

Vadnais Lake Area Water Management Organization 2024 Water Monitoring Summary



VLAWMO's monitoring program involves:

- » Grab samples on 15 lakes in the watershed
- » Grab samples and remote sensors on Lambert Creek
- » Water quality sampling bimonthly from May through September. Monitoring includes bacteria, chloride, Chlorophyll-A (chl-A), phosphorus, total suspended solids (TSS), pH, conductivity, dissolved oxygen (DO), temperature, and occasional storm sampling.

Water monitoring data gives us important insight into the health of our watershed.

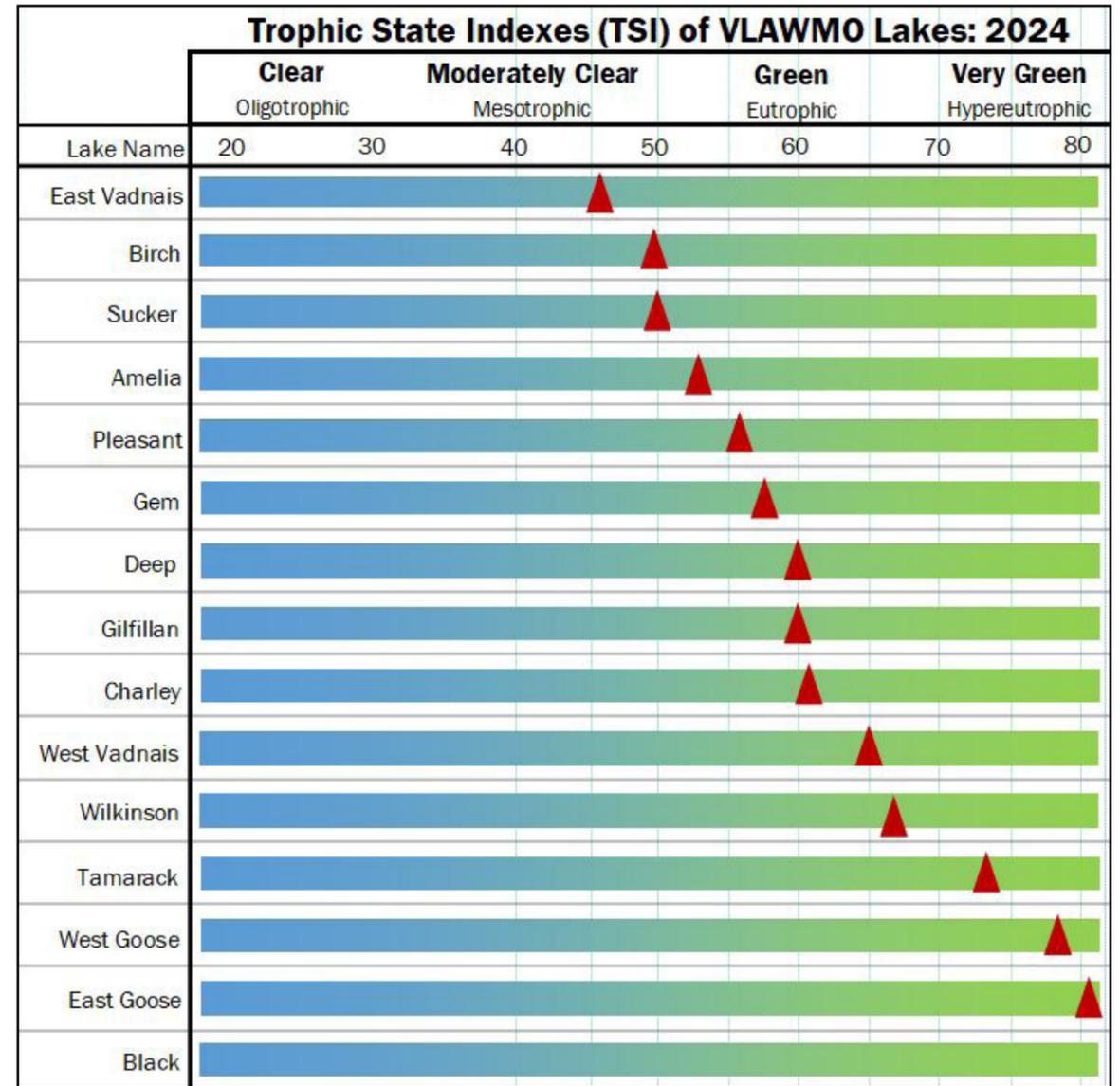


Find the complete 2024 monitoring report at www.VLAWMO.org/resources/reports



Thinking like a lake scientist:

