

# It's a WRAPS: Does your watershed have one?



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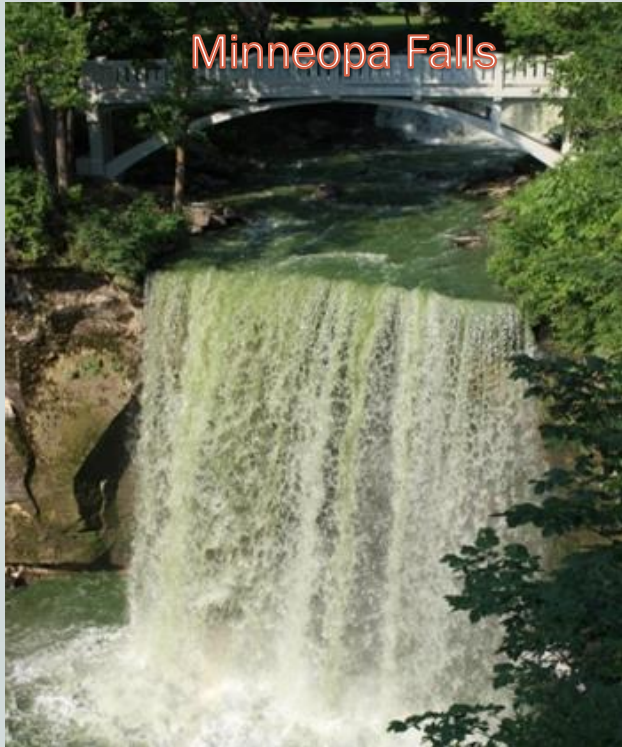


Minnesota Pollution  
Control Agency

# Why study Minnesota's waters?



Minneopa Falls



# Basis of Clean Water work:

- ✧ Federal Clean Water Act of 1972
  - Goal – Fishable/Swimmable by 1983
  - MPCA completes work for EPA
- ✧ Minnesota Clean Water, Land and Legacy Amendment passed in 2008
  - Increased state sales tax by  $\frac{3}{8}$  of 1% beginning on July 1, 2009 and continuing until 2034 (25 years).

# Legacy Amendment

- Legacy Amendment uses 4 funds to fulfill its charge to:
  - protect drinking water sources; protect, enhance, and restore lakes, rivers, streams, and groundwater
  - protect, enhance, and restore wetlands, prairies, forests, and fish, game, and wildlife habitat;
  - preserve arts and cultural heritage;
  - support parks and trails.

## Allocations by Fund

Based on FY 2010 - FY 2015 appropriations. [Learn more about the funds.](#)

<http://www.legacy.leg.mn/>

3



LEGACY FUND  
**Arts & Cultural  
Heritage Fund**

1



LEGACY FUND  
**Clean Water Fund**

2



LEGACY FUND  
**Outdoor Heritage  
Fund**

4



LEGACY FUND  
**Parks & Trails  
Fund**

1,2,4



TRUST FUND  
**Environment &  
Natural Resources  
Trust Fund**

- Protecting Minnesota's waters is a joint effort between seven partner agencies, who collaborate and partner on Minnesota's water resource management activities under the Clean Water Fund.

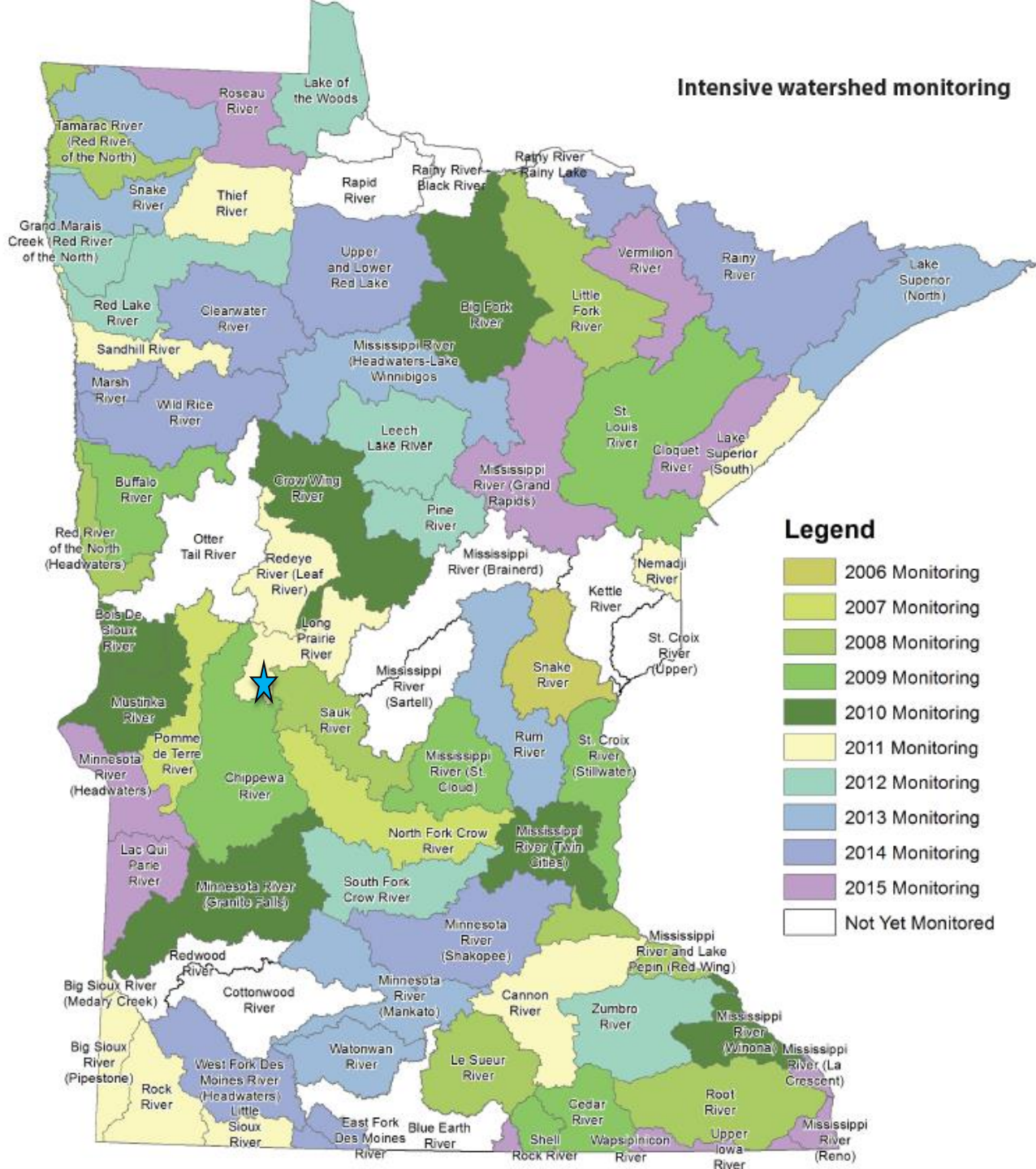


- ✧ DNR: Provide info/analysis about streams, lakes and aquifers to identify the most important water quality issues and prioritize solutions
- ✧ MDA: Facilitate implementation of ag. BMPs, support research and demo projects, enhance groundwater protection efforts and monitor pesticides
- ✧ MDH: Well-head protection planning, support to private well owners, proactive assessment of CECs
- ✧ BWSR: Oversee non-point protection and restoration efforts by working with LGUs and private landowners
- ✧ PFA: Assist local governments with wastewater and stormwater projects and administer the small community wastewater program
- ✧ Met. Council: Model groundwater and its response to pumping, expand water reuse opportunities
- ✧ MPCA: Water quality studies (TMDLs); water quality monitoring/assessment

