



Lake Hubert

DNR ID: 18-0375

Vitals

MN Lake ID:	18-0375-00
Zoning Authority:	Crow Wing County, Nisswa
Lake Classification:	General Development (GD)
Major Watershed:	Crow Wing River
Latitude/Longitude:	46.48805556 / -94.26472222
Water Body Type:	Public
Invasive Species	Curly-leaf pondweed

Physical Characteristics

Surface area (acres):	1287
Littoral area (acres):	465
% Littoral area:	36%
Max depth (ft):	83 (m): 25.3
Mean depth (ft):	N/A
Lakeshed : lake area ratio	2:1
Inlets / Outlets / Accesses	1 / 1 / 1

Total Phosphorus

Lake Hubert is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in Lake Hubert in 2002-2004, 2006-2012. The data do not indicate much seasonal variability. The majority of the data points fall into the mesotrophic range.

Chlorophyll *a*

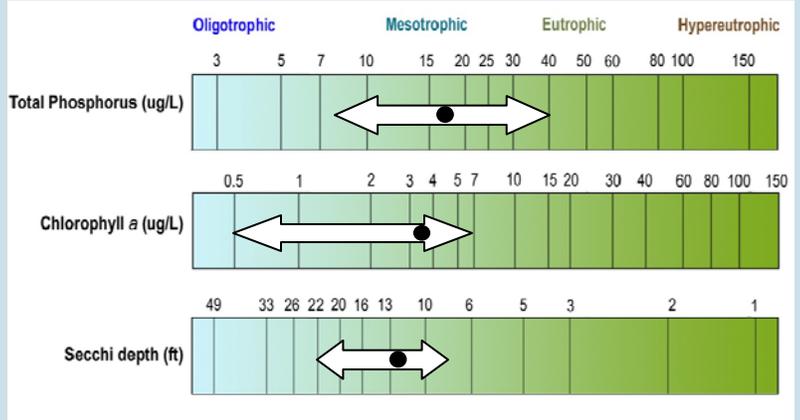
Chlorophyll *a* is the pigment that makes plants and algae green. Chlorophyll *a* is tested in lakes to determine the algae concentration or how "green" the water is. Chlorophyll *a* was evaluated in Lake Hubert in 2002-2004, and 2006-2012. Chlorophyll *a* concentrations remained well below 10 ug/L on all sample dates indicating clear water most of the summer.

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 Lake Hubert ranges from 9.0 to 18 feet and appears to be relatively uniform throughout the lake. Lake Hubert shows no statistically significant 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 (43) for Lake Hubert falls into the mesotrophic range. There is good agreement between the TSI for phosphorus (45), chlorophyll *a* (43) and transparency (40), indicating that these variables are strongly related. Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer.



Lake Hubert total phosphorus, chlorophyll *a* and transparency historical ranges. The arrow represents the range and the black dot represents the historical mean (Primary Site 206). Figure adapted after Moore and Thornton, [Ed.]. 1988. Lake and Reservoir Restoration Guidance Manual. (Doc. No. EPA 440/5-88-002)

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