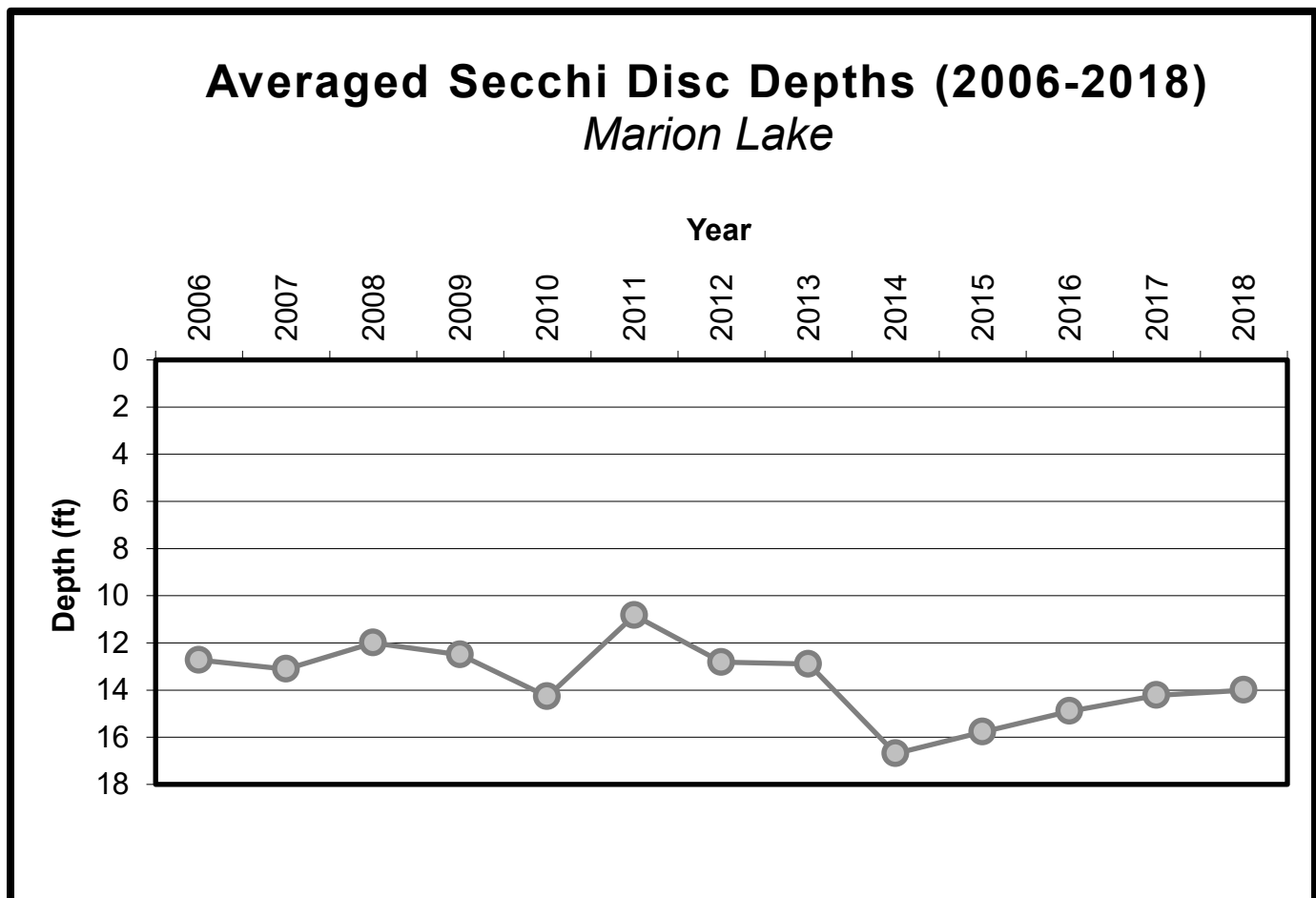


Marion Lake Water Quality

Tip of the Mitt Watershed Council monitored water quality in Marion Lake as part of our Comprehensive Water Quality Monitoring Program in 2013 and 2016. The lake has since been retired from the program, however a volunteer lake monitor collected additional parameters throughout the season from 2006 to 2018.

