza require yearly updates of vaccinations. The recent surfacing of diseases for which there is no cure or vaccination and bio-terrorism threats underscore the need for a good public health system to early detect new diseases in order to prevent a large scale epidemic. Increased resistance of diseases to various antibiotics is another area of concern.

Other concerns include diseases impacting livestock such as hoof and mouth disease that recently resurged in Europe, and diseases impacting wildlife population such as chronic wasting disease affecting deer populations.

St. Louis County has an All Hazard Response and Recovery Plan which is implemented to prevent loss and damage related to public health concerns. The plan was updated in 2012.

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 or natural disaster.

Civil unrest: If a disease outbreak would occur, deaths, fear and misinformation could trigger civil unrest, lawlessness and panic.

Plans and Programs in Place

Emergency Operations Plans: The County EOP outlines procedures to respond to an outbreak of infectious disease. This plan outlines procedures for County and local units of government for contacting appropriate state and federal agencies and provides guidelines and strategies for dealing with infectious disease and command structures with County Health Department and Emergency Manager for St. Louis County. An appropriate response can limit the spread of a disease and reduce the number of people or livestock impacted.

Public Health Preparedness and Bio-terrorism: St. Louis County has a Public Health Coordinator position responsible for developing a response plan for natural and human caused emergencies, including bio-terrorism. Internal public health improvements include:

- Public Health Emergency Response Plan
- Mass Clinic Protocol for Immunizations and Distribution of Antibiotics
- Disease Prevention and Control Framework
- Communicable Disease Investigations

The Public Health Coordinator collaborates with area officials and organizations, such as hospitals and emergency response workers, who would or could be involved in responding to a terrorist event.

Public Health Preparedness Programs: Disease surveillance, food, restaurant and lodging inspections, WIC assessments for young children, and immunization programs.

Arrowhead Hospitals Mutual Aid: There is a mutual aid agreement in place between the 16 hospitals in the Arrowhead Region that allows sharing of decontamination technology.

Program Gaps or Deficiencies

There is an ongoing need for training to practice responding with the plans and programs in place. Practice that includes all the parties involved would help ensure that a response to an event is coordinated in case of a real occurrence.

Table 3.12: Infectious Disease Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No major disease outbreaks have been documented for St. Louis County.							

Source: St. Louis County

3.1.9 Lightning

Lightning is caused by the discharge of electricity between clouds or between clouds and the earth. In a thunderstorm there is a rapid gathering of particles of moisture into clouds and forming of large drops of rain. This gathers with it electric potential until the surface of the cloud (or the enlarged water particles) is insufficient to carry the charge, and a discharge takes place, producing a brilliant flash of light.

The power of the electrical charge and intense heat associated with lightning can electrocute on contact, split trees, ignite fires, and cause electrical failures. Most lightning casualties occur in the summer months, during the afternoon and early evening. An average of 215 structural and non-structural fires are caused by lightning each year in Minnesota, with average annual damages totaling $3,013,171. Lightning causes an average of 35 wildfires per year in Minnesota, with average annual suppression costs totaling $54,864 and average annual damages totaling $10,357 based upon statistics maintained by the MN Department of Natural Resources (MN DNR) Division of Forestry**.** Wildfires caused by lightning are a concern for St. Louis County.

Relationship to Other Hazards-Cascading Effects

Lightning strikes may cause wildland fires or structural fires.

Plans and Programs in Place

None known.

Program Gaps or Deficiencies

Cell Phone Towers: Emergency response personnel and city staff members rely heavily on the use of cell phones during storms, floods and other emergencies. Towers need to be adequately protected from potential damage or loss.

Table 3.13: Lightning Events
St. Louis County

Date	Location	Cost	Deaths	Injuries	Notes
09/20/2007	Grand Lake	N/A	0	0	A garage in Grand Lake Township was destroyed by fire after being struck by lightning.
07/27/2010	Nopeming	N/A	0	1	A 16 year old boy was struck by lightning along West Skyline Parkway near Spirit Mountain. The boy was knocked unconscious by the strike, and after coming to, was treated for third-degree burns on his right ankle and second-degree burns down the back of his legs.
08/09/2012	Duluth	NA	1	N/A	Lightning hit a sail boat that was beached on Park Point killing one boy and injuring many others.
09/19/12	Duluth	N/A	0	0	Lightning strike at St. Louis County Pike Lake Campus. Phones and computers knocked out.

Source: NOAA National Climatic Data Center, St. Louis County, City and Township contacts updates

3.1.10 Solar Storm

A solar storm is defined as solar flares and other related eruptions from the sun that blast energy and energy-charged material through interplanetary space at more than 600,000 mph. As this energy impacts the earth's protective upper atmosphere, magnetic storms are produced that affect our climate and occasionally result in temporary damages to some or our most critical technological systems.

Solar storms can impact the power grid, communications systems, satellites and navigation systems that depend on accurate satellite information.

Relationship to Other Hazards-Cascading Effects

None known.

Plans and Programs in Place

St. Louis County has no specific plans and programs in place to respond to solar storms. The State Hazard Mitigation Plan identifies no mitigation recommendations other than to promote awareness and understanding of the impacts a solar storm can have on technological systems.

Program Gaps or Deficiencies

None known.

Table 3.14: Solar Storms
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No solar storms have been documented for St. Louis County.							

Source: NOAA National Climatic Data Center

3.1.11 Thunderstorms

Thunderstorms are the most common summer storm in St. Louis County, occurring primarily during the months of May through August. The most severe storms are most likely to occur in June and July. Thunderstorms are usually localized events, produced by cumulonimbus clouds, always accompanied by lightning, and often having strong wind gusts, heavy rain and sometimes hail and tornadoes. Straight-line winds and heavy rain associated with thunderstorms are one of the greatest concerns for St. Louis County. They can cause downed power lines, damage trees and damage buildings.

Relationship to Other Hazards-Cascading Effects

Because thunderstorms are frequently associated with heavy rain and wind, cascading effects are similar. See sections 3.1.7. and 3.1.14.

Plans and Programs in Place

Thunderstorms are frequently associated with heavy rain and wind. See sections 3.1.7 and 3.1.14.

Program Gaps or Deficiencies

Thunderstorms are frequently associated with heavy rain and wind, cascading effects are similar. See sections 3.1.7. and 3.1.14.

Table 3.15: Thunderstorm Events
St. Louis County

Date	Location	Cost	Deaths	Injuries	Notes
06/07/2007	St. Louis County	N/A	0	0	Severe thunderstorms developed in the afternoon and continued into early evening, producing large hail and damaging winds. A gust front ahead of a line of storms produced up to 70 mph winds from Itasca County through southern St. Louis County. Numerous trees were blown down by the strong thunderstorm winds.
09/20/2007	Side Lake	N/A	0	0	Severe thunderstorms with damaging winds and large hail. The St. Louis County Sheriff's Office reported that winds up to 60 mph caused damage in French Township around Side Lake, with downed trees and power lines.
06/12/2008	Brookston	N/A	0	0	Thunderstorms produced strong winds and some hail. Twenty trees were blown down. A shed was blown over and a greenhouse flattened by the strong winds.
07/14/2008	St. Louis County	N/A	0	0	Numerous trees were blown down.
09/23/2008	West Duluth	N/A	0	0	A large tree up to two feet in diameter was blown down across 59th Avenue West in Duluth.
09/26/2008	Silica	N/A	0	0	Hail was the primary threat with the storms, though there were some reports of wind damage as well. Several dead tree limbs were blown

					down over the roadway.
06/17/2008	Side Lake		0	0	A few trees were blown down, and severe wind gusts bent pine trees to the ground.
06/24/2010	St. Louis County		0	0	Large hail and damaging winds. There were several reports of funnel clouds. A healthy 3-foot diameter tree was blown down. A 14-foot aluminum boat was blown 50 feet into a tree. Power outages were reported. Several 6 to 8-inch diameter trees were blown down. Several 4-inch diameter branches were blown down. Numerous large trees were uprooted on the south side of Grand Lake. Two 10-inch diameter trees were uprooted. Twelve to fourteen trees were snapped in half. An aluminum flag pole was snapped in half by the wind.
07/14/2010	Proctor		0	0	Trees were blown down along the Willard Munger State Trail.
04/10/2011	St. Louis County		0	0	Trees and branches were blown down. A garage had its roof lifted off with some damage to the walls. A boat house of unknown construction was destroyed. Many trees down near the intersection of Highways 73 and 22 north of Side Lake. Trees and power lines were blown down in the Cook area.
05/28/2011	North St. Louis County		0	0	A tree was blown down and blocked Highway 135 near Highway 26. A tree was blown down in Gilbert. Trees and power lines were blown down in the Cook area.
07/04/2011	Gheen		0	0	Several trees were blown down across Jansen Road, just north of Gheen. Power was out for about 12 hours.
08/08/2011	South St. Louis County		0	0	A 30 foot flag pole was blown over. A 4-inch diameter tree branch was broken at 83rd Avenue and Grand Avenue in Duluth.
06/10/2012	Kabetogama		0	0	Wind damage.
06/14/2012	South St. Louis County		0	0	High winds brought power lines down around the intersection of Midway Road and US Highway 2. Lines were also down along US Highway 2. A 40 foot tall maple was snapped off by strong winds.
06/19/2012	St. Louis County		0	0	Rainfalls were 10 inches or more. This widespread rainfall event broke all records in northeast Minnesota. The huge thunderstorm complex also produced areas of hail and locally damaging wind. A Governor's Executive Order declaring a state of emergency was announced for Cook, Lake, St. Louis, and Aitkin counties. (See flood event of same date.)

Source: NOAA National Climatic Data Center

3.1.12 Tornadoes

Tornadoes are violently rotating columns of air rising up into a cloud. A thunderstorm is the first step in the creation of a tornado. A thunderstorm happens when there is moisture in the atmosphere, a lifting force causing air to begin rising, and unstable air that will continue to rise once it starts. Then, if other conditions are right, the thunderstorm may spin out one or more tornadoes. Tornadoes can occur at any time of year; however, they are a very rare event for St. Louis County. From 1950 to 2005 St. Louis County had 31 tornadoes. Only five counties in Minnesota had more tornadoes than St. Louis County during this time period. This is in part due to the county's large land area, i.e. there is more area for a tornado to occur. There has not been a tornado in the county since 2005.

All thunderstorms are characterized by updrafts and rising air currents which supply the warm, humid air that fuels storms. Sometimes, the column of rising air becomes a vortex or a funnel cloud which, if it reaches the ground, is a tornado.

A tornado is often located at the edge of an updraft, next to air coming down from the thunderstorm with falling rain or hail. This explains why a burst of heavy rain or hail sometimes indicates an impending tornado.

As air rises from the ground in the vortex of a tornado, a low-pressure area is created near the ground. Air rushes to fill this area, causing additional damage to areas not directly hit by the tornado. As air rushes into the vortex, its pressure lowers, cooling the air. This cooling condenses water vapor in the air into the tornado's familiar funnel-shaped cloud. As the swirling winds pick up dust, dirt, and debris from the ground, the funnel turns even darker.

In Minnesota, the peak months of occurrence are June, May, and July (in that order). The typical time of day when a tornado occurs in Minnesota ranges from 4 p.m. to 7 p.m. Most of these are minor tornadoes, with wind speeds under 125 miles per hour. A typical Minnesota tornado lasts approximately ten minutes, has a path length of five to six miles, is nearly as wide as a football field, has a forward speed of about thirty-five miles an hour and affects less than one-tenth of one percent of the county warned.

Between 1950 and 2003, there was an estimated damage of $6.4 million dollars as a result of tornadoes. Some of the more significant tornado events documented for St. Louis County occurred in August 1969 when a number of tornadoes impacted St. Louis, Lake and Cass Counties. Those tornadoes destroyed 88 homes, damaged 119 homes and destroyed 27 farm buildings. In 1976 a tornado left a path 400 ft wide and 10 miles long that resulted in $40,000 in downed timber. Between 1950 and 2003, three deaths have been attributed to tornadoes.

Relationship to Other Hazards-Cascading Effects

Damaged and downed timber increases fuels in forest areas and the risk of wildland fires.

Plans and Programs in Place

Communities are implementing warning systems, back-up power sources such as generators and emergency shelters.

Severe Weather Awareness Week is a week in April to promote safety during summer storms. The preparation of a family emergency disaster plan, how to receive emergency information and what to do in times of severe weather are included in the program.

Program Gaps or Deficiencies

Some communities lack storm shelters and warning systems.

Table 3.16: Tornado Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
There are no tornadoes on record for St. Louis County since 2006.							

Source: NOAA National Climatic Data Center

3.1.13 Wildland Fire

Wildland fire is ranked as one of the greatest hazard threats in St. Louis County. In Minnesota, 98% of wildfires are caused by people, either accidental or intentional, and are preventable. The immediate danger from wildfires is the destruction of timber, property, wildlife, and injury or loss of life to persons who live in the affected area or who are using recreational facilities in the area.

Wildland fires can leave large areas of scorched and barren land, which may not return to its pre-fire condition for many years. Major fires can completely destroy ground cover, which can, in turn, lead to erosion.

Population growth in and near rural forested areas in the

Northeastern part of the county has increased the potential for loss of life and property due to wildland fire. Wildland fire danger is a high concern in the wildland-urban interface (WUI) where spruce budworm outbreaks and aging forest conditions contribute to heavy fuel load.

Most wildland fires in St. Louis County are human caused, either accidental or intentional. Reducing starts and vigorously pursuing arson are important actions. The MN DNR implements burning restrictions during periods of high fire danger, such as in the spring. The public generally refers to this as a 'fire ban'. This action has greatly reduced Fire Department calls related to escaped debris burning fires and has the added benefit increasing public awareness of high fire danger.

Information on current wildfire conditions and burning restrictions can be found at http://www.dnr.state.mn.us/forestry/fire/

St. Louis County updated its Community Wildfire Protection Plan (CWPP) in 2008. The CWPP has two objectives:

- First, the plan identifies and prioritizes wildland-urban interface (WUI) areas within St. Louis County (including State, County, Federal and other lands) for hazardous fuels reduction treatments and recommends methods for achieving hazardous fuels reductions. WUI areas are portions of the landscape as identified by the St. Louis County CWPP where wildland fuels (trees, brush and other vegetative materials) threaten to ignite combustible homes and structures.
- Second, the plan outlines measures for reducing fire danger to structures throughout St. Louis County at-risk communities. The objectives for the aforementioned vegetative and structural treatments are broadly addressed within each wildland-urban interface community (beginning on page 30 of the CWPP). Each WUI area will be addressed in depth as the implementation teams works with WUI communities, its residents and partners in plan implementation.

The CWPP provides details on wildland fire history, current risks and priorities, strategies and implementation. The complete plan is posted on the St. Louis County website.

Summary wildland fire data is in tables 3.17 and 3.18. Details and maps are available in the CWPP and from the MN DNR and the USFS. Note that some fires did not start in St. Louis County and some fires burned into bordering counties.

Plans and Programs in Place

Minnesota DNR Division of Forestry: The Division of Forestry has primary responsibility in Minnesota for the protection of all lands from wildfire. DNR Forestry maintains Cooperative Agreements with fire departments and Emergency Equipment Rental Agreements with contractors and loggers. Emergency hire personnel are employed at times of high fire danger. The Division of Forestry utilizes both fixed wing and rotorcraft aircraft extensively in managing wildfire.

United States Forest Service (USFS): The USFS is responsible for fire protection in the areas within the Superior National Forest.

Prescribed burns and mechanical treatment in Blow Down Area: This is described in the USFS EIS that addresses the approach the USFS will take to reduce the fuel load caused by the July 1999 storm that resulted in a major blow down. In response to the massive 1999 blow down, a plan was developed to reduce the fire risk in the blow down area

through the use of prescribed burns and mechanical removal of fuel loads.

National Fire Plan: The USDA Forest Service maintains the National Fire Plan that is updated annually for effective use of national resources to combat wildfires in the United States. Further information in the National Fire Plan can be found at www.fireplan.gov.

Interagency Coordination: St. Louis County has an Incident Command Center in Place that allows agencies to come in and respond to an emergency in St. Louis County. The NE-Minnesota Integrated Response Plan was developed to address the inter-agency emergency response actions that may result from a wildfire in the 1999 blow down area of Northeastern Minnesota. The Minnesota Incident Command System (MNCIS) is Minnesota's application of the National Interagency Incident Management System (NIMS). MNICS allows state and federal agencies to share equipment resources, personnel and knowledge. The Minnesota Interagency Fire Center (MIFC) in Grand Rapids, MN is also a valuable resource to the local Fire Departments.

Both MN DNR and the USFS have cooperative agreements with a number of local fire departments for wildland fire suppression and for standby duty during periods of high fire danger. These agreements benefit the MN DNR, the USFS, the cooperating fire departments and the public. This cooperation is becoming increasingly important as experienced people retire.

Interagency Fire Training: The DNR and USFS host several training sessions for fire departments each year. Trainings are offered annually at the Fire Academy in Grand Rapids, MN. Wildland fire training is also offered to local fire department members. Recent local training locations include Aurora, Tower, Hoyt Lakes and Ely. There is no cost to local Fire Departments. Limitations to hosting additional classes are personnel available, budget constraints and limited participation of fire department members. On the ground training would be of great benefit to all.

Minnesota Interagency Fire Center: Located in Grand Rapids, MN, the purpose of MIFC is to increase the efficiency and effectiveness of wildfire management by facilitating the interagency exchange of fire resources, providing a common point for the collection and dissemination of fire intelligence and streamlining dispatch procedures. These responsibilities include assigning state firefighting crews, tracking resource orders and their distribution and dispatching air tankers and helicopters to needed areas. Partners include MN DNR, USFS, US Fish and Wildlife Service, National Park Service, Bureau of Indian Affairs and the MN Department of Public Safety – Division of Homeland Security and Emergency Management.

Fire Aviation Programs: Fire aviation operations in St. Louis County are managed by DNR Forestry and the USFS. Aircraft are primarily based at the Hibbing and Ely airports and the Ely Seaplane base. Aerial fire detection routes are flown in times of increased fire danger and are dependent upon the smaller airports in the county. The Aviation Fire Program provides an effective and efficient tool in managing fire and providing for public safety.

Radio Warning System: The radio warning system capabilities, using the weather radio frequency has been expanded to include portions of the Boundary Waters Canoe Area Wilderness. This will allow for distribution of information to travelers in this area including information on evacuation routes in case of a major fire.

Communication of Extreme Fire Danger or Red Flag Days: The National Weather Service has protocols in place to communicate Extreme Fire Danger or Red Flag Days. This information is posted daily on their website. Training of the local fire departments on these forecasts and the availability of information from the National Weather Service and Department of Natural Resources is important in preventing a small wildland fire from becoming a disaster. Announcements of Red Flag Conditions are broadcast to fire department personnel by St. Louis County Dispatch.

Wildfire Condition Monitoring: The MN DNR Division of Forestry collects weather data on a daily basis. This data is being input into an U.S. Department of Agriculture (USDA) Forest Service computer, which uses the National Fire Danger Rating System to determine daily and forecasted fire danger indices. This information combined with fire weather forecasts from the National Weather Service (NWS) are used to develop short-range guidelines for scheduling detection, equipment standby, and personnel.

Wildfire Prevention and Open Burning Regulations: Regulation of open burning and the use of burning permits has been an important tool in preventing wildfire in Minnesota. Burning permits are required by the MN DNR when the ground is not snow covered. Permits can be obtained from MN DNR forestry offices, Fire Wardens or purchased online. When risk of wildfire is very high, burning is not permitted. The USFS sets burning

restrictions within the BWCAW when fire danger warrants.

Fire Wise Program: This is a national program targeted towards educating residents in wildfire risk areas on how to make their structures safer from wildfire. The Fire Wise program is funded through the USFS, and administered by the DNR. Funding is available for local fire departments and other governmental units to inspect properties and advise residents on how they can further reduce risks. The program offers governments 50/50 cost share grants to assist with mitigation activities around homes.

Community Wildfire Protection Plan: A meeting was held in January 2013 to review mitigation projects such as chipping and prescribed burns. The various funding sources available for such projects were reviewed.

Wildfire Sprinkler Retrofit Project: This project, funded by the Hazard Mitigation Grant Programs, is available to eligible home and business owners in high risk locations. St. Louis County maintains data for locations of applicants and location where sprinkler systems are installed.

Wildfire Prevention Education: The USFS created Smokey Bear in 1944 to help publicize residents' and visitors' role in preventing wildfires. MN DNR and USFS continue to successfully use this wildfire prevention icon at fairs, parades and in schools. Educational materials for teaching children are made available to schools. Fire danger signs have been installed in Embarrass, Greenwood, Eaglesnest and Colvin Townships.

Timber Management: In some areas timber sales are being structured to reduce fire risks where there are a large number of structures at risk. An example would be the area along Highway 53 north of Virginia.

Subdivision Standards: County subdivision standards regulate size of access roads. Adequate space for access roads is critical for emergency response vehicles to be able to respond to a property.

Program Gaps or Deficiencies

Participation in Fire-Wise Program: There is room for increased participation in the Fire-Wise program. In rural areas with long response times, it is important that residents understand what they can do to prevent damage to their property. There are several fire departments involved in this program, but more could be brought on board. It would be helpful to have a Fire Wise Specialist to assist communities specifically in Northeast Minnesota. There is ongoing need to coordinate communication with local units of government and residents on the Fire Wise program.

Dry Fire Hydrants: Water access can be a problem in some areas. Installment of dry fire hydrants and static water storage tanks in strategic locations can alleviate this problem.

Increase Wildfire Danger Awareness: Visitors to the area need to be aware of the dangers of wildfire. For example, in the Boundary Waters Canoe Area Wilderness rescue during a wildfire may be difficult.

Fire Safety Standards: Standards could be set for new structures assuring they are built with fire safe materials, adequate access for emergency vehicles and proper signage. Clarify to residents their part in reducing risk of damage to their property and what they can reasonably expect regarding agency response to wildfire.

Table 3.17: Wildland Fire Events - USFS
St. Louis County

Year	Number of Fires	Total Acres Burned
2006	56	47.7
2007	30	11.5
2008	22	27
2009	11	8.5
2010	25	90
2011	30	59.4
2012	39	308

Source: United States Forest Service (USFS)

Table 3.18: Wildland Fire Events: Annual Averages Minnesota Department of Natural Resources (DNR)
St. Louis County

Year	Fire Count	Forest Acres Burned	Nonforest Acres Burned
2006	292	148.2	325.0
2007	205	262.8	171.8
2008	86	50.5	158.8
2009	117	23.4	60.6
2010	223	970.8	712.8
2011	83	18.4	24.3
2012	129	47.1	94.8

Source: Minnesota Department of Natural Resources (DNR)

3.1.14 Windstorms

Wind storms can and do occur in all months of the year, however, the most severe windstorms usually occur during severe thunderstorms during the warm months. The most common type of windstorms to affect St. Louis County are straight-line winds and downbursts associated with strong thunderstorms.

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 M.P.H. 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. They can also create a hazard for small watercraft on Lake Superior.

Winds of greater than 60 M.P.H. are associated with intense winter, spring, and fall low-pressure systems. These can cause damage to buildings and, in some cases, overturn high profile vehicles. This type of windstorm can impact residents living on the shore of Lake Superior and watercraft on Lake Superior and damage shoreland structures such as docks and marinas.

Most of the Arrowhead Region of Minnesota, including St. Louis County, is located in Wind Zone II. Wind Zone I is designated as a moderate wind speed area while Wind Zone II is a high wind speed area. Buildings in Wind Zone II should be constructed to withstand wind speeds of up to 160 M.P.H.

Relationship to Other Hazards-Cascading Effects

Timber blowdown related to windstorms may increase fuels and risk of wildland fires.

Wind storms can cause downed trees on power lines leading to fires and increasing fire department calls.

Plans and Programs in Place

None known.

Program Gaps or Deficiencies

None known.

Table 3.19: Windstorm Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
There are no windstorm events on record for St. Louis County since 2006.							

Source: NOAA National Climatic Data Center

3.1.15 Winter Storms: Blizzards, Snow, Ice Storms

Severe storms can occur throughout the year in St. Louis County. For practical purposes storms are categorized as summer or winter storms, although there are not specific dates or months that delineate the seasons.

Winter Storm Awareness Week is promoted in November each year. Public safety promoted includes winter weather, emergency preparedness at home and emergency items to bring along while traveling.

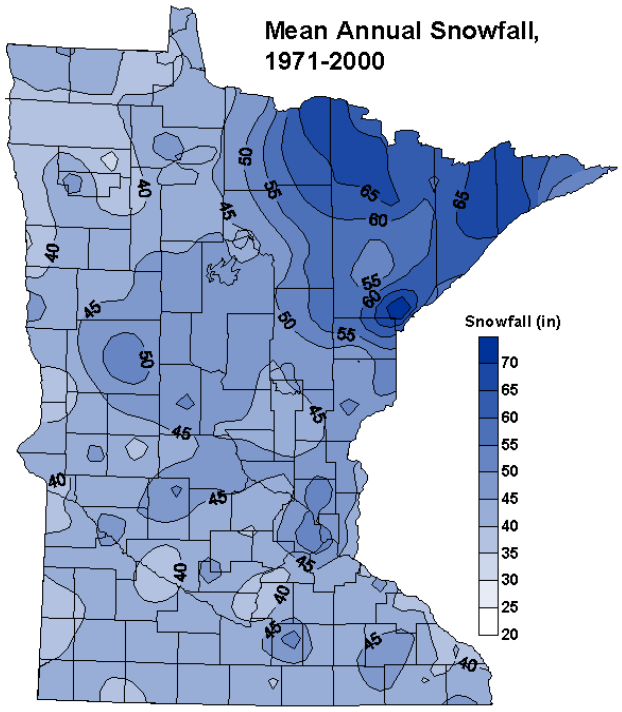
Blizzards are storms that contain heavy snowfall, strong winds, and cold temperatures. The combination of these elements creates blinding snow with near zero visibility, deep drifts, and life-threatening wind chill values. Figures 2.2 and 2.4 in the community Profile Section provide an overview of average snowfall and temperatures for St. Louis County.

St. Louis County does experience heavy snowfall sometimes augmented by lake effect snow. However, blizzard and drifting snow situations are not common because the wind does not have free range due to the forested character of most of St. Louis County.

Blizzards are characterized by strong winds blowing heavy snow. They have the ability to completely immobilize large areas, restrict transportation and to isolate and kill humans (and animals) in their path. According to the National Weather Service (NWS), although there is no fixed temperature requirement for blizzard conditions, the life-threatening nature of low temperatures in combination with blowing snow and poor visibility increases dramatically when temperatures fall below 20-degrees Fahrenheit.

Blizzards can occur between October and April, however, they occur with the most frequency from early November to the end of March.

Map 9: Mean Annual Snowfall
St. Louis County



Source: State of Minnesota Climatology Office

Ice storms are events when damaging accumulations of ice occur during freezing rain situations. The terms freezing rain and freezing drizzle warn the public that a coating of ice is expected on the ground and on other exposed surfaces. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers.

Communications and power can be disrupted for days while utility companies work to repair damage. Ice formed on exposed surfaces can range from a thin glaze to coatings approximately one inch thick. Even thin accumulations of ice on sidewalks, streets, and highways cause extreme hazards to motorists and pedestrians.

Sleet does not stick to trees or wires, however, in sufficient depth it does cause hazardous driving conditions. Heavy sleet, defined as an accumulation of ice pellets covering the ground to a depth of ½-inch or more, is a relatively rare event.

Ice and sleet storms can occur from October through April. According to statistics maintained by the National Climatic Data Center (NCDC), in St. Louis County, freezing rain and freezing drizzle events occur on average of at least one day per year. The month of March has, on average, the greatest number of days in which freezing rain and freezing drizzle occurs.

The National Weather Service (NWS) notes that over 85-percent of all ice storm deaths are traffic related.

Winter Storm History

Based upon the 1975-1991 historical record, Minnesota has an average of one blizzard per year. The greatest number of blizzards occurred in the month of January, followed by March and November, respectively.

St. Louis County, along with all areas of the state, is susceptible to heavy snowstorms. However, the relatively level and tree-barren terrain of western and southern Minnesota makes those regions more susceptible to the high wind speeds which are intrinsic to blizzard conditions than is the case for St. Louis County.

Damages from blizzards can range from human and livestock deaths to significant snow removal costs. During the 1975-1991 time period, there were 49 deaths associated with blizzards statewide, or an average of three deaths per year. Deaths attributable to blizzards have dropped in recent years, primarily due to increased weather awareness and warning capabilities. An overview of major storm events can be found in Table 3.20.

Table 3.20: Winter Storm Events
Northeast Minnesota

Date	Type	Location	Cost	Deaths	Injuries	Notes
Jan-72	Blizzard	NE MN	N/A	1	4	Schools closed.
Jan-75	Blizzard	MN	$14,000,000	35	N/A	18 inches of snow in Silver Bay (Lake County) and 9.5 inches in Duluth.
Jan-82	Blizzard	NE MN	N/A	N/A	4	52 mph winds. Duluth Transit Authority busses canceled, 20+ cars stranded, access to Park Point closed off, Blatnik Bridge to Superior, WI closed to traffic, all schools closed, 21 traffic accidents. Snow Emergency declared.
Oct-91	Blizzard	NE MN	N/A	N/A	N/A	Most businesses closed, no bus service. 21 inches of snow fell in less than 24 hrs. Cook County schools closed. 70 traffic accidents were reported in Duluth.
Jan-97	Snow & Ice Storm	NE MN	N/A	N/A	N/A	21 inches of snow fell in Duluth, 23 inches in Pequot Lakes, 18 inches in Finlayson, 16 inches in Two Harbors, and 12 inches in Babbitt.
12/30-31/06	Winter Storm	St. Louis County	N/A	0	0	Freezing rain. One-quarter inch of ice in the Orr area. Up to ½ inch of ice and 10 inches of snow in the Babbitt area with downed trees and power lines. Five inches of snow in the Ely area. Up to 7.5 inches of snow around Embarrass and Floodwood.
04/03/07	Winter Storm	S St. Louis County	N/A	0	0	Six to 10 inches of snow across the region with 12.1 inches reported in Duluth. Winds of over 20 mph created blowing and drifting conditions.
12/01-02/07	Winter Storm	St. Louis County	N/A	0	0	Cities of Duluth and Hermantown had 14-16 inches of snow. Wind gusts of 30-40 mph caused blowing and drifting snow.

12/22-23/07	Winter Storm	St. Louis County	N/A	0	0	Snowfall totals ranged from 6-18 inches. Wind gusts up to 40 mph caused blowing and drifting snow.
04/05-07/08	Winter Storm	N St. Louis County	N/A	0	0	Snowfall totals ranged from 8-20 inches with 26 inches reported in Hibbing and 32 inches just north of Virginia.
04/10-11/08	Winter Storm	N St. Louis County	N/A	0	0	Heavy wet snow and localized blizzard conditions. Six-14 inches of snow. Wind gust over 40 mph across the area with up to 62 mph reported in Duluth. Widespread power outages with 11,000 Minnesota Power customers without power. Many schools and businesses closed on 04-11-08.
04/25-26/08	Winter Storm	N St. Louis County	N/A	0	0	Heavy snow totaling 11-15 inches.
12/13-15/08	Winter Storm	N St. Louis County	N/A	0	0	Heavy snow, strong winds, near-blizzard conditions. Eight – 15 inches of snow. Wind gusts of over 50 mph caused blizzard conditions and zero visibility in Duluth. Waves of 15 feet at the Duluth ship entry damaged part of the Duluth Lakewalk. Bitter cold wind chills of 40-50 below zero.
03/09-11/09	Winter Storm	St. Louis County	N/A	0	0	Snowfall of 15-19 inches. Gusty winds of 25-35 mph with blowing and drifting snow.
03/31/09 – 04-01-09	Winter Storm	St. Louis County	N/A	0	0	Heavy snowfall rates of over 1 inch per hour at times. Over 7 inches of snow and up to 18 inches in some areas. Blowing and drifting snow.
12/23-26/09	Winter Storm	St. Louis County	N/A	0	0	Snow, sleet, rain and strong winds. Most areas received 8-10 inches of snow. Up to 24 inches of snow in areas including Hermantown, Proctor and Brimson. Record snowfall reported at the Duluth airport totaling 24.5 inches.
01/23-25/10	Winter Storm	St. Louis County	N/A	0	0	Freezing rain and snow. Icy roads. Snow amounts ranged from 7-12 inches.

Source: National Climatic Data Center and Public Library Search by Arrowhead Regional Development Commission for 2005 Hazard Mitigation Plan

Responding to winter storm watches and warnings and adequate preparation can usually lessen the impact of blizzard events in Minnesota. Technical advances made in transportation, including improved vehicles and better constructed and maintained roads, have contributed to the decline in deaths related to blizzard events.

Heavy snowstorms combined with low temperatures can be a significant danger to life and property and can lead to significant cost in snow removal for local governments. Stranded drivers may make uninformed decisions, such as leaving the car in conditions that can put them at risk. Because of the blinding potential of heavy snowstorms, drivers are also at risk of collisions with snowplows or other road traffic. Without emergency plans and kits, residents and visitors are vulnerable to the life threatening effects of heavy snow storms such as power outages, cold weather, and inability to travel, communicate, obtain goods or reach their destinations.

Heavy snow loads can damage structures, particularly in areas where there are no building codes or for residents living in manufactured homes. The frequency of structure fires tends to increase during heavy snow events, primarily due to utility disruptions and resident's use of alternative heating sources.

Power outages associated with snow and ice storms can impact residences and businesses. Electric outages can cause the interruption of equipment, loss of heating ability and waterline breaks.

Waterline breaks occur when pumps turn on and off due to power outages causing surges in water pressure. These surges can cause pipeline breaks through water mains in weak points.

Power outages can result in sewage spills due to the failure of wastewater collection equipment. The major wastewater systems do have power redundancy built in.

In 2001, power outages caused by an ice-storm led to all but two area radio stations being down which limited the ability to spread emergency messages to the public.

Winter storms impact driving conditions which can lead to an increase in motor vehicle crashes. These same poor driving conditions directly impact the emergency

response to motor vehicle crash, fire and medical emergencies.

