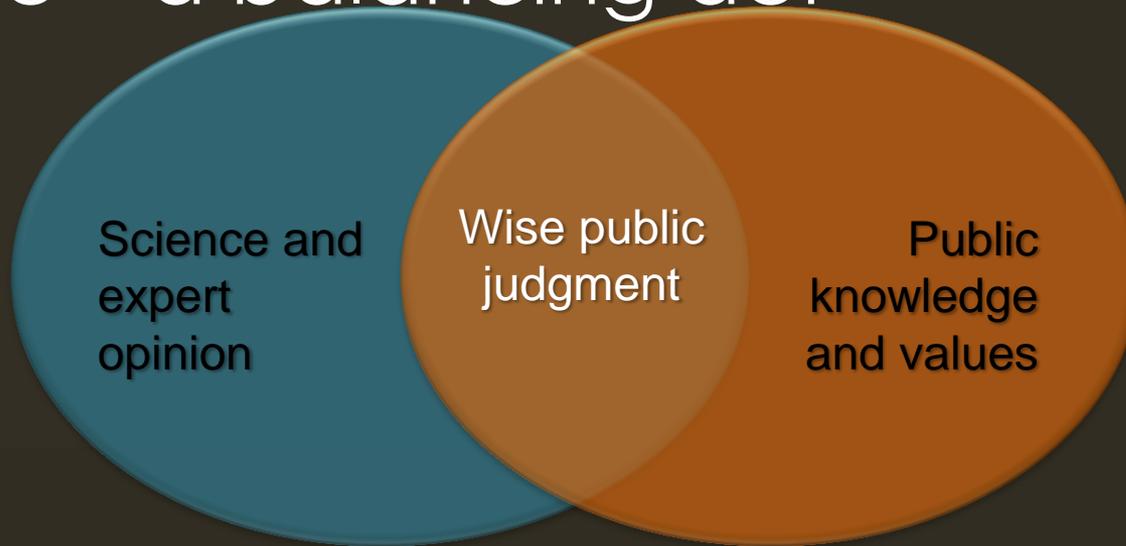


WATER RESOURCES MANAGEMENT

- Civic engagement is foremost a shift in philosophy about governance and the role of citizens in our work
- Collaborating with, empowering the public – a balancing act



Civic Engagement Definition

“Making resourceFULL decisions and taking collective action on public issues through processes of public discussion, reflection and collaboration. “

-- Minnesota Extension Service

Next Horizon: Authentic Civic Engagement

- Builds trust and relationships
- Trust = relationships
- Relationships = getting work done

Lake Tomah

A young girl in a white shirt and dark shorts is fishing on the shore of Lake Tomah. She is holding a fishing rod that extends across the water. In the background, a speedboat is moving across the lake, leaving a white wake. The sky is overcast, and the far shore is visible with some trees and structures.

**Our Community
Managing for
the Future**



**IF LAKE TOMAH WAS A
HIGHWAY THIS IS THE
CURRENT CONDITION IT
IS IN!**

What's the Problem?



Lake Management Plan

- **Link Lake Science and Community Values**
- **Lake Goals**
- **Objectives (How to improve)**
- **Implementation Strategies**
- **Responsibilities**
- **\$\$\$\$\$\$\$\$\$\$\$\$**

An aerial photograph of a rural landscape with a grid overlay. A blue lake is highlighted in the upper right quadrant, with the text 'Lake Tomah' written in black above it. A white mouse cursor is positioned in the top right corner of the image.

Lake Tomah Management Successes

- **Lake Map**
- **Carp Eradication**
- **Fisheries Restoration**
- **Handicap Pier**
- **Aquatic Plant Restoration**
- **Habitat and Island Restoration**
- **Water Quality Improvement**
- **Sediment Trap Maintenance**

PARTNERSHIP WORKING TOGETHER

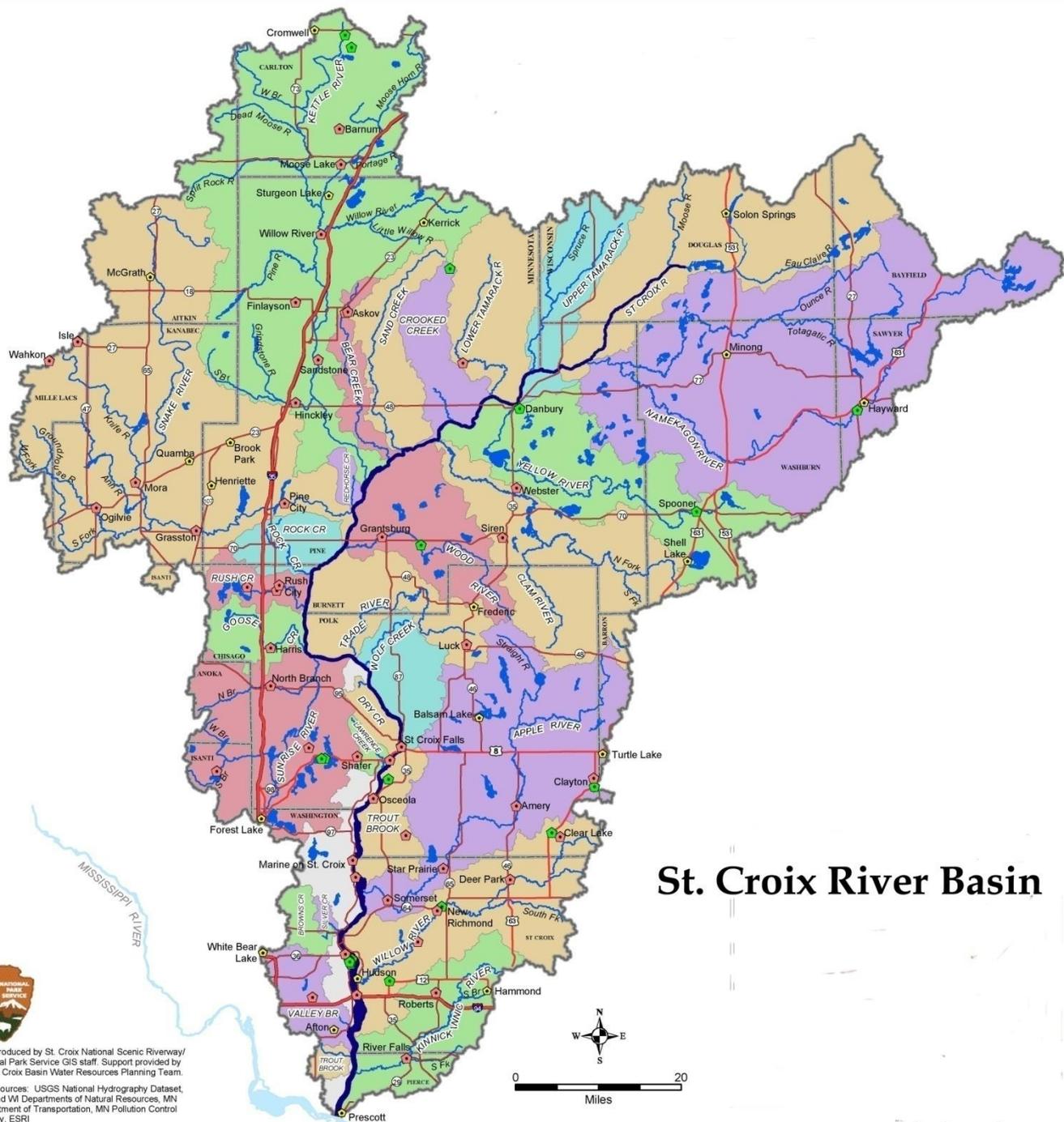
- **LAKE IMPROVEMENT
EQUALS IMPROVED
QUALITY OF LIFE**

St. Croix Water Quality

An aerial photograph of the St. Croix River winding through a lush, green forest. The river is the central focus, reflecting the sky and surrounding trees. The forest is dense and covers rolling hillsides. The sky is blue with scattered white clouds.