# Watershed Approach



## Intensive watershed monitoring



80 major watersheds in MN

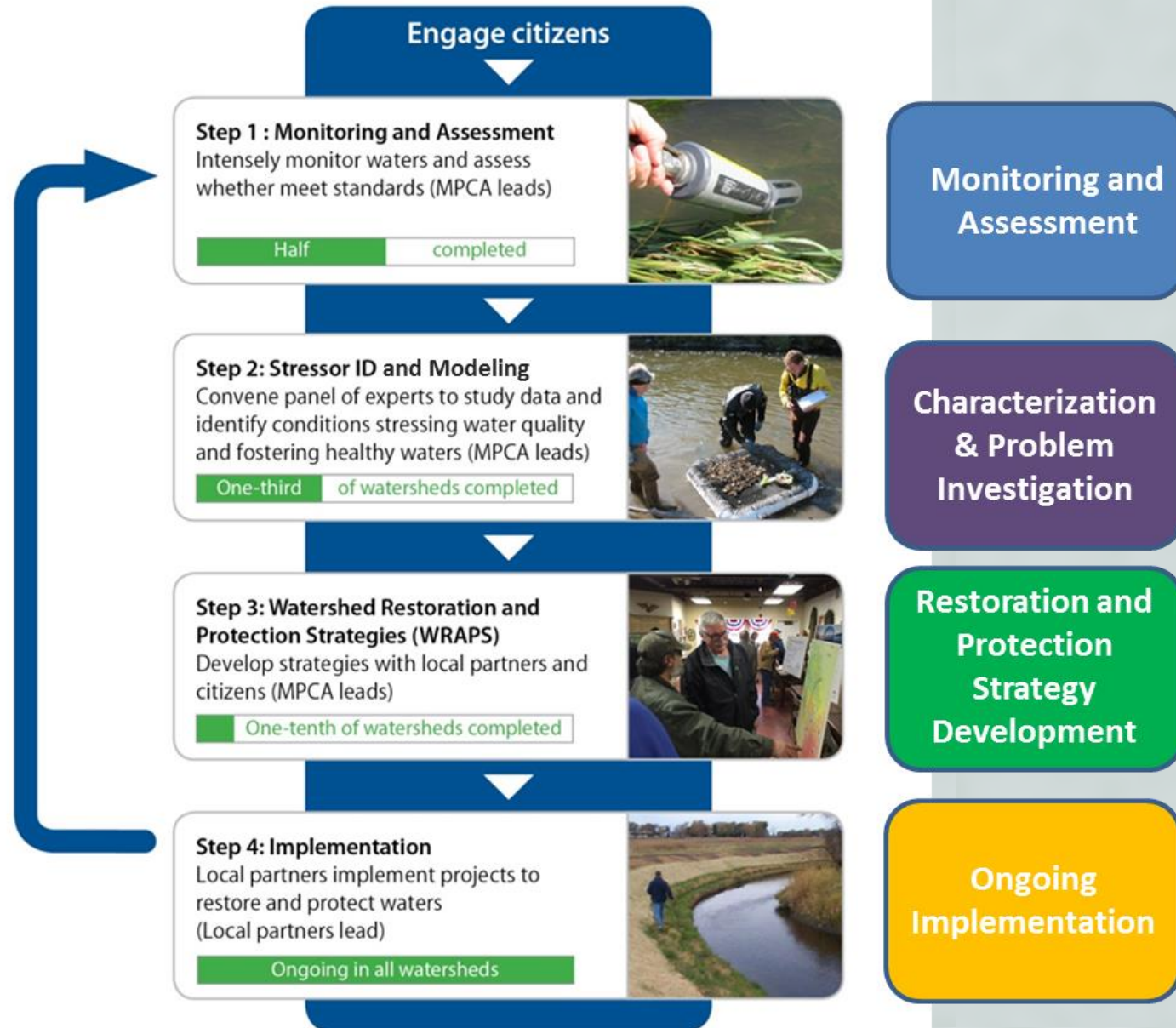
★ Alexandria in Long Prairie River

**What is a Watershed?**  
**A watershed is the area of land where all of the water that drains off of it goes into the same place—a river, stream or lake.**

# MPCA's role

One end product of this is a WRAPS report

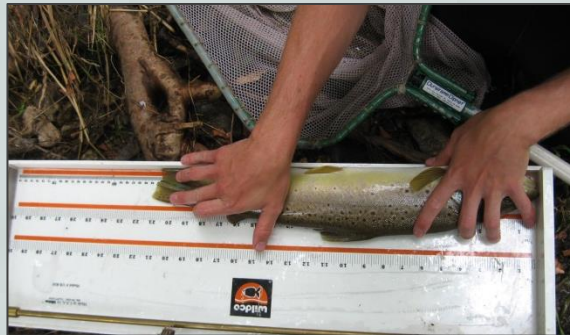
CWAA language sets much of the content





# Monitoring and Assessment

- ◇ Monitor the waters
- ◇ Assess the waters
  - ◇ Based on standards that make lakes and rivers swimmable and fishable
  - ◇ Different standards for different intended uses
- ◇ Impaired versus Protect
- ◇ Informs the next steps in process



# Citizen Monitoring Network

- ✧ Volunteers help gather vital information about the health of our water resources.
- ✧ MPCA uses their data to make decisions on watershed protection and restoration.
- ✧ For some lakes and streams, data collected by volunteers are the only data available, making this work indispensable.
- ✧ Over 1,400 volunteers
  - ✧ 400 on streams monitoring 500 sites



# Map of MPCA sites in MR-Winona

## Major Watershed

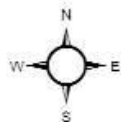
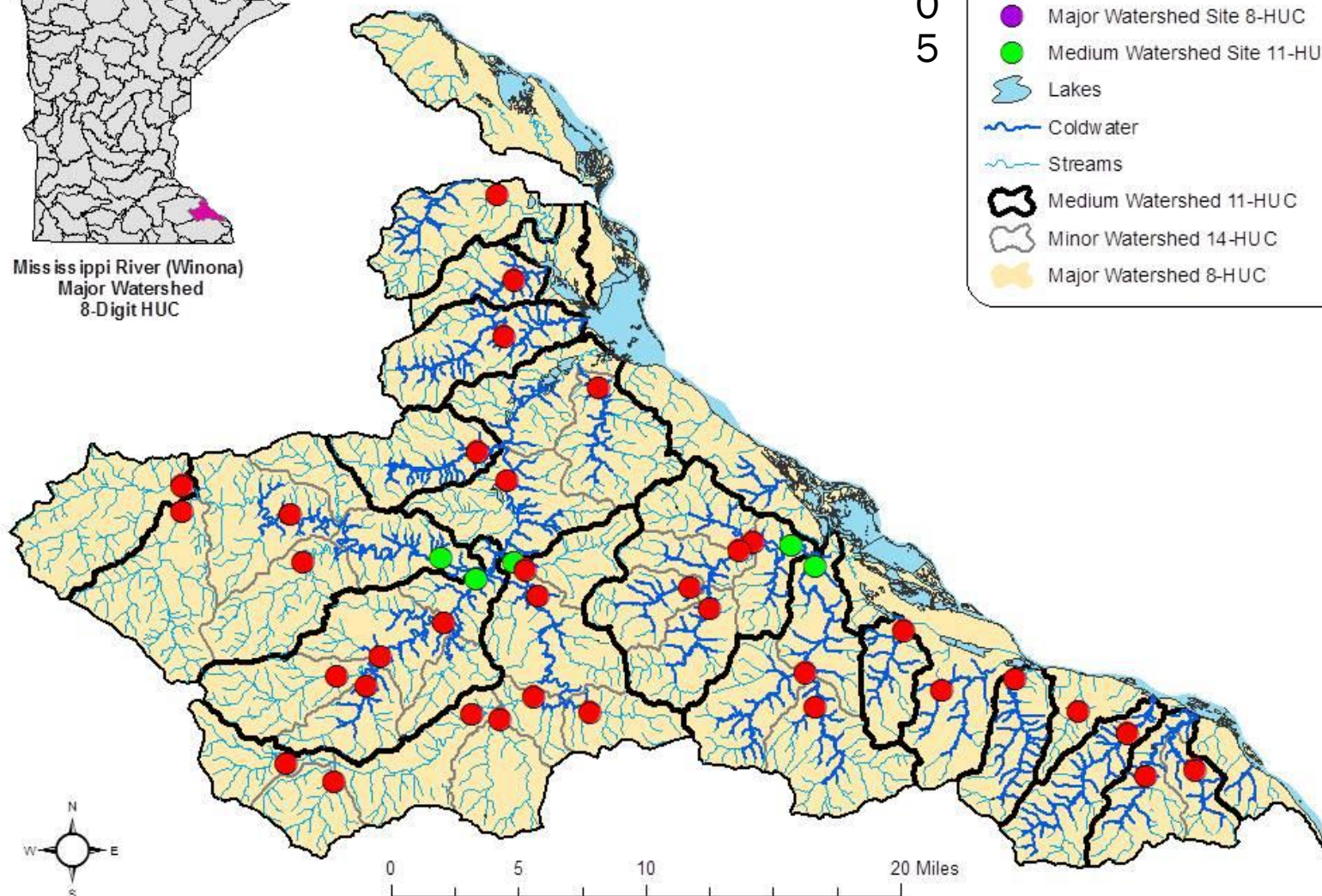


Mississippi River (Winona)  
Major Watershed  
8-Digit HUC

35  
0  
5

## Legend

- Minor Watershed Sites 14-HUC
- Major Watershed Site 8-HUC
- Medium Watershed Site 11-HUC
- ☪ Lakes
- ☪ Coldwater
- ☪ Streams
- ☪ Medium Watershed 11-HUC
- ☪ Minor Watershed 14-HUC
- ☪ Major Watershed 8-HUC

