

# Zumbro Watershed Management Plan: Sediment-Reduction Part

Norman Senjem

Zumbro Watershed Partnership

March 29, 2012

# Zumbro Watershed Management Plan

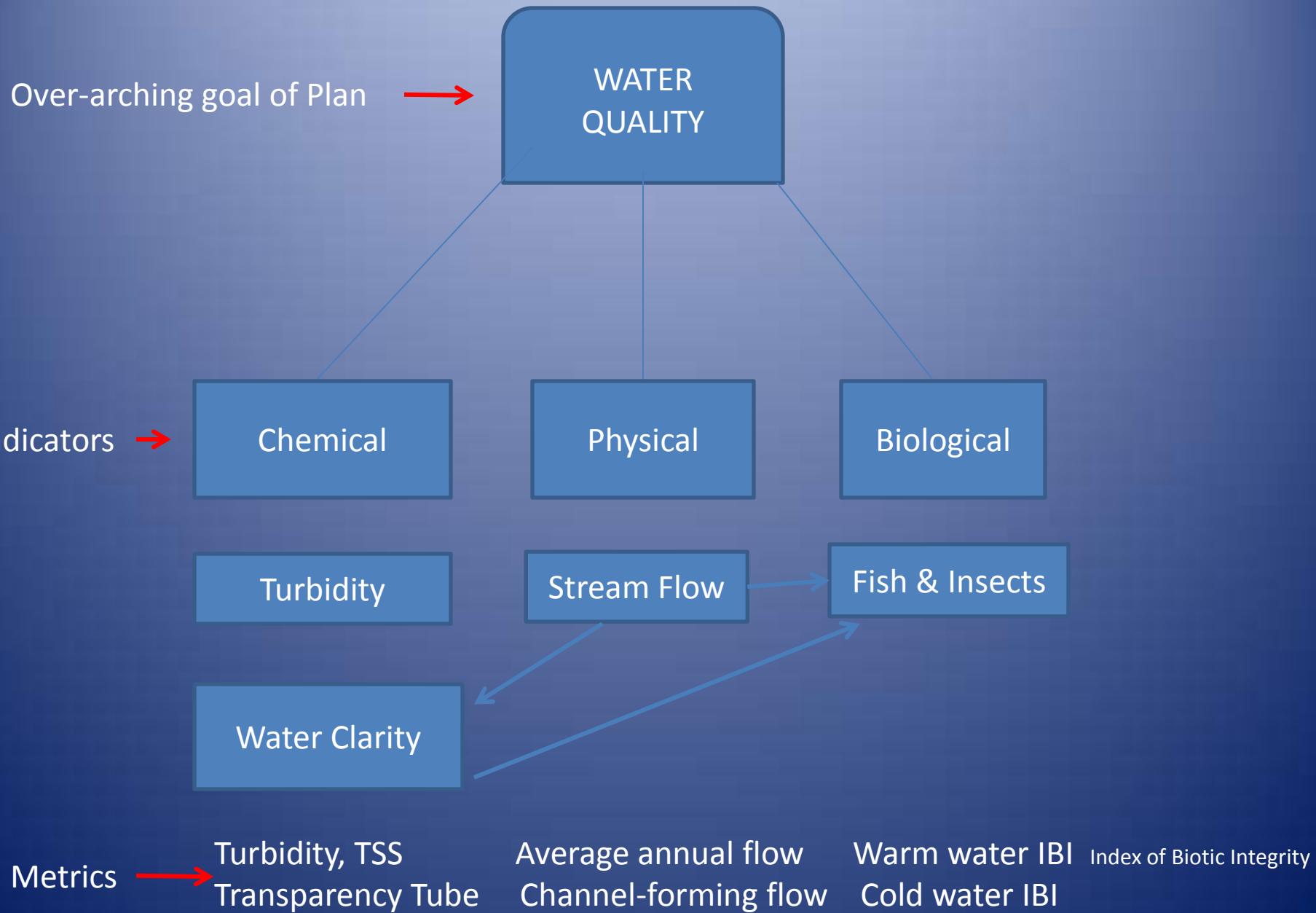
- Introduction & Goals
- Strategies for Achieving Goals
- Activities for Implementing Strategies
- Research Needs
- Monitoring