Table 3.21 displays ice and sleet events that have impacted Northeast Minnesota as documented by the National Climatic Data Center (NCDC). The NCDC has no records of ice or sleet events since June of 2006.

Table 3.21: Ice and Sleet Events
Northeast Minnesota

Date	Location	Description
3/91	St. Louis County	6 inches of ice, TV tower toppled, many communities without utilities for over 24 hours.
11/12-13/1993	All but Southeast Minnesota	Ice Storm and Snow - A wintry mixture of precipitation in the form of freezing rain, sleet, and snow with significant accumulation of ice. Five inches of snow fell on top of the ice making travel hazardous.
01/20/1993	Northern Minnesota	Ice Storm - Freezing rain developed with at least half of an inch of ice coating area roads.
11/27-28/1994	Southwest, Central, Northeast, and Southeast Minnesota	Heavy Snow and Ice. The storm contributed to at least three fatalities. A buildup of ice and snow, combined with strong winds, resulted in numerous downed power lines.
04/28-29/1994	Entire State	Heavy Snow and Ice - Heavy, wet snow, sleet, and freezing rain occurred.
03/23-24/1994	Northern and Central Minnesota	Heavy Snow And Ice - A late March snowstorm deposited a band of heavy snow, up to 10 inches, as well as a mixture of freezing rain, sleet, and snow, causing extremely slippery road conditions.
01/01-2/1997	Northeast Minnesota	Ice Storm - Freezing rain left up to a ¼-inch of ice on area roads. Part of State Highway 61 was closed for several hours.
04/01-2/1999	Northeast Minnesota	Ice Storm - Ice accumulations of ¼ to ½ inch occurred, which caused slippery roads and airport runways as well as widespread electrical outages. 1000 residents were out of power.
02/01/1999	Northeast Minnesota	Ice Storm - Freezing rain and freezing drizzle coated the area with as much as ¼ inch of ice.
04/03-4/1999	Northeast Minnesota	Ice Storm - Ice accumulations up to ¼ of an inch, with a mixture of sleet, snow, and slush on the ground, made travel very hazardous. The weight of ice accumulations brought down trees and power lines and caused extensive damage to an 800-foot television tower.
04/2001	St. Louis County	17,000 homes lost power, $3.5 million damage to homes and $450,000 damage to roads and infrastructure. Total damages estimated for Duluth at $4 Million. Disaster declaration 1370.

Source: National Climatic Data Center and public library search by Arrowhead Regional Development Commission

Snowfall is very important to the economy of St. Louis County with winter recreation including dog sledding, skiing and snowmobiling contributing. Snowfall is greatest near Lake Superior. The length of time for snow coverage is longest in the northern third of the county.

NOAA is the source of weather information for St. Louis County below. Data for communities in the Southeast (Duluth), Southwest (Floodwood) Northwest (Kabetogama) and Northeast (Tower) were selected as those locations provide information on the diverse areas of the County. The site at Kabetogama appears to be a data collection site that was established later than the year 2000. The other sites have information for over a 100 year time period.

The total annual snowfall for the four sites in the county is: Duluth 80.7 inches, Floodwood 53, Kabetogama 68 inches, Tower 52 inches. While the region adapts well to snow conditions, major snow events can cause serious disruptions and can be a public safety problem. The largest snowfall in the county in a single day is shown in Table 3.22:

Table 3.22 Largest Snowfall on Single Day
St. Louis County

Duluth	Floodwood	Kabetogama	Tower
24.1 inches in 1991	17.0 inches in 1997	15.0 inches in 2003	27.8 inches in 1926
23.2 inches in 1950	11.0 inches in 1993 and 1998	11.8 inches in 2009	27.5 inches in 2008 and 1926
18.2 inches in 2004	10.5 inches in 2003	11.3 inches in 2010	27.0 inches in 1961 and 1926
18.0 inches in 1917	10.0 inches 2008 and 1991	9.4 inches in 2012	26.5 inches in 1926
17.2 inches in 1965	9.5 inches in 1998	9.0 inches in 2001	26.0 inches in 1926
16.8 inches in 1934	9.0 inches in 2007, 2001, and 1996	8.7 inches in 2010	24.0 inches in 1926
16.5 inches in 1983		7.7 inches in 2011	20.0 inches in 1926
16.4 inches in 2007		7.5 inches in 2005	18.0 inches in 1926
16.3 inches in 1994		7.2 inches in 2010	
15.0 inches in 1917		6.8 inches in 2009	

Source NOWData NOAA online Weather Data July 2012

3.2 Technological (Human Caused) Hazards

3.2.2 Dam Failure

Dam failures can result in flooding and damage to property, injuries and loss of life. Very few dam failures in Minnesota have resulted in major damages or loss of life. However, dams can cause problems when they fail or are not operated properly. A problem at a dam would most likely occur during a flood event, but could occur anytime.

Dam safety is regulated at the state and federal level. St.

Louis County has a number of hydro dams for electricity production and headwaters dams for storage of water for hydropower production. The dams that are part of hydropower production are regulated through the Federal Energy Regulatory Commission (FERC). Non-federal dams are under the regulatory jurisdiction of the DNR, Division of Waters.

The Minnesota Power St. Louis River Hydroelectric Project consists of nine facilities; four generating stations and five headwater storage reservoirs. Three of the generating stations are located in Carlton County, including Thomson which is the largest station. The fourth station is Fond du Lac, which is the first dam upstream from Lake Superior and is in St. Louis County within the Duluth city limits. The reservoirs north of Duluth include Island, Fish, Rice, Boulder and Whiteface, all of which are in St. Louis County.

The FERC and the DNR rate dams based on hazard potential; high, significant or low. The hazard rating is an indication of the downstream consequences if the dam failed and is not determined by the structural integrity of the dam. The Fond du Lac, Fish Lake and Island Lake dams are rated high hazard. (Thomson is also rated high hazard but is in Carlton County.) Hunter and Bowman Lakes would be affected by dam failures at Fish or Island Lakes. Duluth would be affected by a failure of the Fond du Lac dam, particularly the Fond du Lac neighborhood.

There are four areas where a significant number of residents may be impacted in case of a dam failure. The residences in the Fond du Lac neighborhood would be severely impacted if the Fond du Lac Hydro facility failed. Dams upstream from the facility, located in Carlton County, could cause a cascading effect if there were a malfunction. The dam at Hartley pond is rated high hazard and could result in extensive damage and potential loss of life in case of failure.

Dam location data is maintained by St. Louis County. The location of the dams and topography gives an indication of areas where dam failure may have the most significant impacts.

History

The Schweiger Dam failed in 1981 when the owner was attempting to perform repairs on the spillway. Dam failure in Chester Bowl Park in Duluth occurred during the June 2012 heavy rain event.

Plans and Programs

Federal Emergency Management Agency (FEMA), National Dam Safety Program: This program is intended to help states bring the necessary resources to bear on inspection, classification, and emergency planning for dam safety.

National Inventory of Dams (NID): NID is a database used to track information on the nation's water control infrastructure. Information from the NID is used in the development of water resource management, land use management, flood plain management, risk management, and emergency action planning.

Federal Energy Regulatory Commission (FERC): FERC regulates and licenses non-federally owned hydroelectric dams that are exempt from state rules and regulations. This includes Fond du Lac, Island Lake, Fish Lake, Rice

Lake, Boulder Lake and Whiteface Reservoirs which are operated by Minnesota Power. These facilities are required to have an emergency plan in place identifying the areas that could be impacted and the response in case of a dam failure.

Minnesota Power officials who prepare the Dam Failure response plans meet annually with affected community and county emergency management staff members. The Minnesota Power representatives also meet with the county communications division to review warning and notification procedures.

Minnesota Department of Natural Resources (DNR), Division of Waters: An existing dam safety program and current dam safety regulations require the safe design, construction, operation, and maintenance of dams in Minnesota. The state program includes review of design plans and plans for proposed dams, safety inspections of existing dams, and repair of dams.

Minnesota Department of Public Safety (DPS), Division of Homeland Security and Emergency Management (HSEM): The mission of HSEM is to reduce the threat posed by hazards that can affect the state, plan ways to cope with disasters when they occur, coordinate the response of state and federal agencies in assisting local government when disasters occur, and coordinate the recovery efforts of state and federal agencies in conjunction with local governments when disaster strikes.

Action Plan Requirement for High Hazard Dams: All high hazard dams are required to have a dam specific action plan in place to respond to an emergency.

Minnesota DNR Administered Mitigation Grant Programs: The Minnesota DNR Division of Waters administers a program to provide grants to local units of government to help pay for the cost of dam repair. They also administer the Hazard Mitigation Grant Program, which can be used to repair and upgrade levees.

National Weather Service, Weather Alert Transmitters: Weather alert radios can warn the general public within their broadcast range function as the primary warning system for the general public.

Program Gaps or Deficiencies

Risk Ratings: These were done over 20 years ago, may be outdated in some areas due to increased development within the shoreland areas.

Inventory of Jurisdictions for Unregulated Dams: There are a number of small dams for which it is not clear under who has jurisdiction. Action may need to take place relating to operation and maintenance of these smaller dams and levees.

Public Awareness of Dam Safety Issues: There may be need for public awareness building with populations in areas that could be impacted by dam failure.

Table 3.23: Dam Failure Events
St. Louis County

Date	Location	Cost	Deaths	Injuries	Notes
06/19/12	St. Louis County	N/A	0	0	Dam Failure at the Forbay reservoir associated with the June 2012 flood event. The Forbay reservoir breached and had a complete dam failure. This failure did much of the damage to Highway 210.

Source: City and Township Contacts

3.2.3 Fire

Fire is a rapid, persistent chemical reaction that releases heat and light, especially the exothermic combination of a combustible substance with oxygen. A fire is categorized as both a natural and a technological hazard that occurs both outside and inside. Structure fires are categorized as Residential, Public/Mercantile and Industrial/Manufacturing/Other Buildings. A second category of fires is vehicle fires including aircraft, boats, trucks, busses, automobiles and trains. (Wildland fires are discussed in section 3.1.13.)

Cooking accidents is the leading cause of home fires. It is also the leading cause of home fire injuries. Cooking fires often result from unattended cooking and human error, rather than mechanical failure of stoves or ovens.

Careless smoking (e.g. cigarettes) is the leading cause of fire deaths. Smoke alarms and smolder-resistant bedding and upholstered furniture are significant fire deterrents.

Arson is both the second leading cause of residential fires and residential fire deaths. In commercial properties, arson is the major cause of deaths, injuries and dollar loss.

Heating system accidents is the third leading cause of residential fires. Heating fires are a larger problem in single family homes than in multi-family dwellings. Unlike apartment buildings, the heating systems in single family homes are often not professionally maintained.

Relationship to Other Hazards-Cascading Effects

None known.

Plans and Programs in Place

Fire Districts and Departments: Structure fires are served by the local fire departments. Fire department service areas and GIS data is maintained by St. Louis County.

Education Services and Inspections: Some fire departments do routine inspections of public properties and businesses within their service area. They check and maintain fire suppression facilities such as fire hydrants. Many participate in local and regional community education events.

Zoning: Certain county and city zoning regulations are intended to improve safety and potential loss from fire. Examples include property setbacks and road width to allow easy emergency vehicle access.

Program Gaps or Deficiencies

Building Codes: There are no building codes in place in the rural parts of the county with the exception of Rice Lake Township. This can make houses more vulnerable to fire and lead to unsafe situations for fire fighters as well as the residents.

Response Times: Long response times in some low-density rural areas are a concern.

Access Issues: Access can be a concern if driveways are long, narrow and/or poorly maintained.

Home Fire Preparedness Plans: Many residents do not practice fire drills or have a fire escape plan for their household. Longer response times in rural areas put a greater responsibility on residents to be prepared to prevent or address a fire before the fire department arrives.

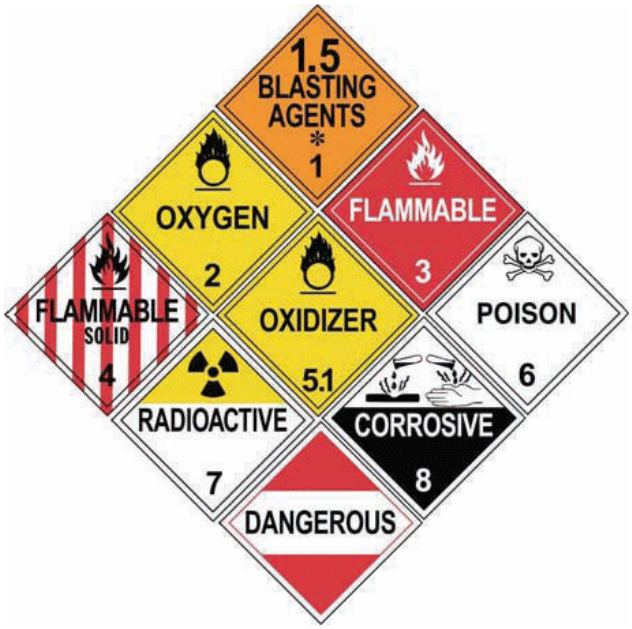
Staffing and Training of Volunteer Fire Departments: Rural fire departments experience increasing difficulty to get an adequate number of volunteers and increasingly rely on mutual aid agreements. Recruiting and sustaining volunteer fire fighters may become more difficult as the population ages as well as in areas where high numbers of residents are seasonal. State programs and grants have eased the burden of paying for training, however, required training has greatly increased and this has made recruitment and retention of firefighters more difficult.

Table 3.24: Fire Events (Structure)
St. Louis County

Year	Number of Fire Runs	Number of Incendiary Incidents	Property Dollar Loss	Deaths	Civilian Burn Injuries	Burn Injury Costs
2006	1,362	98	$212,731	0	62	$98,097
2007	1,277	115	$427,635	N/A	N/A	N/A
2008	72	73	$221,475	N/A	N/A	N/A
2009	965	85	$584,331	0	60	$674,421
2010	999	74	$67,321	2	80	$1,438,672

Source: Minnesota State Fire Marshall Annual Report

3.2.4 Hazardous Materials



Hazardous materials are comprised of substances that are flammable or combustible, explosive, toxic, noxious, corrosive, oxidizers and/or radioactive.

Business types that commonly use hazardous materials include:

- Hospitals and clinics
- Schools
- Metal plating and finishing
- Aircraft industry
- Public utilities
- Cold storage
- Fuel industries
- Communications
- Chemical distributors
- Research
- High technology firms

Each business of these types is required to maintain plans for warning, notification, evacuation and site security under various regulations. Hazardous materials incidences are generally associated with transportation accidents or accidents at fixed facilities.

Hazardous materials may be released as a secondary result of natural disasters such as wildland fire and floods. In such cases, hazardous materials can be released if buildings or vehicles are structurally compromised or are involved in traffic accidents. Pipelines can be exposed or ruptured from collapsed embankments, road washouts, bridge collapses, and fractures in roadways.

Hazardous materials spills can lead to short term or long term evacuation of an affected area. Depending on the nature of the spill and local weather conditions, residences, businesses, hospitals, schools, nursing homes, and roadways may be evacuated or closed to traffic until the hazard is contained or cleanup can be completed.

A variety of hazardous materials are stored in fixed facilities throughout St. Louis County.

There are 1,300 active, small quantity hazardous waste generating facilities. These facilities generate less than 2,200 pounds of hazardous materials or 2.2 pounds of acutely hazardous waste per calendar month. These facilities are required to file a response plan with the local fire and police department.

There are seven active large quantity generators. These facilities are required to have a more elaborate contingency plan in place.

There are four transportation, storage and disposal sites located in the county. These facilities are required to have a contingency plan in place.

Small generators can dispose of hazardous materials through the Western Lake Superior Sanitary District's Clean Shop program. This program is in effect throughout the county. Household hazardous waste can be disposed of at sites in Hibbing, Virginia and the WLSSD facility in Duluth.

The major generators of hazardous waste are listed in Table 3.25.

Table 3.25: Large Quantity Hazardous Material Generators
St. Louis County

Owner Name	Address	Industry Classification
AccelorMittal	5950 Old Highway 53 North Mountain Iron, MN 55792	Taconite facility
Cirrus Design Corp	4515 Taylor Circle Duluth, MN 55811	Aircraft manufacturing
Irathane Systems	3516 East 13th Avenue Hibbing, MN 55746	All other plastics product manufacturing. Metal coating, engraving and allied services to manufacturers.
Minnesota Twist Drill	1 SW 7th Street Chisholm, MN 55719	Cutting and machine tool
P & H Mine Pro Services	8317 Jasmine Street Mountain Iron MN 55792	Mining machinery and equipment manufacturing. Construction and mining machinery.
Essentia Health – St. Mary's Medical Center	407 3rd Street East Duluth, MN 55805	General medical and surgical hospital
St. Luke's Hospital	915 E 1st St Duluth, MN 55805	General medical and surgical hospital
Proctor Railroad Yard	951 Ugstad Road Proctor, MN 55810	Railroad

Source: Minnesota Pollution Control Agency

Transportation of Hazardous Materials

Hazardous materials are transported in St. Louis County by road, rail, boat, air, and pipeline. Transported hazardous materials include materials moving from producers to users, moving between storage and use facilities, and hazardous waste moving from generators to treatment and disposal facilities.

The major commercial road routes are shown on Map 2.11, Appendix C. For highways, the main routes are Trunk Highway 53 traveling north and south through the County, Highway 33 functions as a connector from Highway 53 to Interstate 35. Highway 169 traveling east and west connects the Iron Range communities; Highway 2 connects to Grand Forks and functions as a major trucking route to Canada. Highway 61 is the major route connecting the communities on the North Shore of Lake Superior and connects Duluth with Thunder Bay in Canada.

Risks are greatest in the more populated areas along major transportation routes. This includes the Iron Range Communities and the Duluth Urban area. According to the most recent findings at the Minnesota Department of Transportation, more than half of all accidents involving hazardous materials have occurred on state roadways.

There are two major railroad lines that traverse St. Louis County with railroad traffic transporting hazardous materials. These are the BNSF and the DWP railroads. Areas of primary concerns are where the railroad passes through populated areas. Accidents in these areas could put populations at risk. According to the Minnesota Department of Transportation, approximately 11 percent of all statewide transportation incidents involving hazardous material in 2002 were from rail transport.

St. Louis County has an international airport, in Duluth, that serves the regional market for pleasure and business flights connecting primarily to the Minneapolis Airport. The Duluth facility is also shared with the Air National Guard. There are municipal airports serving St. Louis County as discussed in the community profile. A variety of flammable liquids and chemicals are stored at these facilities used for the airplanes. Accidents involving aircraft and chemicals related to their operation create a potential situation where hazardous material could be released. In addition, the risk of an incident is further increased by any hazardous cargo that may be brought into the facility for transport.

The Duluth-Superior Harbor functions as an international seaport and is the most westerly located seaport in the U.S. connecting to the Atlantic Ocean via the St. Lawrence Seaway. Harbor safety is under the jurisdiction of the United States Coast Guard.

Under the direction of the Coast Guard Captain of the Port of Duluth, there are two plans which reference each other. They are the Western Lake Superior Area Maritime Security Plan (AMSP) and the Western Lake Superior

Area Contingency Plan (ACP). The AMSP's purpose is to ensure effective governmental and private sector measures to deter, detect, disrupt, respond to and recover from a Transportation Security Incident (TSI) or threat thereof across the inter-modal MTS within specific port areas. In addition, the AMSP has a Maritime Transportation System Recovery (MTSR) annex, in an effort to get the port open after an incident. The ACP describes the strategy for a coordinated federal, tribal, state and local response to a discharge or substantial threat of discharge of oil, or a release or substantial threat of release of hazardous substances(s) within the boundaries of the coastal and inland area of Western Lake Superior.

The security plan assesses risks for infrastructure and facilities within the coastal area and makes recommendations for improvements. The plan looks at infrastructure that in case of an event may have impacts that would fall under the Coast Guard's responsibility to respond to and that may have an impact on shipping commerce. This plan is reviewed on a yearly basis.

Key infrastructure that has been assessed under this plan includes power generating facilities such as the Thompson Hydro Dam system, bridges, port facilities, structures that could be vulnerable from the waterfront such as the Duluth Entertainment and Convention Center (DECC).

The security plan identifies Marine Security (MARSEC) Levels. Under each MARSEC level for different jurisdictions there is a listing of assistance each law enforcement entity can provide. This can include staff and equipment. The MARSEC levels are related to the Homeland Security threat levels. Further, the Captain of the Port can raise the level of readiness for the port if there is intelligence regarding a local threat.

All shipping facilities have a security plan in place that is filed with the Captain of the Port. Vessels need to file plans with Headquarters of the Coast Guard. The Duluth Superior Port Authority is in the process of setting up a cooperative to assist in the development of the facility security plans since the cost of doing plans independently may be a concern for some of the smaller port operations.

Fixed Facilities

A variety of hazardous materials are stored in fixed facilities throughout St. Louis County. There are 47 small quantity hazardous waste generating facilities. These facilities are required to file a response plan with the local fire and police department. Further, there are 8 large quantity generators. These facilities are required to have a more elaborate contingency plan in place. There are 4 transportation, storage and disposal sites located within the county. These facilities are also required to have a contingency plan in place.

Relationship to Other Hazards-Cascading Effects

- Wastewater supply contamination as a result of improper disposal of chemicals.
- Impacts on surface and groundwater resources and fisheries as a result of a spill.
- Soil contamination.

Plans and Programs

State Agency Cooperation: St. Louis County works directly with the appropriate state agencies to address needs for responding to and mitigating the impacts of a hazardous event.

Emergency Operations Plan: St. Louis County has an EOP in place that outlines procedures for dealing with hazardous materials accidents, spills or releases.

Hazardous Materials Response Team: The hazardous materials response team is located in Duluth and staffed by the Duluth Fire Department under a state contract. Local units of government can contact this resource through the State Duty Officer.

55th Civil Support Group: This unit can provide assistance in analyzing threat and proper response. Local units of government need to make contact through the State Duty Officer to access this resource.

Western Lake Superior Area Maritime Security Committee (AMSC): The AMSP's purpose is to ensure effective governmental and private sector measures to deter, detect, disrupt, respond to and recover from a Transportation Security Incident (TSI) or threat thereof across the inter-modal MTS within specific port areas. In addition, the AMSP has a Maritime Transportation System Recovery (MTSR) annex, in an effort to get the port open after an incident.

Western Lake Superior Port Area Committee (PAC): The PAC plans the strategy for a coordinated federal, tribal, state and local response to a discharge or substantial threat of discharge of oil, or a release or substantial threat of release of hazardous substances(s) within the boundaries of the coastal and inland area of Western Lake Superior.

Program Gaps or Deficiencies

Warning Systems: Warning and notification of populations is important in case of a hazardous materials related emergency. Communities need ongoing action to

ensure that warning systems are functional and residents know how to access information in case of an emergency.

Access Concerns for Emergency Response in Case of a Train Derailment: Access by emergency vehicles is a concern in Orr. A derailment in town can prevent direct access to Highway 53 by emergency and fire response vehicles. Access to the hospital in Cook can be a concern if a derailment would take place in town. The hospital and emergency response services are located on opposite sides of the tracks. Access concerns exist for emergency response in the case of a derailment in Floodwood which could cut off direct access to US Highway 2.

Need for Increased Training in Response to Hazardous Materials: There is an ongoing need for training and updates for current and new personnel.

Grant Writing Assistance: Local fire departments write grant proposals and, in some cases, must secure local match funds to ensure adequate equipment is available to respond to an incident or to pay for training.

Table 3.26: Hazardous Material Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No events reported.							

Source: EPA

3.2.5 Radiological

A radiological hazard is defined as an unintentional exposure to materials that emit ionizing radiation.

The primary radiological hazard is the health effects resulting from unintentional exposure to ionizing radiation. When radiation interacts with atoms, energy is deposited, resulting in *ionization* (electron excitation). This ionization may damage certain critical molecules or structures in a cell. Ionizing radiation is emitted from molecular elements generally referred to as radio nuclides, and this radiation has the ability to alter in varying amounts the function of living processes at the cellular level. Types of ionizing radiation include Alpha particles, Beta particles, Gamma rays, X-rays, and Neutron particles.

Radiation is measured in different ways. Measurements used in the United States include Roentgen, radiation absorbed dose (RAD), and roentgen equivalent man (REM). See http://www.nrc.gov/NRC/EDUCATE/REACTOR/05/part10.html. The term RAD is being replaced by the International System skin dose unit for radiation absorbed dose, the gray (Gy) which is a measurement of absorbed dose in any material. 1 Gy = 100 RAD.

Radiation effects fall into two broad categories:

- Direct effect on cells (direct impact with a particularly sensitive atom or molecule in a cell).
- Indirect effect on cells (interaction with water molecules in the body where the deposited energy in the water leads to the creation of unstable, toxic hyperoxide molecules which then damage sensitive molecules and afflict subcellular structures).

The nature and extent of damage caused by ionizing radiation depend on a number of factors including the amount of exposure (energy strength), the frequency and/or duration of exposure, and the penetrating power of the radiation to which an individual is exposed. Acute exposure to very high doses of ionizing radiation is rare but can cause death within a few days or months. The sensitivity of the exposed cells also influences the extent of damage. For example, rapidly growing tissues, such as developing embryos, are particularly vulnerable to harm from ionizing radiation.

Nuclear power plants are a significant potential source of ionizing radiation. The health and environment impacts from the Three-Mile Island and Chernobyl, Russia disasters illustrate the potential hazards from nuclear power plants. Other sources of ionizing radiation include medical and diagnostic X-ray machines, certain surveying instruments, some imaging systems used to check pipelines, radioactive sources used to calibrate radiation detection instruments, and even some household fire detectors.

History

On December 7, 1979, following the March 1979 Three Mile Island nuclear power plant accident in Pennsylvania, President Carter transferred the Federal lead role in off-site radiological emergency planning and preparedness activities from the Nuclear Regulatory Commission (NRC) to Federal Emergency Management Agency (FEMA).

FEMA established the Radiological Emergency Preparedness (REP) Program to (1) ensure that the public health and safety of citizens living around commercial nuclear power plants would be adequately protected in the event of a nuclear power station accident and (2) inform and educate the public about radiological emergency preparedness. FEMA's REP Program responsibilities encompass only "off-site" activities, that is state and local government emergency preparedness activities that take place beyond the nuclear power plant boundaries. Onsite activities continue to be the responsibility of the NRC. See the REP site for additional information: http://www.fema.gov/pte/rep/

The U.S. Department of Energy (DOE) occasionally transports radioactive material through Minnesota via road and rail. Information on these shipments can be located at www.ntp.doe.gov.

University laboratories, medical treatment facilities and medical laboratories also contain a large number of radionuclides. These materials are used in research, diagnostics and treatment.

Plans and Programs

At the federal and national level there are a number of agencies that have capabilities to respond to radiological emergencies these include: U.S. Department of Energy (DOE), Nuclear Regulatory Commission (NRC), Federal Emergency Management Agency (FEMA), U.S. Department of Transportation (DOT), American Nuclear Society (ANS). More information on these agencies and their roles and responsibilities can be found in the State All Hazard Mitigation Plan.

At the state level the following agencies have capabilities:

- Department of Public Safety (DPS), Homeland Security and Emergency Management (HSEM): HSEM has response equipment and capabilities related to radiological incidents. In addition, HSEM shall assess the need for protective actions in the event of a radiological incident at a nuclear power plant.
- Department of Health (MDH): MDH has response and laboratory equipment capabilities related to radiological incidents.
- Department of Health, Environmental Health (EH), Asbestos, Indoor Air, Lead, and Radiation Program: The Section of Asbestos, Indoor Air, Lead and Radiation regulates radioactive materials under letter agreement with the NRC and is prepared to provide accident assessment and advisory support in the event of a nuclear power plant emergency. See http://www.health.state.mn.us/divs/eh/about.html#programs
- State Hazardous Materials (HAZMAT) teams, based in Duluth for St. Louis County, have equipment to respond to a radiological incident.
- The Federal Radiological Emergency Response Plan (FRERP) is in place to establish an organized and integrated capability for a timely, coordinated response by Federal agencies to peacetime radiological emergencies.
- The MN Department of Health has a response plan for radiological incidents.
- The Minnesota Emergency Operations Plan (MEOP) addresses the response to radiological incidents for Minnesota Government Agencies.
- The St. Louis County Emergency Operations Plan outlines County's role in a response to a radiological incident.

Program Gaps or Deficiencies

No program gaps or deficiencies at the County level have been identified.

Table 3.27: Radiological Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No known radiological events in St. Louis County.							

Source: St. Louis County

3.2.6 Terrorism

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

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

The Duluth Superior Harbor and the Duluth Airport could be potential targets for terrorism as well as other infrastructure such as power and pipelines traversing the County. The Coast Guard has conducted a risk assessment for facilities within the Duluth Superior Harbor as part of their Western Lake Superior Maritime Security Plan.

History

St. Louis County has no history of terrorist activity or individual acts to cause disasters against people or property. However, during the Anthrax scare there were a number of false anthrax threats that had to be responded to in the County. Vandalism, assaults and other criminal acts do occur, but these isolated incidents fall within the purview of local law enforcement.

Relationship to Other Hazards-Cascading Effects

Cascading effects of an intentional human-caused disaster are highly dependent on the specific mode used and asset targeted. Impacts could include spread of infectious disease, fires and secondary explosions are possible with explosive attacks and fires from arson attacks can extend beyond intended targets such as cause forest fires. Further, impacts could include the ability to use the harbor or airport for trade and transportation purposes.

Plans and Programs

Cooperation with State and Federal Officials: St. Louis County officials work with state and federal officials on domestic preparedness efforts.

Western Lake Superior Area Maritime Security Plan: This document includes a risk assessment of all facilities within the Duluth Superior Harbor and along the shoreline of Lake Superior.

Western Lake Superior Area Maritime Security Committee (AMSC): The AMSP's purpose is to ensure effective governmental and private sector measures to deter, detect, disrupt, respond to and recover from a Transportation Security Incident (TSI) or threat thereof across the inter-modal MTS within specific port areas. In addition, the AMSP has a Maritime Transportation System Recovery (MTSR) annex, in an effort to get the port open after an incident.

Program Gaps or Deficiencies

No gaps or deficiencies have been identified at this point.

Table 3.28: Terrorism Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No known terrorism events in St. Louis County.							

Source: St. Louis County

3.2.7 Wastewater Treatment System Failure

Sewer

Wastewater collection systems often receive additional water during heavy storm events as a result of inflow and infiltration. This may cause the wastewater treatment system to reach its maximum treatment capacity. In this event, excess flow will be directed into waterways untreated, resulting in sewage contamination. Inflow and infiltration can be a problem for communities on the Iron Range because of aging infrastructure. The city of Duluth has had problems with its collecting systems resulting in sewer overflows. The Western Lake Superior Sanitary District has seen significant sewage spills due to system failures in 2003 and work is being completed to correct this. Cities in St. Louis County that have had bypasses as a result of clear water inflow include Duluth, Mountain Iron and Aurora (MPCA communication).

Septic Tanks

Septic tanks are enclosures that store and process waste where no sewer system exists, such as in rural areas or on boats. Treatment of waste in septic tanks occurs by bacterial decomposition. The resulting material is called sludge. A significant number of residences in St. Louis County are served by septic systems as opposed to public waste treatment facilities. Contamination of water from septic tanks can occur under various conditions.

Poor placement of septic leach fields can feed partially treated wastewater into a drinking water source. Leach fields are part of the septic system for land based tanks and include an area where wastewater percolates through soil as part of the treatment process.

Badly constructed percolation systems may allow water to escape without proper treatment. System failure can result in clogging and overflow to land or surface water.

High density placement of tanks, as in suburban areas, can result in regions containing very high concentrations of wastewater. This water may seep to the land surface, run-off into surface water or flow directly into the water table.

History

Older communities in the County have problems in inflow and infiltration in their wastewater collection systems. During heavy rain events this can overwhelm the capacity of the collection and treatment infrastructure and lead to the release of raw sewage. Cities in St. Louis County that have regular bypasses as a result of clear water inflow include Duluth, Mountain Iron and Aurora (MPCA communication).

Plans and Programs

Certified Operators: Certain employees at the wastewater treatment systems are required to be certified under state requirements. These operators are required to take state training to maintain their certified operator status.

State Permit Enforcement: The MPCA regulates wastewater systems. State staff members in the water quality point source program issue permits, monitor compliance through data review and inspections, and enforce permit conditions. They also work with communities to develop strategies to solve wastewater treatment problems.

St. Louis County Water Plan: The County Water Plan has an extensive section on wastewater and provides guidance for both traditional and performance standard systems.

Program Gaps or Deficiencies

Address Inflow and Infiltration Problems and Replacement of Aging Infrastructure: Many communities in the county have aging wastewater infrastructure which can lead to system failures. Securing adequate funding is often a challenge for communities and funding will likely require a combination of local funding and state and federal support.

Septic System Failures: Septic failure rates have not been systematically inventoried throughout the county. This limits the ability of the county to identify problem areas and to assign priorities for addressing these system failures.

Table 3.29: Wastewater Treatment Plants Failure Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No Wastewater Treatment Plant Failures reported since 2006							

Source: MPCA, EPA

3.2.8 Water Supply Contamination

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

The causes of water contamination are numerous and range from failing septic systems, to leaking underground tanks, and improper use of household chemicals.

Residences near lakes and rivers often have wells that use shallow ground water that is particularly at risk for contamination. Seasonal homes or cottages may have older wells that need repair or replacement, but are a lower priority than the primary residence.

In some instances surface water is used for the household water supply. Surface water presents a different set of risks and problems; information about special consideration and testing for surface water is available from the MN Department of Health (MDH).

The most obvious concern about an unsafe water supply is the health risk to family or guests. Wastewater contamination can be a source of bacteria, viruses, and parasites that can cause gastrointestinal problems or transmit contagious diseases.

History

Residents in the Duluth area of St. Louis County who are connected to municipal systems use Lake Superior as their primary source for drinking water. Residents in the Iron Range area and northern St. Louis County rely on either groundwater or a surface water source. No records were found of any significant drinking water contamination incident.

Relationship to Other Events-Cascading Effects

Infectious Diseases: Polluted human water resources can cause illness and epidemics in both humans and animals.

