

Wisconsin River Basin Water Quality Improvement Project

2014 Government Affairs Seminar
February 27, 2014

Ann Hirekatur, Wisconsin River TMDL Project Manager



Photo by Jean Unmuth

Wisconsin River Basin Water Quality Improvement Project

- ❖ Part I. Project Overview
- ❖ Part II. TMDL Development Process
- ❖ Part III. Status and Results
- ❖ Part IV. Where to find more information

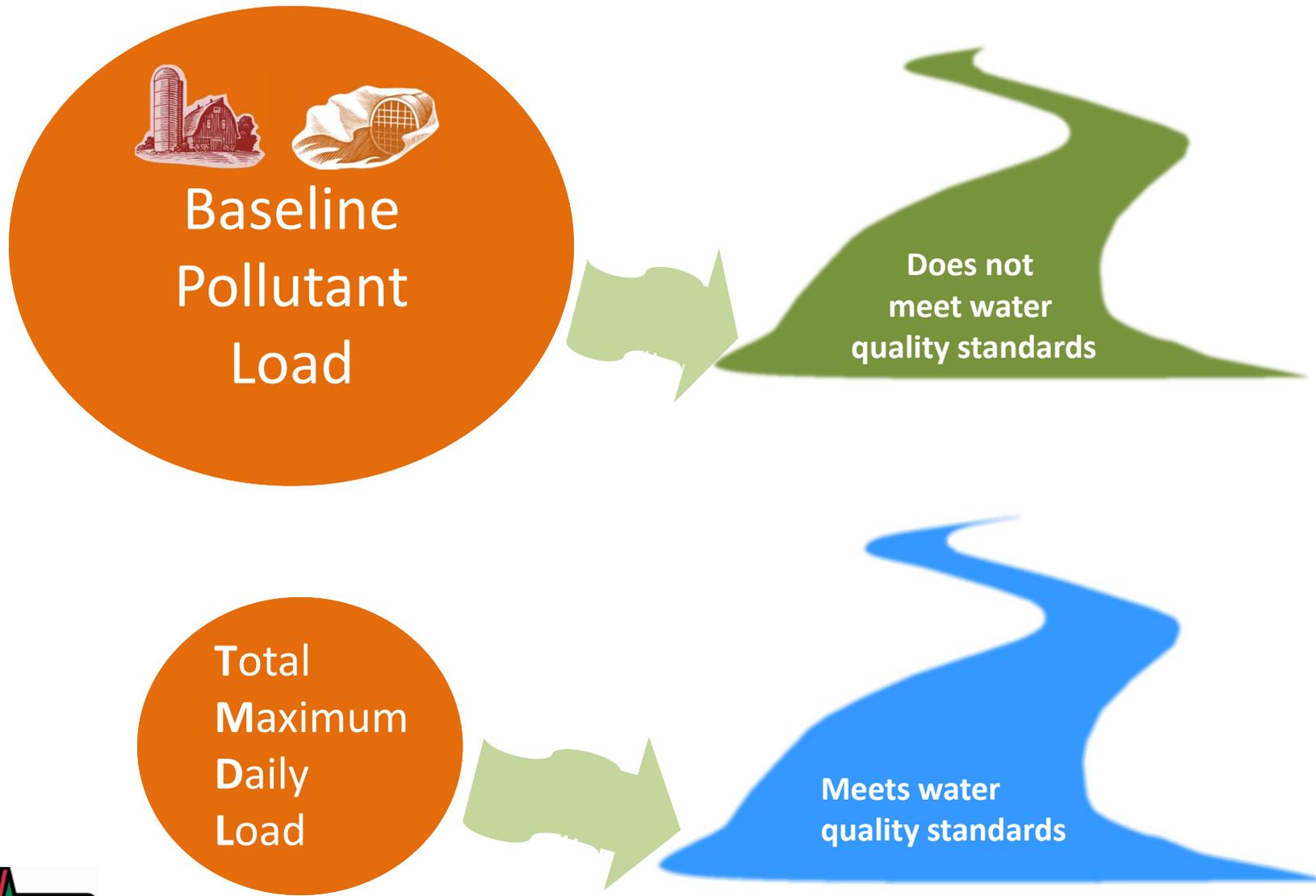
Wisconsin River Basin Water Quality Improvement Project

Part I

PROJECT OVERVIEW



Why develop a TMDL?



Developing a TMDL

Baseline
Pollutant
Load

?
TMDL
Load

What is the magnitude of the
Total Maximum Daily Load ?



Developing a TMDL

Baseline
Pollutant
Load

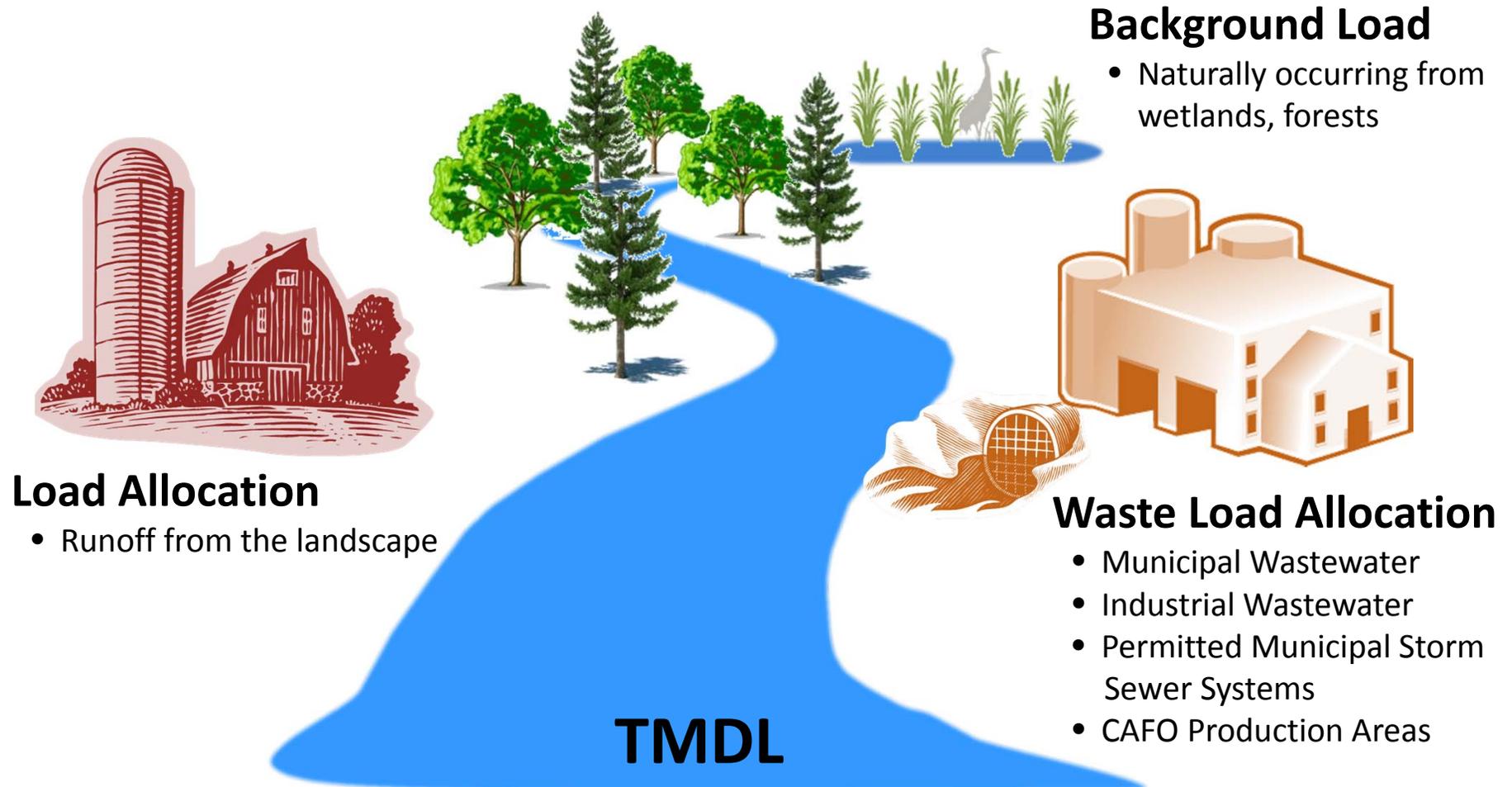


How will the load be
apportioned among sources?



WRB Total Maximum Daily Load (TMDL)

Each subwatershed is assessed for:



Load Allocation

+

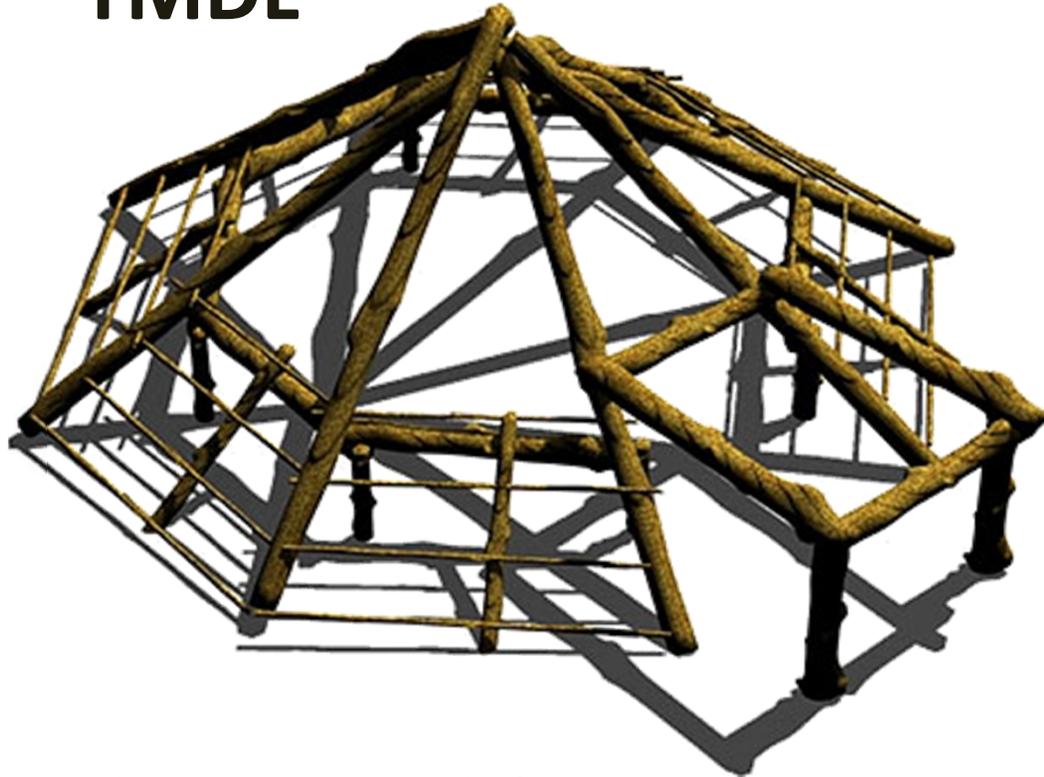
Waste Load Allocation

+

Margin of Safety

Total Maximum Daily Load (TMDL) = Framework for Water Quality Improvement

TMDL



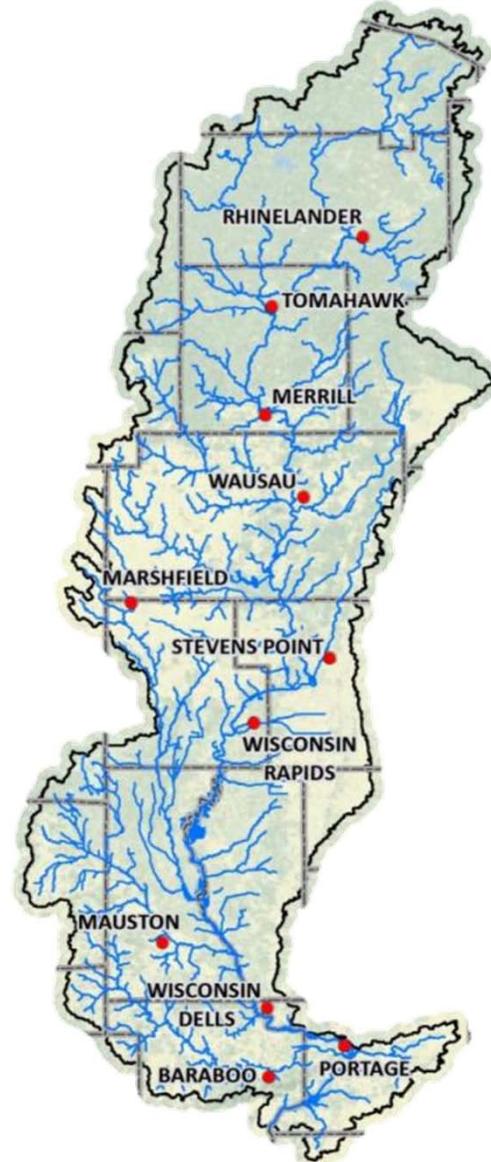
The **Framework** for Wisconsin River Basin Water Quality Improvement Project



