Land Services Department
CROW WING COUNTY
BRAINERD, MINNESOTA 56401

Crow Wing County Water Quality Factsheet Series

North Long Lake

DNR ID: 18-0372

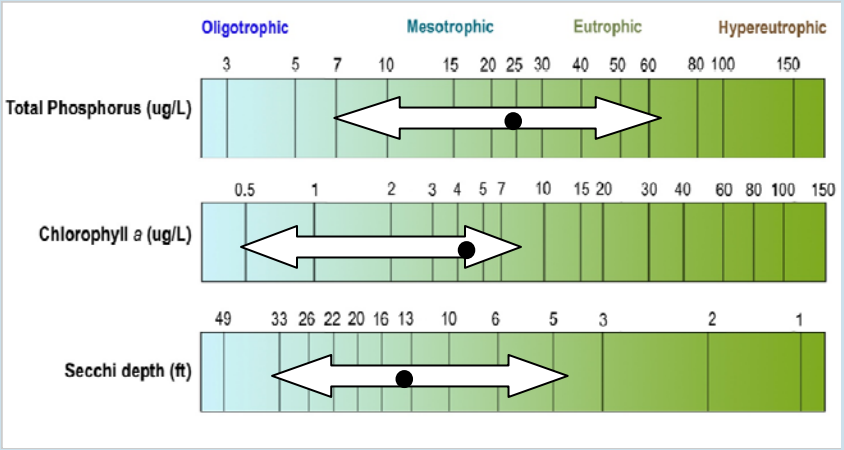
Vitals		Physical Characteristics		
MN Lake ID:	18-0372-00	Surface area (acres):	6,143	
County:	Crow Wing	Littoral area (acres):	3,905	
Lake Classification:	General Development (GD)	% Littoral area:	64%	
Major Drainage Basin:	Upper Mississippi River	Max depth (ft):	97	(m): 29.6
Latitude/Longitude:	46.4375/-94.24194444	Mean depth (ft):	16	(m): 4.9
Water Body Type:	Public	Lakeshed size (acres):	12,970	
Invasive Species	None documented	Lakeshed : lake area ratio	2.1:1	
		Inlets / Outlets / Accesses	1+ / 1 / 4	

Total Phosphorus

North Long Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in North Long L. in 1975, 1984, 1998, and 2007-2008. The data indicate that total phosphorus concentrations increase slightly throughout the year.

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 North Long Lake in 1975, 1984, 1998, and 2007-2008. Chlorophyll *a* concentrations remained below 10 ug/L in all years at all sites, indicating clear water most of the summer. The chlorophyll a concentrations stay relatively consistent throughout the summer.



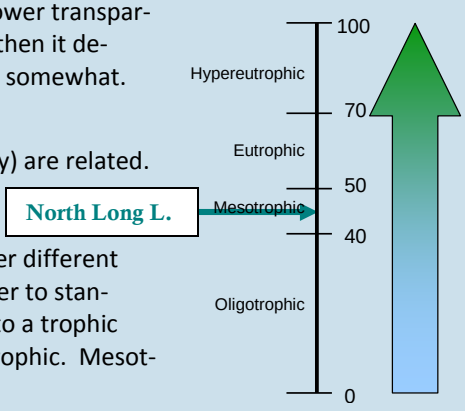
North Long Lake total phosphorus, chlorophyll *a* and transparency historical ranges. The arrow represents the range and the black dot represents the historical mean (Primary Site 210). Figure adapted after Moore and Thornton, [Ed.]. 1988. Lake and Reservoir Restoration Guidance Manual. (Doc. No. EPA 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. All three basins are relatively similar in transparency. In the past few years, the west basin had a lower transparency than the main and east basins. North Long Lake transparency is highest in May and then it declines slightly throughout the rest of the summer. In October, the transparency rebounds somewhat.

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 to make them directly comparable, we convert them to a trophic state index (TSI). The mean TSI(42-44) for North Long Lake indicates all basins are Mesotrophic. Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer.



Local association info: North Long Lake Association, P.O. Box 54, Merrifield, MN 56465, www.northlong.com