



Mille Lacs Lake

DNR ID: 48-0002

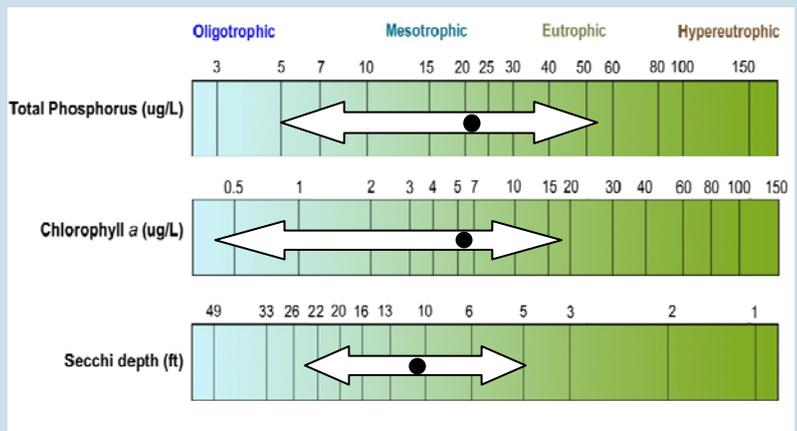
Vitals		Physical Characteristics	
MN Lake ID:	48-0002-00	Surface area (acres):	128,223
Counties:	Aitkin, Mille Lacs, Crow Wing	Littoral area (acres):	33,129
Lake Classification:	General Development (GD)	% Littoral area:	26%
Major Watershed:	Rum River	Max depth (ft):	43 (m): 13.1
Latitude/Longitude:	46.2333333/ -93.64194444	Mean depth (ft):	21 (m): 6.4
Water Body Type:	Public	Lakeshed size (acres):	116,480
Invasive Species	Eurasian watermilfoil, zebra mussels, Spiny Water Fleas	Lakeshed : lake area ratio	1.9:1
		Inlets / Outlets / Accesses	14 (perennial) / 1 / 12

Total Phosphorus

Mille Lacs Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in Mille Lacs Lake in 2005-2012. The majority of the data points fall into the mesotrophic and eutrophic ranges.

Chlorophyll *a*

Chlorophyll *a* is the pigment that makes plants and algae green. Chlorophyll *a* is tested in lakes to determine the algae concentration or how "green" the water is. Chlorophyll *a* was evaluated in Mille Lacs Lake from 2005-2012. Chlorophyll *a* concentrations remained below 20 ug/L on all sample dates indicating no nuisance algae blooms. During 4 sample dates in late summer chlorophyll *a* results were greater than 10 ug/L indicating minor algae blooms.



Lake Mille Lacs total phosphorus, chlorophyll *a* and transparency historical ranges. The arrow represents the range across all sites and the black dot represents the historical mean across all sites. Figure adapted after Moore and Thornton, [Ed.]. 1988. Lake and Reservoir Restoration Guidance Manual. (Doc. No. EPA 440/5-88-002)

Transparency (Secchi Depth)

Transparency is how easily light can pass through a substance. In lakes, it is how deep sunlight penetrates through the water. Plants and algae need sunlight to grow, so they are only able to grow in areas of lakes where the sun penetrates. Water transparency depends on the amount of particles in the water. An increase in particulates results in a decrease in transparency. The annual mean transparency ranges from 6.7 to 16.5 feet. The transparency throughout the lake appears to be relatively uniform. Mille Lacs Lake shows no evidence of water quality trends. That means that the water quality is stable.

Trophic State Index (TSI)

Phosphorus (nutrients), chlorophyll *a* (algae concentration) and Secchi depth transparency) are related. As phosphorus increases, there is more food available for algae, resulting in increased algal concentrations. When algal concentrations increase, the water becomes less transparent and the Secchi depth decreases. The results from these three measurements cover different units and ranges and thus cannot be directly compared to each other or averaged. In order to standardize these three measurements, we convert them to a trophic state index (TSI). The mean TSI (46) for Mille Lacs Lake falls into the mesotrophic range. There is good agreement between the TSI for phosphorus (42) and chlorophyll *a* (48), indicating that these variables are strongly related. Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer.

Mille Lacs

