

Wisconsin River Basin

Clean Waterways Project



November 2014

Updates on the Wisconsin River TMDL and water quality improvement efforts.

Water quality efforts underway

A Total Maximum Daily Load (TMDL) is the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. A waterway that exceeds water quality standards is often no longer suitable for its designated uses, such as wildlife habitat, fishing, or other recreational activities. The ultimate goal of a TMDL is to improve water quality by reducing pollutants such as phosphorus and sediment.

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

In 2008, the Petenwell and Castle Rock Stewards—a group of local residents and business owners who depend on the Wisconsin River, its reservoirs and tributaries for recreation and for their livelihood—took area 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 Wisconsin Department of Natural Resources to develop a [TMDL project for the WI River](#).

Stay up to date!

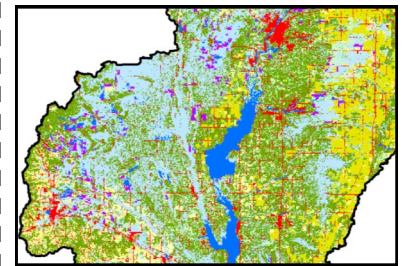
A TMDL requires several years of monitoring data to determine where the pollutants are coming from. This data is combined with computer models to determine how reductions can be made fairly and in the most cost-effective way possible. Through this newsletter, the Wisconsin River TMDL team is working to communicate progress on the different stages of TMDL development and invite public feedback. This quarterly newsletter also highlights information, tools and resources available to help with conservation efforts in the state.



[Subscribe](#) to receive email updates about the Wisconsin River TMDL.

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IN THIS ISSUE



Mapping the land in the Wisconsin River Basin

The Wisconsin DNR is using an innovative approach to create high quality spatial datasets and maps that will help to prioritize areas for conservation and achieve water quality improvements.

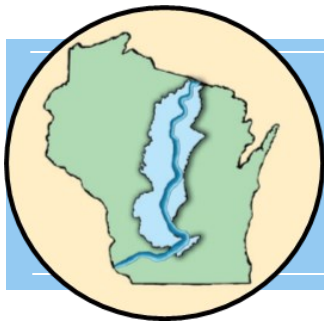
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EVAAL: A new tool for precision conservation

The DNR has developed a new toolset to assist watershed managers in prioritizing areas within a watershed that may be vulnerable to water erosion (and thus increased nutrient export) and thus may contribute to downstream surface water quality problems.

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Mapping What's Happening on the Land in the Wisconsin River Basin

All of the activities that occur on the land have an impact on what happens in our waterways. When it rains, water runs over the land, picking up sediment and nutrients and transporting them to streams, rivers, and lakes. One of these nutrients is phosphorus. Phosphorus is essential to plant growth, which is why people apply it to their lawns, gardens and agricultural fields. However, if too much phosphorus washes off the land and into water bodies, it can cause severe weed and algae growth that can harm fish and aquatic life, decrease recreational opportunities, and create health risks for people and pets.

There is a major effort underway to improve water quality in the Wisconsin River Basin. The framework for this effort is a Total Maximum Daily Load (TMDL), which is the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. A waterway that exceeds water quality standards is referred to as "impaired" and is no longer suitable for its designated uses, such as wildlife habitat, fishing, or other recreational activities.

Understanding what is occurring on the landscape is a critical part of understanding what is happening in the water and figuring out how to achieve better water quality. The Wisconsin River Basin covers 9,156 square miles, approximately 15 percent of the state, and figuring out what is happening on all of that land is no small task. The DNR is using an innovative and efficient approach to generate high quality, high resolution maps of the landscape in the basin. These maps and the underlying data will increase our ability to protect and restore healthier waterways.

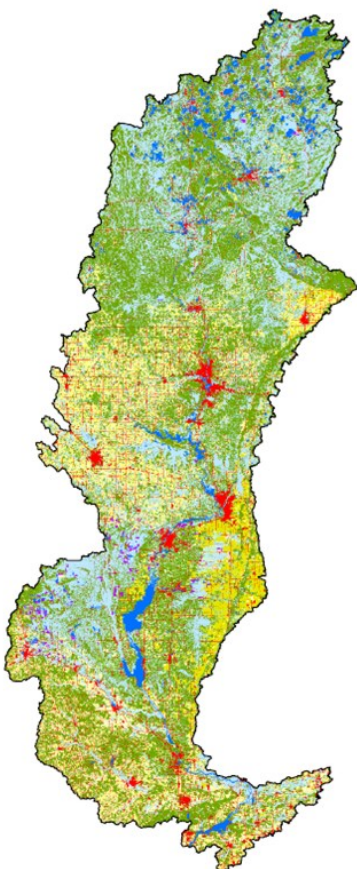
How do we calculate pollutant loads from agricultural and natural areas?

