

(Water) Quality Time on Lake Temagami

By: Diana Van Vlymen, with contributions from Peter Healy and Adam Tretjack

What do you imagine when you think of a summer spent here on Lake Temagami? If you're anything like me, you may remember warm days spent participating in water sports, fishing at your favourite secret spot, a home-cooked meal prepared using water from the lake, and watching the stars on a calm night. Whether this is what you think of, or if your Temagami memories represent something different and equally significant to you, the lake is an integral part of the experience. The TLA recently began to implement a water quality monitoring program on Lake Temagami in order to establish a baseline of how the water's doing, so to speak, and to make efforts to preserve this lake in its current healthy condition.

With this goal in mind, the TLA's summer staff for the year continued the water quality program that began in earnest in 2012. We tested the lake in 43 locations, taking measurements of depth, pH, and clarity/turbidity using a Secchi disc. We also recorded temperature and dissolved oxygen using a ProODO (professional optical dissolved oxygen) probe. From the data we gathered in two rounds of sampling – May and August – we were able to interpret a few things about the lakewater quality.

First and most importantly, is the topic of phosphate or phosphorus. It is interesting to note that the two substances are slightly different, while the terms are often used interchangeably. Phosphorus is an element required by most life on earth, and phosphate is the ionic form in which it often exists, in living tissues and in the water column of the lake. Therefore, when our water samples are tested for phosphorus content, phosphate is the ion being measured because phosphorus exists as phosphate in phytoplankton (algae) and in the water. Measuring phosphate ensures we measure the phosphorus content not only of the water, but also that which is collected and used in the living cells of the algae.

But why is phosphorus so important? Why are environmental scientists, biologists, limnologists (lake scientists), and others concerned with the element? Phosphorus is necessary for the growth of virtually all life on earth, including phytoplankton. Phosphorus has been scientifically proven to be one of the main determinants of algal growth. Even in the presence of abundant nitrogen, potassium, and other nutrients, inadequate phosphorus limits the growth of algae. Conversely, abundant phosphorus can lead to nearly unrestricted algal growth – often called an algal “bloom”. Therefore, it is important that we know how much phosphate is currently in Lake Temagami, monitor change in the levels of phosphate over the years, and take steps to restrict any influx of excess phosphate into the lake from our own activities at the cottage.

Lake Temagami's current level of phosphate is an average of 4.2 µg/L in the spring and an average of 4.9 µg/L in the summer. Both of these values were determined using data collected over the last two years. In relation to other Ontario lakes, this level is excellent. Using data collected by the Ministry of the Environment through the Lake Partners Program, the concentration of phosphate in other Ontario lakes can be determined, yielding a result of 13.3 µg/L on average. Few other lakes in the province have the quality of water that Lake Temagami does. Other important data collected in May and August included the turbidity readings, pH, and dissolved oxygen/temperature, summarized in the dark box on this page.

However, it is important to note the gradual increase shown in the historical graph provided. While this increase is slow, it is steady, and seems like it will continue for many years. For this reason, we should do whatever we can to limit our own impact on the lake's phosphate levels. This means not using fertilizer at the island. (Trust me, many plant species are fine without any at all! And less garden maintenance means more time having fun at the cottage.) It also means using phosphate-free soaps like those sold during the summer at the TLA headquarters building and rinsing away from the lake, or using another option if you have one (like an indoor or outdoor shower). Using phosphate-free soaps for washing laundry and dishes is also a good idea, since all of the water used on islands eventually drains back to the lake. Finally, it is important to have your septic system checked out and perhaps replaced, since this can be another major source of nutrients that find their way into the lake if not functioning properly. Each of these considerations can help to minimize our impact on Lake Temagami, helping to keep the water healthy for generations to come!