Photo: Nile Fellows

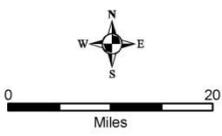
St. Croix Basin Water Resources Planning Team

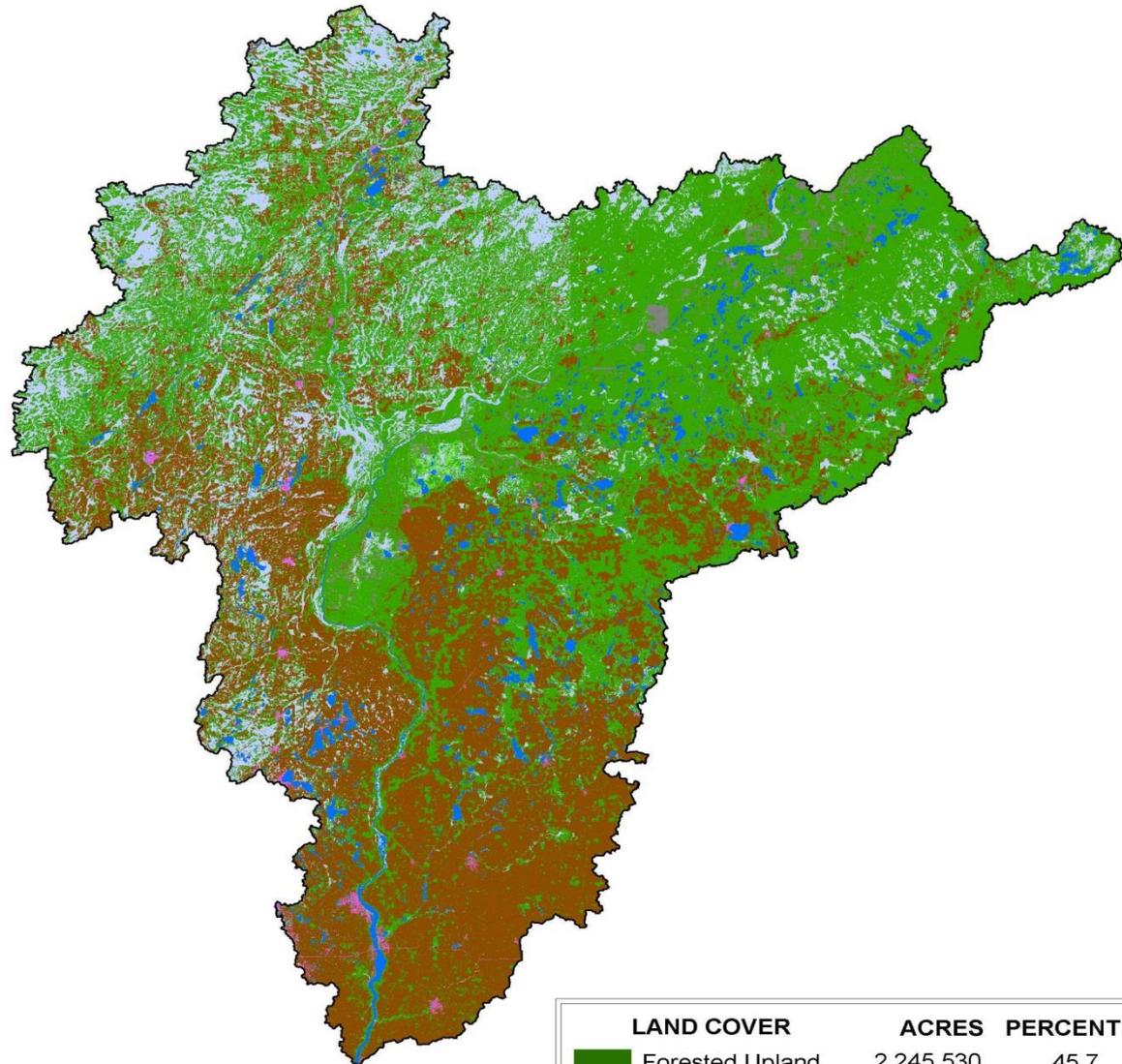


St. Croix River Basin



Map produced by St. Croix National Scenic Riverway/
 National Park Service GIS staff. Support provided by
 the St. Croix Basin Water Resources Planning Team.
 Data sources: USGS National Hydrography Dataset,
 MN and WI Departments of Natural Resources, MN
 Department of Transportation, MN Pollution Control
 Agency, ESRI





St. Croix River Basin 1992 Land Cover

LAND COVER	ACRES	PERCENT
 Forested Upland	2,245,530	45.7
 Cultivated/Planted	1,627,610	33.1
 Wetland	765,430	15.6
 Open Water	182,500	3.7
 Barren	41,880	0.9
 Developed	34,370	0.7
 Grassland	17,980	0.4
 Shrubland	3,490	0.1
TOTAL	4,918,790*	100%

*Acreages have been rounded



ST. CROIX BASIN WATER RESOURCES PLANNING TEAM

1993 Cooperative Agreement-Members

- **National Park Service**
- **Wisconsin Department of Natural Resources**
- **Minnesota Department of Natural Resources**
- **Minnesota Pollution Control Agency**
- **MN-WI Boundary Area Commission**

Basin Team Cooperating Members

- **U.S. Geological Survey**
- **Metropolitan Council-
Environmental Services**
- **Minnesota Department of
Agriculture**
- **Science Museum of Minnesota - St.
Croix Watershed Research Station**
- **University of Minnesota**
- **University of Wisconsin Extension**
- **County Soil and Water Agencies**
- **St. Croix River Association**

1993 Cooperative Agreement between Riverway administering agencies

Form a Basin Team to:

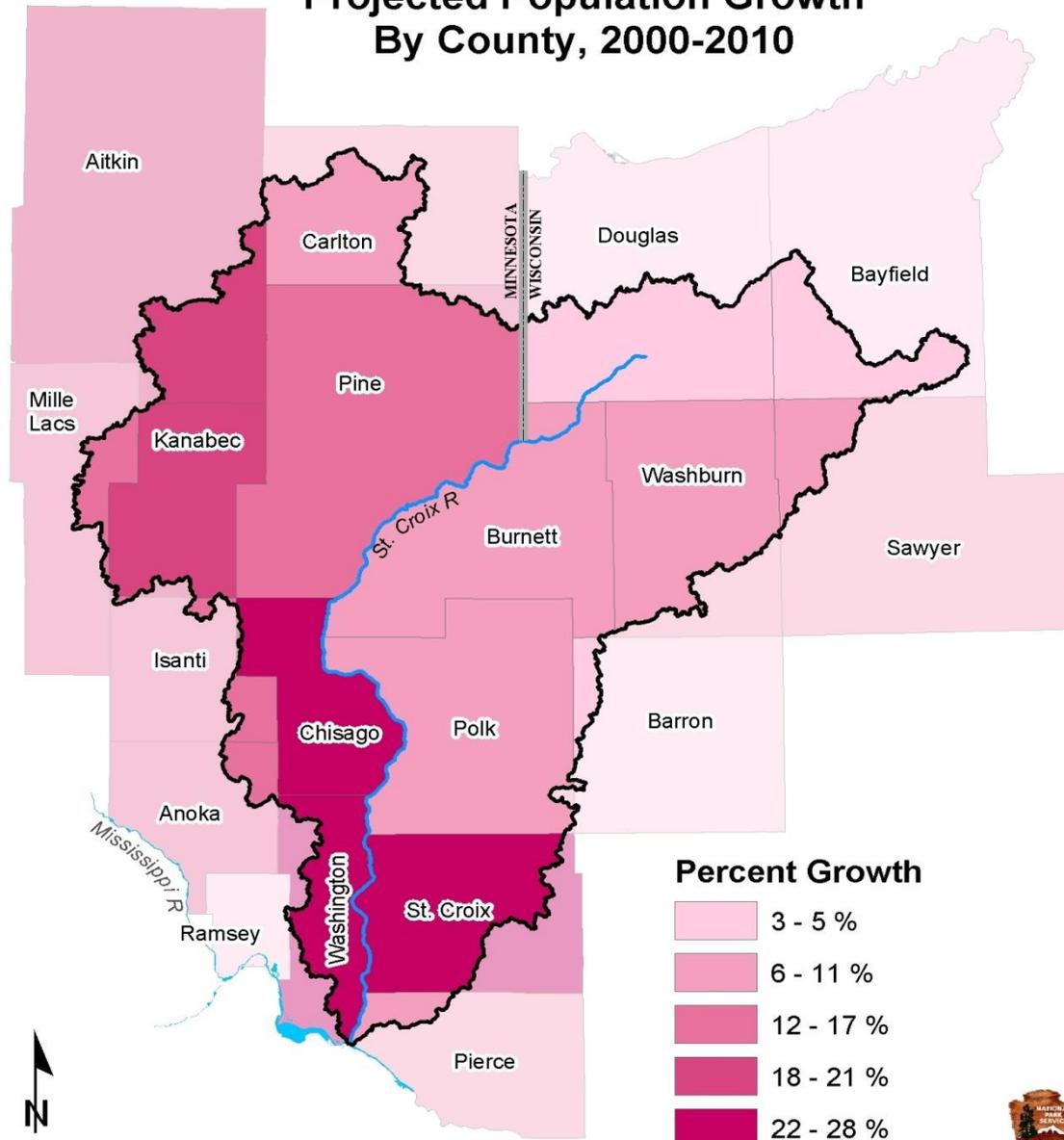
- 1. Formulate a protection plan**
- 2. Cooperate with the USGS**
- 3. Develop a plan of study**
- 4. Coordinate monitoring**
- 5. Act as a public forum**