Lake science is a continual quest for data. Results vary from year to year, depending on what's happening within or around a lake. Lake scientists take a long-term approach, using critical thinking to piece together multiple variables and draw conclusions. VLAWMO references Minnesota's state water quality standards. Some of VLAWMO's lakes meet these standards, while others do not.



The graph above shares the Trophic State Index (TSI) of the lakes in VLAWMO's watershed. These values refer to a lake's nutrient levels, transparency, and chlorophyll. The data for each reading is combined to create a single value, depicted above with red arrows.

Oligotrophic: Low nutrient levels and abundant oxygen. May be suitable as an unfiltered water supply.

Mesotrophic: Moderate amount of dissolved nutrients. Iron or manganese taste/odors, increased turbidity.

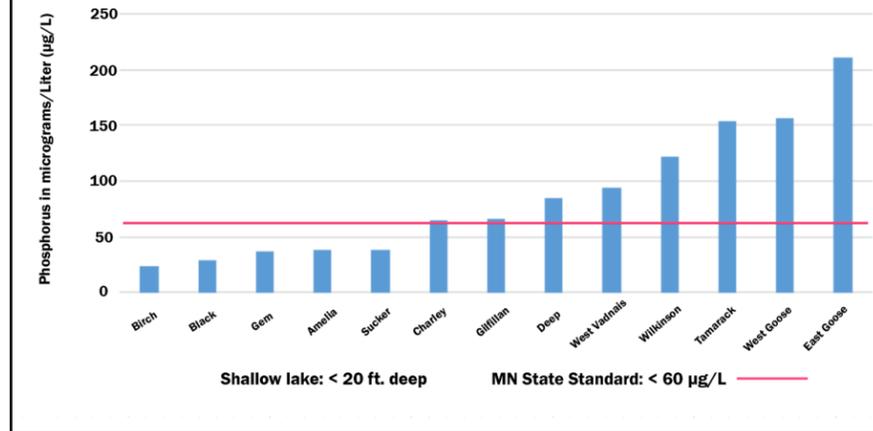
Eutrophic: Nutrient-rich, supporting either a dense plant population or large algae blooms. *Eutrophication* is the natural process of nutrient loading into a waterbody from the surrounding watershed, accelerated by erosion and stormwater runoff.

Hypereutrophic: Exceptionally high nutrients causing dense algae and macrophytes. Rough fish (bullhead, carp) dominate, blue-green algae likely, fish kills possible during algae blooms. Episodes of severe taste and odor.

Nutrients and Chlorides

Visit vlawmo.org/waterbodies for specific lake studies, reports, and lake fact sheets.

Average Total Phosphorus (TP) of VLAWMO Shallow Lakes: 2010-2024



Phosphorus: What is it?

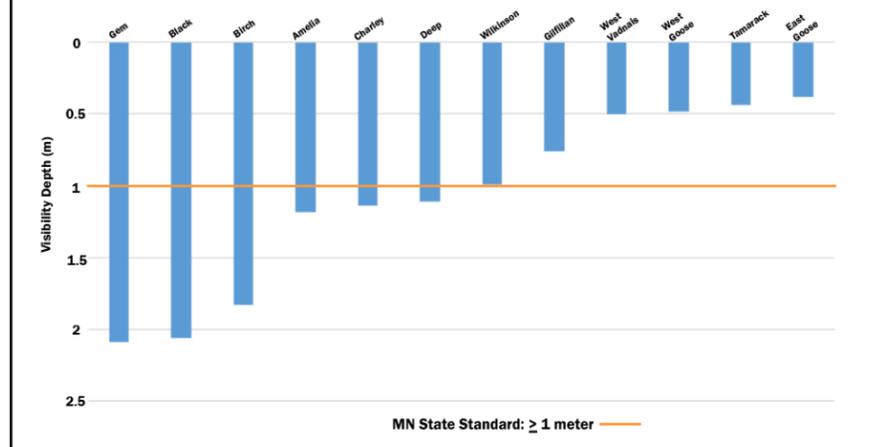
Phosphorus is a naturally occurring nutrient that drives algae growth. One pound of phosphorus can produce up to 500 pounds of algae. Increased algae levels create low oxygen and poor light penetration in lakes, reducing quality of habitat for fish and wildlife.