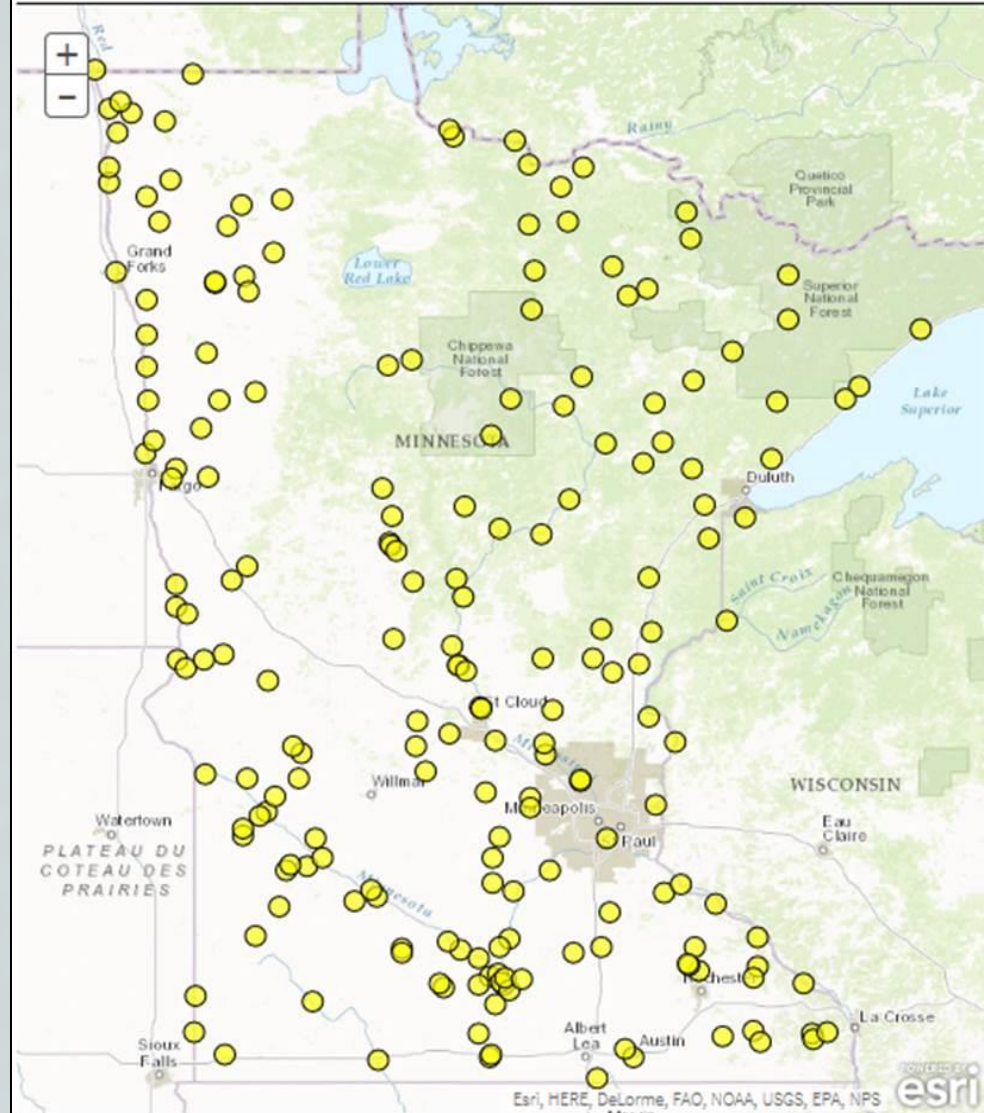


0 5 10 20 Miles

# Watershed Pollutant Load Monitoring Network

- ✧ Spatial and temporal pollutant load information from Minnesota's rivers and streams
  - ✧ TN, TP, TSS, etc.
- ✧ Track water quality trends by region of MN
- ✧ Just over 200 sites were established between 2007-2015 using money from the CWF

Click on a site to get more details and data.



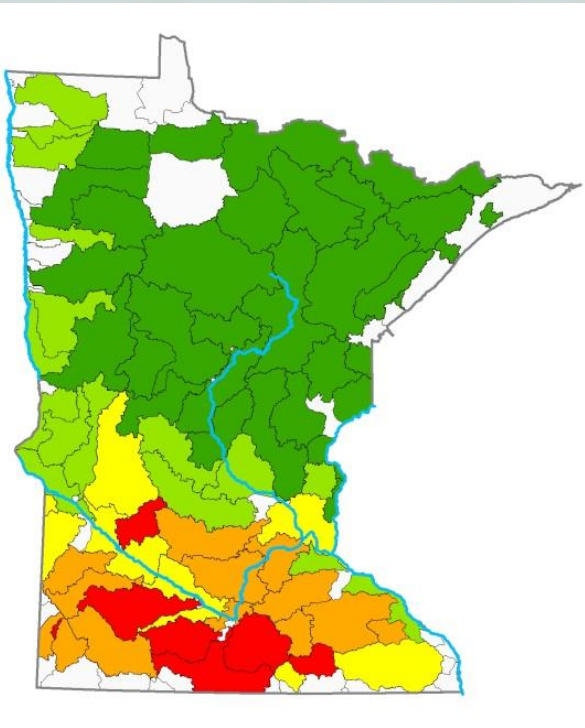
# Statewide Results



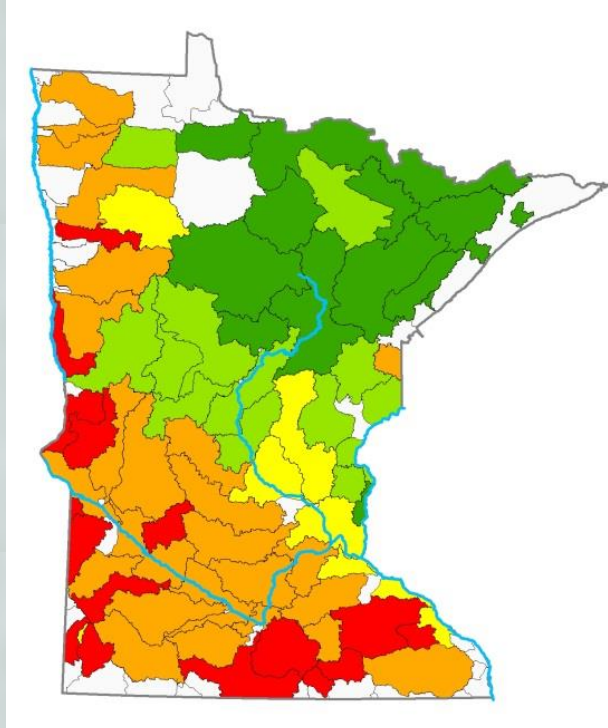
(Watershed Pollutant Load Monitoring Network)