Secchi Disk

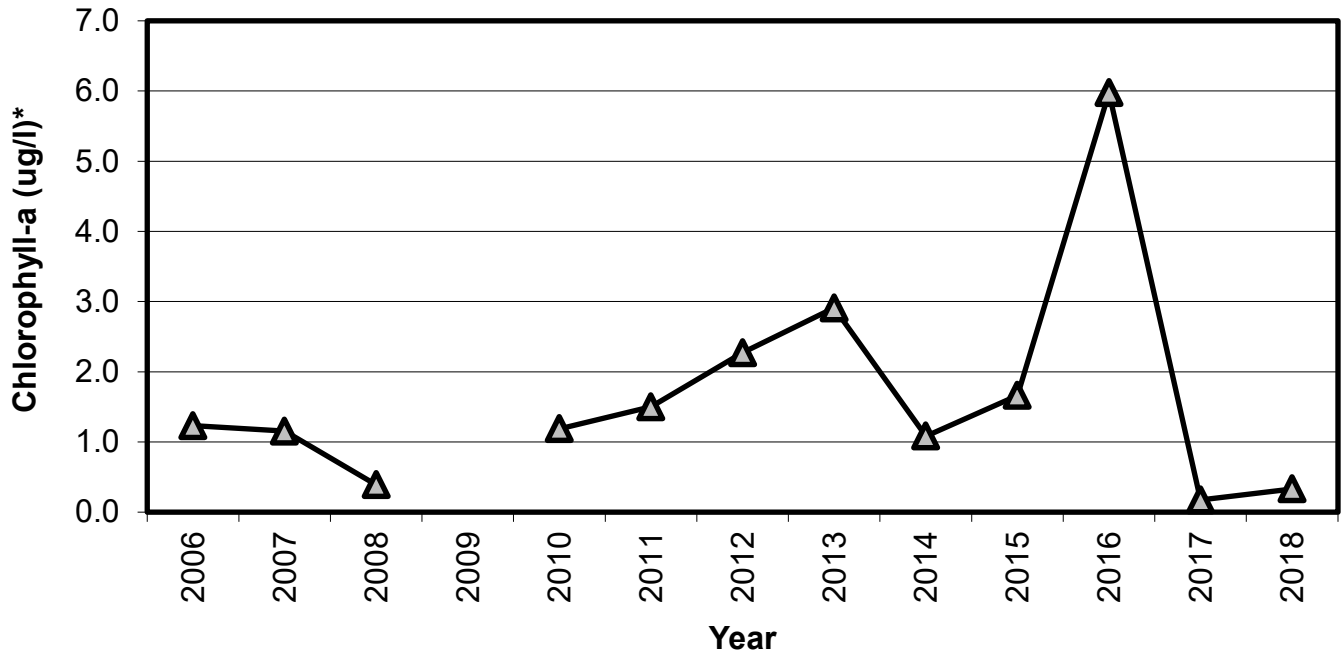
The Secchi disk is a weighted black and white disk used to measure water clarity by lowering it into the water and recording the depth at which it is no longer visible. The average Secchi disk reading in 2018 was 14.00 feet. Deeper Secchi disk readings mean there are decreasing levels of nutrients and sediments in the water. Shallower Secchi disk readings mean there are increasing levels of nutrients and sediments. Since 2006, Marion Lake Secchi disk readings are trending slightly deeper, however the trend is not statistically significant.



