

ANN LAKE

MN Lake ID: 61-0122-00



POPE SOIL & WATER



SUMMARY

Ann Lake is a shallow eutrophic lake. Algae concentration results (chlorophyll-a) show that the lake experiences major algae blooms every summer. The data indicates an improving trend in water transparency over the past 11 years. The phosphorous levels in Ann Lake are very high and increasing which could cause water quality to decline in the future. MPCA has identified the lake as impaired for aquatic recreation. Ann Lake has adequate historical water quality monitoring data, which makes a lake evaluation like this possible. Monitoring should continue to enable future water quality analyses.

LAKE VITALS

ECOREGION:	North Central Hardwood Forest
MAJOR WATERSHED:	Chippewa River
SURFACE AREA (ACRES):	369.77
LITTORAL AREA (ACRES):	369.77
% LITTORAL DEPTH:	100%
MAX DEPTH (FT):	14
AQUATIC INVASIVE SPECIES:	None



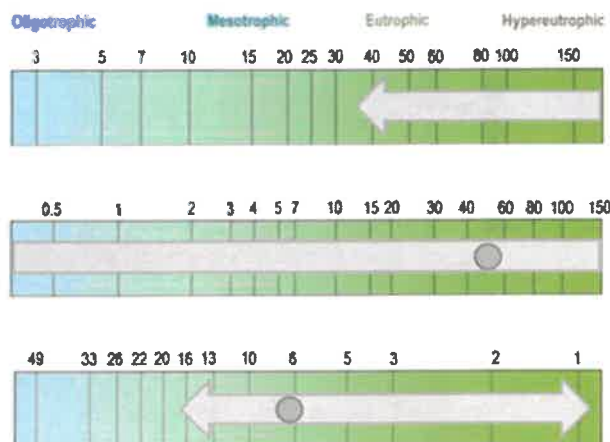
WATER QUALITY CHARACTERISTICS

YEARS MONITORED: 2004 - 2021

PARAMETERS	201	100
TOTAL PHOSPHORUS MIN (UG/L):	37	155
TOTAL PHOSPHORUS MAX (UG/L):	761	519
NUMBER OF OBSERVATIONS:	79	17
TOTAL PHOSPHORUS MEAN (UG/L):	321.1	322.9
CHLOROPHYLL-A MIN (UG/L):	-1.8	2
CHLOROPHYLL-A MAX (UG/L):	354	395
NUMBER OF OBSERVATIONS:	73	17
CHLOROPHYLL-A MEAN (UG/L):	47.5	79.5
SECCHI DEPTH MIN (FT):	0.8	0.5
SECCHI DEPTH MAX (FT):	17	13
NUMBER OF OBSERVATIONS:	79	17
SECCHI DEPTH MEAN (FT):	6.3	5.6

TROPIC STATE INDEX

Eutrophic (65.7) - Site 201



ECOREGION COMPARISONS

ECOREGION: North Central Hardwood Forest

TOTAL PHOSPHORUS:	Poorer Than Expected Range
CHLOROPHYLL-A:	Poorer Than Expected Range
SECCHI DEPTH:	Within Expected Range

PRIMARY SITE ONLY. COMPARISONS ARE BASED ON INTERQUARTILE RANGE, 25TH - 75TH PERCENTILE, FOR ECOREGION REFERENCE LAKES.



2021 WATER QUALITY CHARACTERISTICS

SITE 201

PARAMETERS	TOTAL PHOSPHORUS (UG/L)	CHLOROPHYLL-A (UG/L)	SECCHI DEPTH (FT)
MIN:	226	< 1	3
MAX:	571	77	15
NUMBER OF OBSERVATIONS:	5	5	5
MEAN:	431.2	19.6	9.6

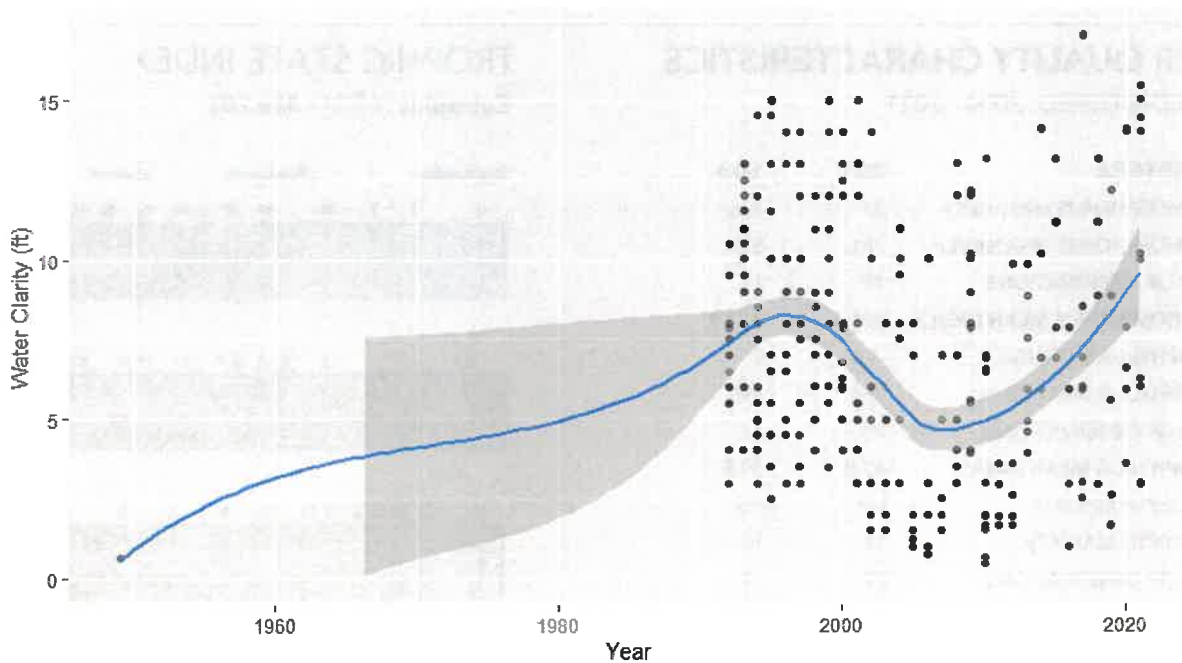
TROPHIC STATE INDEX: 61.8

TREND ANALYSIS REPORT

For detecting trends, a minimum of 8-10 years of data with four or more readings per season are recommended by the MPCA. Where data does not cover at least eight years or where there are only few samples within a year, trends can be misidentified because there can be different wet years and dry years, water levels, weather, etc., that affect the water quality naturally. The data was analyzed using the Mann Kendall Trend Analysis.

SITE	PARAMETERS	DATE RANGE	TREND
201	Transparency	2004-2021	Improving with 99% confidence
201	Total phosphorus	2004-2021	Declining with 99.9% confidence
201	Chlorophyll-A	2004-2021	Improving with 99% confidence

ANN LAKE TRANSPARENCY TREND



GRAPH SOURCE: MINNESOTA POLLUTION CONTROL AGENCY

Ann Lake shows an improving trend in transparency monitored in the past 11 years. The data indicates an improving trend in chlorophyll-a with a declining trend in total phosphorus. Phosphorous is considered the leading indicator in water quality. The extremely high levels seen in Ann Lake are concerning, especially since the level continues to increase. The overall condition of Ann Lake is "not always suitable for swimming and wading due to low clarity or excessive algae caused by the presence of nutrients such as phosphorus in the water." (MPCA). Monitoring should continue so that this trend can be tracked in future years.