



December 2010

The Crystal Lake Conservancy is dedicated to the preservation and protection of Crystal Lake for the benefit of the public by promoting and supporting the unique natural beauty and enjoyment of the Lake.

Results of Testing Water from March through November

The recent months have been an exciting time for the Crystal Lake Conservancy. Our dedicated and intrepid volunteers have taken the Conservancy rowboat onto the lake two times during almost every week from March through November in order to test the clarity and temperature of the lake water. In addition, professional environmental scientists have tested the level of dissolved oxygen and pollutants in the lake. When we embarked on the adventure, many people assumed that any pollution in the lake would be coming from the houses adjacent to the lake and the people and other animals bathing in the lake.

Our work has revealed that there is pollution in the lake—especially after the big storms like the ones we had this past spring—and that at the end of the summer, the level of oxygen became too low to support fish life at the bottom of the lake. (Detailed results can be found on our website: www.CrystalLakeConservancy.org.) The more surprising result is that the damaging pollution is entering Crystal Lake through the eight storm drains that empty into the lake. Pollution from lawn fertilizers, animal wastes, and other sources runs into the storm drains and is quickly deposited into the lake by the end of the day. It would be far more beneficial if the runoff were allowed to sink and travel slowly through permeable ground, naturally filtering out the pollutants by taking a longer course of days or weeks to reach the lake.

As a result of what we have learned, we have begun to research ways that we can minimize the pollution that enters Crystal Lake from the storm drains. We have talked with Fred Civian, Storm Water Coordinator for the Mass. Department of Environmental Protection and Jane Peirce, the Nonpoint Source Coordinator of the DEP. We'll keep you informed as we learn more.

First Annual Forum at Newton Library

On November 6, the Conservancy was proud to present its first annual forum at the Newton Free Library.

The first guest speaker was limnologist Larry Beals, who has guided the Conservancy board members through testing the lake. Mr. Beals, the president of Beals Associates, Inc., an environmental engineering firm, gave the audience a basic understanding of how a lake functions and presented the results of our water testing and indicated possibilities for future testing.

Fred Civian, Storm Water Coordinator for the Mass. Department of Environment Protection, was the second speaker. He described the problems that are caused by storm water drainage and what we can do to mitigate its

Lake Ave. Resident Issues Challenge Grant

Lake Ave. resident David Putnam has issued a \$5000 challenge grant to all supporters of the Crystal Lake Conservancy (and their friends.)

The Crystal Lake Conservancy is in great need of additional money to buy water test kits for next spring and summer. In addition to the tests we performed this year, lake experts have recommended that we test for types of pollutants. The tools used by our volunteers so far were thermometers and a simple Secchi disk, which measures water clarity. The further testing will be more sophisticated and, therefore, will cost more than the basic procedures we used this past year. Our estimate of the cost is \$10,000.

Mr. Putnam will cover half the cost of the additional testing if others will join with the CLC Board to match the other half. If you can help us to reach that goal, please use the form in this newsletter to send a contribution, or make a donation online at www.CrystalLakeConservancy.org. Please help us to meet the challenge!



Join the Crystal Lake Conservancy

Keep informed and help to sponsor our environmental testing and all work for a healthier lake!

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone Number: _____

E-mail Address: _____

I am paying by enclosed check

Please note: If paying by credit card, please go to www.CrystalLakeConservancy.org and use the Paypal link.

- | | |
|--|---|
| <input type="checkbox"/> Individual membership (\$40) | <input type="checkbox"/> Patron membership (\$500) |
| <input type="checkbox"/> Family membership (\$75) | <input type="checkbox"/> Non-profit membership (\$100) |
| <input type="checkbox"/> Supporting membership (\$150) | <input type="checkbox"/> Corporate membership (\$1000) |
| <input type="checkbox"/> Sustaining membership (\$300) | <input type="checkbox"/> Conservation Council membership (\$5000) |

Please send your membership information and to The Crystal Lake Conservancy,

Help us stay green AND save paper and printing costs—sign up for our electronic newsletter by going to our website at www.CrystalLakeConservancy.org

Volunteers Needed for Watershed Survey

In the spring, the Conservancy will begin a survey of all homes in the Crystal Lake Watershed. (To see what's included in the watershed, see the map at our website: www.CrystalLakeConservancy.org.) Surveyors will make notes of the amount of impermeable surface and will attempt to ascertain how drainage is directed at each home.

In addition, we will continue to need volunteers to spend an hour or two in a rowboat on the lake for water testing.

If you are will to spend a few hours working with another volunteer, please contact Jean Artin at jeanartin@rcn.com or David Stein at dwjstein2@comcast.net.

Are you making changes to your landscaping or drainage?

In April, the Conservancy hopes to apply for an EPA grant to improve the quality of the water entering into Crystal Lake from the storm drains.

