

Algae Problems on Our Lakes - Summer 2007

What are algae?

Algae are tiny aquatic plants containing chlorophyll and are usually green in colour. They make their food in the form of starches or oils by using the energy of sunlight and nutrients from the lake. They grow in many forms. Some species are microscopic single cells; others can grow as mass aggregates of cells or in strands.

Algae are critical to the life of our lakes. They are the base of the food chain and convert nutrients to organic matter and help to oxygenate the water.

What kind of algae is causing this bloom?

The algae bloom on our lakes is most likely the alga from the group *Mougetia*, *Spirogyra*, *Zygnema*. This mat-forming alga is historically found throughout the Rideau system and area lakes. It becomes a nuisance when all components of good growing conditions are present including:

- available nutrients like phosphorus and nitrogen
- warm water temperatures
- sunlight
- and precipitation

All these factors give algae a competitive advantage and room to grow.

Will it harm the Lake?

Potentially. The effect algae will have on a lake depends on how much of it there is. Phosphorous appears to be the key factor responsible for excessive growth.

Phosphorus enters the lake from septic systems and overland by surface runoff. In years when there is a lot of rain, phosphorus from sources such as animal waste and lawn fertilizers is carried into the lake. When phosphorus levels are high, the algae has an unlimited food supply and is able to grow at a faster rate. Reducing the amount of phosphorus available to plants is the most effective way to solve the algae problem.

As the oxygen is depleted, phosphorus that is trapped in the lake sediments is released into the water and becomes available as food for plants in the spring. More food means more plants, more plants mean more dead matter that must decompose. More decomposing plant material means oxygen levels may become depleted which causes phosphorus to be released from the sediments. The increased phosphorus increases the algae growth and the cycle begins again. This cycle can be slowed by reducing phosphorus inputs to the lake primarily by maintaining vegetation along the lakeshore to filter out the nutrients before they enter the lake.

Zebra mussels may also increase algae's competitive advantage in two ways. Zebra mussels filter the lake water, removing nutrients and particles and increasing water clarity. With fewer particles in the water, sunlight is able to penetrate to a deeper depth which also improves plant growth. In addition to more sunlight, plants receive a substantial supply of nutrient rich feces from the zebra mussel colony.

Blue-Green Algae – What is it and is it toxic?

While the algae type that is causing the blooms on area lakes is filamentous, blue green algae are a common alga that does exist in most fresh water bodies.

Blue-green algae are primitive microscopic plants that live in fresh water. Their scientific name is cyanobacteria. Normally blue-green algae are barely visible, but, during warm weather, populations can rapidly increase to form a large mass called a bloom. Blooms most commonly occur during the late summer and early fall and are naturally occurring phenomena.

It is important to note that many forms of blue-green algae are relatively harmless, although some forms produce toxins which can be harmful to your health and the health of your animals. The most common toxins are called microcystins.

For more information visit:

<http://www.ene.gov.on.ca/cons/5088.pdf>

<http://www.ene.gov.on.ca/programs/4661e.pdf>

http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/cyanobacteria-cyanobacteries_e.html

<http://www.ene.gov.on.ca/cons/5087.pdf>

Aerators:

Aerators have been used in some lakes to help control algae blooms. Aerators work to keep water moving and maintain a more constant temperature from top to bottom of the water column. This helps to prevent extremely warm layers of water from forming at the surface during the hot summer months. Aeration also prevents severe oxygen depletion initiated by the death and decay of an algal bloom. Algae may still bloom despite aeration.

It is important to note that considering an aerator system for Otty Lake is a costly approach to dealing with the problem and will affect the entire lake. An aeration system will need to be installed throughout the entire lake and will require engineering of the system and costly installation.

The first treatment step should always be bloom prevention. Natural surface water will occasionally bloom regardless of the best efforts at prevention. But the frequency and severity of the bloom can be reduced by using good management practices. Runoff should be controlled to minimize fertilizer and/or waste inputs. Water should be kept as nutrient-free as possible.

How it affects fish populations:

Many fish rely on algae for spawning, nursery and feeding functions, however when alga becomes excessive it can negatively impact the physical water requirements by fish (dissolved oxygen, temperature).

Increased sunlight and nutrients allow the algae and other plants to grow in large, thick patches. During the day, algae use the sunlight to produce oxygen. At night these thick mats of algae require oxygen to live, to the disadvantage of other plants and animals that must compete for the limited oxygen supply.

When the plants die off in the fall, large amounts of plant material sink to the lake bottom and begin to decompose, a process which consumes oxygen. When there is a lot of plant material, oxygen supplies at the bottom of the lake can be used up. When oxygen levels become used up the lake becomes

“anoxic”- there is no oxygen left for the fish and other animals that live in the lake. This can cause large numbers of fish and other critters that live on the lake bottom to die.

Who’s dealing with the problem out there? Who should I call?

While the Rideau Valley Conservation Authority can answer some of your questions and concerns about algae on your lake, the Ministry of the Environment and your local Health Unit are the agencies that have the response role.

These two organizations work together to let the public know if an algae bloom becomes harmful to human health. If a lake is suspected of toxic blue-green algae, the history of algae blooms on the lake is considered, sampling and identification of the algae is completed by the MOE and the Health Unit lets the public know through a Public Service Advisory if there is a problem. Advisories come with recommendations and advice on how to deal with the situation.

What you can do to help:

As it was mentioned earlier, phosphorus enters the lake from septic systems and overland surface runoff from animal waste and lawn fertilizers. Reducing the amount of phosphorus available to plants is the most effective way to solve the algae problem.

Ways you can reduce your phosphorus inputs into the lake

- Plant a shoreline buffer with native grasses, flowers, shrubs and trees
- Increase your buffer if you already have one
- Reduce ornamental lawn areas and if possible avoid them completely
- Try to contain overland runoff
 - Install eaves on upland buildings
 - Look at drainage routes on your property and redirect flows to buffer/planted areas
 - Plant upland buffers on steep areas in your yard
 - Maintain permeable surfaces on your property such as gravel driveways and wood chip walkways
- Stop using fertilizers on your property
- Get your septic inspected
 - Upgrade if necessary
 - Maintain regular pumpouts

Algae are not going to go away nor do we want them to because they are an integral part of lake ecosystems. However, we don’t want them in abundance. The key is to limit their food sources. The main contribution the individual can make is, as detailed above, to reduce the input of nutrients to the lake from their property. This will not guarantee that there won’t be any more algae blooms but it can help to limit the frequency and extents of algae blooms in the future.