Phosphorus: Why does it matter?

High phosphorus levels determine whether the water looks like pea soup or an aquarium. Excessive algae can produce foul smells and toxins harmful to humans and pets.

To prevent high phosphorus levels, keep sediment and nutrients like grass clippings and leaves on the landscape and out of waterbodies.

Average Secchi Depth of VLAWMO Shallow Lakes: 2010-2024



Secchi Depth: What is it?

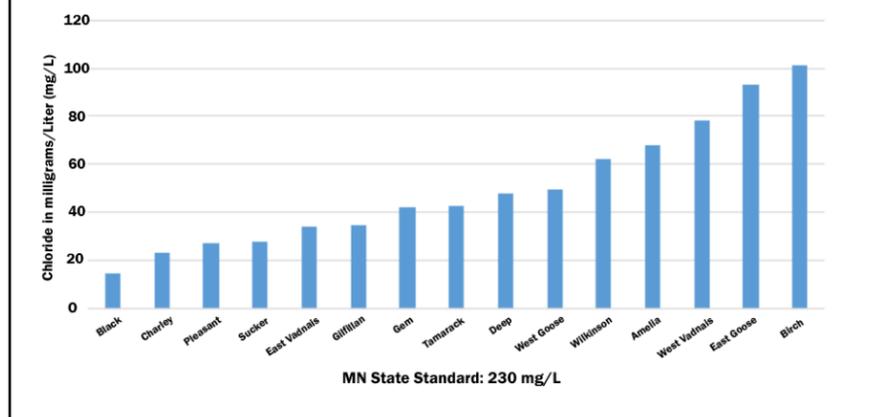
A Secchi disk is a 20-cm flat disk that is lowered into the water until it can no longer be seen. The depth of where the disk disappears, called the Secchi depth, is a measure of the water's clarity, or transparency.

Secchi Depth: Why does it matter?

Water transparency is a basic indicator of risks for most lake uses. This measurement controls how far light can reach, indicating potential challenges for aquatic plants and animals. Poor transparency means extra debris in the water column.

Transparency can be affected by pollutants or sediment draining into the lake. It can also be impacted by existing sediments recirculating from the lake bottom.

Average Chloride Levels of VLAWMO Lakes: 2010-2024



Chloride: What is it?

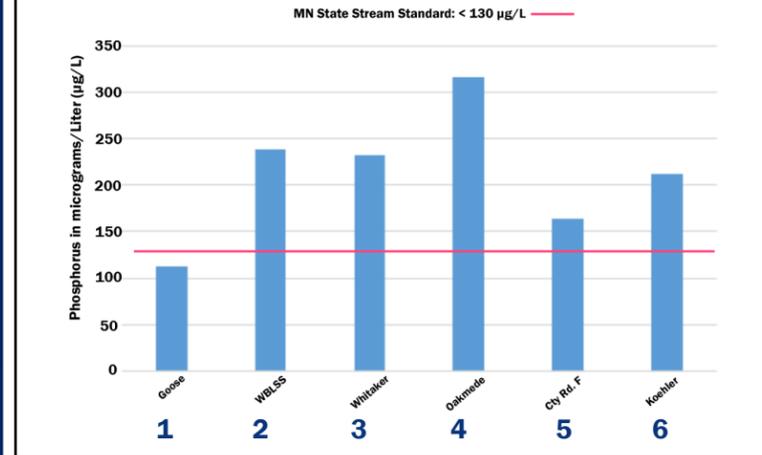
Chloride is a common ingredient in de-icing salts and home water softening. Even a small quantity makes a big impact: One teaspoon of chloride permanently pollutes five gallons of water.

Chloride: Why does it matter?

