

Water WoRDs

Updates from the Water Resources Division



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Michigan's Great Inland Lakes

Michigan is famous for its surrounding Great Lakes, but more than 11,000 smaller inland lakes also dot the landscape. They come in all shapes and sizes, from Houghton Lake in Roscommon County, which covers more than 31 square miles, to many smaller lakes covering less than 20 acres. These lakes are ecologically important for the state's native plants and animals and economically vital for the state's recreation industry.

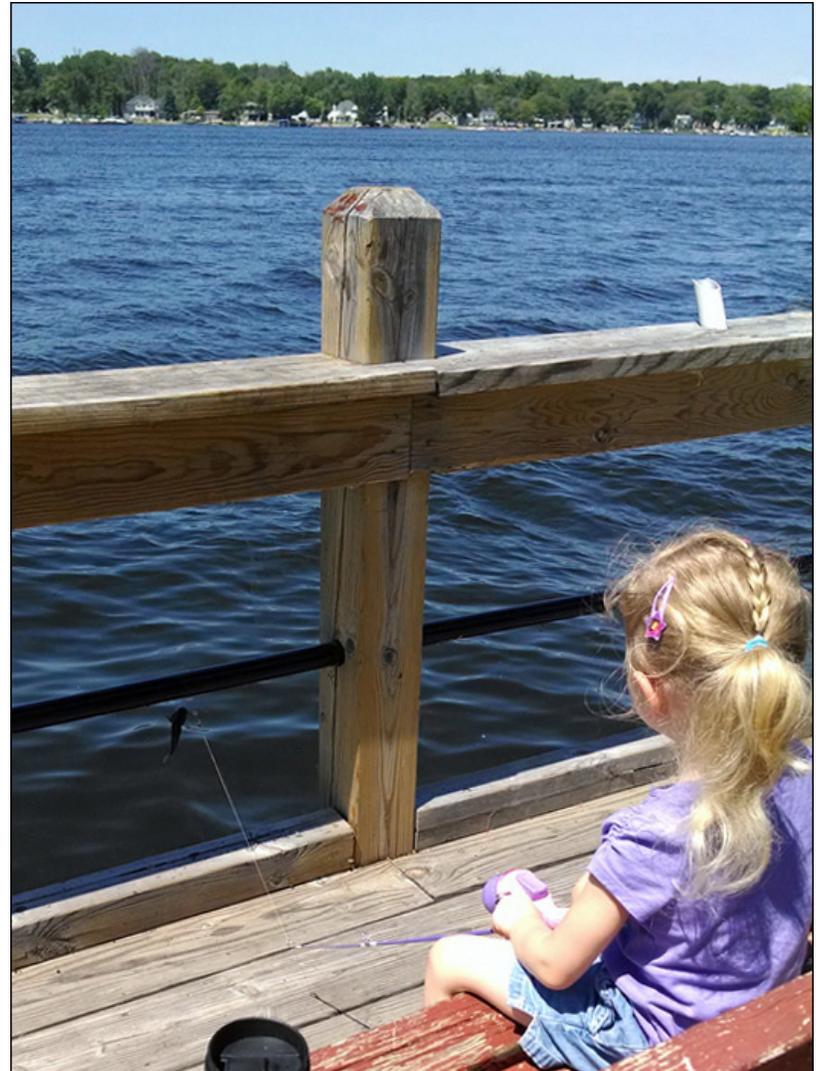
Biologically, one of the most important features of a lake is its trophic status – essentially a classification for how productive a lake is. Trophic status is calculated from a combination of:

- water clarity, or how far into the lake you can see;
- chlorophyll-a concentration, a measurement used as an indicator of how much algae is in the water;
- and phosphorous concentration, an essential nutrient needed by aquatic plants and algae to grow.

Lakes are either “eutrophic” (high productivity), “mesotrophic” (moderate productivity), or “oligotrophic” (low productivity). Although most people consider oligotrophic lakes to be “cleaner,” with clearer water and less algae, lakes naturally progress from oligotrophic to eutrophic over time. However, this process can be greatly accelerated by human activity.

While most of Michigan's inland lakes are healthy, some lakes experience more stress than others. Major stressors to a lake ecosystem include excess nutrients, conversion of shorelines from their natural state to an artificial shoreline, such as riprap or a seawall, and the introduction of invasive species.