# Watershed Pollutant Load Monitoring Network

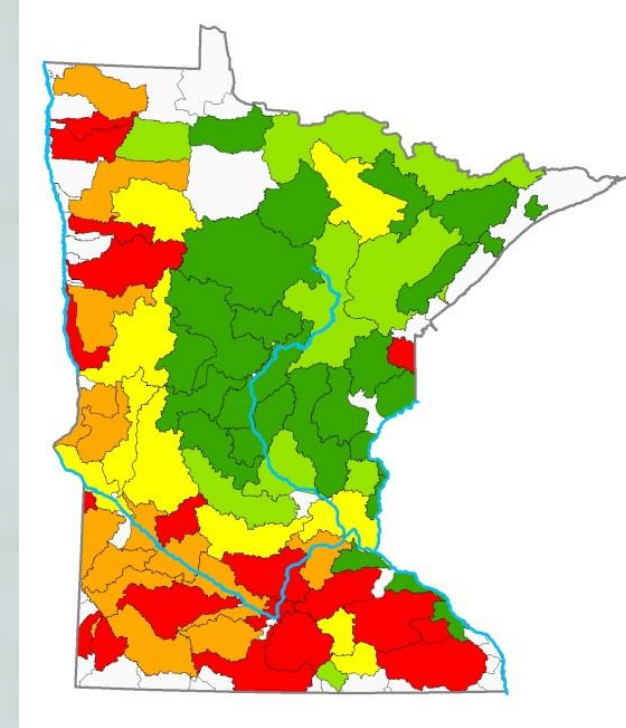
Nitrogen



Phosphorus



Suspended Solids

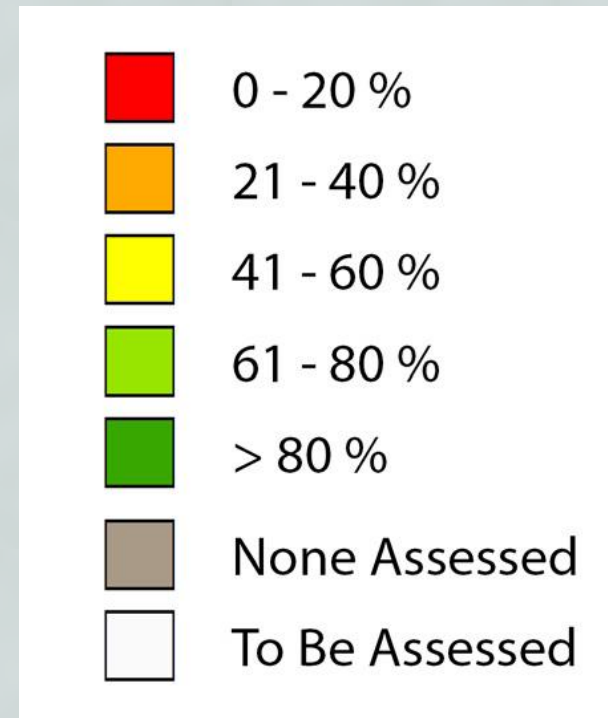
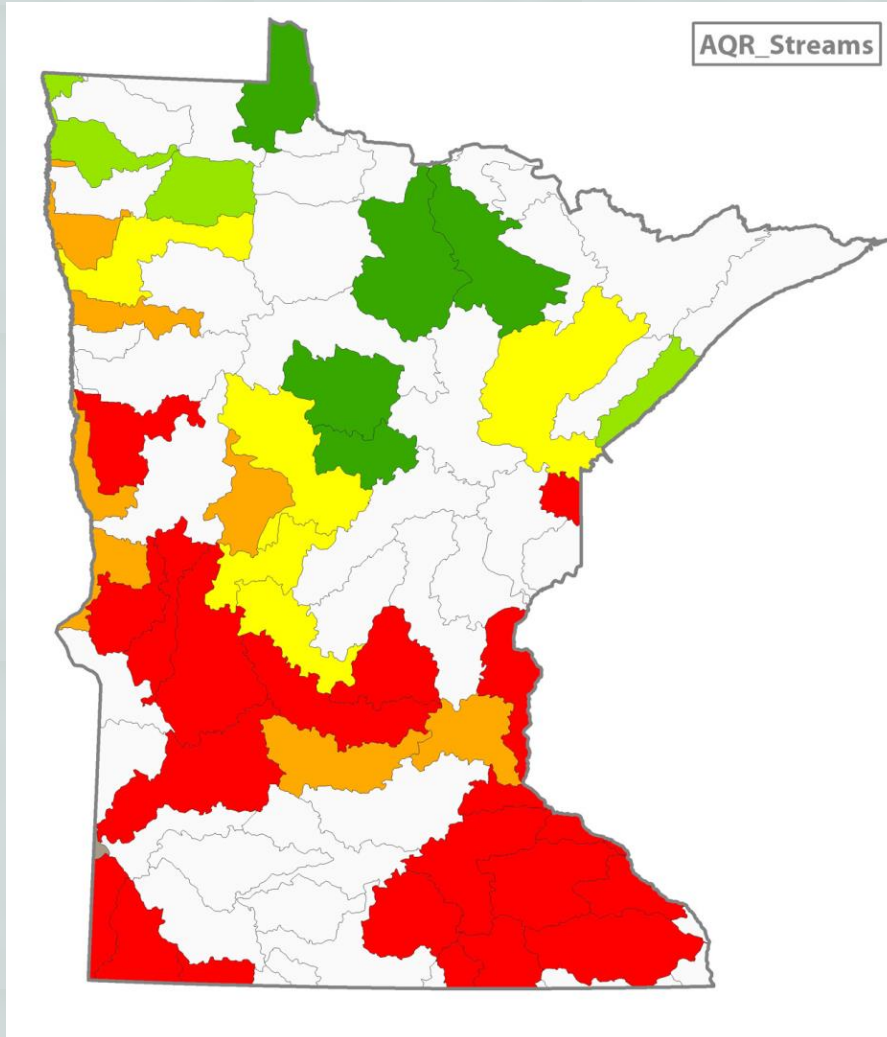


low



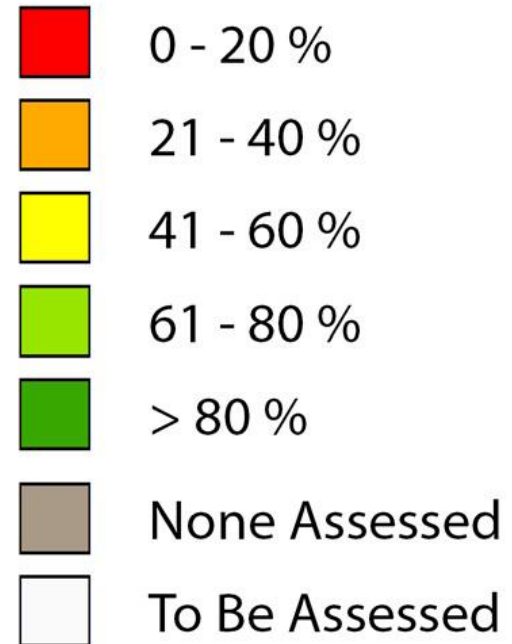
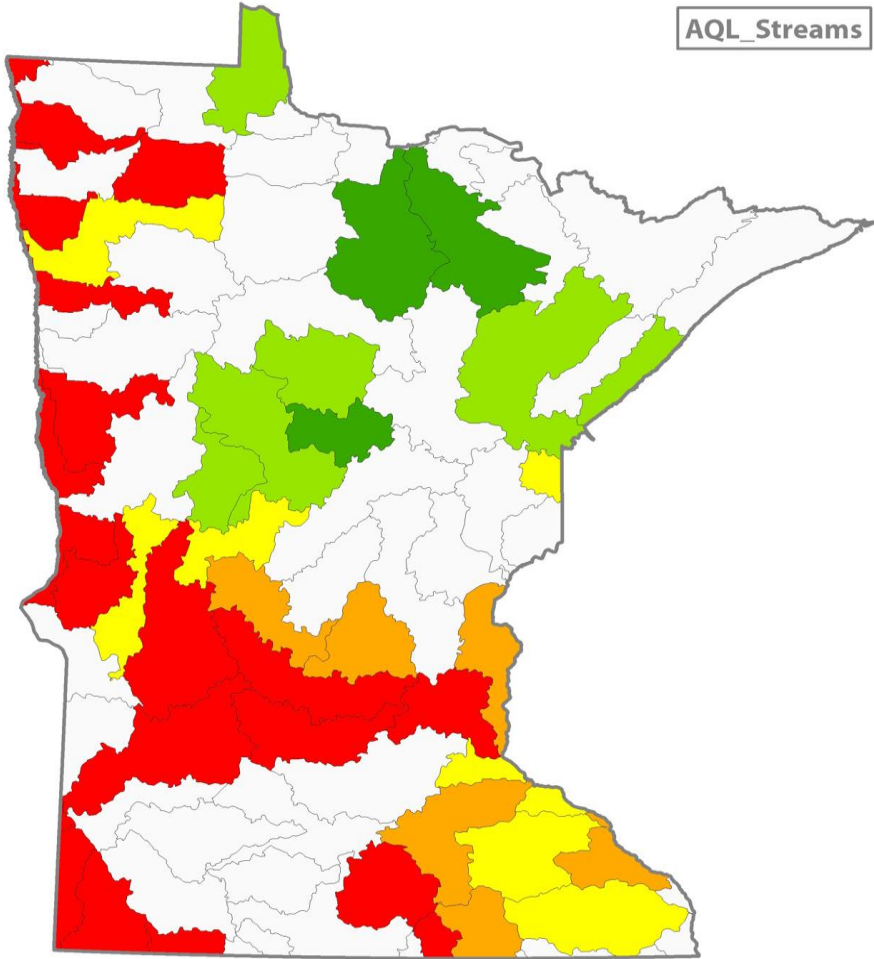
high

