



WISCONSIN RIVER BASIN

WATER QUALITY IMPROVEMENT PROJECT

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The Wisconsin River Basin Water Quality Improvement

Several reservoir lakes and tributaries in the Wisconsin River Basin are impaired as a result of excessive nutrient loading. As a result, a comprehensive study of the Wisconsin River Basin (WRB) has been initiated by the Wisconsin Department of Natural Resources (WDNR) that will culminate in the development of a plan to improve the water quality of the river, its impoundments and tributaries. The water quality improvement study and plan will be undertaken in the form of development and implementation of a **Total Maximum Daily Load (TMDL)**.

Project Partners

An enormous task requires an enormous effort. Partnership formed between various agencies, local governments and most importantly citizen organizations to achieve water quality goals has played a pivotal role in the success of the project to date,

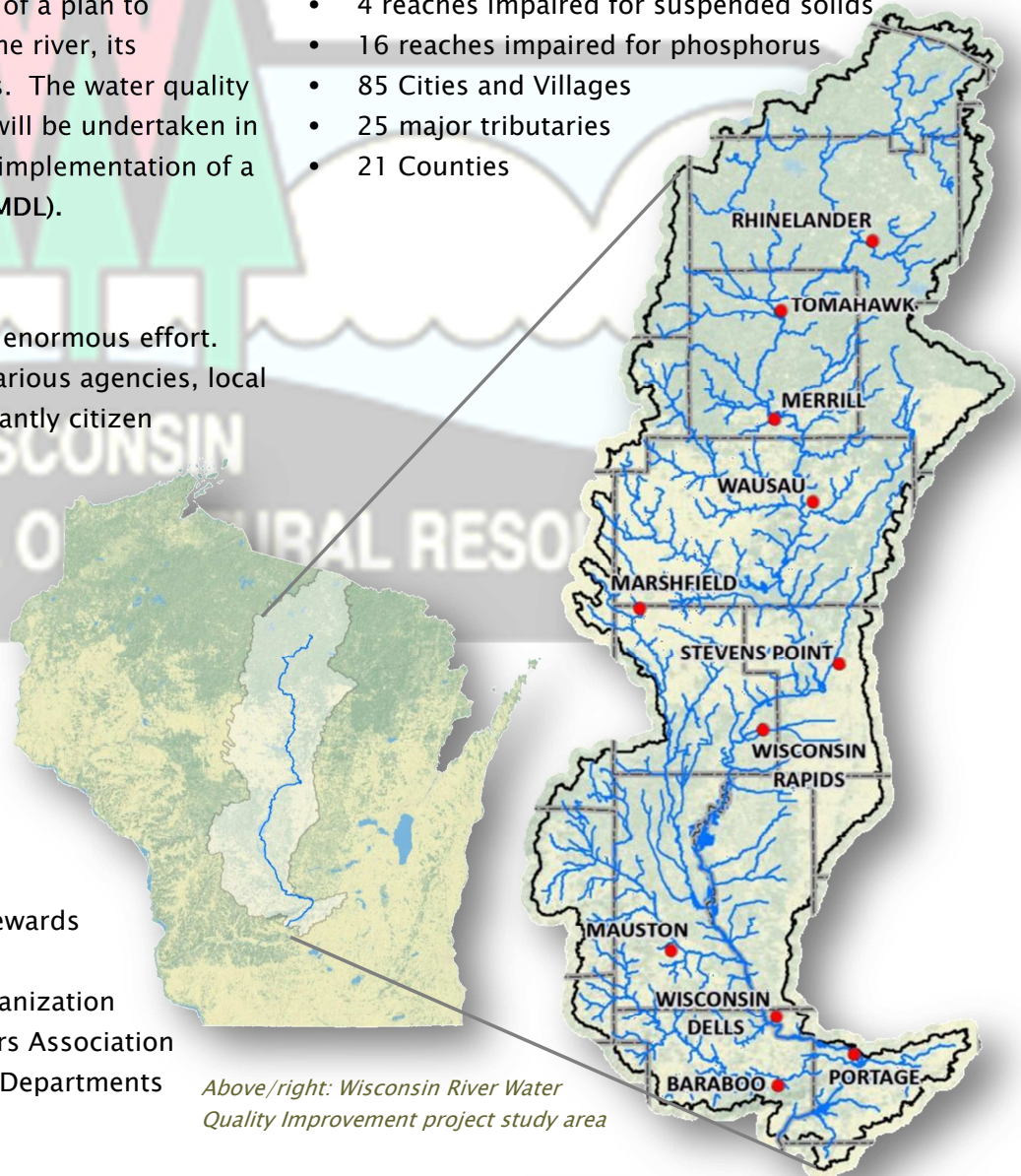
A few key project partners include:

- WDNR
- UW- Stevens Point
- UW-Stout
- US Army Corps Engineers
- US Geological Survey
- Petenwell & Castle Rock Stewards
- Lake Wausau Association
- Big Eau Pleine Citizens Organization
- Lake DuBay Property Owners Association
- County Land Conservation Departments
- And many more...

Project Area

The Wisconsin River TMDL study area spans Wisconsin's central corridor from the river's in Vilas County to Lake Wisconsin in Columbia County, covering 9,156 mi² – approximately 15 percent of the state. The project area also encompasses:

- More than 110 wastewater dischargers
- 2nd & 5th largest inland lakes in Wisconsin
- 4 reaches impaired for suspended solids
- 16 reaches impaired for phosphorus
- 85 Cities and Villages
- 25 major tributaries
- 21 Counties



Above/right: Wisconsin River Water Quality Improvement project study area

Reservoirs mean Recreation!