Plans and Programs

St. Louis County Water Plan: the St. Louis County Water Plan identifies issues and strategies regarding protection of the County's water supply. The plan includes a listing of the ranking of vulnerability of public water supplies.

Drinking Water Standards, Requirements: The U.S. Environmental Protection Agency (EPA), as required by the Safe Drinking Water Act of 1974, sets uniform nationwide minimum standards for drinking water. State public health and environmental agencies have the primary responsibility for ensuring that these federal drinking water standards, or more stringent ones established by the state, are met by each public water supplier.

Public Water Supply Monitoring: The EPA requires an ongoing water quality monitoring program to ensure public water systems are working properly. Local officials work together with the Minnesota Department of Health and the EPA to ensure that all public water supplies are safe. Testing includes resort and hotel facilities under the Department of Health Program water monitoring program.

Wellhead Protection Program: St. Louis County cooperates with utilities that need assistance as they work with the State Health Department on the development of a wellhead protection program. This program identifies wellhead protection areas.

Well Construction and Testing: Since 1974, all water wells constructed in Minnesota must meet the location and construction requirements of the Minnesota Well Code. It is recommended that private wells be tested annually, however this is at the discretion of the property owner.

Program Gaps or Deficiencies

Groundwater Study Needed for the Iron Range and Gravel Area Near the City of Duluth: The County Water Plan identifies the need to conduct a level 2 ground water study in cooperation with the MNDNR. For more information see the St. Louis County Water Plan.

Testing of Individual Drinking Water Wells: Residents carry personal responsibility to test their well water on a regular basis to ensure their water supply is safe. If residents do not take this responsibility, there is no mechanism in place to protect their drinking water.

Table 3.30: Water Supply Contamination Events
St. Louis County

Date	Type	Location	Cost	Deaths	Injuries	Source	Notes
No events reported							

Source: Minnesota State Health Department

3.2.9 Hazard Events and Impacts on St. Louis County Communities

In addition to publicly available data, all cities, townships and tribal governments were contacted and asked to send information about any hazard event since 2005. E-mail messages and a simple data collection form were sent to all community contacts on August 16, 2012 and a reminder was sent on September 4, 2012. The memo and form are in Appendix B.

After September 10, 2012, cities that did not respond were contacted by phone in a final attempt to collect information. This resulted in a total of 22 cities, 2 tribal governments and 36 townships responding. Because townships are not required to adopt the plan in order to be eligible for project funding, they were not contacted a third time.

Data collected is shown in table 3.31.

Table 3.31: Hazard Events and Impacts since 2005 as reported by Cities, Townships and Tribal Governments
St. Louis County

City/ Township	Hazard	Date of Event	Brief Description	Impact and/or Damage	Cost of Damage	Comments
City of Aurora	Severe Rain Storm	June 19, 2012	Flooding caused by rain	Storm sewer lines collapsed, inflow valve on water intake collapsed	$20,000	
City of Aurora	Lightning Strike	June 19, 2012	Lightning strike at Wastewater Treatment Plant	Lightning damage to computerized systems resulting in damage	$3,000	
City of Babbitt	Hail Storm	July 2006	Golf ball sized hail	Roofs and vehicles	$250,000	Arena roof was $120,000
City of Biwabik	NONE					
City of Brookston	Severe Rain Storm	June 2012	Heavy rain	Damage to roads and culverts	$8,000	
City of Buhl	NONE					
City of Cook	Severe Rain	March 4, 2005	High inflow/infiltration in wastewater system. Pump failure	Flooded basements, burned out wastewater pumps, bypass to Little Fork River	$30,000	Only damage that was known was the cost of new pumps and installation
City of Cook	Severe Rain	April 2011	High inflow/infiltration	Flooded basements, bypass to Little Fork River	None known	New lift station being installed during the incident period
City of Duluth	Winter Storm	4/5/2008	32” Snow	Schools, Business and Government Closure, No Travel	NA	
City of Duluth	Blizzard	4/10/2008	Heavy Snow and 62 mph winds	Schools, Business and Government Closure, No Travel		
City of Duluth	Blizzard	12/14/2008	Blizzard Heavy Snow and 50mph winds	Schools, Business and Government Closure, No Travel	NA	
City of Duluth	Ice Storm	3/29/2009	Ice Storm 1-2 inches of Ice	Schools, Business and Government Closure, Downed power lines and trees, No Travel	NA	
City of Duluth	Blizzard	12/24/2009	24” Snow, 55 mph winds	Business and Government Closure, No Travel	NA	

City of Duluth	Wind/Rain/ Snow Event	10/26/2010	Heavy Rain, snow mixture with 60mph + Winds	Downed trees, power lines, flooding		
City of Duluth	Hail	5/30/2012	Hail Storm	Widespread damaged roofs, vehicles, etc	NA	
City of Duluth	Drought	10/1/2012-6/18/2012	Limited to no precipitation causing very dry conditions	No long term effect	NA	
City of Duluth	Flooding	6/19/2012	10 inches of rain causing widespread flooding, landslides, and damaged roads	Declared disaster. Infrastructure, homes, parks, and river and creek beds severely damaged	100 million+	
City of Eveleth	Hail Storm	July 2, 2012	Sever Storm with Large Hail	Vehicular and residential damage to roofs and siding	Hundreds of thousands	Claims to vehicles and structures are still coming in to insurance companies
City of Ely	Chemical	Oct 2011	Meth lab clean up			County did clean up and paid cost
City of Ely	Chemical	2006	Meth lab clean up			County did clean up and paid cost
City of Floodwood	Flood	June 2012	Flood	Three homes and infrastructure	$250,000	
City of Hermantown	Flood	June 20, 2012	Major flood event	Roads, bridges and homes damaged	$571,000	
City of Hoyt Lakes	NONE					
City of Hibbing	NONE					
City of Kinney	NONE					
City of Leonidas	NONE					
City of Meadowlands	NONE					
City of Mountain Iron	NONE					
City of Orr	NONE					
City of Proctor	Flood	June 20, 2012	City flooded after receiving 8” of rain in a 24 hour period	Several city streets were washed out. Downtown businesses flooded. Basements of many homes flooded.	$750,000	
City of Tower	Hail Storm	July 2010	Hail	Damage to water tower, lift station house, pump house, well house	$8,100	
City of Tower	Hail Storm	July 2011	Hail	Damage to train canopy and depot roof	$12,000	
City of Tower	Winter Storm	April 16, 2012	10” or more snow fall in one 24 hour period	Severe power outages and major damage to sanitary sewer system and lift stations	$15,000	
City of Winton	NONE					
Angora Township	NONE					
Arrowhead Township	NONE					
Ault Township	NONE					
Balkan Township	NONE					
Basset Township	NONE					
Biwabik	NONE					

Township						
Brevator Township	Severe Rain and Flood	June 19-20, 2012	Severe rain and flooding	Roads washed out	$35,000	
Cedar Valley Township	Wildland Fire	May 2010	Fire started on State Forest Land	Approximately 20 acres burned	$0 to township	MN DNR handled the fire
Cedar Valley Township	Wind Storm	July 2012	Straight Line Winds	Several large trees snapped and uprooted	$0 to township	Private property and state land
Clinton Township	Flood	June 2012	Flash Flood	Road and culvert washout	$1,850	
Colvin Township	Heavy Rain	June 19-20 , 2012	Flash Flood	Road damage	$5,119	
Fairbanks Township	Flood	June 2012	Flash Flood	Road damage	N/A	
Fayal Township	NONE					
Field Twp	NONE					
Fine Lakes Township	Flood	June 19-21, 2012	20" of rain in less than 72 hours	All township roads damaged. Washouts. Two culverts damaged.	$28,500	Gravel, spreading, replacing culverts
Floodwood Township	NONE					
French Township	NONE					
Gnesen	Heavy Rain	June 2012	Road flooding	Replace culvert	$4,000	
Grand Lake Township	Flood	June 2012	Area-wide flooding	Roads under water, aggregate and calcium chloride washed out.	Estimated $32,645	Request/claim sent to FEMA on 7/23/12
Greenwood Township	NONE					
Great Scott Twp	NONE					
Halden Township	Flood	June 20, 2012	Road flooding and washouts. Basement cave in. Flooded house. Multiple flooded basements.	Seven homes n southwest portion of township stranded for approximately one week except for boat access. Basement cave in not worth repairing. Over 3 feet of water in house on slab, house needed to be gutted, and appliances ruined. Multiple homes with ruined appliances and personal goods. Power outage for 7.5 hours caused sump pumps to fail.	Over $95,000	County roads flooded by Sixteen Creek. House with basement cave in was unoccupied. Residents of one flooded house left area, undecided whether to rebuild.
Kugler Township	NONE					
New Independence Township	Severe Rain Storm	June 17-18, 2012	Intense rain caused washouts on local roads	Township roads were affected by washouts caused by the extreme intensity of the rain	N/A	The Supervisor who oversees roads ith New Independence has met with local authorities about the damages and attended meetings with FEMA.
Leiding Township	NONE					
McDavitt Township	NONE					
Midway Township	Severe Rain	June 20, 2012	Heavy rain	Stark Road flooded, Volske Road flooded, Bridge at Midway Road on Hwy 13 washed out, Skyline Parkway and	N/A	

				Becks Road washed out		
Morse Township	NONE					
Ness Township	NONE					
New Independence	Flood	June 2012	Heavy rain	Road washouts	$1,672	
North Star Township	NONE					
Stoney Brook Township	Flood	June 21-22	Township road washouts and flooding	Gravel hauled to fill in washouts and grade	$11,000	
Rice Lake Township	NONE					
Sandy Township	NONE					
Solway Township	Severe rain	June 20, 2012	Damage to township roads and soccer field	Replace culverts, rebuild roads	$18,000	This is public damage only. Not known if there was any damage to private homes.
Vermilion Lake Township	NONE					
Willow Valley Township	NONE					
Wuori Township	NONE					
Bois Forte Band Tribal Government	Ice Storm	Winter 2007	Power out for days	Interrupted serviced		
Bois Forte Band Tribal Government	Severe Weather	November 30, 2010	Severe winter weather	Loss of government services ½ day		
Bois Forte Band Tribal Government	Severe Weather	December 30, 2011	Severe winter weather	Loss of government services ½ day		
Bois Forte Band Tribal Government	Severe Weather	January 28, 2011	Severe winter weather	Loss of government services ½ day		
Bois Forte Band Tribal Government	Blizzard	April 16, 2012	Power out for days	Interrupted services, lost power, needed emergency shelter set up for community.		
Bois Forte Band Tribal Government	Wind storm and blowdown event	July 2-4, 2012	Straight line wind and horizontal rain with some damage	Interrupted services, lost power and water, trees down over roads	$50,000 (per FEMA study)	
Fond du Lac Band of Lake Superior Chippewa	Flood	June 19, 2012	Heavy rains caused flooding	Road washouts, homes and businesses with flood damage, evacuation of homes due to road conditions.	Over $900,000	

Source: Local Jurisdictions in St. Louis County

SECTION FOUR:

St. Louis County Risks and Vulnerabilities

SECTION 4: RISKS AND VULNERABILITIES

4.1 Introduction

The St. Louis County Hazard analysis reflects all hazards that may impact the County's communities. It is based on the best available information describing those hazards that have occurred and which ones are most likely to occur. Risk level was updated based on a survey of Planning Team members and key community leader contacts.

4.2 Evaluating Risks

Threat and Hazard Identification and Risk Assessment

In 2012 St. Louis County Emergency Management developed a Threat and Hazard Identification and Risk Assessment (THIRA). The THIRA is an effort to identify and assess the probabilities, frequency of occurrence and possible threats posed by natural, technologic and human-made hazards. The THIRA is an important guide in planning for and prioritizing future preparedness, response, mitigation and recovery activities.

THIRA findings are based on historical data, existing response capabilities and current planning efforts, such as updating the county hazard mitigation plan in 2012-13.

Frequency of occurrence and probabilities are in the following table.

Table 4.1: THIRA Probability

Natural Hazards	
Severe Rain Storm	2
Hail Storm	3
Thunderstorm	3
Lighrning	4
Wind storm	4
Winter Storm (Blizzard)	4
Ice Storm	3
Extreme Heat	2
Extreme Cold	2
Flood	2
Drought	2
Tornado	1
Wildland Fire	4
Disease Outbreak	2
Earthquake	1
Solar Storm	1
Technological Hazards	
Dam Failure	1
Hazardous Materials (Chemical Spill)	2
Biological	1
Radiological	1
Nuclear	1
Explosives	2
Terrorism	2
Water Supply Contamination	1
Waste Water Treatment System Failure	1

Source: St. Louis County

1= Unlikely: <1% probability of occurrence in the next 100 years

2= Occasionally: 1-10% probability of occurrence per year, or at least one chance in next 100 years

3= Likely: >10% but <100% probability per year, at least 1 change in the next 10 years

4= Highly likely: 100% probability in a year

Sectoring is dividing a community into manageable segments or portions based on local geography in relation to a specific hazard event. The St. Louis County Hazard Mitigation Sectors map in Appendix A shows the boundaries of each sector.

Sectors in St. Louis County were created to identify local areas of service, identify vulnerable areas and determine risks for future events. Sectors allow the County to evaluate how an area could be impacted or how it has been impacted, and what can be done to mitigate impacts from a specific event. They can also be used to organize and conduct emergency response activities.

St. Louis County is divided into eight sectors. The sectors were defined by the hazard mitigation team and mapped. The sectors follow primarily existing emergency response district boundaries but also take into consideration special characteristics such as the Duluth Superior Harbor.

Sector One:
Duluth Metro Area

The Duluth Metro Area includes the cities of Duluth, Proctor and Hermantown as well as Midway, Solway, Grand Lake, Fredenberg, Canosia, Rice Lake, Lakewood and Duluth Township. Over half of the County population is concentrated in this area. Canal Park located on Duluth's waterfront is a major tourist draw. Duluth serves as the government and business services center for Northeast Minnesota. The City is further home to two major medical centers, Essentia Health and St. Luke's Hospitals and Clinics that serve a regional function. The City is home to the County Seat and a number of federal offices are located in the City as well. The main transportation connections are Interstate 35, Highway 61, Highway 2, and Highway 53. A number of railroads run through Sector One. There are three dams in Sector One: Fond du Lac, Rice Lake and Fish Lake. The Haz-Mat Response Team is located in Duluth.

Sector Two:
Duluth-Superior Harbor

The Duluth-Superior Harbor is the most westerly located seaport offering access to the Atlantic Ocean. The U.S. Coast Guard is responsible for port security as well as coordination of response to oil spills, hazardous substance discharges or other incidents in the Harbor that may interfere with commerce. The U.S. Coast Guard has a Port Security Plan, and an Oil Spill and Hazardous Substance Response Plan. As part of these planning efforts, the U.S. Coast Guard coordinates with agencies from both the City of Duluth and the City of Superior as well as with appropriate tribal, state and federal agencies. The recent increase in terrorism threat has increased the U.S. Coast Guard's activities regarding port security. Under the direction of the Coast Guard Captain of the Port of Duluth, there are two plans which reference each other.

The Western Lake Superior Area Maritime Security Committee (AMSC) is comprised of representatives from a variety of port related sources to continually assess security risks to the ports, determine appropriate risk mitigation strategies and develop, revise and implement the Area Maritime Security Plan. The AMSC also serves as a mechanism by witch security threats and changes in MARSEC Levels are communicated to port stake holders.

The Western Lake Superior Port Area Committee is a planning and preparedness organization. Individual members may have an oil and hazardous substance response role. The planning role is required by Sections 311(a)(18) and (j)(4) of the Clean Water Act (CWA) as amended. The Area Committee is mandated to prepare and submit for approval an Area Contingency Plan (ACP) which describes the strategy for a coordinated federal tribal, state and local response to a discharge or substantial threat of discharge of oil or a release or substantial threat of release of hazardous substances(s) within the boundaries of the coastal and inland area of Western Lake Superior.

Sector Three:
South Central St. Louis County Lakes Area

This sector is characterized in general by low density population. The landscape has a forest character and includes large portions of wetlands. Cities in this sector include the cities of Floodwood and Meadowlands. Flooding is a concern in the city of Floodwood and the immediate surrounding area. This sector also includes a portion of the Fond Du Lac Indian Reservation. Main transportation routes in this sector include Highway 53, Highway 2 and Highway 33 offering a connection to I-35. The St. Louis River drains into a large portion of this sector in the western half. The Cloquet River originates in the eastern half and drains the majority of that side of the sector and flows into the St. Louis River. This sector further includes three Minnesota Power reservoirs.

Sector Four:
West St. Louis County Iron Range Communities

This sector includes the cities of Hibbing, Chisholm, Kinney, Buhl and Mountain Iron and the surrounding townships. Hibbing, with a population of over 17,000, is the second largest community in the County. There is a County Courthouse and county offices in Hibbing.

Taconite mining, manufacturing and call centers are the primary economic activities in this area. Highway 169 is the primary transportation route through this sector. The Laurentian Divide runs through this sector. The taconite pellets are shipped out by rail. Iron World, a major tourist attraction interpreting the mining and cultural history, is located in this sector.

Sector Five:
Central St. Louis County Iron Range Communities

This sector includes the communities of Eveleth, Virginia, Gilbert, Biwabik, Aurora and Hoyt Lakes and the surrounding townships. Mining, manufacturing and a number of call center operations are the primary economic activities in this area. The City of Virginia further houses a number of county offices serving the northern half of St. Louis County. Main transportation routes include Highway 169 and Highway 53. The Laurentian Divide runs through this sector. The DWP railroad, which serves as an important international railroad connection, travels through this sector as well. The taconite pellets are shipped out by rail. The Giants Ridge Recreation Area serves as an important tourist attraction in this sector and includes a ski-hill and golf course.

Sector Six:
East St. Louis County Iron Range Communities

This sector includes the communities of Babbitt, Tower and Ely as well as a number of townships. It also includes the Lake Vermillion Section of the Bois Forte Reservation which includes the Fortune Bay resort complex. Portions of this sector are located within the Superior National Forest. Mining used to be an important part of the economic activity in this area, but currently there are no active mines. The LTV mine was recently closed, however there is potential for a precious metal mining operation in the future on this site or in its proximity. The area includes a large portion of public lands and is part of the Canadian Shield. The Laurentian Divide runs through this sector. Development predominantly is located on the lakes located within the area. The area experiences a great seasonal fluctuation in the number of residents. Road infrastructure is limited in this area. A significant number of properties in this sector are in remote locations and sometimes have water access only. The primary transportation routes are Highway 169, Highway 135 and Highway 1. These routes serve in general a more regional function. Provision of emergency services is a challenge in this area due to its low-density population, seasonal population fluctuations and remote character. Impacts from wildfire on residences are a concern in this area.

Sector Seven:
North St. Louis County

This sector includes the communities of Cook, Orr and Crane Lake as well as Pelican Lake and portions of Lake Vermilion. It further includes a small portion of Nett Lake, which is part of the Boise Forte Reservation. This area is similar in characteristics as section six. Population densities are low in general and a large number of seasonal residences are located on the lakes within the area. The emergency response districts are geographically spread out and many properties are located in remote areas with limited access. Wildfire is a concern in this area. Other concerns include the potential for derailments on the DWP railroad and chemical spills in the communities of Orr and Cook where the location of emergency services poses logistical challenges in case of an event within these communities. In the city of Cook, flooding of the Little Fork River is a concern. Primary economic activities are logging and wood producing industries as well as tourism.

Sector Eight:
Boundary Waters Canoe Area Wilderness and Voyageurs National Park

This sector includes a Federal designated wilderness area and a national park. The primary functions of these areas are wilderness and recreation. In general, natural processes such as wildfires are not being interfered with but rather are monitored to ensure populated areas outside these areas are not negatively impacted. The BWCAW does not allow motorized access with a few small exceptions on the large border lakes. This impacts the ability to respond to emergencies or wildfires within the area. Exceptions can be made only for special circumstances. The BWCAW and Voyageurs National Park straddle the Canadian Boundary. Customs and Immigration monitor this area through the International Borders Enforcement Team (IBET). The recent terrorism concerns have increased the need to monitor this area.

4.3 Hazard Priority Rating and Vulnerability Assessment

Tables 4.1 and 4.2 provide a summary of the priority rating of hazards for each of the eight sectors. This data was collected for the 2005 plan and remains unchanged for the 2012 update.

A survey tool was developed, modeled after surveys from other county hazard mitigation plans. This was prior to the availability of a newer MN HSEM survey tool. The HSEM tool will be used for the next update.

Table 4.2: Natural Hazards-Priority Rating by Sector (2005)
St. Louis County

Hazard Type	County Priority	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8
Flooding	Low	Moderate (Duluth)	Low	Moderate Floodwood, Meadowlands and Cotton	Moderate (Hibbing-Chisholm storm water related)	Moderate	Low	Moderate (City of Cook)	Low
Drought	Low	Low	Low	Low	Low	Low	Moderate (Fire Concern)	Moderate (Fire Concern)	Moderate (Fire concern)
Wildfire	High	Moderate (for rural areas in one)	Low	Moderate	Moderate	Moderate	High (Some blow down)	High (Some blow down)	High (Blow down area)
Extreme Temperatures	Low (Dry hot weather concern for fire danger, Cold temperatures with no snow cover a concern)	Low	Low	Low	Low	Low	Low	Low	Low
Winter Storms	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Summer Storms	Moderate (Windstorms associated with powerful thunderstorms greatest concern)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate (Warning time a concern due Doppler Radar limitations)	Moderate (Warning time a concern due Doppler Radar limitations)
Earthquake	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
Solar Storm	Low (Most residents and businesses are prepared to deal with power interruptions)	Low	Low	Low	Low	Low	Low	Low	Low

Source: St. Louis County

Table 4.3: Technological Hazards (Human Caused) Priority Rating by Sector (2005)
St. Louis County

Hazard Type	County Priority	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Sector 8
Terrorism	Low	Moderate	Moderate	Low	Low	Low	Low	Low	Low
Fire	Moderate (longer response times in rural more remote areas)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low
Wastewater Treatment Facility Failure	Moderate	High (Duluth Collection System and WLSSD)	High (WLSSD located on St. Louis River)	Low	Moderate (Aging Infrastructure)	Moderate	Low	Low	Low
Dam Failure	Low	High (Thomson Dam, Fond du Lac, Fish Lake, Hartley Pond probability low)	None	High (Island Lake probability low)	Low	Low	Low	Low	Low
Infectious Diseases	Low	Moderate (Major Population Concentration)	Moderate (Related to shipping activities and population))	Low	Moderate	Moderate	Low	Low	Low
Water Supply Contamination	Low	Moderate (Impacts on major population Center)	Low	Low	Moderate (Population Concentration)	Moderate	Moderate	Low	Low
Hazardous Materials	Moderate	High	High	Moderate	Moderate	High (Rail and Highway 53 corridors)	Moderate	High (Orr and Cook Railroad Incidents, Hwy 53)	Low
Radiological	Low	Low	Low	Low	Low	Low	Low	Low	Low

Source: St. Louis County

Table 4.34: 2012 Natural Hazards-Priority Rating County-Wide in Next Five (5) Years
St. Louis County

Hazard	Low	Medium	High	Response Count
Severe rain storm	6	25	20	51
Hail storm	7	29	14	50
Lightning	4	29	17	50
Wind storm	3	29	19	51
Winter storm (blizzard)	1	18	**31**	50
Ice storm	6	20	**24**	50
Extreme heat	25	21	4	50
Extreme cold	5	24	21	50
Flood	29	17	5	51
Drought	20	16	12	48
Tornado	29	19	1	49
Wildland fire	9	20	**23**	52
Disease outbreak	32	13	1	46

Source: St. Louis County

The natural hazards that rated highest risk in the risk assessment survey are winter storm (blizzard), ice storm and wildland fire. It should be noted that almost all wildland fires in Minnesota are caused by people.

Table 4.5: 2012 Technological Hazards (Human)-Priority Rating County-Wide in Next Five (5) Years
St. Louis County

Hazard	Low	Medium	High	Response Count
Chemical spill	32	17	5	54
Biological	46	5	3	54
Radiological	53	1	0	54
Nuclear	54	0	0	54
Explosives	45	8	1	54
Terrorism	47	4	3	54

Source: St. Louis County

The human-caused hazards that rated highest risk in the risk assessment survey are chemical spill, biological and terrorism. These results indicate that human-caused hazards are of minimal concern in St. Louis county. Most risk is likely related to the mining industry, transportation of hazardous materials by rail and truck and the active port and rail yard in Duluth.

4.4 Natural Hazards of Specific Concern

Flooding in general is low to medium concern in St. Louis County and damages from flooding events in general have been limited. Three areas have ongoing concern relating to flooding and these include the cities of Duluth, Floodwood and Cook (Sectors 1, 3 and 7). Flooding is primarily a concern during the spring snowmelt combined with rain and faster run-off due to poor drainage as a result of frozen ground.

Concerns for Floodwood include the need for better mapping of flood zones in order to prevent future development from taking place in potentially flood prone areas. Floodwood also has a need to relocate and mitigate existing flood prone structures. The majority of the City of Cook is within the flood zone (See Map 2.4 Appendix C). For the City of Cook a mitigation plan was developed using retention ponds to slow down the flow of water. This plan has not been able to be implemented because some of the properties needed for the retention ponds could not be acquired.

Some of the Iron Range communities (Sectors 4 and 5) have flooding concerns which are a combination of storm water related and poor drainage during extreme rain storm events.

Flash flooding is a concern in areas, such as Duluth, where heavy rain and runoff fills and overflows streambeds. Parts of the County were declared disaster areas and suffered significant damage due to a June 2012 storm.

Throughout the county localized flood damage to road infrastructure is an ongoing concern during extreme summer storm events and spring snowmelt. Danger to motorist related to road outwashes and people being stranded are a concern.

Severe storms can impact all sectors in St. Louis County. Severe winter storms can pose risks for certain population groups living in the more remote parts of St. Louis County. The population in these areas may have some delays in getting roads cleared. Power may be interrupted for a period of time. However, in general, populations living in more remote areas are well prepared with extra food and water and back-up heat available. Winter travel can be a concern during severe storms and cold weather. Ongoing education on the importance of winter storm preparedness can help ensure risks are limited.

Severe thunderstorms producing straight-line winds can cause significant damage. Downed timber, debris clearance, infrastructure damage to roads and power lines and loss of business amounted to the greatest losses as a result of this storm. St. Louis County does experience low intensity tornadoes that can cause localized damage. Large waves as a result of strong Nor'easter storms on Lake Superior can damage the shoreline and infrastructure such as the Lakewalk in Duluth.

Older residents in rural areas sometimes have challenges in the aftermath of severe storms. They sometimes have limited options to clear snow or debris and ongoing medical needs may be a concern as well. Education and personal preparedness are important tools to reduce risks.

Wildland fire presents risk of damage to forest resources, property and lives across the County. Wildland fire is a natural part of the Northern Minnesota forest ecosystem. The current risk of a large wildfire in northeast St. Louis County is a result of insect and disease damage to certain tree species and aging forest resulting in heavy fuel loading. The sectors where wildfire is a primary concern are 3, 4, 5, 6, 7 and 8. However, any wildland urban interface area has risks. Spring grass fires along railways are a concern for rural townships.

Estimating potential losses due to wildfire is difficult. Losses depend on the size of the fire, the area through which it burns, weather conditions and the speed at which it moves. The FEMA 386-2 Understanding Your Losses Manual does not offer standards for calculating potential losses to structures or content due to wildfires. The wildland fire hazard rating form included in this manual does not provide a very applicable methodology to rate the risk of wildland fire hazard for properties, as development tends to be scattered in low densities interspersed with larger sections of public lands. Northeastern St. Louis County has the greatest risk of larger scale wildland fires impacting residences. Average prices for residences in the rural areas are between $150,000 and $250,000 with lake properties being on the higher end of this price range. However, in some cases lake properties may be at lower risk from wildland fire. Further, a large-scale fire in the BWCAW could impact visitors in this area.

4.5 Human Caused Hazards of Specific Concern

Terrorism and technological hazards caused by humans have historically been a low risk in St. Louis County. With increased concerns regarding terrorism, Sectors 1 and 2 are most vulnerable as these two sectors hold the main population concentration and include the Duluth-Superior Port, the Duluth International Airport and National Guard Airbase, as well as a number of local, state and federal government offices. Other potential targets include electric power facilities and lines, and oil and gas transportation and distribution lines traversing the County. The remote border with Canada, Sector 8, may pose challenges related to monitoring illegal entry into the U.S.

Hazardous materials and chemical spills pose the greatest concerns in relation to impacts on the population. Concerns are in all sectors that include major transportation routes or concentrations of businesses that use chemicals. Sectors of particular concern include Sectors 1 and 2 where most of the population and commercial shipping activity is located. Sector 7 also has two areas of concern; the communities of Orr and Cook, where chemicals transported by rail may pose risks to the population and where the location of rail and emergency response infrastructure may pose challenges to respond to a major incident. Highway 53 is a major transportation corridor and chemicals transported on this road continue to be a concern.

SECTION FIVE:

St. Louis County Goals, Objectives and Strategies

SECTION 5: GOALS, OBJECTIVES, AND STRATEGIES

5.1 Introduction

Section five discusses the vision, goals, objectives, and strategies and outlines an implementation strategy. The goals, objectives, and strategies are listed in a matrix format for each hazard. To facilitate implementation, the strategies have been rated whether they are a high, medium, or low priority. An updated project timeline and a list of responsible parties have been identified for each goal, objective, and strategy.

5.2 Goals, Objectives, and Strategies

For each hazard, the plan presents a goal that reflects the desired end condition to be achieved as part of this plan. For each goal, measurable objectives have been identified. Finally, implementation strategies are identified for each objective, and where appropriate, stakeholders that need to be involved. Goals and objectives provide a long-range perspective and tend to remain the same over time. Strategies will change over time as projects are completed, needs change and opportunities arise.

Implementation of strategies and decisions about mitigation projects will largely occur at the local level. Tribal, city and township governments have the best understanding of the risks, needs and capacity for their residents and visitors.

In the chart that follows, the "Implementation" column indicates which jurisdiction will likely participate in the strategy. For some specific or unique strategies, one or more jurisdictions may be named. For strategies that indicate implementation will include all jurisdictions in St. Louis County, it is assumed that all cities, townships and tribal governments have an interest and probability of participation.

5.3 Hazard Mitigation Vision

For the 2005 plan, the Planning Team agreed upon a vision for all hazard mitigation strategies that unifies the goals, objectives, and strategies. The vision remains the same for this update. The vision statement reads:

"St. Louis County will strive to work on an ongoing basis on identifying risks and the development of programs and partnerships at the local, state, tribal, and federal level that reduce risks and damages as a result of natural, technological, and human caused hazards and will strive to make St. Louis County and the region a safer place to live."

5.4 Implementation and Review

The St. Louis County All Hazard Mitigation Plan is a "living document." The plan should at a minimum be reviewed every five-years. The matrix included in this chapter functions as the primary tool to review progress on the implementation of the St. Louis County All Hazard Plan. St. Louis County Emergency Management Coordinator will initiate and lead meetings on a regular basis to monitor plan implementation progress and to reassess needs and opportunities.

A plan monitoring workgroup with representatives that reflect the planning team that assisted in the development of this plan and includes representatives from the various County Departments will be implemented. Beginning in 2014, this will be done annually during the third quarter and/or in response to funding cycles of programs that provide resources for hazard mitigation activities. Additional meetings will be held following any significant hazard event. Participants will include representatives from St. Louis County departments including Planning and Community Development, Public Health and Human Services, Land and Minerals, Public Works and the County Board. Additional stakeholders, including members of the public, will be included based on need. The review or an update of the plan could be an agenda item on an annual basis at a regularly scheduled County Board meeting. Distribution of the plan and ongoing posting on the County website will promote implementation.

Plan updates will be the responsibility of the St. Louis Sheriff's Office Emergency Management staff. The update process will be managed by the Emergency Management Coordinator. The planning process, data collection, draft and layout will be contracted, as it has been in the past.

Contracted planners will be St. Louis County staff members if available. If more appropriate, qualified planning consultants will be hired under contract to complete the process according to specifications.

5.5 Implementation Tools

A number of implementation tools are available to address and mitigate hazards. Many of these tools are identified in the matrix, however, in some cases additional discussion is needed in order to identify what strategies are most appropriate. One tool that local jurisdictions might use is the FEMA Evaluating Alternative Mitigation Actions – STAPLEE Worksheet. This will be part of an ongoing discussion as the County and communities look for opportunities for plan implementation. The following tools should be considered:

- **Education:** In many cases education of residents has been identified as one of the most effective mitigation strategies. St. Louis County is a large rural county with low population densities. This limits the ability to provide services and increases the responsibility residents have to prepare for natural and man caused hazards.
- **Capital Investments:** Capital investments such as fire and ambulance equipment, sprinkler systems and dry fire hydrants are tools that can limit risks and impacts of natural and human caused hazards.
- **Cost-Benefit Review:** Whenever a project is planned, an analysis of cost-benefit should be completed. Using this tool assures that funds spent and resources used are of value in the long term in relation to the results expected and the property and lives protected.
- **Data Collection and Needs Assessments:** Data collection and needs assessments can aid in gaining a better understanding of threats and promote planning for mitigation strategies accordingly. Evaluation and data collection is likely to be an ongoing activity as resources become available.
- **Coordination:** Responsibilities for implementation of mitigation strategies run across various county departments, local fire and ambulance departments, tribal, city and township governments, and several state and federal agencies. Ongoing coordination is important to ensure resources are used efficiently. Coordination can help to avoid duplication of efforts or prevent gaps that are created if roles and responsibilities are unclear. The mitigation plan review process can function to promote and facilitate ongoing discussion about roles and responsibilities and opportunities for coordination.
- **Ongoing Integration:** Integration of mitigation data, information, goals and strategies into planning documents and mechanisms are the responsibly of various county departments, local fire and ambulance departments, tribal, city and township governments and state and federal agencies.
- **Regional Cooperation:** Counties and public safety services providers throughout the Arrowhead Region often share similar challenges and opportunities. In some cases a regional approach to mitigation strategies may be warranted in order to save resources. Mutual-aid agreements are already in use for a number of services. Needs assessments for fire and ambulance services and development of assistance for volunteer recruiting, training, and retention could benefit from a regional approach. Cooperation between counties could be effective when lobbying for certain funding priorities that address concerns related to challenges in service delivery in rural areas. Organizations such as the Arrowhead EMS, Arrowhead Regional Development Commission and the State Regional Emergency Coordinator offer tools and resources to assist in these cooperative efforts.
- **Regulation:** Regulation is an important mitigation tool for St. Louis County. Regulation is particularly important for land use, access to structures and the protection of water resources and public health.
- **Key Contacts:** Maintain communication with a key contact person at each city, reservation and township to monitor project implementation. Consult with planning team members as appropriate.