NUTRIENT SUBCOMMITTEE



ST. CROIX RIVER BASIN

Projected Population Growth By County, 2000-2010



Percent Growth



St. Croix Studies



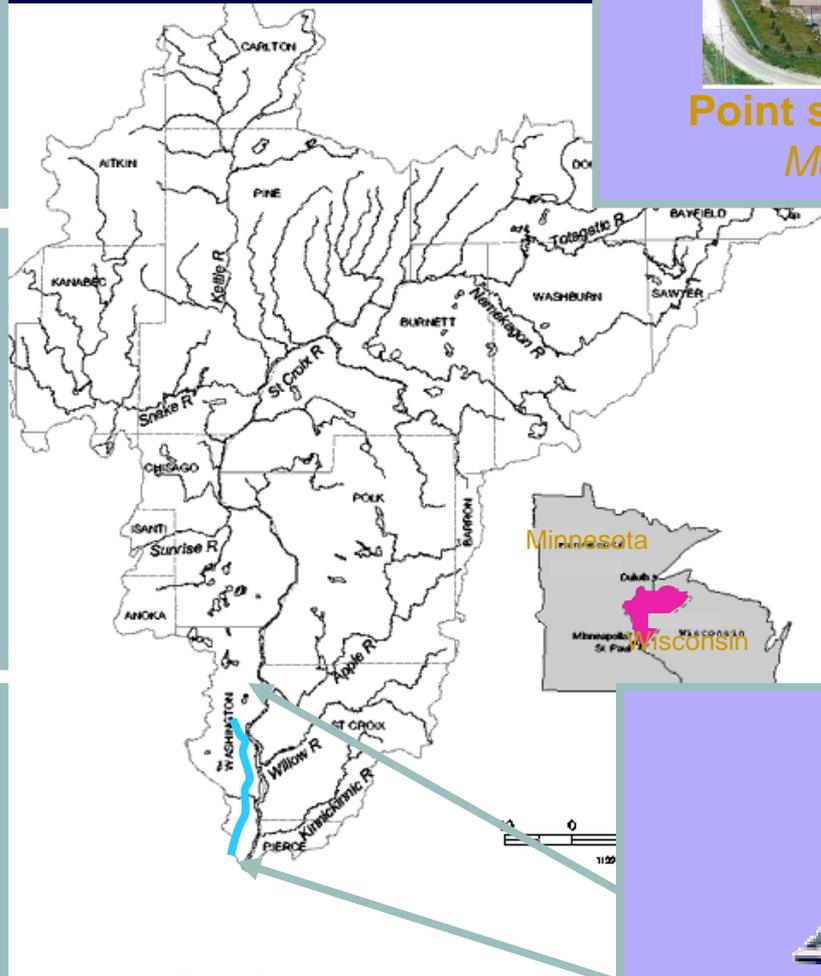
Water quality trends
Brenda Moraska Lafrancois



Point source records
Mark Edlund



Basin nutrient loading
Bernie Lenz



Map from the Minnesota Pollution Control Agency, <http://www.pca.state.mn.us>



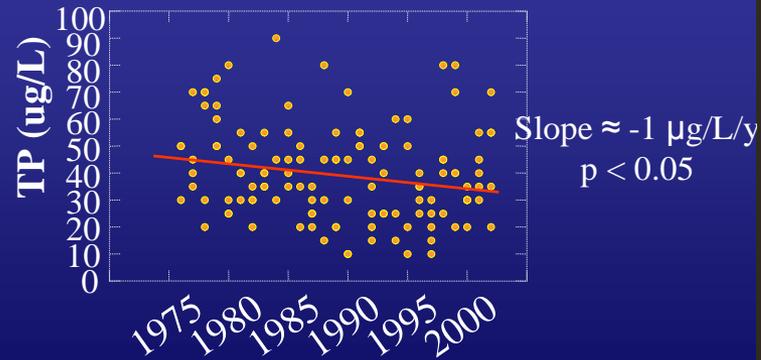
Lake sediment cores
Laura Triplett



Modeling P reductions
Bernie Lenz

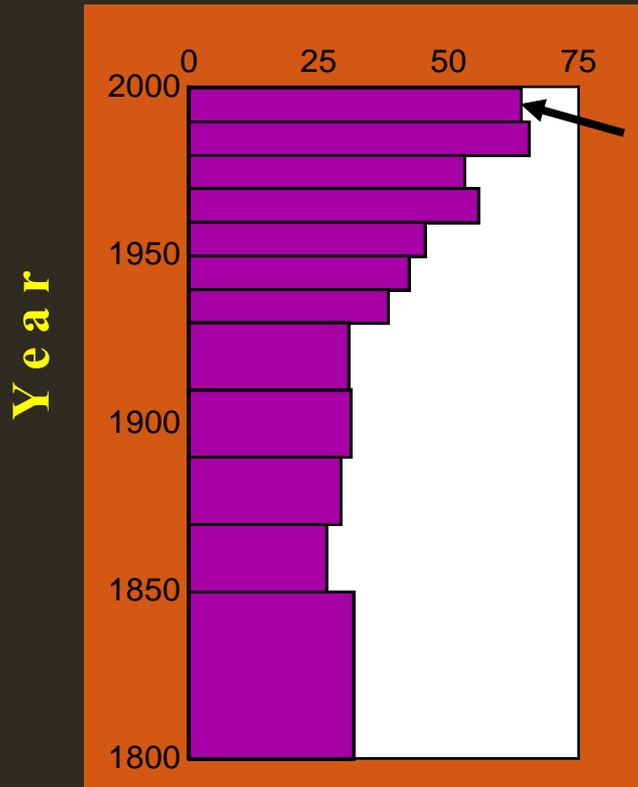
Water Quality Trends

Trends: Total P



Lake Sediment Cores

**Historical water TP
(ug/L)**

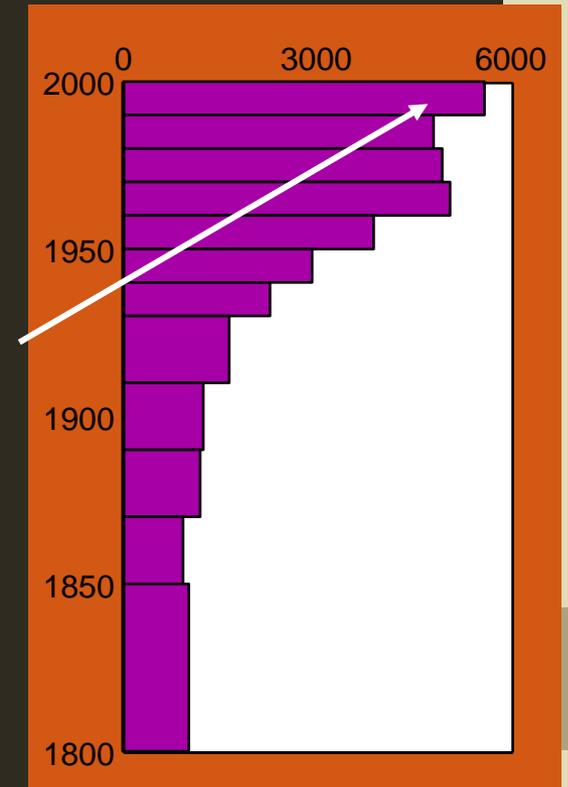


**2-fold increase since
pre-European
settlement**

**5.5-fold increase
since pre-settlement**



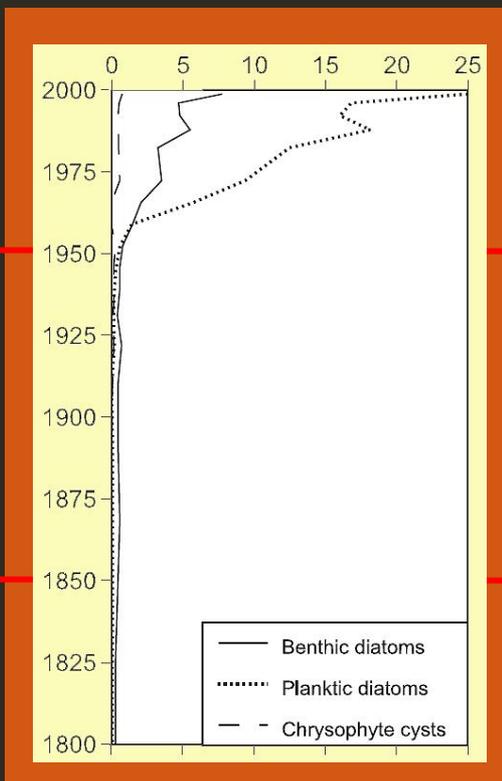
**Biogenic silica (diatoms)
in sediment (t/yr)**



