

2017 MONITORING SUMMARY

Pleasant Lake

Introduction

During the spring of 2016, the Pleasant Lake Association (PLA) expressed interest in partnering with the Sauk River Watershed District (SRWD) to collect water quality data for Pleasant Lake. SRWD staff trained a volunteer from the PLA on the sample collection procedure and field note documentation, and coordinated pick up times with the volunteer throughout the season. This partnership continued into 2017, where 5 samples were collected (one per month from May through September).

“It is the vision of the Sauk River Watershed District to protect and enhance our natural resources by increasing public awareness and involvement....The District will be wise stewards of our natural resources and will work alongside our partners to leave the water quality better for future generations.”



Pleasant Lake Information

During the 2017 monitoring season, Pleasant Lake was sampled for total phosphorus and chlorophyll-a. These sample results, along with secchi disk (water clarity) readings are used to determine the trophic state of the lake (this is described in greater detail on page 4 of this report).

Pleasant Lake data in this report was analyzed based on the 2B lake water quality standards for the North Central Hardwoods Forest section of the state. These standards are designed to evaluate the lakes within a specific ecoregion, with a maximum depth greater than 15 feet (the sampling location for Pleasant Lake is 29 feet deep). The class 2 (2B) standards are for waters, aquatic life and recreation, defined as,

“Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare.”

<https://www.revisor.leg.state.mn.us/rules/?id=7050.0140>

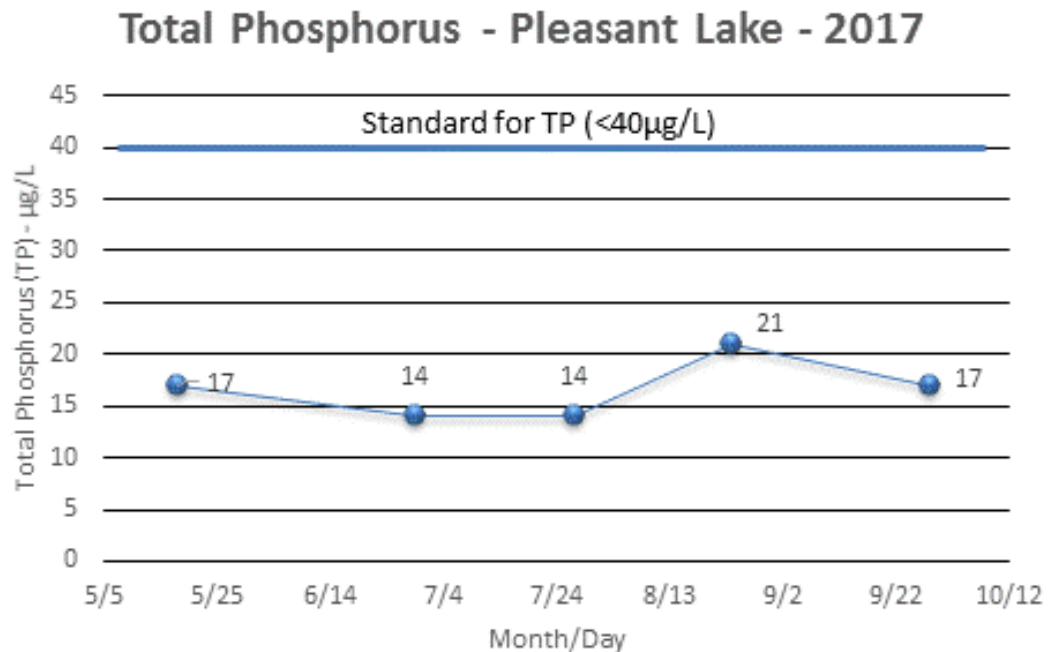


Pleasant Lake Data

Total Phosphorus (TP)

Total phosphorus is made up of both organic and inorganic (ortho-phosphorus) materials. It can be found suspended in the water or in the bottom materials of the lake. The MPCA's ecoregion standard level for phosphorus in deep lakes (max depth greater than 15 feet) is 40 µg/L.