Chlorophyll-a

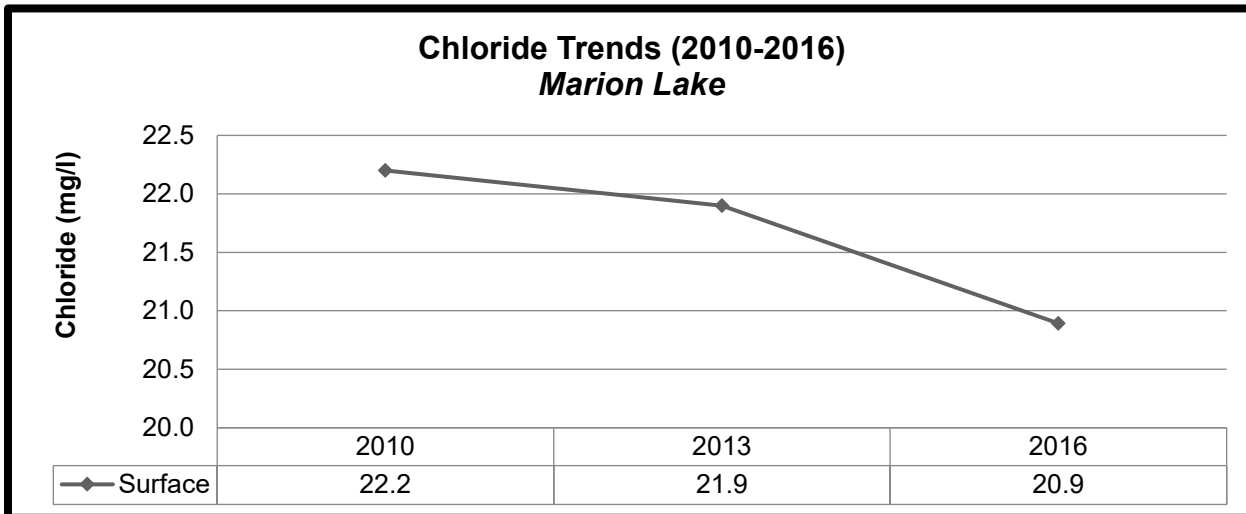
Chlorophyll-a is a pigment found in all green plants, including algae. Higher chlorophyll-a concentrations indicate greater phytoplankton densities, which reduce water clarity. The results of 2018 chlorophyll-a sampling were 0.33 $\mu\text{g/L}$, down from a high of 5.98 $\mu\text{g/L}$ in 2016.

