

# AMELIA LAKE

MN Lake ID: 61-0064-00

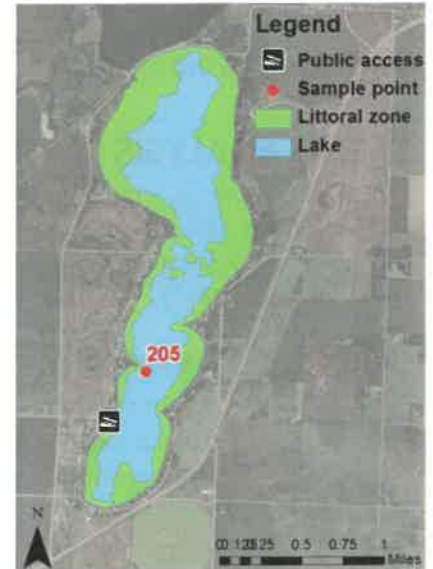


## SUMMARY

Amelia Lake is a mesotrophic lake, with nutrient levels that fall within or better than the ecoregion range. Algae concentration results (chlorophyll-a) show that the lake experiences minor algae blooms most summers in August. There are improving trends in transparency, phosphorus, and chlorophyll-a levels over the past 20 years. This means that the lake is stable or improving, with no indications of declining water quality. Recently zebra mussel filtration of the water has affected water monitoring observations. Zebra mussels consume algae, reducing observed chlorophyll-a levels while improving clarity. Monitoring should continue to enable future water quality analyses that will detect if the zebra mussel benefit is long lasting or temporary.

## LAKE VITALS

<b>ECOREGION:</b>	North Central Hardwood Forest
<b>MAJOR WATERSHED:</b>	Chippewa River
<b>SURFACE AREA (ACRES):</b>	934.4
<b>LITTORAL AREA (ACRES):</b>	376.63
<b>% LITTORAL DEPTH:</b>	40.3%
<b>MAX DEPTH (FT):</b>	69
<b>AQUATIC INVASIVE SPECIES:</b>	Zebra Mussels



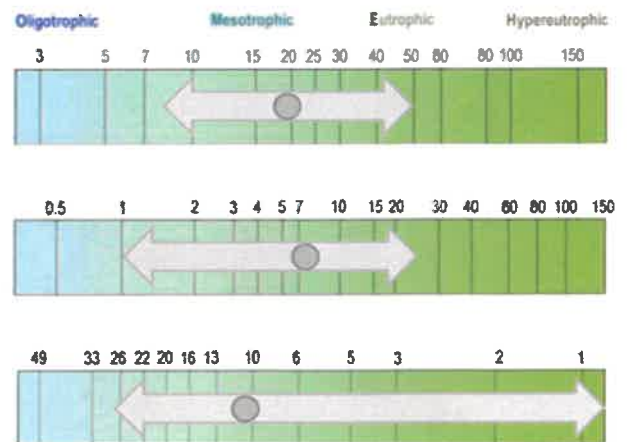
## WATER QUALITY CHARACTERISTICS

YEARS MONITORED: 1996-2021

PARAMETERS	205
TOTAL PHOSPHORUS MIN (UG/L):	8
TOTAL PHOSPHORUS MAX (UG/L):	50
NUMBER OF OBSERVATIONS:	278
<b>TOTAL PHOSPHORUS MEAN (UG/L):</b>	<b>19.6</b>
CHLOROPHYLL-A MIN (UG/L):	1
CHLOROPHYLL-A MAX (UG/L):	24
NUMBER OF OBSERVATIONS:	255
<b>CHLOROPHYLL-A MEAN (UG/L):</b>	<b>7.3</b>
SECCHI DEPTH MIN (FT):	0
SECCHI DEPTH MAX (FT):	27
NUMBER OF OBSERVATIONS:	249
<b>SECCHI DEPTH MEAN (FT):</b>	<b>11.6</b>

## TROPHIC STATE INDEX

Mesotrophic (46.1)



## ECOREGION COMPARISONS

ECOREGION: North Central Hardwood Forest

<b>TOTAL PHOSPHORUS:</b>	Better Than Expected Range
<b>CHLOROPHYLL-A:</b>	Within Expected Range
<b>SECCHI DEPTH:</b>	Better Than Expected Range

