



**NEWTON
CONSERVATORS**

AUTUMN ISSUE

NEWSLETTER

Newton's land trust working to preserve open space since 1961

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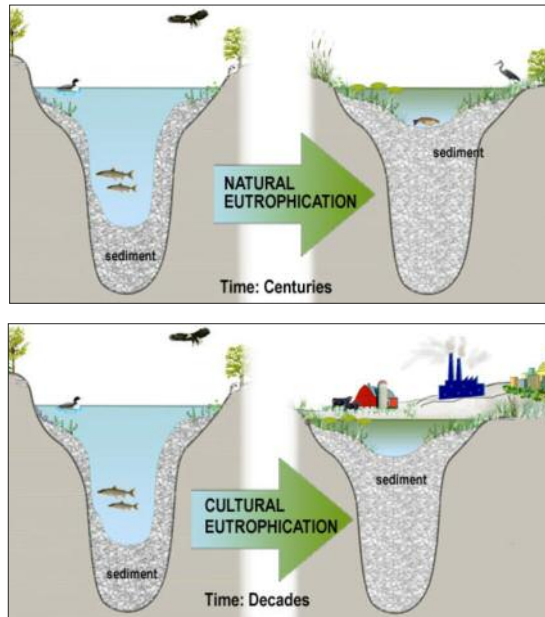
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The “Green” State of Crystal Lake and What You Need to Know

✎ By Maria Rose, Environment Engineer, City of Newton

Summertime provides the ideal conditions to enjoy our local parks, beaches and conservation areas, but this summer the swimming conditions at Crystal Lake were less than ideal. If you were here in early August, then you probably noticed the bright green color of the lake water. If you'd like to know what happened and why, then read on...

A widespread blue-green algae bloom occurred, which precipitated a swimming ban at Crystal Lake for much of August. The blue-green algae, also known as cyanobacteria, appear like thick green paint on the lake's surface. (See photo on p. 2.) Hot, sunny weather and slow moving water provide ideal conditions for algae blooms. With last season's mild winter and a hot, relatively dry summer, the stage was set for an early algae bloom. Crystal Lake often experiences a late-summer algae bloom. Algae are mostly microscopic plants that may be free-floating (phytoplankton) or attached to a substrate (periphyton). "In a moderately rich lake, there could be nearly one hundred species of algae in a tablespoonful of lake water. In a eutrophic lake, there may be millions of cells in a gallon of water." (*The Practical Guide to Lake Management*, Massachusetts Department of



Figures 1 & 2: The process of eutrophication can be both natural and human-induced. Natural eutrophication, where the basin gradually fills in from nutrient and sediment inputs, occurs over long time periods—on the order of centuries. Human-induced, or cultural eutrophication, occurs on a much shorter time scale (decades) as a result of human disturbance and nutrient inputs.

Source: RMB Environmental Laboratories. *Eutrophication*. 2009.

Environmental Protection (MaDEP) and the Department of Conservation and Recreation (DCR) 2004).

Based upon regional information and data we have gathered about Crystal Lake, it is a moderately (nutrient) rich lake. However, if warmer winters and significant human impacts continue, the lake will become “eutrophic.” Eutrophication is the process by which a body of water acquires high concentrations of nutrients (in particular, phosphorus and nitrogen) that promote excessive algae growth. As

the algae die and decompose, high levels of organic matter deplete the water of oxygen. Eutrophication of freshwater ecosystems results in serious water quality problems that can have broader implications. These include unsightly algae blooms; depletion of dissolved oxygen, resulting in fish kills; depreciation of lakeshore property values; and negative impacts to recreational uses in and around the lake.

As shown in the Figures 1 and 2, all lakes and ponds will eventually yield to eutrophication, but human activity can accelerate this process significantly—unduly shortening the life of a lake or pond if left unchecked.