# Streams and rivers that fully support swimming and recreation



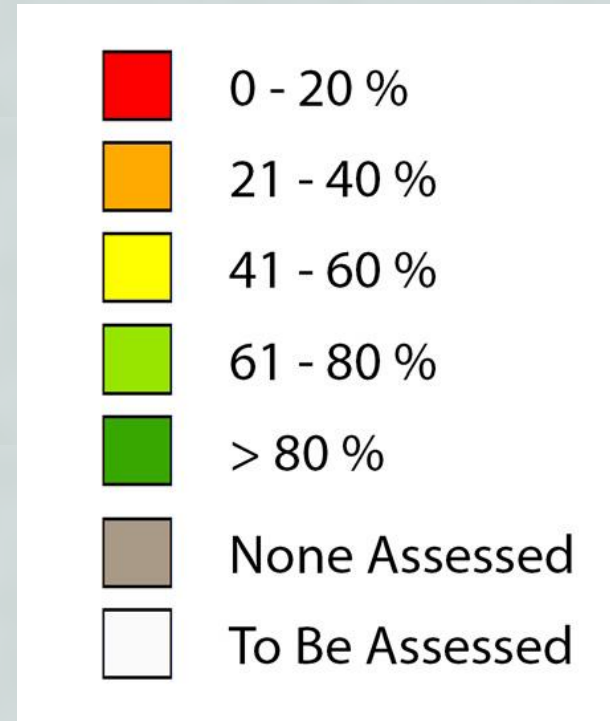
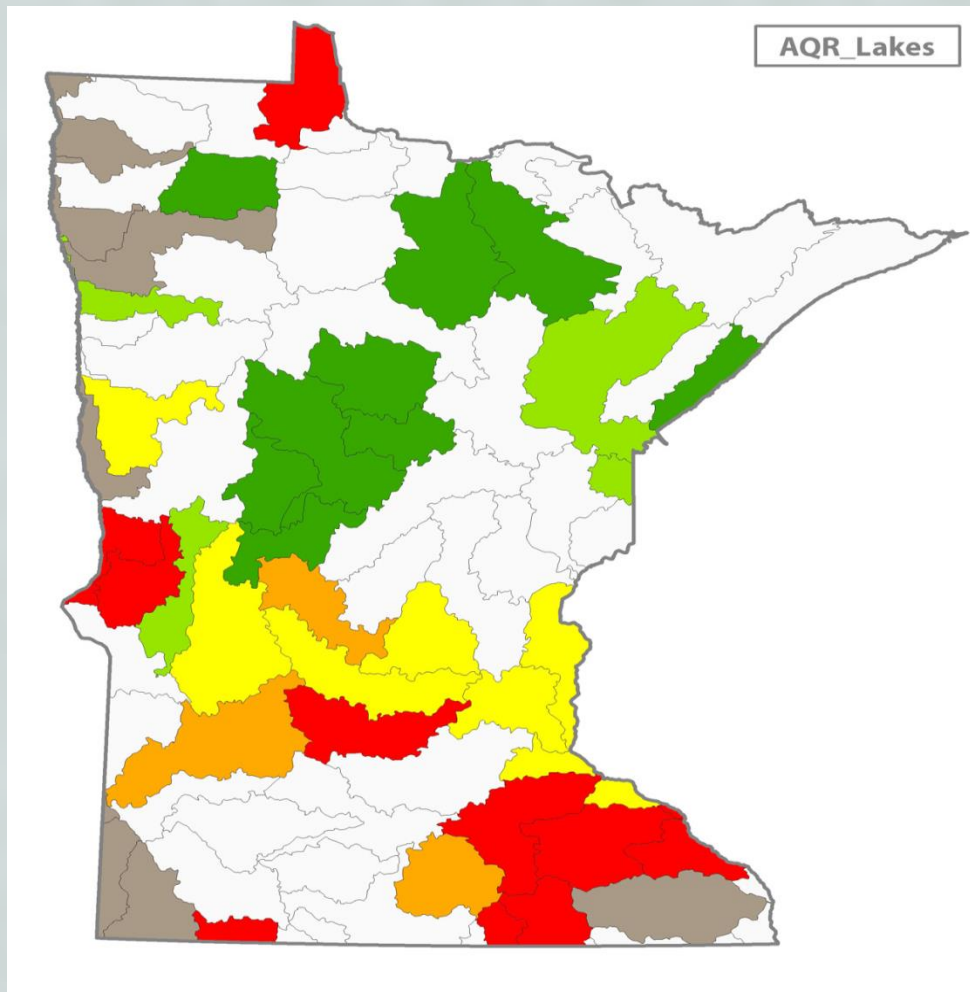
# Streams and rivers that fully support fish and other aquatic life

AQL\_Streams





# Lakes that fully support swimming and recreation



# General pattern



LAKE SUPERIOR SOUTH (NE)



ROCK RIVER (SW)



- ✧ Water quality is exceptionally good in the northeast part of the state
- ✧ Water quality declines moving toward the southwest
- ✧ Impairments typically occur in areas of higher pollutant loading

# Characterization and Problem Investigation

## Stressor Identification: explain reasons for biotic community impairments

### The elements of stream health

The Minnesota Pollution Control Agency and Local Partners examine several interrelated factors to identify stressors. The goal is to maintain conditions in healthy streams and remedy the situation in unhealthy streams.

#### Stream Connections

Examples: dams, culverts and tile drainage



#### Hydrology

Examples: stream flow and runoff



#### Stream Biology

Examples: fish and bugs



#### Water Chemistry

Examples: oxygen, nutrients and temperature



#### Stream Channel Assessment

Example: erosion



### What conditions stress our streams?

Several factors can stress the condition of habitats within our streams. Below are a few examples.

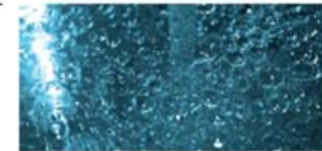
#### Too much sediment

Soil and other matter in water can make it hard for fish and other aquatic life to breathe, feed and reproduce. Sediment can also cover spawning areas and fill in parts of streams.



#### Low oxygen

Aquatic life needs oxygen dissolved in the water to breathe and survive.



#### Temperature

Stream temperature affects metabolism and the ability to get oxygen, especially for species such as trout.



#### Lack of habitat

Habitat affects all aspects of survival for fish and other aquatic life. Habitat encompasses places to live, food to eat, places to reproduce and means of protection.



#### Too many nutrients

Excess nutrients, such as phosphorus and nitrates, can be toxic to aquatic life and cause algal blooms. High nitrates can also be a concern for drinking water.



# Characterization and Problem Investigation

## Connecting Impairments to Implementation

Macroinvertebrate Impairment  
Stressor – Lack of Habitat



Stressor ID discovered other large sources of sediment: Gullies

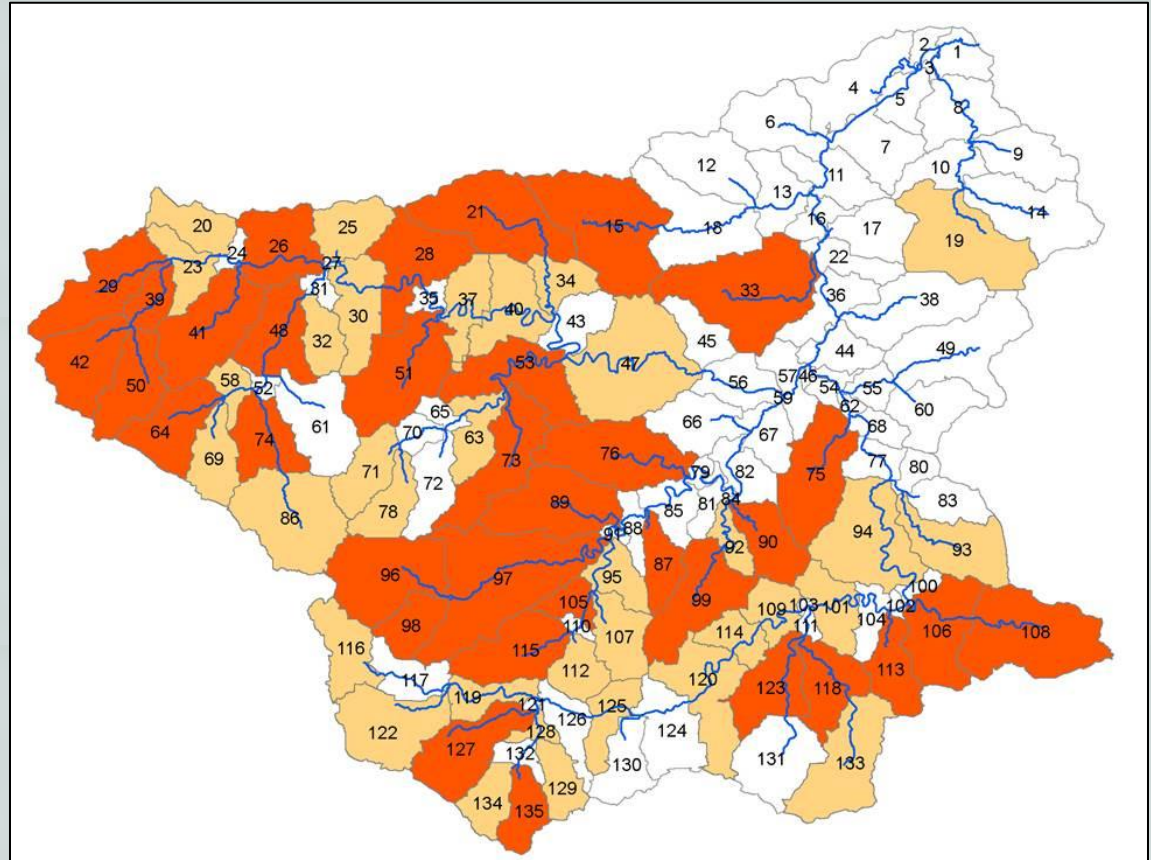


Identified need for sediment/water control basins in the uplands of this steep topography to control erosive flow to the stream.

# Characterization and Problem Investigation

## Modeling

- ❑ What goes in:
  - ✧ Land use
  - ✧ Soils
  - ✧ Climate
  - ✧ Water Quality Data
  - ✧ Stream Flows
  - ✧ Point Source Data
- ❑ Outputs:
  - ✧ Current Loads
  - ✧ Identified Load Reductions
  - ✧ Scenarios to achieve Reductions



Whitewater watershed showing top 25% (dark orange) and 50% (dark + light orange) sediment loading.

