Algal Blooms in Ontario's Lakes

As of August 2011, blue-green algae had been reported in several Ontario locations, including Sturgeon Lake, Big Bald Lake, Pigeon Lake, Desbarats Lake, Crab Lake, the French River, Lake Nipissing, and on four City of Sudbury Lakes: Long, McFarlane, Middle and Ramsey.

Not all algae are toxic. Read onward to learn what to look for, and what to do if you find algae in your lake.

What are Algae?

Algae are small, mostly microscopic plants that live in virtually all water bodies. They can be free-floating, or attached to rocks or the lake bottom. There are literally thousands of species of algae that grow in many different habitats. Algae are similar to other terrestrial (land) plants in that they require nutrients and light, and they grow better when it is warm.

Algae are an important part of lake "food

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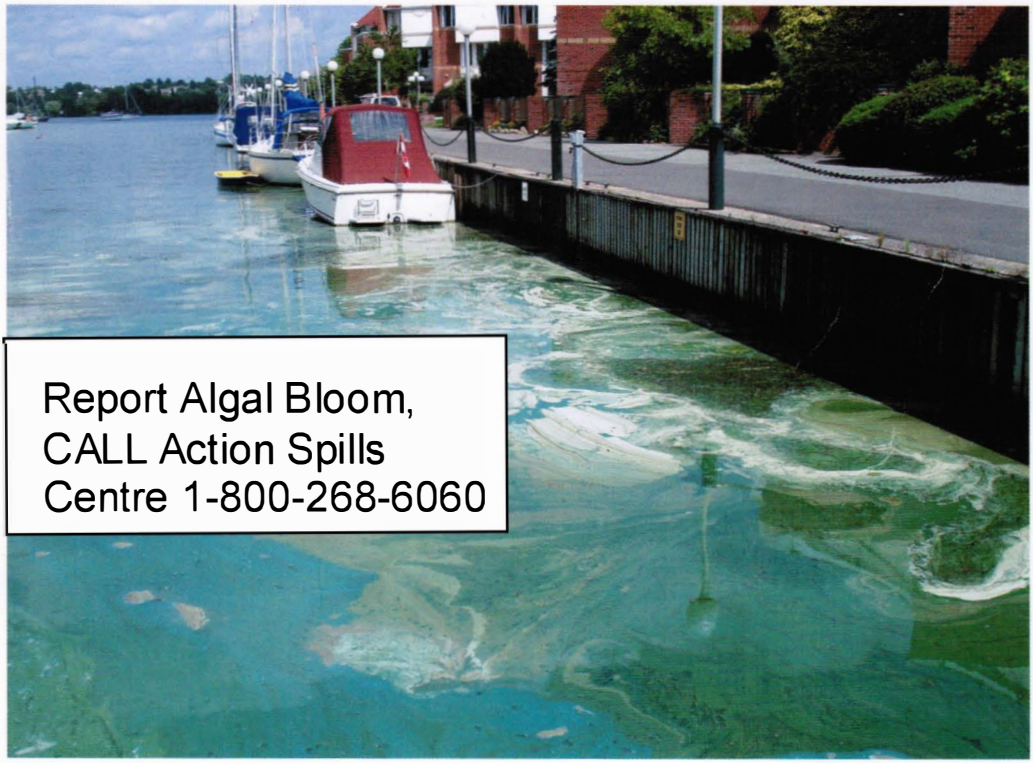


Blue-green algal bloom. Photo courtesy of the Ontario Ministry of the Environment

Algal Blooms *continued from front page*

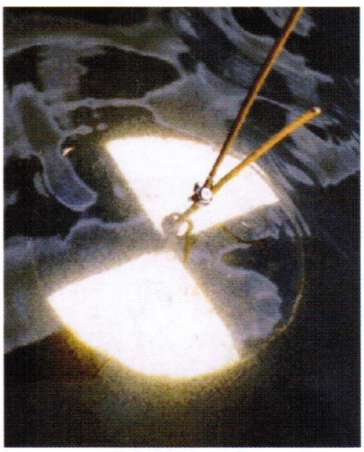
webs" and a necessary part of ecosystem integrity. They have an effect upon our atmosphere by producing oxygen and converting carbon into organic compounds that "feed" zooplankton and, in turn, small and larger fish in our waters.

What is an Algal Bloom?

A "bloom" is the excessive growth of one or more species of algae. Blooms are less likely to occur in deep lakes with lower total phosphorus (TP) levels. Conversely, blooms are most likely to occur in shallow lakes or bays that have moderate to high TP.

Blooms may:

- Affect the appearance of water
- Result in unpleasant tastes or odours
- Reduce water clarity
- Colour the lake a vivid green, brown, yellow or red
- Deplete oxygen levels
- Produce toxins that are dangerous to humans and animals.



Algal bloom on Secchi Disk

Non-toxic Algal Blooms

Some kinds of algal growth are not toxic, even though you may not be thrilled to find them in your lake. Filamentous Green Algae is an example. Golden Algae, also called "chrysophytes" is an increasingly common type of algae in Ontario, particularly in low-nutrient lakes. These types of blooms can cause bad taste and odour in water, but do not release toxins.

