

# Lake Superior Environmental Monitoring Collaborative



Minnesota  
Pollution  
Control  
Agency



November 19-20, 2014

US EPA Office of Research & Development  
MED Conference Center, Duluth

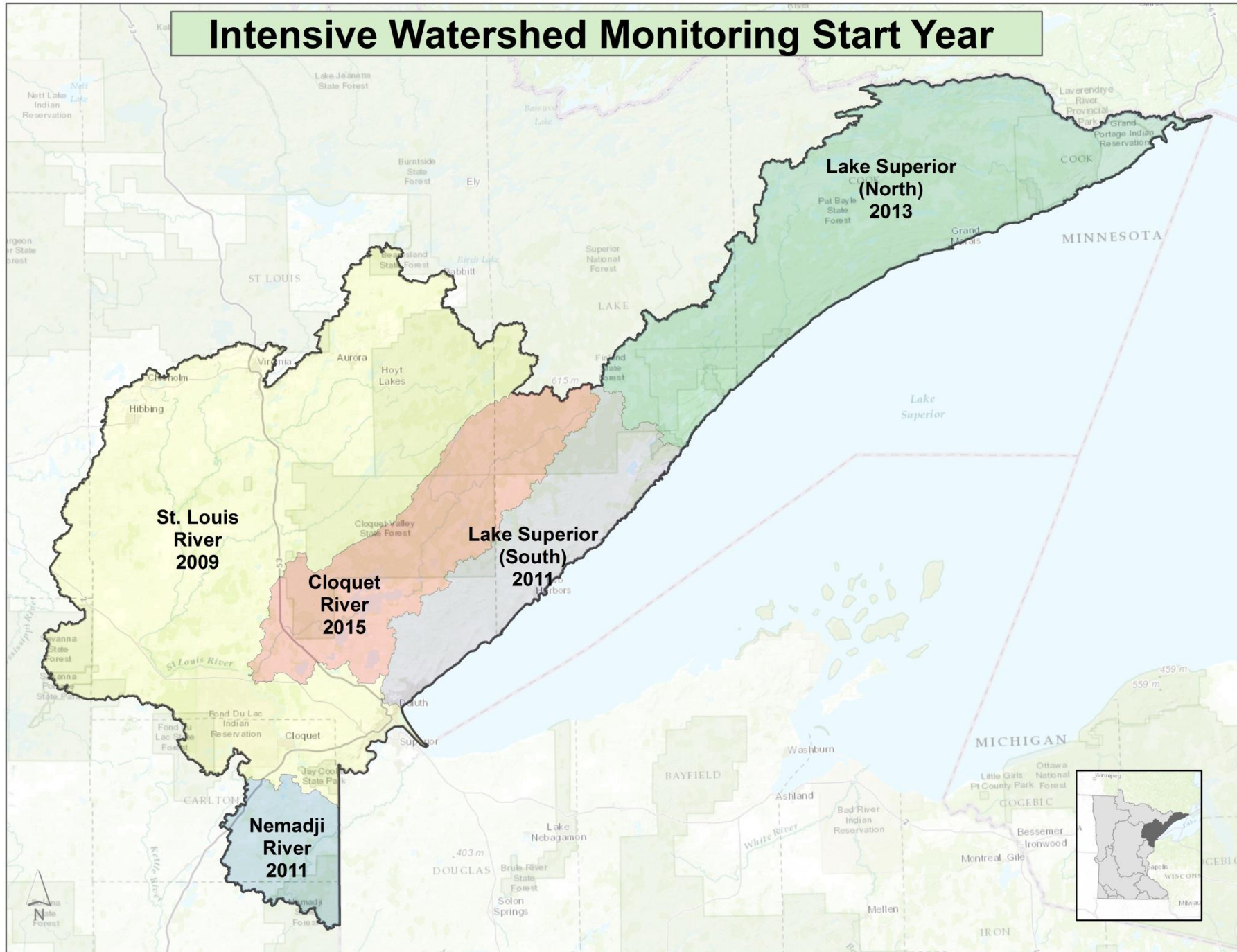
State of Minnesota Monitoring Data

# Lake Superior Basin Environmental Monitoring

- ❑ Biological, chemical, physical monitoring
- ❑ Lakes, streams, wetlands and groundwater
- ❑ Watershed approach focus
- ❑ Also problem investigation for the AOC, biological impairments, mercury
- ❑ Long-term trend monitoring
- ❑ Multiple state, federal, local partners