In order to determine where the nutrients are coming from, the DNR uses a combination of field research and computer model simulations. One of these computer models is called the Soil and Water Assessment Tool (SWAT), which uses information about the landscape (e.g. soil type, elevation, land cover, land management, etc.) to predict where the nutrients are coming from within the watershed.

The SWAT model uses satellite images to determine the land cover types within the basin,

such as agriculture, grassland, wetland, forest, urban, etc. This is an important part of the model because the land cover can affect the amount of rain and nutrients coming off of the

land and entering a nearby stream or river. It is important to further break down the agricultural land cover, especially in the Wisconsin River Basin where nearly 25 percent of the land is agricultural, ranging from the dairy farming in the north central region to potatoes and vegetables in the central sands, and corn and soybean crops in the southern region. Individual farms also



Landcover Definition			
	Agriculture		Grassland
	Barren / Shrubland		Forest
	Cranberries		Open Water
	CRP		Wetlands
	Pasture / Hay		Urban

use different management styles (e.g. what crops are planted, how much tillage is occurring, and how nutrients are applied), creating an even greater variety of activities on the land. Due to this unique challenge, the DNR chose to use a new approach to better define the land management within the basin. The steps used are detailed in the graphic below.



This is the first time a TMDL in Wisconsin has used such a detailed and in-depth process, incorporating knowledge from local experts. Using this new and innovative approach, DNR was able to create high quality spatial datasets and maps that will help prioritize areas for conservation and achieve water quality improvements. The data has also been shared with counties to help them in their work with farmers and to get conservation practices installed where they are most needed. Kurt Calkins, Director of Land and Water Conservation for Columbia County, shared his thoughts on this: "Having the best available data in the model is a win-win for everyone, because it will help us better define areas on the agricultural landscape that have the greatest potential for reductions. Having quality data in a quality model helps bring all the players to the table with the higher degree of buy-in regarding sources and reductions."

“Having the best available data in the model is a win-win for everyone, because it will help us better define areas on the agricultural landscape that have the greatest potential for reductions.”



A New Tool for Precision Conservation

The Wisconsin DNR Bureau of Water Quality has developed the Erosion Vulnerability Assessment for Agricultural Lands (EVAAL) toolset to help watershed managers prioritize areas that may be vulnerable to water erosion (and thus increased nutrient export) and may be contributing to downstream surface water quality problems. It evaluates the land for erosion vulnerability using information about topography, soils, rainfall and land cover. This tool enables watershed managers to prioritize and focus field-scale data collection efforts, saving time and money while increasing the probability of locating fields with high sediment and nutrient export for implementation of conservation practices.

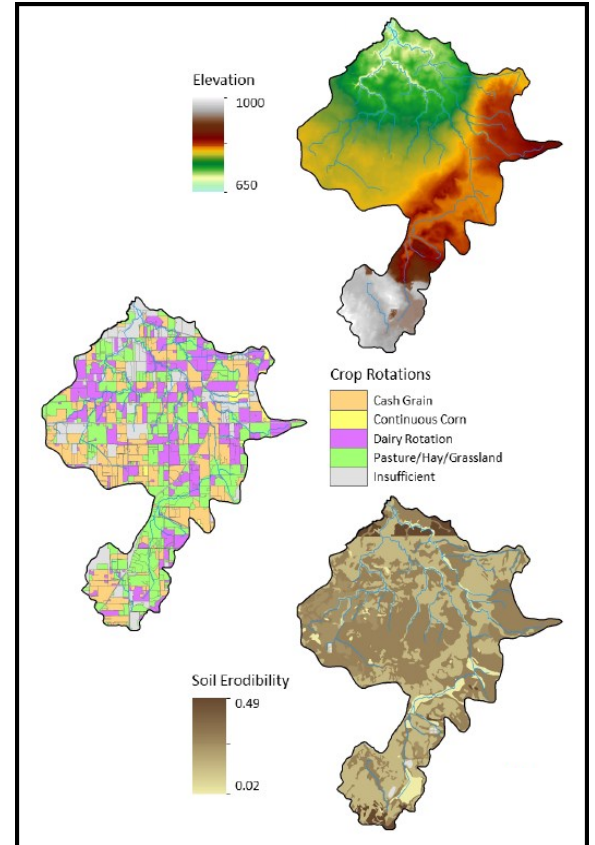
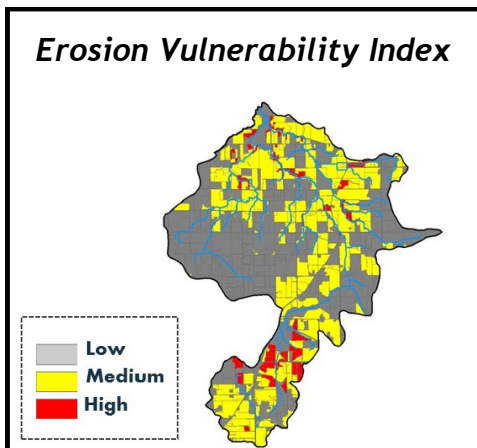
How does EVAAL work?

