



Roosevelt Lake

DNR ID: 11-0043

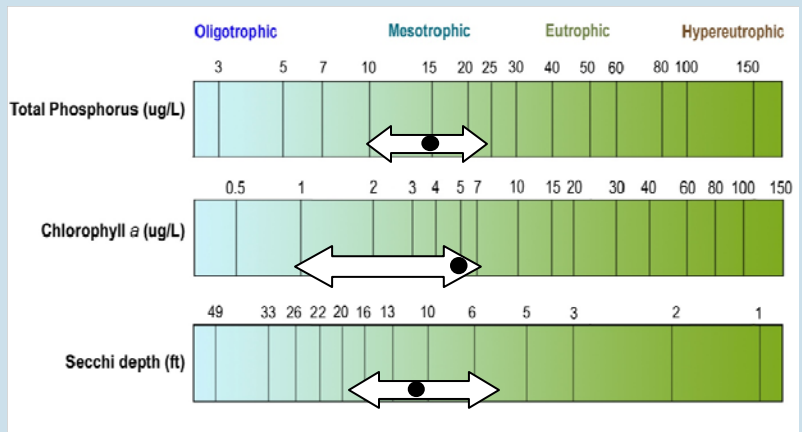
Vitals		Physical Characteristics	
MN Lake ID:	11-0043-00	Surface area (acres):	1,510
Zoning Authority:	City of Emily, Cass County	Littoral area (acres):	390
Lake Classification:	General Development (GD)	% Littoral area:	26%
Major Drainage Basin:	Pine River Watershed	Max depth (ft):	130 (m): 39.6
Latitude/Longitude:	46.79166667 / -93.95861111	Mean depth (ft):	35 (m): 10.7
Water Body Type:	Public	Lakeshed size (acres):	7,646
Invasive Species	None documented	Lakeshed : lake area ratio	5:1
		Inlets / Outlets / Accesses	2 / 1 / 1

Total Phosphorus

Roosevelt Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in Roosevelt Lake in 2002, 2006-2010. The data do not indicate much seasonal variability. Phosphorus concentrations were similar for both bays across all years. 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 Roosevelt Lake in 2002, 2006-2010. The northern bay of the lake had higher chlorophyll a concentrations than site 206, and experienced mild algae blooms in late June and late August (>10 ug/L). In the southern bay, chlorophyll a concentrations remained below 10 ug/L, indicating clear water most of the summer.



Roosevelt Lake 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)

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 ranged from 7.4 to 15.0 feet. The transparency throughout the lake appears to be relatively uniform. The North Bay of Roosevelt Lake shows no significant trend in transparency from 1995-2011 or 2001-2011. That means the transparency is not getting significantly better or worse, it is maintaining at the same level. The South Bay shows an improving trend in transparency from 1999-2011. The transparency has improved an average of 2 feet in the South Bay.

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 the two main sites of Roosevelt Lake fall in the mesotrophic range. The TSI is slightly higher in the north bay (46) of the lake than in the deeper, south bay (43). Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer.

Roosevelt L.