# Characterization and Problem Investigation

## Total Maximum Daily Load (TMDL)

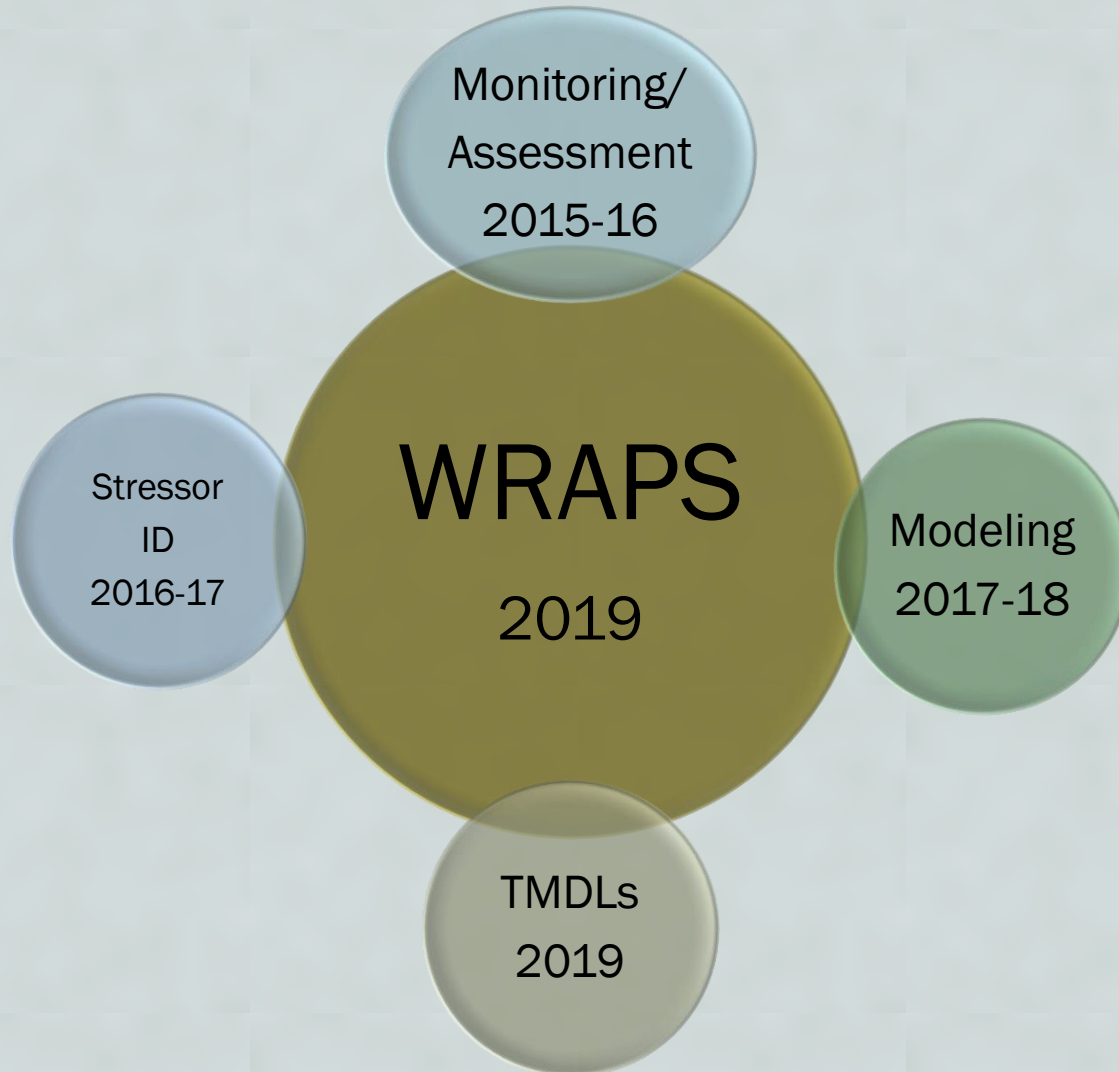
- ✧ A TMDL is maximum amount of a pollutant a water body can handle and still meet standards.
- ✧ Determines where reductions are needed.

Expressed mathematically, the TMDL equation is:

$$\text{TMDL} = \Sigma \text{WLA} + \Sigma \text{LA} + \text{MOS}$$

Where **WLA** is the sum of wasteload allocations (point sources), **LA** is the sum of load allocations (nonpoint sources and background) and **MOS** is the margin of safety.

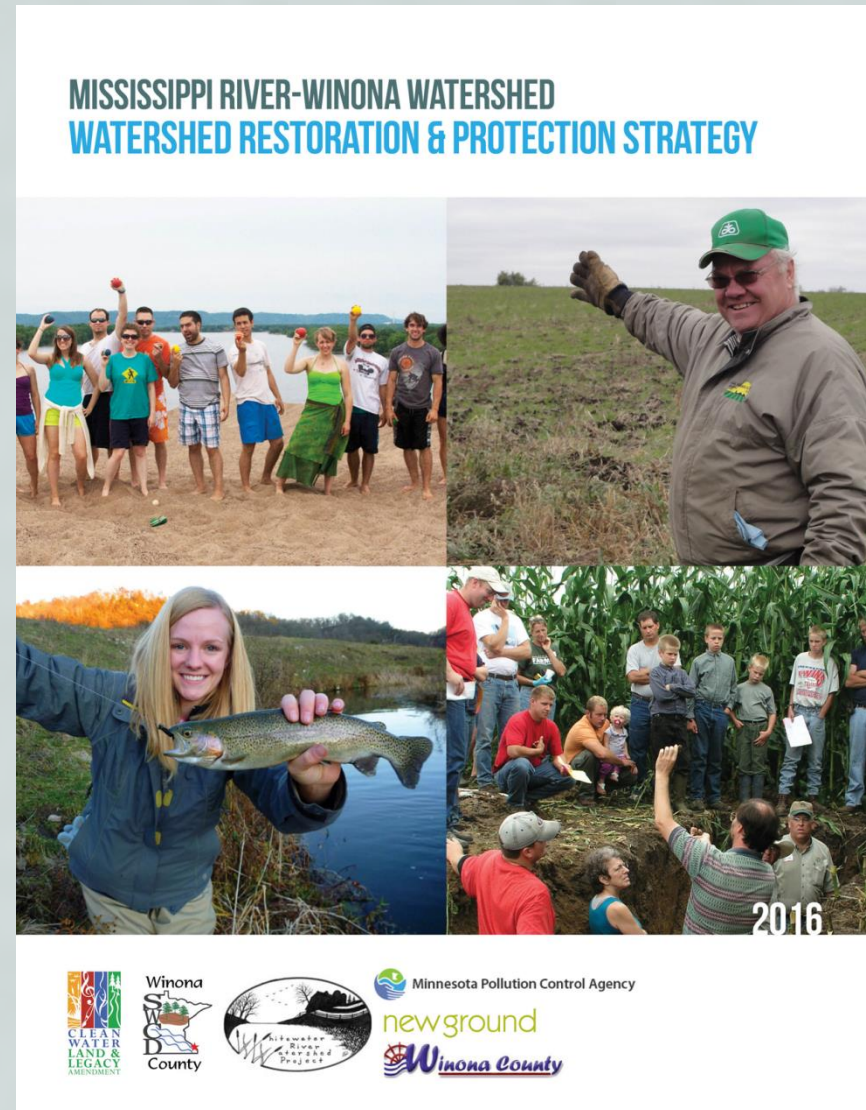
# Bringing it all together



# Restoration and Protection Strategy Development

## WRAPS

- ✧ Summarizes Information and Conclusions
  - ✧ Monitoring and Assessment
  - ✧ Stressor Identification & Modeling
  - ✧ TMDLs
- ✧ Action Plan
  - ✧ Targets and Prioritizes
  - ✧ Identifies Strategies to protect and restore local water resources.





# Restoration and Protection Strategy Development

## MISSISSIPPI RIVER - WINONA WATERSHED

### Impaired Streams & Lakes

Human impacts are widespread and continuing, which makes it necessary to either restore or protect every acre in this watershed.