5.6 Chart

Priority:
1=High, 2=Medium, 3=Low

Timeframe:
Short-term = 0-1 years, Mid-term = 2-4 years, Long-term = 5 years+, Ongoing = Continue Existing Program(s)

Cost Benefit Analysis: The Cost Benefit Analysis survey tool should be used as appropriate.
Funding: Funding sources will be related to individual projects and the entities involved. Possible sources include, but are not limited to: Federal funding including FEMA and the US Dept of Housing and Urban Development, State funding including the Dept. of Natural Resources, Board of Soil and Water Resources, Iron Range Resources and Rehabilitation Board and Clean Water Legacy Funds, St. Louis County, Cities and Towns, North St. Louis Soil and Water Conservation District, South St. Louis Soil and Water Conservation District, Arrowhead Regional Development Council, Northland Foundation, Blandin Foundation, Community Foundations, and United Way.
Ongoing Integration: Integration of mitigation data, information, goals and strategies into planning documents and mechanisms are the responsibility of various county departments, local fire and ambulance departments, tribal, city and township governments and state and federal agencies.

NATURAL HAZARDS

1. VIOLENT STORMS AND EXTREME TEMPERATURES

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 1.1: Residents are aware of locations of storm shelter facilities.				
OBJECTIVE 1.1.1: Residents, business owners and local leaders will have/receive information on locations of storm shelters and under what conditions they should use them.				
STRATEGIES				
1) Use State Severe Weather Awareness Week to educate St. Louis County residents and visitors on safety during strong summer storms.	1		St. Louis County, State, NOAA, City of Duluth, Bois Forte Band of Chippewa	1) Ongoing
2) Use local publications to educate St. Louis County residents and visitors on safety during strong summer storms.	3		Bois Forte Band of Chippewa	1) Mid-term
3) Work with campground operators to post information regarding storm shelters and safety during severe storms on bulletin boards.	1		St. Louis County, campground operators, City of Duluth	1) Ongoing
4) Continue County Health Department licensing requirement shelters for mobile home parks.	1		St. Louis County Health Department	1) Ongoing
5) Regularly update information about storm shelters and assure it is communicated to the affected residents, visitors and community leaders.	2	Developed a GIS database of storm shelters	St. Louis County Health Department, mobile home park operators, Townships, City of Duluth, Bois Forte Band of Chippewa	1) Ongoing

GOAL 1.2: Residents and visitors will have ample and effective advance warning of approaching severe weather.				
OBJECTIVE 1.2.1: Each emergency personnel member is trained and able to recognize approaching severe weather and know how to respond to notifications of approaching severe weather.				
STRATEGIES				
1) Ensure storm spotters in St. Louis County receive training on a regular basis in order to maintain their storm spotting skill level.	1	Skywarn training is offered annually at a minimum of two locations in the County.	National Weather Service, Emergency Manager, Sheriff's Department local Fire and EMS Departments, City of Duluth	1) Ongoing
2) Ensure procedures are in place so that area emergency management personnel, county sheriffs, and other emergency response teams are notified as soon as possible in the event of an approaching storm.	1		National Weather Service, Emergency Manager, Sheriff's Department local Fire and EMS Departments, City of Duluth, Bois Forte Band of Chippewa	2) Ongoing
OBJECTIVE 1.2.2: Residents and visitors receive ample and timely warning of approaching severe weather.				
STRATEGIES				
1) Install strategically located signage along roadways informing people about emergency information radio frequency.	3		Emergency Manager, Highway Department, School Districts, businesses	1) Mid-Term
2) Promote the use of NOAA weather radios for weather related emergency information during storm awareness weeks.	1	NOAA weather radios provided to schools in the County; provided by NOAA and distributed by the Duluth office of the National Weather Service. Implemented and completed in 2007.	Emergency Manager, City of Duluth	2) Ongoing
3) Assure the functionality of warning systems for the areas with warning systems in place.	2	Duluth has installed a new siren/voice warning system. Duluth and the National Weather Service has implemented an elaborate warning system for Rip Currents in Lake Superior.	Emergency Manager, local units of government including Hibbing, Chisholm, Moutain Iron, Virginia, Gilbert, Aurora, Hoyt Lakes, Babbit, Ely, Duluth, Floodwood.	3) Mid-Term

GOAL 1.3: Residents are aware of and prepared for potential for extended periods of extreme hot or cold temperatures.				
OBJECTIVE 1.3.1: All education materials and programs for extreme temperatures are accurate, up to date and proven to be effective.				
STRATEGIES				
1) Participate in the winter storm awareness program.	1		County Emergency Manager, State, School Districts, County Departments, Municipalities, City of Duluth	1) Ongoing
2) Expand information on risks of heat related illnesses available to residents, especially the elderly and people who participate in physically strenuous activities.	2		County Emergency Manager, State, School Districts, County Departments, Municipalities, City of Duluth, Bois Forte Band of Chippewa	2) Mid-term
3) Assure there are current information and delivery systems in place related to extreme temperatures.	2		County Emergency Manager, State, School Districts, County Departments, Municipalities, City of Duluth	3) Mid-term

GOAL 1.4 Residents have access to safe shelters as needed during violent storms or periods of extreme temperatures.				
OBJECTIVE 1.4.1: All locations where shelters are needed are identified and current shelter locations are in the County GIS database.				
STRATEGIES				
1) Update and maintain a database of shelters including capacity and features such as air conditioning and back-up power.	3	Developed a GIS database of storm shelters.	County emergency managers, all jurisdictions in St. Louis County, Red Cross, City of Duluth. St. Louis County Planning and Community Development Department	Long-term
2) Assure shelter is available to residents and visitors based on geographic distribution and will meet needs including features such as pre-wiring for generator power and provision of air conditioning.	3	St. Louis County has been awarded a grant to update the shelter and capabilities list. The survey work is being implemented in 2012.	All jurisdictions in St. Louis County, County emergency managers, all local units of government, Red Cross, City of Duluth, Bois Forte Band of Chippewa	Long-term
3) Build and/or maintain storm shelters for residents and visitors who are vulnerable because such shelter is not available such as in their homes, cabins or camping facilities.	1		All jurisdictions including cities, tribal governments and townships. Owners of private resorts, campgrounds, camps and mobile home parks. City of Duluth.	Long-term

2. FLOOD				
GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 2.1: Transportation infrastructure is resilient to flooding events and potential damage is minimized				
OBJECTIVE 2.1.1: Identify routes with limited detour options and assure they will have zero to minimal damage in the case of a flood.				
STRATEGIES				
1) Maintain bridge, road, and culvert infrastructure at a level that is capable of sustaining a major storm event and will not be vulnerable to washouts.	1		St. Louis County Public Works Department, City of Duluth, Bois Forte Band of Chippewa	Ongoing
2) Incorporate vulnerability of infrastructure and population put at risk when setting funding priorities for infrastructure projects.	1		St. Louis County Public Works Department, City of Duluth, City of Chisholm	Ongoing
3) Address ice dams that may impact the road system in a timely manner in order to prevent damage to infrastructure, in particular during the spring thaw.	1		St. Louis County Public Works Department, City of Duluth	Ongoing
4) Steer development away from areas that may be difficult to serve with reliable road access.	1		St. Louis County Planning and Community Development Department, Public Works, City of Duluth, Bois Forte Band of Chippewa	Ongoing
5) Assure access for residents and emergency vehicles during and after flood events.	1		St. Louis county Planning and Community Development Department, Public Works, City of Duluth	Ongoing

GOAL 2.2: Land areas that have flood risk will not be developed.				
OBJECTIVE 2.2.1: All areas with flood potential are identified and in the County GIS database.				
STRATEGIES				
1) Ensure floodplain maps are accurate and current.	1		DNR, City of Floodwood, City of Meadowlands, City of Duluth, St. Louis County Planning and Community Development Department, City of Proctor	Mid-term
2) Maintain effective communication with MN DNR Waters and FEMA.	1		DNR, City of Floodwood, City of Meadowlands, City of Duluth, St. Louis County Planning and Community Development Department, City of Proctor	Ongoing
3) Make use of GIS capability to estimate potential damage and estimate cost.	2		St. Louis County Planning and Community Development Department, City of Proctor	Ongoing
OBJECTIVE 2.2.2: All current shoreland management standards are enforced.				
STRATEGIES				
1) Maintain and facilitate an effective zoning process for shoreland management.	1		St. Louis County Planning and Community Development Department, DNR, local units of government with shorelands within their jurisdictional boundaries including Cities of Duluth, Hibbing, Chisholm, Biwabik, Virginia, Ely, Mountain Iron, Proctor	Ongoing
2) Enforce all shoreland management standards.	1		St. Louis County Planning and Community Development Department	Ongoing

OBJECTIVE 2.2.3: Identify mitigation solutions in areas known to have flooding potential.				
STRATEGIES				
1) Identify flood mitigation solutions for high risk communities.	1		All Jurisdictions in St. Louis County, DNR flood mitigation program	Long-term
2) Property acquisition of homes with repeated flood risk.	1		All jurisdictions in St. Louis County, City of Duluth, City of Floodwood, City of Cook, City of Chisholm, City of Hibbing	Short-term
3) Repair, restore and stabilize shorelines of streams, rivers and lakes.	1		All jurisdictions in St. Louis County, MN DNR, City of Duluth	Mid-term
GOAL 2.3: Flooding due to storm water is prevented.				
OBJECTIVE 2.3.1: Establish and implement storm water management policies and practices.				
STRATEGIES				
1) Identify areas in watersheds that may be vulnerable for increased flooding as a result of development that changes peak run-off regimes.	3		DNR, BWSR, NEMO, MPCA, SWCD (North and South) local units of government responsible for storm water management including Cities of Duluth, Hermantown, Hibbing, Chisholm, Mountain Iron, Virginia, Aurora, Proctor	Long term
2) Ensure that current storm water management guidelines are adequate to limit post development run-off and will not result in storm water run-off created flood damages.	2		Local units of government, Planning and Zoning Authorities, City of Duluth, City of Proctor, Bois Forte Band of Chippewa	Mid Term

OBJECTIVE 2.3.2: Flooding that results from beaver dams are addressed in a timely manner.				
STRATEGIES				
1) Identify and address beaver problem areas.	3		DNR, Local Units of Government	Ongoing
2) Maintain effective communication with MN DNR.	3		St. Louis County, City of Duluth	Ongoing
OBJECTIVE 2.3.3: Locate and correct/maintain infrastructure that may pose flooding risk by functioning as a dam.				
STRATEGIES				
1) Work with right of way owners to address ditch and drainage maintenance concerns	2		Local units of government public works and highway maintenance departments	Ongoing

3. INFECTIOUS DISEASES

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 3.1: The threat and spread of infectious diseases are minimized.				
OBJECTIVE 3.1.1: Effective programs are in place, implemented, supported and maintained to keep residents and visitors safe from infectious diseases.				
STRATEGIES				
1) Secure adequate resources to ensure an effective public health system is in place to identify and respond to outbreaks of infectious diseases.	2	Implemented beach advisories related to contamination with additional emphasis on dissemination of information.	St. Louis County Board, St. Louis County Health Department, Bois Forte Band of Chippewa	Ongoing
2) Ensure that the St. Louis County Emergency Operations Plan (EOP) is reviewed as needed in order to effectively respond to a disease outbreak.	2	Annual update of the County Emergency Operations Plan, including review of infectious diseases.	St. Louis County Health Department, St. Louis County Emergency Manager, City of Duluth, Bois Forte Band of Chippewa	Ongoing
3) Educate residents about available resources and who to contact in case of an emergency.	1		St. Louis County Health Department, City of Duluth	Ongoing
4) Develop and promote a beach testing program for recreational beaches on inland lakes.	3		St. Louis County Health Department, City of Duluth	Ongoing
5) Promote public information programs regarding beach closures	1		St. Louis County Health Department, City of Duluth	Ongoing

4. WILDLAND FIRE				
GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 4.1: Property damage is minimized and there are zero injuries or deaths as a result of wildfire.				
OBJECTIVE 4.1.1: All residents know how to minimize risk of property damage and prevent injury or death due to wildfire.				
STRATEGIES				
1) Educate area residents through the FireWise Program.	1	Developed and distributed materials to promote Firewise safety and emergency management safety tips under the Secure Rural Schools Title III grant. Fire danger signs installed in Embarrass, Greenwood, Eaglesnest and Colvin Townships.	St. Louis County Emergency Management, St. Louis County Land and Minerals Dept.,DNR FireWise Program and local fire departments, City of Duluth, Bois Forte Band of Chippewa	Ongoing
2) Identify and work with communities to achieve official Firewise Community Status.	1		USFS, Local governments, communities identified in CWPP	Ongoing
3) Educate and inform landowners about fire prevention related to tree and shrub species, replanting and defensible space.	2		USFS, Soil and Water Conservation Districts	Short-term
4) Identify and map high risk and high hazard areas on non-federal lands using GIS technology.	1		DNR, St. Louis County Planning and Community Development Dept., St. Louis County Land and Minerals Dept., Local governments	Ongoing

OBJECTIVE 4.1.2: Residents receive prompt and effective communication in the event of any large-scale wildfire.				
STRATEGIES				
1) Update and maintain communications plans and public information systems.	1	Developed the Community Wildfire Protection Plan (CWPP) with the USFS, MNDNR, Fire Departments, Fond du Lac Band, Bois Fort Band the St. Louis County Land Department and the St. Louis County Sheriff's Office.	St. Louis County, Emergency Managers, Fire Departments, USFS, and DNR, City of Duluth, City of Ely, City of Tower	Ongoing
2) Update and develop evacuation plans for high risk communities and rural areas.	1		St. Louis County, USFS, Local governments, City of Ely, City of Tower	Ongoing

OBJECTIVE 4.1.3: Each property has proper access, egress and water resources relative to wildfire suppression.				
STRATEGIES				
1) Identify areas where firefighting capacity is lower because of limited availability of water	1	Identified capabilities, resources and areas of concern for each fire department in the CWPP.	Local Fire Departments, City of Duluth	Mid-term
2) Installation dry fire hydrants or water holding tanks at strategic locations.	1	Received grant and implemented a wildfire sprinkler project for eligible homeowners and businesses.	City of Duluth	Mid-term
3) Coordinate and ensure that new development will have adequate access and egress for emergency response vehicles.	1	Installation of updated 9-1-1 signage for some landowners under the Secure Rural Schools Title III grant.	St. Louis County Planning & Community Development Department, Local Fire Departments, City of Duluth	Ongoing
4) Install sprinkler systems at high risk homes and businesses.	1		St. Louis County,Bois Forte Band of Chippewa	Short-term
5) Identify areas on public and private property where fuel reduction is needed and develop effective fuel reduction programs.	1		USFS	Ongoing
6) Identify, develop and maintain strategically located Safety Zones in high risk areas to assure resident and visitor safety.	1		USFS, Local governments	Ongoing
7) Install metal roofing on high risk homes and businesses.	1		St. Louis County, All jurisdictions in St. Louis County	Ongoing

OBJECTIVE 4.1.4: Effective inter-agency and multi-jurisdiction efforts are in place and employed to prevent, identify, contain and extinguish wildfires.				
STRATEGIES				
1) Continue inter-agency training efforts.	1		USFS, DNR, Local Fire Departments	Ongoing
2) Continue to involve residents of at risk communities in planning efforts.	1		USFS, DNR, City of Ely, City of Winton, City of Tower, City of Babbitt, City of Duluth	Ongoing
3) Develop and implement protocol to warn fire departments of high-risk fire days to ensure adequate staff is on hand.	1	Cooperative protocol in place with St. Louis County Dispatch and MN DNR	USFS, DNR, Local Fire Departments	Short-Term
4) Assure effective forest management and wildland fuels management practices.	1	Identified area of high risk for wildland fires. Implemented chipping projects to eliminate fuels in highest risk areas.	US Forest Service, St. Louis County Emergency Management, MN DNR, Fire Departments, St. Louis County Land and Minerals Dept.	Ongoing
5) Recruit and train firefighters to assure adequate fire response capacity.	1		Local fire departments, City of Chisholm	Ongoing
6) Update and implement the Community Wildfire Protection Program	1		USFS	Mid-term
7) Collaborate on landscape level fuels reduction and forest management.	1		USFS, MN DNR, St. Louis County, all local jurisdictions	Ongoing
8) Explore and develop biomass options to lower costs when implementing fuels reduction.	2		USFS	Ongoing

TECHNOLOGICAL HAZARDS

5. DAM FAILURE

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 5.1: All dams are maintained to assure safety for residents and to prevent property damage.				
OBJECTIVE 5.1.1: State and Federal dam safety programs are implemented.				
STRATEGIES				
1) Work with state and federal agencies, local jurisdictions, and private parties to ensure dams are structurally sound, maintained and functioning properly.	3	Minnesota Power provides St. Louis County with annual updates and revisions to their emergency action plan.	Dam Operators in St. Louis County, City of Duluth, Mining Companies with tailings ponds	Ongoing
2) Work with the Department of Natural Resources (DNR) dam inspection program using their technical expertise to identify risks and develop solutions for at-risk dams.	3		Dam Operators in St. Louis County, City of Duluth	Ongoing
GOAL 5.2: Residents are aware if and how they may be impacted as a result of a dam failure.				
OBJECTIVE 5.2.1: Educate all residents who are at risk of impacts in the case of a dam failure.				
STRATEGIES				
1) Identify populations and property at risk in case of a dam failure.	2		Dam Operators in St. Louis County, St. Louis County 911, DNR and Federal Dam safety programs, City of Duluth	Mid-Term
2) Inform property owners in these areas of potential risks, what warning systems are in place and the proper response in case of dam failure.	2		Dam Operators in St. Louis County, St. Louis County 911, DNR and Federal Dam safety programs, City of Duluth	Mid-Term
3) Assure adequate warning systems are in place.	2		Dam Operators in St. Louis County, St. Louis County 911, DNR and Federal Dam safety programs, City of Duluth	Mid-Term

6. HAZARDOUS MATERIALS

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 6.1: Personnel are trained and equipment prepared to handle hazardous materials events.				
OBJECTIVE 6.1.1: Data and information on what and where hazardous materials are located in or are moved through the County is accurate and up to date.				
STRATEGIES				
1) Maintain current information on hazardous materials that typically travel through St. Louis County.	3		Emergency Managers, MN Dept. of Transportation, City of Duluth	Mid-term
2) Maintain communication with MN-DOT, MN State Patrol and U.S. Customs regarding hazardous material transportation.	3	Implemented in 2011, the county requests DOT Hazardous Materials Guidebooks from the State of MN, which is published every four years. Guides are distributed to local fire departments, EMA, law enforcement, public works, emergency managers and others.	Emergency Managers and Minnesota Pollution Control Agency, US Coast Guard, City of Duluth, Coast Guard MSU Duluth	Ongoing
3) Continue to work with MPCA, MN Division of Homeland Security and Emergency Management (EPCRA) to identify and map all fixed hazardous materials sites within St. Louis County.	3	The Emergency Operations Plan (EOP) is updated regarding hazardous materials in the county. Data from hazardous materials reports to the State of MN and other agencies provide the county with an updated inventory of extremely hazardous substances (EHS) that are used in the county. The facilities with EHS materials are noted in the EOP.	Emergency Managers, Minnesota Pollution Control Agency, Local Governments, HSEM/EPCRA, City of Duluth	Ongoing

4) Disseminate information to all affected local units of government.	3	Annual Pipeline Safety Training is available county-wide to all fire, EMS, 911 dispatchers and others. Companies may visit emergency management and law enforcement annually to review their respective distribution system and response plans.	City of Duluth, US Coast Guard, Western Lake Superior Area Maritime Security Committee, Western Lake Superior Port Area Committee	Ongoing
5) Improve safety where railroads intersect with roads and trails.	1		City of Orr	Ongoing
OBJECTIVE 6.1.2: Effective policies and programs are implemented to assure the county is prepared with personnel and equipment to handle hazardous materials events.				
STRATEGIES				
1) Participate in regional exercises that test local plans and interaction between agencies, including the Minnesota Incident Command Center.	1		Local fire and emergency response departments, St. Louis County Sheriff's Office, City of Duluth, US Coast Guard, Western Lake Superior Area Maritime Security Committee, Western Lake Superior Port Area Committee	Ongoing
2) Provide drop off locations or pick up times for resident hazardous waste.	2		Townships, all local jurisdictions	Ongoing

7. FIRE – URBAN AND STRUCTURE

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 7.1: Property damage is minimized and there are zero injuries or loss of life due to structure fires.				
OBJECTIVE 7.1.1: Residents have current and thorough knowledge about fire prevention and safety.				
STRATEGIES				
1) Support educational programs that stress fire prevention.	2		Fire Departments, Emergency Managers, City of Duluth	Ongoing
2) Educate residents about the need to have a personal fire emergency plan.	2		Fire Departments, Emergency Managers, City of Duluth, Bois Forte Band of Chippewa	Ongoing
OBJECTIVE 7.1.2: Volunteer fire departments have adequate equipment and resources to provide needed fire protection.				
STRATEGIES				
1) Develop regional partnerships to assist volunteer fire departments to recruit, train, and retain volunteer firefighters to ensure adequate staffing for response to fires, to conduct inspections and to provide education programs.	1		Arrowhead EMS, St. Louis County Sheriff's Office, Fire Departments, City of Duluth, Bois Forte Band of Chippewa	Short-term
2) Recruit and train firefighters to assure adequate fire response capacity.	1		All local fire departments, City of Chisholm	Ongoing
OBJECTIVE 7.1.3: Infrastructure required for effective firefighting is in place and maintained.				
STRATEGIES:				
1) Coordinate between local Fire Chiefs and St. Louis County Land Use Planners to ensure properties have good access and egress.	1		Fire Departments, St. Louis County Planning and Community Development, City of Duluth	Ongoing
2) Identify areas that have limited water availability for firefighting and continue to strategically place dry fire hydrants or water holding tanks.	1		Fire Departments, St. Louis County Public Works, City of Duluth, Bois Forte Band of Chippewa	Mid-term

8. WATER SUPPLY CONTAMINATION

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 8.1: Residents and visitors have safe, high quality drinking water.				
OBJECTIVE 8.1.1: High quality drinking water resources are protected.				
STRATEGIES				
1) Work with the MN Department of Health to develop wellhead and source water protection plans.	1		St. Louis County Planning and Community Development Dept., Municipal Water Providers, St. Louis County Public Health and Human Services Department, MN Department of Health, City of Duluth, Bois Forte Band of Chippewa	Ongoing
2) Provide individual well water testing to St. Louis County residents.	1	The County has provided well-testing kits to households for use after the June 2012 flood event.	St. Louis County Health Department, City of Duluth	Ongoing
3) Assure water and wellhead protection is addressed with railroad.	1		City of Orr	Ongoing
4) Monitor water and wastewater lines, including televising options.	1		City of Orr	Ongoing
5) Assure safe water source for all residents and visitors.	1		City of Aurora, City of Biwabik, City of Hoyt Lakes	Ongoing

9. WASTEWATER SYSTEM FAILURE

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 9.1: Public health is protected from wastewater related risks.				
OBJECTIVE 9.1.1: All wastewater in public and private systems is adequately treated.				
STRATEGIES				
1) Working with the MPCA to ensure installations work properly	2	Wastewater treatment facilities have installed large holding tanks to eliminate stormwater runoff directly into Lake Superior. Duluth and the I&I project implemented to prevent ground water seepage into the sewer system.	Municipal Wastewater providers, Sanitary Districts, MPCA, City of Duluth	Ongoing
2) Continue to implement programs that ensure municipal infrastructure works properly.	1		St. Louis County Health Department, MPCA, City of Duluth, Bois Forte Band of Chippewa	Ongoing
3) Continue to implement programs that ensure proper septic treatment systems are in place in areas not served by a central wastewater treatment system.	1		City of Duluth, St. Louis County Environmental Services Dept.	Ongoing
OBJECTIVE 9.1.2: All wastewater treatment plants are secure.				
STRATEGIES				
1) Assure secure access, sufficient lighting and security equipment.			City of Duluth	Ongoing
OBJECTIVE 9.1.3: Residents and visitors are aware of proper waste disposal and use of septic systems.				
STRATEGIES				
1) Continue education efforts to public about septic system maintenance and use.	2	Two videos produced by St. Louis County Planning and Community Development Department with Environmental Services available online.	St. Louis County Environmental Services, MPCA, WLSSD	Ongoing

10. TERRORISM

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 10.1: Critical infrastructure and government facilities are protected from acts of terrorism.				
OBJECTIVE 10.1.1: All facilities and critical infrastructure have established and implemented safety measures in place against acts of terrorism.				
STRATEGIES				
1) Work with operators of critical infrastructure to assess needs and implement safety measures such as restricted access and monitoring capabilities.	1	Emergency Management staff attended training related to the Protected Critical Infrastructure Information Program (PCII) with implementation in 2009. Emergency Management staff attended training for the Automated Computer Asset Management System (ACAMS) in 2012 and use of the software system related to Critical Infrastructure and Key Resources (CIR) was implemented in 2010.	Emergency Managers, Sheriff's Office, local law enforcement offices, City of Duluth, US Coast Guard, Western Lake Superior Area Maritime Security Committee, Western Lake Superior Port Area Committee	Short-term
GOAL 10.2: The county has strong inter-agency cooperation for terrorism prevention.				
OBJECTIVE 10.2.1: The county has effective communication and preparation with state and federal agencies to protect against terrorism.				
STRATEGIES:				
1) Participate and assist in regional preparedness exercises using the Homeland Security Exercise Evaluation Program.	1	Received training related to Enhanced Risk and Threat Assessment. The ability to assess property was implemented in 2012.	Emergency Managers, Sheriff's Office, Local Fire Departments, City of Duluth, US Coast Guard, Western Lake Superior Area Maritime Security Committee, Western Lake Superior Port Area Committee	Ongoing

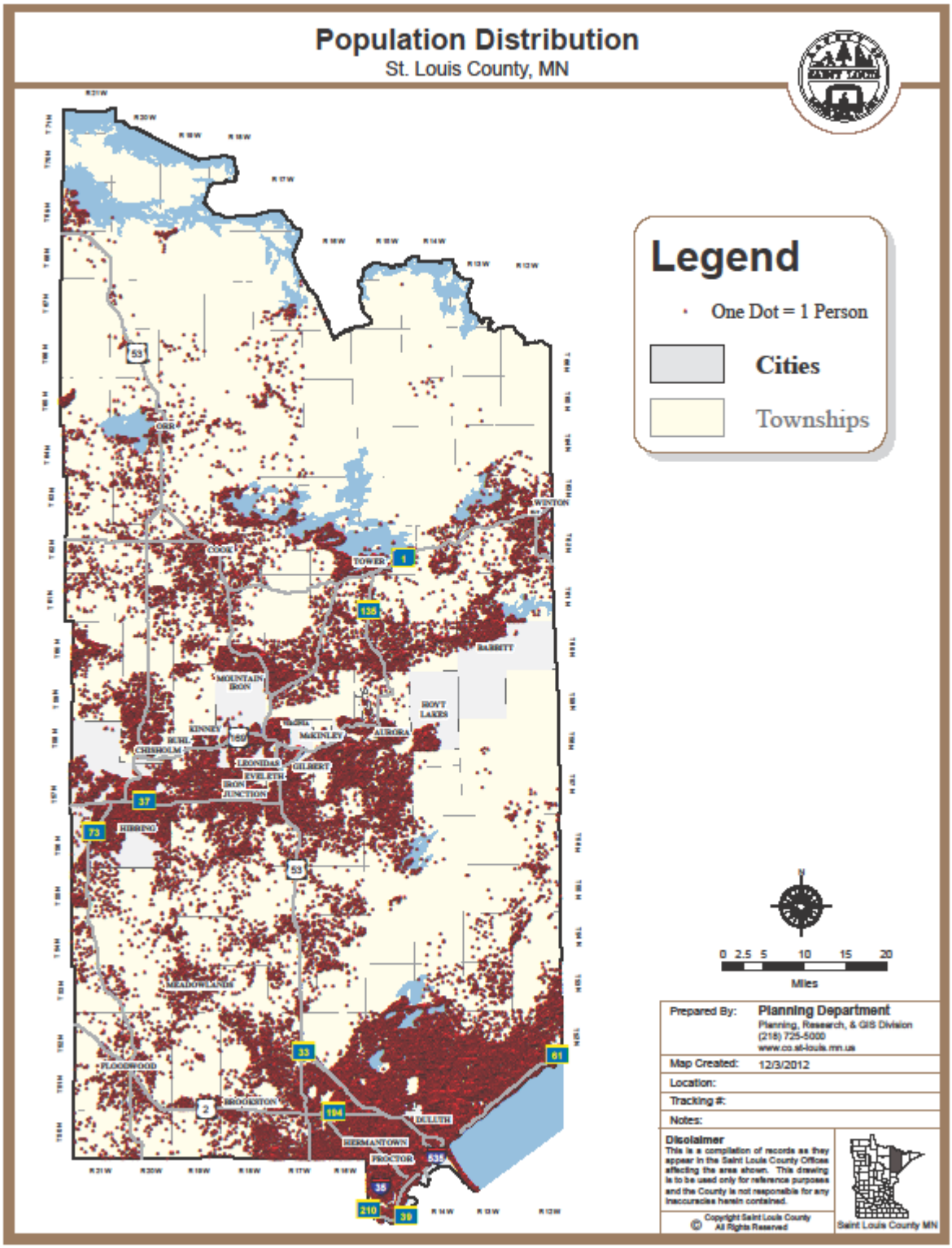
2) Ensure exercises are coordinated to effectively use available time and resources such resources available through the Coast Guard Area Maritime Security Plan.	1		City of Duluth, US Coast Guard, Western Lake Superior Area Maritime Security Committee, Western Lake Superior Port Area Committee	Ongoing

11. REGIONAL COOPERATION AND COMMUNICATION

GOALS/OBJECTIVES/STRATEGIES	PRIORITY	PROGRESS 2005 - 2012	IMPLEMENTATION	TIMEFRAME
GOAL 11.1: St. Louis County has excellent local and regional emergency response capabilities.				
OBJECTIVE 11.1.1: Emergency response communication systems are integrated locally and regionally.				
STRATEGIES				
1) Assure compatibility of communications systems and develop communications protocols.	1	Regional communications exercises were conducted in 2011 and 2012.	Local municipal emergency management directors, City of Duluth, Bois Forte Band of Chippewa	Ongoing
2) Assure an effective command and control radio system.	1	In the process of implementing migration to the new 800 mhz Allied Radio Matrix for Emergency Response (ARMER) with completion expected in 2013. Two dual-band mobile amateur radio units were purchased in 2010 with support the back-up of the County radio communications.	St. Louis County Sheriff's Office, Municipal Response Agencies, Fire Departments, St. Louis County Public Health and Human Services, Volunteer Amateur Radio Operators, City of Duluth, City of Aurora, US Forest Service, MN Dept. of Natural Resources	Ongoing
OBJECTIVE 11.1.2: Emergency response plans are coordinated between local and regional agencies.				
STRATEGIES				
1) Implement local emergency management plans as part of regional emergency management exercise efforts.	1	St. Louis County purchased a Sheriff's Command vehicle (motor home type) in 2011. It was used during a large wildland fire in 2011 in an adjoining county. A generator was replaced at the St. Louis County EOC in 2011 which supports the EOC and other County communications equipment.	St. Louis County Emergency Management Director, Local emergency management directors, Arrowhead EMS, Emergency Management Service Providers, City of Duluth, City of Aurora, US Coast Guard, Western Lake Superior Area Maritime Security Committee, Western Lake Superior Port Area Committee, Bois Forte Band of Chippewa	Ongoing

2) Assure an efficient system for delivery of supplies and availability at local sites in the case of a disaster.	1		All jurisdictions and shelter sites.	Ongoing
3) Assure adequate, trained staff is available in the case of a disaster.	1		All jurisdictions and shelter sites.	Ongoing
4) Assure security of shelter sites during disaster events.	2		All shelter sites. City of Duluth.	Ongoing
5) Assure residents and visitors have routes and transportation to shelter sites in the case of a disaster.	2		All jurisdictions and shelter sites.	Ongoing