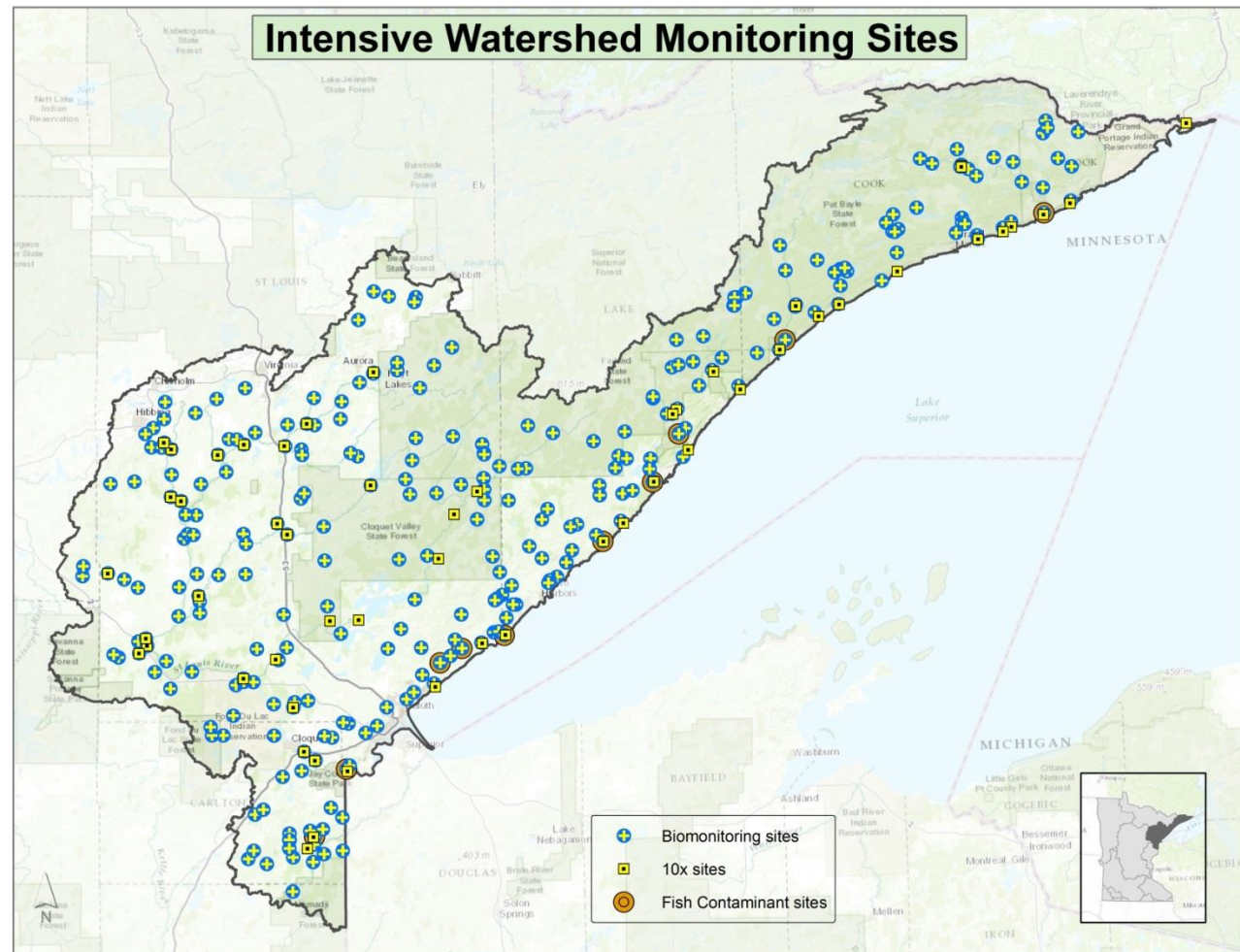


# Intensive Watershed Monitoring Start Year



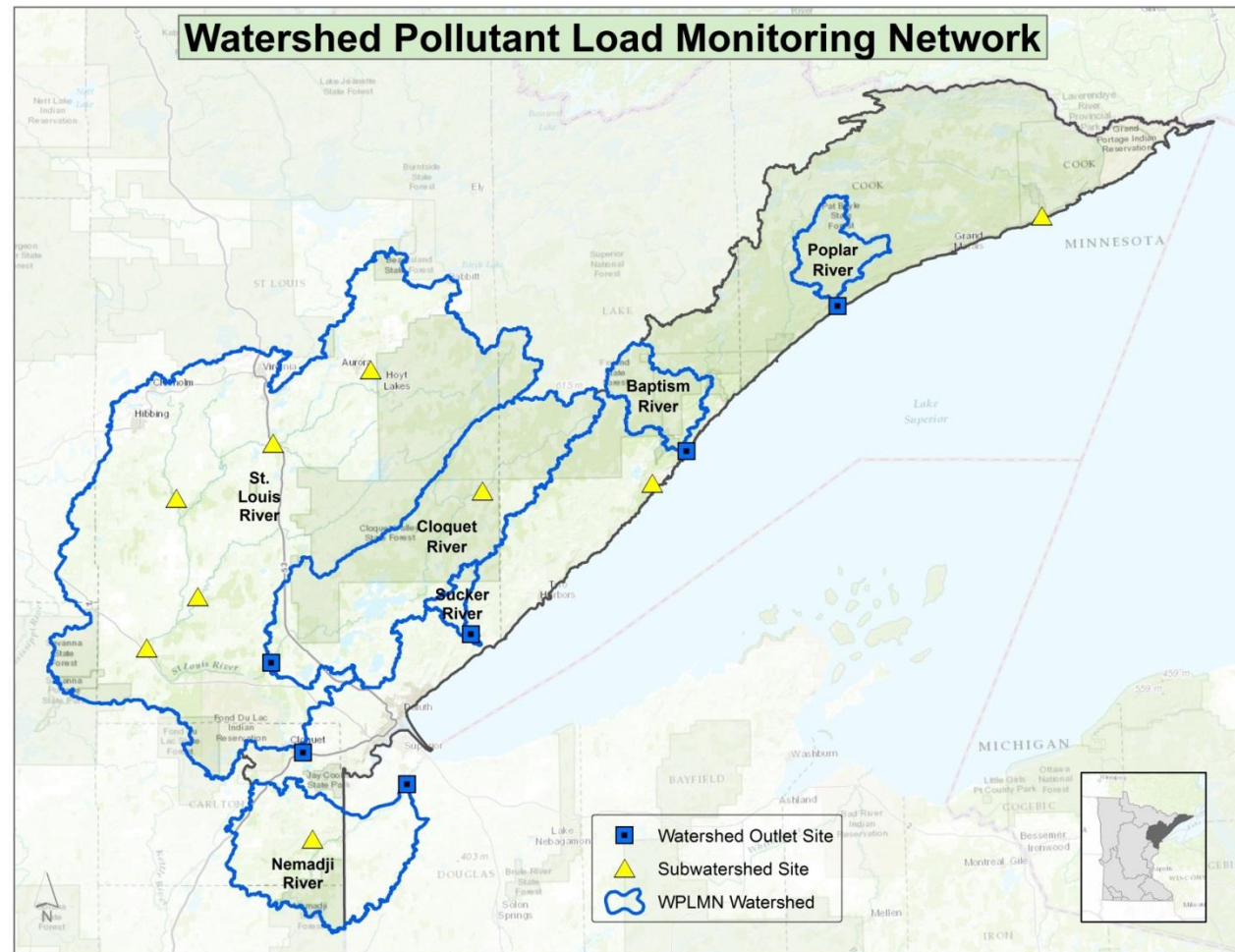
# Intensive Watershed Monitoring

- Every 10 yrs
- Fish, invert.'s, habitat, land use...
- Nutrients, sediment, chlorophyll, Cl, SO<sub>4</sub>...
- Temperature
- Fish tissue (Hg, PCBs)

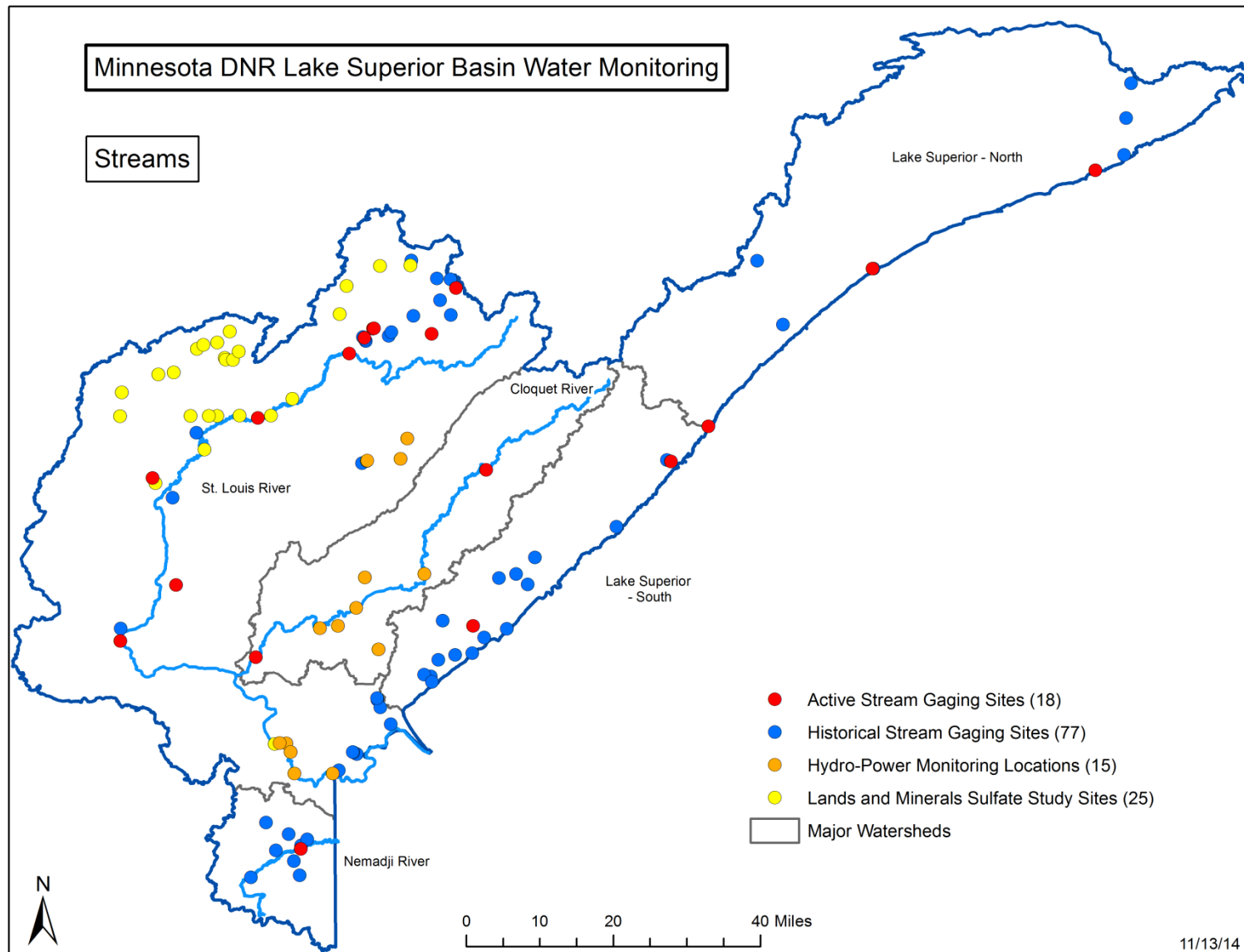


# Watershed Pollutant Load Monitoring

- Every year
- Flow (DNR)
- Chemistry (MPCA):  
nutrients,  
sediment,  
chlorophyll,  
organic  
carbon