+

- **Watershed Governance**
- **Communication**
- **More Pollutants**
- **More!**

This Plan

Add to Expanded Plan



Over-arching goal of Plan

WATER  
QUALITY

Indicators

Chemical

Physical

Biological

Turbidity

Stream Flow

Fish & Insects

Water Clarity

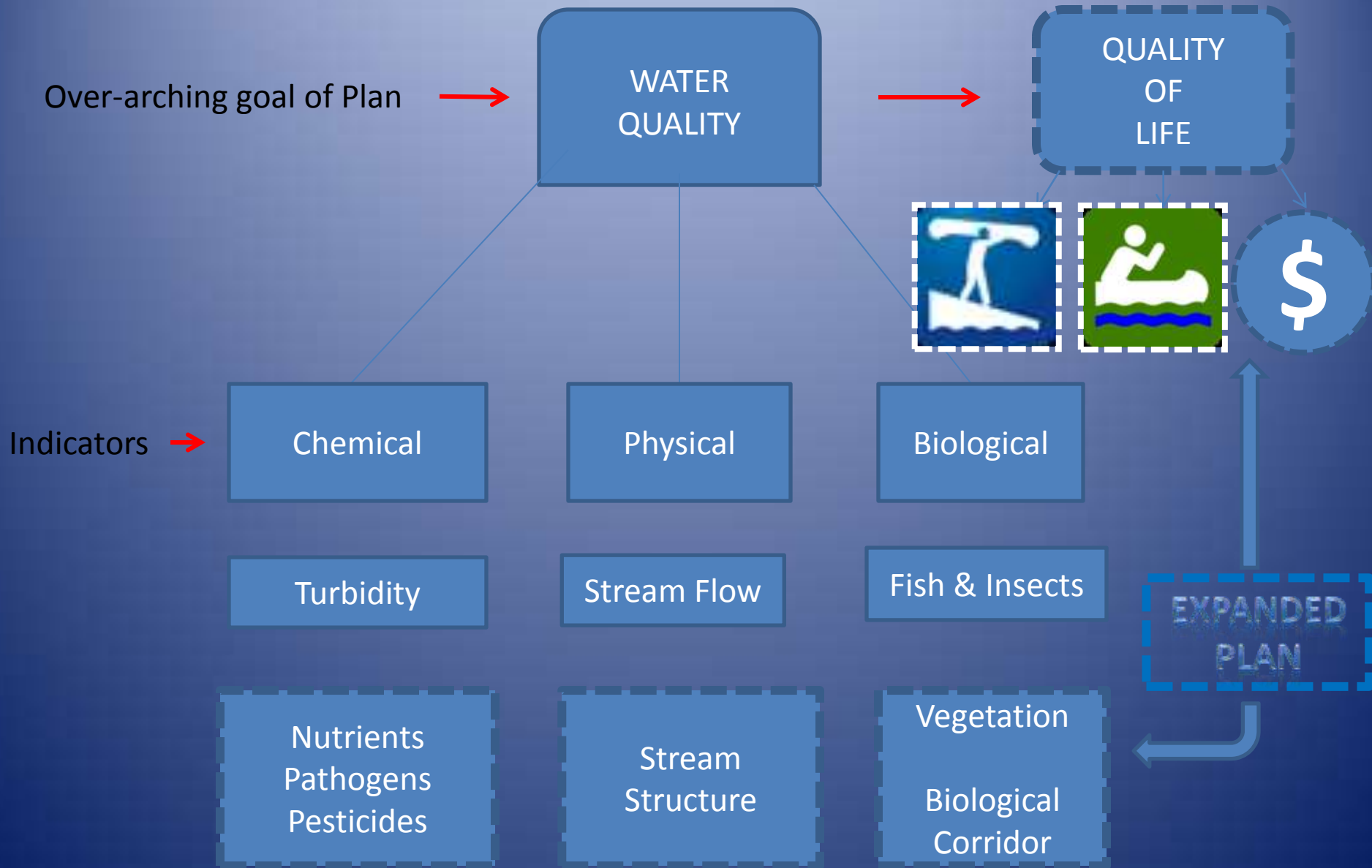
Metrics

Turbidity, TSS  
Transparency Tube

Average annual flow  
Channel-forming flow

Warm water IBI  
Cold water IBI

Index of Biotic Integrity



# Regional Grouping of Strategies

- Whole Watershed
- Headwaters Region
  - Western Uplands
  - Non-contiguous uplands
- Major tributaries and main stem
  - Excluding headwaters region