APPENDIX A:
Maps


Population Distribution
St. Louis County, MN
Legend
One Dot = 1 Person
Cities
Townships
0 2.5 5 10 15 20
Miles
Prepared By:
Planning Department
Planning, Research, & GIS Division
(218) 725-5000
www.co.st-louis.mn.us
Map Created:
12/3/2012
Location:
Tracking #:
Notes:
Disclaimer
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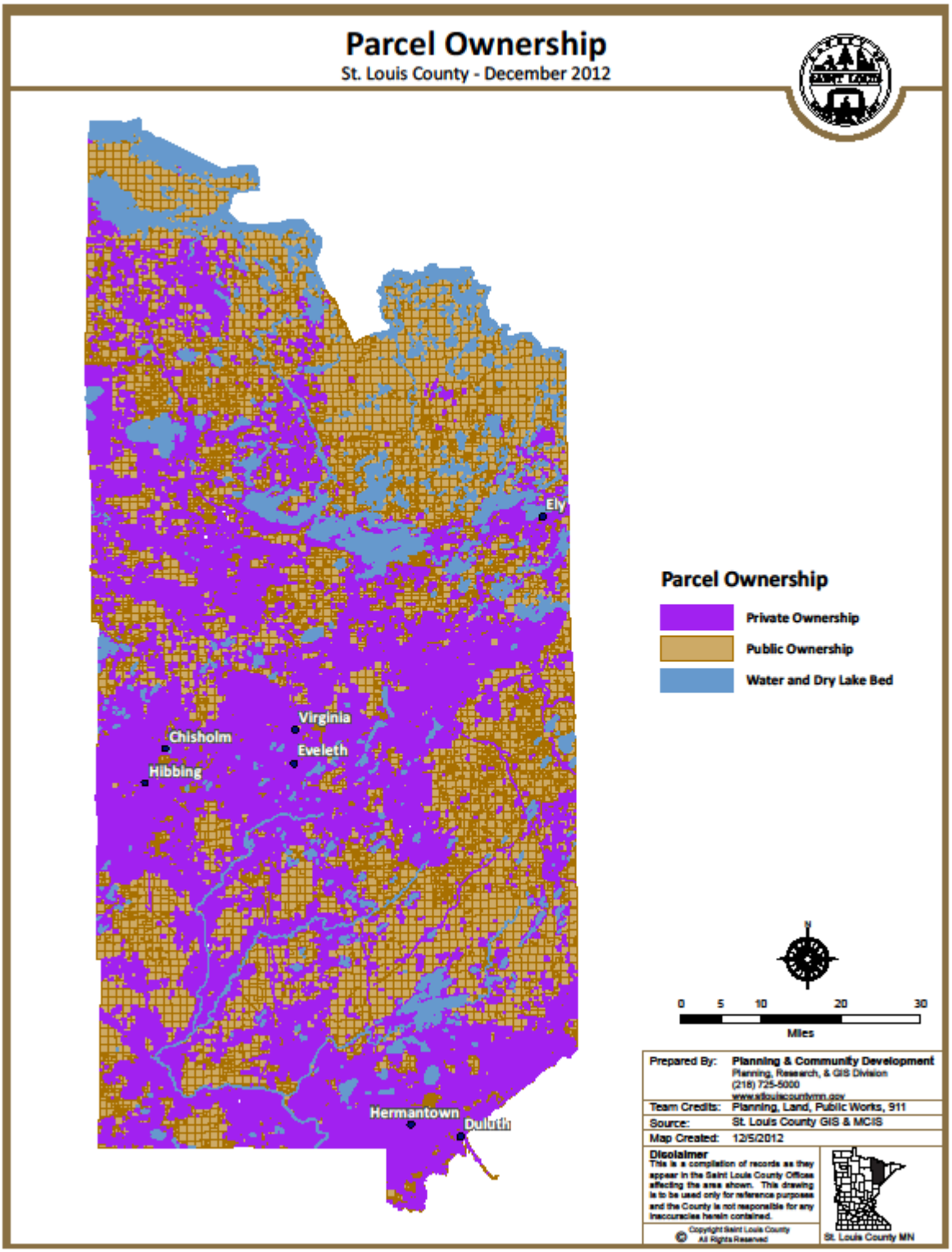
Saint Louis County MN
TOWER
BABBITT
MOUNTAIN IRON
HOYT LAKES
AURORA
McKINLEY
KINNEY
BUHL
CHISHOLM
LEONIDAS
GILBERT
EVELETH
IRON JUNCTION
HIBBING
MEADOWLANDS
FLOODWOOD
BROOKSTON
DULUTH
HERMANTOWN
PROCTOR
WINTON
COOK
ORR


Parcel Ownership
St. Louis County - December 2012
Ely
Virginia
Chisholm
Eveleth
Hibbing
Hermantown
Duluth
Parcel Ownership
Private Ownership
Public Ownership
Water and Dry Lake Bed
N
0 5 10 20 30
Miles
Prepared By: Planning & Community Development
Planning, Research, & GIS Division
(218) 725-5000
www.stlouiscountymn.gov
Team Credits: Planning, Land, Public Works, 911
Source: St. Louis County GIS & MCIS
Map Created: 12/5/2012
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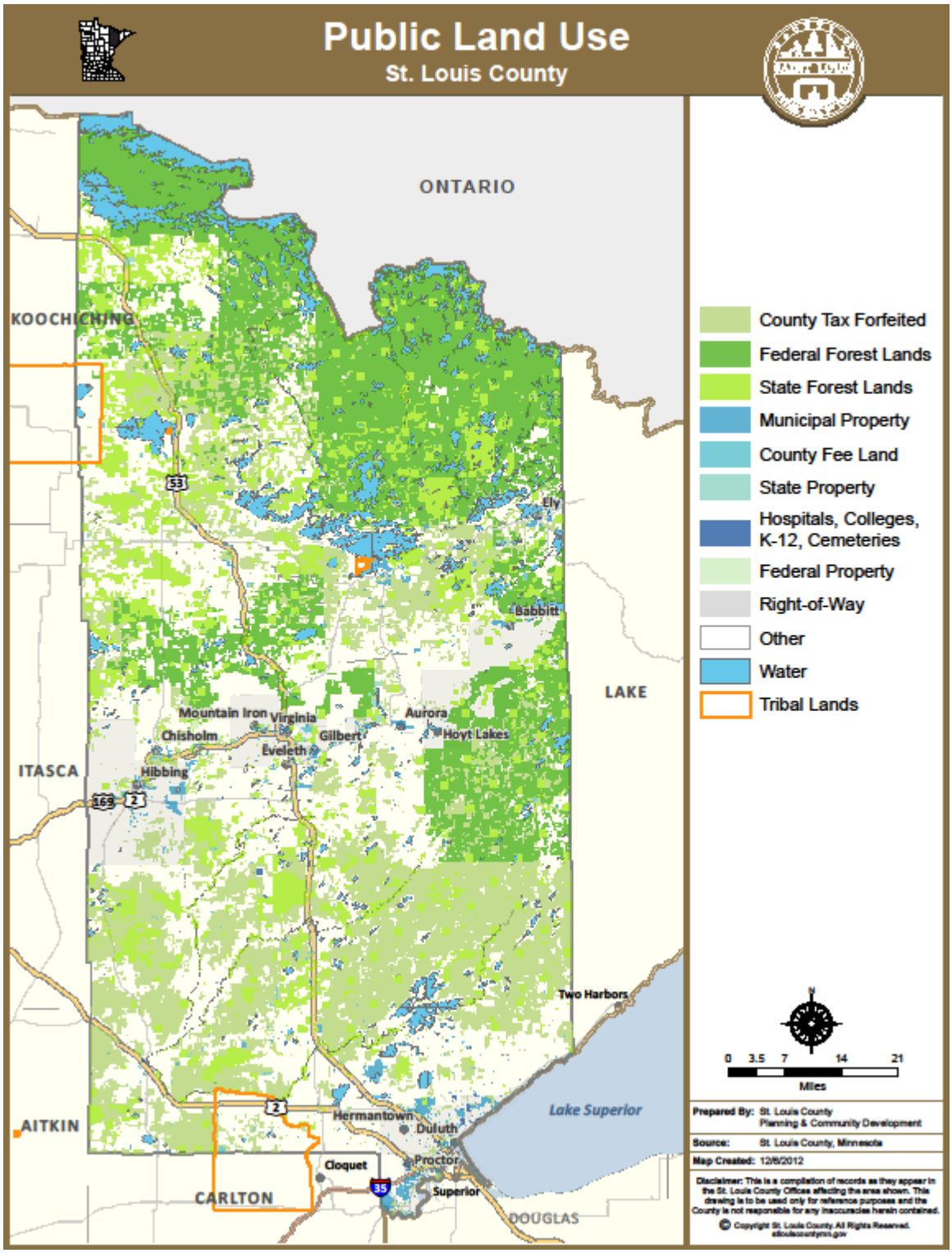
Public Land Use
St. Louis County
ONTARIO
KOOCHICHING
ITASCA
LAKE
AITKIN
CARLTON
DOUGLAS
Lake Superior
Ely
Babbitt
Aurora
Hoyt Lakes
Mountain Iron
Virginia
Chisholm
Gilbert
Eveleth
Hibbing
Two Harbors
Hermantown
Duluth
Proctor
Superior
Cloquet
53
169
2
35
County Tax Forfeited
Federal Forest Lands
State Forest Lands
Municipal Property
County Fee Land
State Property
Hospitals, Colleges, K-12, Cemeteries
Federal Property
Right-of-Way
Other
Water
Tribal Lands
0 3.5 7 14 21
Miles
Prepared By: St. Louis County Planning & Community Development
Source: St. Louis County, Minnesota
Map Created: 12/6/2012
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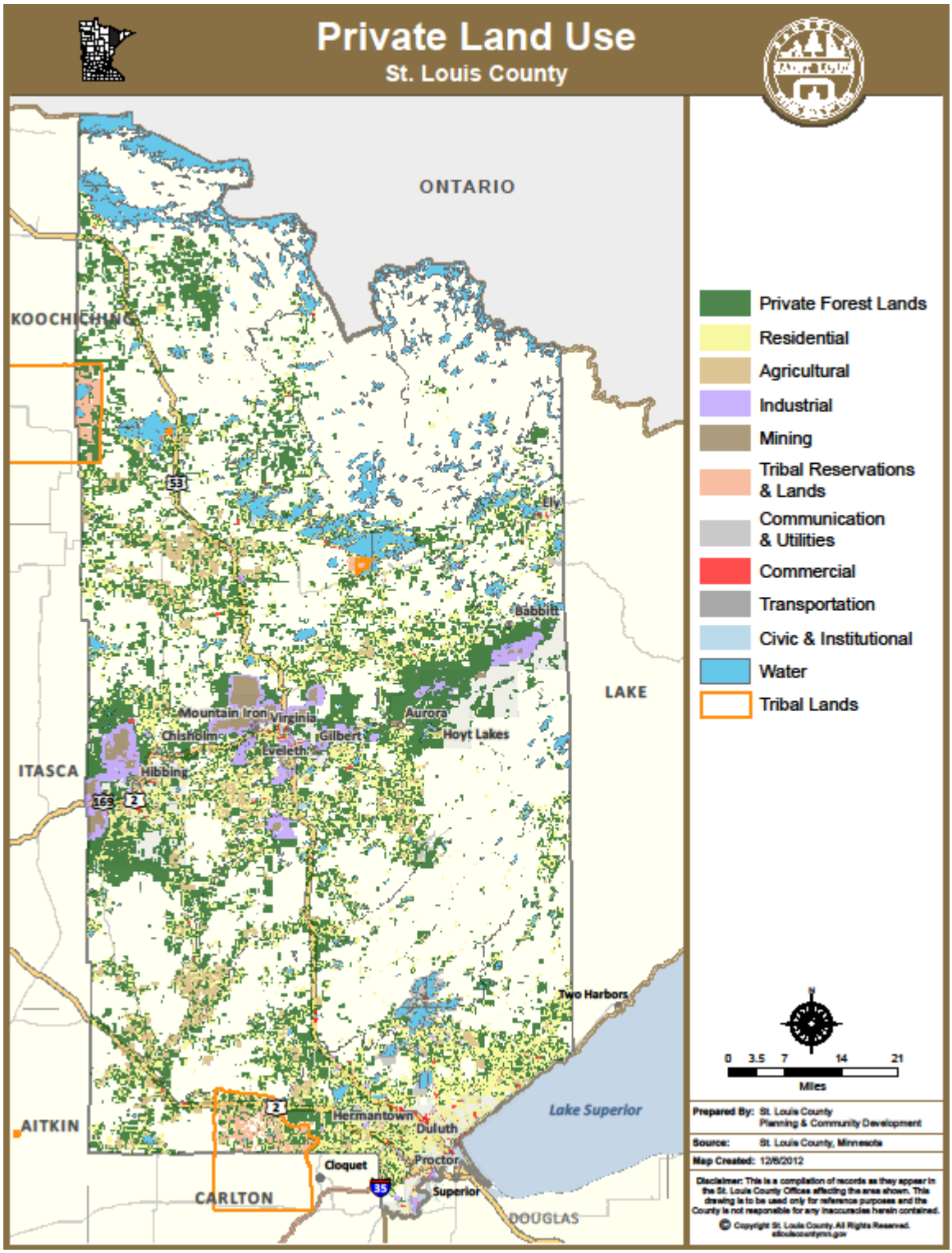
Private Land Use
St. Louis County
ONTARIO
KOOCHICHING
ITASCA
LAKE
AITKIN
CARLTON
DOUGLAS
Lake Superior
Ely
Babbitt
Aurora
Hoyt Lakes
Mountain Iron
Virginia
Chisholm
Gilbert
Eveleth
Hibbing
Two Harbors
Hermantown
Duluth
Proctor
Superior
Cloquet
53
2
169
35
Private Forest Lands
Residential
Agricultural
Industrial
Mining
Tribal Reservations & Lands
Communication & Utilities
Commercial
Transportation
Civic & Institutional
Water
Tribal Lands
0 3.5 7 14 21
Miles
Prepared By: St. Louis County Planning & Community Development
Source: St. Louis County, Minnesota
Map Created: 12/6/2012
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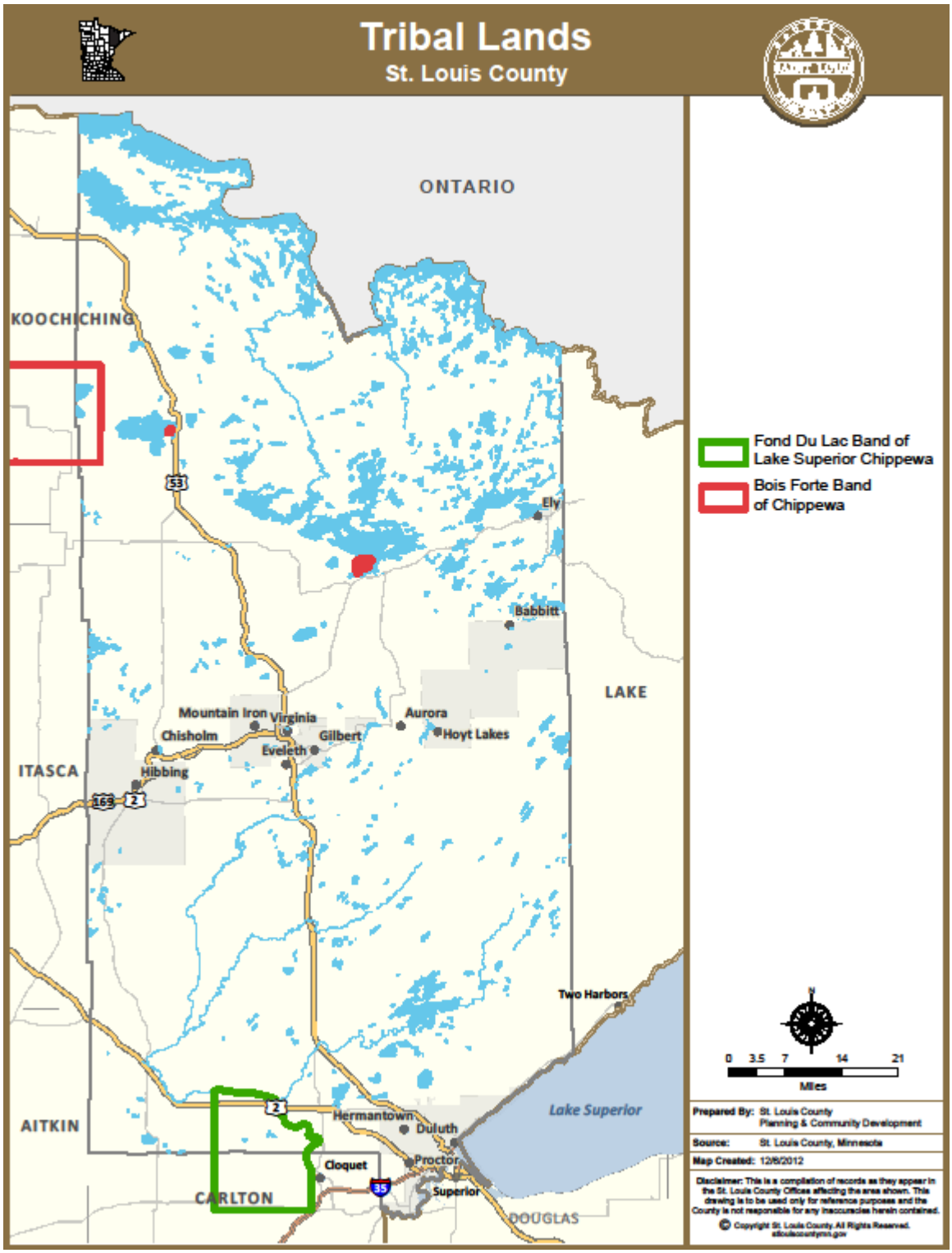
Tribal Lands
St. Louis County
ONTARIO
KOOCHICHING
53
Ely
Babbitt
LAKE
Mountain Iron
Virginia
Chisholm
Gilbert
Eveleth
Aurora
Hoyt Lakes
ITASCA
Hibbing
169
2
Two Harbors
Lake Superior
AITKIN
2
Hermantown
Duluth
Cloquet
Proctor
35
Superior
CARLTON
DOUGLAS
Fond Du Lac Band of Lake Superior Chippewa
Bois Forte Band of Chippewa
0 3.5 7 14 21
Miles
Prepared By: St. Louis County Planning & Community Development
Source: St. Louis County, Minnesota
Map Created: 12/6/2012
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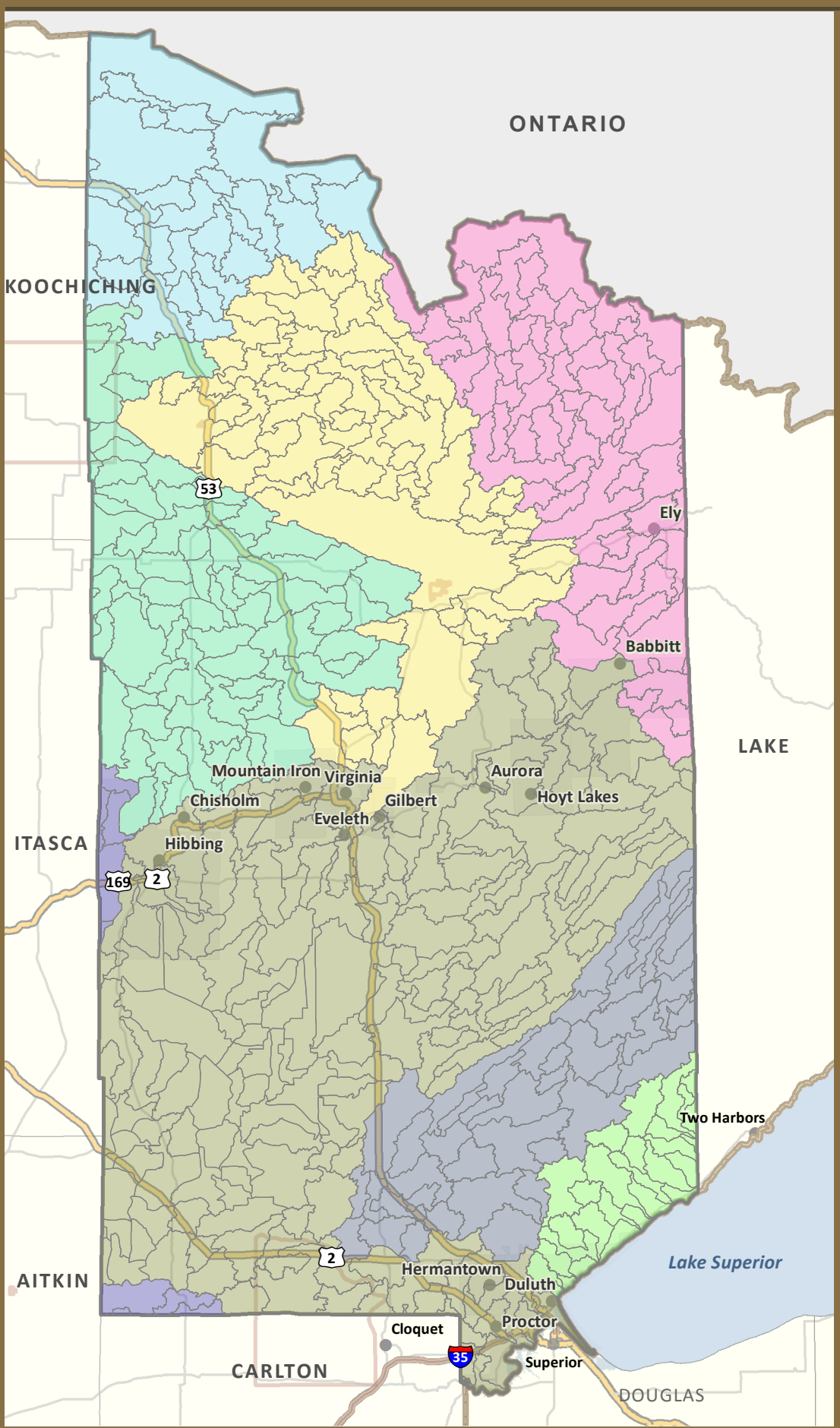
Watersheds

St. Louis County



Minor Watersheds

Major Watersheds

- Cloquet River
- Lake Superior - South
- Little Fork River
- Mississippi River - Grand Rapids
- Nemadji River
- Rainy River - Headwaters
- Rainy River - Rainy Lake
- St. Louis River
- Vermilion River
- Canada

N

0 3.5 7 14 21

Miles

Prepared By: St. Louis County
Planning & Community Development

Source: St. Louis County, Minnesota

Map Created: 1/17/2013

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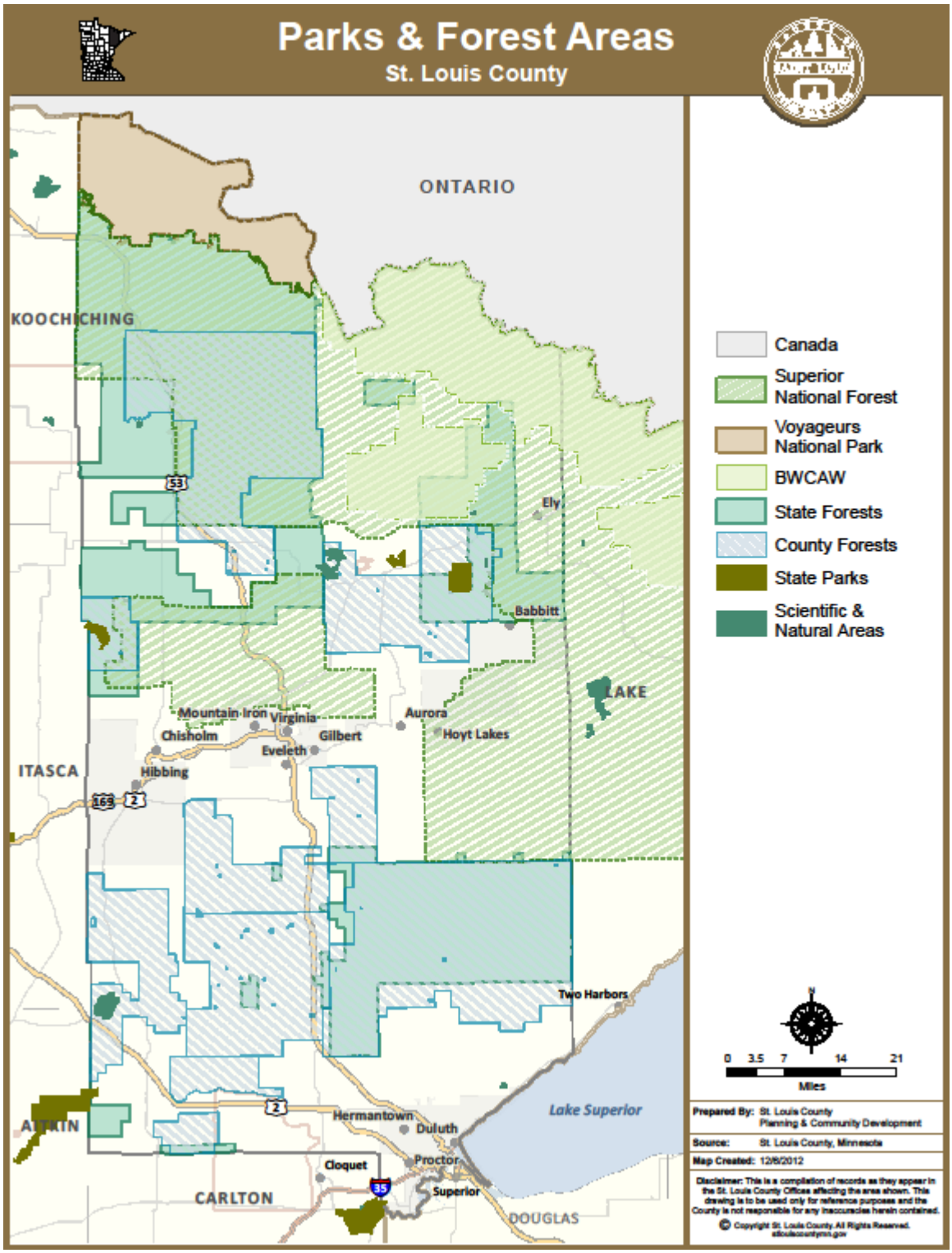
Parks & Forest Areas
St. Louis County
ONTARIO
KOOCHICHING
ITASCA
LAKE
CARLTON
AITKIN
DOUGLAS
Lake Superior
Ely
Babbitt
Mountain Iron
Virginia
Chisholm
Gilbert
Eveleth
Hibbing
Aurora
Hoyt Lakes
Two Harbors
Hermantown
Duluth
Proctor
Superior
Cloquet
53
169
2
35
Canada
Superior National Forest
Voyageurs National Park
BWCAW
State Forests
County Forests
State Parks
Scientific & Natural Areas
0 3.5 7 14 21
Miles
Prepared By: St. Louis County Planning & Community Development
Source: St. Louis County, Minnesota
Map Created: 12/6/2012
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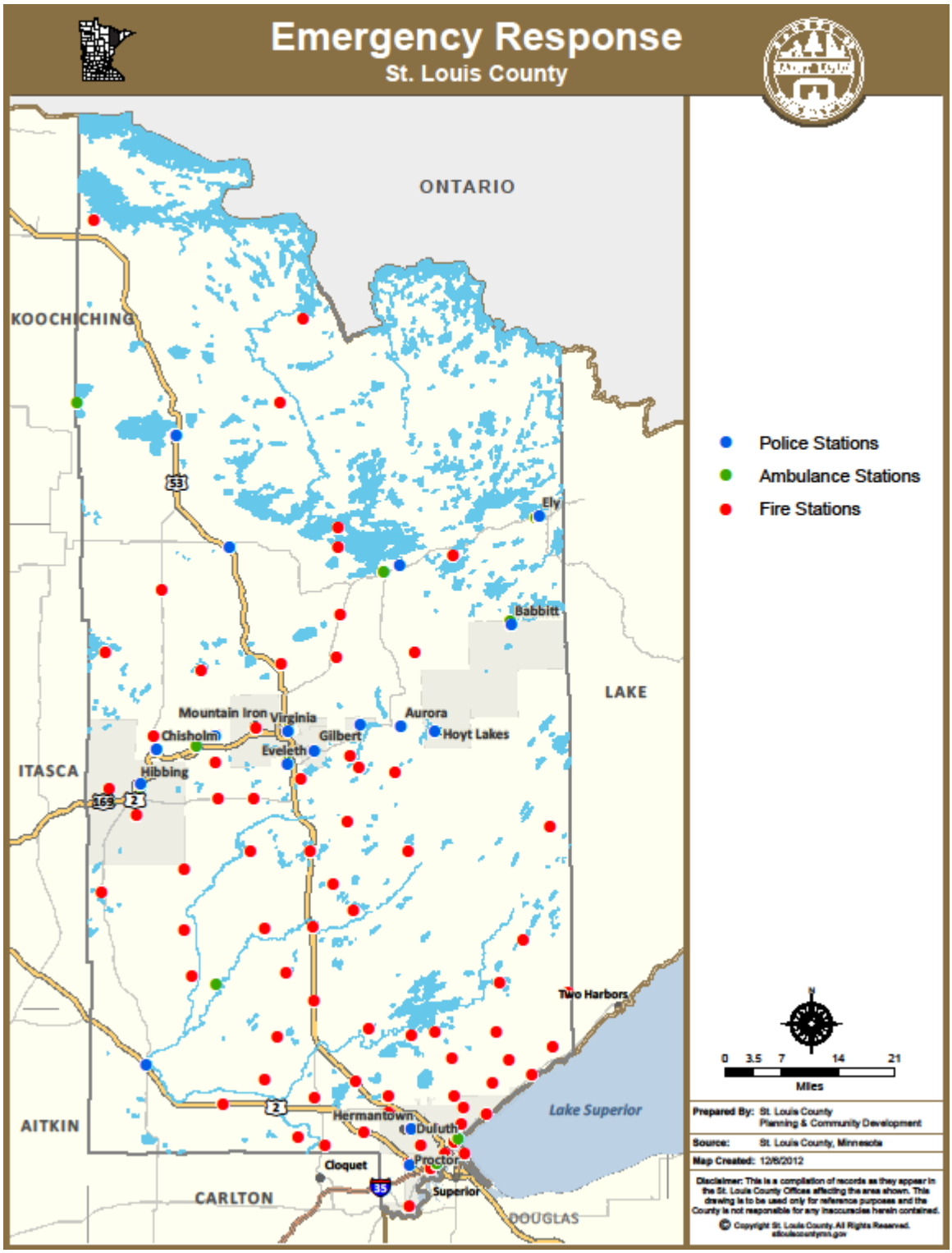
Emergency Response
St. Louis County
ONTARIO
KOOCHICHING
LAKE
ITASCA
AITKIN
CARLTON
DOUGLAS
Lake Superior
Police Stations
Ambulance Stations
Fire Stations
Ely
Babbitt
Mountain Iron
Virginia
Chisholm
Gilbert
Eveleth
Aurora
Hoyt Lakes
Hibbing
Two Harbors
Hermantown
Duluth
Proctor
Cloquet
Superior
53
169
2
35
0 3.5 7 14 21
Miles
Prepared By: St. Louis County Planning & Community Development
Source: St. Louis County, Minnesota
Map Created: 12/6/2012
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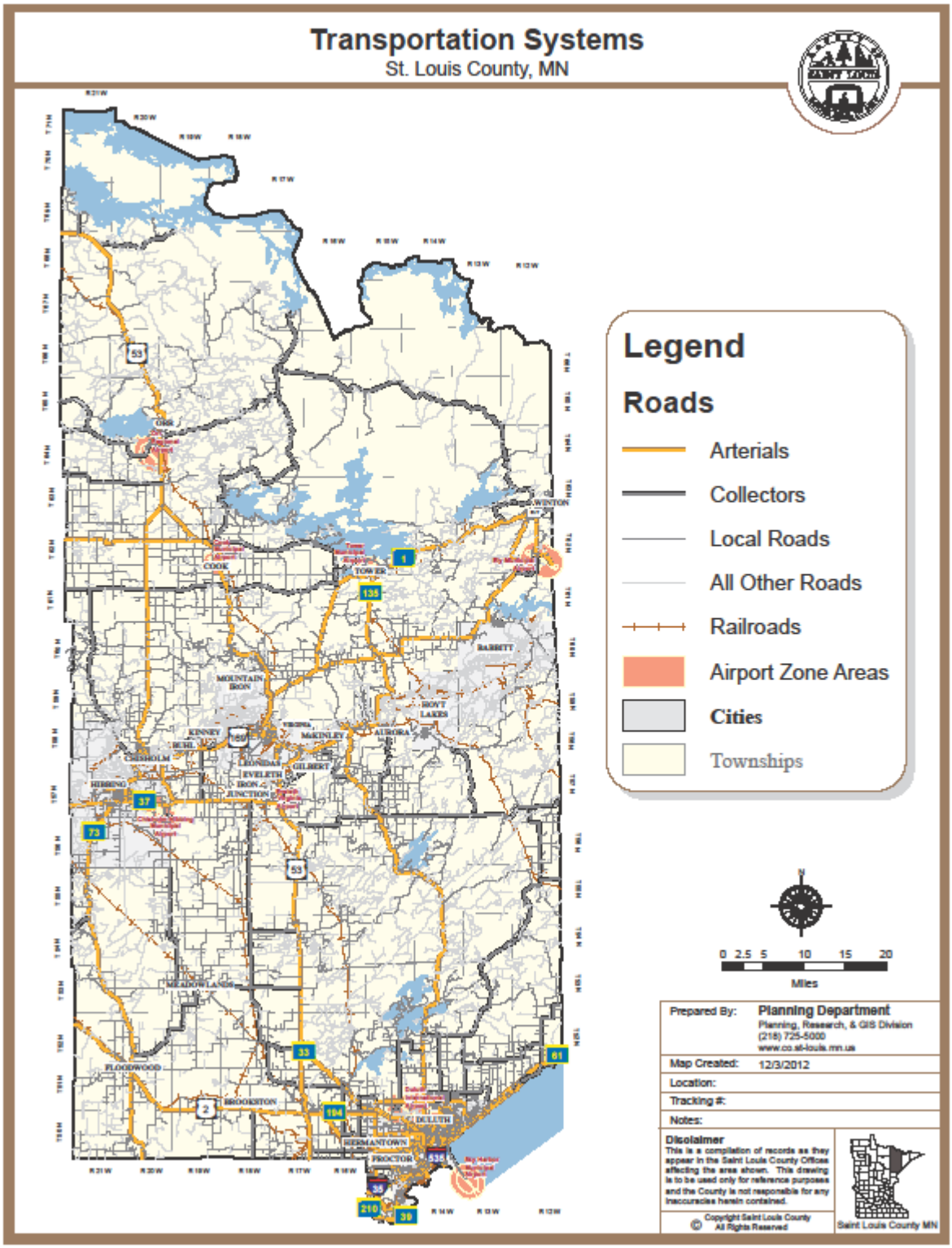
Transportation Systems
St. Louis County, MN
Legend
Roads
Arterials
Collectors
Local Roads
All Other Roads
Railroads
Airport Zone Areas
Cities
Townships
0 2.5 5 10 15 20
Miles
Prepared By:
Planning Department
Planning, Research, & GIS Division
(218) 725-5000
www.co.st-louis.mn.us
Map Created:
12/3/2012
Location:
Tracking #:
Notes:
Disclaimer
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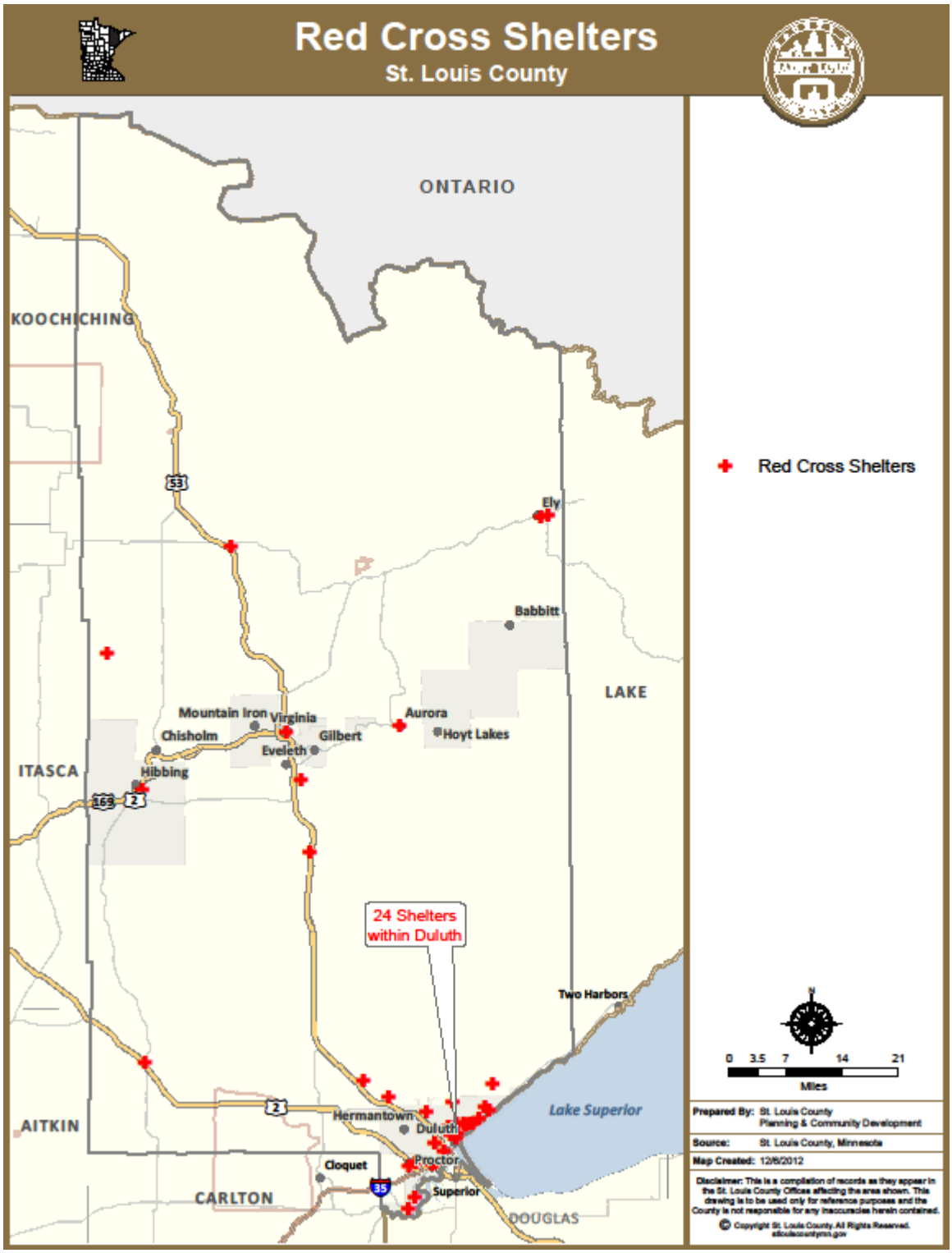
Red Cross Shelters
St. Louis County
ONTARIO
KOOCHICHING
ITASCA
LAKE
AITKIN
CARLTON
DOUGLAS
Ely
Babbitt
Mountain Iron
Virginia
Chisholm
Gilbert
Eveleth
Aurora
Hoyt Lakes
Hibbing
24 Shelters within Duluth
Two Harbors
Hermantown
Duluth
Proctor
Superior
Cloquet
Lake Superior
Red Cross Shelters
0 3.5 7 14 21
Miles
Prepared By: St. Louis County Planning & Community Development
Source: St. Louis County, Minnesota
Map Created: 12/6/2012
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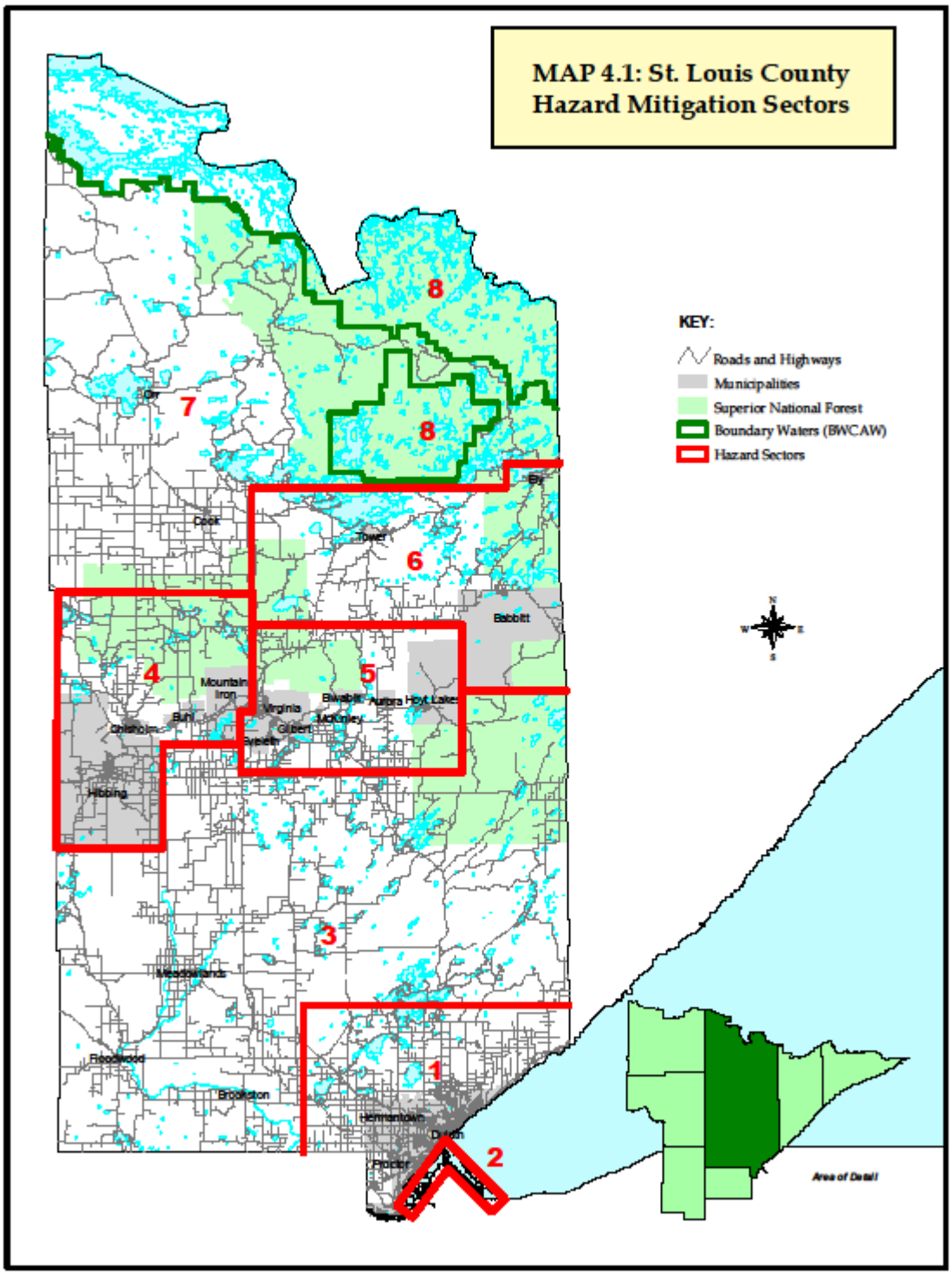
MAP 4.1: St. Louis County
Hazard Mitigation Sectors
KEY:
Roads and Highways
Municipalities
Superior National Forest
Boundary Waters (BWCAW)
Hazard Sectors
1
2
3
4
5
6
7
8
Area of Detail