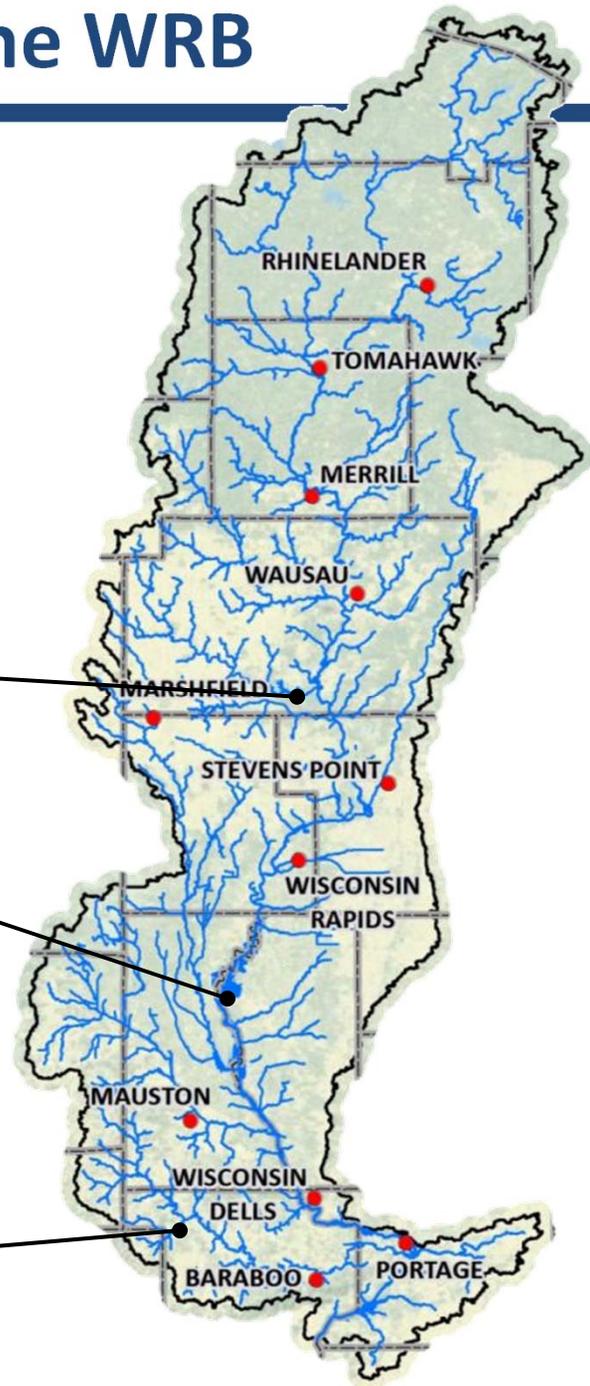
A TMDL answers the following questions:

- How much is the existing pollutant load? What is the contribution from each source?
- How much does pollution need to be reduced in order for waterways to achieve water quality standards?
- How will the pollutant load reductions be achieved?

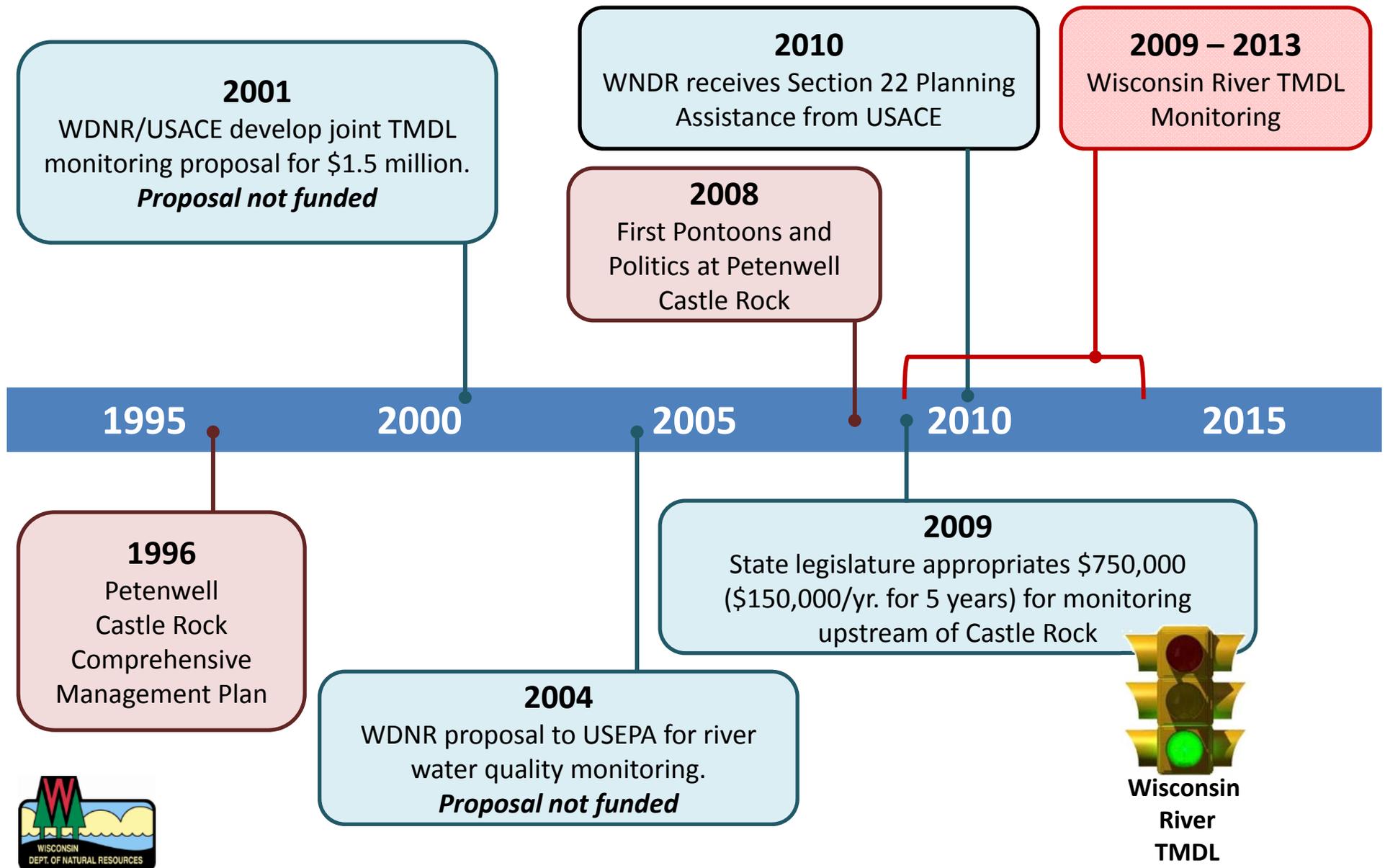
The Wisconsin River Basin (WRB) Water Quality Improvement Project



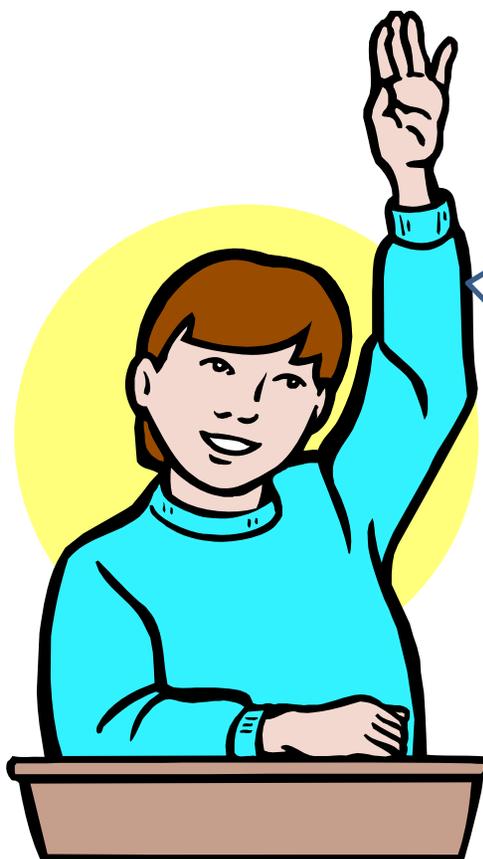
Water Quality Concerns within the WRB



How did we get a Water Quality Project in the WRB?



A Common Question About the WR TMDL...



My facility doesn't discharge directly to the Wisconsin River, so the TMDL won't affect me....right?

WRONG.

Wisconsin has statewide nutrient criteria, therefore

- Every point source with a surface water discharge will get an allocation
 - *Regardless of whether the receiving water is impaired*
 - *Regardless of whether the discharge is to the main stem or a tributary of the Wisconsin River*
- Allocation will be protective of nutrient criteria for both ***immediate and downstream*** receiving waterway



Statewide Phosphorus Criteria



Rivers
100 µg/L



Streams¹
75 µg/L



Reservoirs

- Not Stratified = 40 µg/L
- Stratified = 30 µg/L



Inland Lakes²
Ranges from 15-30 µg/L



Great Lakes

- Lake Michigan = 7 µg/L
- Lake Superior = 5 µg/L

¹All unidirectional flowing waters not in NR 102.06(3)(a). Excludes Ephemeral Streams.
²Excludes wetlands and lakes less than 5 acres

Wisconsin River Basin Phosphorus Criteria - Central/South

Stream / River Phosphorus Criteria

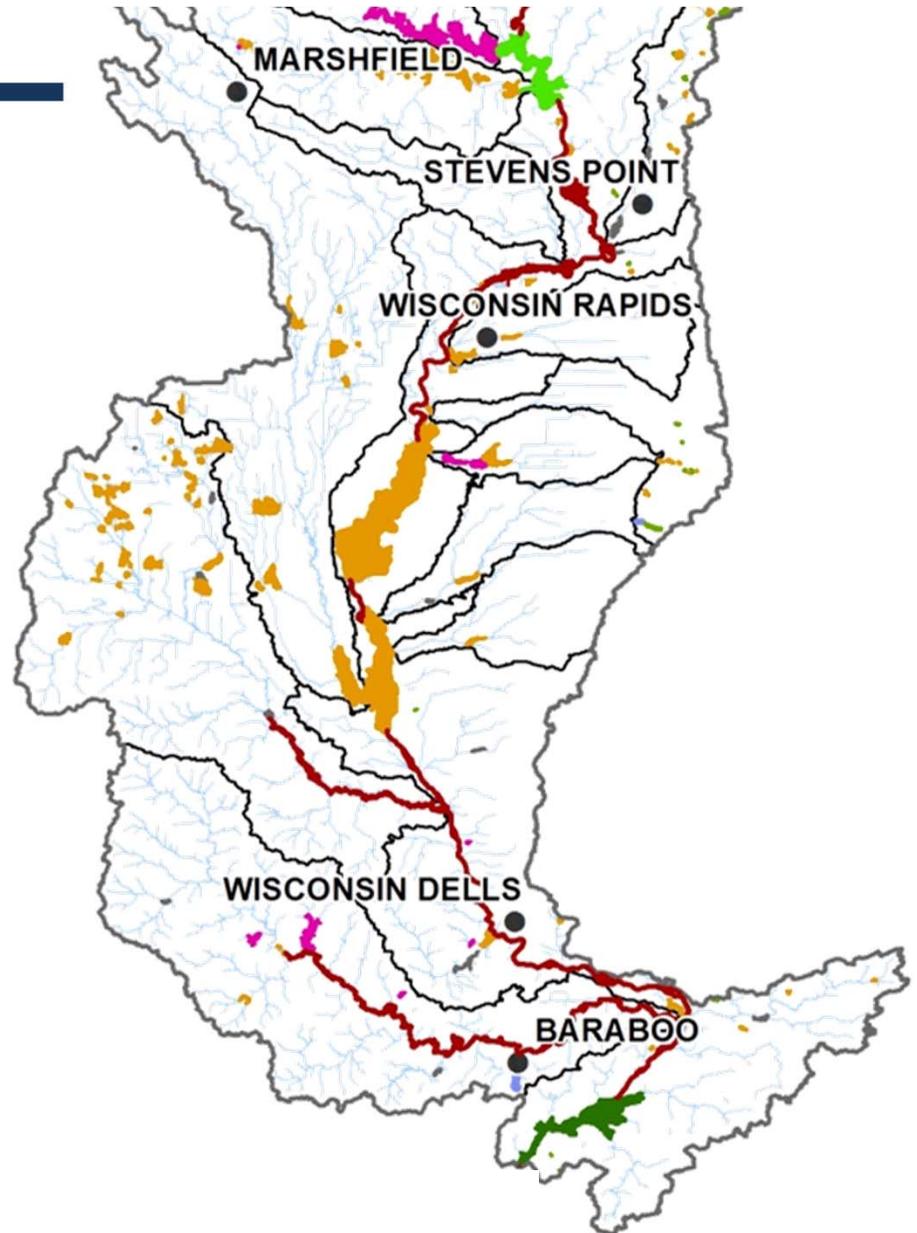
-  75 ug/L
-  100 ug/L

Reservoir Phosphorus Criteria

- | | |
|--|---|
|  Requires SSC |  40 ug/L |
|  15 ug/L |  40 ug/L or SSC (Undetermined) |
|  20 ug/L |  75 ug/L |
|  30 ug/L |  100 ug/L |

Notes:

1. Phosphorus criteria delineated using the 24K Hydro layer and the 100 ug/L river extent narrative from administrative code NR 102.06
2. Streams with a stream order of two or greater are shown. All smaller tributaries stream are assumed to have a phosphorus criteria of 75 ug/L.



