

Water Quality Update for Wahwashkesh Lake

During the past 13 years, volunteers from Wahwashkesh Lake have taken water quality samples on the lake in cooperation with the Ontario Ministry of the Environment Lake Partner Program. These data include total phosphorus, which is the limiting nutrient to algae and plant production on Canadian Shield lakes such as Wahwashkesh Lake and water transparency. Increases in total phosphorus in the water will increase tiny microscopic algae (phytoplankton) in the water column, cause the water to turn greenish, and reduce the clarity or visibility in the water. We used a secchi disk to measure water transparency. In Wahwashkesh Lake, water transparency will change with the amount of phytoplankton algae in the water. Also in our lake, conifer trees dominate the watershed, and tannins from terrestrial vegetation leach into the lake. This causes the water to appear slightly tea stained or brown, and this is a natural process.

Since 2002, average total phosphorus concentrations in Wahwashkesh Lake have ranged from 6 to 10 parts per billion (ppb) and upward and downward trends were not evident (see Figure 1 below). In 2013, phosphorus concentrations were higher compared to most years. Besides 2013, high phosphorus concentrations were also measured in 2003, 2008, and 2009. Over time, most individual total phosphorus concentrations were in the oligotrophic range (low nutrients), with a few concentrations in the mesotrophic range (moderate nutrients). Since 2001, average annual water transparency has ranged from 2.7 to 3.5 meters and similar to phosphorus, trends over time were not evident (see Figure 1 below).