The blue-green algae, also known as cyanobacteria, appear like thick green paint on Crystal Lake's surface. *— Schuyler Larrabee*

If we want to slow down the eutrophication process, we need to modify our cultural behaviors. One of the primary ways we can effect change is to limit the phosphorus inputs to our waterbodies. Sources of phosphorus include fertilizers, sediment, automobile exhaust, wash water, and human and animal waste. Phosphorus is conveyed to Crystal Lake via stormwater runoff. Although it is unrealistic to think stormwater runoff ever will be completely “clean” in our modern society, the quality certainly can be improved. There are many things that you can do to improve stormwater runoff quality and to reduce the ecological impacts to Crystal Lake:

- Test your lawn to determine what nutrients it needs before applying fertilizer, and consider using lawn clippings and compost as part of your lawn-care regimen.
- Switch to zero-phosphorus fertilizer. Those with phosphorus are unnecessary (unless starting a new lawn)

President's Message

— Jane Sender

We have devoted much of this quarter's newsletter to the problems facing Newton's water bodies—particularly Crystal Lake and the Charles River—as a result of this year's algae bloom. Maria Rose and Amy Rothe have done a wonderful job of describing the problem and discussing what we as homeowners, drivers and dog walkers can do to reverse this damaging growth of bacteria.

I have lived on a cove of the Charles River for 24 years and have been involved with the problems facing the river's health all that time. The very weekend my husband and I moved into our house in July 1988, neighbors in waders were in the water off our back yard pulling water chestnuts. Coming from Boston, we were quite intrigued that this is what people did for fun in suburbia. We joined right in, and in the process began to learn about the fragile health of the river and what could and should be done. Twenty four years and literally hundreds of thousands of public and private dollars later, the river is in worse shape, not better. Why?

There are many reasons, not the least of which is a stop-and-go commitment on the part of the state with respect to the river to stay on top of this issue. But there are two other very

because phosphorus is abundant in our local soils—and it costs less to make the switch!

- Utilize the City's free yard-waste collection, and never dispose of grass clippings along the bank of any lake, stream or river.
- Reduce and/or treat stormwater runoff from your own property as much as possible. Consider planting a rain garden, using rain barrels or dry wells and replacing impervious areas, such as driveways and patios, with permeable pavers or porous pavement.
- Use a car wash, where water is treated and recycled, instead of washing your car in your driveway, where detergent-laden water may enter the drainage system.
- Pick up after your dog, and properly dispose of the waste in the garbage.
- Reduce areas of exposed soil on your property to eliminate sediment runoff in the drainage system.
- Perform regular maintenance on your septic system to prevent backups.
- Do not feed wild animals, especially geese and ducks, to minimize animal waste in the lake.

The City supports these initiatives with various educational programs and strives to set a positive example. Recently, the Department of Public Works installed a water quality treatment device and a series of underground recharge units to infiltrate the stormwater runoff from the Crystal Lake bathhouse parking lot—which previously discharged directly to the lake, and the Parks and Recreation Department specified zero-phosphorus fertilizer for maintenance of 200 acres of land.

significant reasons that trouble me deeply. Our love affair with a beautiful green lawn never seems to cool. Our attachment to quick fixes like chemical treatments seems imbedded in the American psyche. The Department of Conservation and Recreation has treated hundreds of water bodies throughout the state with chemicals and embraces this as a way of dealing with the problem rather than focusing on curtailing fertilizer use, controlling storm-water runoff on their properties and finding other long-term solutions. I liken it to a physician prescribing statins to an obese patient to control high cholesterol without any mention of weight loss, diet and exercise. The reason for the high cholesterol is in part what the patient is eating; just as the reason for invasive aquatic vegetation is that we are feeding the water bodies with phosphates and other chemicals. The problems won't go away without treating these behaviors.

There is an old saying that the easy way out is the quickest way back in. As we continue to embrace only solutions like harvesting and chemical treatment, we unfortunately will be fighting these battles for the same way for another twenty-four years. I know it's not easy to change behavior, but we must if we want to protect these beautiful areas, not only for human enjoyment but for the many other species foraging and breeding in these habitats.