



Nokay Lake

DNR ID: 18-0104

Vitals

MN Lake ID:	18-0104-00
Zoning Authority:	Crow Wing County
Lake Classification:	Recreational Development (RD)
Major Drainage Basin:	Upper Mississippi River
Latitude/Longitude:	46.37638889 / -93.96555556
Water Body Type:	Public
Invasive Species	None

Physical Characteristics

Surface area (acres):	698
Littoral area (acres):	221
% Littoral area:	32%
Max depth (ft):	42 (m): 12.8
Mean depth (ft):	N/A
Inlets / Outlets / Accesses:	4 / 1 / 1
Lakeshed to lake area ratio:	5:1

Total Phosphorus

Nokay Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in Nokay Lake in 2007 and 2008. The data show that phosphorus concentrations increase somewhat as the summer progresses. The majority of the data points fall into the mesotrophic and eutrophic ranges.

Chlorophyll *a*

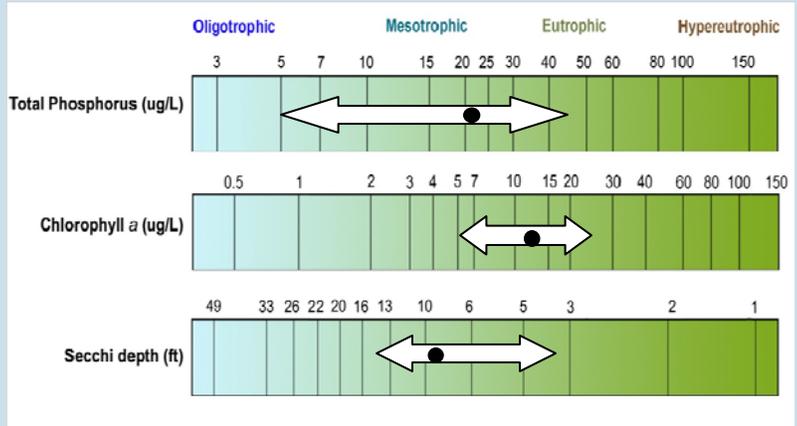
Chlorophyll *a* is the pigment that makes plants and algae green. Chlorophyll *a* is tested in lakes to determine the algae concentration or how "green" the water is. Chlorophyll *a* was evaluated in Nokay Lake in 2007 and 2008. Chlorophyll *a* concentrations reached 10 ug/L both years and 20 ug/L twice in 2007, signaling algae bloom frequency and severity. These results follow the phosphorus results.

Transparency (Secchi Depth)

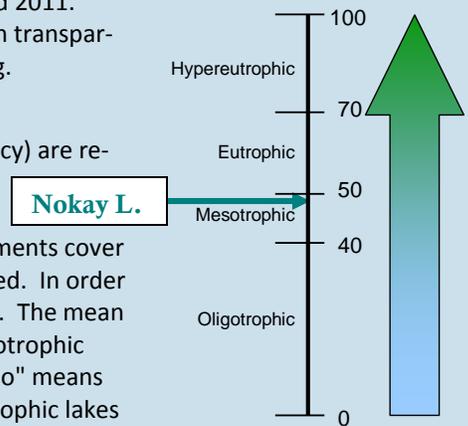
Transparency is how easily light can pass through a substance. In lakes, it is how deep sunlight penetrates through the water. Plants and algae need sunlight to grow, so they are only able to grow in areas of lakes where the sun penetrates. Water transparency depends on the amount of particles in the water. An increase in particulates results in a decrease in transparency. The mean transparency is 9.9 feet. Annual means were near the long-term mean in 2006, 2008, and 2011. There is not enough data to conduct a trend analysis (using data through 2011), but mean transparency did remain within 3 feet of the long-term mean during the entire span of monitoring.

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 for Nokay Lake falls on the border between mesotrophic and eutrophic (49-51). Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer. "Meso" means middle or mid; therefore, mesotrophic means a medium amount of productivity. Mesotrophic lakes are commonly found in central Minnesota and have clear water with algal blooms in late summer. They are often good for walleye fishing.



Nokay Lake total phosphorus, chlorophyll *a* and transparency historical ranges. The arrow represents the range and the black dot represents the historical mean (Primary Site 201). Figure adapted after Moore and Thornton, [Ed.], 1988. Lake and Reservoir Restoration Guidance Manual. (Doc. No. EPA 440/5-88-002)



Local association info: none available