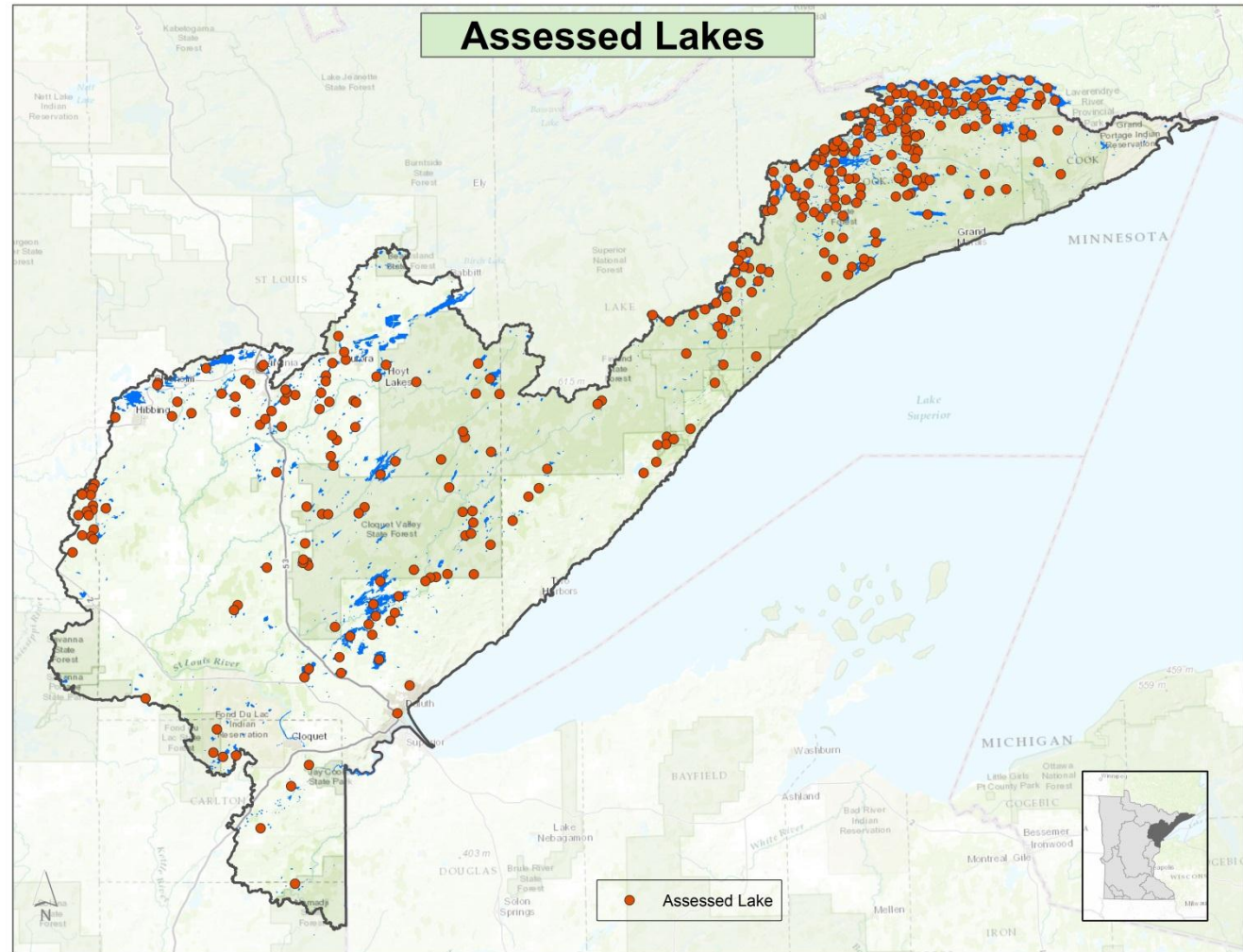


# Flow – Current and Historical

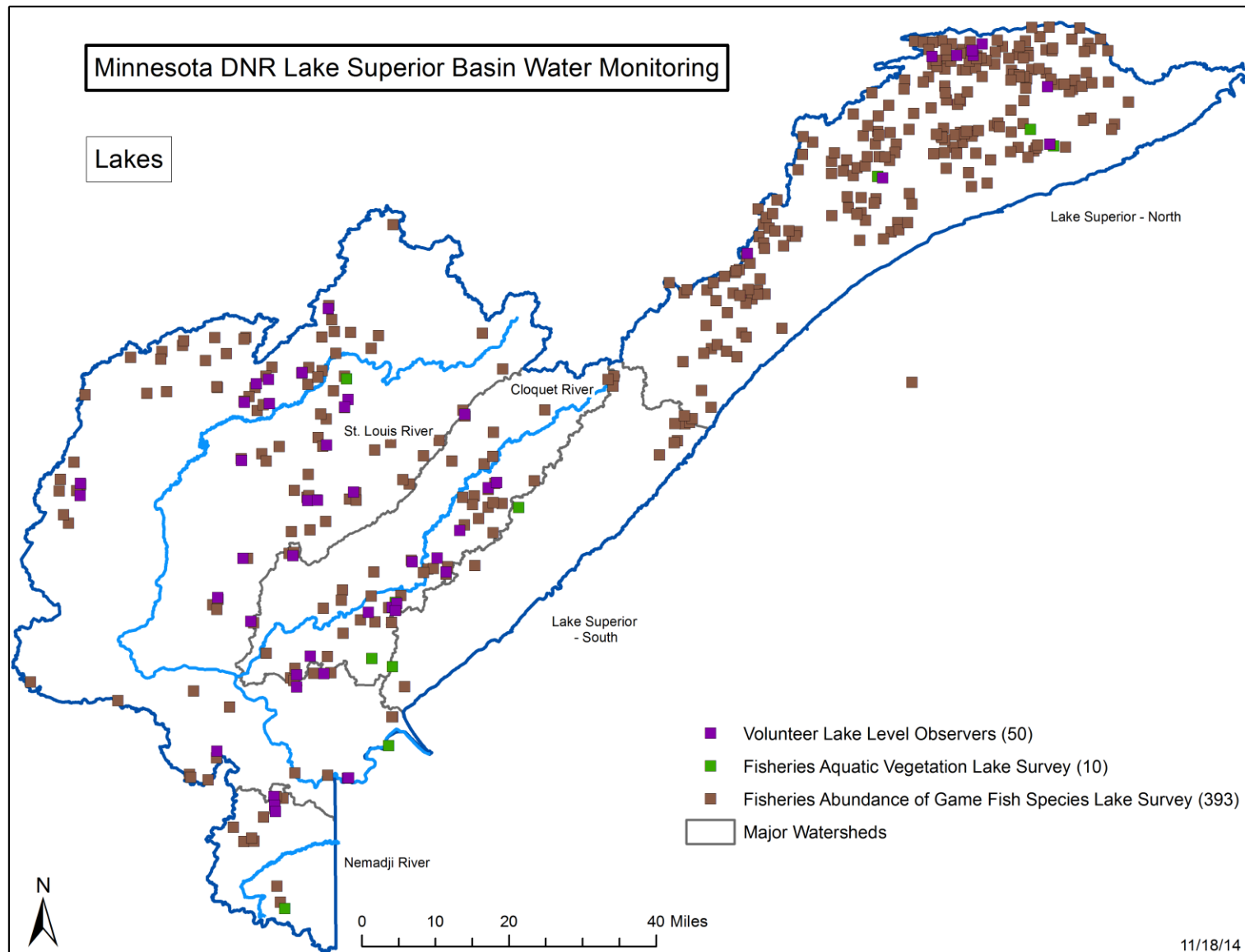


# Lake Monitoring

- Two out of 10 years
- Chemistry (MPCA): nutrients, sediment, chlorophyll
- Biology (DNR): TBA



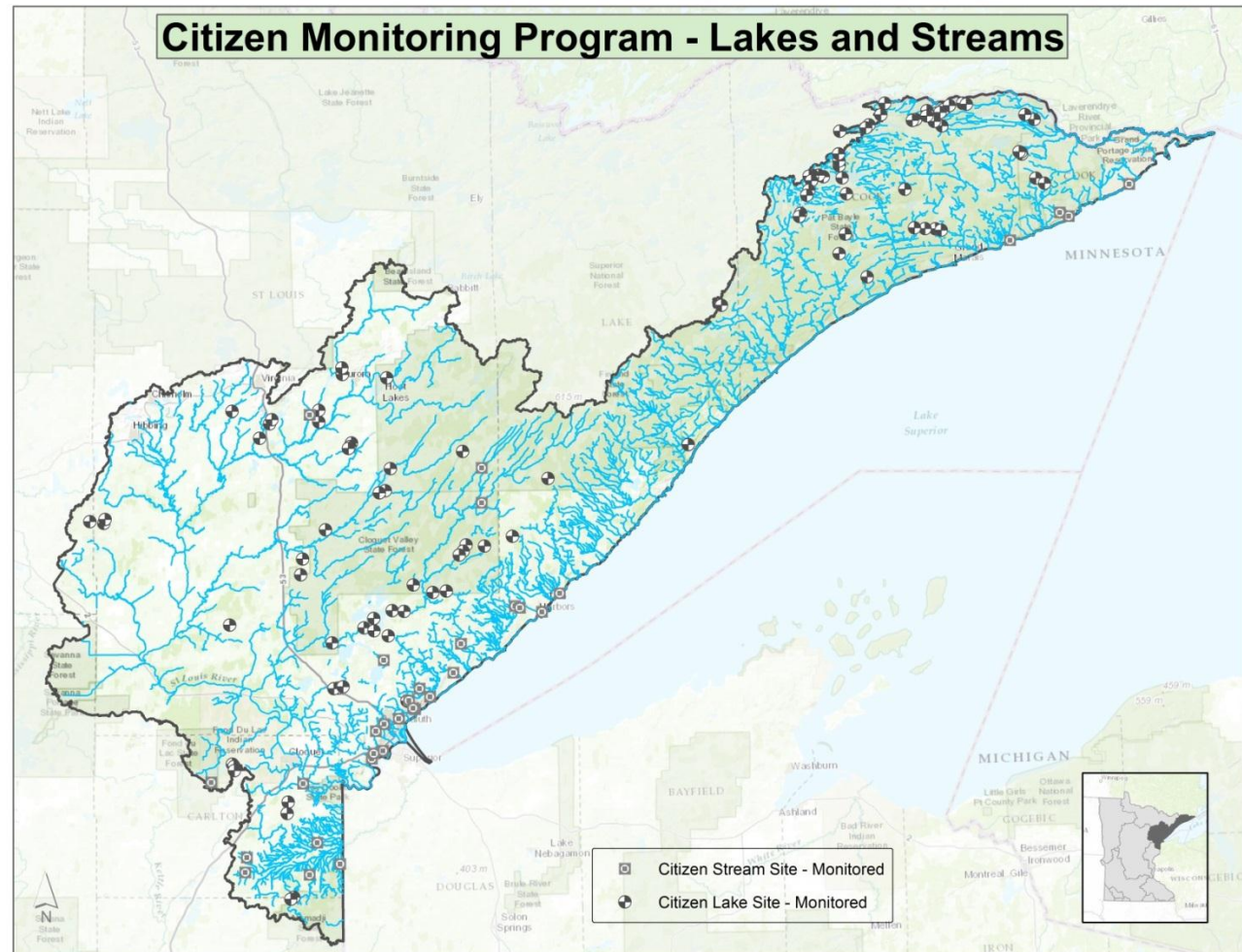
# Lakes, Cont.





