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Go aboard the floating lab chasing Great Lakes algae blooms

The *Limnos* is about to embark on another series of Great Lakes research voyages

By Jeff Green, [CBC News](#) Posted: Apr 10, 2015 6:45 AM ET Last Updated: Apr 10, 2015 6:45 AM ET



The crew aboard the *Limnos*, Canada's floating lab in the Great Lakes, spends the season chasing the Great Lake's version of the golf course gopher.

The bacteria better known as a blue-green algae bloom — and to be clear it's actually bacteria and not algae — can rise to the surface or sink below it using specialized cells to control their depth. They're also responsible for swimming warnings in Hamilton Harbour and [a drinking water ban in Toledo, Ohio](#), last year.

'Why are they producing these toxins? That's the million dollar question.' - *Dr. Sue Watson*

And they're wreaking havoc on shorelines and the ecosystem below the water's surface around the lakes.

Those blooms can also "choke" the marine life below, leaving a sometimes dangerous film on the shore which one scientist strongly advises you avoid, let alone let your dog drink. The blooms can hide below the water's surface out of plain sight, to capture the best sunlight to store nutrients and multiply into the blooms that cover shores — releasing toxins that can cause liver and kidney damage in the process.

"Why are they producing these toxins?" asked Dr. Sue Watson, a research scientist with the Great Lakes Surveillance Program who focuses on algae. "That's the million dollar question."

On Monday, the *Limnos* will set sail on its 2015 research season in Lake Ontario and Lake Huron. Some of the trips will last five days at sea, others up to three weeks. The 47-year-old ship, captained by Blaine Morton, has a range of 3,500 nautical miles (6,482 km), carries 8,300 litres of fuel, and is nimble enough to be in water just 3.5 metres deep, despite its 44.8 metre length.

Using satellite images showing the algae bloom locations, which can create blankets greater than 100 kilometres wide, the scientists based out of Burlington's Canada Centre for Inland Waters can formulate a plan for the *Limnos* to study the ancient bacteria.

Bloom believed to be cause of drinking water ban in Toledo, Ohio

Those blooms, however, don't disrupt Hamilton and Burlington's drinking water. Watson said the area's water is so clean she would drink the water drawn from deep in Lake Ontario before it's treated. On the surface though, she doesn't suggest swimming in an algae bloom.

The scientific voyages are part of the lakes long term monitoring plan, building a base of knowledge the scientists aboard hope could help explain why the blooms exist, among other things.

"They're not just organisms floating around," says Watson. They can produce the toxin microcystins, which can't be boiled out of the water (it increases in concentration that way) and can cause kidney and liver failure, [as was warned in the Toledo water ban](#).

As for why it's called an algae bloom when it's a bacteria, Watson explained that when scientists first started classifying algae, they started by colour.

Under the microscope a much different story is seen — algae are more like plants while cyanobacterial is a more simple bacteria and can produce toxins that disrupt marine life.

From lake to lab in 3 minutes

But blooms aren't the only thing they study. They monitor metal toxins, including mercury, which can bio-multiply — building in mass at an exponential level — as the metal is absorbed up the food chain.

They monitor dissolved oxygen, temperature, nutrient and organic material levels and create depth profiles with specialized sampling tools.

Those tools can take completely sealed samples of water at different depths, up to 300 metres below the surface, and have them analyzed in the small laboratory onboard in under three minutes.

They also measure new synthetic chemicals such as bisphenol a, and the water resistant chemical formerly used in Scotch Guard, which Alice Dove, an environmental scientist who monitors water quality, said is one of "the most persistent compounds known."

Watson, Dove and researcher manager Bob Rowsell, say they need to understand the long term changes in the Great Lakes to make sense of the short term shifts, such as the algae blooms. Their research would also be able to determine what is the cause, such as farming, waste treatment or industrial run off, for example.

And they need to work with the United States, especially in the wake of incidents like last year's Toledo's drinking water ban.

"We share ship space, we share science, and we share expertise," Watson said. "It's essential that we share expertise."



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