Wisconsin River Basin Phosphorus Criteria - North

Stream / River Phosphorus Criteria

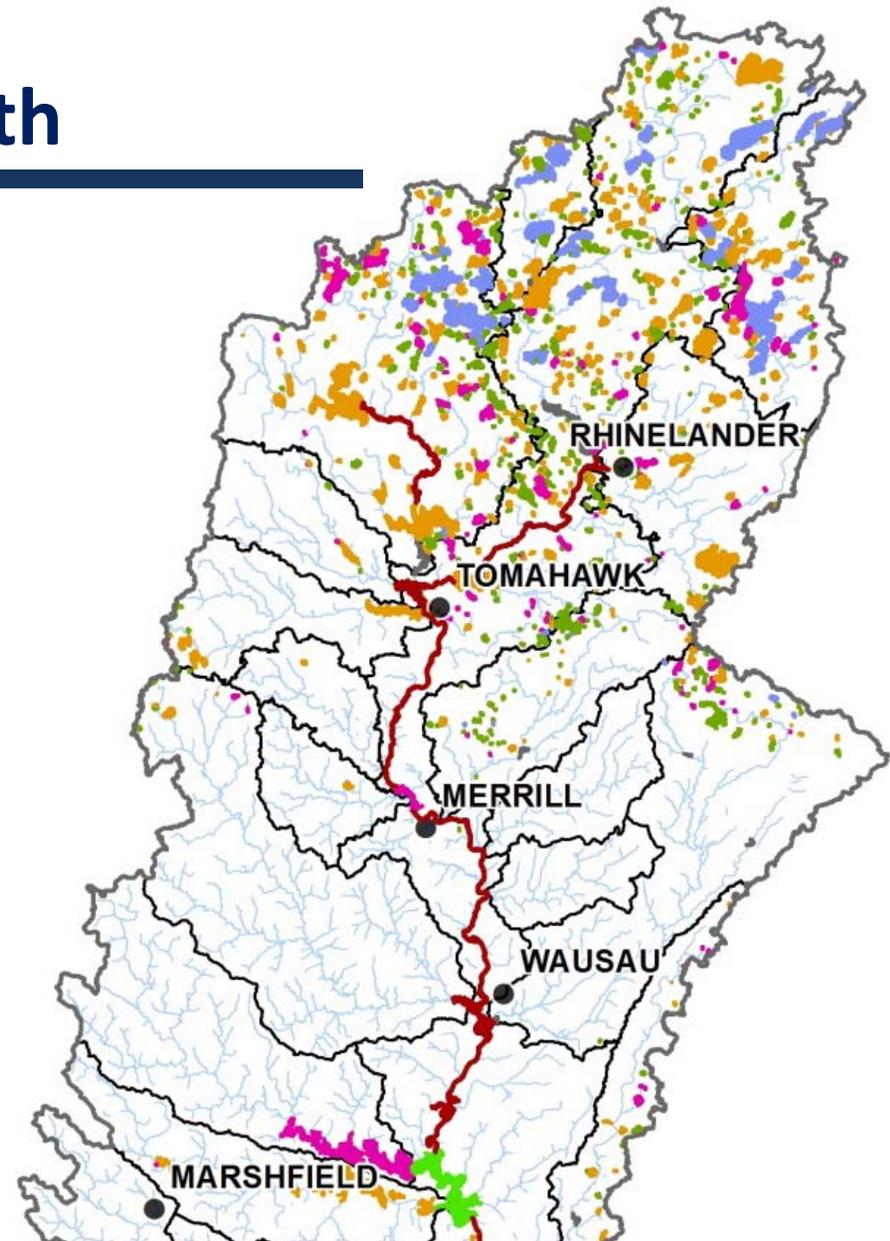
-  75 ug/L
-  100 ug/L

Reservoir Phosphorus Criteria

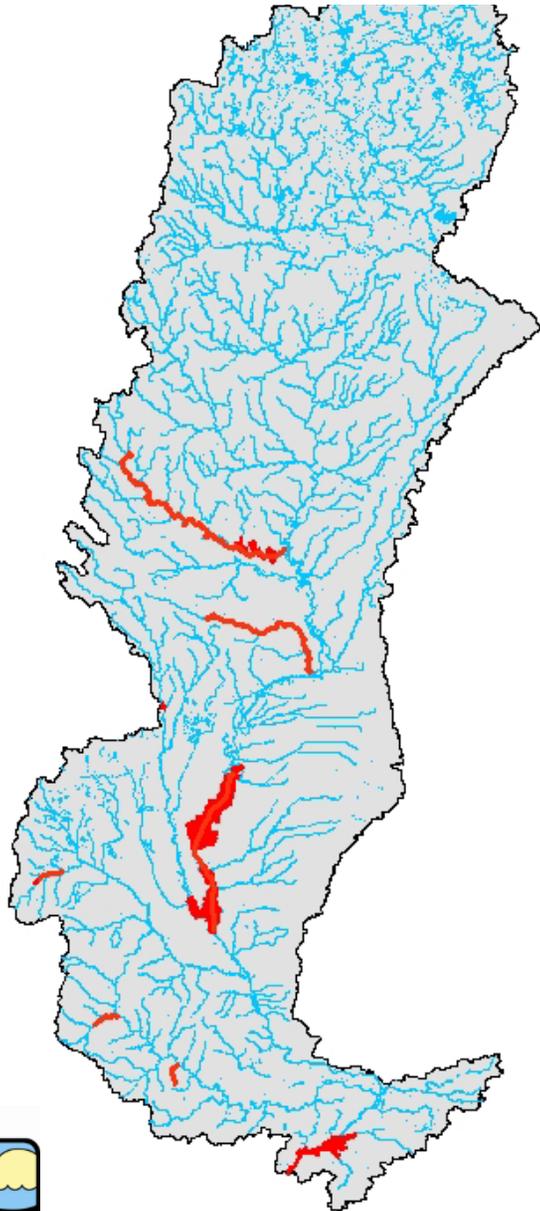
- | | |
|--|--|
|  Requires SSC |  40 ug/L |
|  15 ug/L |  40 ug/L or
SSC (Undetermined) |
|  20 ug/L |  75 ug/L |
|  30 ug/L |  100 ug/L |

Notes:

1. Phosphorus criteria delineated using the 24K Hydro layer and the 100 ug/L river extent narrative from administrative code NR 102.06
2. Streams with a stream order of two or greater are shown. All smaller tributaries stream are assumed to have a phosphorus criteria of 75 ug/L.



303(d) List of Phosphorus Impaired Waters



2010

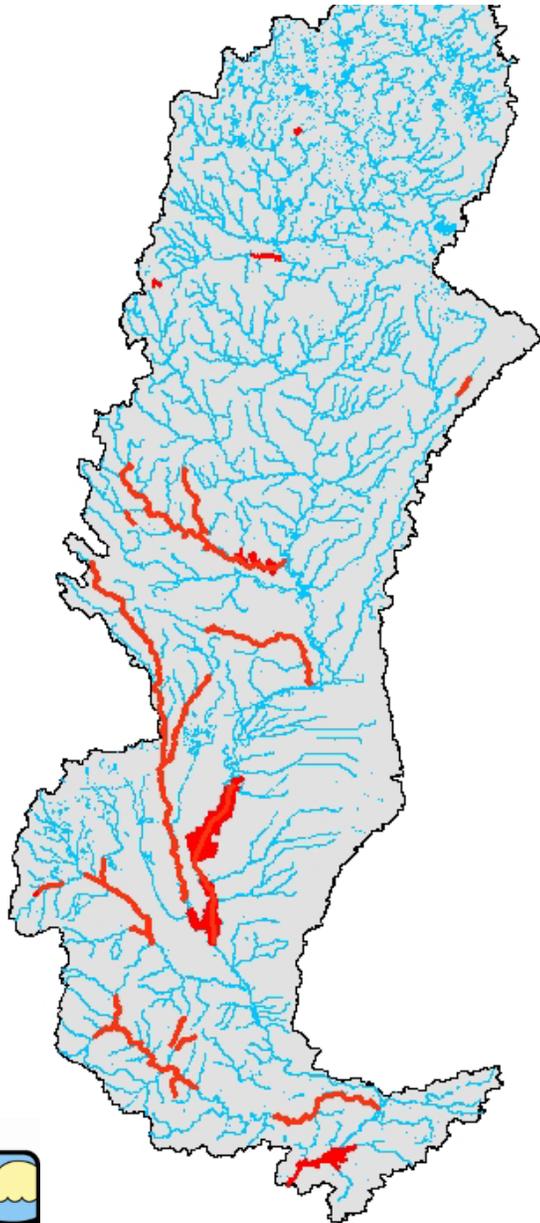
Number of Phosphorus Impaired Waters = 12

What it looked like when we started the TMDL

No numeric phosphorus criteria!



303(d) List of Phosphorus Impaired Waters



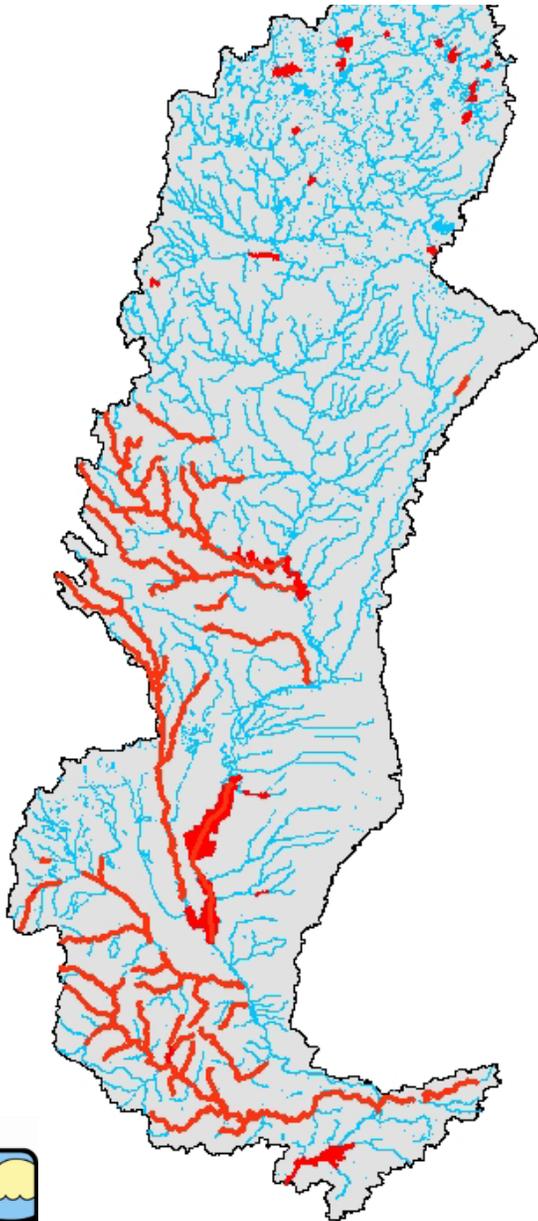
2012
Draft*

Number of Phosphorus
Impaired Waters = **28**



*Awaiting USEPA Approval

303(d) List of Phosphorus Impaired Waters



2014
Draft*

Number of Phosphorus
Impaired Waters = **85**



*Public Comment Period open until Thursday, March 6, 2014

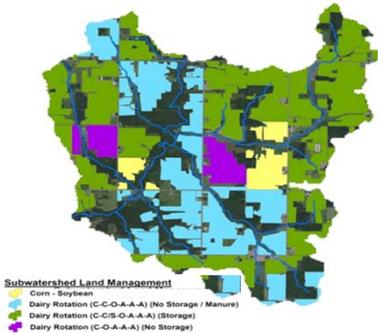
Wisconsin River Basin Water Quality Improvement Project

Part II

TMDL DEVELOPMENT



TMDL Development Overview



Baseline



TMDL



TMDL Process Overview: Monitoring



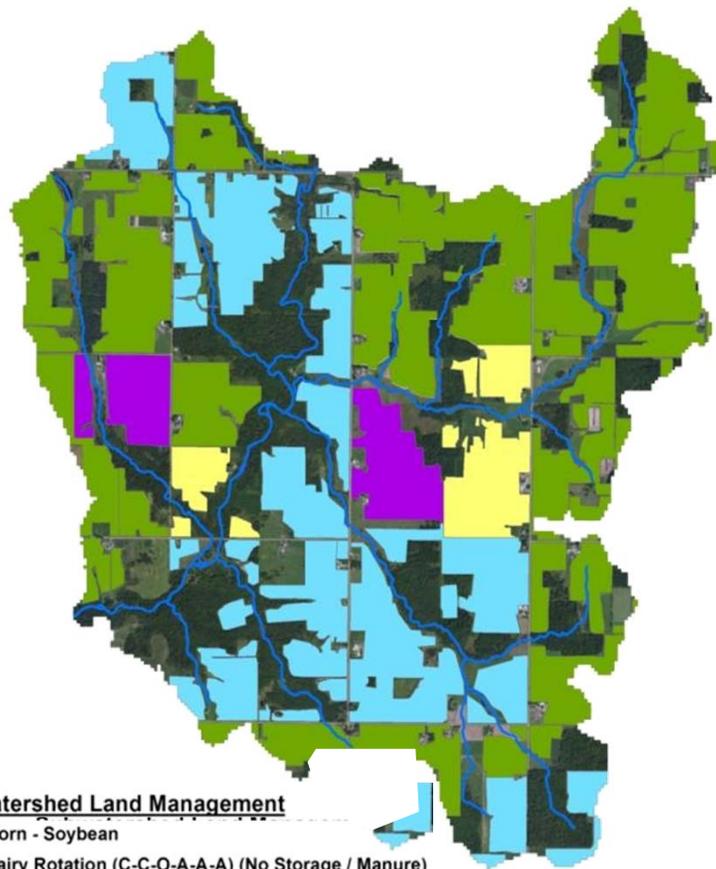
What are the measured reservoir conditions in response to loads/flows?

What are the measured flows, and pollutant concentration/loads:

- Entering from tributaries?
- On the main stem of the river?



TMDL Process Overview: Conceptualization



Subwatershed Land Management

-  Corn - Soybean
-  Dairy Rotation (C-C-O-A-A-A) (No Storage / Manure)
-  Dairy Rotation (C-C/S-O-A-A-A) (Storage)
-  Dairy Rotation (C-O-A-A-A) (No Storage)

What's going on in the watershed?

- Land use/management
- Climate
- Soils, topography, slope
- Hydrography

What's going on in the reservoir system?

- Size, shape, depth, volume
- Hydrologic budget (rain, evaporation, inflow, outflow)
- Pollutant concentration
- Chemical conditions



TMDL Process Overview: Modeling



Watershed Modeling

- What is the existing/baseline load?
- How much of the load is coming from each source? ?