# Watershed-Wide Strategies

- Decrease rural soil erosion & runoff
- Increase soil infiltration & water storage
- Increase water storage on the land
- Riparian filters along streams & drainage ditches
- Stream bank and bluff stabilization
- Improve woodland and forest stands
- Improve pasture land
- Non-regulated urban runoff controls
- Regulated MS4 Programs (municipal separate storm sewer system)

# Headwaters Region Strategies

- Filter strips along streams & drainage ditches
- Observe setbacks for manure & pesticide application
- Increase reduced tillage on row crop land
- Restore wetlands
- Non-contiguous headwaters (steep)
  - Conservation plans – reduce soil erosion to T
  - Soil Loss Limits ordinances
  - Conservation Compliance

# Major tributaries and main stem strategy

- 1) Choose priority sub-watersheds
- 2) Establish citizens engagement process
- 3) Write and implement the work plan
  - 1) Small scale
  - 2) One-on-one contact
  - 3) High citizen input and involvement
- 4) Measure results



# Action Item Example 1

WW Action 1: Identify and correct major erosion sites

- a) From LCCMR project, identify and rank the 50 highest sediment sources among the ravines, stream banks and other sources listed. Group priority sites within watershed lobes: South Fork, Middle Fork, North Fork, and Lower Main Stem.
- b) Contact landowners and seek their cooperation in a project to design and implement solutions with cost-share assistance from state or federal funding sources.
- c) ZWP in cooperation with LGUs completes grant application for up to four project clusters (one for each lobe).

# Action Item Example 2

- WW Action 7: Demonstrate conservation drainage methods
- a) In western uplands of Dodge, Steele, Rice and Goodhue counties, work through local SWCDs and the MDA to identify a set of conservation drainage methods -- including alternative drainage ditch designs, water table management through tile outlet controls, and methods of tile drainage that avoid loss of nearby wetlands – suitable for the area.
- b) Solicit landowner cooperators to host demonstration projects on their land.
- c) Include education and outreach components in projects, and linkage among projects in different counties.
- d) Apply for Clean Water Fund grant from BWSR or MDA.

# Plan for this evening

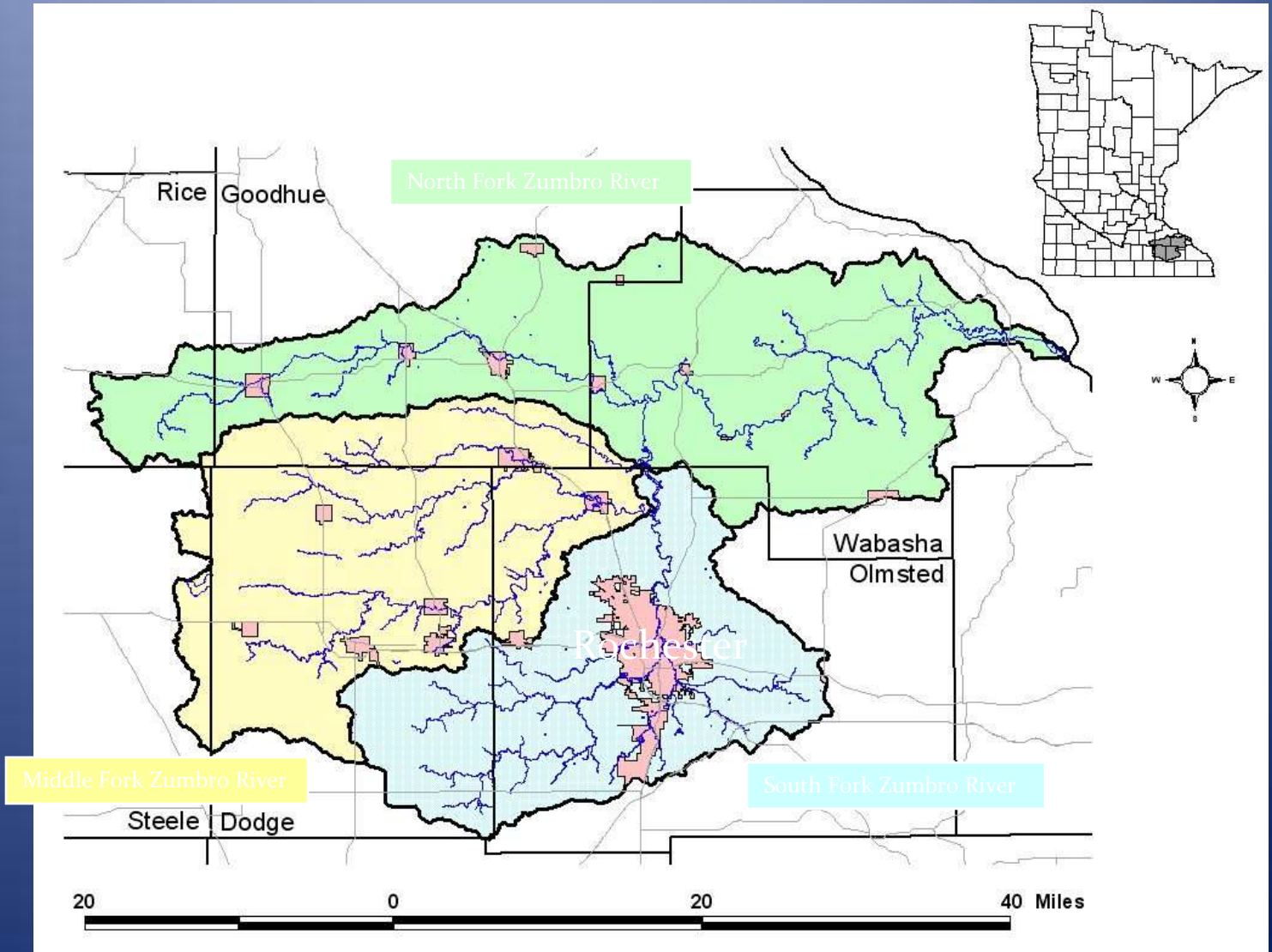
1. Vote for priority actions
2. Identify gaps and gaffes
3. Future Steps