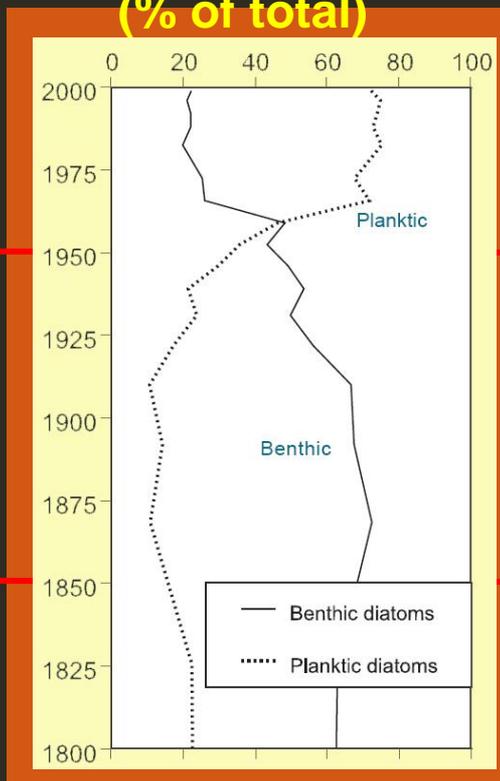
Lake Sediment Cores

Three periods: Prior to 1850 Pre-settlement
1850-1950 European settlement
Since 1950 Green revolution,

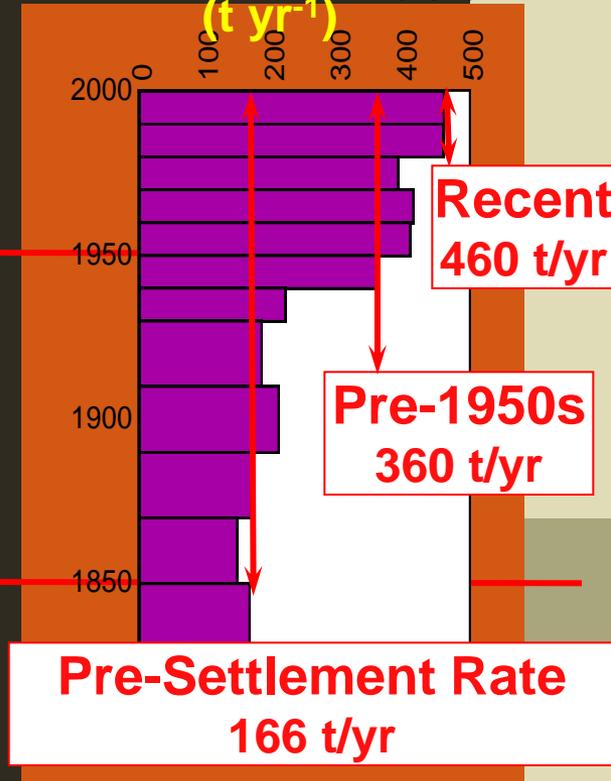
Diatom Accumulation
(10^6 valves $\text{cm}^{-2} \text{yr}^{-1}$)



Diatom Relative Abundance
(% of total)

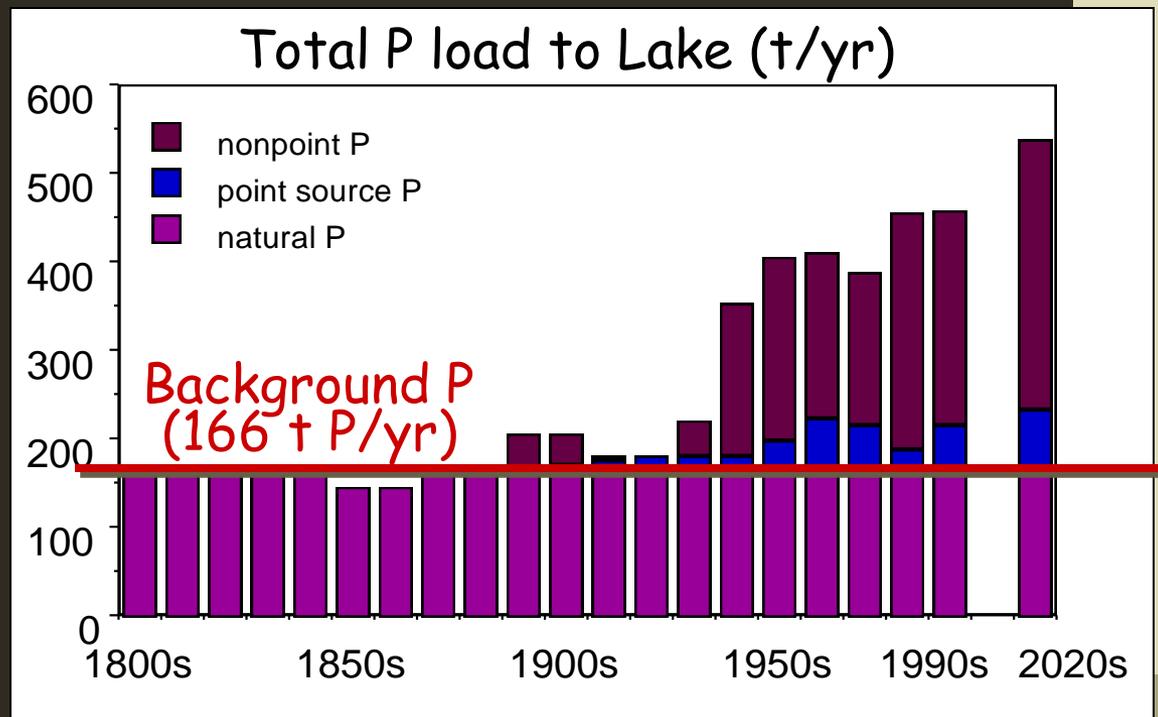


Total Phosphorus load
(t yr^{-1})



HISTORICAL AND PROJECTED LOADS

- background P loading **166** tons P/yr
- cultural contribution of 20-300 tons P/yr (1900-2000) point and nonpoint combined
- in 1990s, **18%** of cultural P attributable to point sources
- in 2020s, est **19%** attributable to point sources



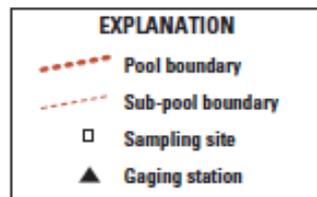


Figure 2. St. Croix River Pools, with pools and sampling locations identified.

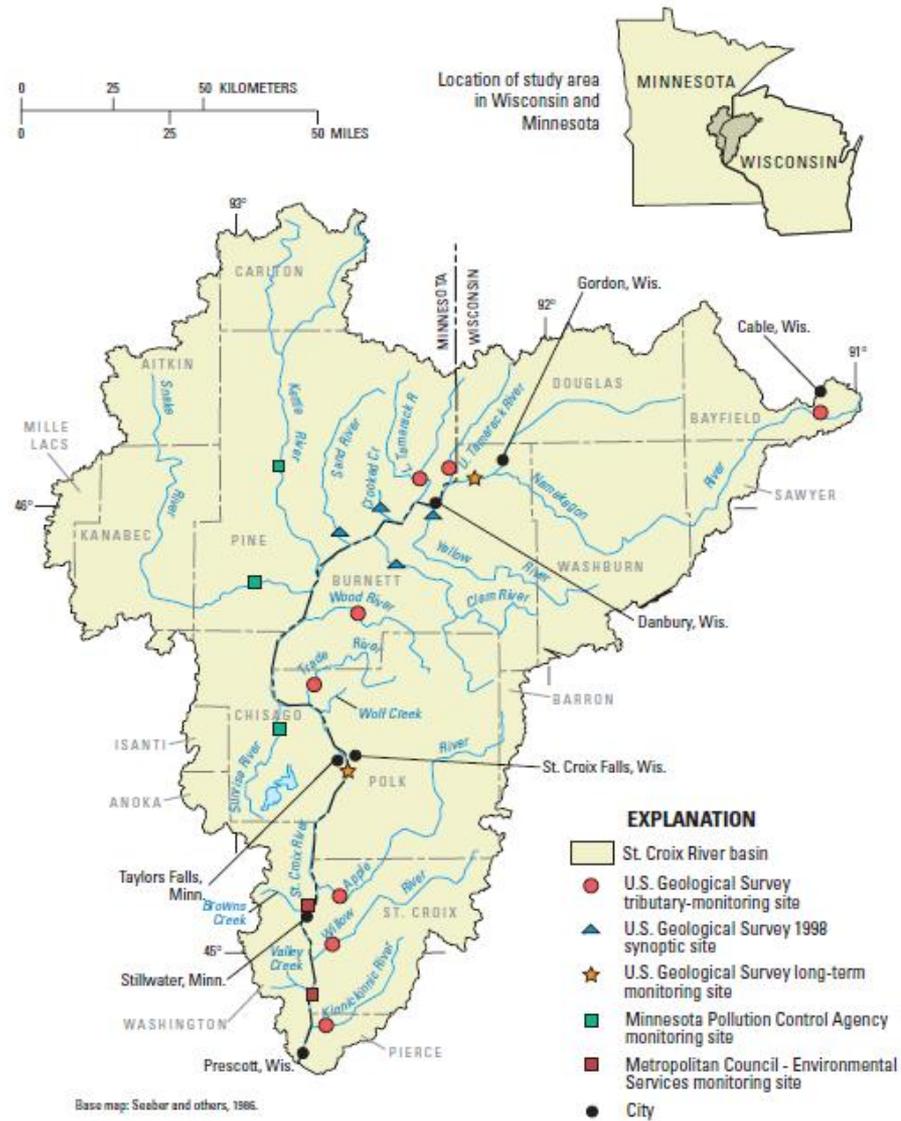
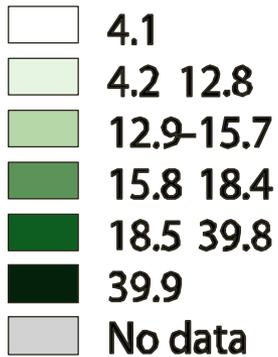


Figure 1. St. Croix River Basin, with stream sites sampled during 1997–99 identified.