APPENDIX B:

Communications with Community Contacts and Planning Team Members

Community Contacts

St. Louis County Hazard Mitigation Plan Update 2013

City/ Township/ Tribe	Contact Name	Position	Request for contact information mailed 12-19-11	Contact form returned? Y/N	Memo re: events since 2005 e-mail 08-17-12	Events since 2005 reply Y/N	Memo: Request for Review 10-04-12	Reminder e-mail from Paul Lee review request 10-29-12	Reminder e-mail from Susan Koschak review request 11-19-12	Review Reply? Y/N
Aurora	Kent Dickinson	Fire Chief/Emergency Manager	Y	Y	Y	y	Y	y	y	N
Babbitt	Cathy Klegstad	Clerk/Treasurer	Y	Y	Y	y	Y	y	y	N
Biwabik	Jeff Jacobson	City Administrator	Y	Y	Y	y	Y	y	y	Y
Brookston	Jeff Antonovich	Mayor	Y	N	Y	y	Y	y	y	Y
Buhl	Michael Buchanan	Clerk/Treasurer	Y	Y	Y	y	Y	y	y	Y
Cherry	Stephani L. Hartzell	Clerk	Y	Y	Y	N	Y	y	y	N
Chisholm	Mark Casey	City Administrator	Y	Y	Y	N	Y	y	y	Y
Cook	Theresa Martinson	Administrator/Clerk/Treasurer	Y	Y	Y	y	Y	y	y	N
Duluth	John Strongitharm	Fire Chief/Emergency Mngt Director	Y	N	Y	y	Y	y	y	Y
Ely	John Lahtonen	Police Chief	Y	Y	Y	y	Y	y	y	N
Eveleth	Jackie Monahan-Junek	City Clerk-Administrator	Y	Y	Y	y	Y	y	y	N
Floodwood	Dave Denoyer	Civil Defense Director	Y	Y	mailed	y	Y	y	y	Y
Gilbert	Susan Harper	City Clerk	Y	Y	Y	N	Y	y	y	Y
Hermantown	Jim Crace	Chief of Police	Y	Y	Y	y	Y	y	y	N
Hibbing	Tom Dicklich	City Administrator	Y	Y	Y	y	Y	y	y	N
Hoyt Lakes	Steven Stoks	Emergency Mmgt Director	Y	Y	Y	y	Y	y	y	N
Iron Junction	Phillip Kaster	Mayor	Y	Y	Y	N	Y	y	y	N
Kinney	Deb Bachel	Emergency Mngt Director	Y	N	Y	y	Y	y	y	N
Leonidas	Joanne Mannikko	City Clerk	Y	Y	Y	y	Y	y	y	Y
McKinley	Tony Nygaard	Mayor	Y	Y	Y	N	Y	y	y	N
Meadowlands	Rick DeBries	Mayor	Y	Y	Y	y	Y	y	y	N
Mountain Iron	Craig J. Wainio	City Administrator	Y	Y	Y	y	Y	y	y	Y
Orr	Louise Redmond	Clerk/Treasurer	Y	Y	Y	y	Y	y	y	Y
Proctor	James Rohweder	City Administrator	Y	Y	Y	y	Y	y	y	Y
Tower	Ann Lamppa	Clerk/Treasurer	Y	Y	Y	y	Y	y	y	N
Virginia	John Tourville	Police Chief/Emergency Mngt Director	Y	N	Y	N	Y	y	y	N
Winton	Anders Nicholson	Council Person	Y	Y	Y	y	Y	y	y	N
Alango	Betsy Phillips	Clerk	Y	N	mailed	N	Y & mailed 10/4/2012			N
Alborn	Dale Larson	Supervisor	Y	Y	Y	N	Y			N
Alden	Sandra Wagner	Clerk	Y	Y	Y	N	Y			N
Angora	Patti Alt	Clerk	Y	Y	Y	y	Y			N
Arrowhead	Angela Irvine	Clerk	Y	Y	Y	y	Y			N
Ault	Toni A. Wangen	Clerk	Y	Y	Y	y	Y			N
Balkan	Jonelle Kallio	Clerk	Y	Y	Y	y	Y			N
Bassett	Jill Anderson	Clerk	Y	Y	Y	y	Y			N
Beatty	Patti Naughton	Clerk	Y	N	Y	N	Y			N
Biwabik	Tracie Birchem	Clerk	Y	Y	Y	y	Y			N
Breitung	Timothy Tomsich	Chairman	Y	Y	Y	N	Y			N
Brevator	Brenda Pallin	Clerk	Y	Y	Y	y	Y			N
Camp 5	Bill Marr	Clerk	Y	Y	Y	N	Y			N
Canosia	Kevin L. Comnick	Chair	Y	Y	Y	N	Y & mailed 10/10/2012			N
Cedar Valley	Cindy Touminen	Clerk	Y	Y	Y	y	Y			N
Cherry	Stephanie Hartzell	Clerk	Y	N	mailed	N	Y & mailed 10/4/2012			N
Clinton	Jeff Skaudis	Supervisor	Y	Y	Y	y	Y			N
Colvin	Natalie K. Beck	Clerk	Y	Y	Y	y	Y & mailed 10/10/2012			N
Cotton	Jamie Bowden	Supervisor	Y	Y	Y	N	Y			Y
Crane Lake	JoAnn Pohlmar	Clerk	Y	Y	Y	N	Y			Y
Culver	John Creegan	Clerk	Y	N	Y	N	Y			N
Duluth	Sue Lawson	Zoning Admintrator	Y	Y	Y	N	Y			N
Eagles Nest	Andrew Urban	Supervisor	Y	Y	Y	N	Y			N
Ellsburg	Randee Erjavec	Clerk	Y	N	Y	N	Y			N
Elmer	Nicole Rewertz	Clerk	Y	Y	Y	N	Y			N
Embarrass	Diane Nelmark	Clerk	Y	Y	Y	N	Y			N
Fairbanks	Kathleen Unger	Clerk	Y	Y	Y	y	Y & mailed 10/10/2012			Y
Fayal	Judy Sersha	Clerk-Treasurer	Y	Y	Y	y	Y			N
Field	Pat Chapman	Clerk	Y	Y	Y	y	Y			Y
Fine Lakes	Julie Kinnear	Supervisor	Y	Y	Y	y	Y			N
Floodwood	Victoria Johnson	Clerk	Y	N	Y	y	Y			N
Fredenberg	Sherri Armstrong	Clerk	Y	Y	Y	N	Y			N
French	Peter Leschak	Fire Chief	Y	Y	Y	y	Y			Y
Gnesen	Lottie L. Haller	Clerk	Y	Y	Y	y	Y			Y
Grand Lake	Brooke Shannon	Clerk	Y	Y	Y	y	Y			N
Great Scott	Sandra K. Husmann	Clerk	Y	N	Y	y	Y			N
Greenwood	Ellen Trancheff	Clerk	Y	Y	Y	y	Y			Y
Halden	Alice Rosenholm	Clerk	Y	N	Y	y	Y			N
Industrial	Martin Fair	Clerk	Y	N	Y	N	Y			N
Kabetogama	Mary Manninen	Clerk	Y	N	Y	N	Y			N
Kelsey	Debbie Slygh	Clerk	Y	Y	Y	N	Y			N
Kugler	Jack Brandt (Julie Suihkonen)	Chairman (Clerk)	Y	Y	Y	y	Y			N
Lakewood	Ellen Hanson	Clerk	Y	N	Y	N	Y			N
Lavell	David L. Seward	Clerk	Y	Y	Y	N	Y			N
Leiding	Marie Milan	Clerk	Y	N	Y	y	Y			N
Linden Grove	Ronette Novak	Clerk	Y	N	mailed	N	mailed 10/4/2012			N
McDavitt	Jim Fisher	Board Supervisor	Y	Y	Y	y	Y			N
Meadowlands	Debra Zubrod	Clerk-Treasurer	Y	N	Y	N	Y			N

Midway	Grant Forsyth	Zoning Admintrator	Y	Y	Y	N	Y & mailed 10/4/2012			Y
Morcom	Les Holm	Supervisor	Y	Y	Y	N	Y & mailed 10/4/2012			N
Morse	Nick Wognum	Clerk	Y	Y	mailed	y	Y			N
Ness	Patricia Ralidak	Clerk-Treasurer	Y	N	Y	y	Y			N
New Independence	Sandra Lee Olson	Clerk	Y	N	Y	y	Y			N
Normanna	Ellen Hanson	Clerk	Y	Y	Y	N	Y			N
Northland	Bobbi Pirkola	Clerk	Y	N	Y	N	Y			N
North Star	Gary Mantay	Fire Chief/Board Supervisor	Y	Y	Y	y	Y			N
Owens	Shirley Ann Woods	Clerk	Y	Y	Y	N	Y			N
Pequaywan	April Smitke	Clerk	Y	N	Y	N	Y			N
Pike	Jodi Backman	Clerk	Y	Y	Y	N	Y			N
Portage	Sandy Lundgren	Clerk	Y	Y	Y	N	Y			N
Prarie Lake	Dale W. Collison	Supervisor	Y	Y	Y	N	Y & mailed 10/4/2012			Y
Rice Lake	Joan Jauss	Clerk	Y	Y	mailed	y	Y & mailed 10/4/2012			N
Sandy	Sharon Maki	Clerk	Y	N	Y	y	Y			Y
Solway	Regena L. Merritt	Clerk	Y	Y	Y	y	Y			N
Stoney Brook	Richard Vukonich	Chairman (Clerk)	Y	Y	Y	y	Y			N
Sturgeon	Char Swanson	Clerk	Y	Y	Y	N	Y			N
Toivola	Ruth Finch	Clerk	Y	Y	Y	N	Y			N
Van Buren	Marilyn Arro	Clerk	Y	Y	Y	N	Y			N
Vermilion Lake	Frances Silverberg	Clerk	Y	Y	Y	y	Y & mailed 10/4/2012			Y
Waasa	Sandra Gibson	Clerk	Y	Y	Y	N	Y			N
White	Mary Anne Helander	Clerk	Y	Y	Y	N	Y			N
Willow Valley	Debra Parson	Clerk	Y	N	Y	y	Y			Y
Wuori	Catherine C. Rouleayu	Clerk	Y	Y	Y	y	Y			N
Fond du Lac	Cassie Diver	Planning Researcher	N	N	Y	y	Y	y	y	N
Bois Forte	Kevin Koski	Emergency Preparedness Director	N	N	Y	y	Y	y	y	N

Planning Team
St. Louis County Hazard Mitigation Plan Update 2012

First Name	Last Name	Position/Title	Agency/Company	Sent Request for Review 10-04-12	Review Reply?
Dave	Aspie	Dam Safety Engineer	Minnesota Power	Y	Y
R. C.	Boheim	District Manager	South St. Louis County Soil and Water Conservation District	Y	
Bill	Bussey		Lake Country Power	Y	
Tim	Campbell		MN Office of Tourism	Y	
Scott	Camps	Emer Services Mgr	St. Louis County Sheriff's Office - HSEM	Y	
Larry	DiDomenico	Coast Guard Planner	US Coast Guard - MSU Duluth	Y	Y
Cassie	Diver	Planning Researcher	Fond du Lac Band of Lake Superior Chippewa	Y	
Jim	Foldesi	Public Works Director	St. Louis County Public Works	Y	
Chuck	Froseth	Senior Planner	City of Duluth Planning Department	Y	
Jim	Gangl	Public Health Analyst Emergency Preparedness Coordinator	St. Louis County Public Health and Human Services Department	Y	
Shaun	Germolus	Executive Director	Chisholm-Hibbing Airport Authority	Y	Y
William	Glesener	Firewise Community Specialist	MN Dept. of Natural Resources - Forestry	Y	Y
Stefanie	Hayes	Supervisor Distribution Operations	Minnesota Power	Y	
Barbara	Johnson	Emergency Mgmt Director	City of Orr	Y	
Kevin	Koski	Emergency Preparedness Dir	Bois Forte Band of Chippewa	Y	
Steve	Lapinsky		Duluth Utilities	Y	
Pat	Lee	Executive Director	Arrowhead EMS	Y	
Paul	Lee	Emer Mgmt Coor	St. Louis County Sheriff's Office - HSEM	Y	
Ross	Litman	Sheriff	St. Louis County Sheriff's Office	Y	
Amy	Loiselle	Area Hydrologist	MN Dept. of Natural Resources	Y	
Barbara	Manahan-Thompson	Fire Prevention Technician	U.S. Forest Service	Y	Y
Bob	Manzolines	Executive Director	Regional Railroad Authority	Y	
Paul	Ojanen	Resource Conservationist	North St. Louis County Soil and Water Conservation District	Y	
Thor	Pakosz	Fire Program Forester	MN Dept. of Natural Resources - Forestry	Y	Y
Mike	Peloquin		MN Dept. of Natural Resources - Waters	Y	
Blaine	Peterson	Terminal/Facilities Manager	Duluth Airport Authority	Y	Y
Mark	Reed	Deputy Land Commissioner	St. Louis County Land and Minerals Dept.	Y	Y
Kurt	Rogers	President	Lakehead Mutual Aid Association	Y	
David	Slauson	Dangerous Goods Officer	Canadian National Railroad	Y	
Ron	Stoffel	Wildfire Suppression Supervisor	MN Dept. of Natural Resources	Y	Y
John	Strongitharm	Fire Chief	City of Duluth Fire Department	Y	
Mark J.	Willoughby	General Mgr., Superior Region	Enbridge, Inc.	Y	

Saint Louis County

Planning and Community Development Department • 100 Missabe Building, 227 West First Street Duluth, MN 55802 • Phone: (218) 725-5000 • Fax: (218) 725-5029
Toll Free in Minnesota: 1-800-450-9777
www.stlouiscountymn.gov

Barbara Hayden
Director

TO: City and Town Clerks

FROM: Susan Koschak, Planner II
St. Louis County Planning and Community Development Department

Paul Lee, Emergency Management Coordinator
St. Louis County Sheriff's Office

DATE: December 19, 2011

RE: St. Louis County Hazard Mitigation Plan

The St. Louis County Sheriff's Office - Division of Homeland Security and Emergency Management is beginning the process of updating its county-wide Hazard Mitigation Plan. Staff members of the county Planning and Community Development Department will lead the planning process and GIS data development.

In 2003, the Federal Emergency Management Agency (FEMA) required that all communities have a plan in place in order to be eligible for funds under the Pre-disaster Mitigation Grant Program. The current plan was adopted in 2005 and updates are required to remain eligible.

Throughout the planning process, which is expected to take 10-12 months, work team members will analyze risks, set goals and objectives, collect data and identify mitigation strategies. It is important to note that this plan does not address any response to a disaster. It is intended to focus on preventing and minimizing losses, damages and costs resulting from natural or manmade disasters.

To be included, each community will need to participate in the development of the plan. **If a community chooses not to participate in the plan development and does not adopt the plan, it will not be eligible for funding of any projects through the mitigation program.** Examples include sprinkler systems, defensible space or hazardous fuel reduction to protect buildings from wildfire, undergrounding wires to prevent ice storm damage and safe room construction to keep residents safe during tornadoes and severe wind events.

Enclosed is a very short form to complete so that we can establish our contact list. Please complete the form and return it no later than January 16, 2012. If you prefer, we can e-mail the form to you as a Word document which you can complete and return electronically. We are collecting this information from all cities and townships in the county, even those that have already documented support.

We are seeking one person from each city or township to act as a contact. This will make communication and information gathering more efficient. More information will be sent to the contact person very soon.

Feel free to contact me at 218-725-5023 or koschaks@stlouiscountymn.gov

Enclosure

"An Equal Opportunity Employer"

2012 St. Louis County Hazard Mitigation Plan
Community Contact

Please return this form by **January 16, 2012** to
Attn: Susan Koschak
St. Louis County Planning and Community Development Department
227 W 1st St, #100
Duluth, MN 55802

If you prefer to complete and return this form electronically (Word document) e-mail me at **koschaks@stlouiscountymn.gov**

City or Township: _____

Name: _____

Position/Title: _____

Mailing Address/ Zip: _____

Phone: _____

E-mail: _____

Does your city or township have a website? ____yes _____no

If yes, what is the address? _____

Does your city or township have an adopted comprehensive plan? _____yes _____no

If yes, is it available online? _____yes _____no

Saint Louis County

Planning and Community Development Department • 100 Missabe Building, 227 West First Street Duluth, MN 55802 • Phone: (218) 725-5000 • Fax: (218) 725-5029
Toll Free in Minnesota: 1-800-450-9777
www.stlouiscountymn.gov

Barbara Hayden
Director

TO: Contacts for Hazard Mitigation Planning Team

FROM: Susan Koschak, Planner II
St. Louis County Planning and Community Development Department

Paul Lee, Emergency Management Coordinator
St. Louis County Sheriff's Office

DATE: February 24, 2012

RE: St. Louis County Hazard Mitigation Plan

The St. Louis County Sheriff's Office - Division of Homeland Security and Emergency Management is beginning the process of updating its county-wide Hazard Mitigation Plan. Staff members of the county Planning and Community Development Department will lead the planning process and GIS data development.

In 2003, the Federal Emergency Management Agency (FEMA) required that all communities have a plan in place in order to be eligible for funds under the Pre-disaster Mitigation Grant Program. The current plan was adopted in 2005 and updates are required to remain eligible.

Throughout the planning process, which is expected to take 10-12 months, work team members will analyze risks, set goals and objectives, collect data and identify mitigation strategies. It is important to note that this plan does not address any response to a disaster. It is intended to focus on preventing and minimizing losses, damages and costs resulting from natural or manmade disasters. Specific projects will be implemented by local communities and must be aligned with the goals and strategies in the plan.

A "Planning Team" is needed to help identify possible hazards, set goals and identify mitigation strategies. We anticipate this work will be done largely by e-mail and phone with occasional meetings if needed. This will make communication and information gathering more efficient.

You have been identified as a person who was previously on the planning team or recommended for inclusion at this time. So that we can update our contact list, lease complete the attached form and return it no later than March 16, 2012. If you prefer, we can e-mail the form to you as a Word document which you can complete and return electronically.

Feel free to contact me at 218-725-5023 or koschaks@stlouiscountymn.gov

Attachment

2012 St. Louis County Hazard Mitigation Plan
Planning Team Member Contact

Please return this form by **March 16, 2012** to

St. Louis County Planning and Community Development Department
Attn: Susan Koschak
227 W 1st St, #100
Duluth, MN 55802

If you prefer to complete and return this form electronically (Word document) or send the information below in a message, please e-mail me at **koschaks@stlouiscountymn.gov**
Phone 218-725-5023
Fax 218-725-5029

Company/Agency: _____

Name: _____

Position/Title: _____

Mailing Address: _____

City/Zip: _____

Phone: _____

E-mail: _____

Notes/Comments:

Saint Louis County

Planning and Community Development Department • 100 Missabe Building, 227 West First Street Duluth, MN 55802 • Phone: (218) 725-5000 • Fax: (218) 725-5029
Toll Free in Minnesota: 1-800-450-9777
www.stlouiscountymn.gov

Barbara Hayden
Director

TO: Community Contacts for Hazard Mitigation Plan Update

FROM: Susan Koschak, Planner II

DATE: August 16, 2012

RE: Information needed for hazard events since 2005

CC: Paul Lee, Emergency Management Coordinator

As you know, St. Louis County is in the process of updating its Hazard Mitigation Plan. Recent events such as the flash flooding in southern areas of the county and the blow down in the northern areas have increased our awareness of the importance of this plan.

Along with goals and strategies for future mitigation efforts, documentation of past events is a key part of the plan to assure that projects are eligible for funding. The most accurate data about hazard events since the 2005 plan was written will come from you, the leaders of local jurisdictions.

Attached in this e-mail is a form that outlines the information we need. You may complete it in whatever way best suits your jurisdiction:

- Save the word document, fill in the information then re-save and send back to me as an attachment in an e-mail
- Save the word document, fill it in and mail it back to me
- Use the form as an outline and send me an e-mail with your information

If you had no events in your jurisdiction since 2005, you may simply type in "none", send me an e-mail or call me and let me know.

Thanks for your participation in the planning process to this point. There will be a few more times over the next months when additional feedback will be requested. This plan is very important because order to be eligible for federal funding, mitigation strategies must be included in the plan.

As always, feel free to contact me if you have any questions or feedback. You can email me at koschaks@stlouiscountymn.gov or call 218-725-5023. Thank you for your attention and time.

Hazard Events and Impacts since 2005

Please fill in the information for hazard events that occurred in your jurisdiction (city, township, reservation) since 2005. **Include only those major events that resulted in actual damage, injury, loss of life or other significant impact.** This form is a Word document and the boxes will expand as you type in your information. You may add rows or save new sheets if needed.

Your Name and Position:___
Your Jurisdiction (city, township, reservation):____

Hazard (Use lists below)	**Date** mm-dd-yy	**Brief description**	**Impact and/or damage**	**Cost of damage**	**Comments**

Natural Hazards Include:	**Human Caused Hazards Include:**
Severe Rain Storm	Chemical Spill
Hail Storm	Biological
Lightning	Radiological
Wind Storm	Nuclear
Winter Strom (blizzard)	Explosives
Ice Storm	Terrorism
Extreme Heat	Other – please name in list on worksheet above
Extreme Cold	
Flood	
Drought	
Tornado	
Wildland Fire	
Disease Outbreak	
Other – please name in list on worksheet above	

You may complete it in whatever way best suits your jurisdiction:

- Save the word document, fill in the information then re-save and send back to me as an attachment in an e-mail to koschaks@stlouiscountymn.gov

- Save the word document, fill it in, print it and mail it back to me
  Susan Koschak
  St. Louis County Planning and Community Development
  100 Missabe Building
  227 W 1st St
  Duluth, MN 55811

- Use the form as an outline and send me an e-mail your information

- If your information is very short call me at **218-725-5023**

September 4, 2012

To Community Contacts for St. Louis County Hazard Mitigation Plan Update

Hello,
Just over two weeks ago I sent you a request to send information about any significant hazard events that occurred in your city or township since 2005. If you have already sent your reply, thank you!

If not, this is a reminder to do so. This information is an important part of our Hazard Mitigation Plan Update, which is required in order to be eligible for mitigation funding in the future.

I am again attaching the memo and form that I sent. If you have not already done so, please **respond no later than Monday, September 10**.

As always, please contact me at koschaks@stlouiscountymn.gov or 218-725-5023 if you have any questions.

Thanks again,
Susan Koschak

Saint Louis County

Planning and Community Development Department • 100 Missabe Building, 227 West First Street Duluth, MN 55802 • Phone: (218) 725-5000 • Fax: (218) 725-5029
Toll Free in Minnesota: 1-800-450-9777
www.stlouiscountymn.gov

Barbara Hayden
Director

TO: City, Township and Tribal Government Contacts and Planning Team Members

FROM: Susan Koschak, Planner II

DATE: October 4, 2012

RE: Review and Feedback on Draft Hazard Mitigation Plan Update

As you know, work on the update of the St. Louis County Hazard Mitigation Plan has been underway for the past several months. Although we are still collecting some data and organizing maps and the appendixes, the draft plan is ready for your review and comments. After your suggestions are incorporated, the next draft will be available for public comment. The draft plan is attached in PDF format. If you are unable to open this attachment, please call me and I will mail you a copy.

Of particular importance for your review is Section 5, Goals and Strategies, beginning on page 103. **Only strategies included in this plan will be eligible for federal funding.** If there are strategies missing or if you have project ideas that do not seem to fit into any of the listed strategies, it is critical to let me know so that I can add them.

Of special note to Cities: participation in the planning process is required in order to be eligible for funding so a response to this request for feedback is important to implementation of any mitigation projects for the next five years. Townships are included under the umbrella of the county adoption of the plan. Each Tribal Government will submit an annex to the plan.

If you are the contact person for a city, please give special attention to and include in your comments which strategies you might implement and/or what mitigation projects you may seek funding for. Being listed does not commit you to implementation but, **if a city is not named in the implementation column, it will not be eligible for mitigation funds during the period for which the plan is in effect, which is five years.** For some strategies, all jurisdictions may be covered when the implementation includes 'all jurisdictions within the county'. If you have specific strategies or unique projects in mind, we will name your jurisdiction where you indicate to do so.

You may use the form attached to this e-mail to send your comments (add rows as needed) or e-mail or mail me your comments in whatever format you'd like. Please include what page each of your comments refers to.

Please send your comments to me **no later than Friday, November 16, 2012**. If you have questions, contact me at koschaks@stlouiscountymn.gov or 218-725-5023.

Attachments

cc: Paul Lee, Coordinator, St. Louis County Sheriff's Office/Division of HS/EM

Feedback Form
St. Louis County Draft Hazard Mitigation Update 2012

Name: _____Position/Title:_____

Phone: _____ E-mail:_____

Who do you represent? Please name the City, Township, Tribal Government, Company or Agency:
_____

Return your comments no later than Friday, November 16, 2012 to:
koschaks@stlouiscontymn.gov
or print and mail to:
Susan Koschak
St. Louis County Planning and Community Development
227 W 1st St, #100
Duluth, MN 55802

Page #	Section #	Comments/Corrections

From: Paul Lee
To: Paul Lee; Susan Koschak
Date: 10/29/2012 10:58 AM
Subject: Hazard Mitigation Plan Review and Comments
Attachments: Paul Lee.vcf

Good Day,

About three weeks ago you received an e-mail message (and attachments) from Susan Koschak of the St. Louis County Planning Department. Susan was requesting your review and feedback on the St. Louis County Hazard Mitigation Plan Update. I would like to encourage you to take some time to look through the plan and send your comments, corrections and ideas to Susan.

As Susan said in her message, you may want to give special attention to the Goals, Objectives and Strategies section of the DRAFT Hazard Mitigation Plan.

We want to be sure that any mitigation project you might consider over the upcoming five years is covered in at least one of the broad strategies so that it is eligible for funding. Cities must participate in the planning process in order to be eligible for any mitigation funded projects. Responding to this request for feedback fulfills that requirement.