# The Zumbro River Watershed

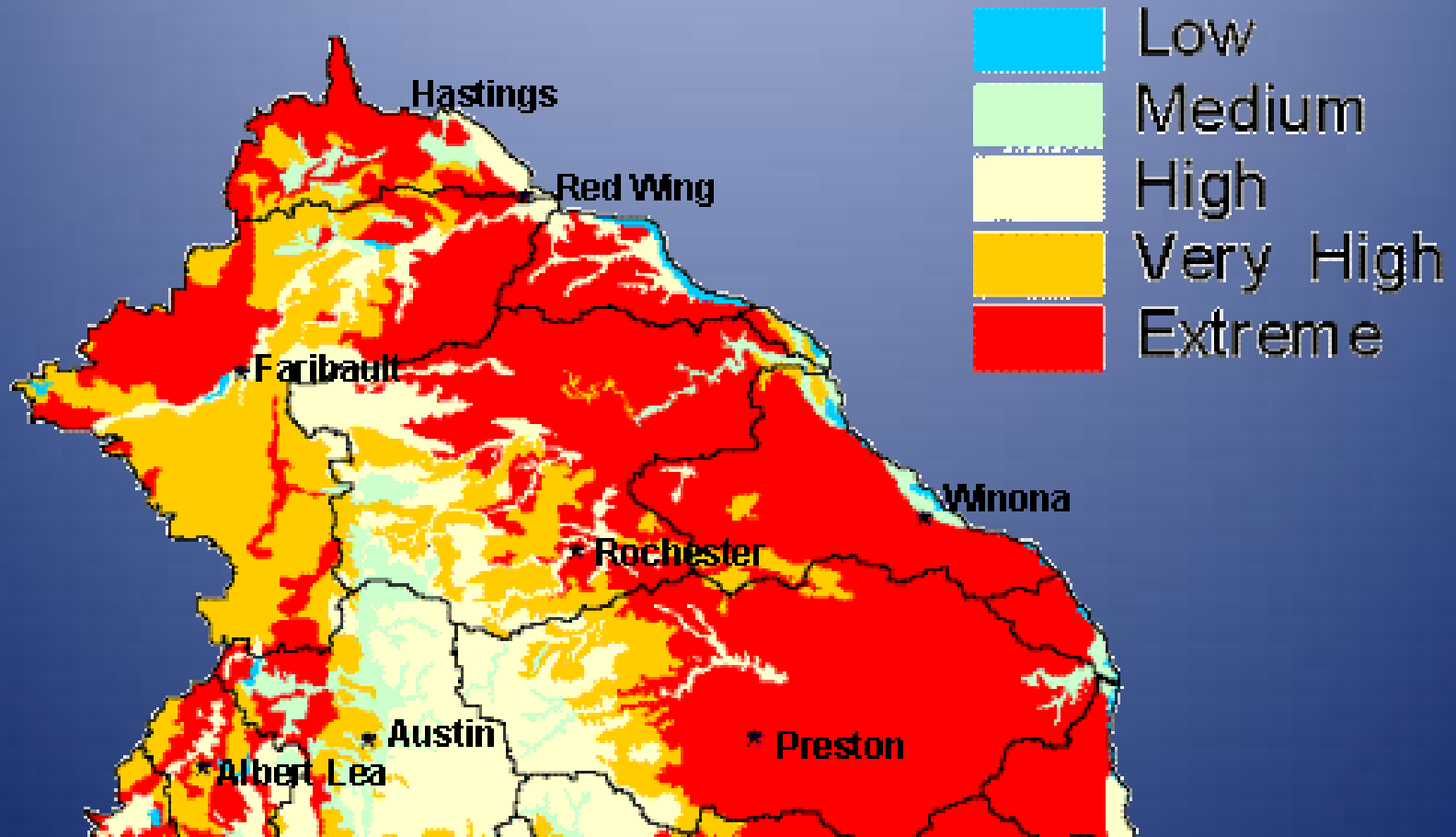
The watershed drains 910,323 acres before it enters the Mississippi River.

