Lake Huron

Summary Report 2013

University of Wisconsin–Stevens Point
and
Waushara County Staff and Citizens
To protect the lake, we must protect the "watershed," the land that drains or sheds its water into the lake.
Lake Huron – Location

Southeast of Plainfield
North of Highway 73
South of County Highway P
Township of Springwater

Surface Area: 41 acres
Maximum Depth: 46 feet

Water Flow

- Lake Huron is a seepage lake; most water enters via groundwater. Surface water runoff and direct precipitation contribute water to lesser extents.
- Most water exits Lake Huron via groundwater.

Lake Huron is a seepage lake; most water enters via groundwater. Surface water runoff and direct precipitation contribute water to lesser extents. Most water exits Lake Huron via groundwater.
Land uses and land management practices occurring in a watershed can affect the water quality in a lake. Land uses and land management also play major roles in how water moves across the landscape and how much water soaks into the ground (for long-term storage) or quickly runs off the land. The surface watershed of Lake Huron is 1,600 acres. Agriculture accounts for the major type of land use in the watershed. Lake Huron is surrounded by mostly forest land. Generally, the land closest to the lake will have the greatest immediate impact on water quality.
Groundwater provides water to lakes in Waushara County throughout the entire year. Hard surfaces on the landscape prevent water from soaking into the ground and becoming groundwater. This results in less water flowing to the lake during the winter and between rains. Groundwater pumping can also reduce the amount of water entering lakes.

The quality of groundwater reflects what is happening on the land surface. Precipitation falling on forested land produces clean groundwater, whereas precipitation falling on lands that have chemical use can leach contaminants to groundwater. Groundwater contamination in central Wisconsin may include nitrogen, pesticides, herbicides and other soluble chemicals originating from septic systems, crops, barnyards, road maintenance, etc. Once in the groundwater, these chemicals slowly move towards a lake or river.

On the map below, arrows indicate the direction of groundwater flow to and from the lakes. Most groundwater enters Lake Huron from the west.

Legend
- Roads
- Groundwater Contour Lines
- Groundwater Flow Direction
- Agriculture
- Forest
- Developed, High Intensity
- Developed, Medium Intensity
- Developed, Low Intensity
- Hay/Pasture
- Open Space
- Water
- Wetlands
Shoreland vegetation is critical to a healthy lake’s ecosystem. It provides habitat for many aquatic and terrestrial animals including birds, frogs, turtles, and many small and large mammals. It also helps to improve the quality of the runoff that is flowing across the landscape towards the lake. Healthy shoreland vegetation includes a mix of tall grasses/flowers, shrubs and trees.

Some stretches of the shoreland around Lake Huron have healthy shoreland vegetation (displayed in green), but some stretches could benefit the lake by being restored.
**Aquatic plants** are the forest landscape within a lake. They provide food and habitat for terrestrial and aquatic creatures such as fish, ducks, turtles, invertebrates and other animals. They increase oxygen levels in the water and utilize nutrients that would otherwise be used by algae. A healthy lake typically has a variety of aquatic plant species creating diversity that can help to prevent the establishment of aquatic invasive species.

- The aquatic plant community in Lake Huron is characterized by slightly below average diversity of plant species when compared to other lakes in the Waushara County Lakes Study.
- An aquatic plant survey in 2011 documented 17 species, with the greatest diversity of species in the shallow areas of the western and southwestern portions of the lake. Lake Huron is a hard water lake; such lakes tend to support a less diverse aquatic plant community.
During the 2011 aquatic plant survey, 60 percent of the sites sampled in Lake Huron had vegetative growth. The average depth of sampled sites was 20 feet and the deepest sampled site of 27 feet. The most frequently encountered species were muskgrass, leafy pondweed and sago pondweed. All three are native species commonly found in Wisconsin lakes.

Species Richness is a count of the number of plant species found at a survey point. A greater number of species in a lake helps to make the aquatic plant community more resilient to year-to-year changes and aquatic invasive species. More plant species means more diverse habitat and food sources are available.

The stems, leaves and seeds of southern naiad provide food to waterfowl and different marsh birds and muskrats. The branches offer food and habitat for many fish and invertebrate species.
Lakes go through a natural aging process that results in increased aquatic plant growth, fish, and wildlife over time. Within a lake’s watershed, human activity on the land, in a wetland, or in the lake can dramatically accelerate this process. Depending on land management practices, changes in a lake that may have normally taken centuries to occur may take place in decades or even years. The amounts of nutrients, algal growth, and water clarity measurements help to define the age of a lake. Based on these measures, lakes can be classified for comparison to one another.

**Oligotrophic Lakes**

*Common uses:*
- Swimming
- Skiing
- Boating

*Vegetation of oligotrophic lakes:*
- Very little vegetation

**Mesotrophic Lakes**

*Common uses:*
- Boating
- Fishing

*Vegetation of mesotrophic lakes:*
- Increased vegetation
- Occasional algal blooms

**Eutrophic Lakes**

*Common uses:*
- Fishing
- Wildlife watching

*Vegetation of eutrophic lakes:*
- Lots of aquatic plants
- Frequent algal blooms

Winter fish kills can occur in shallow lakes due to low oxygen levels.
**Phosphorus** is a major nutrient that can lead to excessive algae and rooted aquatic plant growth in lakes. In fact, one pound of phosphorus entering a lake can result in 500 pounds of algal growth. All Waushara County lakes have either sufficient or excessive nutrients for aquatic plant growth, so these lakes will benefit from limiting the addition of more nutrients. Sources of phosphorus include septic systems, animal waste, storm water runoff, soil erosion, and fertilizers for lawns, gardens and agriculture.