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



# 2021 WATER QUALITY CHARACTERISTICS

SITE 205

PARAMETERS	TOTAL PHOSPHORUS (UG/L)	CHLOROPHYLL-A (UG/L)	SECCHI DEPTH (FT)
MIN:	12	2	0
MAX:	23	5	20
NUMBER OF OBSERVATIONS:	10	10	11
MEAN:	15.5	3.5	11.3

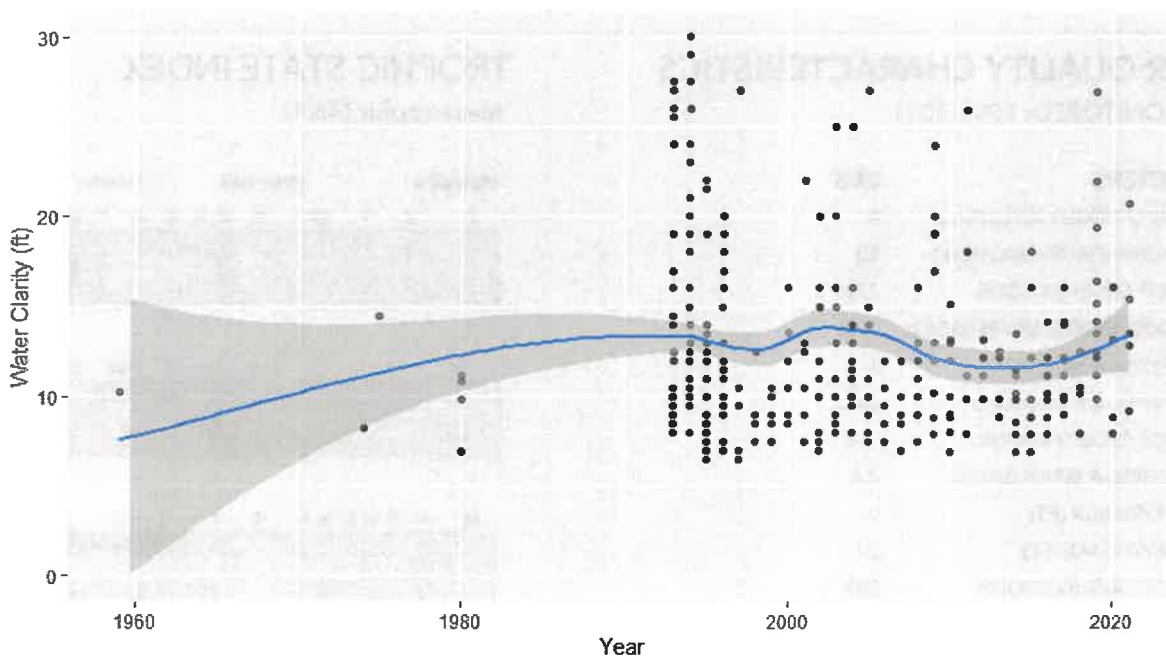
TROPHIC STATE INDEX: 42.4

## 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
205	Transparency	1996-2021	Improving with 95% confidence
205	Total phosphorus	1996-2021	Improving with 99% confidence
205	Chlorophyll-A	1996-2021	Improving with 95% confidence

### AMELIA LAKE TRANSPARENCY TREND



GRAPH SOURCE: MINNESOTA POLLUTION CONTROL AGENCY

Amelia Lake shows evidence of an improving trend for total phosphorus with 99% confidence over the past 20 years. This trend shows that the water quality is stable with indications of improving clarity. Not all zebra mussel infested lakes see declines in total phosphorous levels, so this indicator seems to signal some measure of overall improvement. Monitoring should continue so that this trend can be tracked in future years. At this stage in infestation much of the lakes production can shift to the lake bottom in the form of rooted algae and plants. Monitoring the distribution and density of the plant and algae growth through Citizen Science methods such as photos and dockside estimates could be useful in gauging Amelia Lake's current and future status. Higher tech methods such as plant surveys, sonar plant biovolume mapping, and submergent plant mapping via satellite imagery are also possibilities.