It includes portions of six counties of SE Minnesota:

- Rice
- Goodhue
- Wabasha
- Olmsted
- Dodge
- Steele



# Water Erosion Potential



# Pollutant Trends in Southeast Minnesota Rivers

	Total Suspended Solids	Total Phosphorus	Nitrite/ Nitrate	Ammonia	Biochemical Oxygen Demand	Chloride
--	------------------------	------------------	---------------------	---------	---------------------------	----------

**Vermillion River** at Br on Blaine Ave, 4 Mi NE of Farmington (VR-32.5) (period of record 1982 - 2008)

overall trend	decrease	decrease	no trend	decrease	increase	little data
average annual change	-1.7%	-1.9%		-3.0%	1.6%	
total change	-37%	-40%		-56%	54%	
median concentrations first 10 years	19	0.8	4	0.08	1.2	no data
median concentrations most recent 10 years	12	0.5	5	<.05	1.4	52

**Cannon River** at Br on CSAH-7 at Welch (CA-13) (period of record 1953 - 2008)

overall trend	decrease	decrease	increase	decrease	decrease	increase
average annual change	-2.6%	-2.3%	1.4%	-7.0%	-0.8%	1.8%
total change	-77%	-69%	105%	-97%	-37%	178%
median concentrations first 10 years	26	0.3	1	0.20	3.6	11
median concentrations most recent 10 years	14	0.2	4	<.05	2.3	28

**Straight River** near CSAH-1, 1 Mi SE of Clinton Falls (ST-18) (period of record 1955 - 2009)

overall trend	decrease	decrease	no trend	decrease	decrease	increase
average annual change	-1.9%	-1.0%		-7.4%	-3.5%	1.4%
total change	-64%	-43%		-98%	-85%	114%
median concentrations first 10 years	38	0.7	1	0.44	6.8	17
median concentrations most recent 10 years	23	0.3	4	<.05	1.1	30