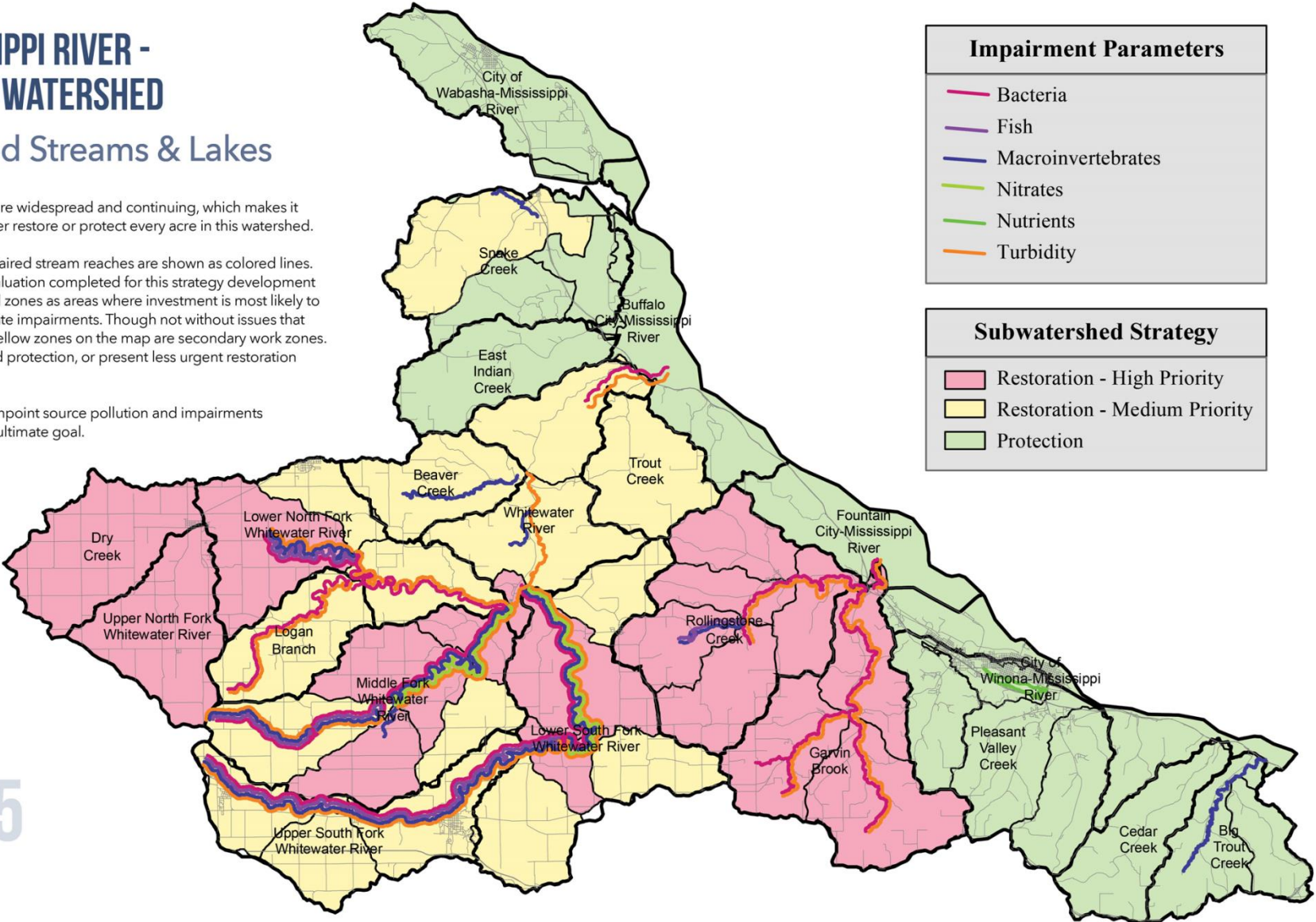
On this map, impaired stream reaches are shown as colored lines. Research and evaluation completed for this strategy development process show red zones as areas where investment is most likely to reduce or eliminate impairments. Though not without issues that need attention, yellow zones on the map are secondary work zones. Green areas need protection, or present less urgent restoration needs.

Elimination of nonpoint source pollution and impairments altogether is the ultimate goal.

Impairment Parameters	
	Bacteria
	Fish
	Macroinvertebrates
	Nitrates
	Nutrients
	Turbidity

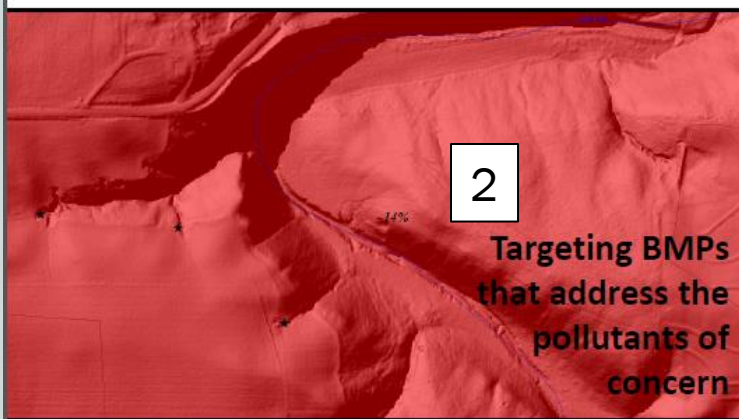
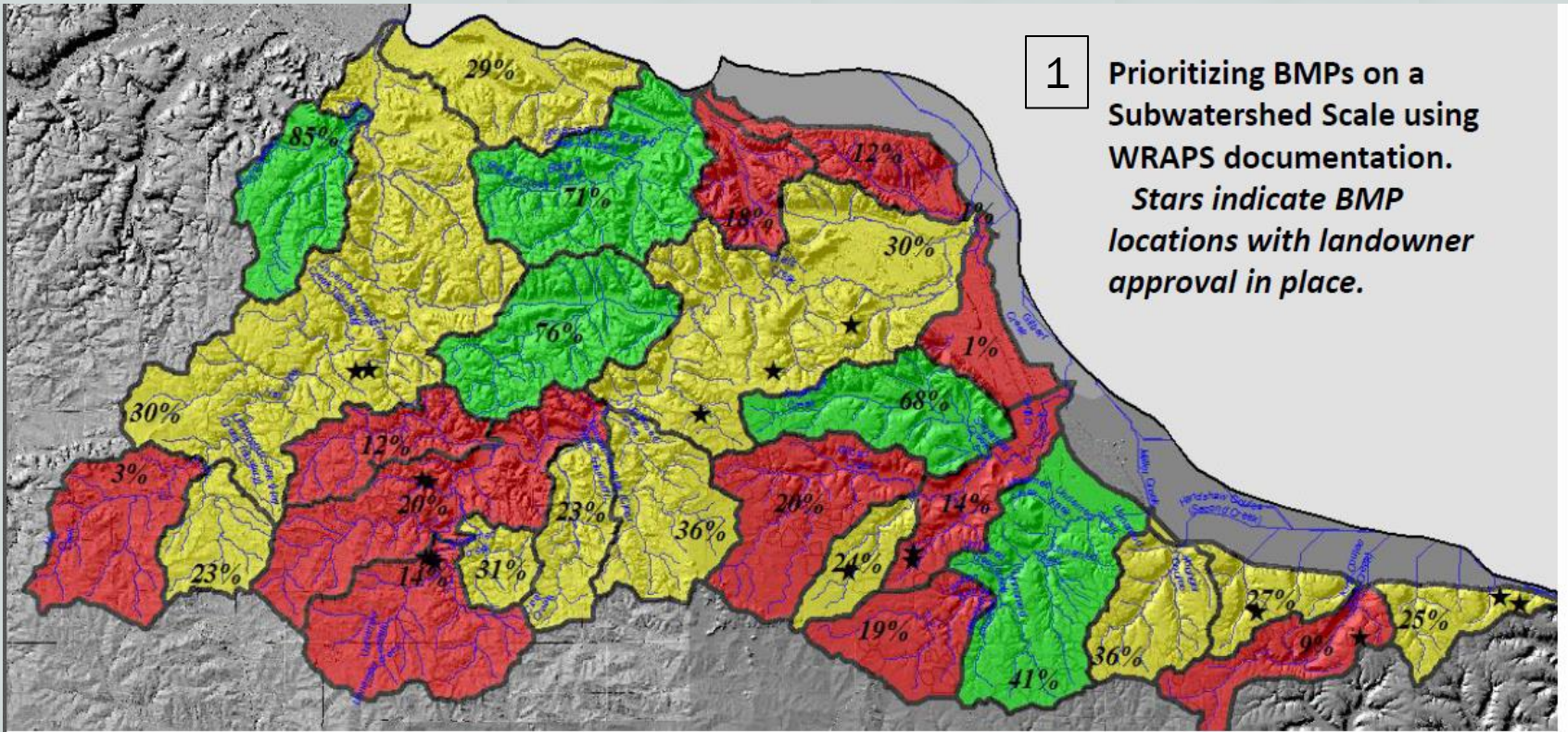
Subwatershed Strategy	
	Restoration - High Priority
	Restoration - Medium Priority
	Protection



2015

# I've got a WRAPS...now what?

- ✧ Local government units and non-profits reference WRAPS for detailed, targeted information to access funding for implementation projects
- ✧ Information from the WRAPS reports are incorporated into local plans



**3** Implementing the BMPs (ex: Sediment Basin and Grade Stabilization Structure)

# Clean Water Fund Project

- ✧ Project and Practices application by Goodhue SWCD; fall 2014
- ✧ **Protecting and Restoring Water Quality in Mississippi River/Lake Pepin Watershed**
- ✧ \$317,983.75
- ✧ Sediment/phosphorus/volume focus
  - grade stabilization structures, terraces and water and sediment control basins
- ✧ Referenced info from WRAPS



