

2018-19 Water Quality Update for Maple Lake



The Minnesota Pollution Control Agency has established water quality standards for lakes that vary with location (ecoregion) and lake depth. Because Maple Lake is classified as a shallow lake (less than 15 feet deep), the state has applied water quality standards that are less strict (allowing higher nutrient concentrations and lower transparency) than the standards that are applied to deeper lakes. The following standards have been applied to Maple Lake water quality data (May-September averages from the last 10 years of data):

- Total Phosphorus should be <60 ug/L (micrograms per liter, or parts per billion).
- Chlorophyll-a should be <20 ug/L.
- Secchi disk depths should be >1.0 meters.

The Maple Lake Improvement District has continued to collect regular water quality samples. Pollutant levels have slightly decreased, and water clarity has increased in recent, 2009-2018 data.

- 2009-2018 Total Phosphorus = 36.93 ug/L
- 2009-2018 Chlorophyll-a = 12.76 ug/L
- 2009-2018 Secchi = 1.44 m

In response to complaints of nuisance algae in Maple Lake in 2018, the Red Lake Watershed District (RLWD) collected samples and utilized RMB Environmental Laboratories' (RMB Labs) algae identification service. A sample of lake water and floating algae clumps was collected from a dock in the Maple Bay area. Analysis by RMB Labs found that the dominant forms of phytoplankton were diatoms and green algae (Spirogyra). Spirogyra is common in freshwater habitats and may develop slimy, filamentous green masses. It can be a nuisance but is not harmful. In addition to identifying the dominant form of algae, however, the lab also noted that potentially toxic species of blue-green algae were also present in the sample.

July 6, 2018: RLWD staff collected a sample that included multiple floating clumps of algae near the southwest access and tested it with an algal toxin test strip. The test indicated that there were approximately 5 µg/L of microcystin algal



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toxins in the sample. Information on the EPA website categorizes that concentration as a “low risk.” The concentration of 4 ug/L was noted on the NOAA website as a level that could be an irritant to people with allergies. A microcystin (algal toxin) concentration of 4 ug/L is also noted as a draft EPA advisory concentration for recreational exposures (EPA recommends a swimming advisory for concentrations higher than that level).

July 9, 2018: The RLWD collected another sample from the public swimming beach on the north end of the lake on and sent it to RMB Labs for analysis. A more thorough analysis was conducted on that sample to accurately quantify the different types of phytoplankton. Cyanobacteria (blue-green algae) comprised 7.4% of the total units (cells/colonies/filaments) per liter of phytoplankton found in the sample.

July 27, 2018: Samples were collected from the swimming beach on the north end of the lake (wading depth) and from the boat access on the southwest end of the lake. Both samples had a microcystin algal toxin concentration of approximately 5 µg/L.

August 24, 2018: Maple Lake was sampled for algal toxins at the north swimming beach and the concentration had decreased since July (0-1 µg/L).

Reducing nutrients in the lake will take teamwork among lakeshore owners, backlot owners, farmers, other landowners, volunteers, and local government. Agricultural runoff is one source of sediment and nutrient runoff to the lake that can be controlled with best management practices. Native plants along lakeshore can help prevent erosion and filter runoff. Many native plants are also beautiful and beneficial to pollinators. Aquatic plants can help stabilize the sediment and nutrients on the bottom of the lake. Local governments can provide and seek out additional funding for projects that will improve water quality in the lake.



In 2019, the RLWD began regularly testing water from the public beach on Maple Lake for algal toxins. No algal toxins were found in the **June 27 and July 2, 2019** samples. A temperature logger has been deployed to see if temperature changes affect changes in algal toxin concentrations. Samples will be collected once every two weeks. Results will be shared with the MLID and on the Maple Lake, Mentor Facebook page. Because of the measurable amounts of algal toxins that were found in within Maple Lake last year, the lake will serve as a “sentinel” on behalf of other area lakes in 2019. If algal toxins are found again in Maple Lake during the regular sampling, other shallow and/or eutrophic lakes within the RLWD (Badger Lake, Oak Lake, Hill River Lake, Cameron Lake, and others) will also be tested for the presence of algal toxins.

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