



**NEWTON
CONSERVATORS**

FALL ISSUE

NEWSLETTER

Preserving open space and connecting people to nature since 1961

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The Growing Threat to Summer Fun: And What We Can Do About It

By Andreae Downs, Newton Conservators' board member, former City Councilor from Ward 5 (at large), and Director of the Wastewater Advisory Committee to the MWRA.

Cyanobacteria are everywhere: in the water, and in the soil. They grow on rocks in the Arctic, the desert, and in hot springs. They predate us by at least two billion years.



PHOTO: COURTESY OF MASS WATER RESOURCES AUTHORITY

Lower basin of the Charles River

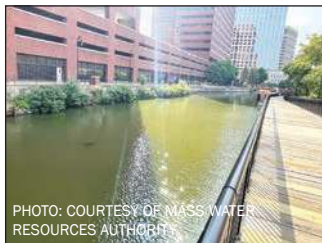


PHOTO: COURTESY OF MASS WATER RESOURCES AUTHORITY

The locks at Fort Point Channel

Cyanobacteria hit the headlines nearly every summer — closed lakes, blooms at the Esplanade — and most recently it turned the renovated Lincoln Memorial Reflecting Pool green.

They are impressive life forms, and we wouldn't be here without them.

According to Current Biologyⁱ, these bacteria are what originally created our oxygen-rich atmosphere. In fact, they may account for a good percentage of the oxygen we breathe now. They also “discovered” photosynthesis — and all other organisms that photosynthesize use their method. Once called blue-green algae because they photosynthesize, cyanobacteria are no longer considered algae by scientists.

If you take Spirulina or eat something with blue food coloring, you are eating a kind of cyanobacteria. Other kinds may be helpful in



producing organic fuel oils, or as animal food. They can also improve poor soils.

The trouble is in an overabundance of cyanobacteria — or a lack of balance. When fresh water is warm and full of nutrients, the perfect conditions exist for cyanobacteria to proliferate — and since they are everywhere, they do.



They are more than a summer nuisance — some of these cyanobacteria blooms produce liver and neurotoxins; exposure may also be carcinogenic.ⁱⁱ Dogs that swim in affected waters can die of liver failure.

Continued on page 2

...The Growing Threat to Summer Fun: And What We Can Do About It (Continued from Page 1)

The blooms also kill aquatic life — first by blocking sunlight, then by removing dissolved oxygen. And their toxins can travel by air, by as much as two miles.

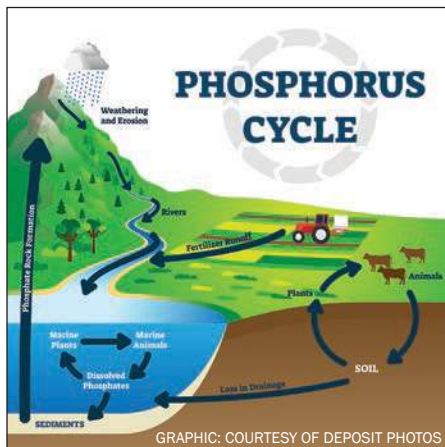
Unfortunately, it's not easy for a layperson to tell if the green scum on the local lake is toxic or not — but cyanobacteria are a vivid green, and blooms can look like spilled paint. They often smell bad, too.

Cyanobacteria are occurring more frequently in New England because of climate change — both the warmer weather and the more intense rains that pick up nutrients from parking lots and lawns as they speed into storm drains and ponds. Blooms don't usually occur in free-flowing rivers, unless they, like the Charles, are mostly still.

It's hard to add turbulence to your local lake, and even harder to cool it when the planet is warming. But we can do something about the nutrients.

Fertilizers provide the nutrients plants need to grow. Most nutrients are naturally abundant. All are needed to form a cyanobacteria bloom. The only one that is rare is phosphorus — so the key to reducing cyanobacteria blooms appears to be reducing the phosphorus that runs into fresh waters.

Not all fertilizers contain phosphorus — it's controlled (somewhat) in Massachusetts, so you should only be buying fertilizer without phosphorus unless you are a professional landscaper. But who checks?



Leaf litter is a good source of phosphorus — and sweeping streets and clearing catch basins is the main thing Newton is doing to contain phosphorus. If leaves are composted or left on garden beds, it's actually the plants that take up the phosphorus, not so much the soil —

another reason to “leave the leaves,” in your garden, not on the pavement.

Phosphorus is the least abundant and most inaccessible of the six nutrients necessary for carbon-based lifeⁱⁱⁱ. Your muscles can't move without it. It is critical for plant growth, and, in fact, ancient civilizations were built on efficient recycling of phosphorus — either effective reuse of sewage and corpses or mining guano off sea islands — these later

became a key acquisition for colonizing empires, including the U.S. (one reason why the US has scattered military bases on islands like Midway and Guam).