7/30/15 Preconstruction Basin#1



8/3/15 Post-construction Basin#1

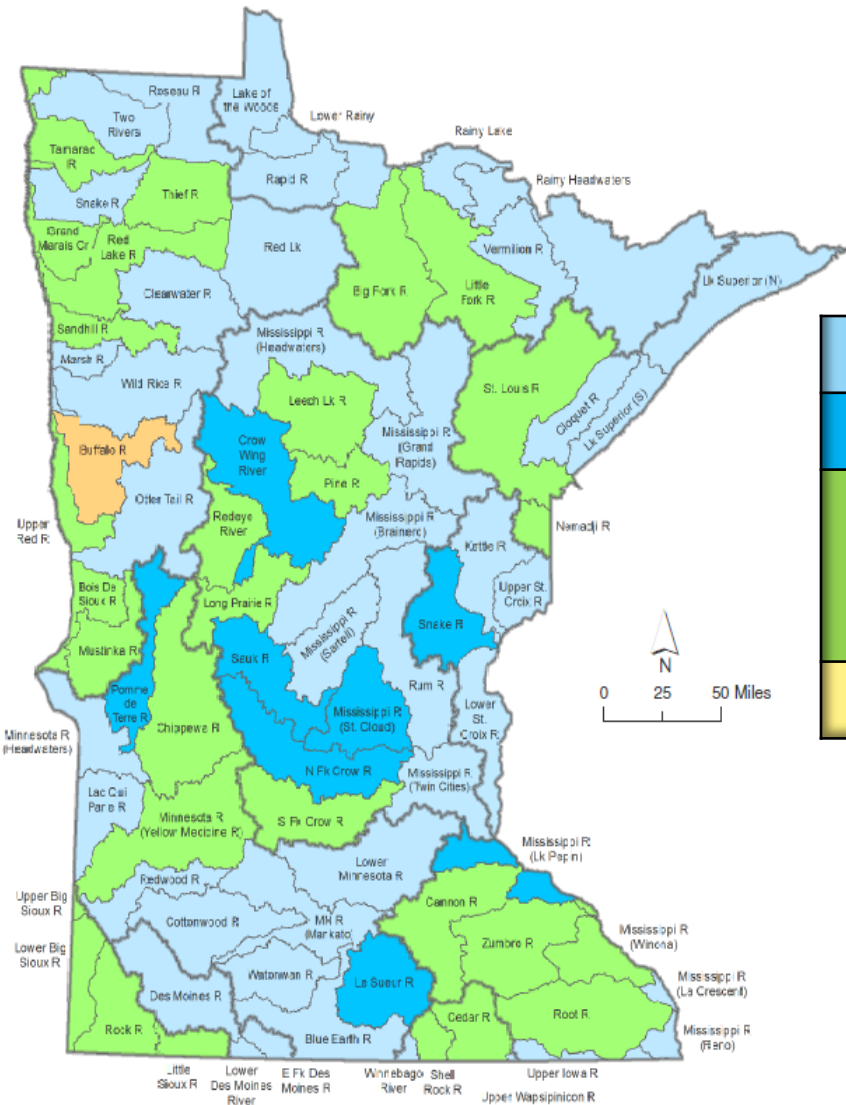


8/5/15 Seeded and Mulching Basin#1

Upper Wells Creek watershed

# Watershed Restoration and Protection Strategies (WRAPS)

## Completed and Upcoming Milestones



Anticipated Notices (next 12 months)	Target Date
Chippewa River	3/1/2016
Root River	3/1/2016
Mustinka River	3/15/2016
Red River of the North - Sandhill River	3/18/2016
Upper Red River of the North	3/29/2016
Cannon River	3/31/2016
Long Prairie River	4/1/2016
Redeye River	4/1/2016
Mississippi River - Winona	4/30/2016
Shell Rock River	5/17/2016
Leech Lake River	6/1/2016
Pine River	6/1/2016
Little Fork River	6/15/2016
Bois de Sioux River	6/30/2016
Cedar River	6/30/2016

	<b>Underway</b>
	<b>Approved</b>
	<b>Anticipated Public Notice (within the year)</b>
	<b>Under Review</b>

### WRAPS Status

#### In Progress

- Underway (IWM/HSPF Started/Complete)
- Anticipated Public Notices (next 12 months)

#### Under Review

- (Target MPCA Signature Date)
- Buffalo River, 12/30/2015

#### Approved by MPCA

- (MPCA Signature Date)
- Pomme de Terre River, 3/1/2013
- Snake River - St. Croix Basin, 8/11/2014
- North Fork Crow River, 1/5/2015
- Crow Wing River, 2/2/2015
- Mississippi River - Lake Pepin, 3/27/2015
- Mississippi River - St. Cloud, 3/5/2015
- Sauk River, 4/8/2015
- Le Sueur River, 8/20/2015



# WRAPS Cycle

# 2

## ✧ Purpose:

Expand understanding of MN water resources

## ✧ Focus:

Re-evaluating watershed conditions

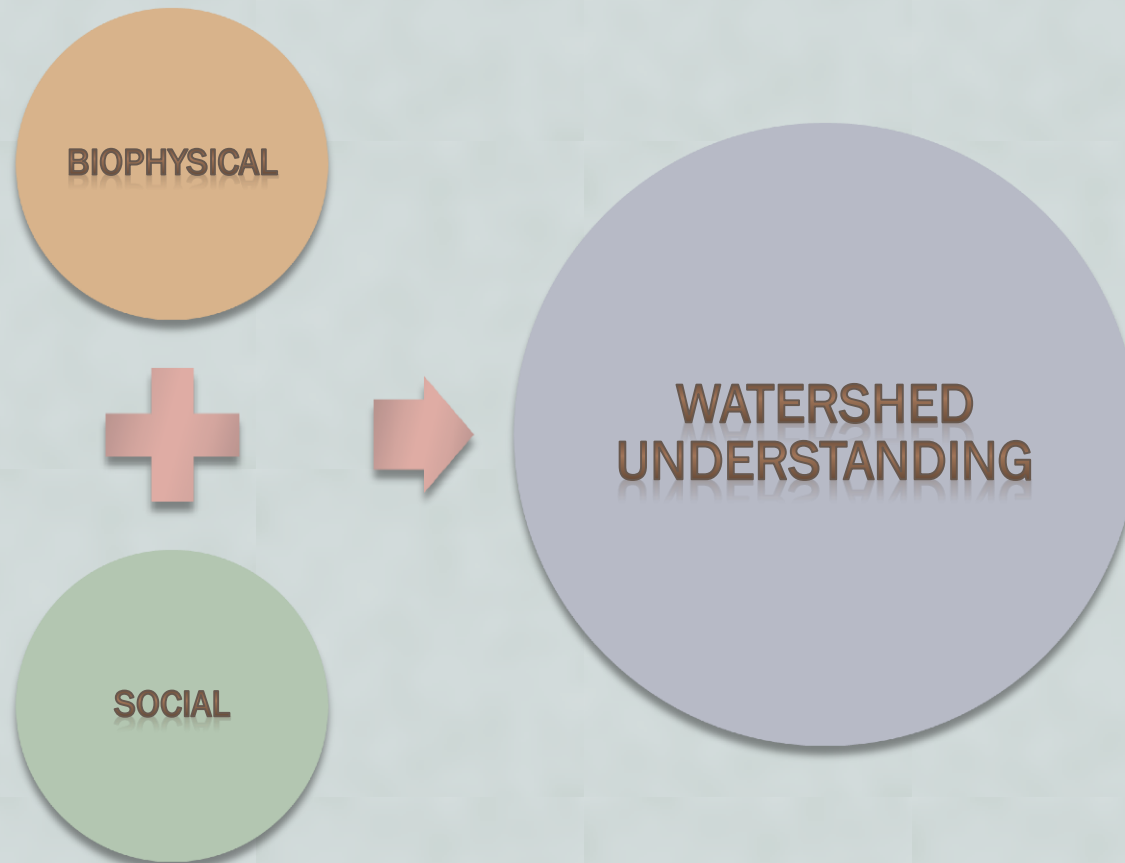
## ✧ Will be a little different than Cycle 1:

✧ Allow refining of monitoring approach

✧ Effectiveness monitoring where implementation of BMPs has occurred

# Social Aspect

- ✧ About 75% of land in MN is privately owned
  - ✧ Not all needed actions are regulated. Most voluntary.
  - ✧ Need to understand drivers and barriers of positive actions





# Social Aspect Activities



# What can you do?

- ✧ Become a Citizen Volunteer in MPCA's Citizen Monitoring Program (lake or stream)
- ✧ Participate in WRAPS related activities/conversations/etc.
- ✧ Enjoy Minnesota's resources: get outside, and bring others with you!
- ✧ Stay informed of what's happening in your watershed, and statewide. (online tools)

# Online Tools

## How's the Water? (MPCA)

- ✧ Info on the health of water resources in MN

<https://www.pca.state.mn.us/water/how-s-water>

## WHAF Tool (DNR)

- ✧ View health scores, natural resource features and summary info about MN's watersheds

<http://www.dnr.state.mn.us/whaf/index.html>

## What's in My Neighborhood? (multiple agencies)

- ✧ View environmental information about your community

<http://www.pca.state.mn.us/data/whats-my-neighborhood>

## Surface Water Data Access (MPCA)

- ✧ Explore information about MN's lakes and rivers

<http://cf.pca.state.mn.us/water/watershedweb/wdip/index.cf>  
[m](#)

# Take aways

- ✧ Legacy Amendment and Clean Water Fund has accelerated implementation of practices to improve and protect Minnesota's water resources
- ✧ Able to collect key information statewide to develop restoration and protection strategies, and to target implementation dollars
- ✧ Pairing the social with the biophysical will allow needed changes to occur
- ✧ This work is happening in all of our backyards and we have the opportunity to be involved.

# Questions

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507-206-2622



**KEEP  
CALM**

It's

**A**

**S**  
**^**

**WRAP!**