

MALMEDAL

MN Lake ID: 61-0162-00



POPE SOIL & WATER



SUMMARY

Malmedal Lake is a shallow hypereutrophic lake. Over the past 2 years, observations have revealed poor water quality. However, long term trend analysis indicates improvements in transparency and algae concentration (chlorophyll-a). Recent observations fall outside the modeled improving trend. Continued monitoring is necessary to determine if the recent trends of poor water quality will continue or if Malmedal Lake will return to its historical levels.

LAKE VITALS

ECOREGION:	North Central Hardwood Forest
MAJOR WATERSHED:	Chippewa River
SURFACE AREA (ACRES):	198.59
LITTORAL AREA (ACRES):	198.58
% LITTORAL DEPTH:	99.9%
MAX DEPTH (FT):	10
AQUATIC INVASIVE SPECIES:	None



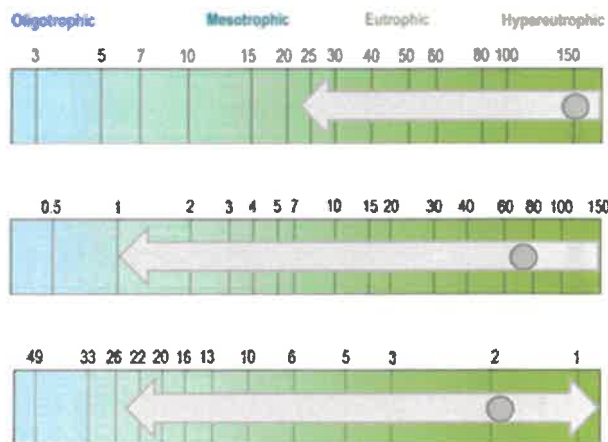
WATER QUALITY CHARACTERISTICS

YEARS MONITORED: 1996 - 2021

PARAMETERS	201
TOTAL PHOSPHORUS MIN (UG/L):	28
TOTAL PHOSPHORUS MAX (UG/L):	374
NUMBER OF OBSERVATIONS:	283
TOTAL PHOSPHORUS MEAN (UG/L):	151.7
CHLOROPHYLL-A MIN (UG/L):	1
CHLOROPHYLL-A MAX (UG/L):	409
NUMBER OF OBSERVATIONS:	259
CHLOROPHYLL-A MEAN (UG/L):	73.1
SECCHI DEPTH MIN (FT):	0
SECCHI DEPTH MAX (FT):	25
NUMBER OF OBSERVATIONS:	255
SECCHI DEPTH MEAN (FT):	1.9

TROPHIC STATE INDEX

Hypereutrophic (71.3)



ECOREGION COMPARISONS

ECOREGION: North Central Hardwood Forest

TOTAL PHOSPHORUS:	Poorer Than Expected Range
CHLOROPHYLL-A:	Poorer Than Expected Range
SECCHI DEPTH:	Poorer Than 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:	145	79	0
MAX:	332	409	1.5
NUMBER OF OBSERVATIONS:	6	6	6
MEAN:	231.3	228.8	0.5

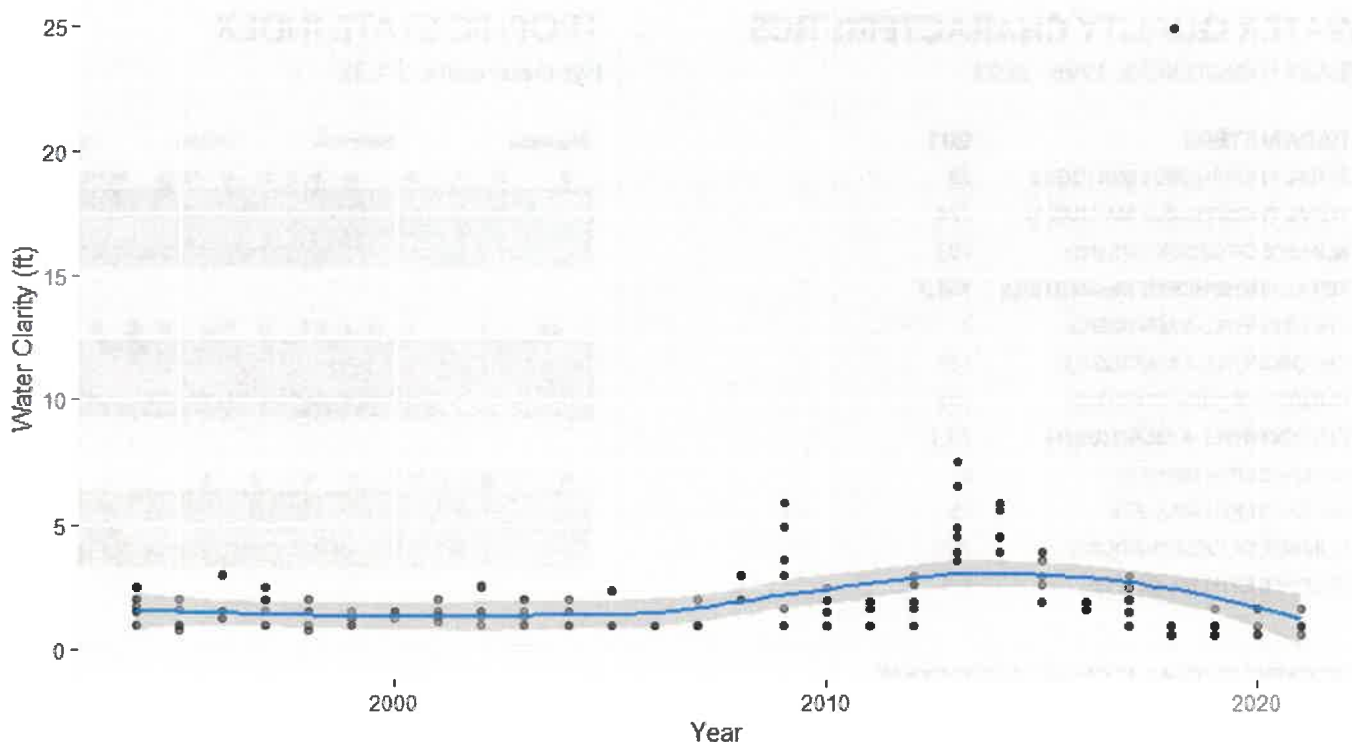
TROPHIC STATE INDEX: 79.7

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	1996-2021	Improving with 99% confidence
201	Total phosphorus	1996-2021	Improving with 90% confidence
201	Chlorophyll-A	1996-2021	Improving with 99.9% confidence

MALMEDAL LAKE TRANSPARENCY TREND



GRAPH SOURCE: MINNESOTA POLLUTION CONTROL AGENCY

Malmedal Lake shows evidence of improving long term trends in transparency, chlorophyll-a, and phosphorus levels. The years 2020 and 2021 were exceptions to this trend. Average nutrient levels in the lake were very high, and during the drought of 2021 algae levels were the highest ever observed. Continued monitoring is necessary to determine if water quality trends will continue.