



Cross Lake

DNR ID: 18-0312

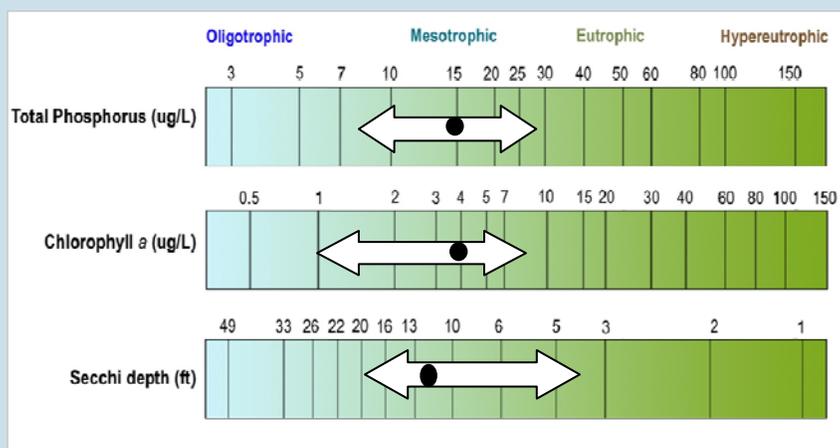
Vitals		Physical Characteristics	
MN Lake ID:	18-0312-00	Surface area (acres):	1,813
Zoning Authority:	Crow Wing County, Crosslake	Littoral area (acres):	879
Lake Classification:	General Development (GD)	% Littoral area:	49%
Major Drainage Basin:	Pine River Watershed	Max depth (ft):	84 (m): 25.6
Latitude/Longitude:	46.66805556/-94.12694444	Mean depth (ft):	NA
Water Body Type:	Public	Lakeshed size (acres):	2,918
Invasive Species	Curly-leaf pondweed	Lakeshed : lake area ratio	2:1
		Inlets / Outlets / Accesses	2 / 1 / 2

Total Phosphorus

Cross Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in Cross Lake in 2003 – 2011. There is no noticeable seasonal pattern in the data. The majority of the data points fall into the mesotrophic range without any outliers.

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 Cross Lake in 2003-2011. Chlorophyll a concentrations varied throughout the year and year-to-year, but remained below 10 ug/L, indicating clear water most of the summer.



Cross Lake total phosphorus, chlorophyll a and transparency historical ranges. The arrow represents the range and the black dot represents the historical mean (Primary Site 101). 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 mean transparency for Cross Lake ranges from 10.1 to 15.3. The three of the last five years appear to be better than the long-term average. Site 101 shows no significant trend in transparency from 1984-1996, 2004, 2007-2011. That means the transparency is not getting significantly better or worse.

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 for Cross Lake falls in the mesotrophic range. Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer.