# Citizen Monitoring

- Goal: every year
- Transparency, physical condition, recreational suitability, stage & temperature (streams)



# Beach Monitoring

http://www.mnbeaches.org/

et Blogs MNBeaches - Latest Results... X


ew Favorites Tools Help

og Post Harnessin... Home RII Metropolitan Council - A... US EPA PPR Research Phar... Home - Minnesota Polluti...

24-hr hotline: 218-725-7724

Home Lake Superior Beaches Other MN Beaches Data Viewer Advice Science Monitoring Programs

Zoom to a location on the map: Zoom All Duluth Two Harbors Silver Bay Schroeder Grand Marais



Map data ©2014 Google 20 km Terms of Use Report a map error

**MN Beach Status (W. Lake Superior)**

**CURRENT BEACH ADVISORIES**

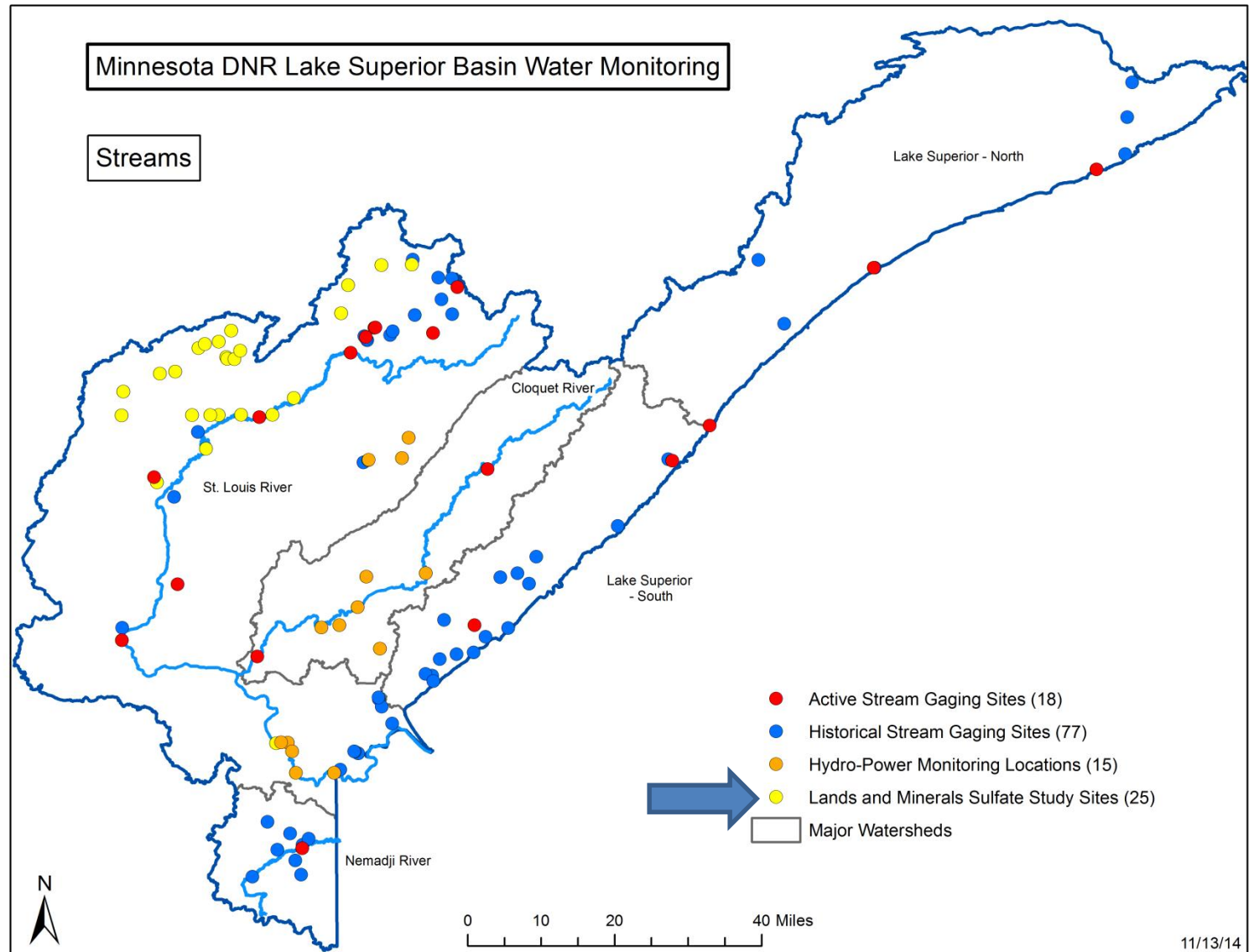
Monitoring of Minnesota's Lake Superior beaches has ceased for the season, and will resume in May 2015.

Refer to [Advice](#) for further water contact recommendations.

- Water Contact Acceptable
- Water Contact Not Recommended
- No Recent Sampling Data

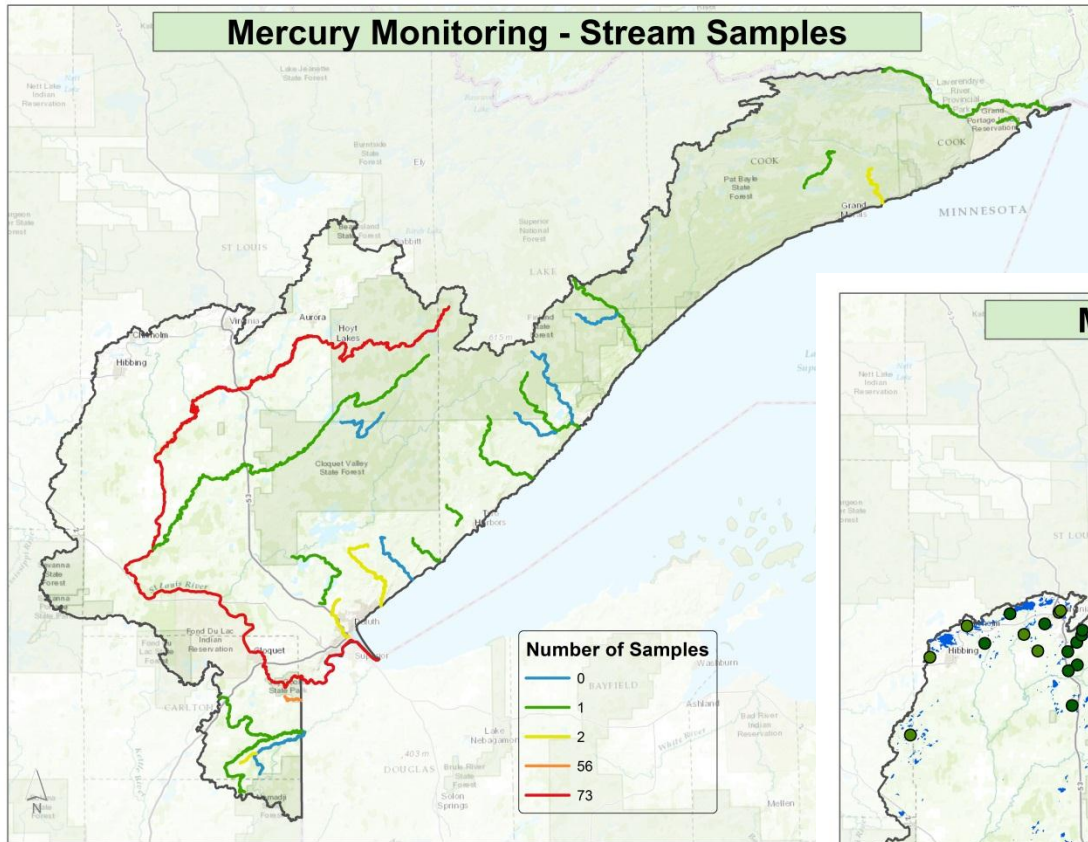
Contact Us About Us Resources Download Data Alert Sign-Up FAQ News Other Programs

