



Citizen Lake Monitoring Report



Report year: 2023

Waterbody name: Boot Lake

WBIC: 418700

Station ID: 433252

County: Oconto County

Lake area: 230 acres

Max. depth: 38 feet

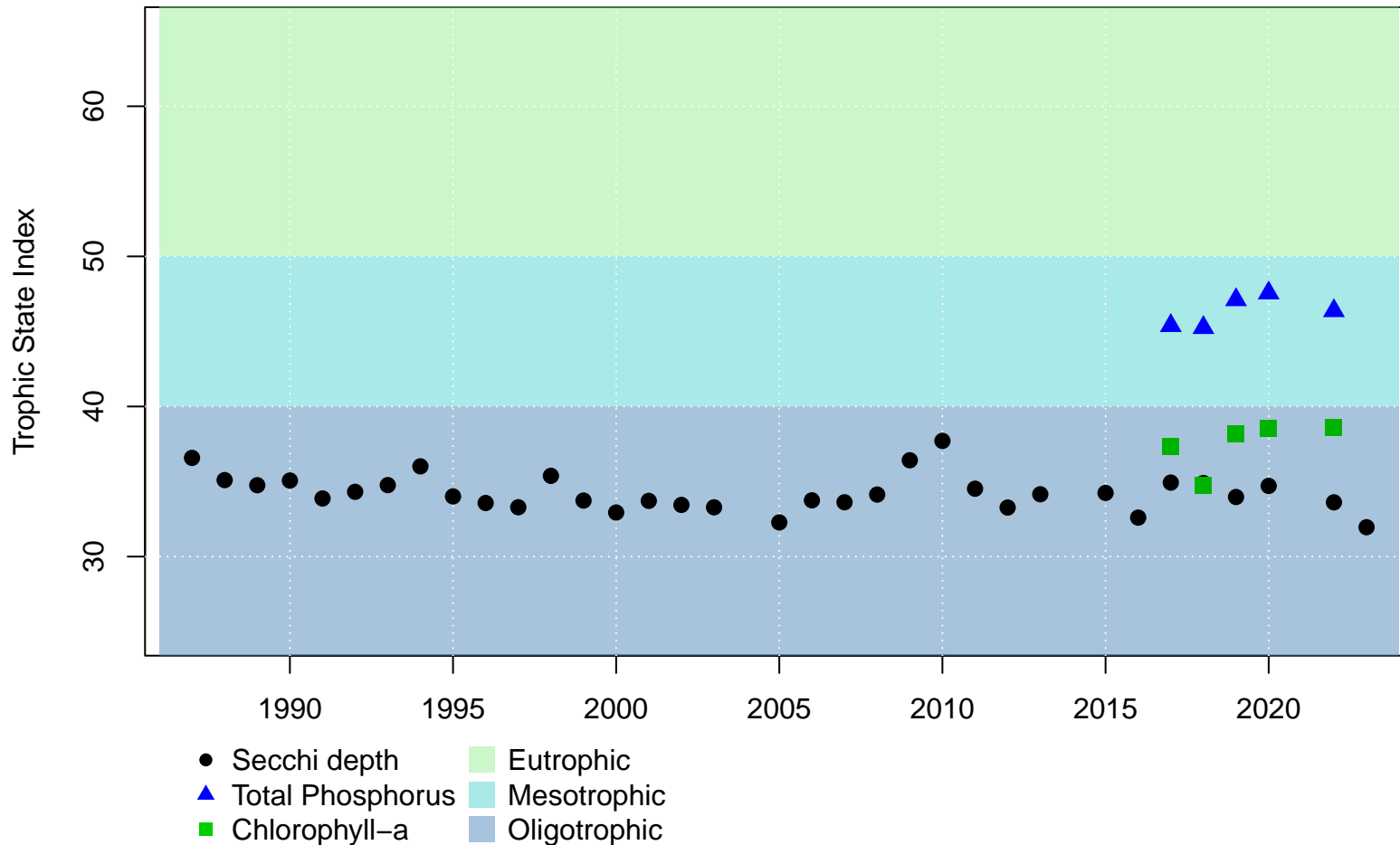
Lake type: Deep Seepage

This report contains information that summarizes data routinely collected by the Citizen Lake Monitoring Network.

