



Mitchell Lake

DNR ID: 18-0294

Vitals

MN Lake ID:	18-0294-00
Zoning Authority:	City of 50 Lakes
Lake Classification:	General Development (GD)
Major Watershed:	Pine River Watershed
Latitude/Longitude:	46.7784 / -94.0475
Water Body Type:	Public
Invasive Species	None (as of 2012)

Physical Characteristics

Surface area (acres):	429
Littoral area (acres):	118
% Littoral area:	28%
Max depth (ft):	78 (m): 23.8
Mean depth (ft):	N/A
Inlets / Outlets / Accesses:	3 / 1 / 1
Lakedshed to lake area ratio:	13:1

Total Phosphorus

Mitchell Lake is phosphorus limited, which means that algae and aquatic plant growth is dependent upon available phosphorus. Total phosphorus was evaluated in Mitchell in 2003, 2005, and 2007-2010. The data do not indicate much seasonal variability. The majority of the data points fall into the mesotrophic or eutrophic range.

Chlorophyll a

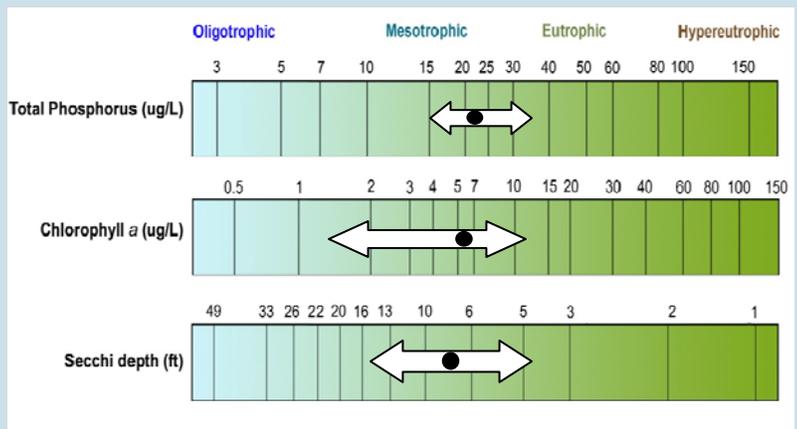
Chlorophyll a is the pigment that makes plants and algae green. Chlorophyll a is tested in lakes to determine the algae concentration or how "green" the water is. Chlorophyll a was evaluated in Mitchell Lake during 2003, 2005, and 2007-2010. Chlorophyll a concentrations remained below 10 ug/L on all sample dates except for one, indicating clear water most of the summer. Chlorophyll a concentrations remained steady throughout 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 annual mean transparency ranges from 6.1 to 12.4 feet with the transparency throughout the lake appearing to be relatively uniform. Mitchell shows no evidence of 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 for Mitchell Lake (47) falls into the mesotrophic range. There is good agreement between the TSI for phosphorus (49), chlorophyll a (46) and transparency (46), indicating that these variables are strongly related. Mesotrophic lakes (TSI 40-50) are characterized by moderately clear water most of the summer.



Mitchell Lake total phosphorus, chlorophyll a and transparency historical ranges. The arrow represents the range and the black dot represents the historical mean (Primary Site 202). Figure adapted after Moore and Thornton, [Ed.], 1988. Lake and Reservoir Restoration Guidance Manual. (Doc. No. EPA 440/5-88-002)

Mitchell L.

