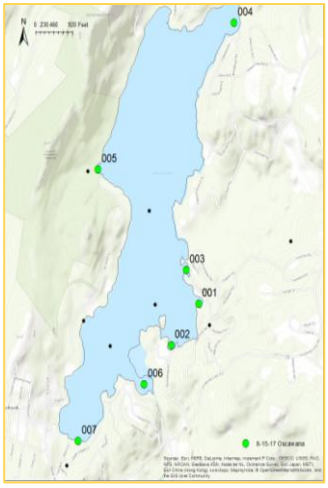
LAKE OSCAWANA

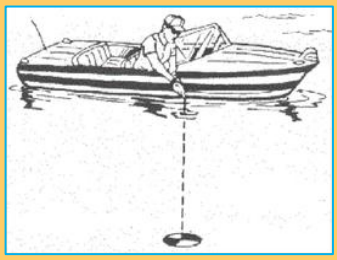
2017 SAMPLING HIGHLIGHTS

Three deep spot stations are used to represent the overall Lake Oscawana water quality. Water quality data displayed are averages of all three stations, throughout the year.

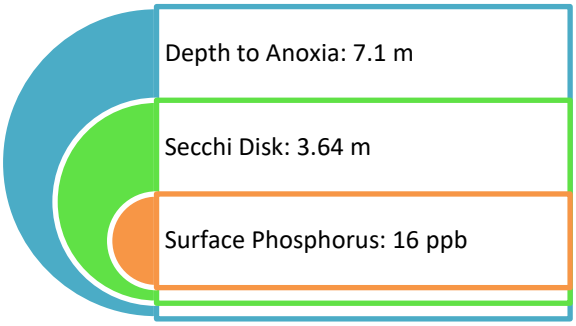
Map 1. In-Lake Water Quality Sampling Stations

Map 2. Near-Shore Sampling Points 2017





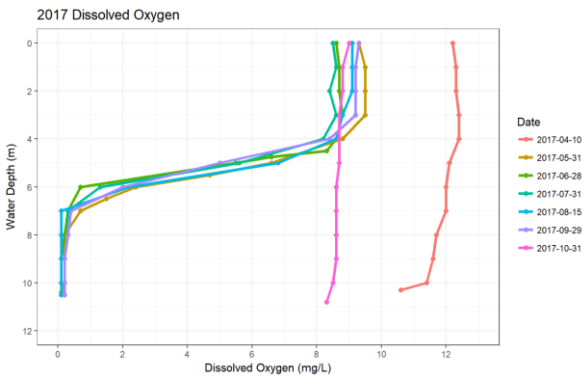
Water clarity is measured at the deep spot using a Secchi disk. Water clarity suggests abundance of algae and nutrients in a lake. Greater Secchi measurements mean greater visibility.



Water Quality

These parameters (among others) are used to indicate the overall health of a water body.

- The Secchi disk reading indicates the water clarity-or how deep you can see from the surface into the lake.
- Phosphorus presence drives plant and algae growth. Nitrogen is a secondary plant & algae nutrient of concern.
- The depth to anoxia refers to the depth at which oxygen drops below 1 mg/L. At Oscawana this number can be from 10.5 to 0-meters. Lower numbers are worsened conditions (indicating anoxia rising closer to surface).

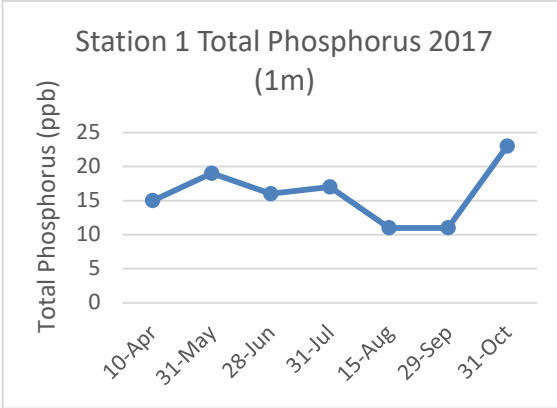


The lake very quickly lost dissolved oxygen in deeper waters from April to May. Dissolved oxygen in a pond is essential to aquatic organisms. Also, decomposition of rooted aquatic plants and algae requires dissolved oxygen (Biological Oxygen Demand) and can deplete the oxygen levels in the bottom waters below the thermocline. This phenomenon results in anoxic (<1mg/L) conditions in the deeper waters for much of the season at Lake Oscawana.