- p. 2–3: Plots summarizing the trophic status and clarity of this lake over time.
- p. 4–6: Trends over time in water clarity, total phosphorus, and chlorophyll–a
- p. 7+: Tables of observations made during the selected report year, and temperature and dissolved oxygen profiles.



Trophic State



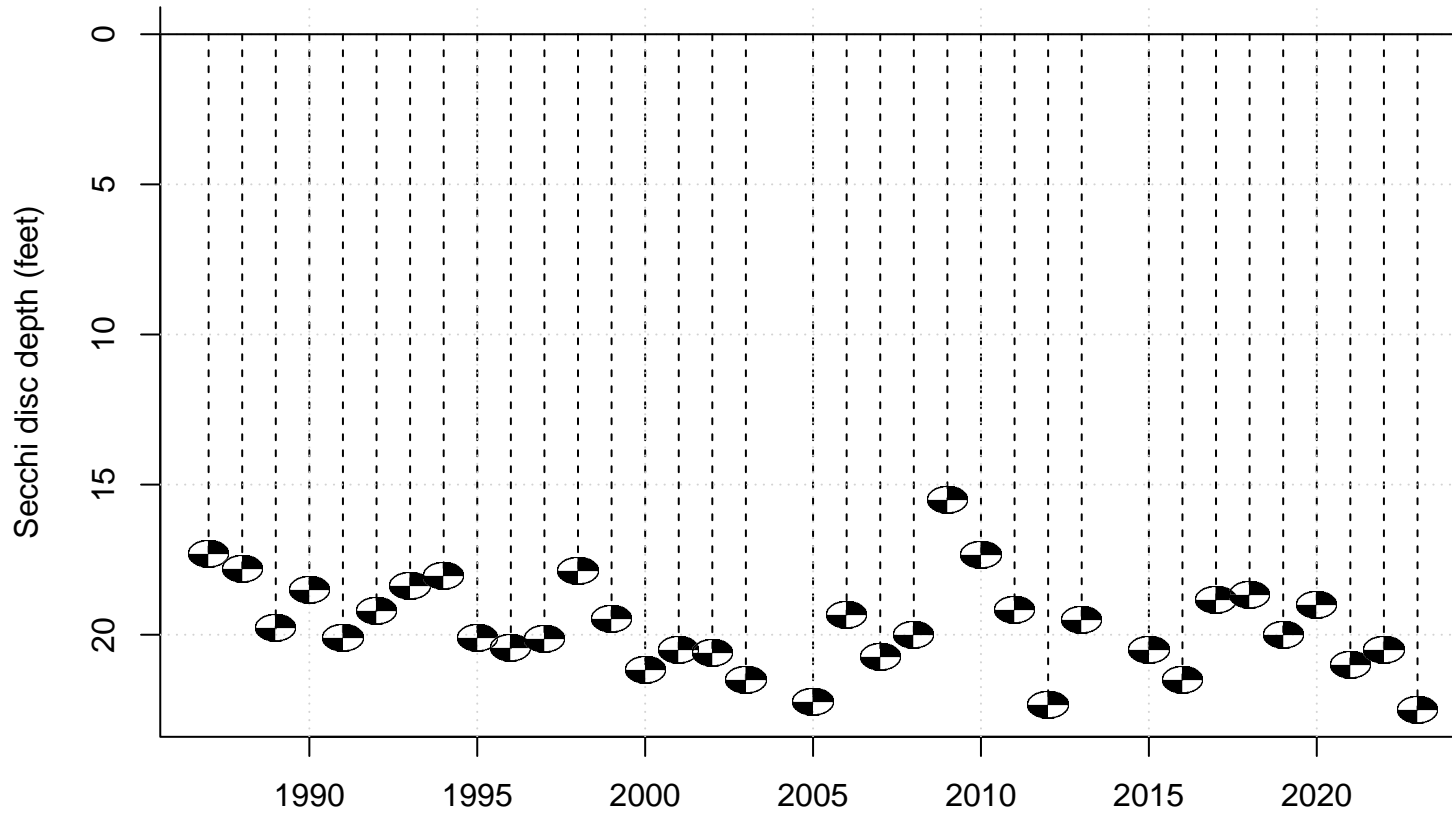
Trophic state indices (TSI) indicate the amount of nutrients in the lake. The TSI equations use late summer (July 15 - September 15) averages of Secchi depth, total phosphorus, and chlorophyll- α .