Reservoir Modeling

- How does system respond to current conditions?
- What load reduction is needed to meet water quality standards?



TMDL Development – Modeling



Watershed Modeling

- What is the existing/baseline load?
- How much of the load is coming from each source?



Reservoir Modeling

- How does system respond to current conditions?
- What load reduction is needed to meet water quality standards?



TMDL Process Overview: Modeling



Watershed Modeling

- What is the existing/baseline load?
- **How much of the load is coming from each source?**



Reservoir Modeling

- How does system respond to current conditions?
- What load reduction is needed to meet water quality standards?



TMDL Process Overview: Modeling

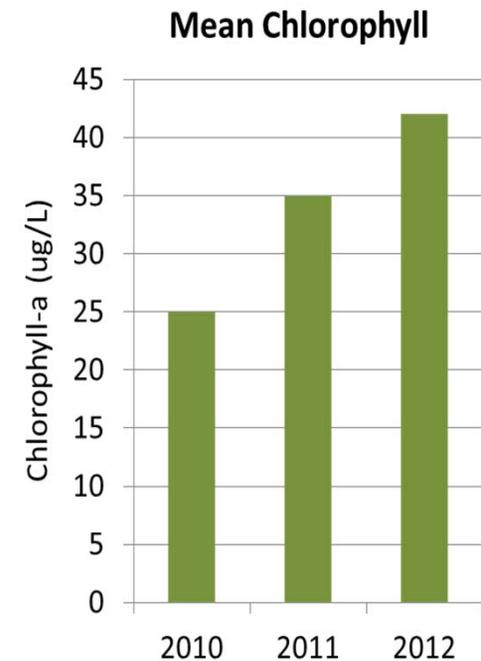


Watershed Modeling

- What is the existing/baseline load?
- How much of the load is coming from each source?

Reservoir Modeling

- **How does system respond to current conditions?**
- What load reduction is needed to meet water quality standards?



TMDL Process Overview: Modeling

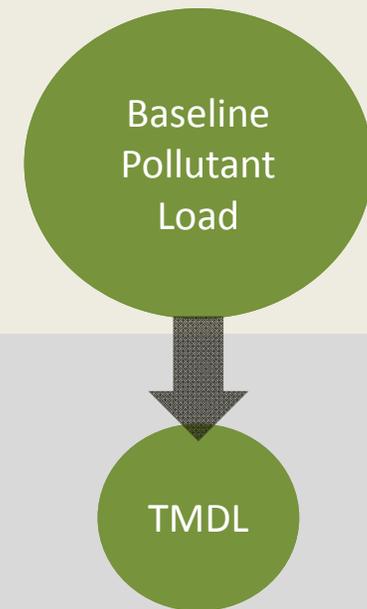


Watershed Modeling

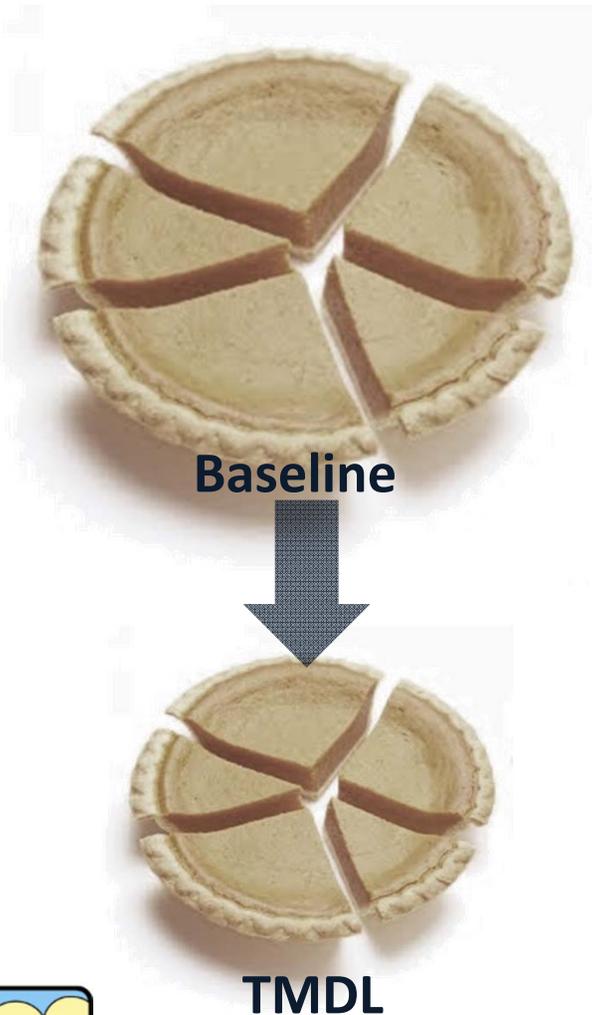
- What is the existing/baseline load?
- How much of the load is coming from each source?

Reservoir Modeling

- How does system respond to current conditions?
- **What load reduction is needed to meet water quality standards?**



TMDL Development: Allocations



Proportional Allocation Method

- Proportional allocation method is developed from **baseline conditions**
- **Baseline Conditions** reflect current regulatory requirements
- The TMDL load for each reach is divided proportionally according to each source's baseline load contribution

Baseline conditions are not based on a facilities current level of performance

TMDL Process Overview: Implementation



TMDL waste load allocations are incorporated into permit limits

- Municipal and Industrial Wastewater
- Permitted Municipal Storm Sewer Systems
- CAFO Production Areas (zero allowable discharge)



TMDL Process Overview: Implementation



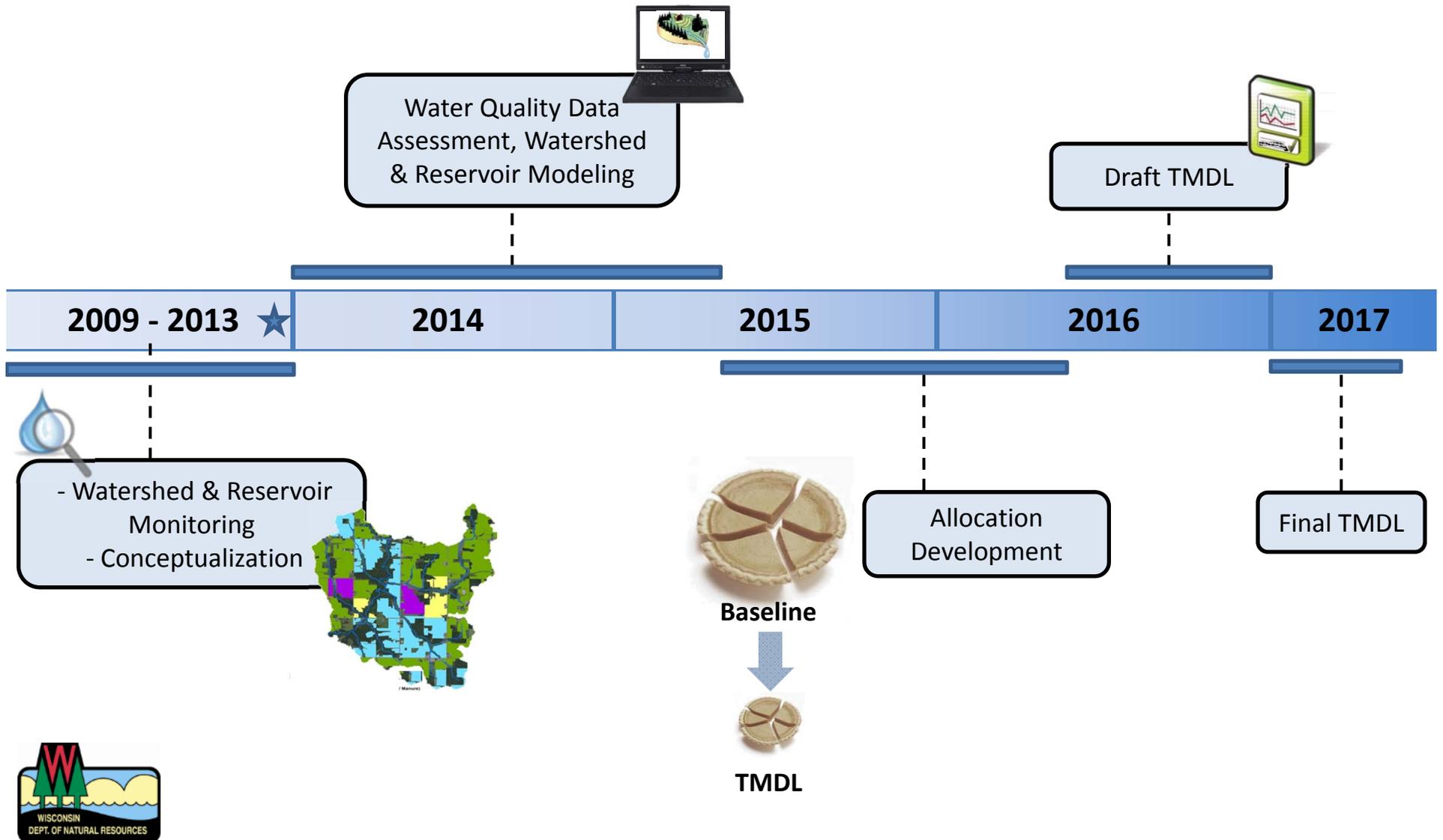
Work with county staff and other partners to implement agricultural land management practices to achieve nonpoint TMDL load reductions

- **Fair Share**- Everyone needs to do what they reasonably can
- **Targeting** – Use available resources to put extra effort towards high loading watersheds/areas



What is the Project Timeline?

Estimated TMDL Development Timeline (as of February 2014)



Wisconsin River Basin Water Quality Improvement Project

Part III

CURRENT STATUS AND RESULTS



Where are We Today?



Where are We Today?

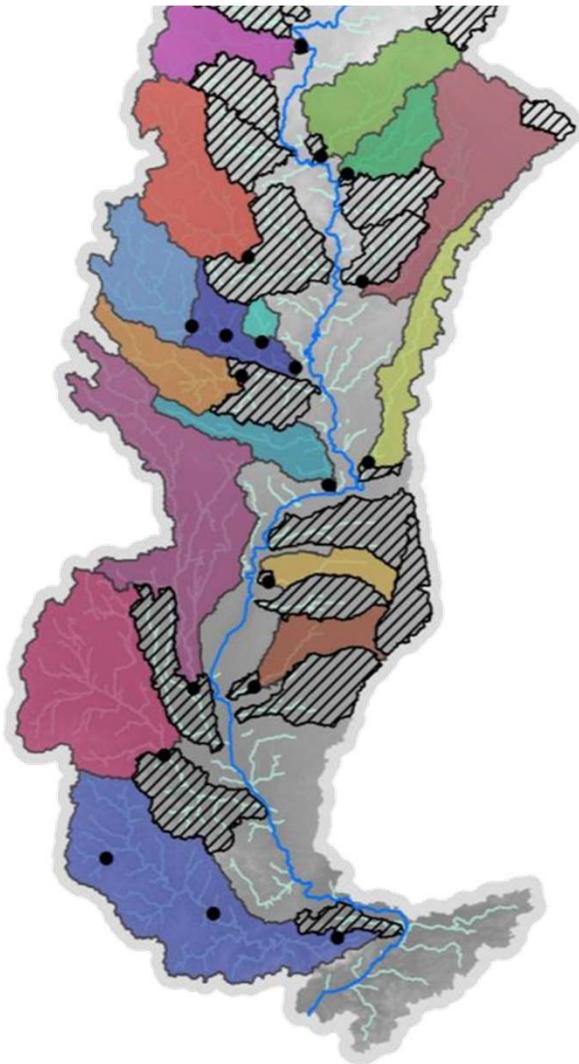


✓ Complete

➤ In Progress

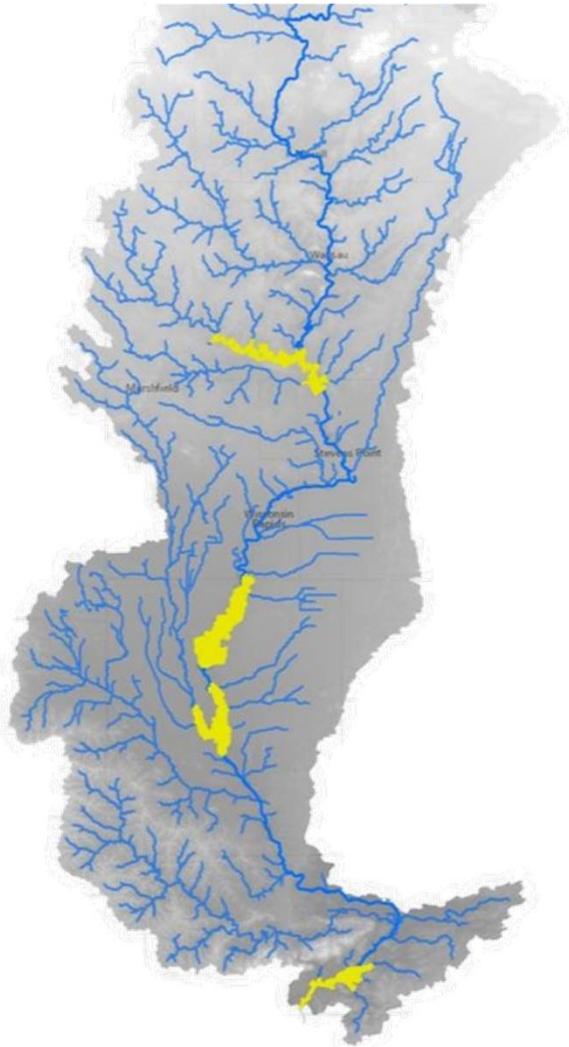


Wisconsin River TMDL Monitoring



- **Tributary Watershed Loads**
19 stations with daily discharge & bi-monthly water quality
2009-2013