Water clarity is a measure of how deep light can penetrate (Secchi depth). Clarity is affected by water color, turbidity (suspended sediment), and algae. Water clarity helps determine where rooted aquatic plants can grow.

- Total phosphorus levels measured when the lake was well-mixed during spring and fall are displayed in the graph to the left.
- During fall and spring 2010-2012, the average total phosphorus level was lower than earlier measurements. Lake Huron is a mesotrophic lake.

- The graph to the left shows water clarity measurements taken between April and November. It is typical for water clarity to vary throughout the year.
- During the summers of 2011 and 2012, on average, the poorest water clarity in Lake Huron was 12.8 feet in June and the best was 14.6 feet in August. In comparison to measurements prior to 2011, water clarity had decreased during the summer.
Lake sediment can help to tell the history of a lake and changes that may have affected the lake related to water quality, the abundance of aquatic plants, and sedimentation or land disturbance in the watershed. These changes are assessed by evaluating the content of the upper layer of the sediment versus lower layers. This information can help to guide management decisions for a lake.

- Analysis of Lake Huron’s sediment core suggests increased disturbance in the lake basin since the time of land clearing.
- Over this time period, the lake has experienced limited increased phosphorus concentrations but large changes in habitat.
- Diatom species and communities, as well as sediment properties, reflect an increase in phosphorus. An increase in aquatic plants and filamentous algae were found in the top of the sediment core.
- As aquatic plants, diatoms and algae decompose, the oxygen in water decreases. This was observed in the top of the core.

This is an example of a sediment core collected from the bottom of a Wisconsin lake. The darker layers indicate organic-rich sediments that are often due to abundant aquatic plants and/or soil erosion from the landscape. Additional analysis of this layer can help to confirm the source(s).

Diatoms are a type of algae commonly found in sediment. They are well-preserved in sediments due to silica-based cell walls which resist degradation.

Different species of diatoms are sensitive to water quality; therefore, changes in the diatom community from the bottom to the top of the sediment core can reveal how water quality in the lake has changed over time.
**Lake Huron – What can you do to help?**

**Stop the Spread of Aquatic Invasive Species!**

**Wetlands and Shorelands:**
- LEARN how to identify invasive plants and animals, and know who to contact if found.
- DO NOT PURCHASE prohibited and restricted species! Whenever possible purchase native plants.
- NEVER transplant water garden plants or aquarium plants into lakes, streams, wetlands, or storm water ponds. Properly dispose of unwanted plants and animals!
- REMOVE invasive exotic plants from your landscape and replace them with native plants or non-invasive exotic plants. Scout annually for new invasive plants.
- AVOID using garden plants from other regions whose invasive potential is poorly understood.

**Lakes and Rivers:**
- LEARN what Wisconsin invasive plants and animals look like and who to contact if seen in a lake or river.
- INSPECT your boat, trailer and equipment when traveling to different water bodies and REMOVE any attached aquatic plants or animals (before launching, after loading, and before transporting on a public highway).
- DRAIN all water from boats, motors, and all equipment after use at a lake.
- NEVER release live fish, bait or pets into a wetland or water body.
- BUY minnows from a Wisconsin bait dealer. Only use leftover minnows at that same water body.

**Lake Users:**
- Run boat engines efficiently
- Observe no/low wake zones
- Refuel away from water
- Dispose of trash properly
- Remove all aquatic plants from boats and trailers
- Respect wildlife and other lake users

**Land Owners:**
- Control soil erosion
- Keep livestock out of lakes and streams
- Control manure runoff
- Carefully manage nutrients and pesticides
- Leave natural shoreland vegetation in place or restore if it has been removed
- Learn to identify and look for invasive species

**Home Owners:**
- Leave natural shoreland vegetation in place or restore if it has been removed
- Leave woody habitat for young fish, turtles and frogs
- Eliminate the use of fertilizer or use no phosphorus fertilizer
- Eliminate or minimize use of pesticides
- Control soil erosion
- Control runoff from rooftops and hard surfaces
- Clean up after pets
- Learn to identify and look for invasive species
Lake Huron – Primary Authors

Authors listed are from the UW-Stevens Point unless otherwise noted.

Aquatic Plants
Jen McNelly

Sediment Core
Samantha Kaplan
Paul Garrison (Wisconsin Department of Natural Resources)

Shoreland Assessments
Ed Hernandez and Waushara County Land Conservation Department Staff
Dan McFarlane

Water Quality and Watersheds
Nancy Turyk, Paul McGinley, Danielle Rupp and Ryan Haney
Ed Hernandez and Waushara County Land Conservation Department Staff

UW-Stevens Point Students: Melis Arik, Nicki Feiten, Sarah Hull, Chase Kasmerchak, Justin Nachtigal, Matt Pamperin, Scott Pero, Megan Radske, Anthony Recht, Cory Stoughtenger, Hayley Templar, Garret Thiltgen

Acknowledgments

We are grateful to many people for supporting this project by providing insight, enthusiasm, and funding. We would like to recognize our project partners:

Waushara County Watershed Lakes Council

Waushara County Staff and Citizens

Wisconsin Department of Natural Resources Professionals, Mark Sessing and Ted Johnson

Wisconsin Department of Natural Resources Lake Protection Grant Program

Dr. Samantha Kaplan and Dr. Paul McGinley

UW-Stevens Point Water and Environmental Analysis Lab