The figure to the right shows the monthly sample results for total phosphorus, all of which meet the standard. The yearly average of total phosphorus for Pleasant Lake for 2017 is 16.6µg/L (it was 18.75µg/L in 2016).

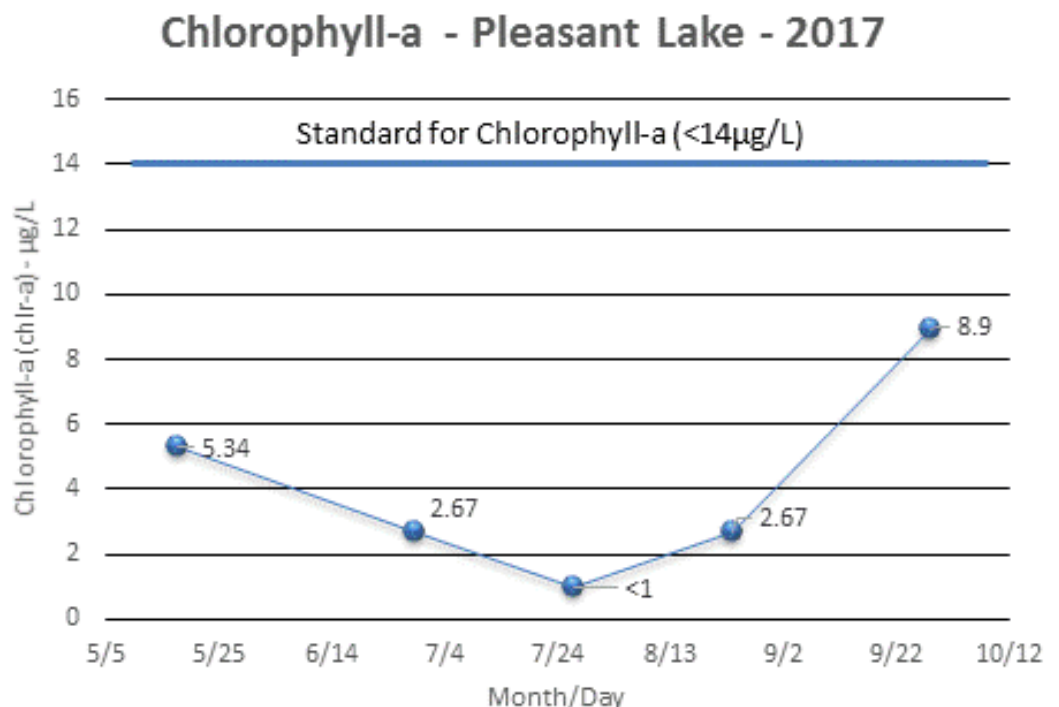


Chlorophyll-a

Chlorophyll-a samples are used to measure the amount of algae in the water. Algae grows as the water warms and the amount of growth is dependent on the amount of phosphorus available. Other environmental factors such as wind and water temperature can impact the amount of algae growth as well.

The ecoregion standard for Chlorophyll-a is 14 µg/L (micrograms/liter). As shown in the figure to the right, all of the samples collected in Pleasant Lake in 2017 meet the ecoregion standard for chlorophyll-a.

The yearly average of chlorophyll-a for Pleasant Lake is 4.12µg/L (it was 5.79µg/L in 2016).



Secchi Disk

Water clarity is measured using a transparency disk (secchi disk) that is lowered into the water on the shaded side of the boat until it can no longer be seen. Clarity is measured every time the lake is sampled. This data, along with phosphorus and chlorophyll a data, is used to assess the water quality of a lake.

The ecoregion standard for secchi disk readings is greater than 1.4 meters (which is equal to about 4.6 feet). The figure to the lower right shows the secchi disk readings collected in Pleasant Lake during the 2017 monitoring season. All of the five readings meet the standard requirements. The seasonal average secchi disk reading is 2.83 meters, which is slightly lower than the average 3.05 meter average in 2016.