Eutrophic: excess nutrients, lower clarity, and greater risk of harmful algal blooms and hypoxia (low oxygen)

Mesotrophic: moderate levels of nutrients, moderate clarity

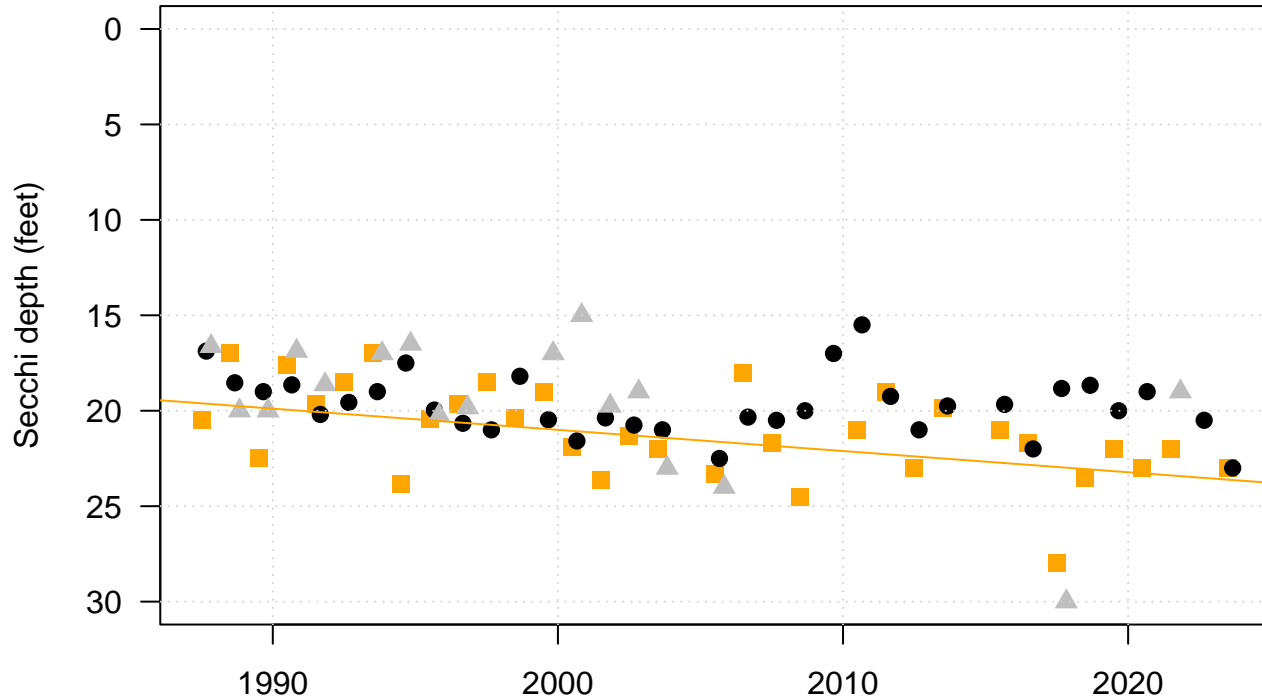
Oligotrophic: low levels of nutrients, high clarity, lower risk of hypoxia

Average Annual Water Clarity (July and August only)



Secchi disc depth is a measure of water clarity made by measuring the depth at which a black and white disc is just barely visible in the water. The above figure shows average Secchi disc depths calculated from all **July and August** readings each year. Low values indicate low water clarity, which can be caused by nutrients fueling the growth of algae, by particles suspended in the water, or from dark staining by dissolved tannins (naturally occurring compounds in leaves).

