

SCANDINAVIAN

MN Lake ID: 61-0041-00



POPE SOIL & WATER



SUMMARY

Scandinavian Lake is a moderately deep mesotrophic lake. Algae concentration results (chlorophyll-a) show that the lake experiences occasional algae blooms. There is a trend of declining clarity and decreasing nutrient levels. These factors are at odds with one another, as lower nutrient levels are generally associated with better clarity. Scandinavian Lake has adequate historical monitoring data, which makes a lake evaluation like this possible. Continued monitoring will enable these trends to be tracked into the future. Scandinavian Lake should be considered for additional analyses including nutrient loading and runoff modeling.

LAKE VITALS

ECOREGION:	North Central Hardwood Forest
MAJOR WATERSHED:	Chippewa River
SURFACE AREA (ACRES):	417.14
LITTORAL AREA (ACRES):	229.73
% LITTORAL DEPTH:	55.1%
MAX DEPTH (FT):	49
AQUATIC INVASIVE SPECIES:	Eurasian Milfoil



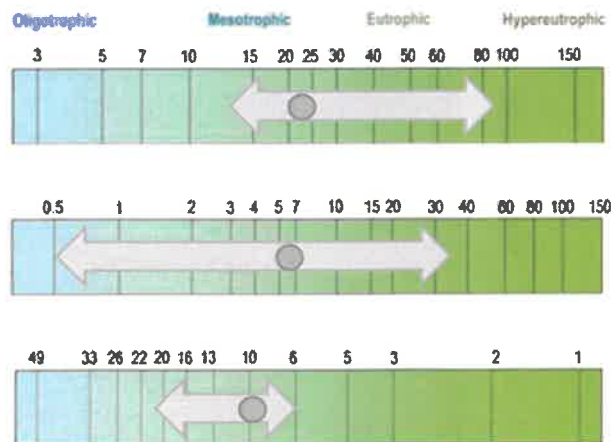
WATER QUALITY CHARACTERISTICS

YEARS MONITORED: 1996 - 2021

PARAMETERS	203	204	208
TOTAL PHOSPHORUS MIN (UG/L):	13	16	18
TOTAL PHOSPHORUS MAX (UG/L):	88	39	19
NUMBER OF OBSERVATIONS:	130	12	2
TOTAL PHOSPHORUS MEAN (UG/L):	23.6	22.9	18.5
CHLOROPHYLL-A MIN (UG/L):	0.5	0.9	4.5
CHLOROPHYLL-A MAX (UG/L):	34	11.6	6.2
NUMBER OF OBSERVATIONS:	118	12	2
CHLOROPHYLL-A MEAN (UG/L):	6.4	4.5	5.3
SECCHI DEPTH MIN (FT):	6	7	7.5
SECCHI DEPTH MAX (FT):	21	16	8
NUMBER OF OBSERVATIONS:	129	12	2
SECCHI DEPTH MEAN (FT):	9.4	10.3	7.8

TROPHIC STATE INDEX

Mesotrophic (47.2) - Site 203



ECOREGION COMPARISONS

ECOREGION: North Central Hardwood Forest

TOTAL PHOSPHORUS:	Better Than Expected Range
CHLOROPHYLL-A:	Within 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 203

PARAMETERS	TOTAL PHOSPHORUS (UG/L)	CHLOROPHYLL-A (UG/L)	SECCHI DEPTH (FT)
MIN:	14	3	7
MAX:	37	7	12
NUMBER OF OBSERVATIONS:	5	5	5
MEAN:	21.6	5	9.6

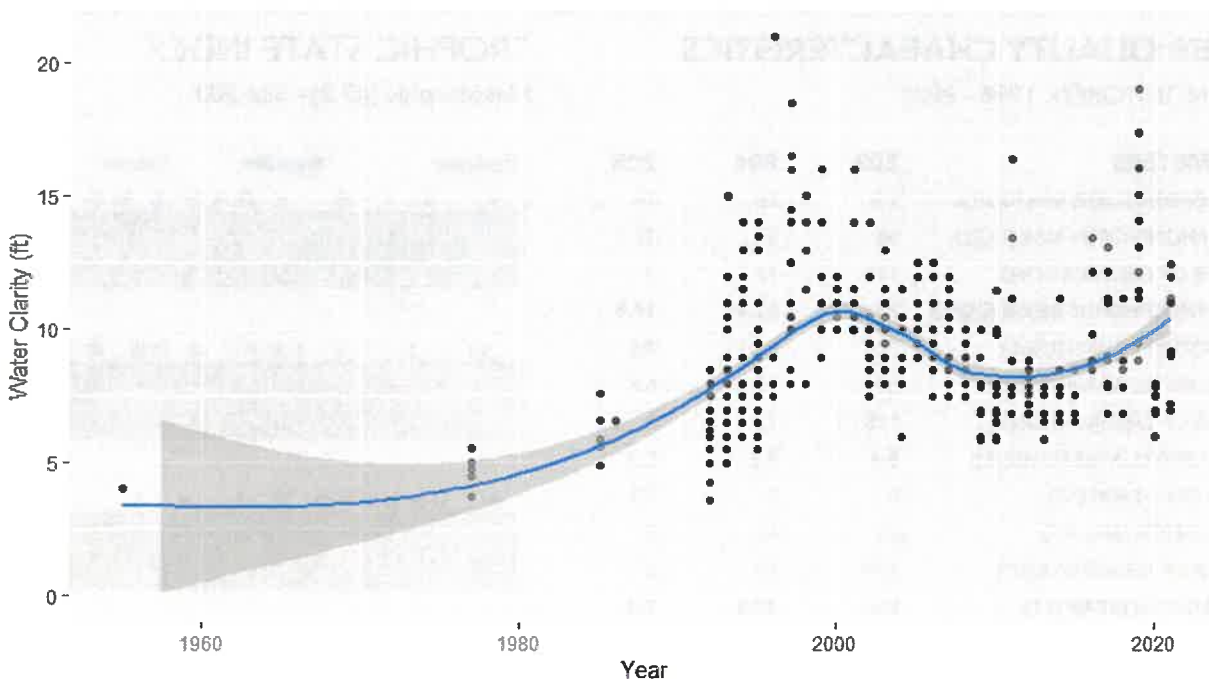
TROPHIC STATE INDEX: 46

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
203	Transparency	1992-2021	No significant trend exists
203	Total phosphorus	1996-2021	No significant trend exists
203	Chlorophyll-A	1996-2021	No significant trend exists

SCANDINAVIAN LAKE TRANSPARENCY TREND



GRAPH SOURCE: MINNESOTA POLLUTION CONTROL AGENCY

Scandinavian Lake’s data shows evidence of declining clarity from 2000-2017. Nutrient levels are also decreasing, which indicates improving water quality. These trends are at odds with one another. Lower nutrient levels are typically associated with better clarity. However, there is a potential improving transparency trend over the past 5 years. Monitoring should continue so that these trends can be tracked in future years. Scandinavian Lake should be considered for additional analyses including nutrient loading and runoff modeling.