

## 2019 Volunteer Lake Assessment Program (VLAP) results for Perkins Pond

During 2019, Perkins Pond was sampled 4 times; June, July, August and September. The sampling was done by Mike Dionian and Gary Szulucka. Greg McKee also assisted with sampling on one of our trips.

The New Hampshire Department of Environmental Services (NHDES) monitors this program. On one of the sampling trips I was accompanied by an intern working for NHDES. These are typically college students working for a summer with the NHDES. Our test samples are turned in to Colby Sawyer College where they have an environmental testing lab. When the NHDES intern came to monitor sampling the samples were taken back to Concord for analysis.

All of this data collected in samples and also by the VLAP volunteers are analyzed by the DES and published in a year end report. We are fortunate that the Perkins Pond Association got on board with VLAP at the very beginning of the program. We have data all the way back to 1987. You can look at reports on the NHDES website by following these directions:

<https://www.des.nh.gov/organization/divisions/water/index.htm>

Once at this page click on "Lake Management and Protection Program", then "Lake Water Quality Reports", then "Volunteer Lake Assessment Program". Then go to "click here to access individual and regional reports". The next page will have VLAP Annual Reports. Click on the year that you want and look for Perkins Pond.

You can see if you look at the report for 2017 that the trend data goes all the way back to 1987. The report for 2019 is not yet posted on the website, but is included in this paper.

The first page is the report and the second page is the data summary.

What are the “take-aways” from this report?

1. The report should be looked at as a trend over time and not any particular reading. So let's look at the trends for particular data and the things that are looked at.

**Chlorophyll-a:** This is the photosynthetic pigment that is found in plants, including algae. It is measured to estimate the amount of algal growth in a lake (or pond) system. As you might expect, Chl-a would increase with algae growth and would also increase as there is more sunlight in the warmer months. In a warm, shallow pond with lots of nutrients, one would expect the Chl-a readings to be high. In 2019 the average was “slightly better than 2018”, but the trend over time is noted as “relatively stable”. It indicates that Perkins Pond is “Mesotrophic”. As a lake ages it moves from Oligotrophic to Mesotrophic to Eutrophic. We are in the “mid-life” of our pond.

**Note:** as a pond or lake moves to Eutrophic we would expect the Chl-a readings to increase. In the life history of our pond 1987-2019 is only a very short time. This process might take hundreds of years. But with the influence of humans, it can be much faster. In my travels around the pond last season (and I did a lot of looking), I did not see any significant evidence of algae blooms. Increased algae blooms would be an indicator of excessive plant growth due to increased nutrient levels in the pond and declining water quality. We must work to keep excess nutrients out of our pond. You may have noted that last season, there were many algae blooms in lakes and ponds around the state.

**Conductivity/Chloride:** Conductivity measures the ability of water to carry an electrical current. Chloride ions are high in saltwater but typically very low in fresh water. Increased levels of chloride may come from road salt, septic systems, wastewater treatment plants and agricultural runoff. For our pond, most of the chloride probably comes from runoff and road salt used during the winter. Of note, chloride was high in the spring from Mary's road sample area, from salt runoff on the road. The state standard for chronically high chloride is >230mg/l. Our numbers are generally low but the levels have been increasing over time. Our efforts should be in trying to reduce runoff in the spring from the roads around the pond. High chloride levels are not good for water quality and life in the pond.

**Color:** this is a visual measure of the color of the water. Our pond water is seen as light brown. Higher color water generally has more organic debris and extensive wetlands. There is no standard for “good” or “bad” color.

**E-Coli:** this is a bacteria that is a natural component of the large intestines of humans and other warm blooded animals. We took several samples to test for e-coli and the readings were negligible. Although just a small sample, these results are great.

**Total Phosphorus:** Phosphorus is a nutrient. It is measured because it is seen as a “limiting nutrient” which means that this nutrient is a limiting factor which determines how much algae growth will occur. Excess phosphorus comes from sources such as fertilizers and septic systems. In our pond, the level is a little higher than the state median but is seen as “stable over time”. The hook up to town sewers has had a positive impact to help control total phosphorus in the pond.

**Transparency:** We measure this with a secci disk. This is a round disk that we lower into the water and note the depth when we can no longer see the disk. As expected, transparency is better in the spring, before lots of algae growth. It decreases in the warmer months due to increased algae growth and also more disturbance of the bottom due to increased boat traffic in the summer months. Over time, transparency has decreased in the pond.

**pH:** IF you recall your high school chemistry, pH is the measurement of hydrogen ions in the water. pH is read 0-14. A pH of 7 is neutral. pH should be between 6.5-8.0. pH levels in the pond have been stable over time and within the desired levels.

What does this all mean?

1. Our pond is fragile. It is very shallow and has a good amount of development around the shoreline. As we can see, the trend is also towards larger, year- round homes. We can all help by:
  - Not using fertilizers close to the shoreline
  - Maintaining a natural shoreline to minimize runoff from the land
  - Minimizing disturbing the bottom in very shallow areas
  - Minimizing runoff from your property
  - As an association, work on projects to reduce road runoff from tributaries
2. Continue to actively sample the pond through VLAP, and monitoring the results
3. Stay active as an association on work together on projects that we can do to help with water quality.