Thanks for taking time to review the draft plan and send your feedback. If you have questions, feel free to contact me at 218-625-3960 or leep@stlouiscountymn.gov or Susan at 218-725-5023 or koschaks@stlouiscountymn.gov

Paul

Paul M. Lee, Coordinator
St. Louis County Sheriff's Office/Division of HS/EM
5735 Old Miller Trunk Highway
Duluth, MN 55811
218-625-3960 (Phone)
218-391-2720 (Cellular)
218-625-3965 (FAX)
leep@stlouiscountymn.gov

From: Susan Koschak
To: Susan Koschak
CC: Paul Lee
Date: 11/19/2012 3:01 PM
Subject: Action needed: Please reply to request for feedback on Hazard Mitigation Plan

November 19, 2012

Hello,
We are just a few weeks away from sending the draft Hazard Mitigation Plan Update out for the review and approval process.

I have not yet heard back from you in response to our request for comments on the draft.

If you have any mitigation projects in mind for the next five years and/or would like to be listed in the implementation column for any of the mitigation strategies, I need to hear from you to include that information. It is especially important for each city to be included in order to be eligible for mitigation funds during the five years this plan covers.

After the plan is adopted by the St. Louis County Board next spring, cities will be encouraged to adopt the plan as well.

Please e-mail me any comments or corrections to the plan as well as projects you may implement **as soon as possible**. **Please reply even if you have no projects planned.**

If you have questions you can contact me at koschaks@stlouiscountymn.gov or Paul Lee at leep@stlouiscountymn.gov

The draft plan is posted on our website at www.stlouiscountymn.gov.

Thanks and have a great Thanksgiving holiday.

Susan Koschak

Susan Koschak
Planner II
St. Louis County, Minnesota
Planning and Community Development
100 Missabe Building
227 W. First Street
Duluth, MN 55802
Phone: 218-725-5023
Fax: 218-725-5029
Email: koschaks@stlouiscountymn.gov
Web: www.stlouiscountymn.gov

APPENDIX C:

Public Involvement Documentation

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Public Notice

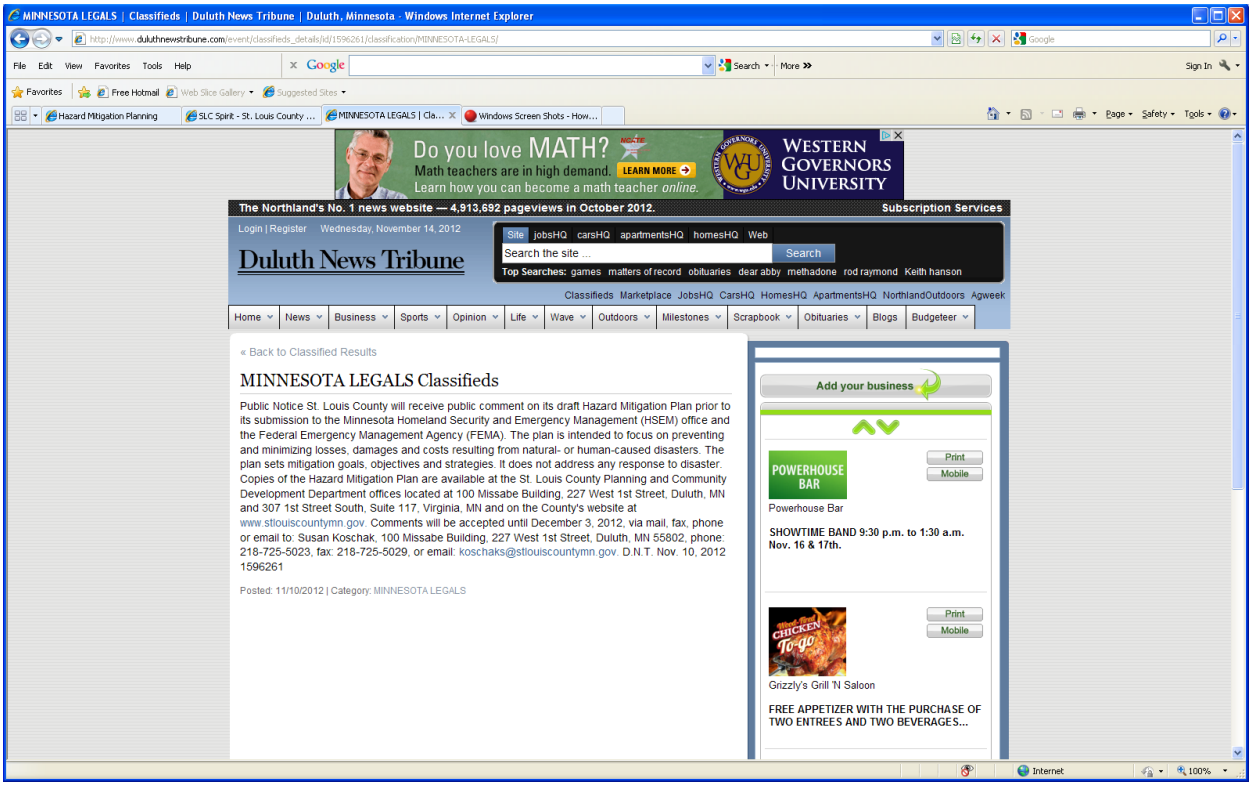
St. Louis County will receive public comment on its draft Hazard Mitigation Plan prior to its submission to the Minnesota Homeland Security and Emergency Management (HSEM) office and the Federal Emergency Management Agency (FEMA). The plan is intended to focus on preventing and minimizing losses, damages and costs resulting from natural- or human-caused disasters. The plan sets mitigation goals, objectives and strategies. It does not address any response to disaster.

Copies of the Hazard Mitigation Plan are available at the St. Louis County Planning and Community Development Department offices located at 100 Missabe Building, 227 West 1st Street, Duluth, MN and 307 1st Street South, Suite 117, Virginia, MN and on the County's website at www.stlouiscountymn.gov.

Comments will be accepted until December 3, 2012, via mail, fax, phone or email to: Susan Koschak, 100 Missabe Building, 227 West 1st Street, Duluth, MN 55802, phone: 218-725-5023, fax: 218-725-5029, or email: koschaks@stlouiscountymn.gov.

D.N.T. Nov. 10, 2012

1596261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SAINT LOUIS COUNTY MINNESOTA

Election results

St. Louis County has approximately 125,000 registered voters, and every vote counts. For complete election results for St. Louis County and throughout Minnesota, please visit the Secretary of State's website.

- Election results
- View a sample ballot

2012 Hazard mitigation plan

The Sheriff's Office - Division of Homeland Security and Emergency Management is seeking feedback on its updated Hazard Mitigation Plan. Read more...

- Review the draft

Jean Duluth Road update

Construction has started to rebuild the bridge over the Lester River. Read more...

- Sign up for construction updates

Flood "heroes" recognized

The County Board is recognizing close to 450 employees for their outstanding response. Read More...

- Flood Resource Center

SAINT LOUIS COUNTY MINNESOTA

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Hazard Mitigation

Planning for Hazards and Emergencies

The purpose of the Hazard Mitigation plan is to determine how to reduce or eliminate the loss of life and property damage resulting from natural, technological, and human-caused hazards. The Federal Emergency Management Agency (FEMA) initiated all hazard mitigation planning in light of the increasing number and harm of disasters in recent years. The plan is currently being updated, and your input is requested. We encourage you to participate and help make St. Louis County a safer place. Click here to review the draft of the 2012 Hazard Mitigation Plan.

Comments will be accepted until December 3, 2012 and can be submitted via mail, fax, phone or email to Susan Koschak:
100 Missabe Building
227 West 1st Street
Duluth, MN 55802

Fax: (218) 725-5029
Phone: (218) 725-5023
Email: koschaks@stlouiscountymn.gov

total items 3 items x page 10 1

Document	Description	Size
2005-St.Louis-County-Hazard-Mitigation-Plan.pdf		20.72 MB
Draft for review-Hazard Mitigation Plan.pdf		4.01 MB
Governors Press Conference Presentation)odf_1.pdf		9.73 MB

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BOARD MEMO NO. 12 - 37

DATE: November 13, 2012

FROM: Kevin Z. Gray
County Administrator

Ross Litman
Sheriff

Barbara Hayden
Planning and Community Development Director

RE: **St. Louis County Hazard Mitigation Plan Update**

In 2003, the Federal Emergency Management Agency (FEMA) required that all communities have a plan in place in order to be eligible for funds under the Pre-disaster Mitigation Grant Program. The current plan was adopted in 2005. An updated plan is required to remain eligible for mitigation funds.

The St. Louis County Sheriff's Office - Division of Homeland Security and Emergency Management is in the process of updating the county-wide Hazard Mitigation Plan. Staff members of the county Planning and Community Development Department are leading the planning process and GIS data development.

Throughout the planning process the internal work team analyzed risks, set goals and objectives, collected data and identified mitigation strategies. Strategies are intentionally broad to include mitigation projects that may be implemented at the local level.

This plan does not address any response to a disaster. It is intended to focus on preventing and minimizing losses, damages and costs resulting from natural or human caused disasters. Project examples include sprinkler systems, defensible space or hazardous fuel reduction to protect buildings from wildfire, undergrounding wires to prevent ice storm damage and safe room construction to keep residents safe during tornadoes and severe wind events.

A planning team was established which included 33 members from various agencies and organizations across the county. Contacts were established with each tribal government, city and township. The draft plan is currently being reviewed by all of these contacts. Their comments will be included in the final plan.

A public comment period has begun. The plan is posted on the St. Louis County website and was announced through an official published public notice. The public comment period will last through December 3, 2012.

After all comments are collected and the draft plan is complete, it will be sent to the Minnesota Homeland Security and Emergency Management (HSEM) office for a review period that is expected to take up to 30 days. Any needed changes based on this review will be made, after which the draft plan will be sent to FEMA for review and approval which is expected to take up to 30 days.

The final step, which is expected to be in March 2013, is for the St. Louis County Board to adopt the plan. Each city and tribal government in the county is also encouraged to adopt the plan. Townships are eligible for mitigation funds as part of the county.

The draft plan is posted on the county website and a copy will also be sent to each commissioner.

Saint Louis County

Sheriff's Office • 100 North Fifth Avenue West, Room 103 • Duluth, MN 55802
Phone: (218) 726-2340 • Fax: (218) 726-2171 • www.stlouiscountymn.gov

Ross Litman
Sheriff

NEWS RELEASE

For immediate release:
February 12, 2013

MEDIA CONTACT: Marcus Bruning, Director
Sheriff's Office Emergency Management Division
(218) 336-4340

Paul Lee, Coordinator
Sheriff's Office Emergency Management Division
(218) 625-3960

St. Louis County to host public meetings about Hazard Mitigation Plan

Reducing and preventing loss of life, damage and costs from a disaster, whether natural or human-caused – that is the purpose of a Hazard Mitigation Plan. The Federal Emergency Management Agency (FEMA) requires all communities to have such a plan in place in order to qualify for funds through its Hazard Mitigation Grant Program.

St. Louis County has a Hazard Mitigation Plan in place, and is working to update that plan. The Sheriff's Office – Division of Homeland Security and Emergency Management, along with the County's Planning and Community Development Department, worked with a team of more than 30 individuals chosen for their technical expertise to analyze risks, set goals, collect data and identify mitigation strategies.

A draft of the plan can be viewed on the County's website. Additionally, the County will host three public meetings for anyone interested in offering feedback about the plan:

Tuesday, February 19, 11 a.m. to 1:30 p.m.

Richard H. Hanson Public Works and Transportation Complex

4787 Midway Road, Pike Lake

Wednesday, February 20, 11 a.m. to 1: 30 p.m.

Ely Maintenance Facility

2210 East Sheridan Street, Ely

-more-

Thursday, February 21, noon to 2:30 p.m.

Northland Office Center

307 South First Street, Virginia

The document outlines the County's risk for various types of disasters, such as extreme winter storms, floods, wildfires, terrorism, chemical spills and drinking water contamination. It also identifies strategies that may be implemented to reduce the impact of a disaster.

Once the plan is complete, it must be approved by both FEMA and the St. Louis County Board. To view a draft of the Hazard Mitigation Plan, visit stlouiscountymn.gov/mitigation, or contact the Sheriff's Office – Emergency Management Division at (218) 336-4340.

# # #

Media List
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St. Louis County wants input on reducing hazards | Duluth News Tribune | Duluth, Minnesota - Windows Internet Explorer
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St. Louis County wants input on reducing hazards
The county is developing a hazard mitigation plan that's required by the Federal Emergency Management Agency in order for funds through FEMA's Hazard Mitigation Grant Program.
By: News Tribune staff, Duluth News Tribune
St. Louis County is asking for citizens' input on a federally mandated effort to reduce hazards to the public, including everything from forest fires to floods and enemy attacks.
The county is developing a hazard mitigation plan that's required by the Federal Emergency Management Agency in order for funds through FEMA's Hazard Mitigation Grant Program.
The goal is to reduce the loss of life, damage and financial costs from natural and human-caused disasters.
The Sheriff's Office Division of Homeland Security and Emergency Management, along with the County's Planning and Community Development Department, worked with a team of more than 30 individuals chosen for their technical expertise to analyze risks, set goals, collect data and identify mitigation strategies.
The county has a draft plan that outlines the county's risk for various types of disasters, such as extreme winter storms, floods, wildfires, terrorism, chemical spills and drinking-water contamination. It also identifies to reduce the impact of a disaster.
A draft of the plan can be viewed on the county's website. The county will host three public meetings for people to review the plan and make comments.
11 a.m. to 1:30 p.m. Tuesday at the Richard H. Hanson Public Works and Transportation Complex, 4787 Midway Rd., Pike Lake
11 a.m. to 1:30 p.m. Feb. 20 at the Ely Maintenance Facility, 2210 E. Sheridan St., Ely
Noon to 2:30 p.m. Feb. 21 at the Northland Office Center, 307 S. First St., Virginia
Go to stlouiscountymn.gov/mitigation or call (218) 336-4340 to see the plan or for more information.
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St. Louis Co. Seeks Public Input for To Avoid Next Major Disaster

February 20, 2013

Updated Feb 20, 2013 at 6:00 PM CST

Duluth, MN (NNCNOW.com) - Cotton resident Gene Rands remembers seeing first–hand the property devastation left behind by June's historic flood.

"The roads were all closed, the bridges were closed—so that did a lot of damage [to] taxpayers," said Rands.

But Rands says much of that damage could've been reduced, or avoided altogether.

Four days after the 10 inches of rain fell, Minnesota Power followed what Rands calls an outdated federal operating plan and opened the Whiteface Reservoir—only worsening the flood for residents downstream.

Rands said no one from the county notified residents of the decision: "We had people trapped, we couldn't get fire trucks, first responders, or anything else into these places."

It's those exposed weaknesses in the Hazard Mitigation Plan that people, like Marcus Bruning of the St. Louis County Sheriff's Office Emergency Management Division, are working to fix.

In all, over 30 people of varying expertise have been chosen to analyze risks, set goals, and listen to first–hand testimony from people, like Rands, about what can be done better on the front–lines of disaster prevention.

"The idea is to go into local areas and [ask], 'how can I help?' That's what the emergency operations plan is all about—having those resources available to us," said Bruning.

But, the reality of the situation is you can't prevent everything, which is why the Hazard Mitigation Squad says these sessions are just as much about response as they are prevention.

"What would be the impact upon our community, upon our citizens, and... our infrastructure? How can we

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4. Governor, State Lawmakers Attend Asian Carp Summit
5. Update: Victim Identified in Fatal Car vs. Train Accident
6. St. Louis Co. Seeks Public Input for To Avoid Next Major Disaster
7. Gun Control Opponents to Lawmakers: Rethink Gun Control Bills
8. Round Two of Gun Hearings in St. Paul
9. Frac Sand Mining Opponents want Stricter

St. Louis County Hazard Mitigation Plan Update
February 19 – 20 – 21, 2013

Use the space below to leave your feedback and comments.

Page #	Section #	Comments

Optional:

Name _____

City _____ **Township** _____

E-mail address _____

APPENDIX D:

St. Louis County Risk Assessment Survey

The following message was sent to all Community Contacts and Planning Team Members via email.

The St. Louis County Sheriff's Office – Division of Homeland Security and Emergency Management is updating the county-wide Hazard Mitigation Plan. You have been identified as a contact person for a city or township or as a member of the Planning Team.

As one step in our planning process, we need to assess our risk of hazards. This short survey is part of that assessment and we invite you to complete it from your perspective. It should take no more than 10 minutes to answer 9 questions.

Your answers will be compiled with all others to help us set goals and identify strategies.

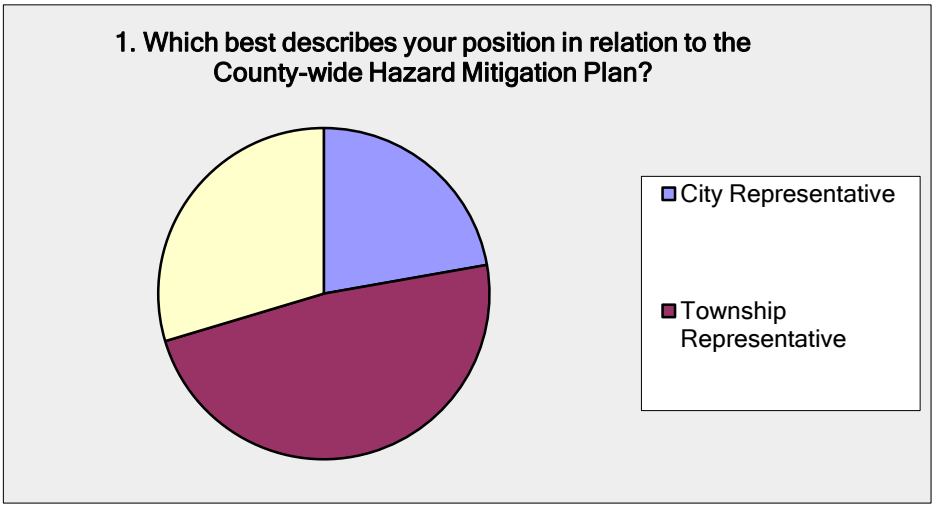
This survey will be open through Friday, April 13, 2012. Please complete it before it closes.

If you have questions, please contact Susan Koschak, St. Louis County Planning and Community Development Department at koschaks@stlouiscountymn.gov or 218-725-5023.

Thank you for your participation.

Hazard Mitigation Risk Assessment

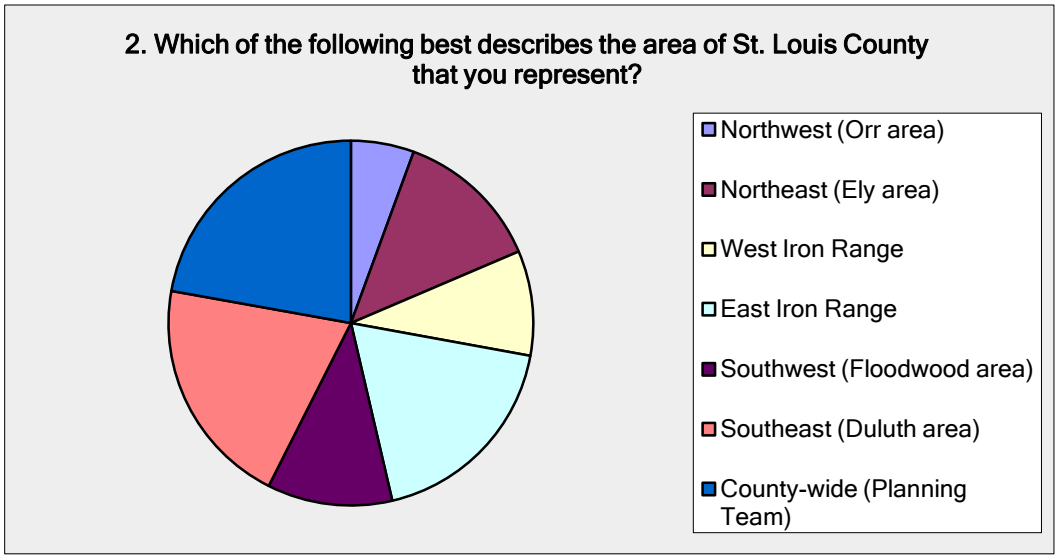
1. Which best describes your position in relation to the County-wide Hazard Mitigation Plan?		
Answer Options	**Response Percent**	**Response Count**
City Representative	22.2%	12
Township Representative	48.1%	26
County-wide agency/organization (Planning Team	29.6%	16
	answered question	**54**
	skipped question	**1**



Hazard Mitigation Risk Assessment

2. Which of the following best describes the area of St. Louis County that you represent?

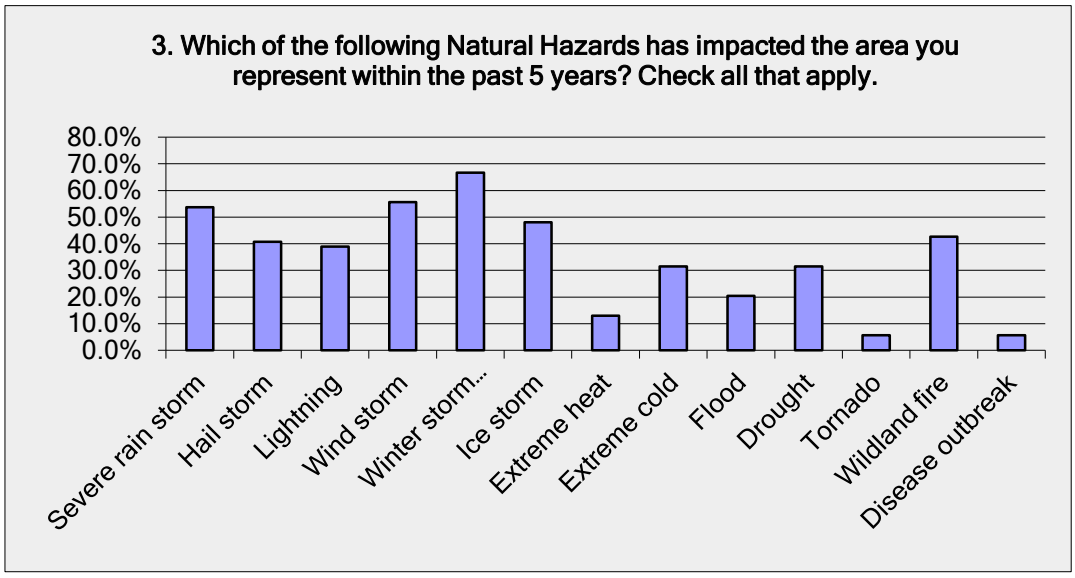
Answer Options	Response Percent	Response Count
Northwest (Orr area)	5.6%	3
Northeast (Ely area)	13.0%	7
West Iron Range	9.3%	5
East Iron Range	18.5%	10
Southwest (Floodwood area)	11.1%	6
Southeast (Duluth area)	20.4%	11
County-wide (Planning Team)	22.2%	12
answered question		54
skipped question		1



Hazard Mitigation Risk Assessment

3. Which of the following Natural Hazards has impacted the area you represent within the past 5 years? Check all that apply.

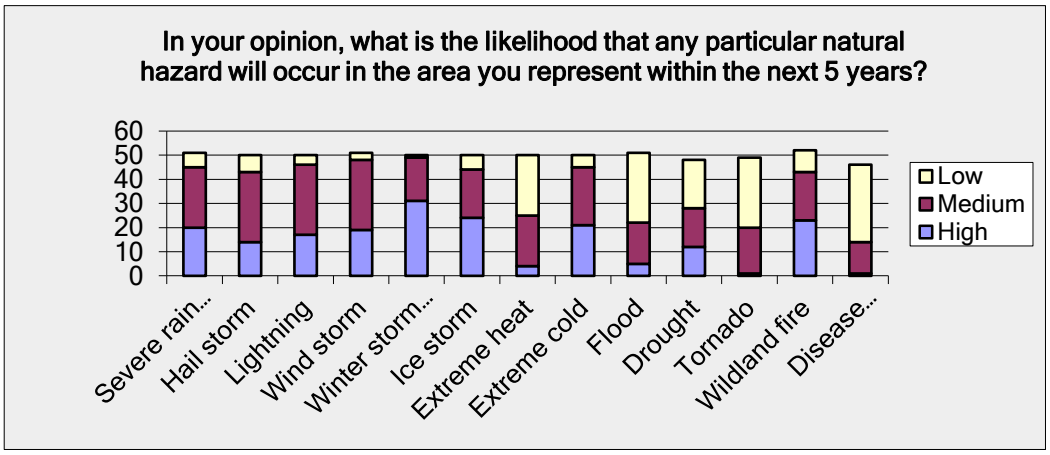
Answer Options	Response Percent	Response Count
Severe rain storm	53.7%	29
Hail storm	40.7%	22
Lightning	38.9%	21
Wind storm	55.6%	30
Winter storm (blizzard)	66.7%	36
Ice storm	48.1%	26
Extreme heat	13.0%	7
Extreme cold	31.5%	17
Flood	20.4%	11
Drought	31.5%	17
Tornado	5.6%	3
Wildland fire	42.6%	23
Disease outbreak	5.6%	3
Other (please specify)		4
	answered question	54
	skipped question	1



Hazard Mitigation Risk Assessment

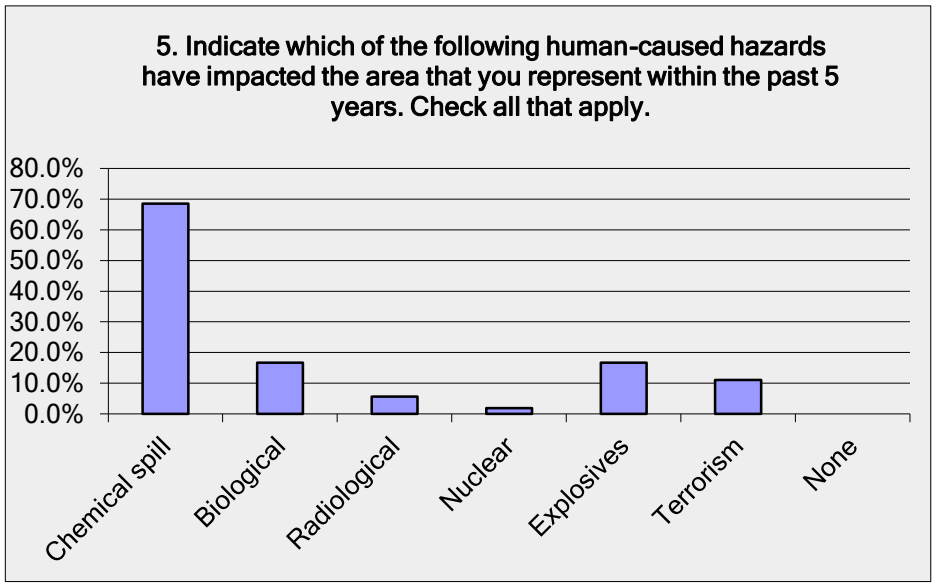
4. In your opinion, what is the likelihood that any particular natural hazard will occur in the area you represent within the next 5 years?

Answer Options	Low	Medium	High	Response Count
Severe rain storm	6	25	20	51
Hail storm	7	29	14	50
Lightning	4	29	17	50
Wind storm	3	29	19	51
Winter storm (blizzard)	1	18	31	50
Ice storm	6	20	24	50
Extreme heat	25	21	4	50
Extreme cold	5	24	21	50
Flood	29	17	5	51
Drought	20	16	12	48
Tornado	29	19	1	49
Wildland fire	9	20	23	52
Disease outbreak	32	13	1	46
Other (please specify)				3
			answered question	54
			skipped question	1



Hazard Mitigation Risk Assessment

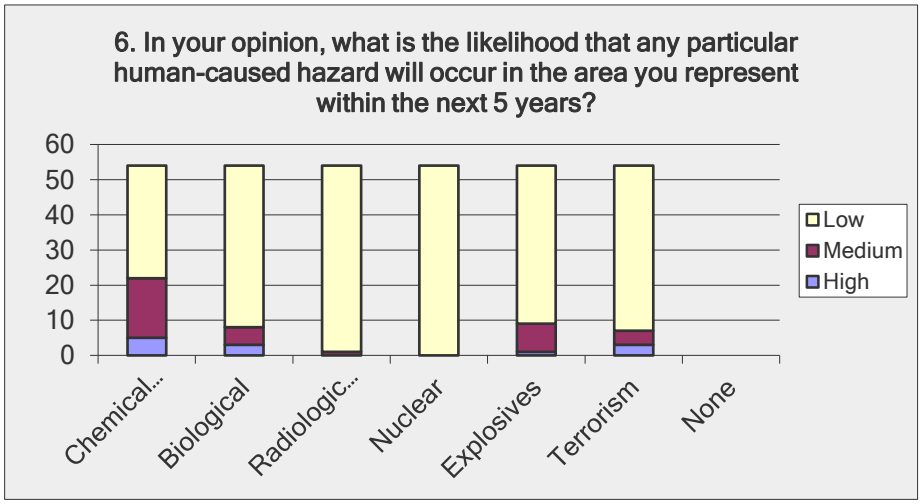
5. Indicate which of the following human-caused hazards have impacted the area that you represent within the past 5 years. Check all that apply.		
Answer Options	**Response Percent**	**Response Count**
Chemical spill	68.5%	37
Biological	16.7%	9
Radiological	5.6%	3
Nuclear	1.9%	1
Explosives	16.7%	9
Terrorism	11.1%	6
None	0.0%	0
Other (please specify)		30
	answered question	54
	skipped question	1



Hazard Mitigation Risk Assessment

6. In your opinion, what is the likelihood that any particular human-caused hazard will occur in the area you represent within the next 5 years?

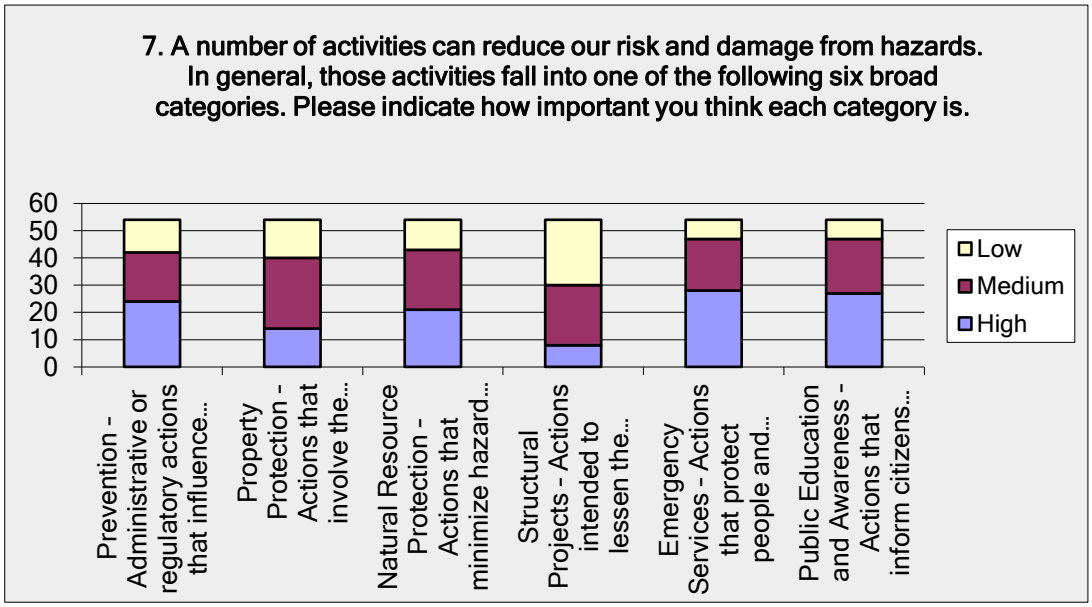
Answer Options	Low	Medium	High	Response Count
Chemical spill	32	17	5	54
Biological	46	5	3	54
Radiological	53	1	0	54
Nuclear	54	0	0	54
Explosives	45	8	1	54
Terrorism	47	4	3	54
None	0	0	0	0
Other (please specify)				3
			answered question	54
			skipped question	1



Hazard Mitigation Risk Assessment

7. A number of activities can reduce our risk and damage from hazards. In general, those activities fall into one of the following six broad categories. Please indicate how important you think each category is.

Answer Options	Low	Medium	High	Response Count
Prevention - Administrative or regulatory actions that	12	18	24	54
Property Protection - Actions that involve the modification	14	26	14	54
Natural Resource Protection - Actions that minimize	11	22	21	54
Structural Projects - Actions intended to lessen the	24	22	8	54
Emergency Services - Actions that protect people and	7	19	28	54
Public Education and Awareness - Actions that inform	7	20	27	54
Other (please specify)				0
			answered question	54
			skipped question	1



Hazard Mitigation Risk Assessment

8. In your opinion, what are some steps local government could take to reduce or eliminate the risk of future hazard damages in the area you	
Answer Options	Response Count
	30
answered question	30
skipped question	25

Hazard Mitigation Risk Assessment

9. What other issues regarding the reduction of risk and loss associated with hazards or disasters in St. Louis County do you think are important?	
Answer Options	Response Count
	27
answered question	27
skipped question	28

Responses to open ended questions sorted into groups of same or very similar answers and edited for spelling and punctuation.