The Wisconsin River has been called “America’s hardest working river” due to its 25 hydroelectric dams and important industries. However, its reservoirs and natural lakes also make it one of the state’s hardest playing rivers, as well! Recreational opportunities abound on the Castle Rock, Petenwell, DuBay, Lake Wausau, Lake

Wisconsin, and Big Eau Pleine reservoirs. Residents and visitors enjoy sport fishing, boating, swimming and camping from the upper reaches of the river down to the Lower Wisconsin Scenic Riverway. There are many homes, businesses and tourist destinations on these lakes, as well as a multitude of state parks and natural areas to enjoy.



Above: Recreation on Wisconsin River Reservoirs; Below, right: Algae Bloom on Lake Petenwell

Water quality impairments threaten our enjoyment

With its long history of use for work and play, the Wisconsin River also suffers from water quality impairments that have accumulated over the decades. Resulting from excessive nutrient loads, these impairments limit the full potential of these beloved Wisconsin waterways.

Low levels of dissolved oxygen and severe algal blooms have decreased opportunities for recreational activities, raised concerns for human health, damaged fish and aquatic life, and impaired the quality of the River.

The impoundment setting is ideal for algae growth – water from a large watershed is slowed and warmed behind the dams. The water carries high levels of phosphorus, which is a primary food source for algae.



Wisconsin River Reservoirs

- Petenwell Lake – 2nd largest inland lake in Wisconsin
- Castle Rock Lake – 5th largest inland lake in Wisconsin
- Lake Wisconsin – 3rd largest Wisconsin River reservoir
- Lake Dubay – 4th largest Wisconsin River reservoir
- Lake Wausau – >1800 acres, popular fishing reservoir
- 21 Storage Reservoirs, including the Big Eau Pleine

Blue-Green Algae (BGA) blooms occur on Petenwell, Castle Rock and other Wisconsin River Basin Lakes. The peak blooms are normally in summer months (the peak of recreation season) and often appear as “pea soup” scum with a foul smell floating on the surface.

Distribution can be lake-wide, but is often most dependent on wind direction. Bays, coves and harbors are usually impacted the most. These blooms have a profound effect on aquatic life and tourism.

BGA are a cyanobacteria that photosynthesizes. Its primary food source is phosphorus, but some can also “fix” and use nitrogen.

Blue Green Algae and your Health

The Department of Health Services has documented human health exposures effects related to blue-green algae blooms. These include respiratory ailments (coughing), gastrointestinal upset, watery eyes and rashes.

The safest strategy is to avoid contact with BGA blooms; people can be exposed to high health risks by direct ingestion or through inhalation of water droplets containing algae. Skin contact can lead to irritation.

- Don't swim, boat, water ski, etc, in an area with an active bloom.
- Don't let children play with scum layers, even from shore.
- Don't let pets or livestock swim in or drink in waters with BGA, and wash pets off immediately.
- Don't treat BGA blooms with herbicides; toxins are released when algae dies.
- Always shower after swimming in waters with any BGA.

See attention from your physician or veterinarian if you or your pets experience illness from blue-green algae exposure.

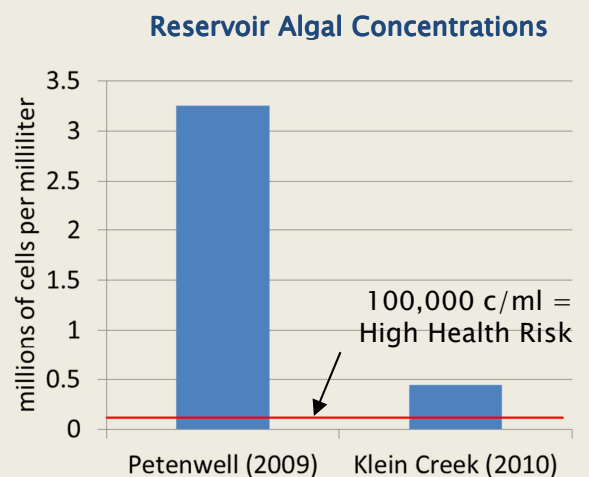


Blue green algal blooms on Wisconsin River reservoirs inhibit recreation and can threaten public health.



What is a high health risk, and how do Wisconsin River levels compare?

The World Health Organization (WHO) *Guidelines for Recreational Waters* references 100,000 cells per milliliter as a high health risk. In 2009 and 2010 algal cell counts in excess of this amount were measured in some Wisconsin River Basin waterways.



What is a TMDL?

A **Total Maximum Daily Load (TMDL)** is the amount of a pollutant that can be discharged into a waterway and still meet water quality standards. In the Wisconsin River Basin, the TMDL is 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. 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.

How did we get a TMDL in the Wisconsin River Basin?

In 2008, local residents and business owners who depend on the Wisconsin River, its reservoirs and tributaries for recreation and for their livelihood, took their legislators out on pontoon boats on Petenwell and Castle Rock Reservoirs. After these elected officials observed the water quality problems firsthand, the state legislature allocated funding for a water quality improvement project, and directed the WDNR to develop a TMDL.

Why develop a TMDL?

Development of TMDL answers the following questions:

- What is the magnitude of the existing pollutant load amount?
- What is the contribution amount from each pollution source?
- How much does pollution need to be reduced in order for each waterway to meet water quality standards and achieve its designated uses (fishing, recreation, habitat etc.)?
- How will the needed pollutant load reductions be achieved for each waterway?

A TMDL study and implementation plan provides a strategic framework and prioritizes resources for water quality improvement.

TMDL Load Assessment

In a TMDL load assessment, each watershed is assessed for pollutant loads from each of the sources shown in the adjacent figure.

