ENVIRONMENT BULLETIN

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Green Algae Bloom on White Lake

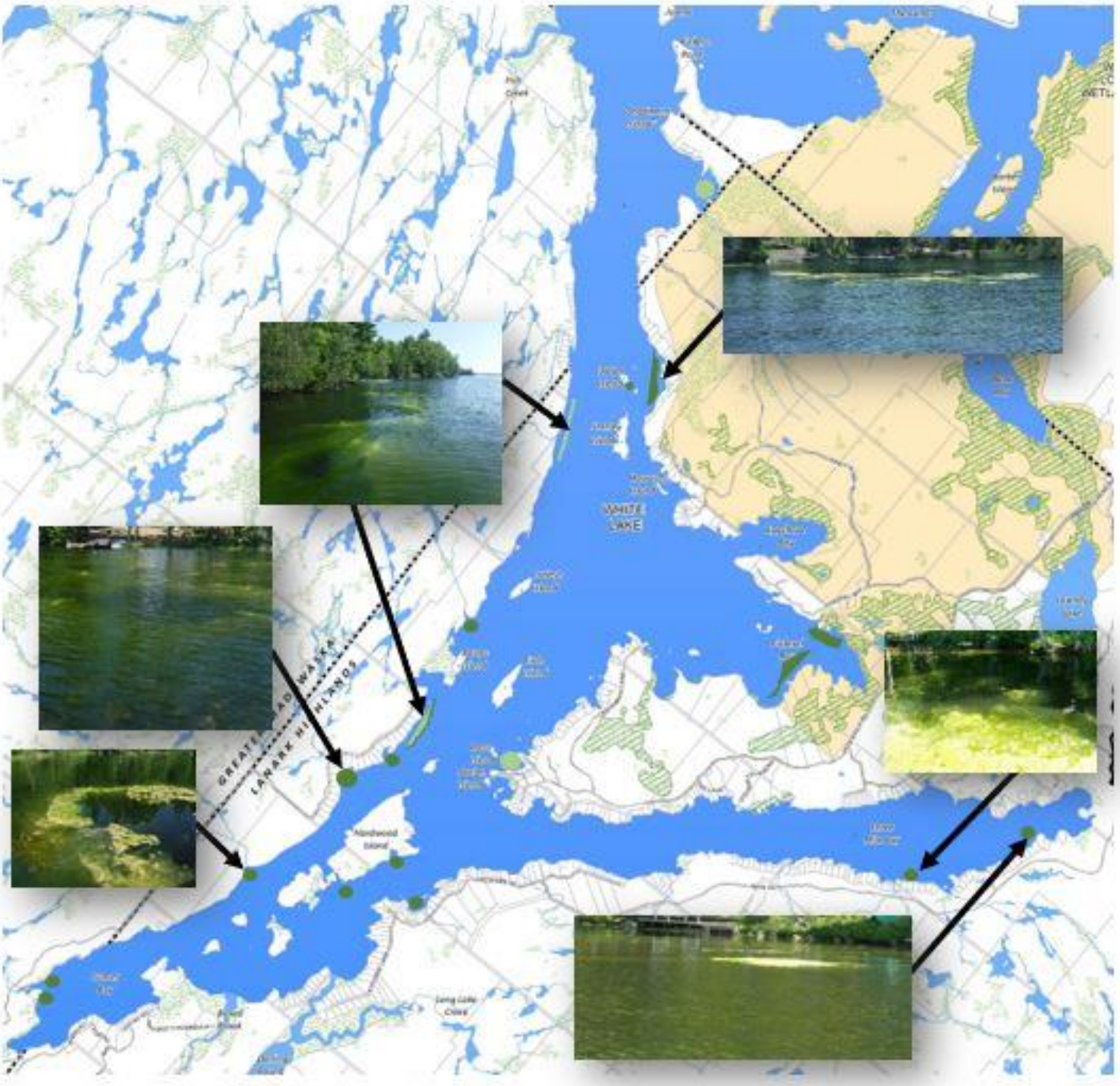
In recent days we have received a number of enquiries and have seen some social media posts on the current on-going green algal bloom on White Lake.