Wisconsin River TMDL Monitoring



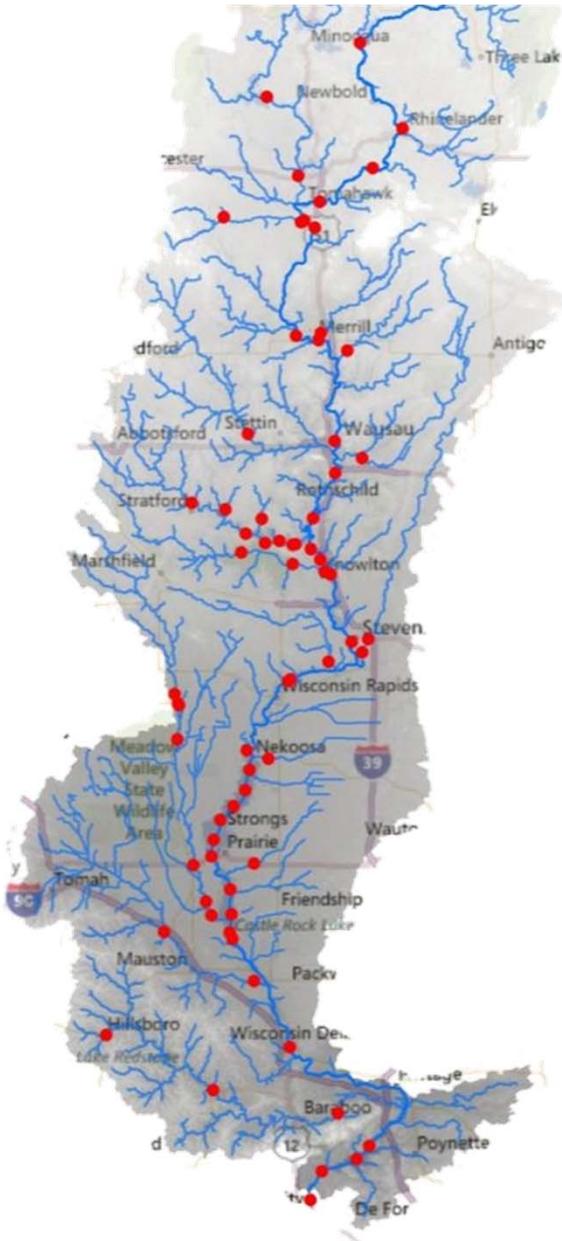
Reservoirs

5 major reservoirs

Big Eau Pleine, Lake Dubay, Petenwell,
Castle Rock , & Lake Wisconsin

2009-2013

Wisconsin River TMDL Monitoring

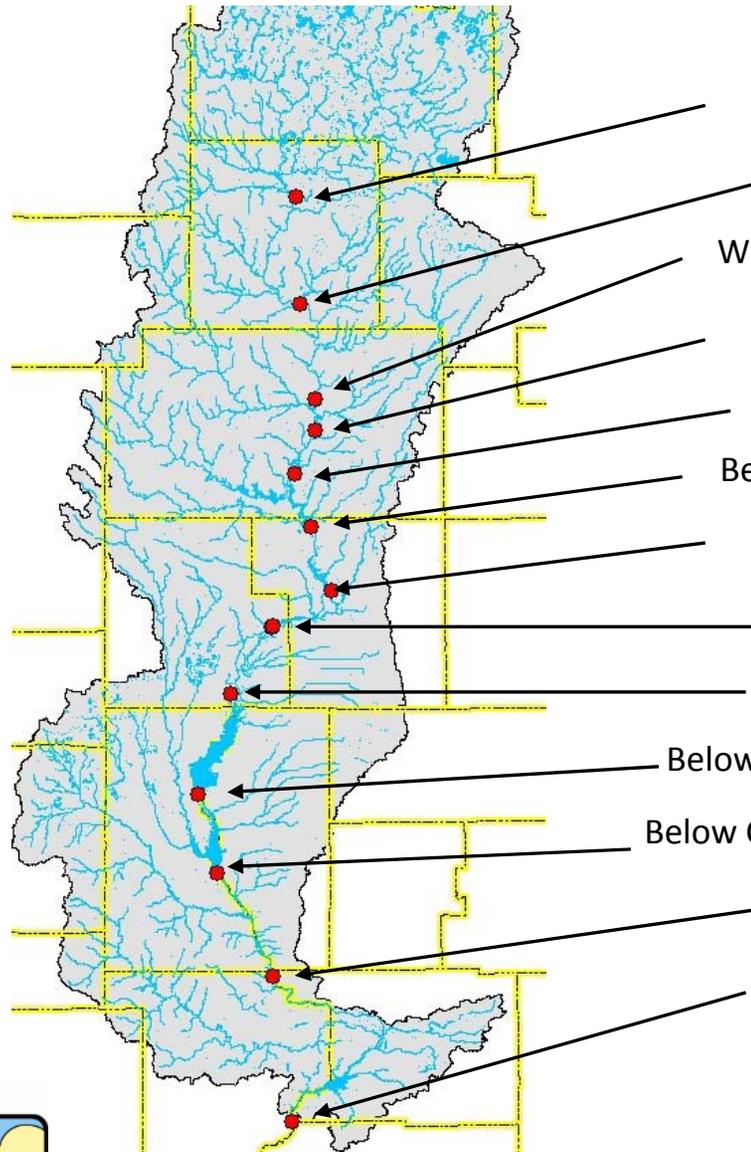


Phosphorus Evaluation Sites

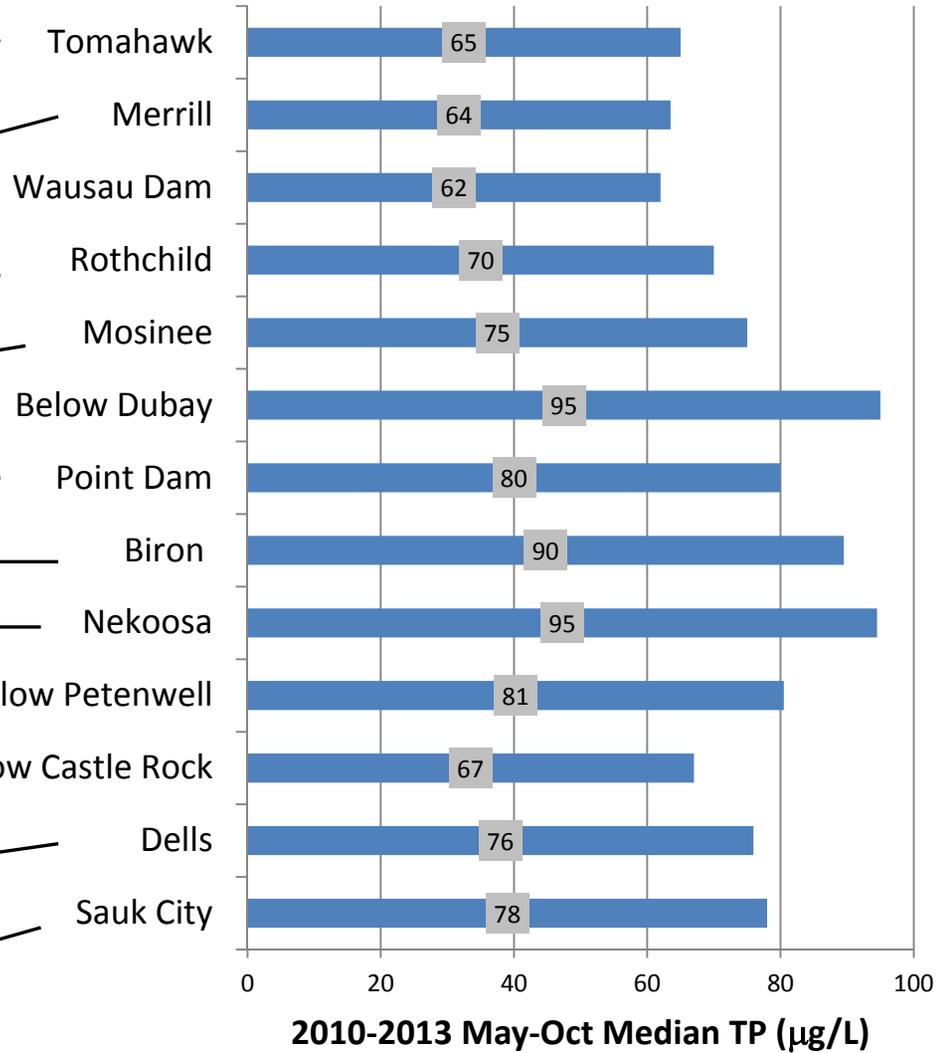
- **98** stations with monthly P samples