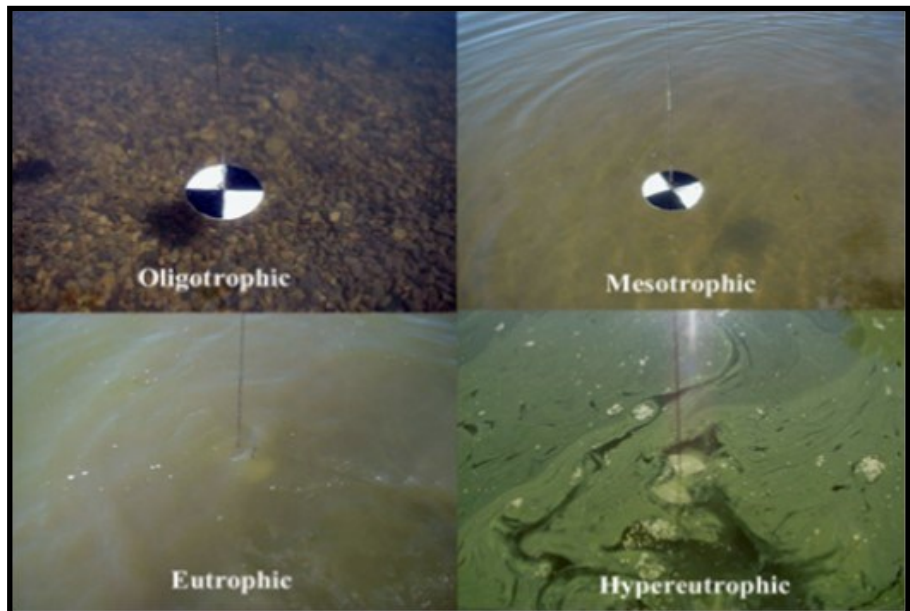


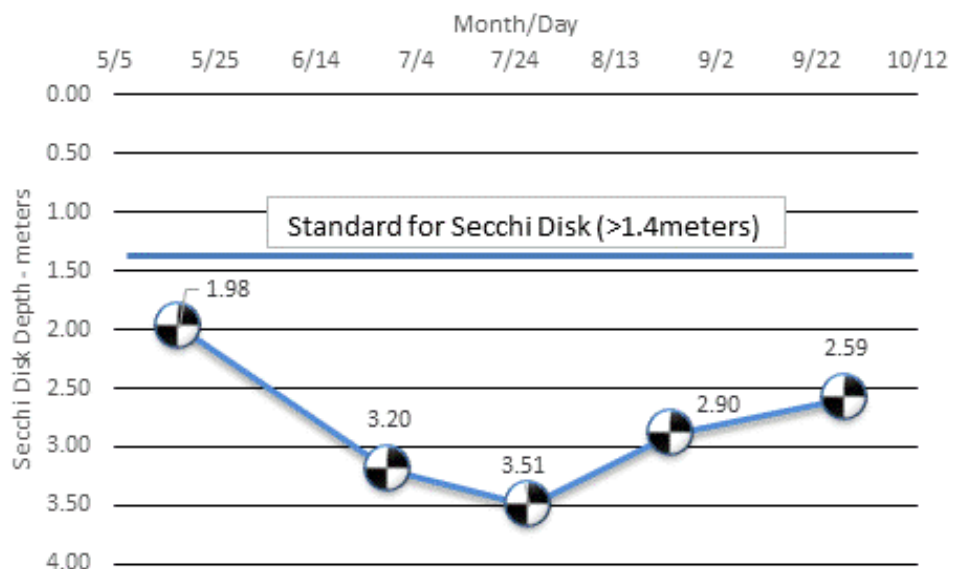
Photo Courtesy of the Minnesota Pollution Control Agency (MPCA)

The above photo provides examples of what the four main lake classifications (according to Carlson's Trophic Status Index/TSI) would look like during a secchi disk reading. Phosphorus samples, chlorophyll-a samples, and clarity/secchi disk readings are used to determine the TSI for a lake.