While we debate what to do with biosolids (treated wastewater sludge) that may be contaminated with pharmaceuticals, PFAS or plastic, researchers estimate that they could provide half of the country's phosphorus needs for agriculture. If only we could keep the contaminants out...

Corpses are also a good source of phosphorus — particularly the long-dead from ancient environmental collapses now secreted in limestone deposits. These are rapidly being mined out of existence — at a huge cost to local communities and the environment. White Phosphorus, a product of such mining, ignites when exposed to air, and the US military^{iv} uses it on the battlefield for illumination — it also has a side effect of melting any flesh it contacts.

Phosphorus overapplication or wastage is also one reason for growing dead zones in Chesapeake Bay, the Gulf of Mexico, the Baltic Sea, and other water bodies. Phosphorus is also a nuisance for wastewater treatment plants as it coats the inside of pipes as a hard substance known as “struvite.”



The Environmental Protection Agency has taken a first step to control phosphorus in our water bodies by imposing a stormwater permit on communities like Newton — called an MS4 (municipal separate storm sewer system). It's one reason Newton's stormwater fee has doubled

and then doubled again — Newton's system is mostly over 100 years old, and there are leaks and illegal connections to toilet-connected sewers (both old and new).

EPA is also tightening controls on combined sewers — in Newton's area that's just Boston, Cambridge, Somerville, and Chelsea. And in the last administration, it started to look at permits for large landowners with acres of buildings or

pavement — car exhaust, it turns out, deposits phosphorus on asphalt, which is washed into local water bodies (large swathes of asphalt also warm the water that swooshes off them).



PHOTO: ARTEMISIA LUK, COURTESY CHARLES RIVER CONSERVANCY

Floating islands in Boston

And the Charles River Conservancy has launched a “floating wetland” of native plants that provide habitat for cyanobacteria-eating microorganisms — as have some communities in the Midwest.

Finally, each of us can use less fertilizer, particularly the soluble, inorganic kind, clear nearby catch basins of leaf litter, line our home sewer laterals^v (usually clay pipes that convey sewage from buildings to sewer lines), and remove pavement from our properties.

In time, with all these efforts, we can perhaps keep phosphorus where it’s needed — and not in the water. ♦

Editor’s note: Crystal Lake was closed three times this swim season, but only the first was for cyanobacteria. The last two were for high fecal bacteria concentrations, which would not necessarily be visible or smelly.

Author’s notes:

ⁱ Crockford PW, Bar On YM, Ward LM, Milo R, Halevy I (November 2023). “The geologic history of primary productivity”. *Current Biology*. 33 (21): 4741–4750. e5. Bibcode:2023CBio...33E4741C. doi:10.1016/j.cub.2023.09.040. PMID 37827153.

ⁱⁱ <https://pmc.ncbi.nlm.nih.gov/articles/PMC11600067/>

ⁱⁱⁱ I am drawing from a wonderful *London Review of Books* article: ***Where the Power Is***, by James Vincent.

^{iv} Also, Russia and Israel

^v All but the newest sewer laterals are leaky. Rather than digging them up and replacing them, a process called **Trenchless Pipe Lining** uses Cured-In-Place Pipe (CIPP) process. A flexible, resin-saturated tube is pulled through the existing pipe and inflated, essentially creating a brand-new, seamless PVC pipe *inside* the old leaking structure. It cuts construction timelines and costs drastically.

Birding Nahanton Park

By Haynes Miller, 40 year Newton resident, emeritus professor at MIT and long-time birdwatcher, has records of more than 1,350 visits to Nahanton Park.

Nahanton Park has many personalities. For many, it’s known for the soccer field; for others, it hosts a kayak rental; for still others, it’s home to the Newton garden plots. For some of us, it’s famous as the “birdiest” spot in the city. Over the years, some 197 species of birds have been reported from the park on eBird, which lists Nahanton Park as a hotspot. More than 40 species breed in or adjacent to the park, and dozens more visit regularly in fall and spring.

Common breeders in the park include Song Sparrow (often nesting on the ground near garden plot fences), Tree



Map courtesy of Newton Conservators from their new trail guide

Swallow, House Wren, Ruby-throated Hummingbird (common around the garden plots), and, most years, Eastern Bluebird (using the many bird boxes around the garden plots and in Woodcock Meadow). Rose-breasted Grosbeak, Yellow-shafted Flicker, Red-bellied, Downy, and Hairy Woodpecker, Eastern Wood-pewee, Great-crested Flycatcher, Wood Thrush, Scarlet Tanager, and Red-eyed Vireo nest in the woods. Gray Catbird, Baltimore Oriole, Common Yellowthroat, and Northern Yellow Warbler are common in the forest margin (though in the past couple of years Yellow Warblers have been fewer). Pine Warbler breeds in pines near the

Continued on page 4