WHITE LAKE

PROPERTY OWNERS ASSOCIATION
ENVIRONMENT VOLUNTEERS

State of the Lake Report

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White Lake and the Environment

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Conrad Grégoire PhD and David Overholt BA

2022 marked the 9th year that we have been reporting on White Lake water quality. A number of parameters are monitored which are indicative of water quality. This data, as well as reports in the scientific literature, form the basis of our annual reports. Data obtained over a period of years is also studied for long-term trends. The more data we have the more accurate is our assessment of the state of White Lake

In this volume we provide observations and information on White Lake gathered over the last nine years. For a complete referenced account of our work, we ask that you access the White Lake Science and Information Website for full-length Water Quality Monitoring Reports as well as Special Reports on individual topics. Alternatively, the website can be accessed via the Environment portal on the White Lake Property Owners Website.

Water Quality

Water quality is a term which can mean different things to different people. Depending on your interest, it could refer to clear water, good fishing, or water suitable for drinking free of toxic chemicals or pathogens. In fact, it is all of these and more. Wikipedia defines it as "the chemical, physical, and biological characteristics of water based on the standards of its usage. The most common standards used to monitor and assess water quality convey the health of ecosystems, safety of human contact, and condition of drinking water".

White Lake is a shallow warm-water lake with high productivity of both plant and animal life. As such, it is very sensitive to nutrient inputs.

One way to assess the impact that nutrient inputs are having on a lake is the number and frequency of algal blooms. Algal blooms are both a sign and a measure of declining water quality.

A recently published report traces the history of algal blooms in White Lake from 1860 to 2021. The detection of algal blooms prior to the construction of the concrete dam at Waba Creek is based on the analysis of sediments using special techniques. Algal blooms to 1977

are reported in the scientific literature and (MOECP) in reports published by the Ministry of the Environment, Conservation and Parks. For the period starting in 1977 and ending in 2012 (35 years), no algal blooms were recorded.

Starting in 2013 and to the present, at least one algal bloom occurred in each year. Four algal blooms were recorded in 2018, two in 2019 and 2020. In 2021, there were 5 algal blooms. In each of these years, there was at least one blue-green algal bloom, some of which released toxins into the lake.

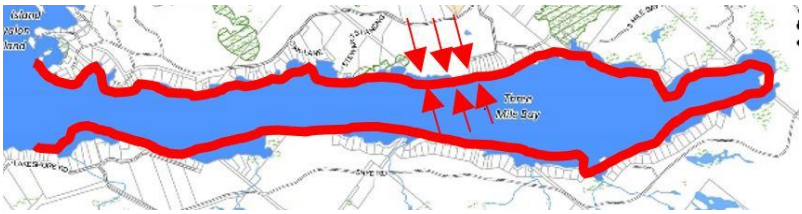
Annual algal blooms are a sign that White Lake is under stress and cannot absorb any increase in nutrients or other impacts of human activity, such as shoreline erosion.

Three factors combine to create this situation: lake overuse, invasive species, and climate change.

Lake Overuse

From 1977 to 2008, the number of cottages, trailers and commercial tourist units on White Lake have increased from 475[1] to 1538, an increase of 324%. Available numbers also show that from 1985 to 2018, permanent homes on White Lake increased by 354% to 209. These trends are continuing today with ever increasing human impact on the lake. More people spending more time using White Lake inevitably means greater amounts of septic system outflow, more and larger boats, etc.

Invasive Species



The presence of zebra mussels in the lake has changed the way phosphorus is cycled creating a near-shore zone where nutrients concentrate causing algal blooms in the spring and fall. This zone is depicted as the red line in the above figure. The arrows indicate that nutrient inputs are transferred to the near-shore area both by land from runoff (above and below ground) and from deeper parts of the lake by the action of zebra mussels, which feed by filtering lake water at the rate of about 1 litre per day per mussel.