# Sulfate

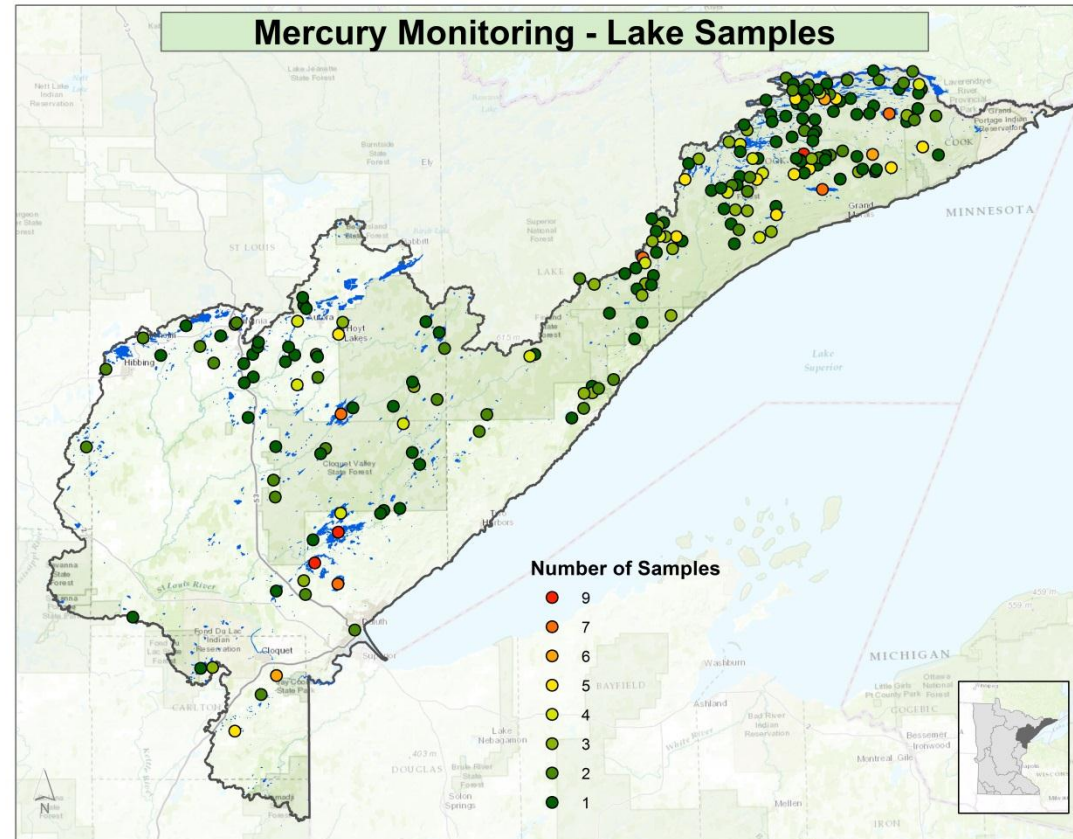


# Mercury

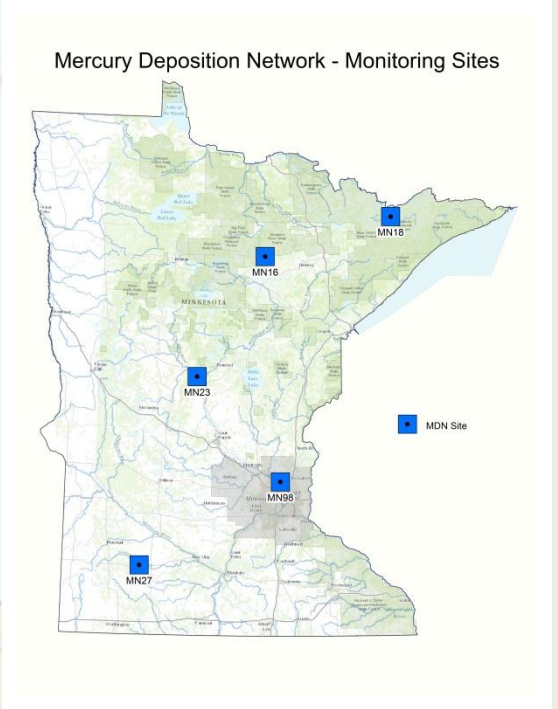
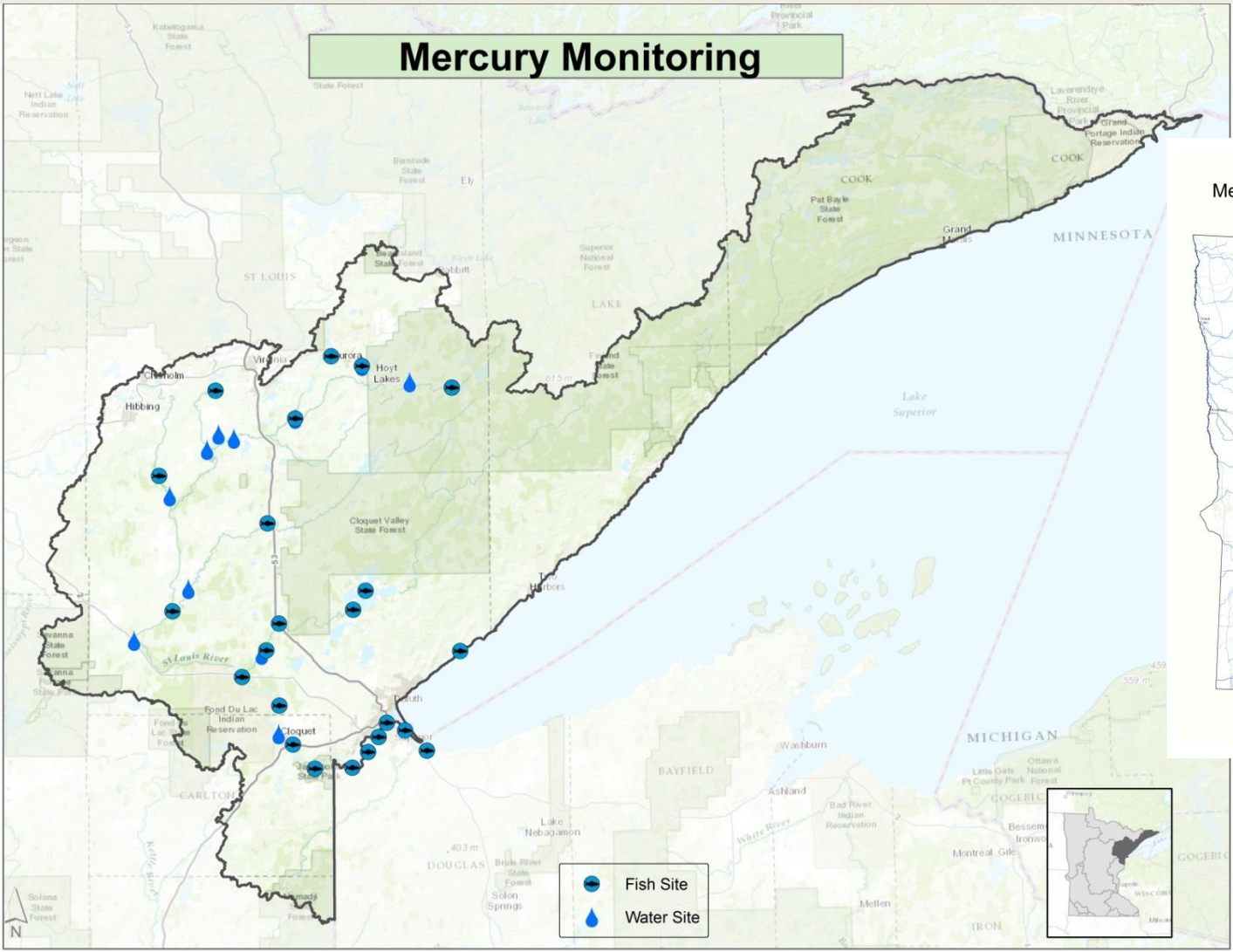
**Mercury Monitoring - Stream Samples**