The grant requires that we participate in a 60/40% match of any funds we would receive. Our 40% can be met through volunteer hours—or through any improvements made in the area that would improve drainage. Installing a rain garden, changing your driveway from impermeable asphalt to gravel or pavers, or creating a cistern to capture the runoff from your downspouts all are improvements that we could count.

If you have made any of these changes since October 8, 2010 or are planning to do so before next October and are willing to let us have a copy of your receipt, please contact Beth Wilkinson at Bethwilkinson@mac.com or at 617-969-4443. If you would like advice on how your landscaping, or even your home improvements can help Crystal Lake, please let us know your plans.



How Crystal Lake “Turns Over” Twice a Year

Like most lakes, Crystal Lake goes through at least two major cycles, or turnovers, in the course of a year. In the fall when air temperatures fall to 10 degrees centigrade (50 degrees Fahrenheit), the top layer of water, exposed most to air and wind, cools first. Because cold water is denser than warm water, it sinks to the bottom; the warmer air that is now on the top starts to cool. The process continues until all of the water in the lake has reached a uniform temperature; the surface winds then are able to mix oxygen into all depths of the lake; and the first “turnover” is complete.

Water is most dense at 4 degrees Celsius—not when it freezes at 0 degrees.. Therefore, when water near the top of the lake reaches that temperature, it sinks to the bottom of the lake. The coldest water on the surface freezes, but because it is less dense than the slightly warmer water beneath it, it floats on the surface, and the lake freezes from the top down. As a result, the bottom of the lake remains an unfrozen habitat for fish. Because of this temperature difference (and possibly ice blocking surface winds from the rest of the lake), oxygen does circulate in the lake as well during the winter months.

In the spring, the sun and warm air bring surface waters to the temperature of the deep water, and, when the temperature is uniform, the surface winds once again can mix and oxygenate all of the water. As the surface water heats up in the summer (measured up to 80 degrees F in Crystal Lake last summer), it remains on the top because the warmest water is most buoyant. In the course of the summer, three distinct temperature layers develop, with warm light water at the top, and colder, more dense water at the bottom. There is mild mixing of water at the top layer and the middle layers and less between the middle and bottom layers. When biological material—plants, algae, and fish-- thrive and then die, they sink to the bottom. As they decompose, they consume the oxygen in the lowest levels of the lake, causing there to be less oxygen available for plants and fish.

When excess nutrients run into the lake from stormwater sources such as lawn fertilizer and animal waste, the decomposition process can escalate greatly, making the bottom of the lake an unhealthy place. If there is too much decay, the water at the bottom of the lake can become anoxic, or completely depleted of oxygen. Fish such as trout prefer to live in cooler water (approximately 45F) at the bottom of the lake, but when excess decay consumes additional oxygen, there isn't enough oxygen left for them at the lower depths where they make their home. The anoxic water releases phosphorus from the sediments at the bottom of the lake, which in turn encourages the growth of algae and weeds. The Crystal Lake Conservancy members and volunteers documented that situation at the end of last summer.



Enjoy Our Logo While Helping the Crystal Lake Conservancy

12” x 18” posters \$10
Logo T-shirts \$15

Sizes:
ADULT: Sm, Med, Lg, XL
CHILD: Sm, Med, Lg, XL
WOMEN’s cut: Sm, Med
(limited quantity)

To order t-shirts or posters, please contact Barbara Wales at barbarawales@realtor.com

Help us stay green AND save paper and printing costs—sign up for our electronic newsletter by going to our website at www.CrystalLakeConservancy.org

To learn more about the Crystal Lake Conservancy, visit our website at www.CrystalLakeConservancy.org



December 2010

The Crystal Lake Conservancy is dedicated to the preservation and protection of Crystal Lake for the benefit of the public by promoting and supporting the unique natural beauty and enjoyment of the Lake.

Conservancy Receives \$1000 Grant Award from the New England Grassroots Environmental Fund

The New England Grassroots Environmental Fund is focused on building community efforts that utilize collaboration toward long term environmental improvements. This grant will help support our plans to continue the Conservancy's efforts to conduct a fact-based environmental assessment of Crystal Lake into 2011. Specifically, these efforts include:

Monitor Water Quality: As part of the process we hope to raise \$10,000 to cover additional tests kits which will allow specific chemical and bacterial testing at 4-6 key locations at least 3-4 different times each during the year.

Survey the Watershed : We plan to work with experts and volunteers to conduct a survey of the watershed in the spring to determine the effects of household practices within the lake's watershed.

Develop Recommendations for the Environmentally Sound Management of the Lake; and

Develop a Program to Educate the Public: The Crystal Lake Conservancy then will work to educate the users of the lake and the residents of the watershed about that plan and to engage them in implementing management measures that will lead to long-term care of Crystal Lake.

If you know of additional grant opportunities for our efforts, please contact Janice Bourque at j_bourque@comcast.com or visit our website for more information.



PO Box 610038
Newton Highlands, MA
02461