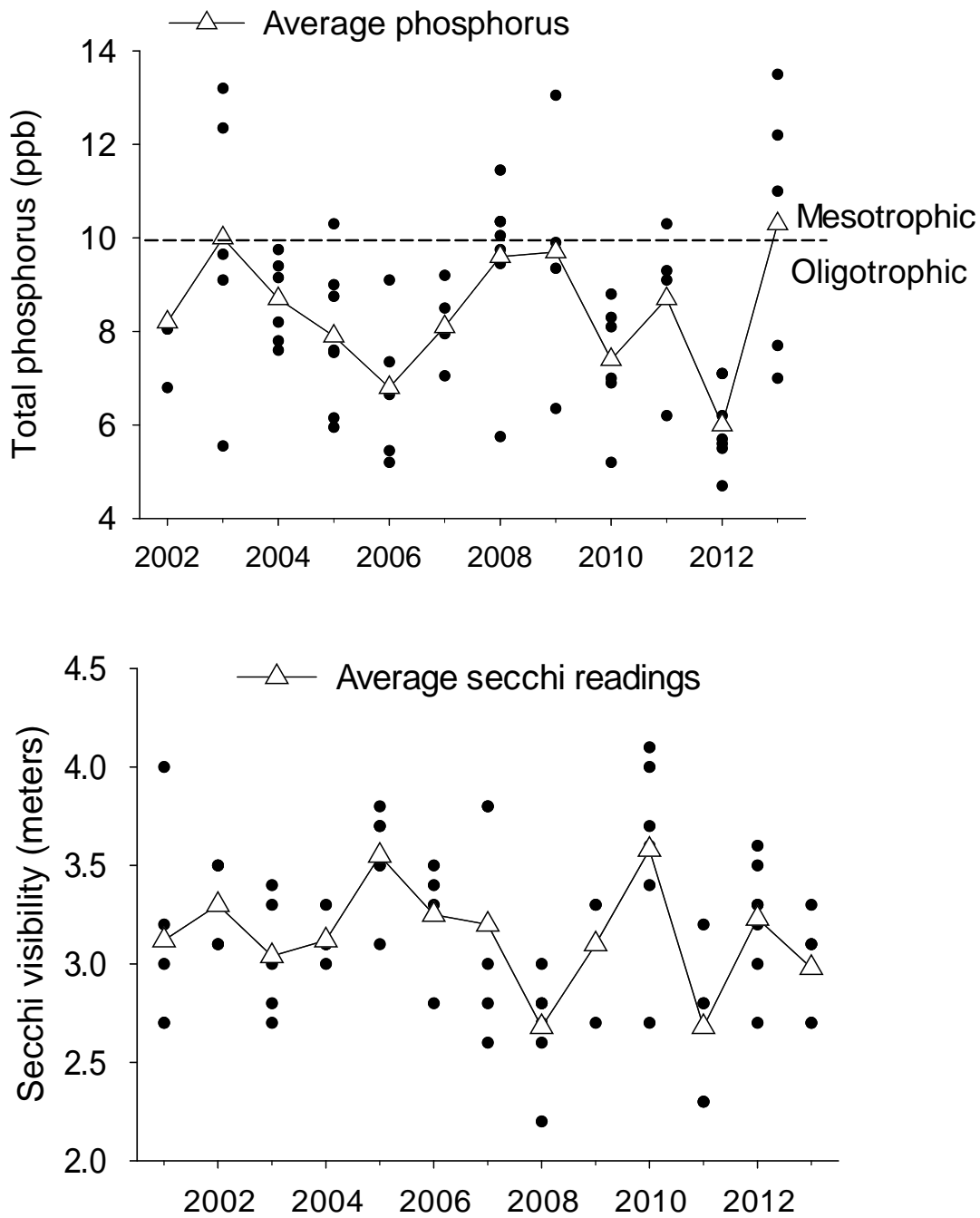


Figure 1. Top graph shows individual and average annual total phosphorus concentrations (parts per billion; ppb) in Wahwashkesh Lake from 2002 to 2013. Each dot represents a single measurement. The bottom graphs shows water transparency measured in meters with a secchi disk from 2001 to 2013. Individual measurements are the dots and represent about 4 to 5 readings made between May and September each year from one location on the lake.

A similar pattern of higher phosphorus concentrations was also observed in Ahmic and Cecebe Lakes in 2013, which are upstream of Wahwashkesh Lake on the Magnetawan River system (see Figure 2 below). Generally, phosphorus concentrations in Wahwashkesh Lake have been lower than phosphorus measured in these two upstream lakes. In 2013, water transparency or water clarity was about 0.5 meter greater in Wahwashkesh Lake compared to Ahmic Lake (see Figure 2 below). The Ministry of the Environment Lake Partner Program database for 2013 did not provide Water clarity data for Cecebe Lake. Over time, water clarity has been greater in Wahwashkesh Lake compared to Ahmic and Cecebe Lakes. Interestingly among these three lakes, annual fluctuations in phosphorus concentrations and water transparencies mimic or parallel each other among these three lakes. I suspect annual climatic conditions (possibly dry versus wet years) have a similar influence on water quality on these three lakes in the Magnetawan River system.

Finally, in Gooseneck Lake, which drains into Slip Bay on the south end of Wahwashkesh Lake, phosphorus concentrations were lower in 2013 than those measured in Wahwashkesh Lake (5.5 versus 10.3 ppb). Over time, phosphorus concentrations have tended to be lower and water clarity about 0.5 meters greater in Gooseneck Lake than in Wahwashkesh Lake. I expect lower phosphorus levels and greater water clarity in Gooseneck Lake as the water shed is smaller, and this lake is upstream of Wahwashkesh Lake.

Continued monitoring of water quality in Wahwashkesh Lake is important to detect if any changes do occur. Leaching of nutrients from faulty or non-existent septic systems and upstream inputs of nutrients are issues that should be closely watch in Wahwashkesh Lake.