Blue-green Algae (cyanobacteria)

Blooms of some species of cyanobacteria (also called "blue green algae") may produce toxins. These toxins can affect the health of humans, livestock and household pets. Although there are relatively few reports of human illness from blue-green algae, these toxins can induce symptoms such as fever, diarrhea, abdominal pain, nausea and vomiting. More common reactions include itchy, irritated eyes or skin caused by external contact with cyanobacteria during water activities such as swimming, boating or water skiing.

Cyanobacteria are a type of photosynthetic bacteria; the term "algae" is applied merely because of their ecology. Under favourable conditions, cyanobacteria can rapidly reproduce to form a bloom. Cyanobacteria have inhabited the earth for over 2-billion years and inhabit a wide variety of environments.

When do algal blooms occur?

A combination of factors are required to result in the formation of a blue-green algal bloom, including:

- calm weather
- strong sunlight
- high air and water temperatures
- relatively shallow water
- sufficiently high levels of nutrients (in the water or sediments).

Interestingly, an investigation of Lake Partner Program results from 2002 to 2009 reveals that a subset of the lakes that had cyanobacterial blooms had higher Spring TP concentrations than average. Phosphorus is a nutrient that can occur naturally, but may also come from a variety of man-made sources, including runoff from household waste management systems, detergents or fertilizers, as well as nearby agricultural or industrial sources.

The conditions favouring algal blooms usually occur from mid-summer to fall in Ontario. However, climate change may be having an effect on algal blooms, extending their growing season to new lengths. Whereas reports during the late 1990s tended to end by September of the year, the trend ten years later was for sightings well into October, and in 2010 the last report came in early December!

How do you report an algal bloom?

Although there are some physical characteristics that can help you to recognize a blue-green algal bloom, a positive identification requires sampling by your local health unit and/or the MOE. Report any of the following:

- dense blue-green algae that make the water look like "bluish-green pea soup" (see cover image)
- solid clumps in large blooms
- fresh blooms often smell like newly mown grass; older blooms smell like rotting garbage

To report an Algal Bloom CALL:
The Ministry of the Environment's (MOE)
Spills Action Centre 1-800-268-6060
or your MOE District office

Important: Keep reporting algal blooms when you find them on your lake. Make your neighbours aware of the need to report every year, so that regional statistics and annual trends will become clearer.

What happens when you report an algal bloom?

The MOE's role is to gather, assess and provide basic scientific and technical information with which the local Health Unit can assess risks to humans. MOE follows a Response Reference Guide that ensures communication and collaboration among the various stakeholders. Samples are tested for toxins and the local Health Unit is notified of the results.

The Health Unit makes the decisions as to what actions should be taken, and notifies the public by means of news releases during the event. Here is the wording from an Ontario Health Unit regarding a recent suspected algal bloom:

> "As a precautionary measure, if there appears to be a blue-green algae bloom in their area, the ... Health Unit advises residents who draw water directly from the lake to find an alternate source of water for all purposes, including drinking, cooking, bathing, washing clothes and dishes, and providing water to pets. Fish caught from the affected parts of the lake should not be eaten. People should also avoid swimming in the water, and dogs and other pets should be kept from entering and swimming in the water. Local residents should also be watchful to see if the algae bloom spreads to other areas of the lake... This advisory does not affect people who use municipal water systems, or those residents who draw water from drilled wells that are not affected by the surface water."

For more information, including factsheets about Blue-Green Algae, visit: www.foca.on.ca/lake-partner.

Algal Blooms Q&A:

QU: Does boiling water contaminated with toxins from blue-green algae make it safe to drink?
Answer: No! Boiling water can release more toxins into the water, and you cannot make the water safe to drink or cook with either by boiling or treating the water with a disinfectant like chlorine (bleach). Use alternate water sources until further notice.

QU: Is the frequency of bloom reports in Ontario lakes increasing?
Answer: MOE statistics over the past 15 years indicate that annual totals for algal bloom reports have increased significantly. However, this may be partly due to an increase in reporting rather than simply an increase in the frequency or extent of algal blooms.

QU: Is there more blue-green algae than previously?
Answer: The greatest increase in recent years has been in reports of cyanobacterial blooms, which represent roughly half of all reported algal blooms in any given year.

Algal bloom

QU: What MOE regions are reporting blooms?
Answer: In 2010 there were reports of algal blooms in each of the five MOE regions across Ontario. The number of reports has increased over the past decade, particularly in Northern and Eastern Ontario.

Interpreting bloom reporting trends is complicated because public awareness of the issue, as well as the (in-)accessibility of some lakes play a role in whether or not blooms are reported. Overall, we need to improve our understanding of the interplay amongst stressors that promote blooms.

This article was developed by FOCA from a presentation at the 2011 Muskoka Stewardship Conference, Bracebridge, by Jennifer Winter of the Ontario Ministry of the Environment.

Sudbury Bylaw Restricts Phosphorus

In July 2011, the City of Greater Sudbury passed a bylaw restricting the use of fertilizers with phosphorus, becoming the first municipality in Ontario to do so. The bylaw comes into effect in April 2012, and also bans the use of fertilizer in the following instances:

- on frozen ground
- when it is raining or predicted to rain
- within 15 metres of any water body
- on "impervious surfaces" such as driveways and parking lots.

City councillors stood united on the vote. The topic was initially brought forward by the Greater Sudbury Watershed Alliance and is intended to help protect the water quality of the 330 lakes in the Sudbury area. Reducing phosphorus is intended to be a proactive move to decrease the likelihood of blue-green algae in area lakes.