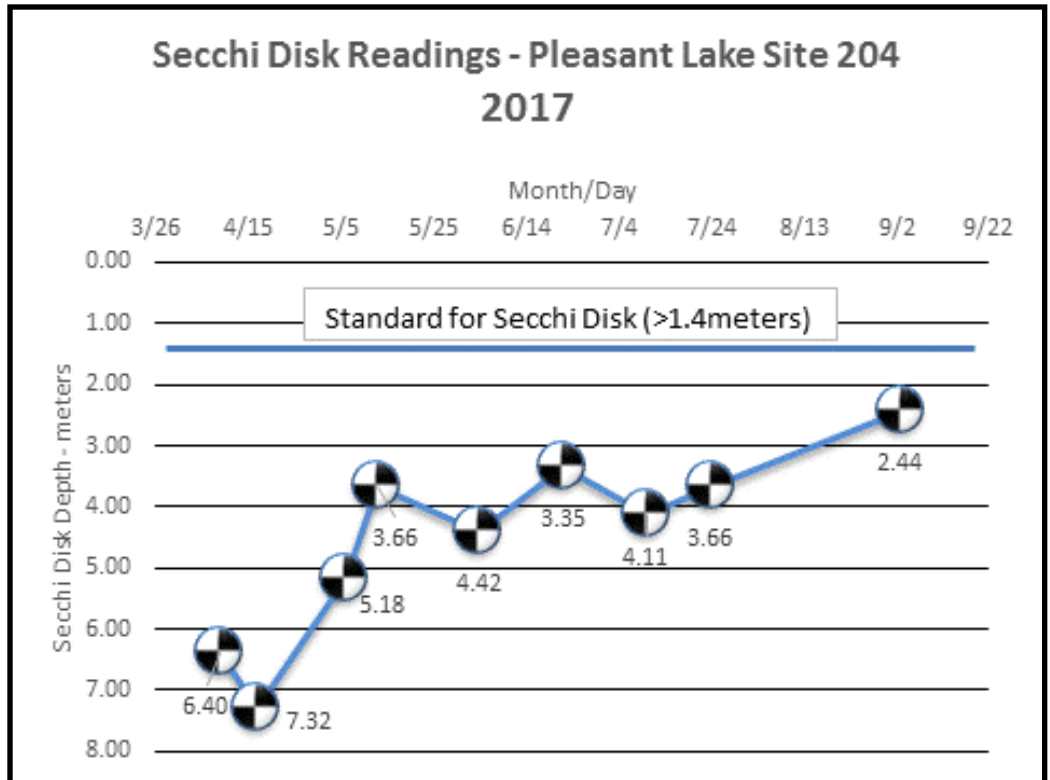
The four stages of lake classification are oligotrophic (clean, clear), mesotrophic (temporary algal and aquatic plant problems), eutrophic (persistent algal blooms and aquatic plant problems), and hypereutrophic (extreme nuisance algal blooms and aquatic plant problems).



Secchi Disk Readings - Pleasant Lake 2017



Pleasant Lake is fortunate to have two volunteers collecting secchi disk data at two different sites on the lake. Data from the second volunteer (pictured on right) began in April, whereas the secchi data on the previous page began when water chemistry sampling began in May. There is some difference in readings between the two sites, which is normal due to the different factors such as rainfall and runoff that may affect each site.