Currently, we have only two volunteers collecting water quality samples on the Big (South) Lake and we could use at least two more volunteers. Only 2-3 hours each summer are needed to do this task. If you wish to be a water quality volunteer or want more information, contact me or log onto to this web site:

http://www.ene.gov.on.ca/environment/en/local/lake_partner_program

Mike Maceina (maceimj@auburn.edu)

Director and Wahwashkesh Lake Water Quality Coordinator

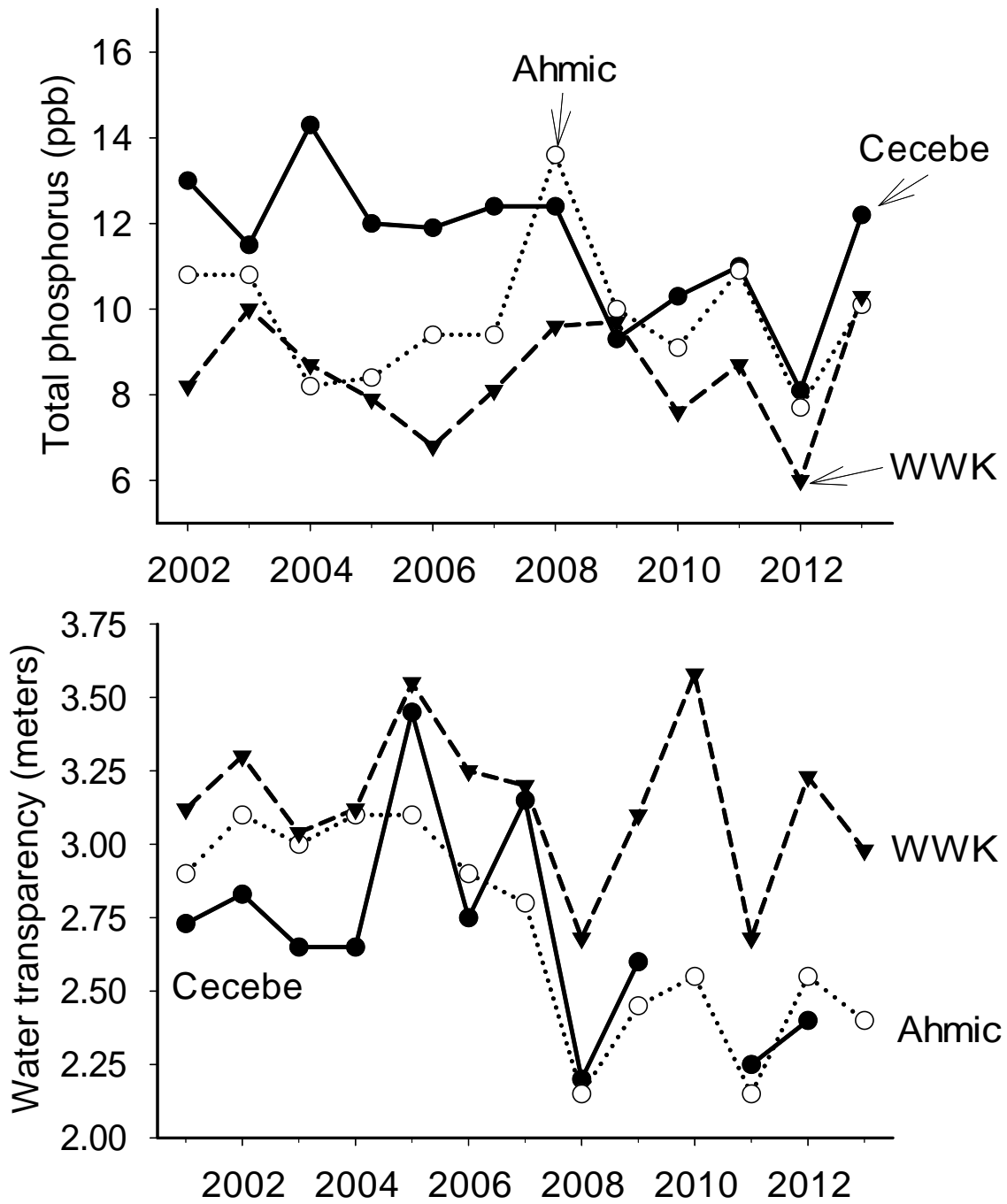


Figure 2. Mean phosphorus concentrations (top graph) and mean water transparency (bottom graph) in Ahmic, Cecebe, and Wahwashkesh Lakes from 2001 through 2013.