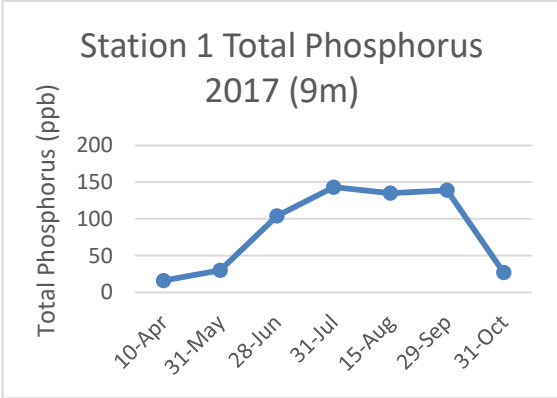
LAKE OSCAWANA

NUTRIENT BREAKDOWN

Phosphorus

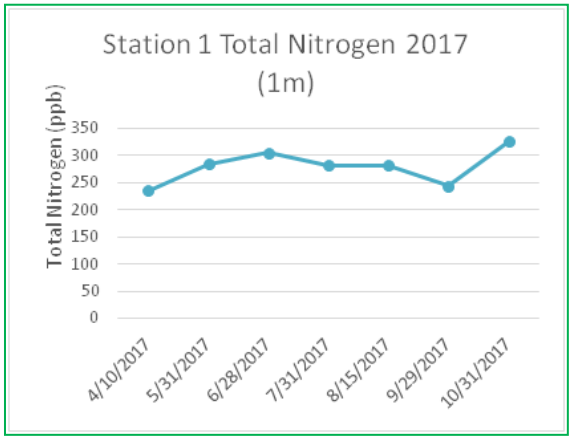


Total Phosphorus (TP) in the surface waters ranged from 11-23 µ-grams/Liter (parts per billion) at Station 1. The highest surface TP was in October after fall turnover.

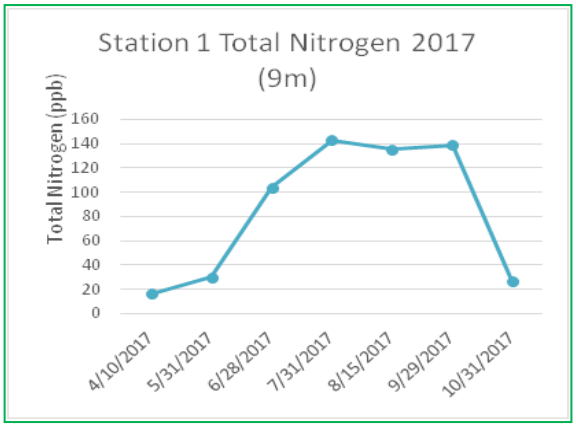


Bottom water TP remained below 150 ppb for the entire season, which is significantly lower than concentrations seen in many prior years. Internal nutrient release is still occurring but was much less than usual - more on par with levels seen in 2010 and 2011.

Nitrogen



Total Nitrogen (TN) trends in surface layers (1-6 meters depth) decreased in August to September during the period of good water clarity and similarly reduced phosphorus in surface waters. The August to September period was the only time during 2017 where TN appeared to follow the same trend at 1, 4, & 6-meter water depths. This period could also be related to reduced watershed loading during the dry late summer period.



Nitrogen in Lake Oscawana has generally been decreasing since the early 2000s. Despite some peaks in 1-meter TN during summer, the trend is statistically significant. There is a very wide range in surface Total Nitrogen throughout the season in some years, but bottom TN increases throughout the summer before decreasing again in fall. This cycle is seen annually.

