

Vadnais Lake Area Water Management Organization

2020 Water Monitoring Summary



VLAWMO's monitoring program consists of:

- 15 Lakes: *Grab samples*
- Lambert Creek: *Grab samples, remote sensors*
- Water quality sampling every other week from May to September:
Dissolved oxygen, conductivity, chlorophyll-A, chloride, phosphorus, nitrates, total suspended solids, turbidity, temperature, bacteria, pH, and storm sampling



See the complete report at www.VLAWMO.org/resources/reports

The Watershed at a Glance

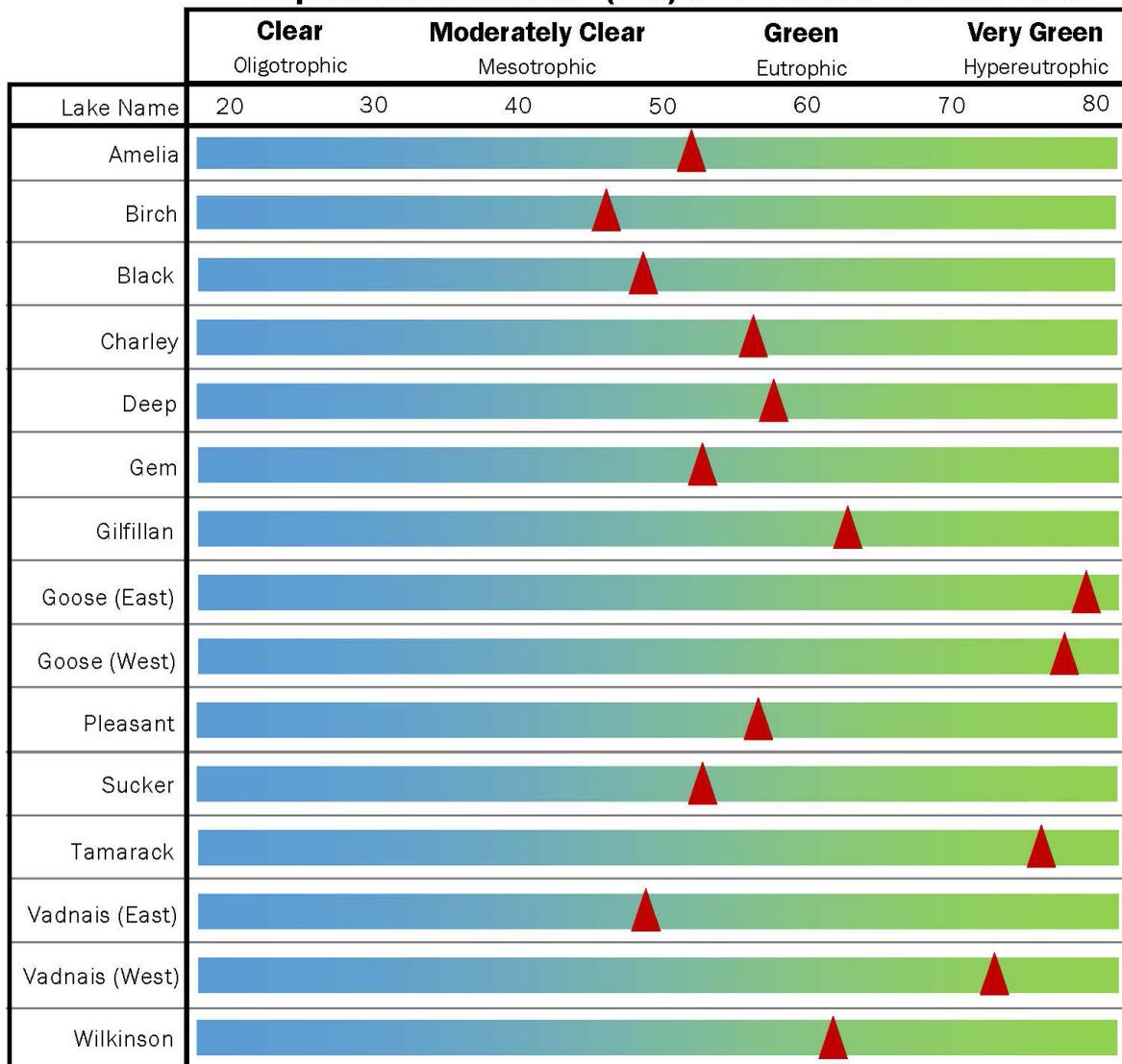
See the 2020 water monitoring report at vlawmo.org/reports for more information.



Thinking like a lake scientist:

Lake science is a continual quest for data, trends, and critical thinking. Lakes can vary from year to year depending on what's happening within as well as around the lake. Because of this, lake scientists take a long-term approach and piece together multiple variables to draw conclusions. Sometimes harm or trends aren't visible to the naked eye, in which case monitoring data provides a more complete picture, along with what potentials exist for the future.