Excess nutrient runoff into a lake can increase the productivity of the lake,

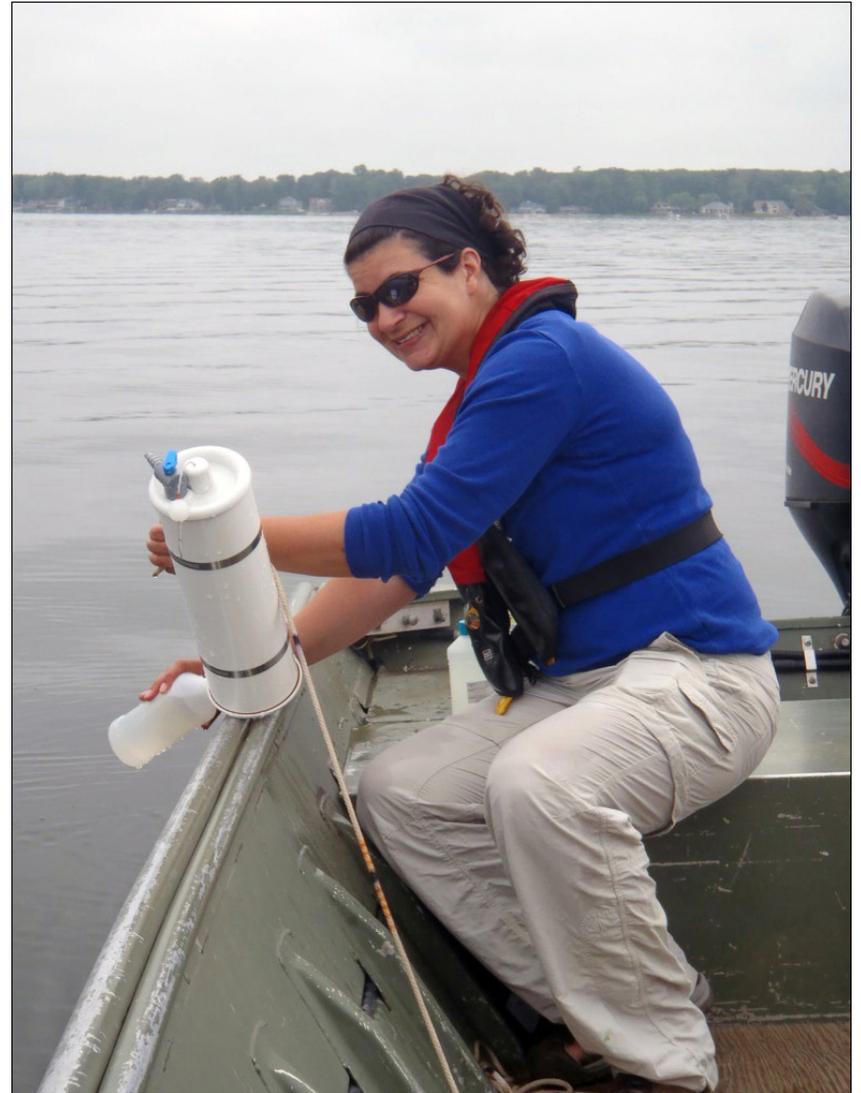


Young angler enjoying one of Michigan's many inland lakes.

causing excess algae in the summer that can sometimes resemble a layer of bright green paint on the surface. In extreme cases, toxic algae may develop. If you are unsure whether or not a certain lake is safe to enter because of excess algal presence, it's usually best to follow the "when in doubt, stay out" motto.

Removing the shoreline's natural vegetation eliminates a filter for nutrients and contributes to an increase in lake productivity. Artificial shorelines also have a tendency to attract unwanted invasive species.