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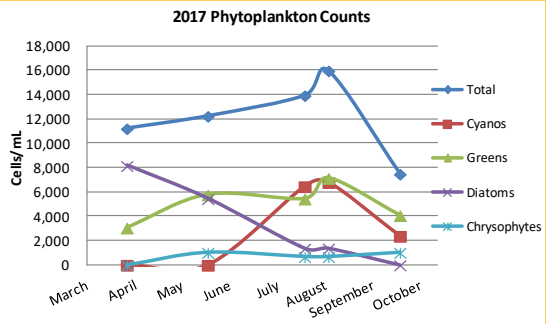
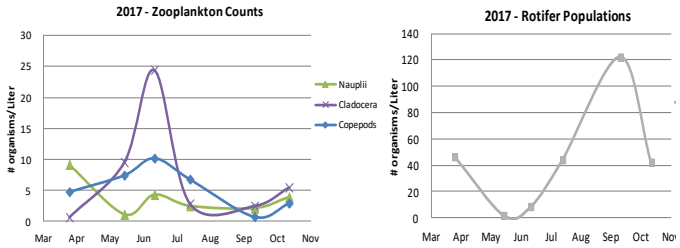


Overall phytoplankton populations in Oscawana in 2017 were very good. The total cells/milliliter (mL) did not rise above 16,000, which is about half of the 2016



The zooplankton population at the Lake was again dominated by Rotifers, yet the general populations were generally lower than in 2016. Cladocera and Rotifer populations were indicative of boom and bust growth cycles where the Rotifer count crashed in May and June, reaching a maximum during September before falling off again in October. Large-bodied Cladoceran populations were highest in June.

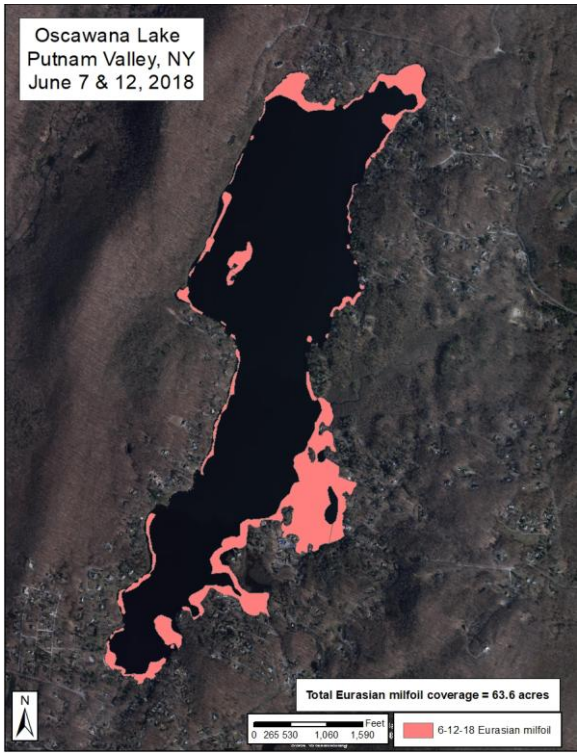
Phytoplankton populations are a product of nutrient loading and often define trends in water transparency (Secchi disk measurements).

Zooplankton are influenced by predators such as small fish, and they regulate phytoplankton populations through their water column filtration capabilities.

A general understanding of the lake plankton assemblage allows for a better interpretation of water quality data.

INVASIVE PLANT COVER

Map 3. Lakewide Milfoil



STORMWATER BIOFILTER

Our sampling and investigation of the biofilter suggests that the groundwater levels are too high for the filter to adequately hold any stormwater in the settling basin. During April to July the groundwater table is higher than the inflow pipe to the biofilter, meaning that there is little time for particle settling during the months with peak stormwater runoff. The lower vegetated wetland part of the biofilter, however, did appear to be working as intended.