In order to assess the extent of this bloom, we mapped the occurrences of this bloom over a large part of White Lake. We toured the entire shoreline of White Lake south of Fish Creek in order to present a 'snapshot' for June 20, 2020 of algal bloom locations. We also collected samples at each site for microscopic examination. Below is a map of the survey area.

We were not able to examine the entire shoreline of White Lake (~ 97 km) due to time constraints, and so cannot report on other areas of the lake, in particular Hayes and Bane Bays, The Canal and the White Lake Village Basin.

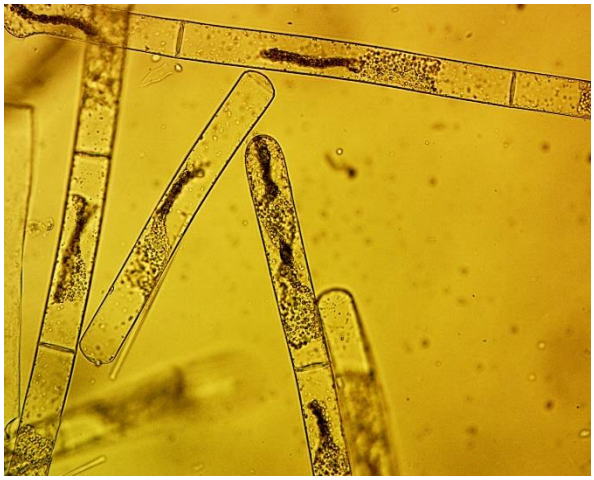
Filamentous green algae of the type we are seeing in the lake has been resident in the lake for likely a good part of the existence of White Lake. Similar algal blooms have been reported recently in the news, in particular in the Rideau Canal, so the bloom in White Lake is not an isolated event.

Algae bloom when conditions are right for its rapid and uncontrolled growth. These conditions include the presence of excess nutrients (phosphorus), favourable water temperature and clarity, sunlight, and the action of wind and waves. For White Lake, the presence of zebra mussels is an additional factor promoting the growth of filamentous green algae. These mussels tend to concentrate nutrients from open waters to the shoreline area where filamentous algal blooms occur. The severity of the algal bloom resulting from the sum of the above factors can be intensified by the runoff of nutrients from areas of shoreline which have been de-treed or altered in such a way that nutrients can enter the lake unmoderated by the presence of trees and other natural shoreline vegetation which prevent nutrients from entering the lake. The map below shows the results of the survey:


WHITE LAKE

In the map above, dark green is used to denote surface and submerged filamentous green algae and light green for submerged only. The size of the green dots indicates the relative size of the algal bloom area at each site, as does the length and width of lines for affected shoreline. The attached photos provide a visual representation of the algal bloom itself.

Thirteen sites with algal blooms were sampled for purposes of identification. All sites sampled showed that the lime-green algal "clouds" forming under the surface represent just one genus of filamentous green algae- a type called mougeotia, which is also commonly known by the unappetizing name of 'elephant snot'. This alga does not produce toxins in the water and so the bloom is considered a nuisance bloom. The photo below shows a mass of their filaments magnified 200 times.



In addition to the blooms shown on the map, we observed numerous free-floating masses of the algae on the surface of the lake in locations where there were no visible fixed blooms. Many of the blooms occurred in bays or small embayments along the shoreline. During its lifetime, this alga produces gases which become trapped in the fine mesh of the algal mat and serve to raise the bloom from the lake floor to the surface, where it can be affected by the wind.

When large mats of algae die and decompose, the water column can become anoxic (no oxygen) causing the release of phosphorus trapped in sediments. Sediments contain about 200,000 times the concentration of phosphorus found in lake water. The released phosphorus can trigger a secondary bloom which could be larger than the original event.

Although there were large patches of this algal bloom in areas near unaltered forested shorelines, the most serious and largest blooms were found immediately adjacent to newly de-treed and landscaped cottage lots, and areas of severely altered shorelines.

The occurrence and extent of these blooms have increased in recent years which may reflect the growth of zebra mussel populations, climate change and lake overuse.

Although the size and shape of these blooms may change over the summer, they will likely remain visible and a nuisance until the end of July and could persist into August as they did in 2019.