Trophic State Indexes (TSI) of VLAWMO Lakes: 2020



Definitions:

TSI: Trophic Status Index. The trophic status of a lake pertains to its nutrient levels, transparency, and chlorophyll. The data for each reading is combined to create a single value, which is a TSI index, depicted with red arrows.

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

Mesotrophic: A moderate amount of dissolved nutrients. Iron or manganese taste/odors, turbidity increases.

Eutrophic: Rich in nutrients, supporting either a dense plant population or large algae blooms.

Eutrophication is the process of nutrient loading into a waterbody from the surrounding watershed (i.e. upland area). It is a natural process that can be accelerated by stormwater runoff and erosion.

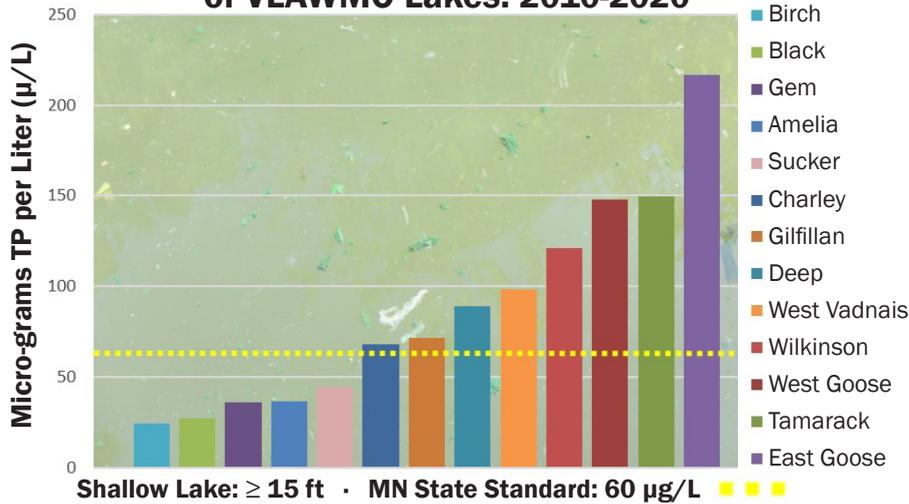
Hypereutrophic: Exceptionally high nutrients causing dense algae and macrophytes. Rough fish (bullhead, carp) dominate, blue-green algae most likely, fish kills possible during algae blooms. Episodes of severe taste and odor.



Nutrients and Chlorides

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

Average Total Phosphorus (TP) of VLAWMO Lakes: 2010-2020



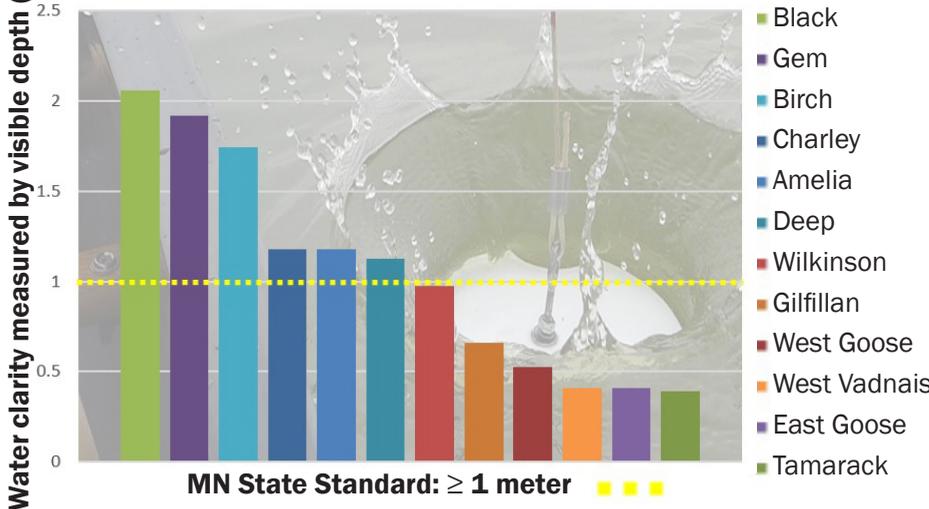
Phosphorus: What is it?

Phosphorus is a naturally occurring nutrient and a main driver of algae growth. 1 lb. of phosphorus can produce up to 500 lbs. of algae. Increased algae levels create low oxygen, poor light penetration, and reduced fish and wildlife habitat.

What it means to me:

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 control this, it's important to keep sediment and nutrients on the landscape and out of waterbodies.

