Association to Preserve Cape Cod monitoring 150 ponds for cyanobacteria

Rich Eldred August 3, 2022

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Six Cape Cod ponds have cyanobacteria blooms serious enough to possibly shut down swimming and lead to restrictions.

Cyanobacteria can lead to serious illness and even death.

Current ponds where use restrictions are recommended are Santuit Pond in Mashpee, Long Pond in Barnstable, Long Pond in Centerville (a different pond), Scargo Lake in Dennis, the West Reservoir in Harwich and Flume Pond in Falmouth.

“Right now there are advisory closures on six ponds on the Cape. A few have chronic cyanobacteria where the bloom lasts the entire season but typically a bloom is a couple of weeks then its back to normal,” said Kevin Johnson, a staff ecologist at the Association to Preserve Cape Cod. “Last year there were 40 ponds total for the entire year."

Cyanobacteria forcing some Massachusetts ponds to close: Here's why it's so harmful

The bacteria is naturally occurring year round but when conditions are right it can explode into blooms overpowering other species and producing greenish color in the water or a scum-like film on the surface. Some cyanobacteria species exude toxins into the water.

Bacteria can be toxic

“That’s what we’re worried about,” Johnson said. “At those levels it can be dangerous to humans and pets and wildlife."

Cyanobacteria are one of the most primitive and ancient life forms of Earth, but half a century ago they were known as blue green algae. Sometime in the intervening decades they were transformed from plants into bacteria.

Many different toxins, some more than others, are produced by cyanobacteria, he said. Some cause skin irritation, others can upset the stomach, cause headaches, or act as a neurotoxin. One of the primary toxins, according to the Massachusetts Department of Public Health is microocystin.

In Barnstable:A possible toxic bloom discovered at Bearses Pond

APCC: Cape Cod ponds need a '208' study

The EPA says microcystin is a liver toxin and possible carcinogen. Back when cyanobacteria was still blue green algae, W.T. Doyle's Nonseed Plants labeled it "fast death factor" accompanied by pallor, convulsions and prostration in two hours.

“They’re just a byproduct of cyanobacteria. People are still researching the toxins produced by each genus. It’s essentially a byproduct of their living, growing and expanding,” Johnson said. “If pets drink the water it can be fatal. We’ve seen a number of pet deaths over the years.”

Johnson uses his team of eight staffers and interns to test and analyze samples that are mostly collected by volunteer citizen scientists at one of 150 or so ponds the Association for the Preservation of Cape Cod monitors. The staffers also communicate the results and coordinate the sampling program often with local pond coalitions or lake associations.

Monitoring ponds for outbreaks

Andrew Gottlieb, executive director of the Association for the Preservation of Cape Cod, said the organization began ramping up its monitoring program for cyanobacteria about six years ago.

“We’ve been working with the folks at the CDC (Centers for Disease Control and Prevention) and (University of New Hampshire) to learn more about it,” Gottlieb said.

The association has found that half of the ponds have conditions that support cyanobacteria, he said.

Pond quest on Cape Cod: How many can you swim in during a summer?

Each year about a third of the ponds the group monitors monitor have serious outbreaks.

“They’re acclimated to warmer temperatures,” he said. “And like all plants they like to be fed.”

If phosphorus levels from septic wastes or fertilizers are high enough a pond can have an algae bloom and possibly, depending on the species, the level of toxins can become dangerous to pets or humans. Dogs have died from drinking cyanobacteria contaminated water on Cape Cod.

"Certain species give off a neurotoxin,” Gottlieb said. “At certain levels it’s hazardous to animals. It has the potential for skin irritation or even organ failure.”

Cyanobacteria closes Scargo Lake in Dennis: Advisories issued at other ponds

The Association for the Preservation of Cape Cod testing program is self-funded from donors, private grants, contracts with towns or lake associations for monitoring the ponds.

Local health officials notified

The association examines conditions in the pond, how much cyanobacteria is present and its growth rate, he said.

"We can forecast the potential for a bloom. We can notify local health authorities and post warnings on the APCC website," Gottlieb said.

Johnson is in charge of the monitoring program.

Samples are taken in the morning, put on ice and brought to the APCC in Dennis, he said. They are placed in special vials and frozen.

In Sandwich: Algae blooms cover Shawme Pond. Is it affecting the spring and drinking water?

“We look at the samples under the microscope and look at the cyanobacteria in each pond, which type it is can be unique where one type dominates,” Johnson said. “Then we’ll look at the samples that are frozen and do a pigment analysis to determine how much cyanobacteria is in the sample.”

The samples are taken in a special bottle as the sampler wades out to water about one meter in depth. The net tow is used at the surface. The scoop sample is done six inches below the surface and another sample is done through the water column.

It’s a two step process. The microscope is used to determine the species present and then looking at the pigment density tells you how much cyanobacteria is present. The denser the pigments the more bacteria

“That way we can know how much and what type,” Johnson said. “That gives us an idea of the volume and where the pond is headed.”

So what causes these population explosions of cyanobacteria?

“Heat and nutrients,” Johnson said. “What humans produce favors cyanobacteria as well as other algae. Cyanobacteria also favor warmer temperatures.”

Earlier this year: Rising temperatures a boon for harmful bacteria in Cape Cod's fresh and salt water

A warming climate would increase blooms and more nutrients, especially phosphorus from wastewater or fertilizers in freshwater can feed the multiplying bacteria.

While cyanobacteria outbreaks are in the news more it isn't a new problem.

"We have older reports about it. It has been an issue pre-2000. There's been a lot more research and now we know what to look for, what the concerns are," Johnson said.

The APCC maintains an up-to-date map on its website.