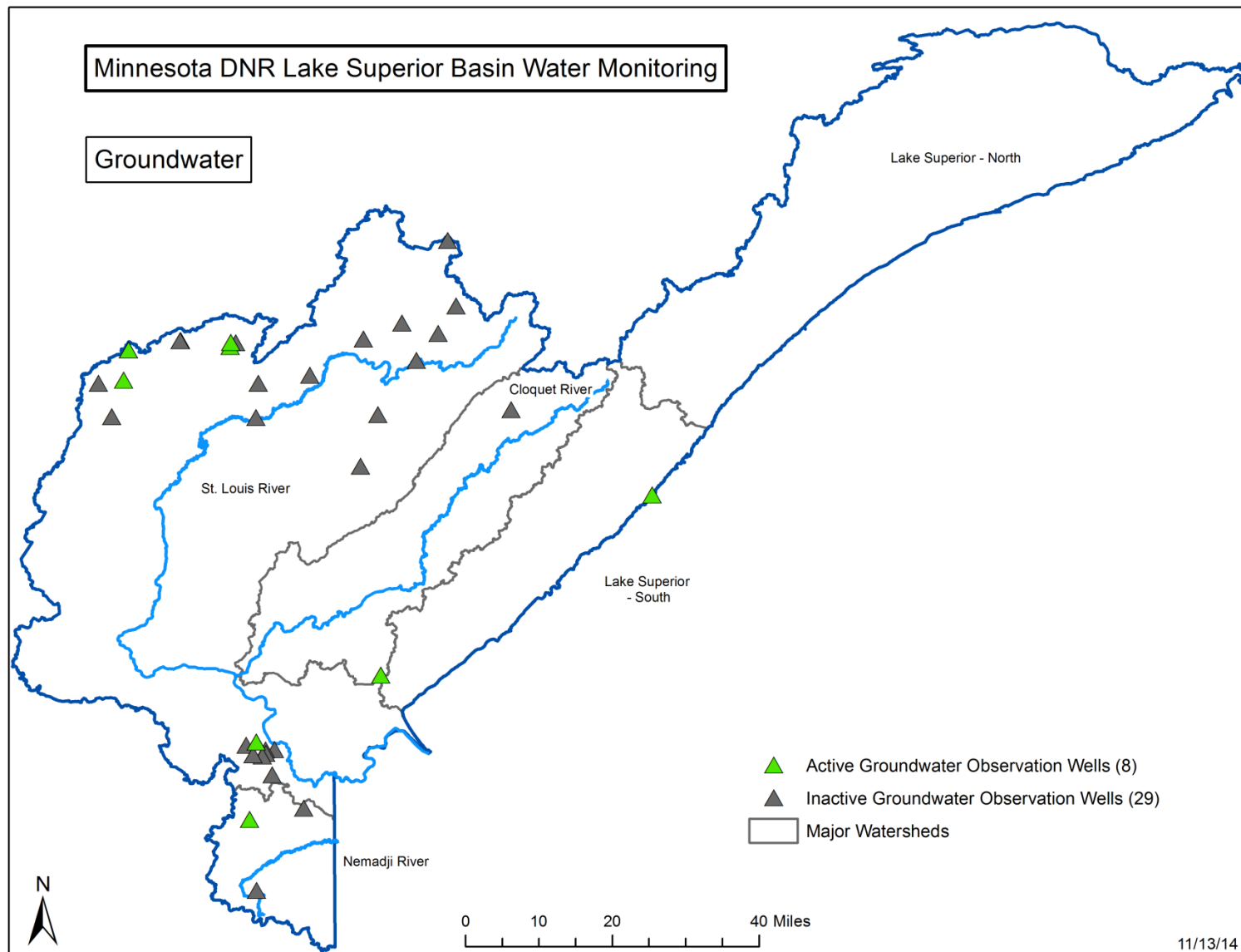
**Mercury Monitoring - Lake Samples**



# Mercury, Cont.

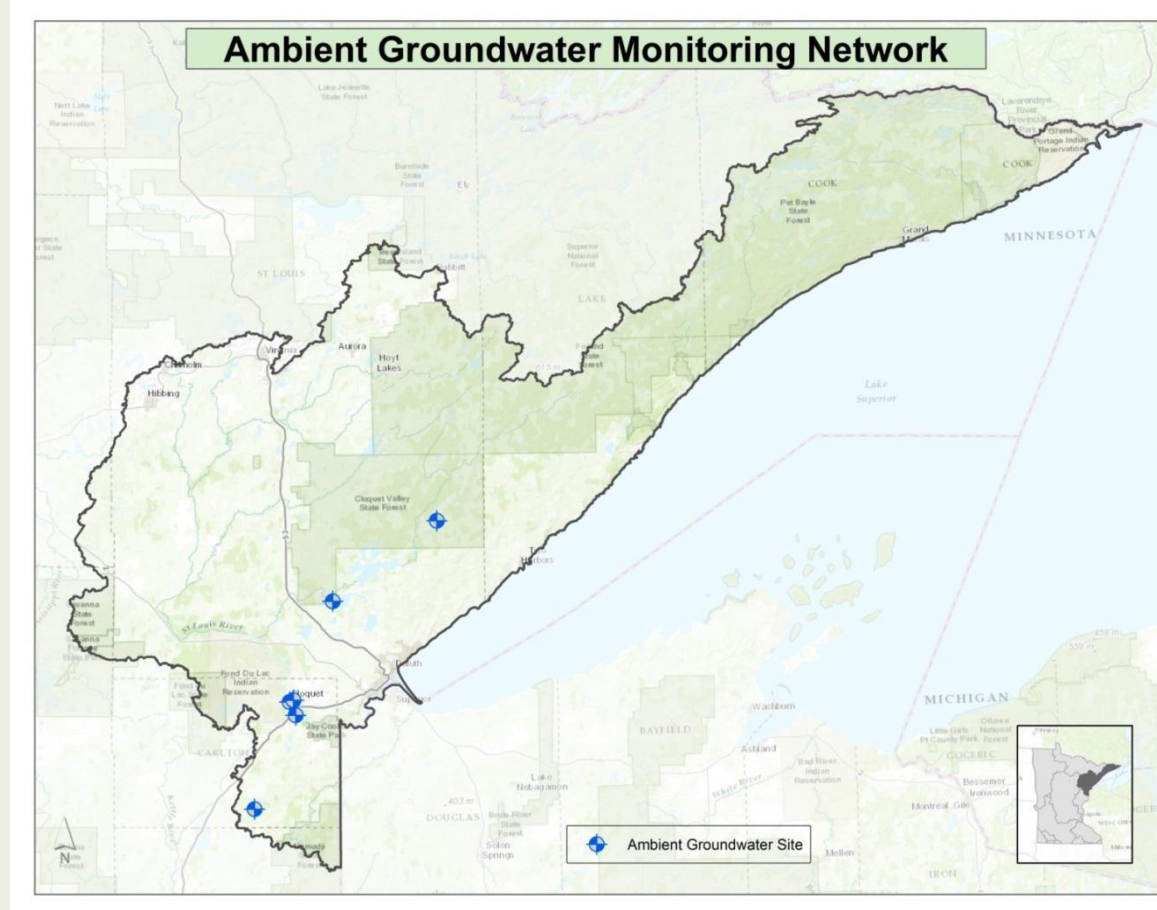


# Groundwater Quantity



# Groundwater Quality

- MDH: Public water supplies
- MPCA: Focus on vulnerable aquifers
- Alkalinity, conductance, N, SO<sub>4</sub>, metals, VOCs, PFCs...
- Contaminants of Emerging Concern (20% of wells/year)



# Additional Monitoring

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- ❑ Lake Superior proper:
  - DNR fisheries evaluations
  - EPA coastal surveys (NARS)
- ❑ Wetland quantity and quality
- ❑ Probabilistic lake and stream studies
- ❑ Long-term lake and stream reference sites
- ❑ Forest landcover and health
- ❑ Climate change
- ❑ Aquatic and terrestrial invasive species