Trends in Secchi Depth Over Time



- early summer (May 15 – Jul 14)
- late summer (Jul 15 – Sep 14)
- ▲— fall (after Sep 15)
- solid lines appear if there is a trend over time
- points represent seasonal averages

Secchi depth is increasing over time in early summer. Secchi depth exhibits no trend over time in late summer and fall. Not enough data to calculate trends in spring.

Trends in Total Phosphorus Over Time

Not enough data to evaluate trends in total phosphorus

Trends in Chlorophyll-a Over Time

Not enough data to evaluate trends in chlorophyll-a

Trophic State Index Samples and Observations

Date	Secchi depth (ft)	Secchi hit bottom	TSI_Secchi	Total phosphorus (mg/L)	TSI_TotalP	Chlorophyll-a (ug/L)	TSI_Chla	Water color	User perception
2023-06-15	24.00	no	31					GREEN	1
2023-07-14	22.00	no	33					GREEN	1
2023-08-18	23.00	no	32					GREEN	1

User perception rating	Meaning
1	Beautiful, could not be nicer
2	Very minor aesthetic problems
3	Enjoyment somewhat impaired (algae)
4	Would not swim but boating OK (algae)
5	Enjoyment substantially impaired (algae)

Temperature and Dissolved Oxygen Data

Start date	Depth (ft)	Temperature (F)	Dissolved oxygen (mg/L)
2023-06-15	0	64.0	12.7
2023-06-15	3	64.2	12.6
2023-06-15	6	64.0	12.9
2023-06-15	9	64.0	12.5
2023-06-15	12	63.7	11.8
2023-06-15	15	63.3	11.0
2023-06-15	18	62.8	10.5
2023-06-15	21	60.1	10.9
2023-06-15	24	60.0	9.7
2023-06-15	27	59.7	9.7