**Zumbro River South Fork** at CSAH-14, 3 Mi N of Rochester (ZSF-5.7) (period of record 1973 - 2008)

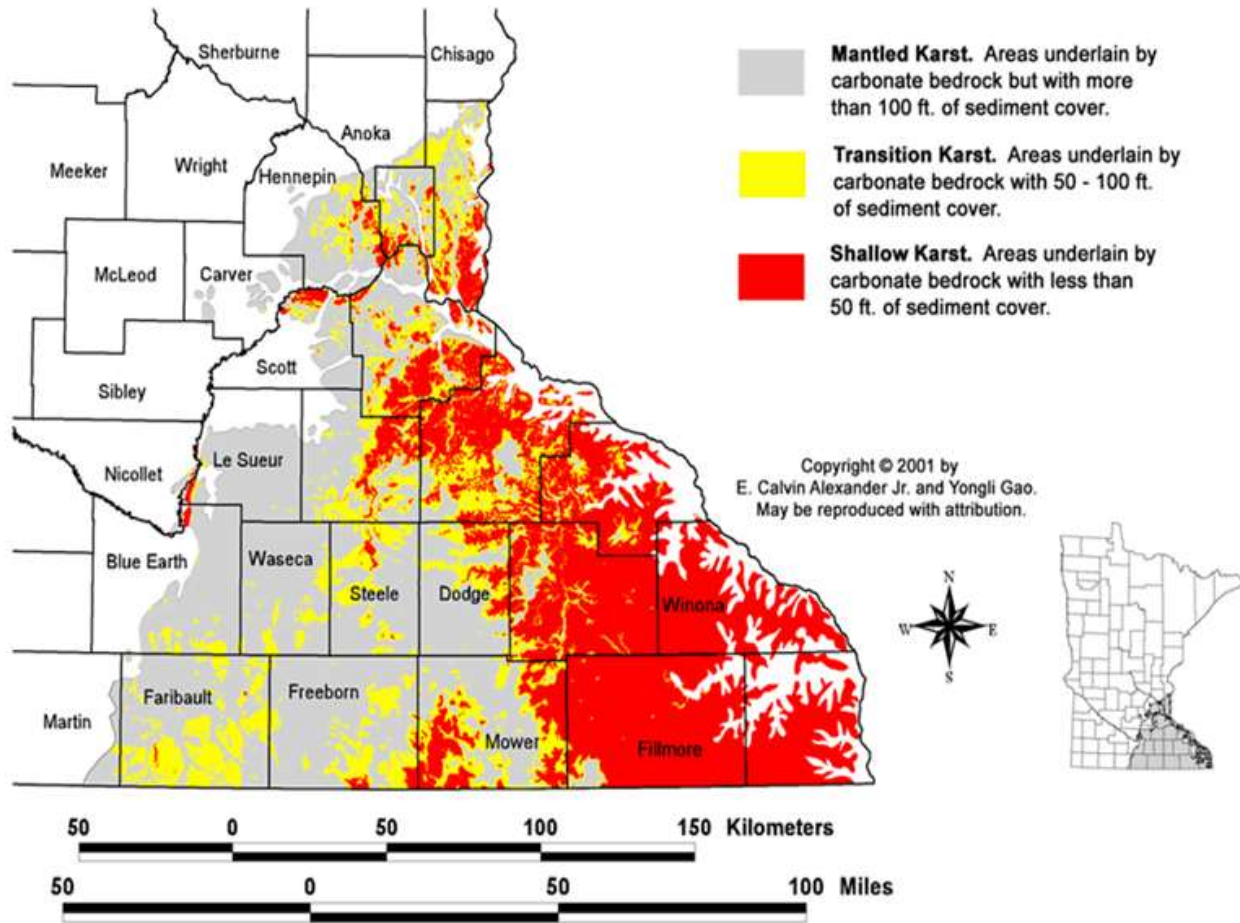
overall trend	decrease	decrease	increase	decrease	decrease	increase
average annual change	-2.9%	-7.1%	2.3%	-10.0%	-4.6%	3.0%
total change	-64%	-92%	120%	-97%	-81%	186%
median concentrations first 10 years	45	0.9	3	0.50	4.9	36
median concentrations most recent 10 years	16	0.2	7	<.05	2.2	54

**Whitewater River South Fork** N of Cr-115, 3.5 Mi NW of Utica (WWR-26) (period of record 1974 - 2008)

overall trend	decrease	no trend	increase	decrease	decrease	increase
average annual change	-2.1%		2.0%	-3.6%	-2.8%	1.9%
total change	-53%		101%	-73%	-64%	94%
median concentrations first 10 years	31	0.5	7	0.10	2.3	27
median concentrations most recent 10 years	13	0.5	11	<.05	1.0	43

# Groundwater Vulnerable to Contamination

## Minnesota Karst Lands



# Stream Flow

- More late summer floods
- Higher “Runoff Ratio” in Streams
  - 40-70% increase over time in volume of flow per unit precipitation.





# We Need You!

- Your perceptions
- Your expertise
- Your connections
- Your passion



# Timeline

- October 2012 – Start!
- December 14, January 26, March 29  
Stakeholders Meetings
- First Draft Review: March 29 – May 3
- Second Draft Review: May 10 – May 24



MPCA Approval\*

\*Theoretically contingent on EPA approval of the Zumbro Turbidity TMDL