EVAAL is a set of tools that can be used within ArcMap, a program that is used to edit, create, and analyze geospatial data. It uses several sets of geographical data, including topography, land cover, and soils. EVAAL was designed to quickly identify areas vulnerable to erosion using readily available data and a user-friendly interface. This tool estimates vulnerability by assessing the risk of different types of erosion, while reducing emphasis on areas that don't drain directly to surface waters.

What information does EVAAL provide?

The purpose of EVAAL is to create a series of maps that help watershed managers locate where conservation practices should be prioritized. One of these maps, the erosion vulnerability index, indicates which fields are most likely to be at a high risk of erosion soil erosion.

While the EVAAL tool prioritizes lands vulnerable to erosion, loss of soil tends to coincide with nutrient loss. Water quality monitoring has demonstrated that measured high concentrations of sediment are often associated with high concentrations of total phosphorus.



“The maps and data produced by the program allow us to focus our efforts and work more efficiently than ever before.”

Greg Baneck, county conservationist with Outagamie County, said his team has been using an early version of the EVAAL software for several months as part of efforts to develop a plan that addresses nonpoint source pollution issues. “The maps and data produced by the program allow us to focus our efforts and work more efficiently than ever before,” Baneck said. “This is a huge benefit with limited staffing resources, helping us to assist the landowners who need it the most.”

Is EVAAL available to download?

The EVAAL Toolbox (Version 1.0), Methods Documentation, Tutorial, and Tutorial Datasets can be downloaded from the [DNR website](#).

Tools and Resources

This page highlights tools and resources available to help with conservation efforts in Wisconsin.



DNR Lake Planning Grants deadline approaching

Lake Planning grants are due on December 10! The purpose of the grants is to collect and analyze information needed to protect and restore lakes and their watersheds. Projects can be small scale projects that focus on public education and awareness, obtaining basic information on lake use and conditions, and enhancing organizational capacity, or large scale projects that address the more complex management challenges of larger lakes.

[Find out more!](#)

New Healthy Lakes Initiative grant program

New DNR Healthy Lakes Initiative provides grants to fund local projects around the state that focus on simple ways to improve fish habitat, integrate native plantings, divert and clean runoff water, and promote natural beauty. Grant application deadline is February 1st, 2015.

[Find out more!](#)



Wisconsin Waters:

Keep up to date with what is happening in Wisconsin's watersheds

[Wisconsin Land and Water Conservation Annual Progress Report - 2013](#) (exit DNR)

Learn about progress made on land and water conservation programs in the Wisconsin River Basin and throughout Wisconsin. This report highlights the diversity of issues that conservation professionals in Wisconsin encounter every day and the creative projects and solutions they are using to improve water quality in the state.

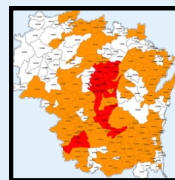
[Wisconsin Land Use Megatrends: How Healthy is Your Water](#) (exit DNR)

What are the connections between water and land use? This report talks about the many factors that can impact our water, including the water cycle, water use, economics of water, and the role of volunteers and organizations in managing specific water resources.



Conservation toolbox:

Reducing nutrient runoff from fields



The [Wisconsin Manure Management Advisory System](#) offers tools all farmers can use to assess how high the risk of runoff is for their general location before they spread manure.

[Find out more!](#)



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