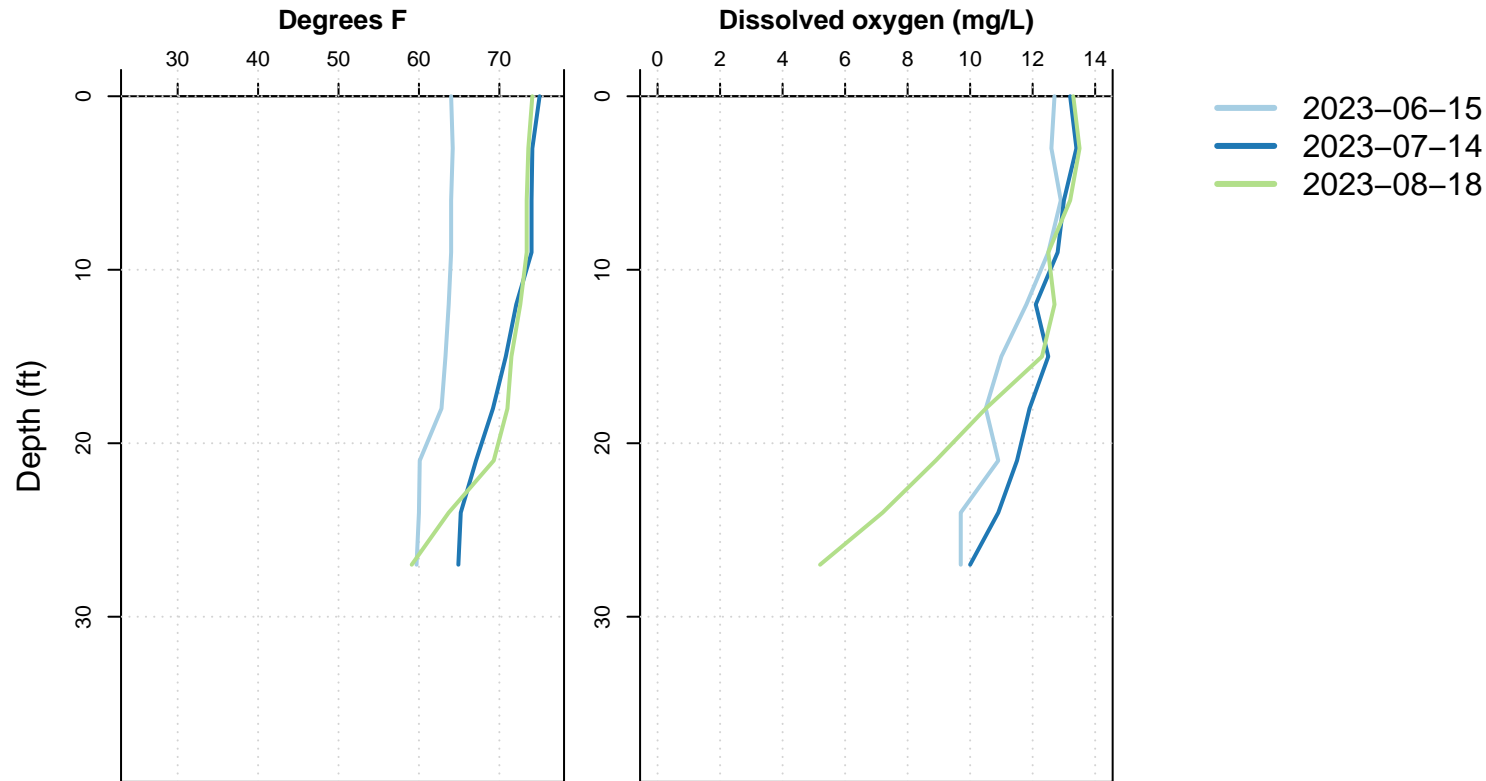
Start date	Depth (ft)	Temperature (F)	Dissolved oxygen (mg/L)
2023-07-14	0	75.0	13.2
2023-07-14	3	74.1	13.4
2023-07-14	6	74.0	13.0
2023-07-14	9	74.0	12.8
2023-07-14	12	72.1	12.1
2023-07-14	15	70.8	12.5
2023-07-14	18	69.2	11.9
2023-07-14	21	67.1	11.5
2023-07-14	24	65.2	10.9
2023-07-14	27	64.9	10.0

Start date	Depth (ft)	Temperature (F)	Dissolved oxygen (mg/L)
2023-08-18	0	74.1	13.3
2023-08-18	3	73.6	13.5
2023-08-18	6	73.4	13.2
2023-08-18	9	73.4	12.5
2023-08-18	12	72.6	12.7

(continued)

Start date	Depth (ft)	Temperature (F)	Dissolved oxygen (mg/L)
2023-08-18	15	71.5	12.3
2023-08-18	18	71.0	10.5
2023-08-18	21	69.3	8.9
2023-08-18	24	63.7	7.2
2023-08-18	27	59.1	5.2

Temperature and Dissolved Oxygen Data



The plot on the left shows how temperature changes from the lake surface (at the top of the plot) to the lake bottom on each sampling date. The plot on the right shows how dissolved oxygen changes from the surface to the bottom. Look for seasonal changes. In spring and fall, most lakes will have steady temperatures and oxygen concentrations throughout the water column. In summer, some lakes will warm near the top and remain cool near the bottom. Those lakes may also have low concentrations of oxygen near the lake bottom.