

JOHANNA LAKE

MN Lake ID: 61-0006-00



POPE SOIL & WATER

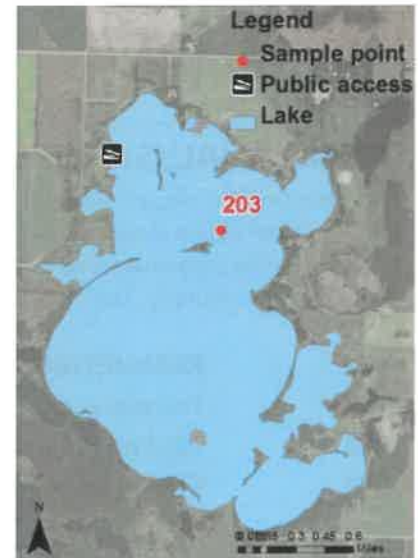


SUMMARY

Johanna Lake is a shallow eutrophic lake and is on the MPCA's Impaired Waters List. Algae concentration results (chlorophyll-a) show that the lake experiences algae blooms every summer between June and July. There is evidence of an improving trend in water clarity since 2007. Johanna Lake has adequate historical water quality monitoring data, which makes a lake evaluation like this possible. Monitoring should continue to inform water quality restoration efforts.

LAKE VITALS

ECOREGION:	North Central Hardwood Forest
MAJOR WATERSHED:	Chippewa River
SURFACE AREA (ACRES):	1,399.25
LITTORAL AREA (ACRES):	1,399.25
% LITTORAL DEPTH:	100%
MAX DEPTH (FT):	10
AQUATIC INVASIVE SPECIES:	None



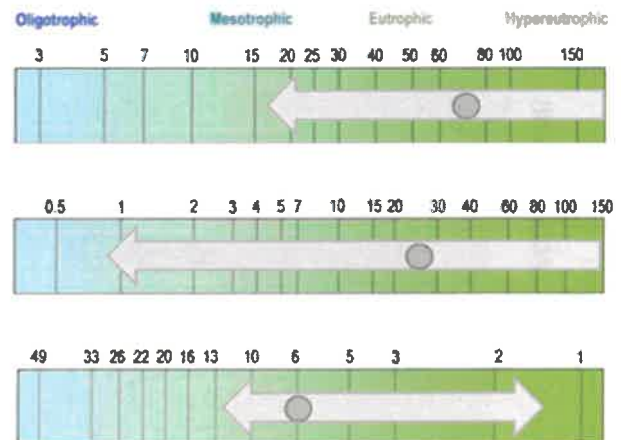
WATER QUALITY CHARACTERISTICS

YEARS MONITORED: 2007 - 2021

PARAMETERS	203
TOTAL PHOSPHORUS MIN (UG/L):	17
TOTAL PHOSPHORUS MAX (UG/L):	356
NUMBER OF OBSERVATIONS:	80
TOTAL PHOSPHORUS MEAN (UG/L):	69.1
CHLOROPHYLL-A MIN (UG/L):	0.9
CHLOROPHYLL-A MAX (UG/L):	414
NUMBER OF OBSERVATIONS:	74
CHLOROPHYLL-A MEAN (UG/L):	26.9
SECCHI DEPTH MIN (FT):	1.5
SECCHI DEPTH MAX (FT):	12.5
NUMBER OF OBSERVATIONS:	77
SECCHI DEPTH MEAN (FT):	6

TROPIC STATE INDEX

Eutrophic (57.2)



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 203

PARAMETERS	TOTAL PHOSPHORUS (UG/L)	CHLOROPHYLL-A (UG/L)	SECCHI DEPTH (FT)
MIN:	18	3	3
MAX:	74	45	7.5
NUMBER OF OBSERVATIONS:	5	5	5
MEAN:	42	21.2	4.3

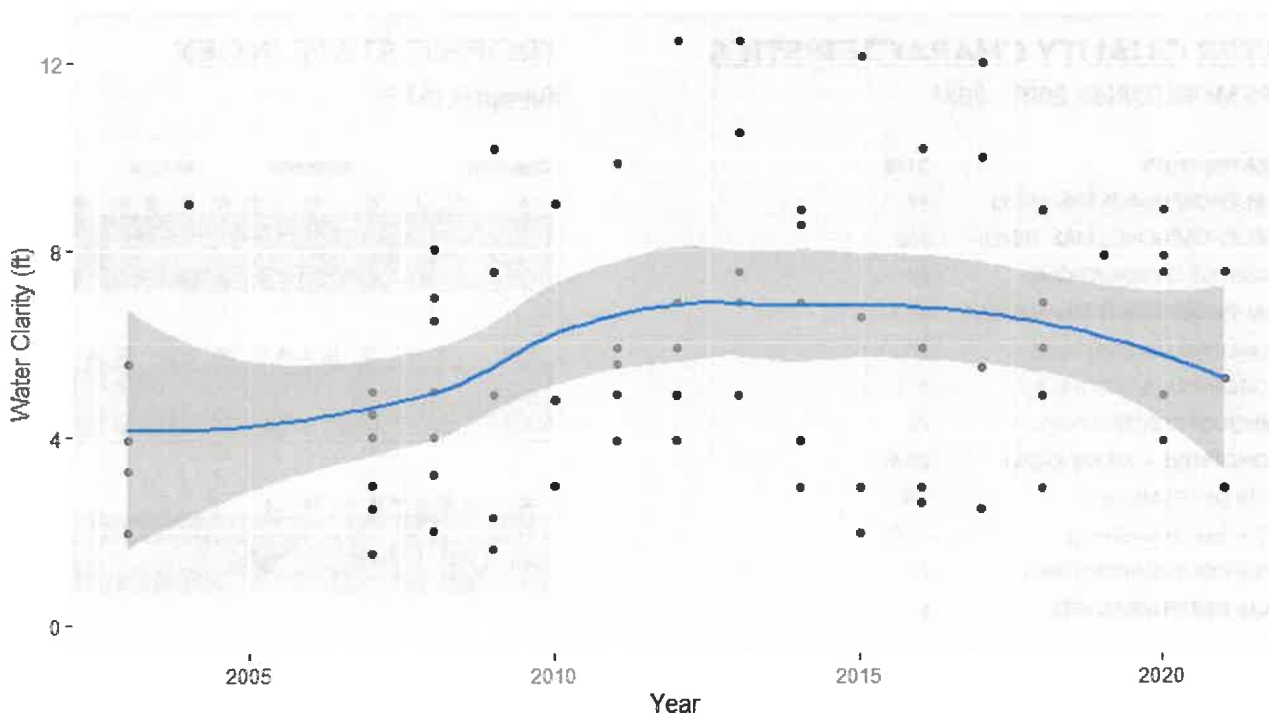
TROPHIC STATE INDEX: 56.2

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	2007-2021	No significant trend exists
203	Total phosphorus	2007-2021	Improving with 95% confidence
203	Chlorophyll-A	2007-2011, 2013-2021	Improving with 80% confidence

JOHANNA LAKE TRANSPARENCY TREND



GRAPH SOURCE: MINNESOTA POLLUTION CONTROL AGENCY

Johanna Lake shows evidence of an improving trend in nutrient levels. Levels were elevated from 2015-2017, but they appear to have balanced out in recent years. Phosphorus levels have been at their lowest ever for the past three years. Johanna Lake is on the MPCA Impaired Waters List. According to MPCA, the 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." Lake monitoring should continue so that this trend can be tracked in future years and any periods of high nutrient levels can be detected.