# THANK YOU!

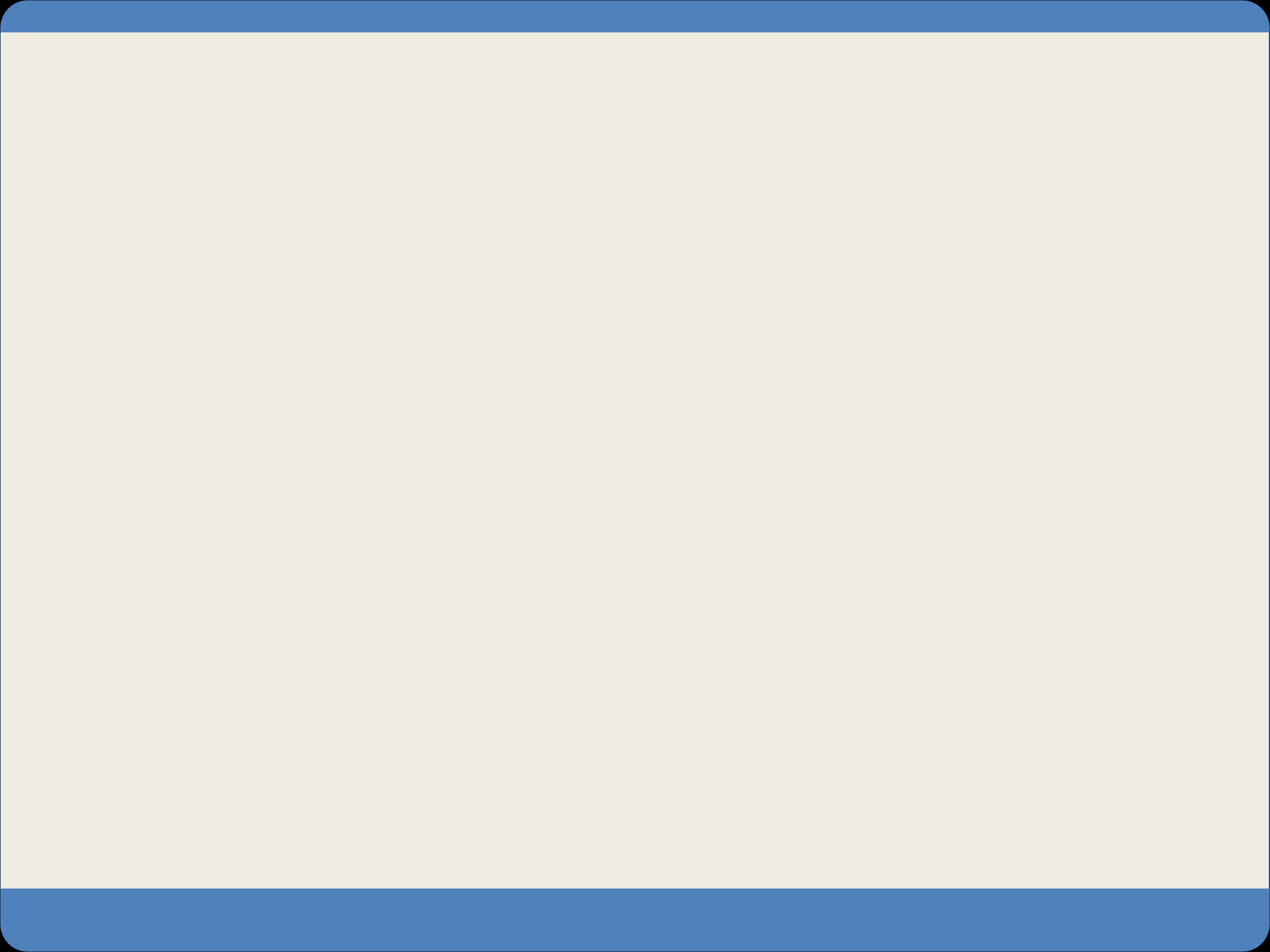


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# Data Sharing: MN Examples

- ❑ Web access to data
- ❑ State agency partnership

The screenshot displays the Minnesota Pollution Control Agency (MPCA) website. The page is titled "Minnesota Watersheds" and features a search bar for finding watersheds by city or town. A map of Minnesota is shown with several watersheds highlighted in orange, including the St. Louis River watershed. A text box provides information about the St. Louis River watershed, stating it flows for 195 miles and is highly fragmented by small tributaries.

Minnesota Pollution Control Agency

e-Services

Google Custom Search

Assistance | Feedback | Site Map | Glossary

Home | Air | Water | Waste | Regulations | Living Green | Quick Links | Data | About MPCA

Water Types and Programs | Permits and Rules | Monitoring and Reporting | Publications | Training | Pollution Prevention

Home > Water > Water Types and Programs > Watersheds

tinyURL : jsrie74 | ID : 2545

## Minnesota Watersheds

**NEW** Twin Cities Metro Watersheds

Find your watershed by city or town:  **GO**

What is a watershed?

Minnesota has 81 major watersheds. Each is defined by rivers, streams, lakes, and wetlands.

### St. Louis River

The St. Louis River flows in a circuitous course for 195 miles from its source at Seven Beaver Lake to Lake Superior at the Duluth-Superior harbor. The St. Louis River watershed is highly fragmented by small, short tributaries. Two major tributaries drain a substantial portion of the watershed: the Cloquet River and the Whiteface River.

# MPCA Watershed Web Pages & EDA

index.php/water/water-types-and-programs/watersheds/st.-louis-river.html

ate.mn.us

Metropolitan Council - A... US EPA PPCP Research Phar... Home - Minnesota Polluti...

## St. Louis River Watershed

Overview Restoration and protection Contacts Maps

### Watershed Map

Many of Minnesota's lakes and streams do not currently meet water-quality standards because of pollution such as excess sediment or nutrients, bacteria or mercury. These waters are considered "impaired." For more information, visit the impaired waters page.

The toggles show impaired waters and monitoring stations. Click on a site for more information.

Impairments in this watershed, listed by lake or stream segment  
Generally, a waterbody has an impairment when it exceeds a particular pollutant standard.

[Toggle Impaired Waters](#) [Toggle Monitoring Stations](#)

Map data ©2014 Google Terms of Use Report a map error

IP/eda/stationInfo.php?ID=09LS110&ORG=MPCAB

Environmental Data Access

Print Report New Search

Metropolitan Council - A... US EPA PPCP Research Phar... Home - Minnesota Polluti...

Environmental Data Access

Print Report New Search

### Biological Station Information

<b>Stream Name:</b>	JOULA CREEK
<b>Waterbody Name:</b>	Joula Creek
<b>Data Steward Org:</b>	MPCA
<b>Station ID:</b>	09LS110
<b>Hydrologic Unit Code (HUC):</b>	04010201
<b>Assessment Unit:</b>	04010201-A16
<b>Period of Record:</b>	2009 through 2009
<b>Predominant substrate:</b>	
<b>Mean Depth (cm):</b>	
<b>Mean Width (meters):</b>	
<b>Drainage Area (square miles)</b>	13.87
<b>Land Use</b>	
	Agricultural 0.1%
	Forest 26.5%
	Range 3.2%
	Urban 0.5%
	Water 0.1%
	Wetland 69.6%
	Other 0.0%
<b>Lat/Lon</b>	47.0551,-92.93598333

### Index of Biological Integrity

Site Index of Biological Integrity

- Visit Year
- Fish IBI
- Fish Rating
- Invertebrate IBI
- Invertebrate Rating

Index of Biological Integrity Chemical Projects Aquatic Life Species Attributes

Data collected from June 30, 2009

Site Visit Date	30-JUN-09
Water Temperature °C	14.9°
Conductivity µmhos/cm	115.7
Field Turbidity NTU	
Dissolved Oxygen mg/L	4.38
PH	6.98
Flow m3/sec	



WIMN: What's in My Neighborhood

Home > Data

tinyURL : enzq1422 | ID : 2761

Data

IN THIS SECTION

e-Services

Air quality

Contaminated Sites

Petroleum storage tanks

Recycling and pollution prevention

Spatial data

Hazardous waste

Solid waste

Groundwater data

Surface water

WIMN: What's in My Neighborhood

RELATED TOPICS

Home

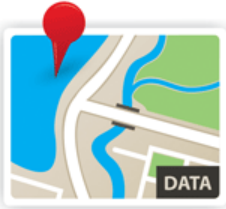
Air

Water

Waste

Regulations

# Surface water data



**Lakes and streams**

Search for data about water health and projects

All of this data is now accessible through a new search tool

- Lake and stream stations
- Citizen monitoring stations
- Pollutant load monitoring
- Impaired waters
- Surface water assessments
- Watershed (WRAPS) and TMDL projects

## Permit, licenses and certifications

- **Construction stormwater permit data.** Find information about permits for discharging stormwater from construction sites.
- **Industrial stormwater permit information access.** Find information about industrial stormwater discharge permittees and their permits.
- **What's in My Neighborhood.** Find information about regulated facilities or sites in an area of interest, including the site types listed below. To list sites of a given type, choose the "text search" option, then select the appropriate "activity type."
  - Construction stormwater projects
  - Feedlots
  - Industrial stormwater dischargers
  - MS4 (municipal separate storm sewer system) projects

# DNR Cooperative Stream Gaging Site

The screenshot displays a web browser window at the URL <http://www.dnr.state.mn.us/waters/csg/index.html>. The page header identifies the organization as the Minnesota Department of Natural Resources, with navigation links for events, a-z list, newsroom, about DNR, and contact us. A secondary navigation bar includes Recreation, Destinations, Nature, Education / safety, and Licenses / permits / regs.