Phosphorus

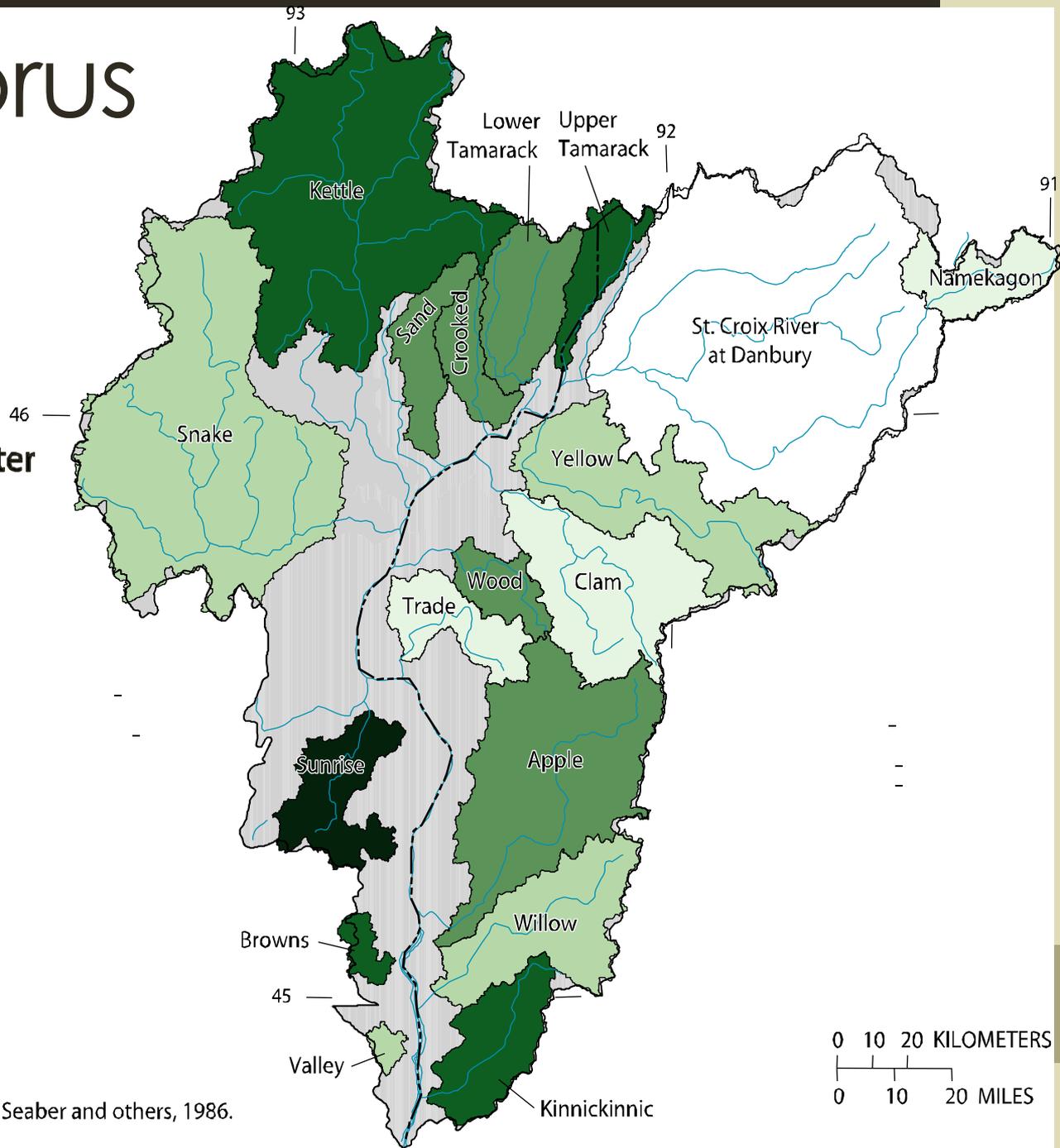
EXPLANATION

Phosphorus yield,
in kilograms per square kilometer
per year



Basin
Nutrient
Loading
(kg P/ha/yr, 1999)

Base map: Seaber and others, 1986.



ST CROIX P LOAD

1990s:

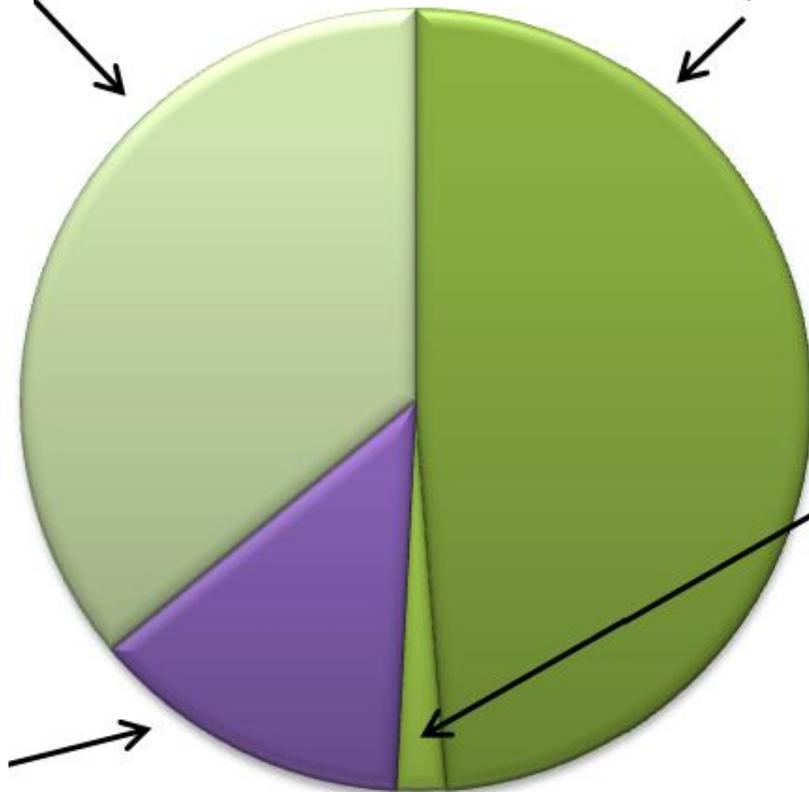
**460 metric
tons/year total**

**Natural
Background
166**

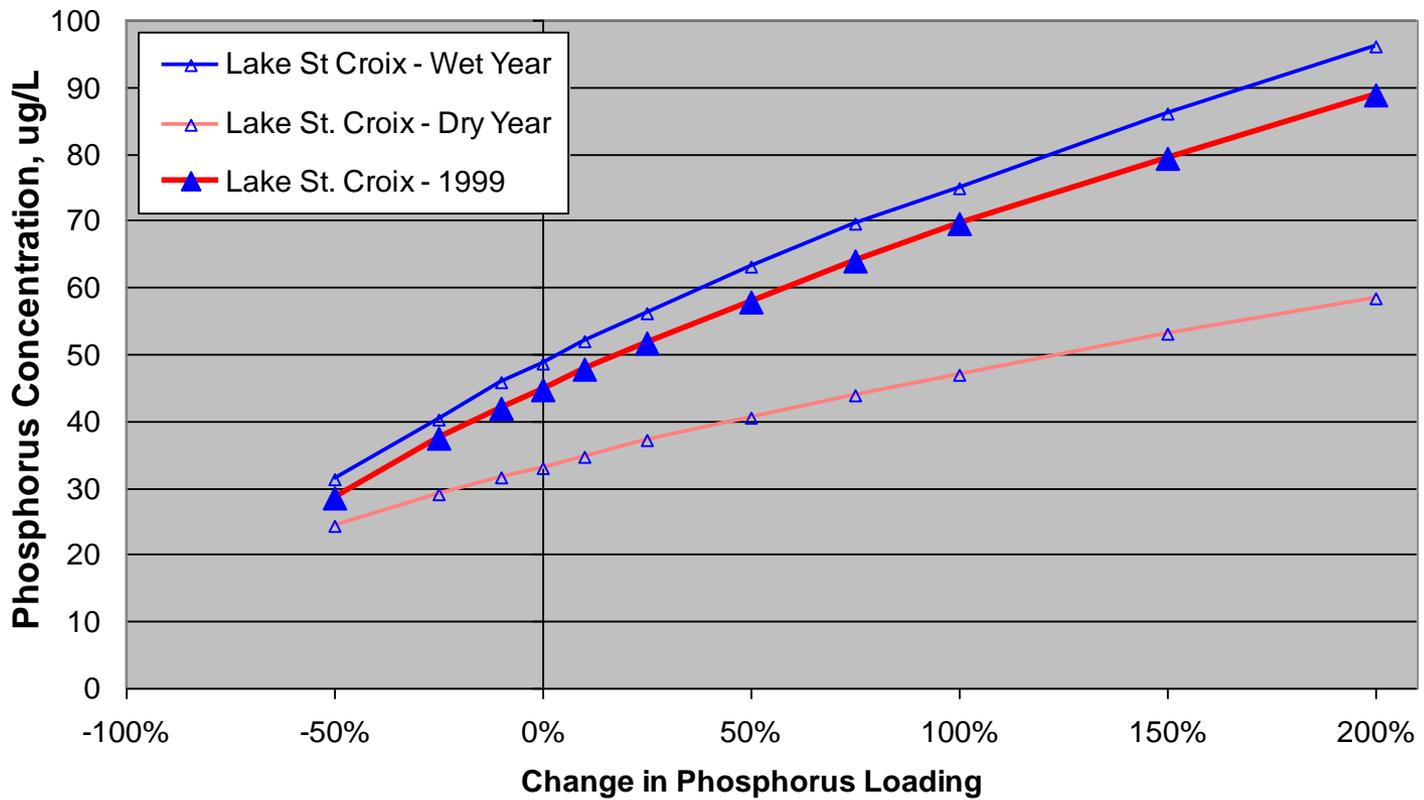
**Nonpoint
Sources
224**

**Point
Sources
61**

**Internal
Lake
Loading &
Other
Sources
9**



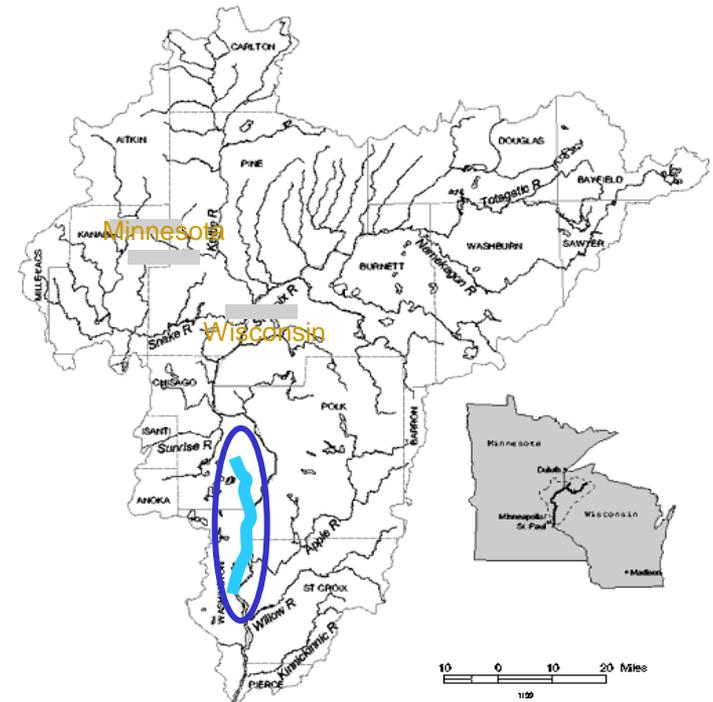
LAKE ST. CROIX RESPONSE TO NUTRIENT LOADING



Lake St. Croix in Goal Setting

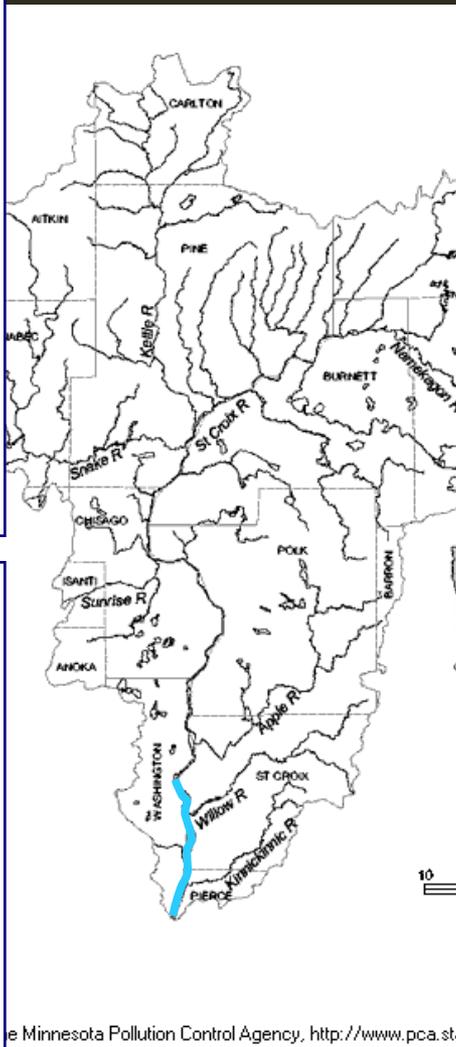
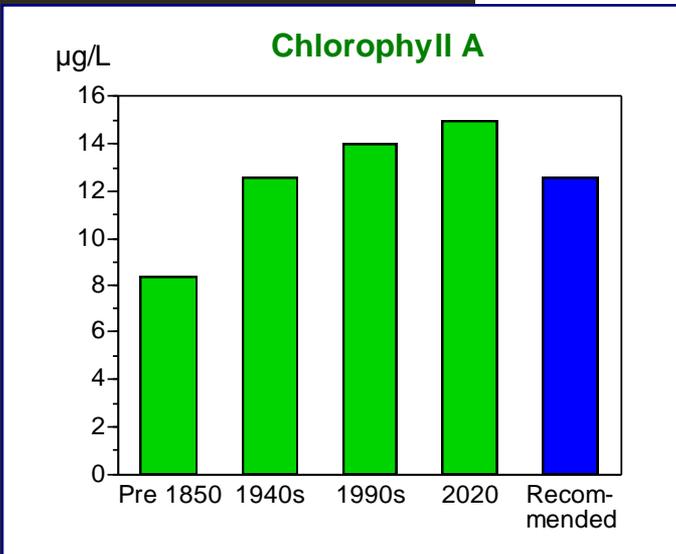
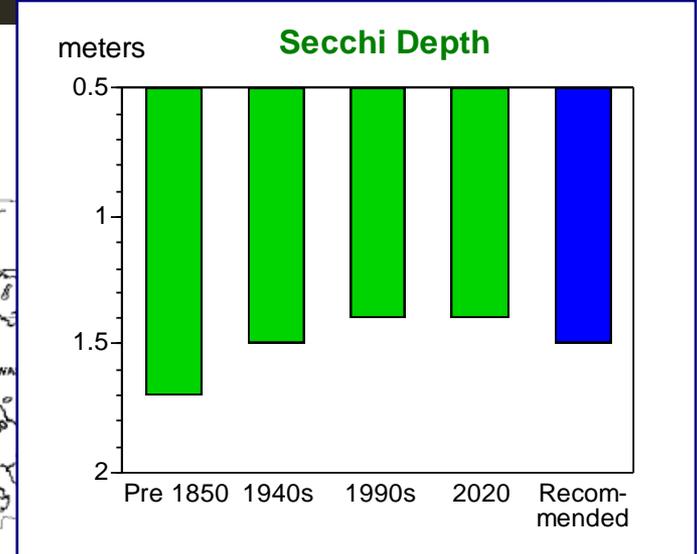
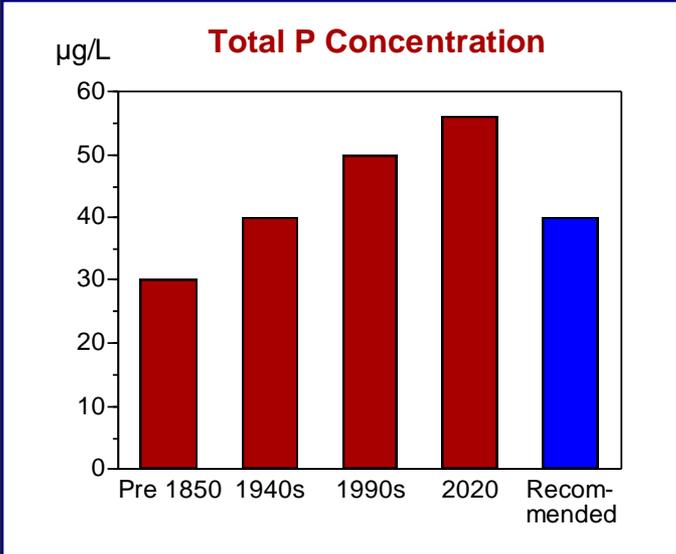
- **Water Quality Integrator**
 - The sum total of all activities in the basin affecting water quality
- **Water Quality Barometer**
 - Measures how the basin has changed over time