Main Stem Monitoring Results

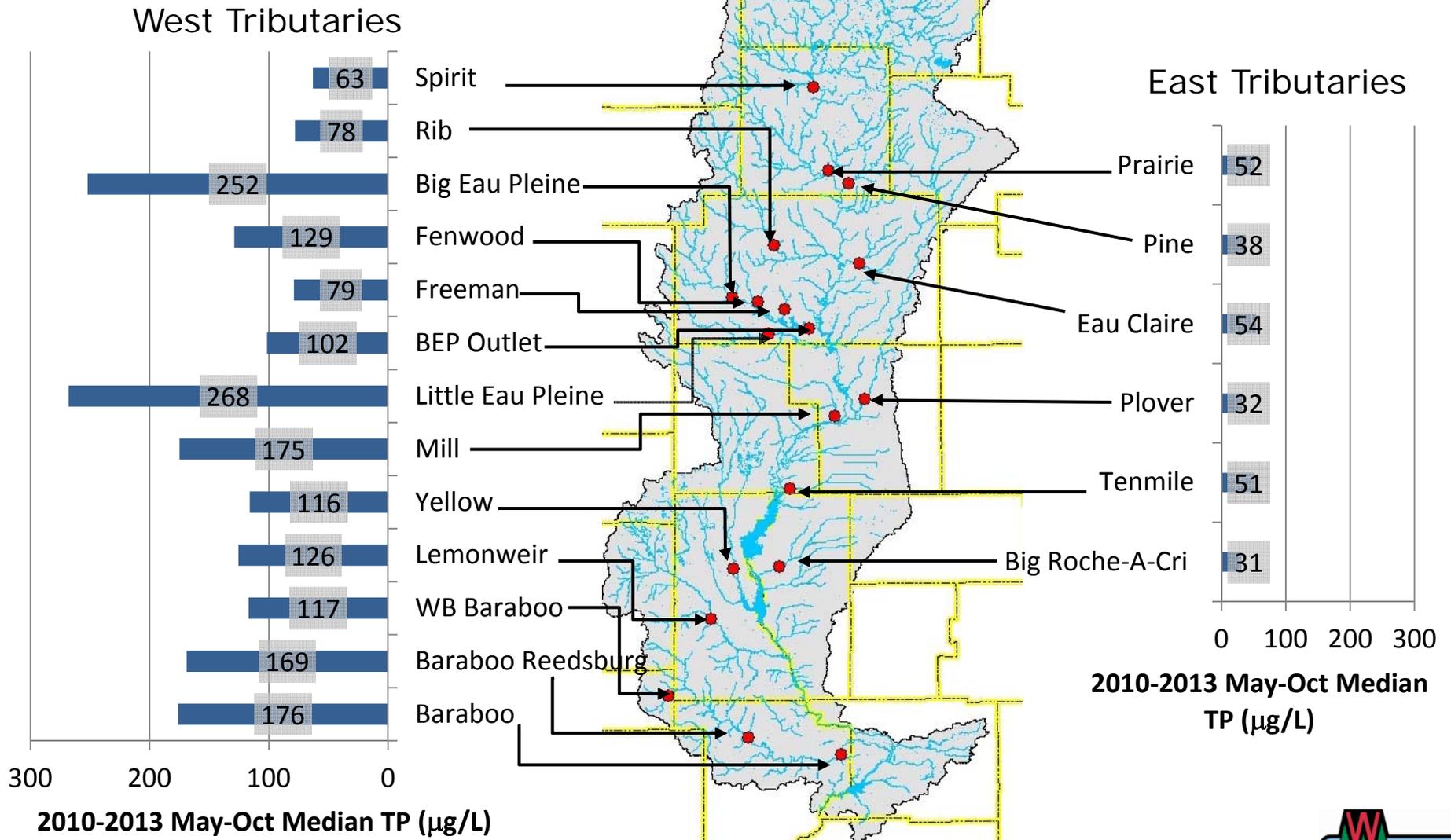


Total Phosphorus Concentration



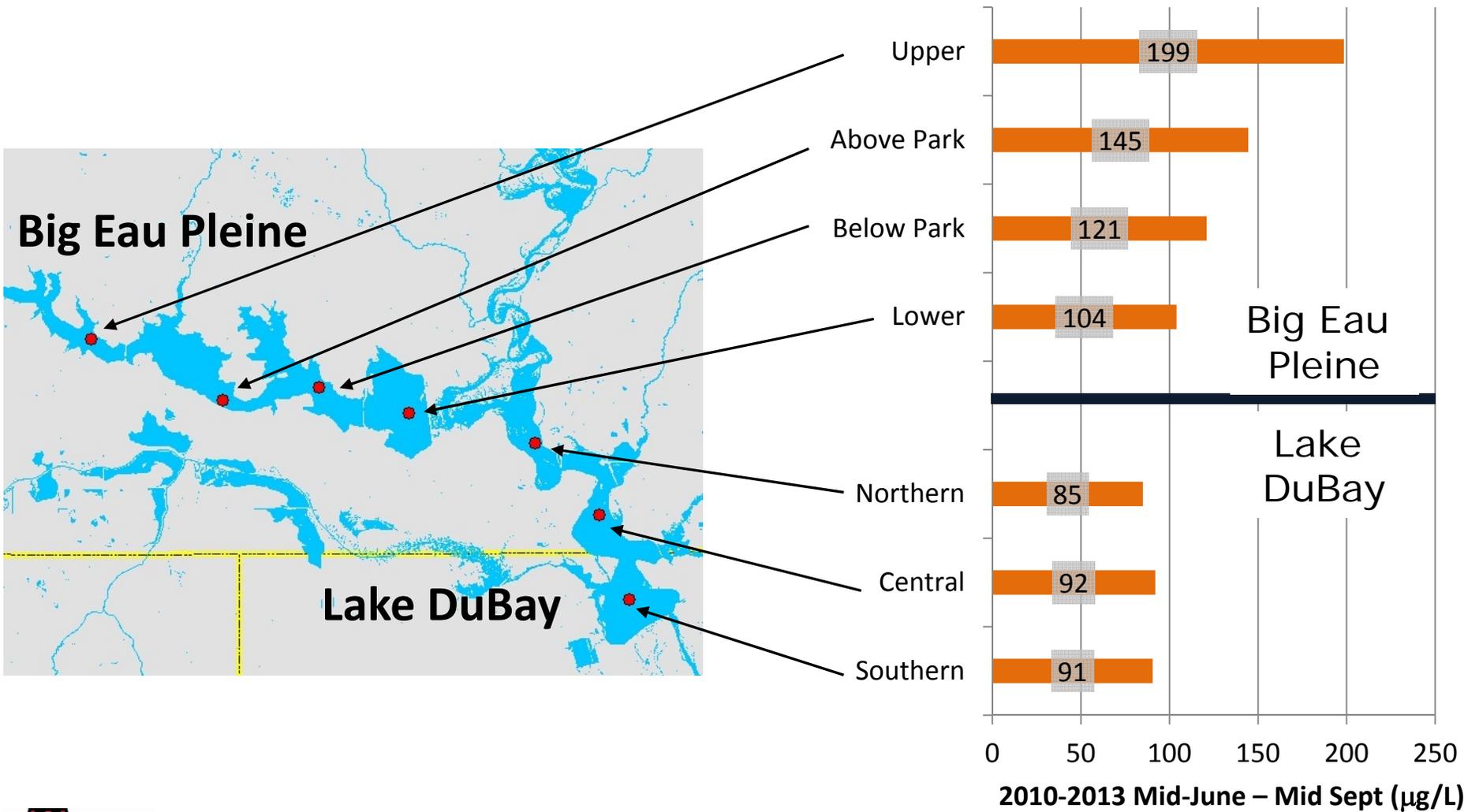
Tributary Monitoring Results

Total Phosphorus Concentration

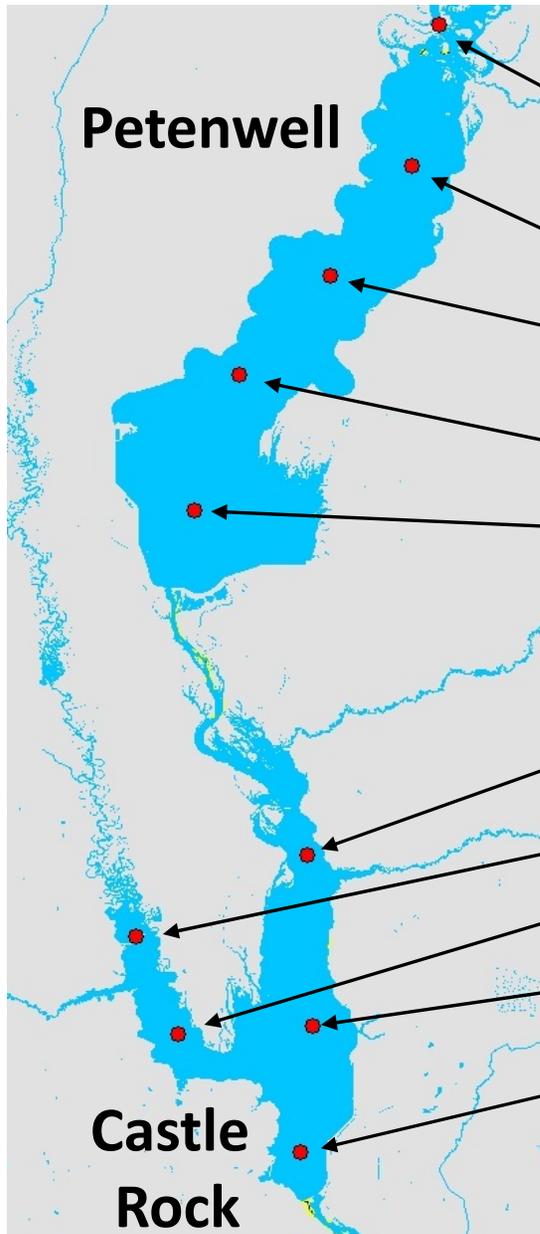


Major Reservoir Monitoring Results

Total Phosphorus Concentration

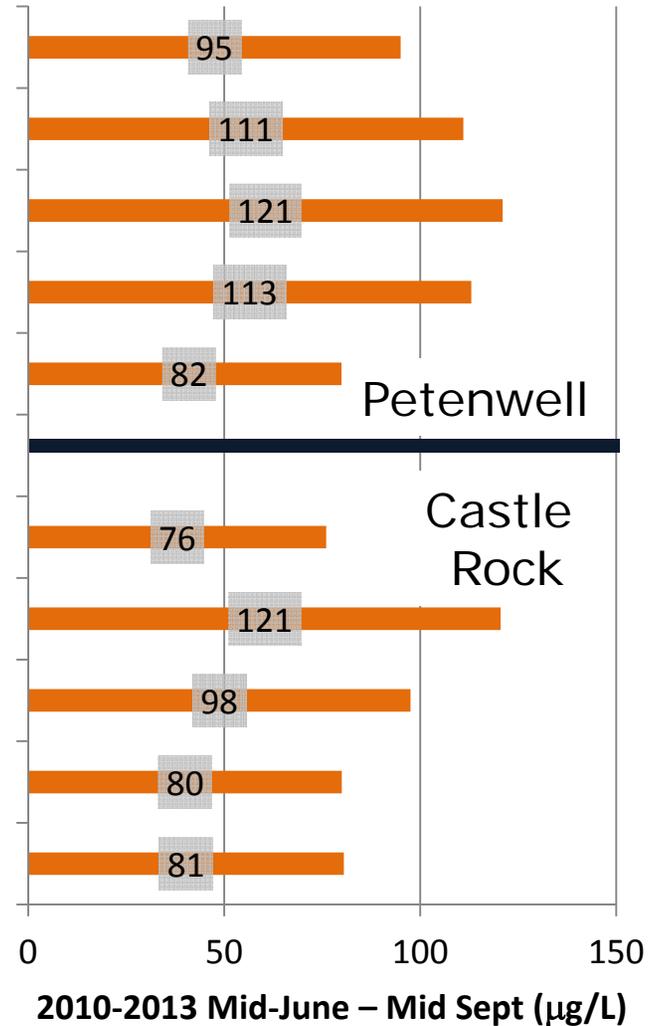


Major Reservoir Monitoring Results

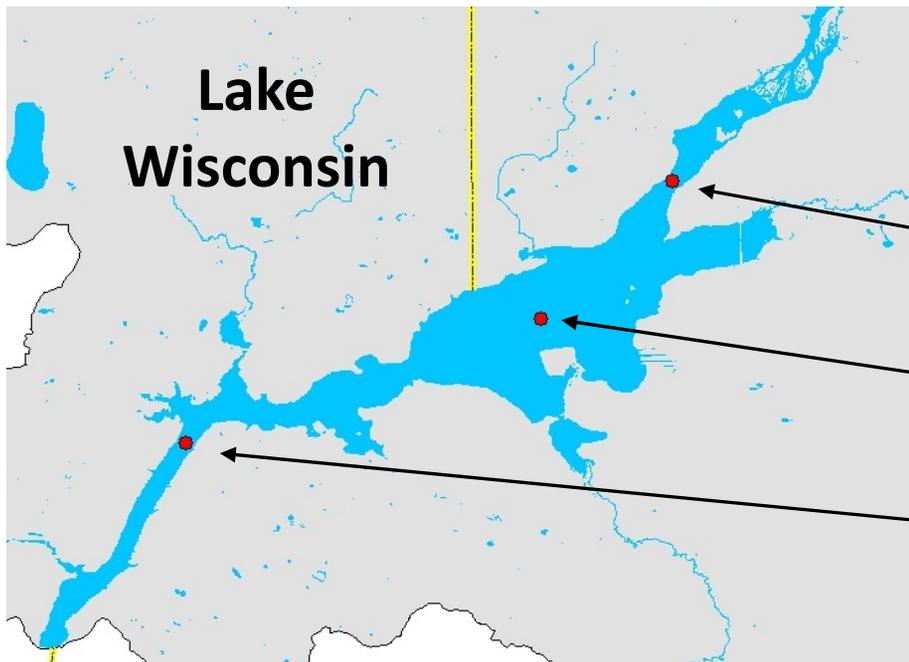


Total Phosphorus Concentration

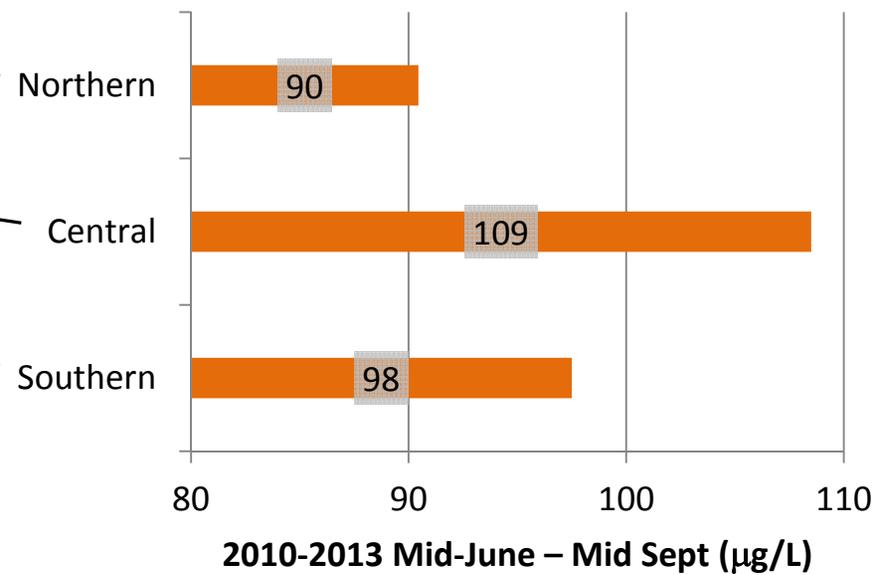
- Northern
- North Central
- Central
- South Central
- Southern
- Northern Main
- CTH G
- Yellow River Arm
- Central Main
- Southern Main



