



OLA News

February 2006

Salt

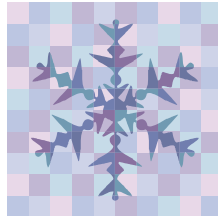
The Poison is in the Dose

Salinity levels are up more than thirty fold in Otsego Lake since 1940 according to Matt Albright of the BFS. That still leaves Otsego Lake far down the list of saline lakes in NY, but new studies raise concerns that most, if not all, of our northeast U.S. lakes are quickly becoming salty. A study recently released in a prestigious scientific journal (Kaushal, *et al.* 2005. Increased salinization of fresh water in the northeastern United States. PNAS) examined East Coast lakes north from Washington D.C. and the authors identified a trend that which must be halted. Our lakes and ground water are becoming more saline and, if not stopped, the study concludes we will experience losses of drinking water and recreational opportunities as well as the loss of many freshwater animals and plants "within the next century". Other studies remind us that even before top waters become salty, lakes can become salty in deep bottom waters because salt water is heavier than fresh water. Salt in deep waters can interfere with spring and autumn lake mixing necessary to provide oxygen to deep waters. If a salt layer developed

continued on next column

Membership Renewals

OLA membership renewals should be going out in the mail in the next 30 days. Please look for the solicitation and mail it back with your check when received – and sign up a friend. Your Lake can only improve with an increased OLA membership.



in Otsego Lake there would be profound impacts for bottom dwelling animals and for the trout and salmon fishery.

A principal claimed by practitioners in various disciplines is one attributed to the ancient Greek Paracelsus who is known for warning that "the poison is in the dose", that is, that many poisonous substances can be well tolerated by a body in small enough amounts. So, the question we must ponder is, "What salt dose is poisonous to our Lake?" The answer may not be apparent until we start to see the loss of species attributable to rising salinity. We need to forestall that unfortunate event for as long as possible.

We know that winters around Otsego Lake in the modern era require salt to ensure the safety and comfort of our loved ones. We need to balance that real requirement with our respect for our Lake. The Lake can also be hurt by the use of some salt alternatives, such as the frequently used incompletely washed sand, which adds phosphorous increasing algae and plant growth. Salt should be used when and where needed and not used to avoid snow removal -- and never used unless icing conditions are predicted. Salt should be used in the minimum amounts necessary to melt ice and should be stored where rainwater cannot dissolve it.

Cooperstown & Lake Receive Christmas Present

At year's end, the Village of Cooperstown received a sizeable gift from the State of New York in the form of a \$76,000 grant for its Otsego Lake septic system management program. The grant will help fund installation of six demonstration septic systems designed to treat wastewater from homes and businesses located on Otsego Lake. The treatment systems will use advanced treatment technologies needed due to difficult site conditions along the Lake's shoreline. State funds will cover system design, purchase and installation of phosphorus removal units, monitoring of system performance, and project management. Demonstration projects will replace systems that failed inspection in 2005. Property owners will pay for purchase and installation of primary and secondary treatment systems, but will benefit from a free design and the additional treatment to remove phosphorus. The total project cost for the six sites is expected to be over \$200,000.

Demonstration systems will provide information on the effectiveness of treatment, which can be reapplied to replacement systems around the Lake. An inspection program for existing septic systems was initiated in 2005. Close to 100 systems were inspected, with 50% failing. There are an additional 250 systems yet to be inspected.

Preparation of the grant application was a collaborative effort involving Win McIntyre, Watershed Coordinator, Matt Albright, Assistant Director at the SUNY Biological Field Station, and Doug VanDeusen, Project Manager with Lamont Engineers. The project will be administered by the Otsego Lake Watershed Supervisory Committee and the Village of Cooperstown Treasurer's office. The six demonstration systems will be designed and installed during 2006, and will be monitored for 2-3 years. The performance of the systems will be summarized in a final report. What is learned about the ability of such systems to remove nutrients, such as nitrogen and phosphorus, has far reaching implications. Strategies to reduce nutrient loading to water bodies is a concern not only locally, but is a primary concern with water management everywhere.

New OLA T-shirts Available – Discounted for Limited Time

The 2006 edition of our famous OLA t-shirts (complete with Lake map on back) have arrived in two new colors: **denim blue** and **soft yellow**. Be the first to wear one at the low introductory price of \$11.00 each. Order them before April to lock in the discounted price.

There are a few 2005 Lake Festival posters, signed and unsigned available at \$20 and \$25, respectively. Half of the proceeds from the posters go to the Water Quality Coordinating Committee. These have already become collectables! They are great gifts! Contact Scottie Baker at 547-5356 if you would like to purchase Lake Festival posters or clothing.

