

We are pleased to publish our 4th DYK article, focusing on the impact of phosphorus in our lakes. The author, Lee Wiesner, is a volunteer with the Citizen Lake Monitoring Network and has been measuring water quality on Middle Eau Claire for 24 years! Lee retired from the Wisconsin DNR as Conservation Warden Supervisor and has degrees in Natural Resources & Wildlife Ecology and Wildlife Management. We hope this article will prompt you to learn more about water quality by clicking on the reference links in [blue](#).

We invite you to reply to this email with your questions and your suggestions for topics relating to all things of interest in the Northwoods for a future DYK.



Did You Know?

August 2022

"Phosphorus and Our Lakes"

Lee Wiesner (Middle Eau Claire Lake)

Did you know that Upper and Lower Eau Claire Lakes are on the 2022 Clean Water Act 303(d) [impaired waters list](#)? Middle Eau Claire Lake has been on the impaired waters list in past years as well. Elevated phosphorus levels in the water have been the main driving force in placing these beautiful lakes on the list of impaired waters. Higher levels of phosphorus can lead to algae blooms making water green or worse yet, unsafe for swimming, other water sports and drinking by animals. Algae blooms in lakes usually do not sneak up slowly. All of a sudden, the lake reaches a tipping point and the lake turns green and may stay green forever.

The Clean Water Act and Water Quality:

Every two years the Clean Water Act requires states to publish a list of all waters not meeting water quality standards and a report on the overall quality of all surface waters in the state. The impaired list is made up of rivers, streams and lakes that are impaired due to various reasons and have no plan in place to reduce levels of pollutants.

The impact that a certain level of phosphorus has on a lake is determined by [lake type](#). In *seepage lakes* that are stratified, that is having two summertime thermal layers, phosphorus levels should be kept below 20 micrograms per liter. Examples of stratified seepage lakes in our area would be Pickerel and George lakes. The three Eau Claire lakes are stratified *drainage lakes* and the critical phosphorus level for these type lakes is 30 micrograms per liter. Lakes like the Eau Claire lakes with a stream entering and exiting them can tolerate a higher level of phosphorus before they experience algae blooms.

The data to determine a lake's health is in large part collected by over [1000 volunteers](#) throughout our state. On many Wisconsin lakes the only parameter measured is water

clarity by use of the Secchi disc. Some lakes are also sampled for water clarity, chlorophyll, phosphorus, dissolved oxygen every five feet and temperature every five feet in late May, June, July and August. The chlorophyll filter and phosphorus sample are sent to the State Lab of Hygiene in Madison for analysis. Water clarity, chlorophyll and phosphorus levels are used to develop a health rating for a lake called the Trophic State Index or TSI. Oligotrophic, the least fertile lakes, have a TSI less than 40, mesotrophic lakes, medium fertile lakes, have a TSI range of 40 to 60 and eutrophic lakes, very fertile lakes, have a TSI of 60 to 100. TSI levels for some area lakes are:

- **Robinson Lake 38-43 (oligotrophic/mesotrophic)**
- **Bony Lake 36 to 38 (oligotrophic)**
- **Upper Eau Claire Lake average 38 (oligotrophic)**
- **Middle Eau Claire Lake 38 to 42, but usually around 42 (mesotrophic)**
- **Lower Eau Claire Lake usually around 44 (mesotrophic)**

Bony, Pickerel and George, as well as others, have not been sampled for some time due to funding cuts to the DNR science and research divisions a few years back. Priority was given to lakes having the most impact on other water bodies. For instance, drainage lakes leading to other waters receive the most priority. Water quality on the Eau Claire Lakes Chain impacts all waters downstream, including the folks in Stillwater, MN on the St. Croix River or those further downstream on the Mississippi River. The Friends of the Eau Claire Lakes Area is currently studying the cost of adding more area lakes back into the water clarity and/or water chemistry monitoring programs.

To learn more about the [water quality of lakes in Wisconsin](#) just enter the name of a lake and its county in your browser. Click on More in the upper right and then click on Water Quality Reports and Data.



Lee gets the whole family involved in water quality monitoring with daughter Jamie and granddaughter Addy volunteering in June 2022

Responsible boating helps keep phosphorus trapped on the lake bottom:

The lake bottom is like a large sponge capturing phosphorus. When we disturb the bottom it releases the phosphorus into the water column which can lead to algae blooms. The shallower the lake the more potential for lake bottom disturbance from natural wave action or boat traffic.

Boats of all types, including pontoon boats, fishing boats, cruising boats, and wakeboard boats, are getting larger and have greater potential of stirring up the bottom of the lake, releasing nutrients into the water column. [In-depth studies](#) suggest that wakeboard boats can impact shoreline erosion at least up to 500 feet from shore and uplift bottom sediment in waters as deep as 20 feet.

To eliminate stirring up lake sediment and releasing phosphorus, remember to accelerate from shore in deeper water, follow slow/no wake laws near shorelines and docks for all type of boats and operate wakeboard boats in waters deeper than 20 feet and 700 feet (more than two football fields) from shore to minimize shoreline erosion caused by their wave action.

The Town of Barnes has partnered with the Friends of the Eau Claire Lakes Area in publishing a boating etiquette brochure outlining steps boaters can take to keep boating safe and fun while protecting the water quality of our beautiful lakes. Click here for the [brochure](#).

Reducing runoff and erosion keeps additional phosphorus out of lakes

A second strategy for managing phosphorus is to reduce the amount of phosphorus entering our lakes and rivers. Property owners can reduce the runoff going into lakes and streams by creating water diversions and rain gardens, by installing roof gutters which redirect rainwater away from lakes and streams, by landscaping with pervious surfaces and by maintaining a natural buffer along the lake shore.

Reducing shoreline erosion helps too. This can be accomplished by installing fish sticks (entire trees with their branches) just off the shoreline to stem erosion and create wonderful fish habitats, by using a special installation of rocks called riprap where more natural barriers are not effective and by encouraging natural shoreline buffers wherever possible.

Friends of the Eau Claire Lakes Area is again taking part in the [Healthy Lakes and Rivers](#) program. Guidance and grants are available for projects like fish sticks, native plantings, water diversions, rock infiltration, and rain gardens. **For more information on the Healthy Lakes and Rivers practices contact Jim Bakken at 715-559-9229 or Lee Wiesner at 715-922-0582.**
