



## Water Quality Monitoring by Satellite

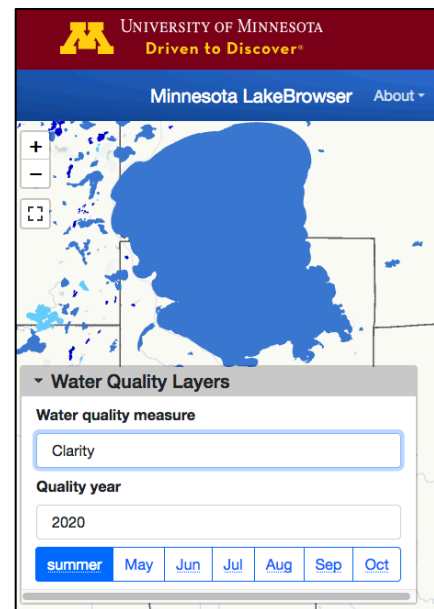
### View Mille Lacs Lake Data with the Minnesota LakeBrowser

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Water quality monitoring of Mille Lacs Lake and its surrounding watershed is ongoing with water sample collection pursued annually by the Mille Lacs Band Department of Natural Resources and carried out on a 10-year cycle by the Minnesota Pollution Control Agency (MPCA). The MPCA's Water Quality Monitoring Strategy 2021-2031 publication is available for download: <https://tinyurl.com/y3zus73y>. The Mille Lacs, Aitkin, and Crow Wing Soil and Water Conservation Districts and members of the Mille Lacs Lake Watershed Management Group (MLLWMG) have also collected data over the years; summaries of results are available on MLLWMG's website: <https://tinyurl.com/2p8mr47h>.

But not all studies are done using water sampling. Since 2002 the University of Minnesota has been using Landsat 8 and European Sentinel-2 satellites to remotely measure water clarity, dissolved organic matter, and chlorophyll-a in Mille Lacs and other state lakes. You can explore their findings using their online tool, the Minnesota LakeBrowser, available here: <https://tinyurl.com/4jkkkd2f>. It provides snapshots of information from moments in time as well as options to view seasonal cycles and long-term trends. The LakeBrowser covers more than 10,500 lakes measured 11 times from 1975–2018. It also includes searchable maps of chlorophyll concentrations and CDOM (colored dissolved organic matter) levels for several recent years.

The Minnesota LakeBrowser site provides links to additional information from the Minnesota DNR and the MPCA. You can access regional summaries by ecoregion, county, or watershed. (Note that the Rum River Watershed includes the sub-watershed of Mille Lacs.) You can see changes over time: Mille Lacs Lake water clarity has increased from about 2 – 3 meters in 1975 to 2 – 4+ meters in 2020. You can view how CDOM varies during the year with concentrations around Mille Lacs' bays, shorelines, and nearby small lakes increasing as the summer wears on. Chlorophyll-a also shows seasonal variation from a low of about 4 micrograms/liter in the spring of 2020 to 16 micrograms/liter in the fall.



Although these studies show that Mille Lacs water quality is good overall, take caution in interpreting this data. Remember that continued protection of our priceless natural gift of Mille Lacs is critical.

Visit [MilleLacsWatershed.org](https://MilleLacsWatershed.org) to learn more about supporting a healthy lake environment.

Image: Screen capture from the Minnesota LakeBrowser website. © 2021 Regents of the University of Minnesota.