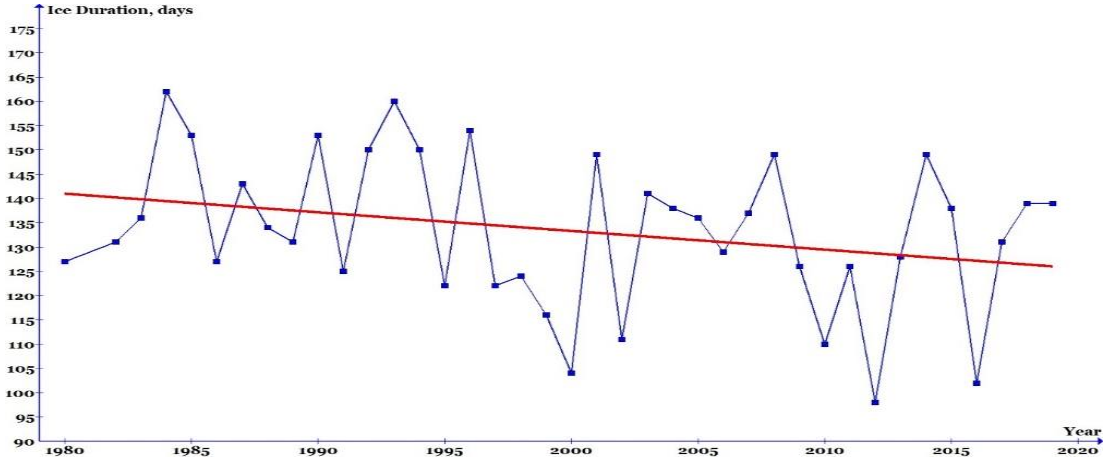
Phragmites is slowly invading our marshlands and could eventually displace cattails and other native plants. Fish and other animals which depend on cattail marshes for reproductive purposes will be harmed. European milfoil is now resident and spreading in White Lake. There are a number of other invasive species including quagga mussels and a number of very harmful plants which could enter the lake soon if nothing is done to stop them.

[1] J.P. Ferris, White Lake Integrated Resources Management Plan, Part I, *Ministry of Natural Resources, Lanark and Renfrew Counties, December 1985.*

Climate Change

Climate change is causing unpredictable and unexpected weather patterns. In recent years White Lake has experienced tornados, a microburst and high wind events causing damage to buildings and infrastructure. Low-snow winters, and prolonged periods of hot weather have resulted in lower water levels and higher water temperatures.

Since 1980, the ice-free season on White Lake has increased by nearly 2 weeks, as shown by the downward sloping redline on the graph below. This means that there are now two additional weeks per year for cottagers and residents to be at the lake and to be using the lake for residential and recreational purposes.



What Can We Do?

One of the most important actions a property owner can take is to restore their shoreline to a natural state using native plants. Maintaining fully-treed lots as much as possible interrupts and/or delays movement of nutrients from septic systems to the lake. Download your own copy of the Lake Protection Workbook and assess your shoreline.

As in any society, there is always a fraction of property owners who will not fully understand the impact that they are having on the lake. It could also be that they are not interested in knowing and just want to enjoy the lake. This is when governments can intervene and take action to preserve White Lake. The people who are charged with managing the lake (with the assistance of the MOECP), are the Councils of the four municipalities sharing White Lake.

Since the Township of Lanark Highlands has both the greatest number of taxpayers of any municipality and the greatest number of its own taxpayers located on White Lake, it has both the most to lose as well as the most to gain when it comes to the health of White Lake.

One suggestion is for LH to take the lead and establish a 4-municipalty committee which could effectively manage White Lake. This committee would provide a forum for local taxpayers to bring forward concerns related to the management of the lake.

Author Profiles

Conrad Grégoire holds a Ph.D. in Chemistry. He was the Head of the Analytical Chemistry Research Laboratories at the Geological Survey of Canada before retirement where he conducted research in analytical and environmental chemistry. He has authored over 200 scientific papers and other works published in international journals. He was also an Adjunct Professor of Graduate Studies at Carleton University and currently collaborates with Carleton University scientists on White Lake studies. For over 20 years he was a Senior Assessor at the Standards Council of Canada, certifying commercial and government labs for ISO (International Standards Organization) compliance. Conrad is interested in studying the chemistry and biology of White Lake and establishing base line values for water quality parameters. He is the Web Manager of the White Lake Science and Information website.

Dave Overholt is an avid citizen scientist and has, through his own study and research, become knowledgeable in a variety of areas, such as aquatic macrophytes and microorganisms and introduced species. He spends a great deal of time documenting species inhabiting the lake and following the population levels. He is involved in education about introduced species and has motivated and inspired lake residents to become involved in phragmites eradication programs.