Average Secchi Disk Depth of VLAWMO Shallow Lakes: 2009-2020



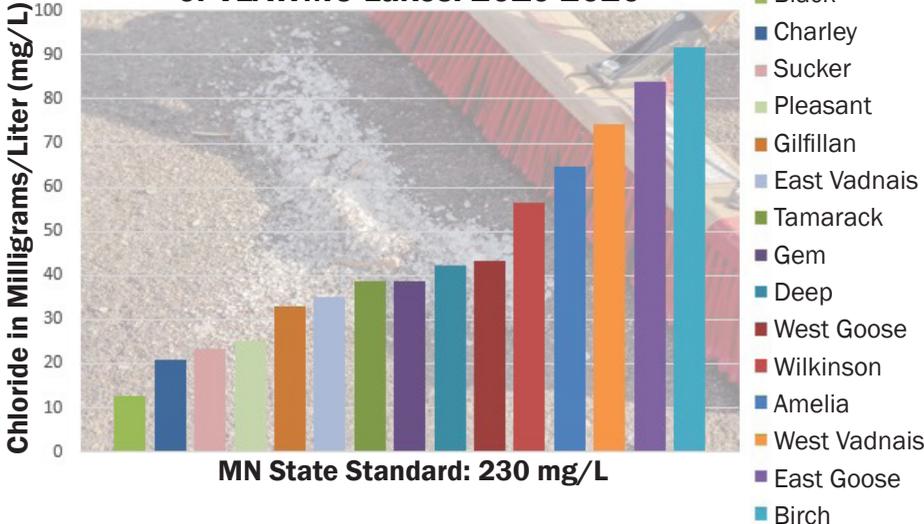
Secchi Disk: What is it?

A Secchi disk is a 20 cm disk that is lowered into the water until it can no longer be seen by the observer. This depth of disappearance, called the Secchi depth, is a measure of the transparency of the water.

What it means to me:

Transparency is the most basic indicator to assess risks for almost any lake use, and informs what to be aware of downstream. Poor transparency means there's something extra in the water that needs to be looked at. Transparency can be affected by pollutants or sediment draining into the lake, or by existing sediments from the lake bottom re-circulating into the water.

Average Chloride Levels of VLAWMO Lakes: 2010-2020



Chloride: What is it?

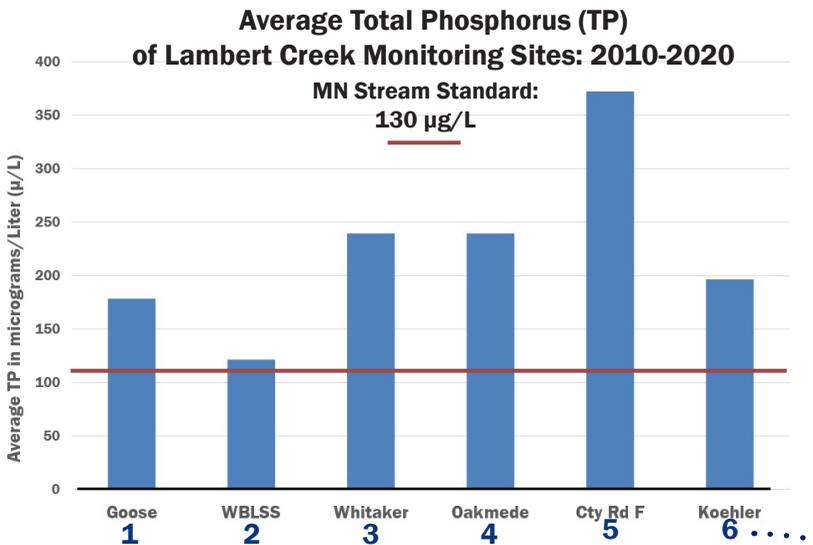
Chloride is a common ingredient in salt de-icers and home water softening. Chloride is a permanent pollutant to water quality, requiring only 1 tsp to pollute 5 gallons of water. It is toxic to aquatic life and interrupts lake temperature and nutrient cycles.

What it means to me:

Chloride poses threats to freshwater and even drinking water supplies, because there is no economical way to remove it. VLAWMO currently has no waterbodies impaired for chloride, but some lakes show upward trends. Lake chloride levels can decline as water flushes through, but that chloride will be present wherever the water goes.