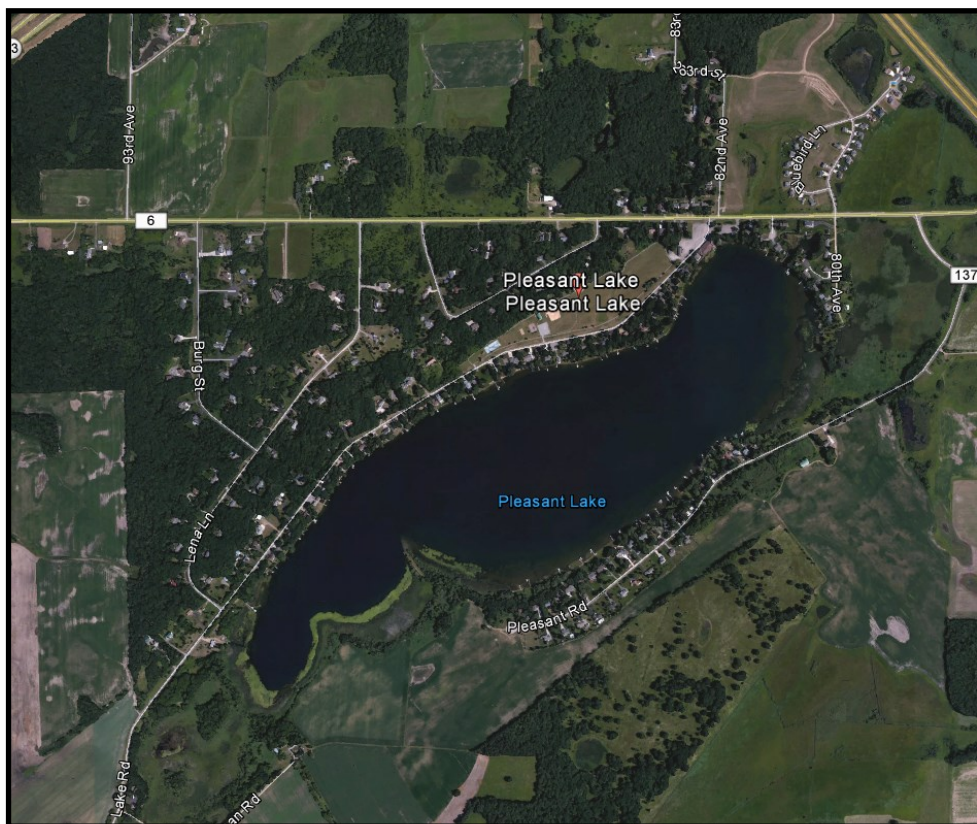


2017 Data Summary

The data collected from Pleasant Lake during the 2017 monitoring season all meets the North Central Hardwood Forest Ecoregion standards for deep lakes, which means the lake has good water quality when compared to these standards. This is consistent with the water quality monitoring results collected in 2016. While this is a great start to collecting a dataset, it is important to remember that two seasons of data does not accurately represent all conditions of a waterbody. Drought years, years with significant rainfall, "normal" years (or years with an average amount of rainfall) are all needed to obtain a complete picture of the water quality of a particular water body.

It is the recommendation of the SRWD that additional seasons (ideally, 5 to 10 total seasons) of water quality data be collected to obtain an accurate picture of the water quality of Pleasant Lake. The SRWD recommends five samples be collected per season (one per month from May through September) and that each sample be analyzed for total phosphorus and chlorophyll-a. Additionally, the SRWD would recommend continuing to collect field notes and secchi disk readings during each sampling event.





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IMPORTANT REMINDERS

THE DATA AND RECOMMENDATIONS INCLUDED IN THIS REPORT ARE BASED ON THE 2016 AND 2017 MONITORING SEASONS. SAMPLES WERE COLLECTED BY A LAKE ASSOCIATION VOLUNTEER AND DATA WAS REVIEWED BY THE SAUK RIVER WATERSHED DISTRICT. IT IS IMPORTANT TO REMEMBER THAT THIS DATASET IS NOT A COMPLETE PICTURE OF ALL CONDITIONS.

PLEASE CONTACT SARAH JO BOSER, MONITORING COORDINATOR AT THE SAUK RIVER WATERSHED DISTRICT WITH ANY QUESTIONS OR CONCERNS REGARDING THE INFORMATION PRESENTED IN THIS REPORT.