Major Reservoir Monitoring Results



Total Phosphorus Concentration



Defining Land Management in Agricultural Areas

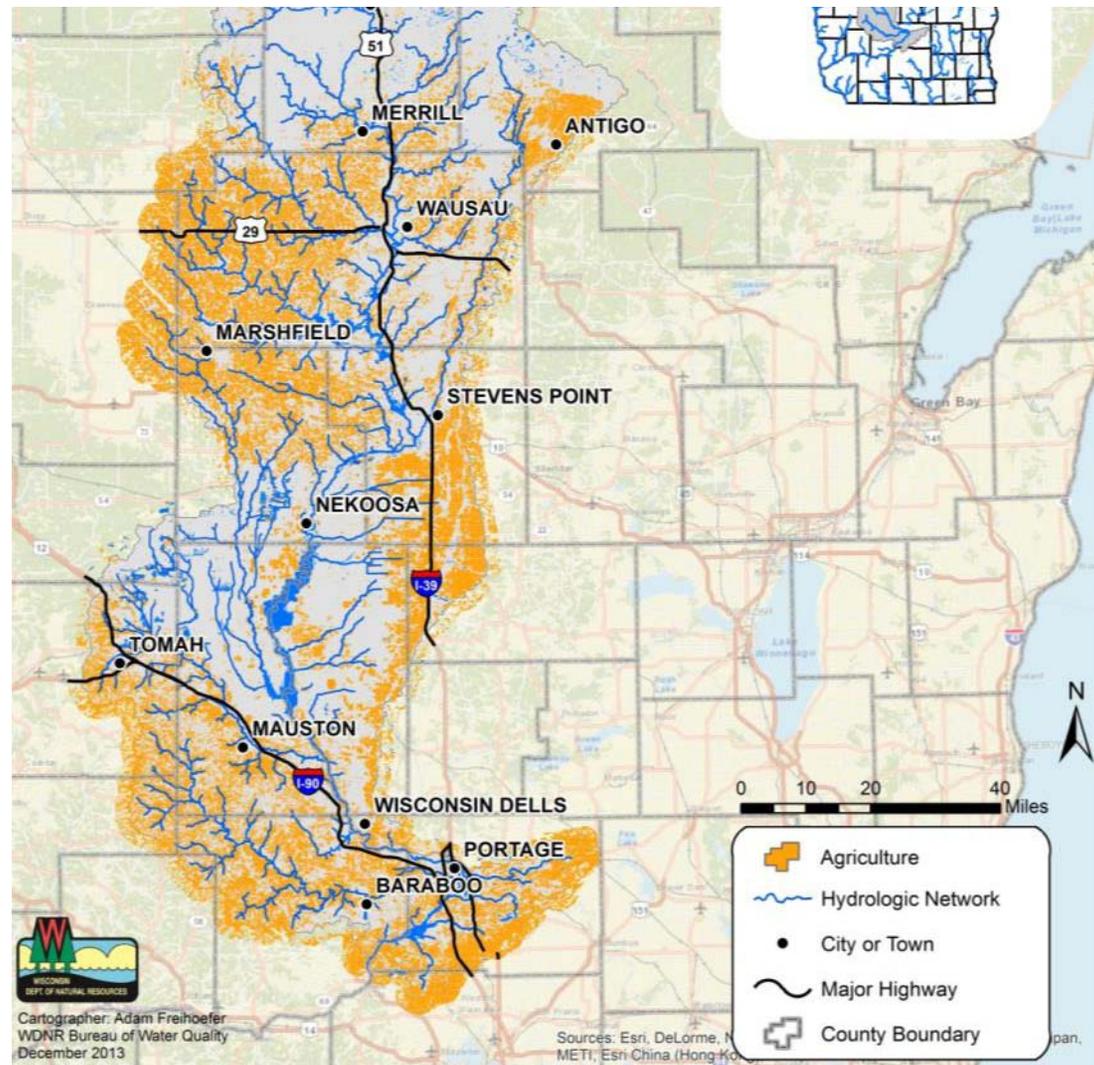
Monitoring
Conceptualization

Modeling

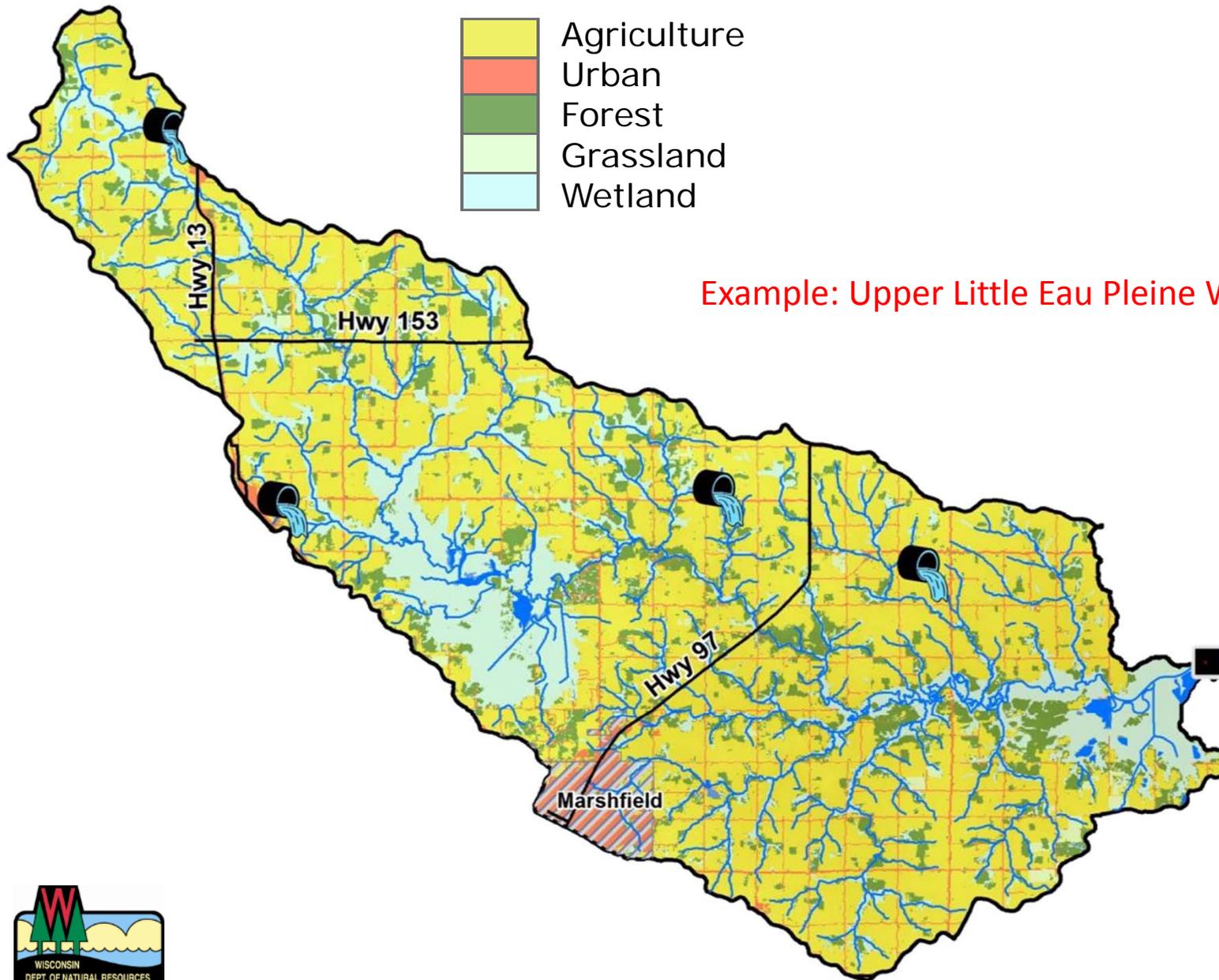
Allocations

Implementation

- Crop rotation
- Tillage
- Nutrient applications



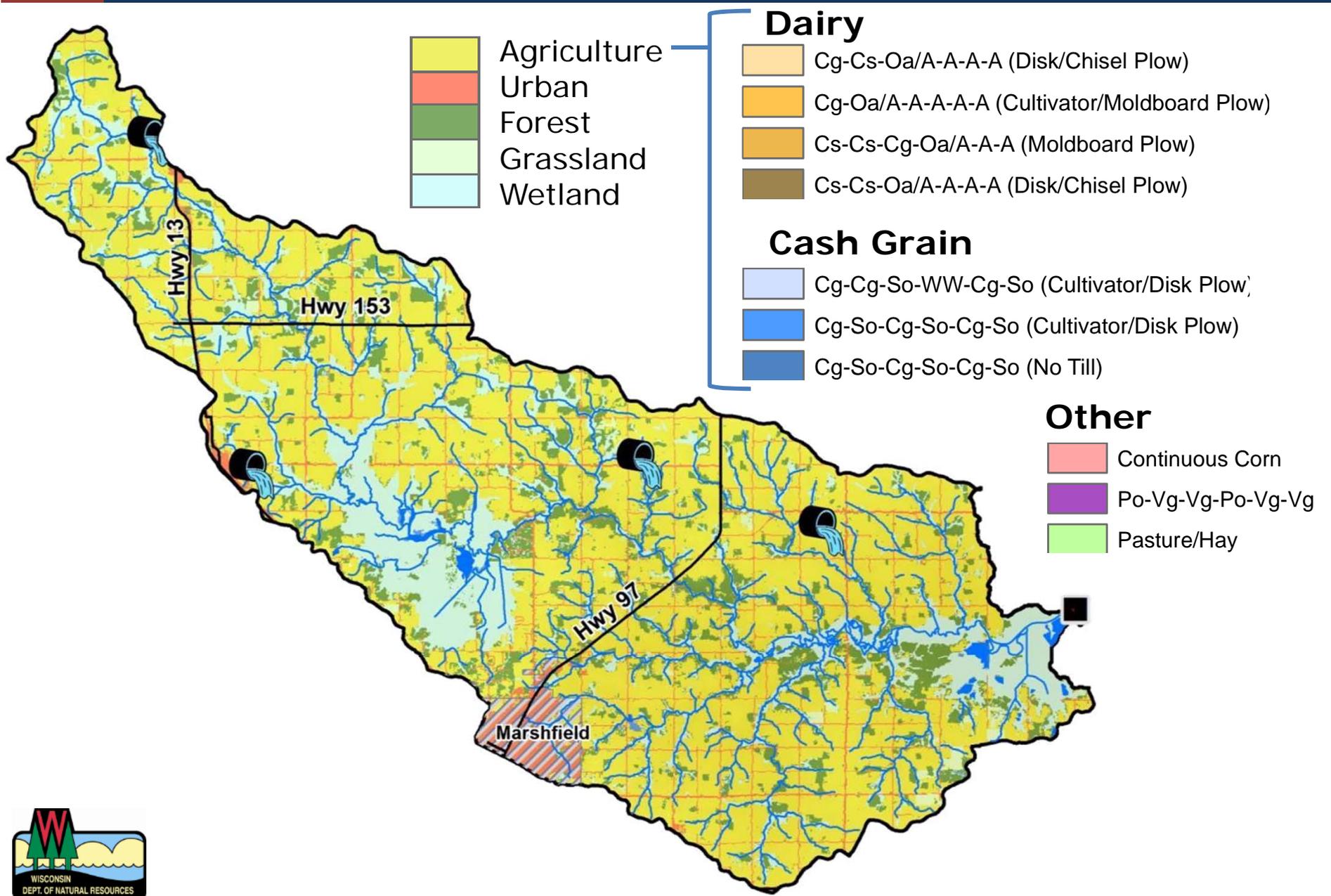
Defining Land Management in Agricultural Areas



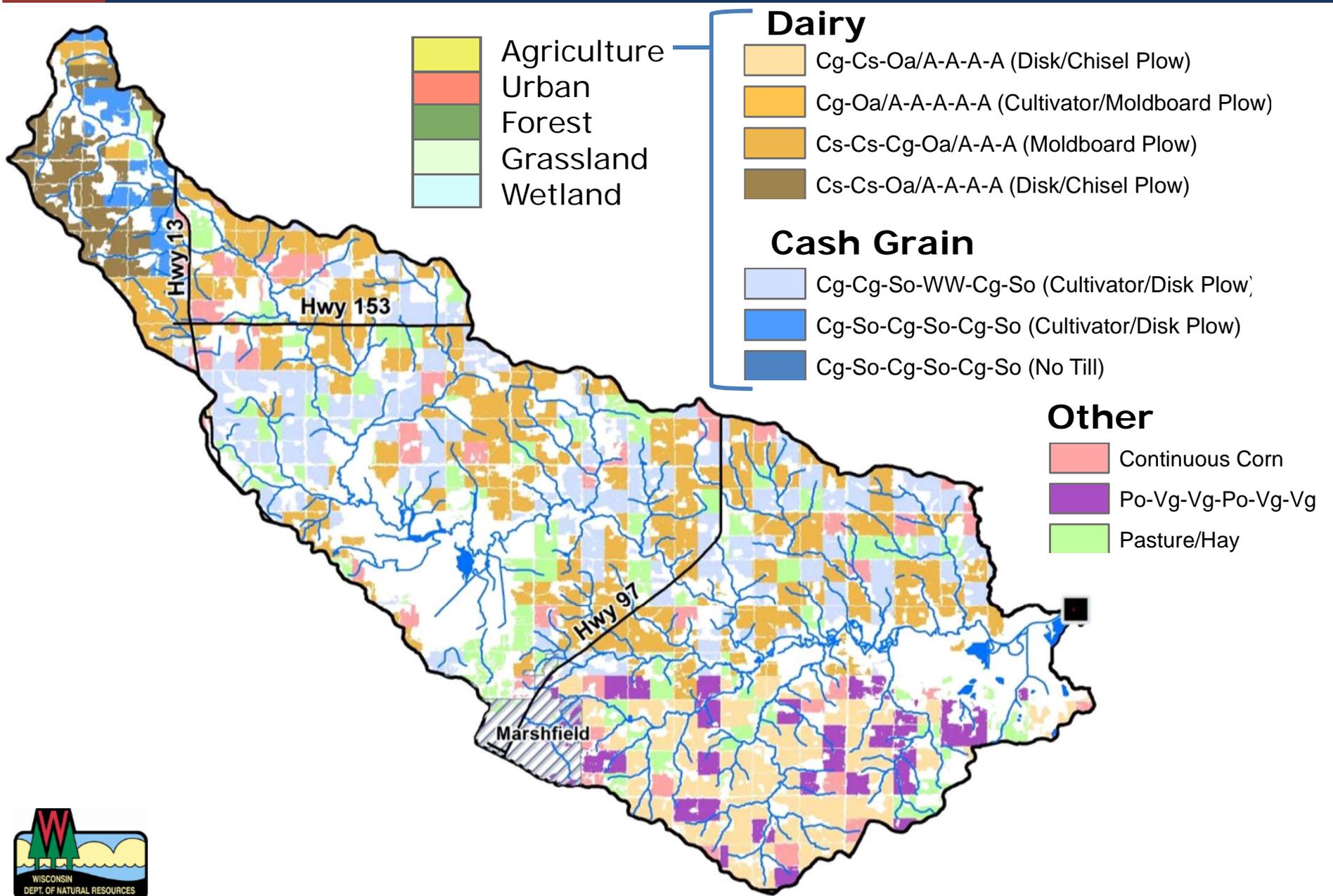
Example: Upper Little Eau Pleine Watershed