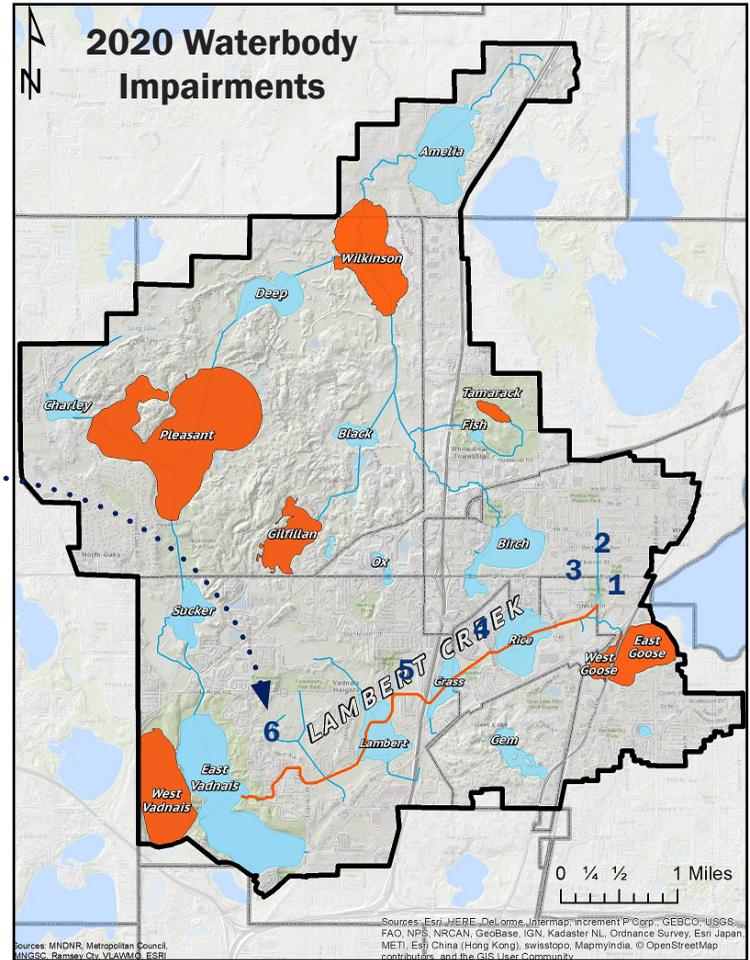
Lambert Creek:



Lambert Creek is impaired for high bacteria during storm events, and although not officially impaired for nutrients, the overall creek results show a trend above the State standard. Water samples from six sites are taken along the creek every other week from May to September (locations on map, right). E. coli bacteria has been detected as largely avian and canine.

Waterbody impairments: VLAWMO has seven lakes and one creek impaired under MN water quality standards. For a lake to be listed as impaired, it must show a trend in being above standards for several years. Impairments can be assigned for a variety of reasons such as nutrients, bacteria, chloride, or others. VLAWMO's lakes are classified as shallow except for Pleasant and East Vadnais, classified as deep. Deep and shallow lakes have different standards due to differences in how they cycle nutrients, form temperature gradients, and respond to wind and winter conditions.

Visit VLAWMO.org/get-involved to see how you can be a part of the solution!

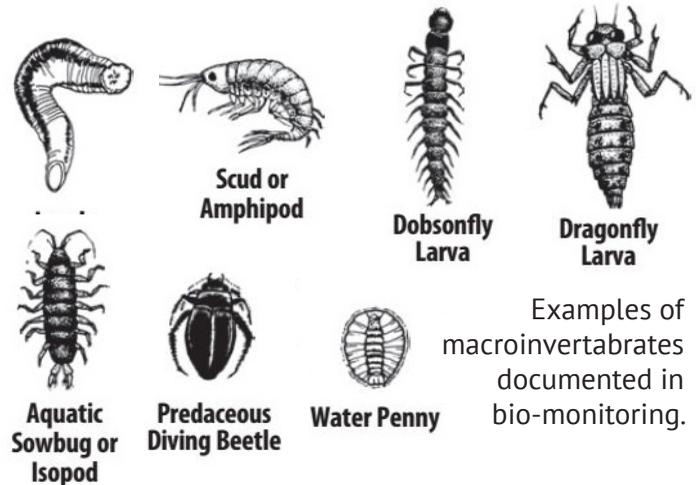


Bio-Monitoring

To compliment chemistry monitoring, VLAWMO utilizes bio-monitoring to gauge what's living in the lake or stream. This data provides a long-term snapshot of the water's health, because certain organisms favor certain water quality and habitat conditions. Based on what we find in our samples, we gain clues about what's happening in the water over time and through the seasons.

This effort is supported by volunteers using the Leaf Pack program. Packs of leaves are placed at specific locations for three weeks, and retrieved for species documentation. Examples include dragonfly and mayfly larvae, leeches, scuds, snails, or aquatic worms.

In 2020, four locations were monitored along Lambert Creek, in addition to the Charley and Deep Lake channels, as well as the Lambert Lake Pond. Visit vlawmo.org/get-involved to learn how to be involved with this exciting new program.



Right: Staff placing a Leaf Pack for macroinvertebrate monitoring in Lambert Creek.