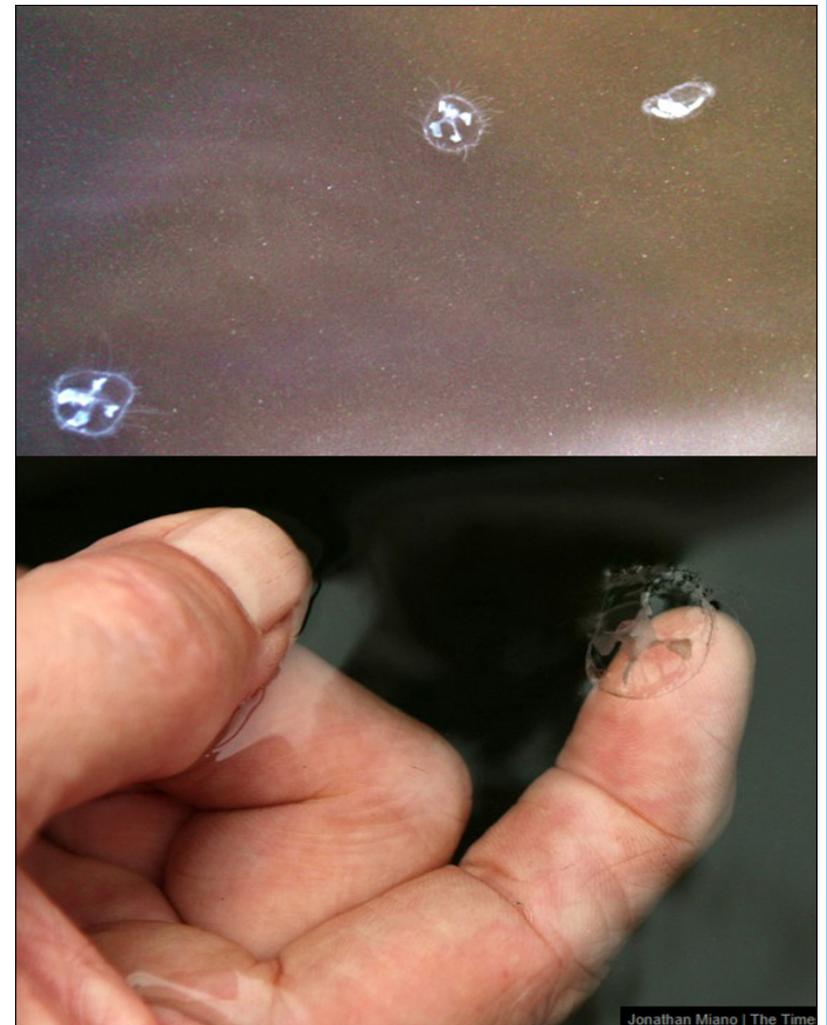
The DEQ's Water Resources Division monitors Michigan's inland lakes to assess water quality and track trends. Monitoring every single lake in the state is impossible. However, in the 1970s and 1980s, DEQ staff sampled 445 randomly selected public access lakes, providing a representative sample of most state lakes greater than 25 acres in size. From 2001-2010, those same lakes were resampled. During both sampling periods, the majority of the lakes were classified as mesotrophic. DEQ also monitors selected lakes in response to specific issues or problems. Additionally, DEQ and the U.S. Geological Survey used satellite images of many Michigan lakes greater than 20 acres in size to predict trophic status and water clarity via an interactive website www.usgs.gov/maps/michigan-lake-water-clarity-interactive-map-viewer/. Because of the importance of inland lakes to Michigan, DEQ is currently in the process of developing a lake monitoring strategy to detect changes and inform management decisions regarding lake water quality.



A WRD aquatic biologist collecting water samples from an inland lake as part of routine monitoring. Data collected at these lakes are used to inform management decisions.

Fun facts about Michigan inland lakes

- During the summer and winter, inland lakes often form distinct warm and cold-water layers, and are sometimes referred to as “two-story lakes.”
- Many inland lakes are home to freshwater jellyfish. They are about the size of a penny and are completely harmless. Sightings are rare though, because they typically only emerge at a lake surface for a couple weeks in the fall and they may not surface again in the same lake for several years.
- Torch Lake, located in Antrim and Kalkaska Counties, has a maximum depth of 285 feet. Lake Erie’s maximum depth is only 210 feet.
- Inland lakes comprise 1,194 square miles, or 2 percent, of Michigan’s total area.
- In the 19th century, prior to electrical refrigeration, entire inland lakes throughout Michigan would have their valuable ice “harvested” every winter once it was around 8 inches thick. The ice was typically loaded onto rail cars, and allowed perishable goods to be shipped across the country.



Freshwater jellyfish found in a Michigan lake, and a canoeist holding a jellyfish to demonstrate their relative size and that they are harmless. Images from www.nwitimes.com and <http://cedarspringspost.com>.

What do you do in the WRD?

Meet Mike Walterhouse. Mike Walterhouse has worked for the WRD since 1993. He earned his B.S. degree from the Fisheries and Wildlife Department at Michigan State University, and began his career in the DNR (and subsequently the DEQ after it was established in 1995) as an aquatic biologist. His primary responsibilities included monitoring lakes, streams and rivers; establishing water quality-based effluent limits for NPDES permits; and developing restoration plans for impaired waters. In 2012, Mike became the WRD's statewide specialist for inland lake monitoring and assessment, and is currently leading an update of our lake monitoring activities. He also serves as the WRD's primary contact for biological assessment in surface waters and is involved in water withdrawal issues. For fun, Mike likes to hunt, fish and golf. He also watches the Chicago Cubs, but admits that usually is more painful than fun.