Average Chlorophyll-a Concentrations (2006-2018)
Marion Lake



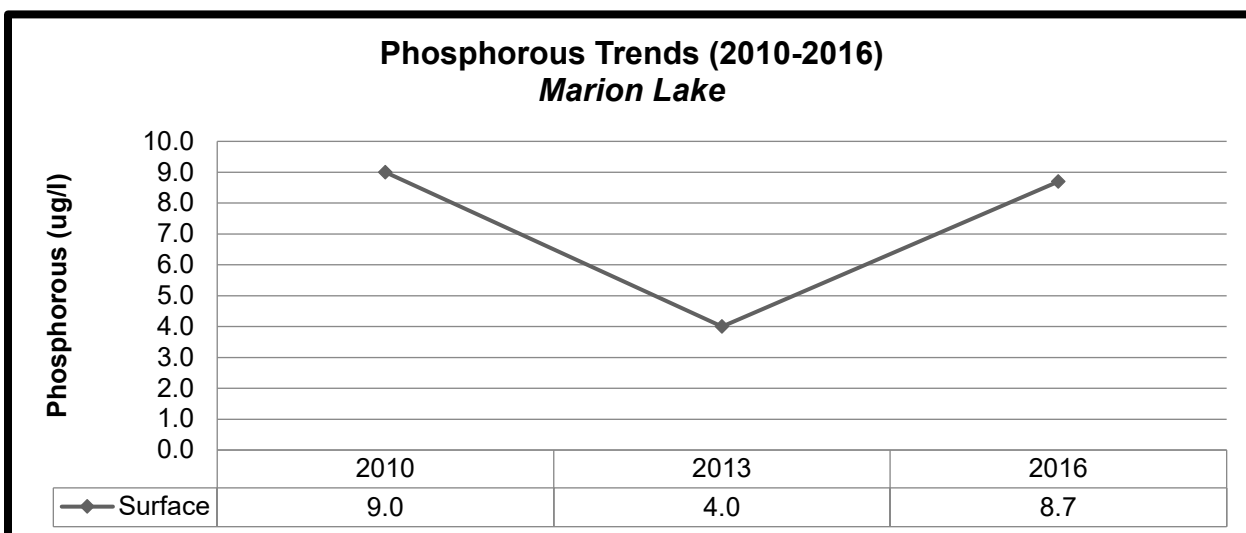
Chloride

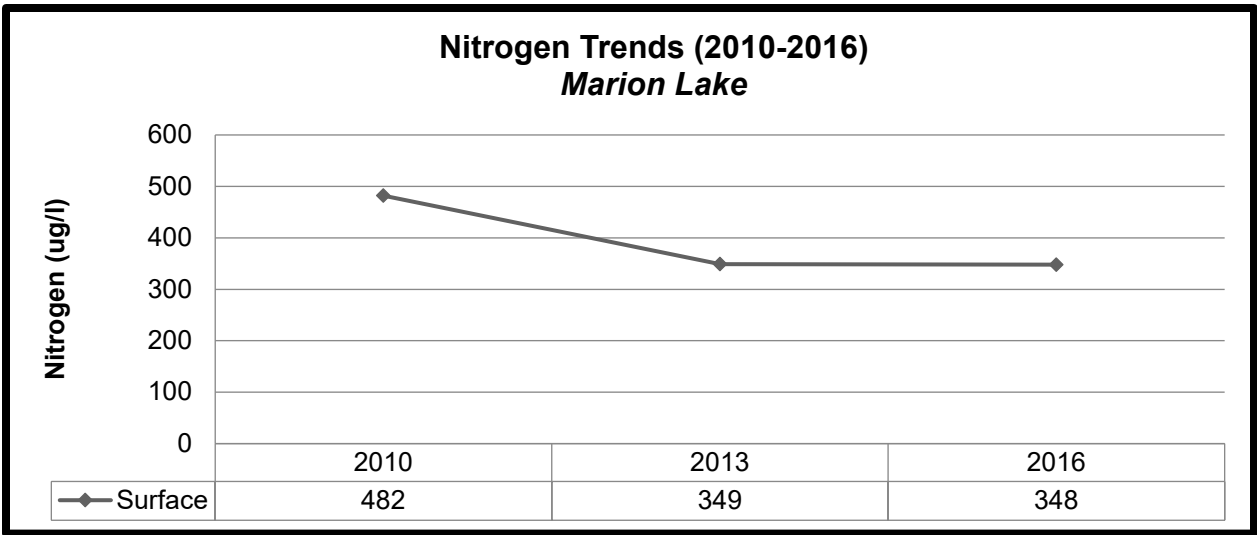
Chloride (Cl⁻) is likely in your kitchen as table salt, in water softener salts, in some fertilizers, and used in the wintertime to de-ice roadways. Chloride on Marion Lake is slightly higher than other lakes in Northern Michigan, however it is still in a range of good water quality. Chloride is often a sign of human influences, so it's good that chloride is on the decline in Marion Lake.



Total Nitrogen and Phosphorus

Phosphorus and nitrogen are two important nutrients for plant and algal growth. However, too much of either can have a negative impact on Marion Lake water quality. Both nutrients are found in fertilizers and can leach from failing septic systems or surface runoff after rainfall. Most lakes in Northern Michigan are phosphorus-limited, meaning the biological productivity (i.e. algal growth) is limited by the amount of phosphorus available. Minimizing external phosphorus inputs to Marion Lake from septic systems and fertilizers is vital to managing nuisance algal blooms and maintaining high water quality. Total nitrogen for Marion Lake was 348 µg/L and total phosphorus was 8.7 µg/L in 2016 at the surface. Both total nitrogen and total phosphorus values were below the U.S. Environmental Protection Agency recommended maximum for high quality lakes.





Overall, the water quality of Marion Lake remains high. Parameters show the lake is oligotrophic, which means the lake has lower nutrients and produces less algae. This is good for water quality, but can stress fish populations if there is not enough to eat.

If you have any questions, comments, or concerns about this information, please contact Monitoring Programs Coordinator Caroline Keson at Tip of the Mitt Watershed Council by phone (231) 347-1181 or email at info@watershedcouncil.org.