Defining Land Management in Agricultural Areas



Defining Land Management in Agricultural Areas



Wisconsin River Basin Water Quality Improvement Project

Part IV

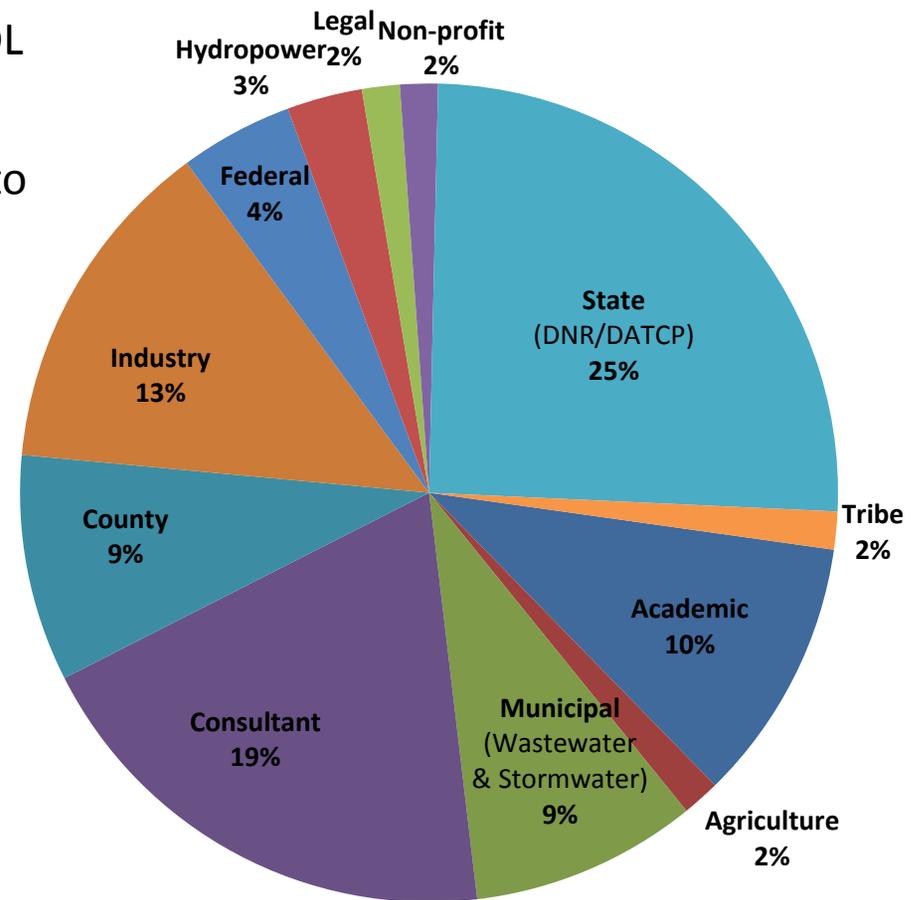
FOR MORE INFORMATION



Technical Stakeholder Meeting Proceedings



- Meetings on November 6th and 13th 2013 at Central Wisconsin Environmental Station
- WDNR and US Army Corps presented approach outlined in Wisconsin River TMDL Technical Scope of Work
- Small and large group discussion to listen to concerns / questions / ideas
- 67 Attendees



TMDL Technical Scope of Work and Meeting Presentations available here:

<http://dnr.wi.gov/water/tmdls/wisconsin/technical/documents.asp>

Wisconsin River TMDL Spatial Data Viewer

The screenshot displays the 'Wisconsin DNR Watershed Restoration Viewer' web application. The interface includes a top navigation bar with a search box and a menu with options like 'Home', 'Show Layers', 'Show Legend', 'Pan', 'Zoom In', 'Zoom Out', 'Previous Extent', 'Full State', 'Point Identify', 'Map Scale', 'Enter Coords', 'Plot Coords', 'Clear Coords', 'Clicked Coordinates', 'Coordinate System', 'Print Map', and 'Print'. The main map area shows Wisconsin with various colored overlays representing TMDL project status. A semi-transparent purple box is overlaid on the map with the text: 'Spatial Viewer Developers: Mark Binder, Aaron Ruesch, Adam Freihoefer, Theresa Nelson'. The left sidebar contains a 'Map Layers' panel with a 'Map Theme' dropdown set to 'Statewide TMDL Status (default)', a 'Show Legend' button, and a 'Filter...' button. Under 'Operational Layers', 'TMDL Project Status' is checked. Under 'Base Maps', 'Road Basemap' is checked. A scale bar at the bottom left shows 100 miles and 100 kilometers. The Wisconsin Department of Natural Resources logo is in the bottom left corner.

Spatial Viewer Developers:
Mark Binder
Aaron Ruesch
Adam Freihoefer
Theresa Nelson

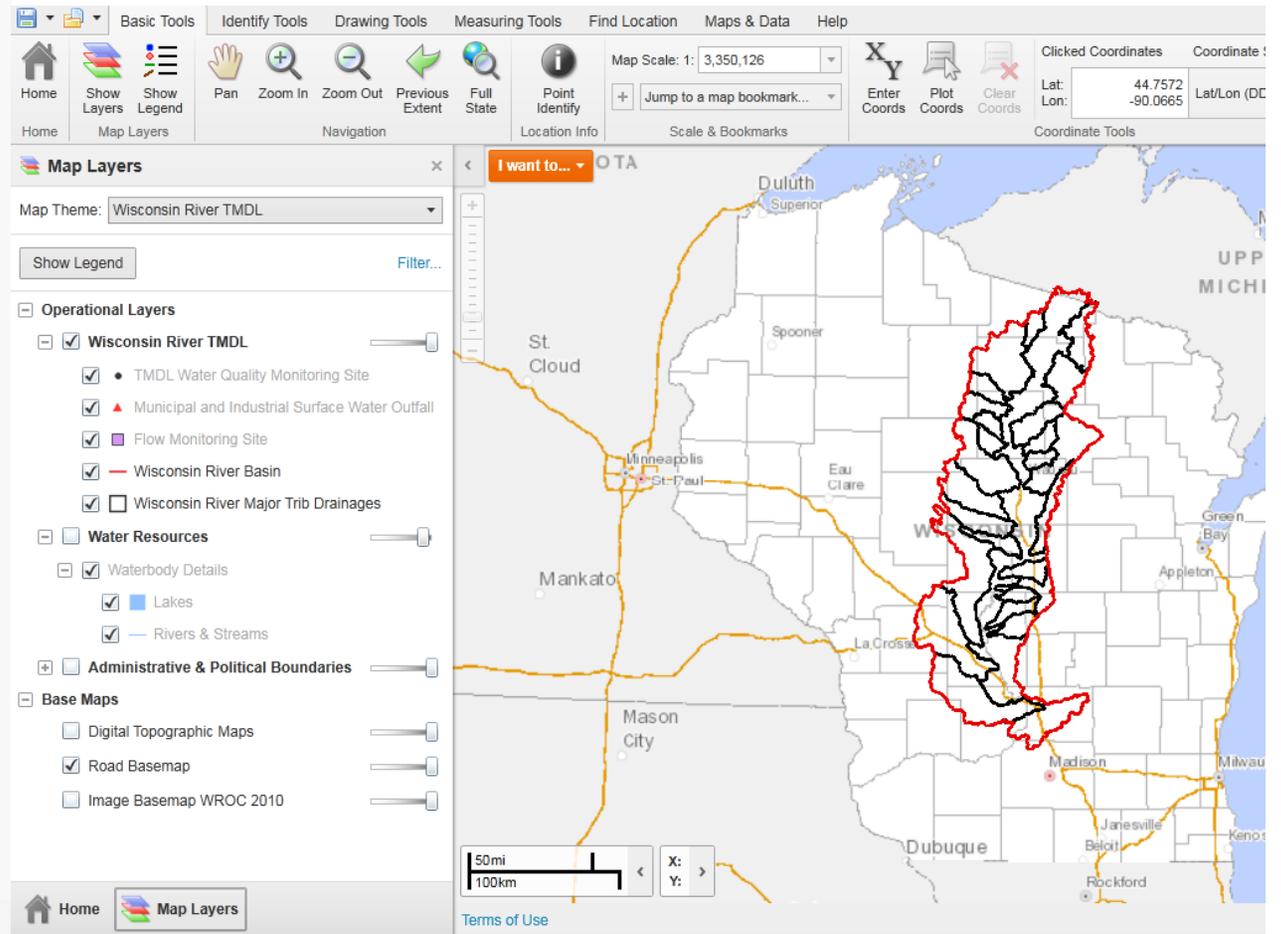
Wisconsin River TMDL Spatial Data Viewer

What's Available NOW?

- TMDL Basin and Major Tributary Drainages
- Flow/Water Quality Monitoring Stations
- Waste water outfalls
- Waterways
- Political Boundaries

What's Coming Soon?

- Landcover
- Urban areas
- Citizen Groups
- Model Sub-basins
- Impaired Waters
- Phosphorus Criteria



<http://dnr.wi.gov/topic/SurfaceWater/restorationviewer/>



Wisconsin River TMDL Spatial Data Viewer

The screenshot displays the 'Wisconsin DNR Watershed Restoration Viewer' web application. The browser's address bar shows the URL 'Wisconsin DNR Watershed Restoration Viewer'. The application's title bar reads 'Wisconsin DNR Watershed Restoration Viewer' and includes a search bar with the placeholder text 'Search for map features...'. Below the title bar is a menu bar with options: Basic Tools, Identify Tools, Drawing Tools, Measuring Tools, Find Location, Maps & Data, and Help. The main toolbar contains icons for Home, Show Layers, Show Legend, Pan, Zoom In, Zoom Out, Previous Extent, Full State, Point Identify, Map Scale (1: 418,766), Enter Coords, Plot Coords, Clear Coords, Clicked Coordinates, Coordinate System (Lat/Lon (DD)), and Print Map. The 'Map Layers' panel on the left is set to 'Wisconsin River TMDL' and includes a 'Show Legend' button and a 'Filter...' option. Under 'Operational Layers', the following are checked: Wisconsin River TMDL, TMDL Water Quality Monitoring Site, Municipal and Industrial Surface Water Outfall, Flow Monitoring Site, Wisconsin River Basin, and Wisconsin River Major Trib Drainages. Under 'Water Resources', 'Waterbody Details' is checked, including 'Lakes' and 'Rivers & Streams'. Under 'Administrative & Political Boundaries', it is unchecked. Under 'Base Maps', 'Road Basemap' is checked, while 'Digital Topographic Maps' and 'Image Basemap WROC 2010' are unchecked. The map area shows several watersheds in green, including New Wood River, Prairie River, Pine River, Copper River, Rib River, Eau Claire River, Plover River, and Big Eau Pleine River. The Wisconsin River Corridor is highlighted in orange. Major cities like Medford, Wausau, and Abbottsford are labeled. A scale bar at the bottom left indicates 10 miles and 10 kilometers. The Wisconsin DNR logo is in the bottom left corner, and a 'Terms of Use' link is at the bottom center.

Wisconsin River TMDL Website

What's Available On the Website?

- Project overview, maps, timeline, FAQ, contacts
- Link to TMDL Spatial Viewer
- Technical Scopes
- Technical Stakeholder Meeting Presentations
- Wisconsin River Basin Publications E-Library
- WR TMDL Presentations
- WR TMDL Webinars
- Wisconsin River Symposium Presentations (coming soon!)



Wisconsin River Water Quality Improvement Proj...

Business Licenses & Regulations Recreation Education Topics Contact Join DNR Search or Keywords Share

Wisconsin River Total Maximum Daily Load (TMDL)

A framework for water quality improvement in Wisconsin River Basin

The Wisconsin DNR, together with many public and private partners throughout the basin, are working to improve water quality of the Wisconsin River, its reservoirs, and tributaries. The TMDL study and implementation plan will provide a strategic framework and prioritize resources for water quality improvement in the Wisconsin River Basin. The Wisconsin River TMDL study area spans Wisconsin's central corridor from the headwaters in Vilas County to Lake Wisconsin in Columbia County, covering 9,156 square miles, approximately 15 percent of the state.

Under existing conditions, many reservoirs and tributaries in the Wisconsin River do not meet water quality standards due to excess pollutant loads, meaning they are not suitable for their designated uses, such as fishing, wildlife habitat, and/or recreational activities such as boating and swimming. The Wisconsin River Basin **total maximum daily load** (TMDL) will determine the total amount of phosphorus and suspended solids that can be discharged into the river, its tributaries and reservoirs, and still meet water quality standards and develop a plan for achieving the needed reductions.

Select Topic Go!

Search Waters Go!

Search Waters, Explore Programs

- TMDL Program
- Gateway to TMDLs
- Search Impaired Waters
- Explore WI Waters!
- Watershed Plans
- Gateway to Basins

TMDL Program

Wisconsin Interactive TMDL Map

About the TMDL

- ▲ [About the Project](#) [PDF]
- ▲ [Timeline](#) [PDF]
- ▲ [What is a TMDL?](#) [PDF]
- ▲ [FAQ](#) [PDF]
- ▲ [Project Map](#) [PDF]

Latest News

- ▲ [2014 Wisconsin River Water Quality Improvement Symposium](#) [Exit DNR]
- ▲ [Adaptive Management, Water Quality Trading Webinars](#)

Handouts, Presentations, Webinars

- ▲ [Handouts](#)
- ▲ [Presentations](#)
- ▲ [Webinars](#)

Wisconsin River TMDL Viewer

- ▲ [Surface Water Data Viewer](#)
- ▲ [SWDV User Guide](#)
- ▲ [Wisconsin River TMDL Spatial Data Viewer](#) - Available February 2014

Technical Approach

- ▲ [Documents and Presentations](#)

Looking for a Document?

- ▲ [Wis. River TMDL E-Library](#)
- ▲ [Photos](#)

<http://dnr.wi.gov/water/tmdls/wisconsin/>

Who Can I Contact?



Ann Hirekatur

Project Manager

Ann.Hirekatur@wisconsin.gov

608-266-0156

Adam Freihoefer

Modeling/Technical Lead

Adam.Freihoefer@wisconsin.gov

608-264-6021

Pat Oldenburg

Monitoring Coordinator

Patrick.Oldenburg@wisconsin.gov

715-831-3262

Terry Kafka

Nonpoint Source Sector Lead

terence.kafka@wisconsin.gov

715-355-1363

Brad Johnson

Stormwater Sector Lead

BradleyA.Johnson@wisconsin.gov

715-359-2872

Doug Casina

CAFO Sector Lead

Douglas.Casina@wisconsin.gov

715-359-2874

VACANT

Wastewater Sector Lead

Or, contact the Wisconsin River TMDL Project Team at
dnrwisconsinrivertmdl@wisconsin.gov

Wisconsin River Basin Water Quality Improvement Project

QUESTIONS?

