

WATERSHED LAKES GREEN WITH ENVY OR ALGAE?

by Andrew Hudak

For those who did not had a chance to meet me, let me introduce myself. My name is Andrew Hudak and I was hired by the Long Lake Preservation Association in cooperation with the UW-Stevens Point to inventory lake water quality in Long Lake and other surrounding bodies of water in the watershed. I am a senior at UW-Stevens Point and will be graduating in December with a degree in Watershed Management and Hydrology.

I had the privilege to be housed over the summer at Tomahawk Scout Reserve and study the watershed lakes with the purpose of acquiring preliminary water quality data. The lakes that I sampled were Long, Big Devils, Little Devils, Harmon, Slim, Slim Creek Flowage, LoyHead, MacRae, Nick, Mud, and Bass. All lakes were sampled weekly to begin the summer, but I cut back to testing every 2 weeks once the lakes began to stabilize.

Long Lake, the largest lake in the watershed, has the oldest history of water quality data. The difference between this year's data and that collected in previous years can be attributed to the equipment available to me.

The LLPA was fortunate to receive a grant that aided in the purchase of a Hydrolab Quanta. This device is equipped with many different sensors to collect information such as temperature, pH, and dissolved oxygen. It also has a depth gauge to collect the exact depth at which the probe is located below the surface.

Along with using the Hydrolab, I tested for the nutrient phosphorous,, which is one of the major causes of algae blooms. Another important collection was water clarity, which was sampled using a Secchi disc.

The question everyone is asking is, "How are the lakes?" This is a very open-ended question and, to sum it up, they are healthy. But there are some interesting results. The main things I looked at were water clarity, phosphorus, and dissolved oxygen. These all give a measure to the productivity of a water body.

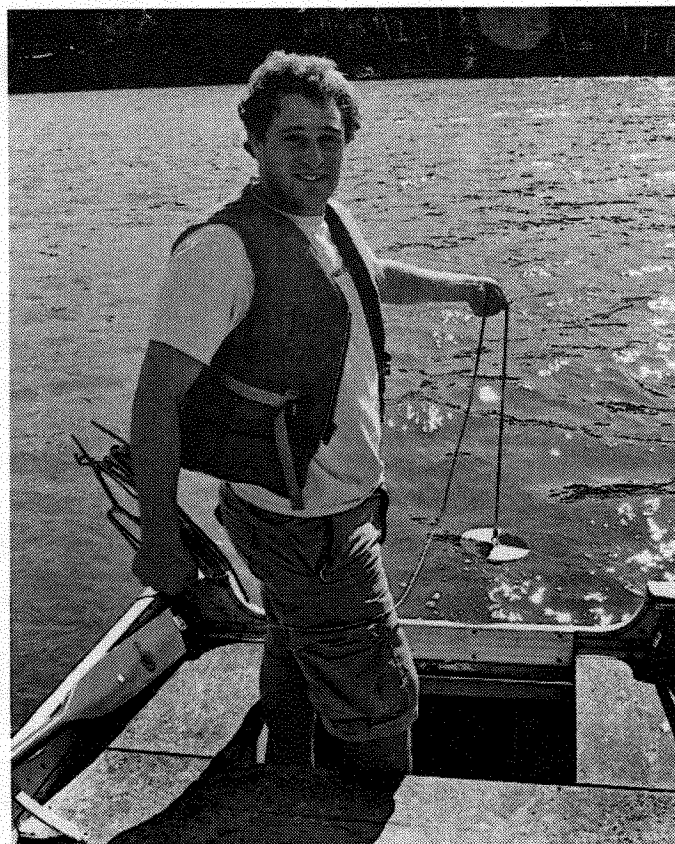
Water clarity is measured using a Secchi disc, which is nothing more than a half black and half white disc that is lowered into the water until it's at a depth that is no longer visible. This is an easy measurement that can be done in less than 5 minutes. The general trend I noticed in all the lakes was that early in the spring the Secchi disc could be read at deeper depths than later in the summer. This is a natural occurrence and happens in any lake that experiences algae growth. This was the case in all lakes sampled. The problem arises when an unnatural growth or bloom decreases water clarity. This was most apparent in Mud Lake, where I took a Secchi reading of 8.5 ft on May 31 and a 1.5 ft reading on August 18.

The next measure of the productivity of a lake is a measurement of the nutrient phosphorous. This measurement consists of water that is collected from the surface and sent to the lab in Stevens Point. There was again a noticeable change in Mud Lake: from 33 mg/l on June 8 to 133 mg/l on August 2.

Other lakes went through the same progression, but it was not as severe. There was also a notable progression at the northern basin of Long Lake. To further investigate sources for this nutrient there, samples were taken from the artesian well located at the northeast corner of the lake. These samples came back very high—at 78 mg/l. This indicates there is a high concentration of phosphorous, likely seeping into the lake from the ground water.

The most difficult productivity measure, but also the most accurate, involves taking weekly measurements of dissolved oxygen. Dissolved oxygen occurs as microscopic air molecules intertwined with water molecules. They get there by two pathways, either through photosynthesis from plants and algae or when water contacts air.

Dissolved oxygen also is removed in two ways, either by respiration of plants and animals or by the decomposition of organic matter. The decrease in dissolved oxygen only occurs when and where it's not capable of being replenished.. In Wisconsin lakes, this is around 20 feet. Throughout the summer, below the 20-foot level, oxygen begins to be in short supply for fish and other



Andy takes Secchi reading