Figure 1 St. Croix River Basin

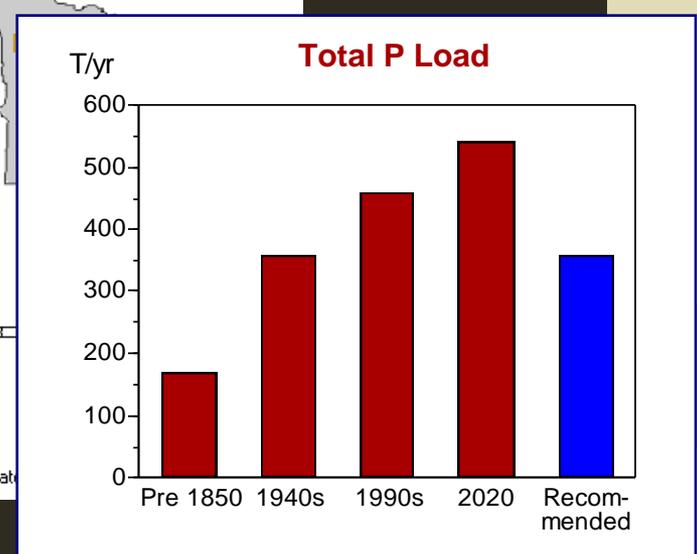


St. Croix Goal

20% Phosphorus Reduction



© Minnesota Pollution Control Agency, <http://www.pca.state.mn.us>



St. Croix Conference 2006



Nutrient Agreement Objectives

- 1. Jointly evaluate and establish phosphorus water quality standards by the end of 2009.**
- 2. Nutrient point and nonpoint loading study and implementation plan - June 30, 2009.**
- 3. Improve & coordinate WQ monitoring & assessment capabilities to track progress towards 20% reduction goal.**
- 4. Continued support and funding for St. Croix Basin Water Resources Planning Team.**

To be successfully implemented, a goal must be:



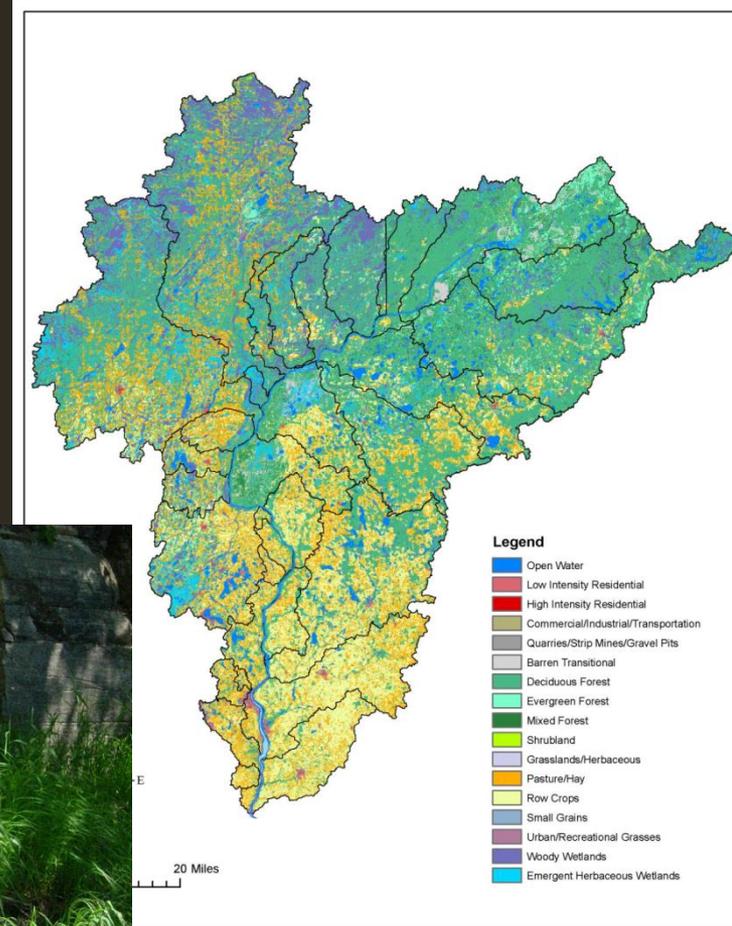
- **Inspirational**
- **Believable**
- **Actionable**

Sheryl Corrigan, MPCA Commissioner, April 2006

Inspirational



BELIEVEABLE ABSOLUTELY



ACTIONABLE ABSOLUTELY

POTW'S REDUCED
P DISCHARGE BY
54% SINCE 1990'S



Clear Lake POTW



Osceola POTW Operators





LAKE ST. CROIX NUTRIENT TOTAL MAXIMUM DAILY LOAD

May 2012

Prepared in Partnership
by
Minnesota Pollution Control Agency
Wisconsin Department of Natural Resources

With
St. Croix Basin Water Resources Planning Team
Science Museum of Minnesota, St. Croix Watershed Research Station
Barr Engineering Company

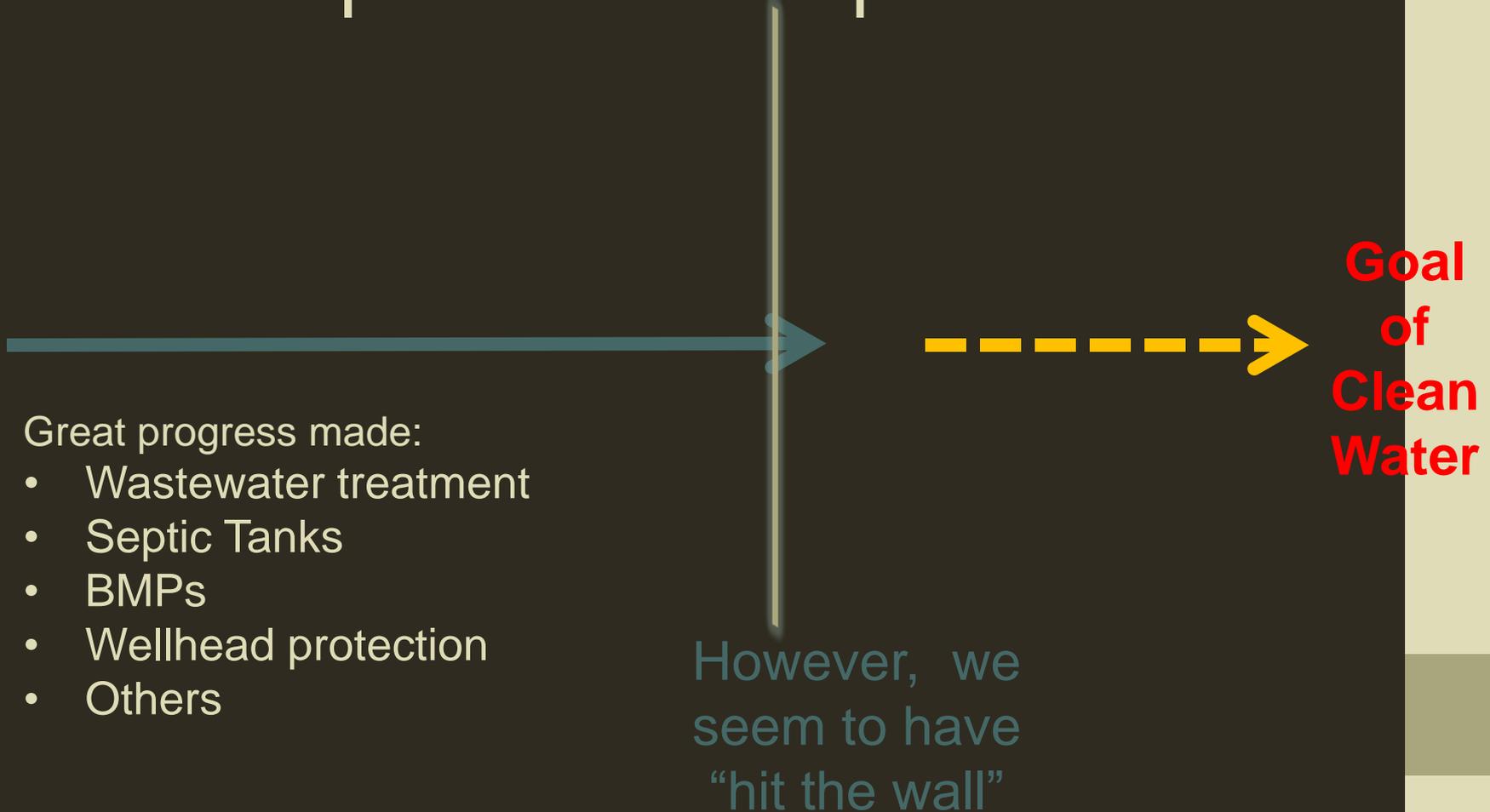
Loading Reductions Needed

Sources	1990s Loading	TMDL Goal
Background	165.6	165.6
Internal/Atmospheric	7.5	7.5
Point source	61.9	40.3
Non-point source	224.3	123.5
Reserve capacity	0	4.4
Tribal Loading	0.7	0.7
Margin of Safety	0	4.4
TOTAL	460	360