Question #4

- Only everyday Northland weather, no major disasters
- a person cannot predict these outbreaks
- forest disease impacting forest health & fire

Question #5 (Edited for spelling and punctuation)

- None
- None of the above but there is no button to select for none of the above.
- Only check as survey would not allow completion with out choosing one.
- None
- None
- None
- None
- None
- None none none ps. no chemical spill !!!
- None of the above
- None
- None
- None
- None
- None - there haven't been any in the past 5 years
- None
- None of above
- None of the above. The survey forced me to pick an answer. There was no box next to Other
- None of the above; the program made me provide a response
- N/A
- N/A
- N/A
- Unknown - new to position
- Wildland fire
- Fire
- Fires
- Hazardous Material
- CN Rail Road carries chemicals
- Spill in the harbor
- Oil Spills
-

Question #6 (Edited for spelling and punctuation)

- None
- CN Railroad carries most of hazardous items
- Oil spill (high)

Question #8 (Edited for spelling and punctuation)

- Forest management; land use planning; emergency preparedness and training; public awareness; road improvements; ditch and drainage management
- Do not increase property tax on persons making improvements for protection.
- Have a better plan on what people should do if a hazard happens and make sure the people know the plan
- Take a better look at potential mitigation projects and to see if their project is eligible for funding via the mitigation program administered by FEMA.
- Provide education and awareness sessions and local news stories.
- More education
- You cannot predict a storm related disaster, dry conditions may lead to fires; keep the issues to local govt such as township...bigger is not better...
- Education/ handouts from St. Louis Co.
- Develop joint powers agreements/ Motions of Understanding re: joint reponses to disasters, develop warning systems for rural areas
- Consider wildland fuels management.
- Education, Material supply support. Tech assistance with related equipment and training. Direct and open communications both from the elected officials as well as Government departments i.e. Public Safety, Health & Human Service, Forestry and so on. The Departments that would have a direct effect and outcome of support in such a hazard.
- In our township a gas pipeline and two railroads increase our risk for chemical disasters. However we don't have any control over these. Perhaps we should have more control and these business should have to put more money into our fire department so we our better able to deal with these possibilities.
- NONE
- Education/Training
- Public education combined with local government developing plans, which are implementable, to recognize and prepare for the obvious hazards.
- Continue to ensure a Pro-active approach (preparedness) for response to natural disasters; Ensure citizens are prepared in the event of a disaster so not to become a victim and be self sufficient until government can support.
- Replacing the storm drains and infrastructure on some of our streets City issue
- Public awareness meetings or having information available at community areas such as town halls and community centers.
- We are most affected by natural hazards, particularly wildfire issues. Do not know what local government could to prevent issues- Minnesota DNR does a fire watch.
- Run some educational TV ads aimed at citizens on what to do in the event of: a number of possible hazards that are more likely to occur in our county

- N/A
- Educate public about best practices regarding the most likely hazards that our area faces. Monitoring any projects designed to deal with or mitigate hazards.
- Property training employees and first responders, improving regulations to prevent problems and continued involvement in the mitigation process.
- None
- Public Education. Website - Map emergency shelters and make them known to public. Map known hazard areas and link potential hazard and options identified to minimize risk.
- Do as we have done: develop a major incident action plan, organize training around it, and keep it updated.
- Maintain support in programs that we are currently implementing and developing.
- Increase planning coordination and public education.
- Fire: Certain areas, for example rural Ely, lake shore areas and other rural areas were extensively built out in the last decade. Zoning officials took no regard what this meant for wildland fire protection and other emergency services. Wildfire is not a problem of nature or forest management, it is a problem of human beings living in fire prone areas. It is the equivalent of building in a flood plain then demanding public funding of levees. The property owners never pay the fees to cover the "emergency". This is true for all rural services; for example, maintaining a road system no longer used to the extent it was decades ago to let's say, Meadowlands, costs us more than anything going on in city areas simply because of the network costs.
- Educate the people.

Question 8 – sorted with compound answers broken into simple elements

- Public awareness
- Provide education and awareness sessions and local news stories.
- More education
- Education/ handouts from St. Louis Co.
- Education, Material supply support.
- Education/Training
- Public education combined with local government developing plans, which are implementable, to recognize and prepare for the obvious hazards.
- Educate public about best practices regarding the most likely hazards that our area faces.
- Public Education. Website - Map emergency shelters and make them known to public.
- Have a better plan on what people should do if a hazard happens and make sure the people know the plan
- Emergency preparedness and training
- Public awareness meetings or having information available at community areas such as town halls and community centers.
- Educate the people.
- Forest management
- Consider wildland fuels management.
- Land use planning

- Road improvements
- Ditch and drainage management
- Replacing the storm drains and infrastructure on some of our streets City issue
- Do not increase property tax on persons making improvements for protection.
- Take a better look at potential mitigation projects and to see if their project is eligible for funding via the mitigation program administered by FEMA.
- You cannot predict a storm related disaster, dry conditions may lead to fires;
- Keep the issues to local govt such as township...bigger is not better...
- Develop joint powers agreements/ Motions of Understanding re: joint responses to disasters, develop warning systems for rural areas
- Tech assistance with related equipment and training. Direct and open communications both from the elected officials as well as Government departments i.e. Public Safety, Health & Human Service, Forestry and so on. The Departments that would have a direct effect and outcome of support in such a hazard.
- In our township a gas pipeline and two railroads increase our risk for chemical disasters. However we don't have any control over these. Perhaps we should have more control and these business should have to put more money into our fire department so we our better able to deal with these possibilities.
- NONE
- Continue to ensure a Pro-active approach (preparedness) for response to natural disasters; Ensure citizens are prepared in the event of a disaster so not to become a victim and be self sufficient until government can support.
- We are most affected by natural hazards, particularly wildfire issues. Do not know what local government could to prevent issues- Minnesota DNR does a fire watch.
- Run some educational TV ads aimed at citizens on what to do in the event of: a number of possible hazards that are more likely to occur in our county
- N/A
- Monitoring any projects designed to deal with or mitigate hazards.
- Property training employees and first responders,
- Improving regulations to prevent problems and continued involvement in the mitigation process.
- None
- Map known hazard areas and link potential hazard and options identified to minimize risk.
- Do as we have done: develop a major incident action plan, organize training around it, and keep it updated.
- Maintain support in programs that we are currently implementing and developing.
- Increase planning coordination and public education.
- Fire: Certain areas, for example rural Ely, lake shore areas and other rural areas were extensively built out in the last decade. Zoning officials took no regard what this meant for wildland fire protection and other emergency services. Wildfire is not a problem of nature or forest management, it is a problem of human beings living in fire prone areas. It is the equivalent of building in a flood plain then demanding public funding of levees. The property owners never pay the fees to cover the "emergency". This is true for all rural services; for example, maintaining a road system no longer used to the extent it was

decades ago to let's say, Meadowlands, costs us more than anything going on in city areas simply because of the network costs.

Question #9 (Edited for spelling and punctuation)

- Water quality control; cell phone and broadband signal availability for personal and local fire department access; funding for local fire department training and equipment compatible with other county emergency agencies
- Education must be a top priority to reduce the risks. If the public does not know what to do and how to prepare, how can we reduce risk?
- We need to realize that federal assistance may not be available following a disaster. We need to do the best we can to try to decrease the impact of a disaster.
- Well coordinated effort among all agencies when called with a direct lead in charge.
- Fire
- People need to prepare for disasters. ie. have food and water on hand, plus evacuation plan.
- Development of regions staging areas, incident command areas, and list of equipment available to respond from each city and township
- Show attention to the county transition to 800 mhz.
- Cannot say enough about Educate in all aspects of this question.
- We seem to be willing to increase our risk of pollution and manmade disasters for jobs. May need to redefine the importance of jobs versus environment.
- NONE
- Generally, government will recognize a risk or potential risk and not be willing to have adequate funds or staff or space set aside for: education, physical actions such as storm shelters or food or safe drinking water as example. I am not sure that local governments in the area have been involved with a large scale exercise that includes citizens/hospitals/schools/transportation. I recall the spill in WI and it seemed there was not enough planning or preparation for such an event.
- Bridge collapse; lake superior vessel incident (sinking, fire, oil spill);
- N/A
- Send out flyer or kitchen magnet listing the emergency numbers to call for our county/area and list a few emergency examples with each number, so they are readily available for people
- N/A
- I would like to see our industry, Railroads, become more integrated into the planning section for emergency response. As a carrier of hazardous material, we have a lot of resources and information that could be utilized in the pre- planning and in actual responses.
- With the likelihood of Copper-Nickel mining, all issues dealing with water quality are critical. Unless we have plans to deal with inevitable accidents or violations, St. Louis County may become dotted with super fund sites. As I write this, legislation is being proposed to lower water and air quality standards in the state.

- Spend more time on physical improvements and training and less on "terrorism" type activities
- Take the matches away from the Forest Service.
- Coordinating public communication between agencies. Information sharing, resource options
- Firewise and Fire Adapted Communities programs.
- Emergency Response planning, what resources are readily available to protect or to react to situations
- Communications - availability to communicate with 800 MHz radios and contingency plans for cell phone or landline phone loss.
- Railroad and Highway hazards
- Maintaining a public health infrastructure. Accepting the fact of climate warming and weather instability; floods and droughts will be more frequent and more intense.
- Wild life, lakes, water sources Give towns money so they can prepare for such action.

APPENDIX E:

Review and Resolutions adopting plan

Appendix F:
Tribal Government Annexes

Hazard Mitigation Plan Annex

Bois Forte Band of Chippewa

An Annex to the 2012 Hazard Mitigation Plan
St. Louis County, Minnesota
Prepared by Kevin Koski, Emergency Preparedness Director
December 6, 2012

Introduction

The intent of this Annex was to analyze the Bois Forte Band's current capabilities, plans, policies and programs with regard to Hazard Mitigation, and to align our goals and strategies with those of the greater St. Louis County where possible. The Bois Forte Band has an emerging Emergency Preparedness Program, and as we plan for future work to prevent and mitigate disasters related to all hazards, both natural and man-made, we are hoping to isolate which plans and programs we have in place which can be built upon, while also identifying any program gaps or deficiencies which can be targeted for future improvement.

This annex was prepared in partnership with the following individuals:

- Paul Lee, Emergency Management Coordinator, St. Louis County
- Susan Koschak, Planner II, St. Louis County
- Joan Tweedale, Mitigation Branch, FEMA Region 5
- Jennifer E. Nelson, State Hazard Mitigation Officer, MN HSEM

An initial planning meeting was conducted with the above-mentioned staff in Nett Lake at the Bois Forte Government Center on August 14, 2012. Follow-up phone and email conversations were also held. Assistance was also provided by Cassie Diver, Planning Researcher for the Fond du Lac Tribe in Cloquet, MN.

Bois Forte Emergency Staff/Community Contacts

Bois Forte Reservation Tribal Council - Kevin Leecy, Chairman
Brandon Benner, District I Representative
Karlene Chosa, District I Representative
David Morrison, Secretary/Treasurer
Ray Toutloff, District II Representative

Corey Strong - Executive Director
Kevin Koski - Emergency Preparedness Director
Bois Forte Volunteer Fire Department, Treasurer
Office 218-757-3261 ext 194, Cell 218-780-7621
Andy Datko - Commissioner, Planning Division
Robbie Goggleye - Fire Chief, Bois Forte Volunteer Fire Department
Pete Drift - Police Chief, Bois Forte Police Department
Kim Griener - Chief Financial Officer
Tara Geshick - Commissioner, Natural Resources Division
Joel Asterford - Commissioner, Public Works Division
Mark Olson - Risk Manager, Fortune Bay Resort & Casino
Teri Morrison - Community Health Nurse, Health & Human Services
Doris Isham - EMT/Ambulance Director
Dave Larson - Reservation Forester
Randy Long – Commissioner, IT Division
Carol Burr – Commissioner, Housing Division

Tribal Background

The Bois Forte Reservation is located in extreme northern Minnesota, about 31 miles south of the Canadian border, and is home to the Bois Forte Band of Chippewa, one of six recognized Bands of the Minnesota Chippewa Tribe. These six Bands are organized under a single Constitution; however, each retains complete autonomy in the exercise of sovereign authority with respect to relationships with Federal, State, and local units of government. The Bois Forte Reservation was established by Treaty with the U.S. government in 1866. By this Treaty and Executive Order in 1881, lands were set aside for the use and residence of the Bois Forte Band of Chippewa. These five land bases encompass roughly 135,000 acres in St. Louis and Koochiching Counties in northeastern Minnesota and include: Nett Lake Reservation, Lake Vermilion Reservation, Sugar Bush, Indian Point, and Deer Creek. 50% of the Nett Lake sector is wetland, and Nett Lake itself is reportedly the largest producer of wild rice in the world.

The current total enrollment of the Bois Forte Band of Chippewa is 3302 persons. Roughly 970 people currently live on the five land bases of the Reservation, a number which includes both bandmembers and non-bandmembers. Roughly 650 residents live in the Nett Lake Village, the band's largest land base consisting of 103,000 acres of predominantly forests, water, and wetlands. Roughly 235 residents live on the Lake Vermilion Sector, which is about 2,083 acres in size and is located 40 miles to the southeast of Nett Lake, on Lake Vermilion near the town of Tower, MN. The Vermilion Reservation is home to Fortune Bay Resort & Casino and the Wilderness Golf Course, which provide jobs for approximately 550 employees. The resort casino is the largest operation with an average of 480 employees and a Band employment average of 24% or 115 workers. Approximately 19 of the workers come from the Nett Lake portion of the reservation while 25 come from the Vermilion sector; the remaining 49 Band employees come from Virginia which is about 25 miles away. Roughly 80 residents live on the two remaining land bases of Indian Point (60 acres) and Sugar Bush (83 acres), which are both located on Pelican Lake near the town of Orr, MN. The unoccupied Deer Creek sector is 22,000 acres in size and is located in northern Itasca County about 1 miles east of Effie, MN.

The closest town to Nett Lake is Orr (twenty-two miles away) and the nearest city with a significant population is Virginia, which is approximately 65 miles south of Nett Lake. The closest hospital to Nett Lake is in Cook, approximately 35 miles away.

The Bois Forte Band of Ojibwe is governed by a five member Tribal Council which is elected to four year, staggered terms. The Tribal Council has assumed much of its sovereign authority in matters of the health and education of its members as well as in the use, protection and management of all the Band's natural resources. The Tribal Council operates its own Headstart and child care programs, medical and dental health clinics, conservation enforcement, criminal and judicial court system, tribally owned businesses, roads and community maintenance departments, public transit system, Nett Lake Volunteer Fire Department and Ambulance Service, Natural Resources and Forestry Departments, and central administration programs.

Emergency Plans and Programs

As mentioned, the Band has an emerging Emergency Preparedness program in place, and has had a full-time Emergency Preparedness Director on staff since December 2011. An original Emergency Operations Plan (EOP) was completed by the Band in 1997 and is currently being revised. A Tribal Emergency Response Committee (TERC) has also been formed and will soon begin revising the EOP, as well as preparing a more detailed risk analysis for the Band and its potential hazards. The Band also has a Pandemic Influenza Plan which was completed as an annex to the EOP in 2007, as well as a Community Health All Hazard Response and Recovery Plan (AHRRP), also completed in 2007. Fortune Bay Resort and Casino also has their own stand-alone Emergency Operations Plan, completed in 2003 and currently being revised.

The Bois Forte Band has its own Police Department, which serves both the Nett Lake and Vermilion Reservations. It also has its own Volunteer Fire Department, with 22 crew members and four fire rigs to serve the Nett Lake Reservation. The Vermilion Reservation is covered by an agreement with the Greenwood Township Fire Department. Nett Lake also has its own ambulance service, with two ambulances and 5 drivers, 11 EMT's and 3 First Responders. The Vermilion Reservation is covered by an agreement with Tower ambulance.

The Band also has a warning siren system with 4 sirens in place (Nett Lake Village, Palmquist, Indian Point, and Vermilion) and a fully-functional Emergency Operations Center in the Tribal Government Center in Nett Lake.

The Band also has clinics in both Nett Lake and Vermilion, and a K-6 school in Nett Lake with approximately 100 students. There are also designated emergency sheltering sites with backup power and emergency supplies at the Tribal Government Center Ballroom in Nett Lake and at Fortune Bay Resort & Casino in Vermilion. Both locations are also outfitted with mass casualty trailers with emergency supplies and equipment.

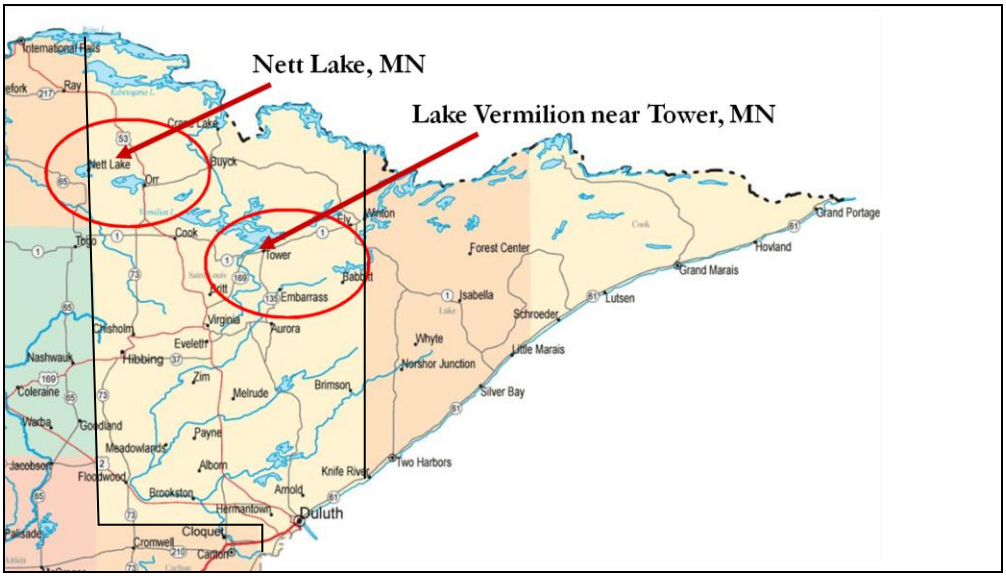


Figure 1 : Location of Nett Lake and Vermilion Reservations Within St. Louis County

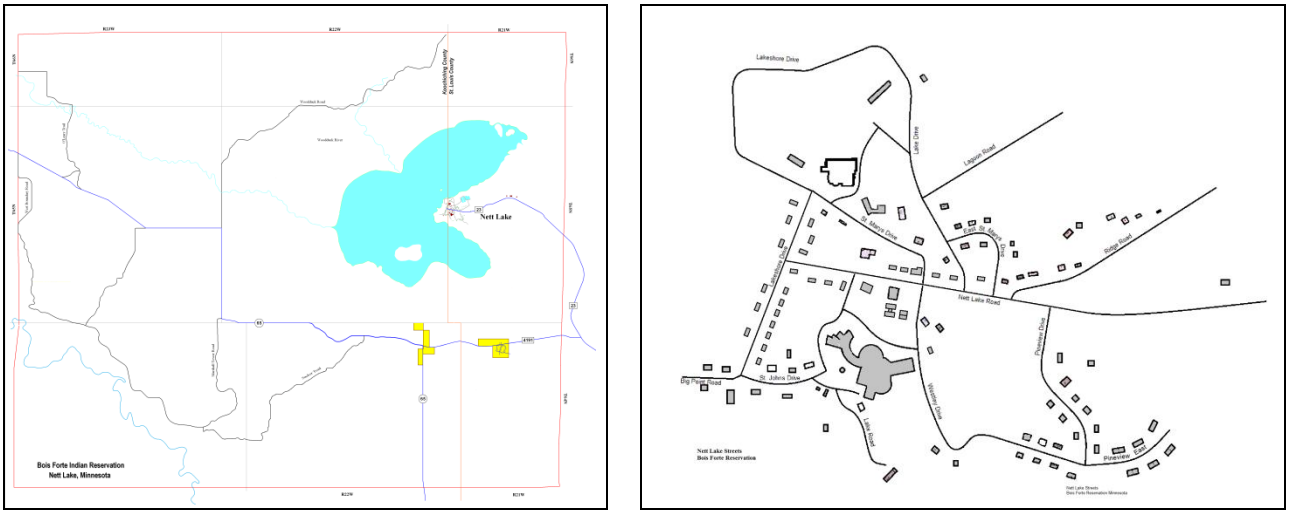


Figure 2: Maps of the Nett Lake Village

Figure 3: Aerial Photos of the Nett Lake Village

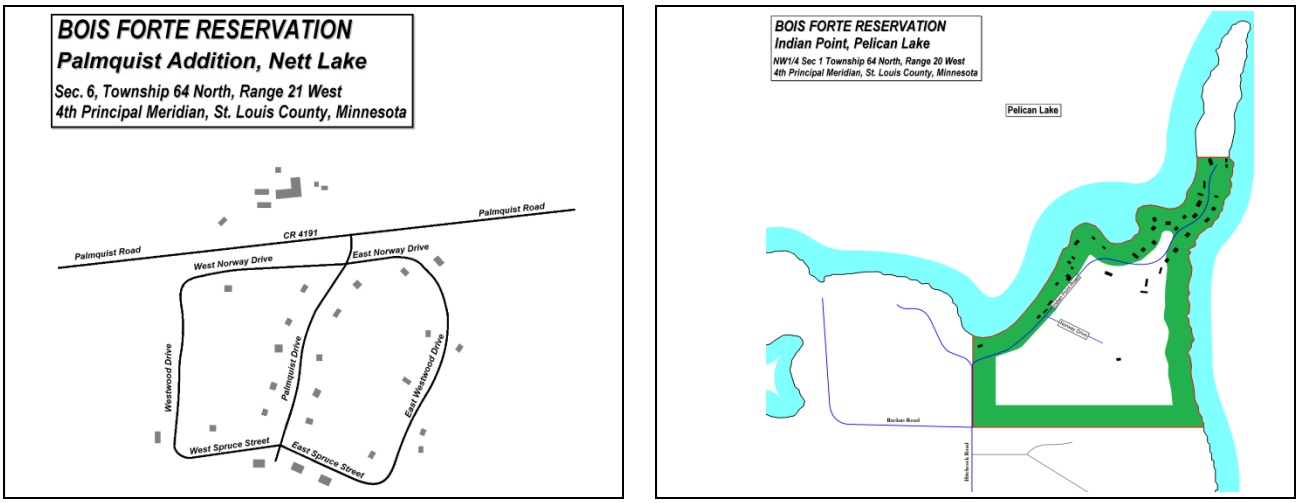


Figure 4: Maps of the Palmquist and Indian Point Neighborhoods

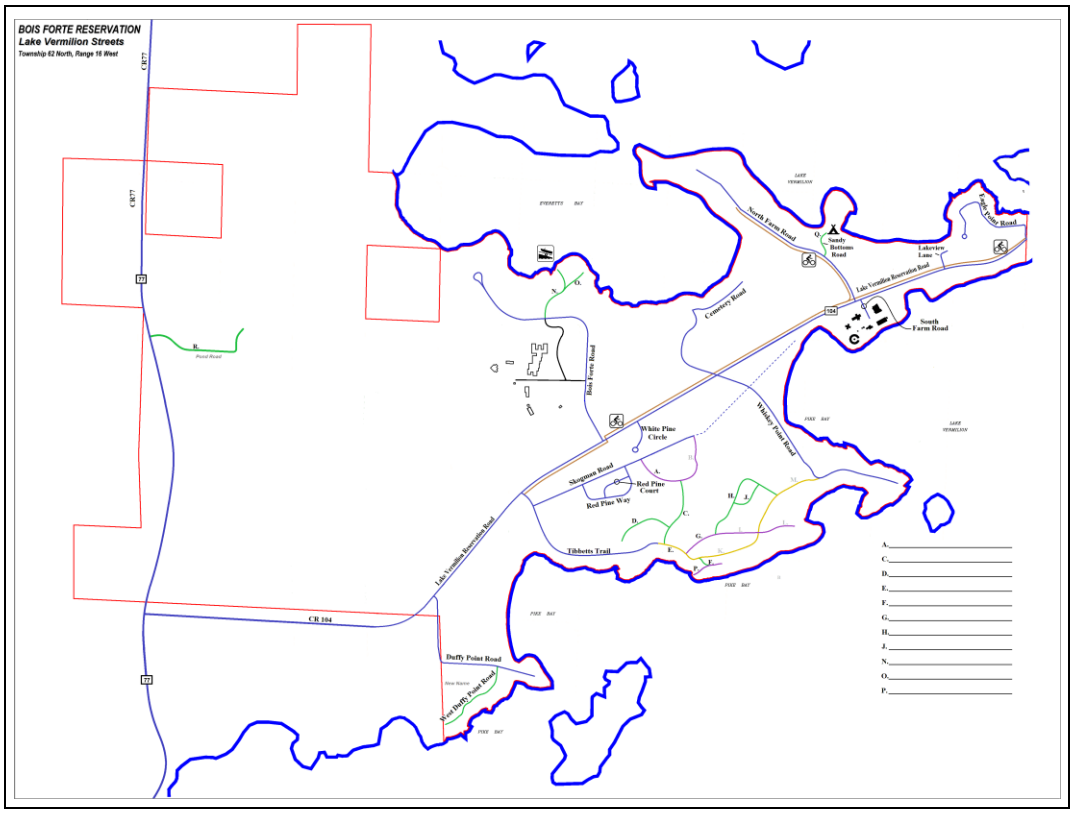
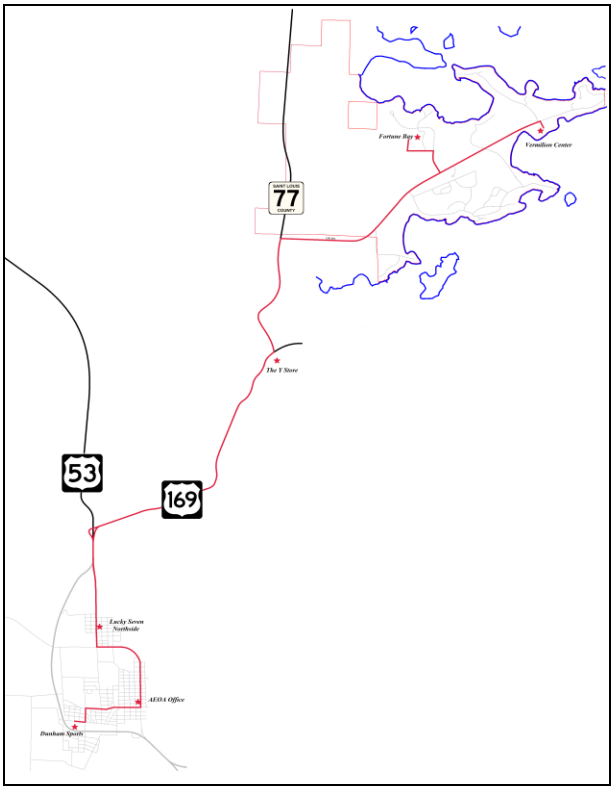


Figure 5: Map of the Vermilion Reservation



Figures 6 & 7: Vermilion Map & Aerial Photo of Fortune Bay Resort & Casino, Tower, MN

Figure 8: Bois Forte Mitigation Project Matrix

Hazard	Location	Mitigation Project	Priority	Alignment With County Strategic Goal
All Hazards	Nett Lake	Complete Work on ARMER Communications Tower just outside of Nett Lake Village	high	Obj. 11.1.1 strategy 1
All Hazards	Nett Lake	Complete Transition to ARMER radio Communication. Assure Fire Dept., Police Department, Ambulance, First Responders & EMT's are fully Equipped	high	Obj. 11.1.1 strategy 1
All Hazards	Nett Lake & Vermilion	Install Interdepartmental Usage Radio Repeater on Nett Lake and Vermilion Sectors Communications Towers	high	Obj. 11.1.1 strategy 1
All Hazards	Nett Lake & Vermilion	Perform Comprehensive Evaluation of Emergency Communications Capabilities throughout Reservation	high	Obj. 11.1.1 strategy 2
All Hazards	Nett Lake & Vermilion	Complete Assessment to Insure Interoperability of Communications between Various Tribal Government Departments	high	Obj. 11.1.1 strategy 2
All Hazards	Vermilion	Perform Coordination Activities with Greenwood Fire Dept. and Tower Ambulance to assure Full Service for Vermilion Residents	high	
All Hazards	Nett Lake	Complete Work to make Emergency Operations Center (EOC) fully-functional	high	Obj. 11.1.1 strategy 2
All Hazards	Nett Lake & Vermilion	Review of Reservation Transportation Facilities & Infrastructure to Identify Critical Risks	medium	
All Hazards	Nett Lake	Perform Comprehensive Evaluation of Evacuation Routes and Complete Project to Construct an Additional Route out of Nett Lake (one way in & out currently)	high	
All Hazards	Nett Lake	Complete Study to Assess Right of Way Dimensions of Roadways to Prevent Road Closures from Storm Debris	medium	
All Hazards	Nett Lake & Vermilion	Distribute/Post Public Information Regarding Hazards on the Reservation	medium	Obj. 1.3.1 strategy 2
All Hazards	Nett Lake & Vermilion	Evaluate Emergency Shelter Locations, Transportation Methods, Update & Obtain Shelter Equipment & Supplies, Complete MOU with American Red Cross	high	Obj. 1.4.1 strategy 2
All Hazards	Nett Lake & Vermilion	Post/Distribute Signage making Residents aware of Emergency Shelter Locations	medium	Obj. 1.4.1 strategy 2
All Hazards	Nett Lake & Vermilion	Maintain Emergency Personnel Training & Maintain and Update Emergency Equipment & Response Protocols	medium	Obj. 11.1.2 strategy 1
All Hazards	Nett Lake & Vermilion	Complete Assembly of Tribal Emergency Response Committee (TERC) and Proceed to hold Regular Meetings	high	Obj. 11.1.2 strategy 1

All Hazards	Nett Lake & Vermilion	Within TERC, Review and Revise existing Emergency Operations Plan and Reservation-Wide, All-Hazard Risk Assessment	high	Obj. 11.1.2 strategy 1
All Hazards	Nett Lake & Vermilion	Complete Tribal Government & Commercial Building Safety Assessments	high	Obj. 11.1.2 strategy 1
All Hazards	Nett Lake & Vermilion	Begin Holding Evacuation, Tornado & Fire Drills in all Tribal Government & Commercial Buildings	high	Obj. 11.1.2 strategy 1
All Hazards	Nett Lake & Vermilion	Hold Employee Compliance Safety Training for All Tribal Government Staff	medium	Obj. 11.1.2 strategy 1
All Hazards	Nett Lake & Vermilion	Hold ICS Training for All Essential Tribal Government Staff & Emergency Personnel	high	Obj. 11.1.2 strategy 1
All Hazards	Nett Lake & Vermilion	Perform Inventory of both Mass Casualty Trailers, Update/Add Equipment and Supplies where needed	medium	
All Hazards	Nett Lake & Vermilion	Post/Distribute Publications to Encourage Families to have home Evacuation Plans and Emergency Kits	medium	Obj. 7.1.1 strategy 2
All Hazards	Nett Lake & Vermilion	Complete Studies to Choose Locations for Helipads on both Nett Lake and Vermilion Reservations	high	
All Hazards	Nett Lake & Vermilion	Obtain Materials & Equipment and Construct Permanent, MNDOT-licensed Helipads for routine Patient Air-Lifting as well as Supply Drop-offs during Extended Periods of Isolation from Disaster Incident	high	
All Hazards	Vermilion	Complete Assessment of Fortune Bay's Emergency Operations Plan and Assure it's Alignment with the Band's Overall Emergency Operations Plan	medium	Obj. 11.1.2 strategy 1
All Hazards	Nett Lake & Vermilion	Review the Band's Existing Relationships/MOU's with Regional Emergency Volunteer Organizations, Update or Add where Needed	medium	
Severe Weather	Nett Lake & Vermilion	Conduct Feasibility Studies Related to the Construction of Storm Shelters for Vulnerable Tribal Government and Commercial Buildings, to Shelter Staff and/or Visitors to Reservation	high	Obj. 1.1.1 strategy 5
Severe Weather	Nett Lake & Vermilion	Construct Storm Above-Ground and/or Underground Storm Shelters for Vulnerable Tribal Government and Commercial Buildings	high	Obj. 1.1.1 strategy 5
Severe Weather	Nett Lake	Complete Personalized Storm Warnings for presentation on Tribal Radio Station	medium	Obj. 1.1.1 strategy 2
Severe Weather	Nett Lake & Vermilion	Install Indoor-Warning System in Tribal Government Buildings (NOAA Weather Radio/PA Notification System)	medium	Obj. 1.2.1 strategy 2

Severe Weather	Nett Lake & Vermilion	Use Severe Weather Awareness Week to Educate Residents on Tips to Prepare for and Combat Severe Weather	medium	Obj. 1.1.1 strategy 1
Debris Removal	Nett Lake & Vermilion	Assess Public Works Department's Capabilities and Assess/Update Equipment Related to Roadway and Building Perimeter Storm Debris Removal	high	
Flooding	Nett Lake & Vermilion	Complete Study to Assess whether Transportation Infrastructure is Resilient to Flooding Events	medium	Obj. 2.1.1 strategy 1
Flooding	Nett Lake & Vermilion	Complete Study to Determine Need for use of Zoning to Prevent Development of Flood-Vulnerable Lands	low	Obj. 2.1.1 strategy 4
Structural Fire	Nett Lake & Vermilion	Complete Survey of Fire Hydrants to Assess Vulnerabilities & Capabilities for Fire Protection	low	Obj. 7.1.3 strategy 2
Structural Fire	Nett Lake	Update Nett Lake Fire Dept.'s Turnout Gear and SCBA Equipment	high	Obj. 7.1.2 strategy 1
Structural Fire	Nett Lake & Vermilion	Post/Distribute Publications to Encourage Families to hold Home Fire Drills	medium	Obj. 7.1.1 strategy 2
Wildland Fire	Nett Lake & Vermilion	Assess Tribal Government & Commercial Buildings, and Tribal Housing Units' Adherence to FireWise Program Principles.	high	Obj. 4.1.1 strategy 1
Wildland Fire	Nett Lake & Vermilion	Develop / Integrate FireWise Principles in to the Housing Department's Rental Unit Lease Contracts. Develop all New Structures with Consideration of FireWise Principles.	medium	Obj. 4.1.1 strategy 1
Wildland Fire	Nett Lake & Vermilion	Perform Tree and Brush Clearing Work where needed to adhere to FireWise Program Principles.	high	Obj. 4.1.1 strategy 1
Wildland Fire	Nett Lake & Vermilion	Perform Assessment of Tribal Government & Commercial Buildings Exterior Fire Protection Needs	medium	Obj. 4.1.3 strategy 4
Wildland Fire	Nett Lake & Vermilion	Install Exterior Fire Protection to Tribal Government & Commercial Buildings where needed	medium	Obj. 4.1.3 strategy 4
Wildland Fire	Nett Lake	Install 20,000 Gallon Underground Water Tank at Palmquist Community to serve as Dry Hydrant for Structural and Wildland firefighting	medium	Obj. 4.1.3 strategy 2
Hazardous Materials Spills	Nett Lake & Vermilion	Improvements to Traffic Infrastructure & Emergency Response Training & Equipment	medium	