The main content area is titled "DNR/MPCA Cooperative Stream Gaging" and features a "Map View" interface. On the left, a legend defines site categories by flow conditions and data availability:

- Flooding (Q10), > 90th pctile
- High Flow (Q25), 76th - 90th pctile
- High Normal, 51st - 75th pctile
- Low Normal, 26th - 50th pctile
- Low Flow (Q75), 11th - 25th pctile
- Critical Flow (Q90), <= 10th pctile
- Not Ranked
- No Telemetry Data

Below the legend, "site filters" are provided as dropdown menus for: has telemetry data (set to "yes"), has archive data, has water chemistry, is CWL site, is flood warning gage, has gagings, has photos, and provider (set to "all providers"). "Update" and "Reset" buttons are located at the bottom of the filter section. Under "Overlay layers", there are checkboxes for "DNR Obwell Inventory", "NEXRAD Mosaic (WMS)", and "NWS State Weather Roundup".

The map itself shows the state of Minnesota with numerous colored markers representing gaging sites. Major highways (94, 35, 95, 90) and a scale bar (100 km / 50 mi) are also visible. At the bottom of the browser window, download options are listed: map | [georss](#) | [kml](#) (all sites) | [kml](#) (telemetry/refreshing) | [shapefile](#) | [csv](#). The system tray at the bottom right shows the time as 3:36 PM on 11/14/2014.

## ural Resources

eve

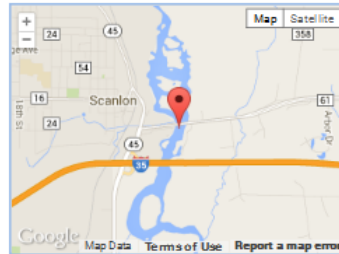
Recreation | Destinations | Nature | Education / safety | Licenses / permits / regs.

Home > Ecological and Water Resources (Waters) > Stream Gaging - Cooperative DNR/MPCA >

### Site report

#### St. Louis River at Scanlon, MN (03174001)

USGS ID: [04024000](#), Water Chemistry ID: [S005-089](#), NWS AHPS: [scnm5](#)  
Provider: USGS

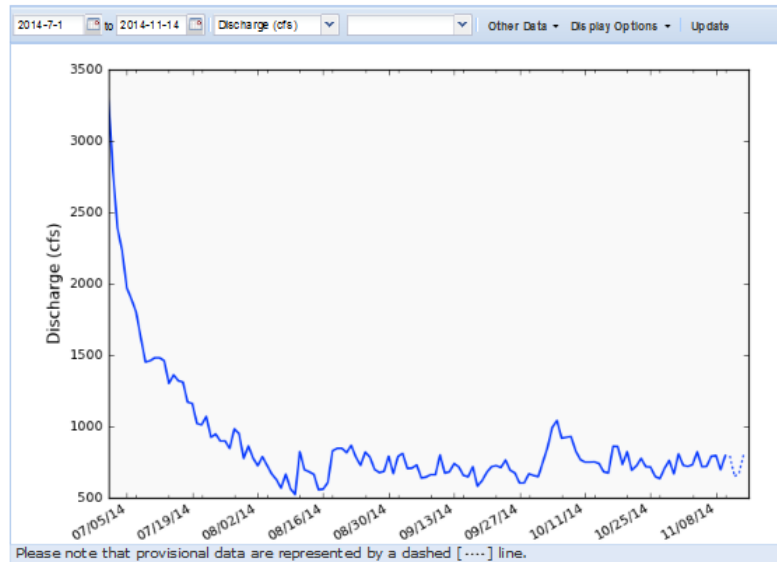


### Most Recent Data

**Stage:** 2.97 ft at Nov 14, 2014 13:30 CST  
**Flow:** 806 ft<sup>3</sup>/sec at Nov 14, 2014 13:30 CST

### Period of Record

**Telemetry data:** 2014-11-11 to 2014-11-14  
Available data: all telemetry variables  
**Archive data:** 1908-01-01 to 2014-11-10  
Available data: daily discharge




Download: [pdf version of above hydrograph](#)

[all water chemistry data](#) (csv) | [water chemistry data for above period](#) (csv)

[all hydro data](#) (csv) | [data for above period](#) (csv)

[all year and summary data](#) (html)

# MDH Environmental Public Health Tracking Portal



Minnesota Department of Health

Minnesota Public Health Data Access

Home & Topics
Asthma
Change Geography

## Asthma Hospitalizations: All Ages, 2007 - 2011 | Age-adjusted rates per 10,000

Select Map
Legend
Data Information
Map Tools

**Legend**

Age-adjusted rates per 10,000

- 1.8 - 7.4
- 7.5 - 12.8
- 12.9 - 20.9
- 21.0 - 43.1
- Unstable rate\*
- Data not shown\*\*
- MSP Airport

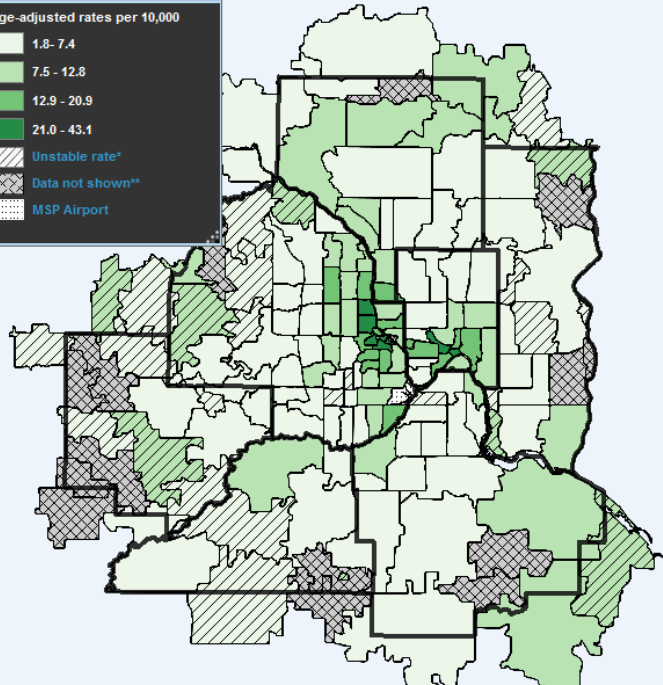


Table
About the Map Data
Help

### Asthma Hospitalizations: All Ages, 2007 - 2011

Age-adjusted Rates per 10,000

Region	Rate	95% CI	5-Year Count	Population	Age under 18	Age over 65
7-County Metro Area	8.5	(8.1 - 8.8)	11,394	2,824,804	24.7%	10.6%
Minnesota	7.4	(7.2 - 7.7)	19,785	5,294,141	24.1%	12.7%

ZIP Code	Rate	95% CI	5-Year Count	Population	Age under 18	Age over 65
55057	6.1	(5.5 - 6.7)	68	24,368	19.5%	11.5%
55065**	**	**	**	1,103	25.8%	8.7%
55068	6.6	(6.1 - 7.1)	89	26,844	30.5%	7.4%
55070	6.3	(5.2 - 7.4)	24	7,262	29.2%	6.5%
55071*	7.8	(6.5 - 9.2)	19	5,619	26.7%	11.0%
55073*	7.8	(4.4 - 12.9)	9	2,936	24.9%	16.0%
55075	8.7	(8.0 - 9.4)	83	20,295	24.0%	11.8%
55076	6.3	(5.7 - 6.8)	62	20,700	21.2%	13.9%
55077	6.9	(6.0 - 7.8)	40	12,958	29.0%	8.4%
55079	7.9	(6.8 - 9.1)	27	7,490	23.5%	7.3%
55082	2.1	(2.0 - 2.3)	39	34,578	24.8%	13.7%
55088**	**	**	**	1,486	25.8%	12.1%
55089*	8.9	(7.0 - 11.3)	8	1,868	23.4%	9.9%
55092	9.7	(8.5 - 11.1)	50	11,153	27.1%	9.8%
55101	29.2	(17.2 - 46.3)	43	5,666	5.5%	11.2%
55102	16.9	(15.2 - 18.5)	125	16,669	15.1%	12.9%
55103	25.2	(22.8 - 27.6)	146	12,938	31.1%	7.4%
55104	14.6	(13.9 - 15.3)	287	42,521	22.9%	8.0%
55105	3.3	(3.0 - 3.6)	41	27,107	17.4%	9.9%

[Download Data](#)