



Red Sand Lake

DNR ID: 18-0386

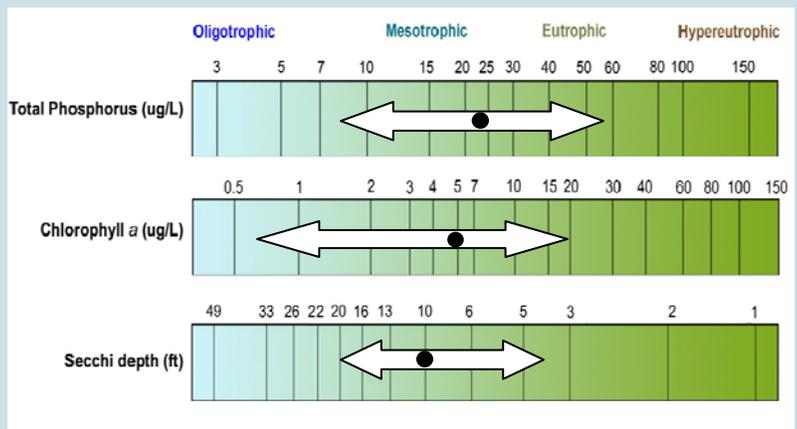
Vitals		Physical Characteristics	
MN Lake ID:	18-0386-00	Surface area (acres):	523
Zoning Authority:	Crow Wing County, City of Baxter	Littoral area (acres):	523
Lake Classification:	Recreational Development (RD)	% Littoral area:	100%
Major Drainage Basin:	Upper Mississippi River	Max depth (ft):	15 feet (4.6 m)
Latitude/Longitude:	46.37000000 / -94.28000000	Mean depth (ft):	N/A
Water Body Type:	Public	Inlets / Outlets / Accesses:	5 / 1 / 1
Invasive Species	None	Lakeshed to lake area ratio:	6:1

Total Phosphorus

Red Sand Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in Red Sand Lake in 2002, 2006-2011. The data do not indicate much seasonal variability. The higher phosphorus in May could be due to spring turnover. 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 concentrations greater than 10 ug/L are perceived as a mild algae bloom, while concentrations greater than 20 ug/L are perceived as a nuisance. Chlorophyll a was evaluated in Red Sand Lake in 2002, 2006-2011. Chlorophyll a concentrations exceeded 10 ug/L in most years, indicating minor algae blooms. Concentrations only reached 20 ug/L once in 2002.



Red Sand 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)

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 transparency annual means ranges from 8.3 to 12.8 feet, and hovers around the mean showing year-to-year variability. Red Sand Lake shows no significant evidence of a trend in water quality for transparency. This means 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 for Red Sand Lake falls in the mesotrophic range (TSI 40-50). Mesotrophic lakes 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.