Agricultural P Loading Reductions

County	Agricultural Land Area (ac)	County-wide Phosphorus Load			Areal Reduction on Ag Land Only (lb/ac-yr)
		Existing (lb/yr)	TMDL (lb/yr)	Reduction (lb/yr)	
<i>Minnesota Agricultural Counties</i>					
Chisago	73,824	68,254	46,012	22,242	0.30
Pine	59,326	117,325	94,305	23,020	0.39
<i>Wisconsin Agricultural Counties</i>					
Burnett	76,444	87,997	67,294	20,702	0.27
Pierce	20,641	14,627	9,248	5,380	0.26
Polk	195,013	161,030	108,557	52,473	0.27
St. Croix	197,410	132,727	83,367	49,361	0.25

Why is civic engagement an important topic?



St. Croix Civic Engagement Speaker Series

- Purpose: To explore & discuss new ideas for encouraging authentic civic engagement in watershed projects in the St. Croix Basin.
- To increase the collective understanding of civic engagement and how it can be encouraged and supported with the St. Croix River Basin.
- Civic ENGAGEMENT – Setting the Stage: Why it matters

Sept. 2011- Jan 2012

Who's responsible today?

- Perception that clean water is government's responsibility
- Reinforced by what we've set up – minimal role for citizens
- No one satisfied with citizen participation processes
- Government will never have enough staff or resources to “fix” the problem

New Model of Water Governance

- People who live and work in a watershed are in the best position to reduce nonpoint source pollution
- Must engage the public as problem-solvers

Bridging the Divide: Envisioning a Better Future Through Dialogue and Understanding

Innovations in Engaging the Public

- **Performance Base Management.**
- **Patrick Moore, Clean Up Our River Environment, Montevideo, MN**
- **Warren Formo, Agricultural Coalition for Water Resources (Formerly MN Corn Growers Association) November 17, 2011**

Performance Based Management Projects for Agriculture

Watershed Councils

Residents work together as a watershed community on environmental goals.



- Non-profit status
- Regular meetings
- Establish water monitoring
- Use outside information and gather local data
- Develop incentive structure
- 12/5/12

Farmer-Led



- Residents come together as a watershed community
- Leadership development
- Linking field management to water quality

www.watershed.org



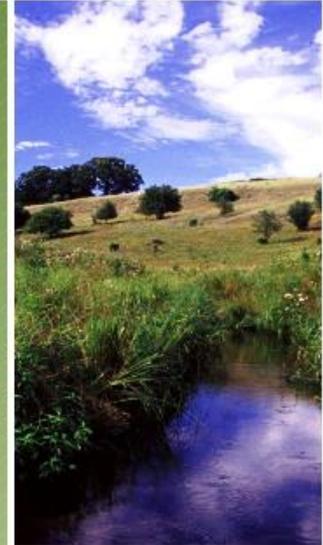
Farmer-Led Council Pilot Project

- Goal – accelerate restoration of water quality by engaging citizens in the process
- Establishment of Farmer-Led Council
- **Establishment of Citizen Advisory Panel**

Landscape-Targeted

Pecatonica River Wisconsin Buffer Initiative (WBI) Pilot Project

*“12% of the land contributed 60%
of the phosphorus load ”*



www.nelson.wisc.edu/people/nowak/wbi
www.dae.wisc.edu/news/PDF/Pecatonica_project.pdf



Photo credits: (Top) Gerald H. Emmerich, Jr.; (Bottom) Timothy Lindenbaum/TNC; Flickr Creative Commons; (Left) Dane County LWRD

Implementation Plan for the Lake St. Croix Nutrient Total Maximum Daily Load

Prepared for:
The Minnesota Pollution Control Agency
in cooperation with
The Wisconsin Department of Natural Resources
and
The St. Croix Basin Water Resources Planning Team

Original October 2012, Revised February 2013



An aerial photograph of a lush green landscape. In the center, there is a small, irregularly shaped pond with light blue water. The surrounding area is covered in vibrant green grass and numerous small yellow wildflowers scattered throughout. The overall scene is bright and natural.

Farmer-Led, Landscape-Targeted, Performance-Based, Water Quality Projects

*To achieve the water quality goals
Red Cedar & St. Croix River Watersheds*

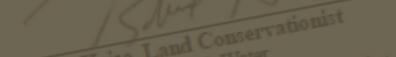
Pilot Projects

- Sponsor: Wisconsin Farmers Union
- UW-RF: coordinator office/support
- McKnight Funding: \$100,000
- DNR funds to UWEX for coordinator: \$300,000
- LCDs (4) 50% FTE: \$167,800
- Kinnickinnic River Land Trust: \$35,000
- Total budget: \$602,800/two years

PARTNERSHIP AGREEMENT — Farmer-Led, Performance-Based Watershed Management Projects in the St. Croix and Red Cedar River Basins

We, the undersigned, have entered into a local and county led watershed management implementation project within the Red Cedar and St. Croix River (Wisconsin portion) Basins. This partnership is being formed by the University of Wisconsin-River Falls, Pierce and Polk counties, the Kinnickinnic River Land Trust, WI Department of Natural Resources, the Wisconsin Farmers Union in five watersheds. We further agree to our respective resources of funding, professional experience and time to implement the project. The achievements of this project will include recreational uses and ecological characteristics of one of our National Water Quality Scenic Rivers and restore the societal and environmental values of one of our most degraded water resources.

PARTNERS


Robert Heise, Land Conservationist
St. Croix County Land & Water Conservation Department

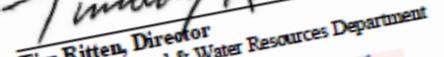

Tom Quinn, Executive Director
Wisconsin Farmers Union


Daniel Prestebak, County Conservationist
Department of Natural Resources

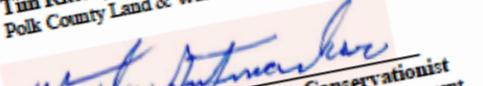

David Fodorci, Executive Director
Kinnickinnic River Land Trust

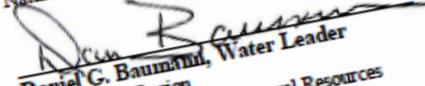

Tim Webb, Director
Department of Natural Resources


Ken, Director
Department of Natural Resources


Tim Ritten, Director
Polk County Land & Water Resources Department


Ken, Director
Department of Natural Resources


Tyler Gruetzmacher, County Conservationist
Perron County Soil & Water Conservation Department

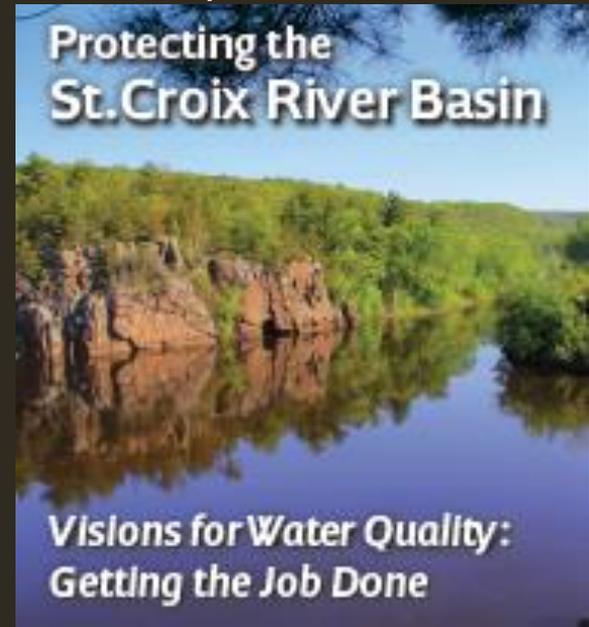

Daniel G. Baumgard, Water Leader
West Central Region
Wisconsin Department of Natural Resources

St. Croix Approach to Civic Engagement

- New approach to water governance
- Tap our collective capacity
- Develop basin team civic engagement vision
- Use civic engagement in Education & Outreach
- What can we do working together

- **St. Croix Basin Conference**
- **14th Annual St. Croix Basin Conference**
- **Protecting the St. Croix River Basin**
Visions for Water Quality: Getting the Job Done
- **Monday, April 8, 2013**
University of Wisconsin River Falls – University Center,
River Falls, WI

<http://stcroixriverassociation.org/>





Protecting the St. Croix