Protecting Sarnia's Water Supply and Shoreline – Shining a light on drains that enter Lake Huron

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Did you know that Lake Huron has a residence time of 22 years?[1] What that means is anything that enters the lake will hang around for decades. Nutrients such as nitrogen and phosphorus can enter the lake and then be transformed or consumed as they move through the lake. These nutrients can impact the oxygen supply and general health of the lake. Therefore, it is important to limit the amount of nutrients that enter a water body such as Lake Huron.

Nutrients such as phosphorus and nitrogen can fuel the growth of harmful algae such as blue-green algae in slow moving or still water. Blue-green algae is a photosynthetic bacteria (Cyanobacteria) which means it can produce energy through photosynthesis. Dense blue-green algae blooms may make the water look bluish-green, or like green pea soup or turquoise paint. The algae can also be olive-green or red.[2]

Blue-green algae can form in any water body that is shallow and warm and can contain the poisonous cyanobacterial toxins which can be harmful to humans or animals. These toxins are released when the cells of the cyanobacteria break open or die. The toxins can impact human health by attacking the liver or the nervous system.

Blue-green algae blooms can be developed for weeks before they are detected at the surface. This is because blue-green algae have gas bags which can regulate its position in the water.[3] Over the past ten years, toxic blue-green algae, or harmful algal blooms, have reappeared in lakes Erie, Ontario and Huron.[4]

So how do nutrients enter our lake? Run off from agricultural fields, agricultural operations, and fertilized lawns can be a source. Improperly functioning septic tanks and sewage treatment plants can also contribute nutrients to the lake. Sewers that can flow into storm drains which are called Combined Sewer Overflows are also a source of nutrients to the lake which is why then need to be removed and replaced with separate storm water and sewage pipes.

Natural and human made drains that enter Lake Huron throughout the watershed are key transport pathways for these nutrients from agricultural sources. These drains need to be assessed and protected. All activities

around these drains need to be managed to minimize any nutrient inputs which could eventually enter Lake Huron.

These drains that enter Lake Huron are also a key entry pathway for phragmites into Lake Huron. These feather-topped reeds have been described as Canada's worst evasive plant as they can crowd out native vegetation and provide poor habitat and food supplies for wildlife.

While phragmites prefer areas of standing water it roots can grow to great lengths which allow it to survive in relatively dry areas. Phragmites have a dense, interconnected root system that emits toxins to choke out rival plants. Phragmites can be burned, poisoned, cut or crushed but still resists removal.[5]

Drains should be monitored and any phragmites found there should be removed to prevent the reeds from travelling into Lake Huron and impacting our shorelines. Phragmites on the shoreline can severely restrict recreational activities that take place there as well as overall enjoyment of the lake.

Phragmites can also be spread by people coming in contact with the plant and transferring seeds to new areas. It is also of note that phragmites should not be composted as it seeds can survive and grow in compost.[5]

Now more than ever we need to keep an eye on the drains that enter Lake Huron to make sure that our water supply and recreational areas can be protected for years to come. Blue-green algae and phragmites are two threats we cannot ignore to ensure that Sarnia's water supply and shoreline is protected for years to come.

References:

1. https://www.safewater.org/fact-sheets-1/2017/1/23/cleaning-up-after-pollution
2. https://www.ontario.ca/page/blue-green-algae
3. https://www.cbc.ca/news/technology/how-blue-green-algae-is-taking-over-canadian-lakes-1.1326761
4. Paerl, H.W., N.S. Hall, and E.S. Calandrino. 2011. Controlling harmful cyanobacterial blooms in a world experiencing anthropogenic and climate-induced change. Science of the Total Environment 409:1739-1745.
5. https://www.ontario.ca/page/phragmites-fact-sheet

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