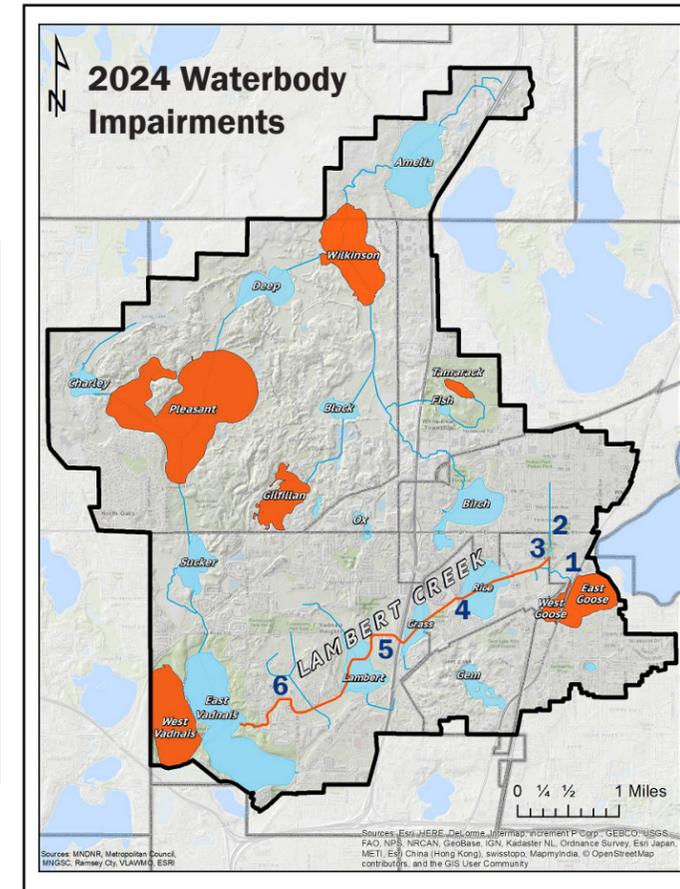
Chloride threatens our freshwater and even our drinking water supply. Chloride is toxic to freshwater fish and plants. It impacts lake temperature and disrupts nutrient cycles. Once chloride is in our water, there is no economical way to remove it. VLAWMO currently has no waterbodies impaired for chloride, but some lakes show upward trends.

Waterbody impairments: VLAWMO has several lakes listed as impaired waterbodies. For a lake to be listed as impaired, it must show a trend of failing to meet water quality standards for several years. Impairments can be assigned for a number of reasons, including high nutrient, bacteria or chloride levels. With the exception of Pleasant, Sucker, and East Vadnais, VLAWMO's lakes are classified as shallow.

Average Total Phosphorus (TP) of Lambert Creek Monitoring Sites: 2010-2024



Lambert Creek is impaired for high bacteria during storm events. Creek monitoring results show high nutrient levels, though the creek is not officially impaired for nutrients. Water samples from six sites are taken along the creek bimonthly from May through September at the locations on the map to the right. *E. coli* bacteria has been detected as largely avian and canine.



Citizen Science

Aquatic Invasive Species (AIS):

VLAWMO partners with Ramsey County Soil and Water Conservation Division to monitor for new infestations of aquatic invasive species. In this program, trained volunteers gather aquatic vegetation samples throughout the growing season. This provides the opportunity for early detection, limiting potential infestation or spread to other lakes.



Right: AIS training in North Oaks.

Macroinvertebrates:

To complement chemistry monitoring, VLAWMO utilizes bio-monitoring at four locations on Lambert Creek and several lake locations including Sucker, Deep, and Pleasant Lakes. This data provides a more robust snapshot of the water's health, as the organisms detected have specific water quality needs and habitat preferences. Examining sample content offers clues about the health of the aquatic habitat and the water itself.

This effort utilizes the LeafPack assessment method, a program of the Stroud Water Research Center. VLAWMO's volunteer group, the Watershed Action Volunteers (WAV), assists in collecting samples and submitting data to the Monitor My Watershed Wiki.



Above: Volunteer Erika Turkington collects a macroinvertebrate sample at Deep Lake.

Visit VLAWMO.org/residents to learn how you can help take care of the watershed from home.