Visit the OLA Web site for minutes of meetings and information regarding Otsego Lake:

www.otsegolakeassociation.org

Understanding Your Lake: Color

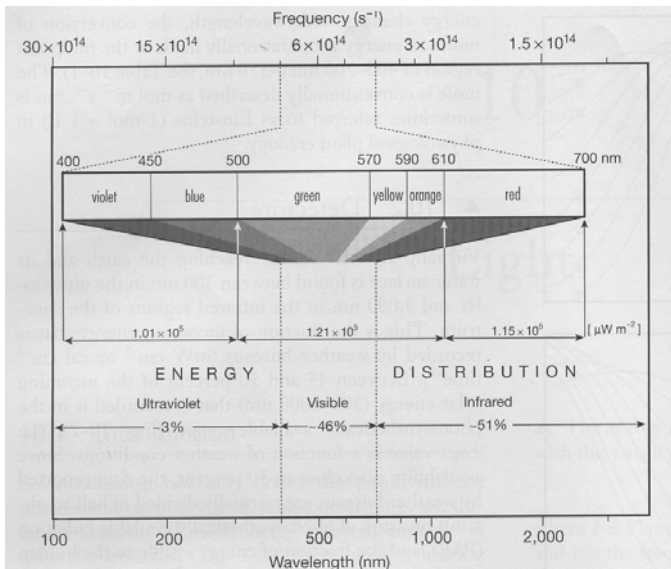
Tom Horvath, Ph.D., Aquatic Biologist & Limnologist

What happens when you jump into a lake? You get wet. What happens when light jumps into a lake? You get color. But how?

Light is made up of a spectrum of wavelengths, some of which our eyes perceive as colors. For example, light in the wavelength 475 nanometers (1000 nm = 0.00004 inches) appears blue to us, while light in the wavelength 650 nm appears red. In fact, we only perceive light in wavelengths from 400 nm to 700 nm (see Figure below; from Kalff 2002, *Limnology*).

It's the fate of light after it enters a lake that determines the lake's color. Light can be either 1) reflected, 2) absorbed, 3) scattered, or it can continue to move through the water (called transmission). **Reflected light** is light that strikes something but is returned in a specific direction (for you physics buffs, recall that the angle of incidence equals the angle of reflection). A good bit of light is reflected from a lake's surface (more so when there are waves because of the increased surface area). Generally, all light wavelengths are reflected, so light appears white (or colorless), and hence doesn't affect color much. **Absorbed light** is light that strikes something and is lost. For example, if an algal cell is hit by light, it will absorb light in most of

the spectrum except green, which is then seen by our eyes. So water that has a lot of algae growing in it appears green to us. **Scattered light** is light that strikes something and heads in a random direction. From physics, we know that the smaller wavelengths (blue) are scattered more than larger wavelengths (green through red). Water that is almost pure will look blue because all the wavelengths are absorbed and lost except blue, which is scattered. Some of the scattered blue light exits the water and reaches our eyes, hence the water appears blue to us. This is also why the sky is blue, at least on clear days.



Lakes come in many colors – some are blue, some are green, some are brown, some are even red - and the color of the water can tell us quite a bit about the lake. Glimmerglass got its name because the water was at one time crystal clear and appeared a deep blue. This was because very little stuff was in the water to absorb light, except the natural absorption capacity of water. There are times in the summer when Otsego Lake takes on a shimmer of green (almost fluorescent at times). This is because the lake is experiencing an algal bloom, which absorbs all the light except green, which is scattered back to our eyes. If you travel into the Adirondack Park, some of the shallow lakes along the roads look rather tea-colored. This is because the water has a lot of dissolved organic matter in it, which comes from the decaying plants all around the water. Dissolved organic matter absorbs light in blue to yellow range, so what gets scattered back to our eyes is the orange to red light, which looks brownish to us.

I hope you are now more familiar with your lake. Keep looking for new articles in future OLA Newsletters. However, if you have specific questions about limnology and / or Otsego Lake, I will try to address them as well. Email questions to me at horvattg@oneonta.edu and I will post both questions and the answers in this newsletter.

Lake Shore Sewers: Why Not?

One of our members has challenged local political leaders to investigate sewers for the Otsego Lakeshore. Sewers appear to have a lot to offer in terms of protecting the Lake since effluent would be discharged downstream of the Lake, but is the cost justifiable? We simply don't have the data to discuss sewers intelligently at this time although some would say that we do not need the expense and delay inherent in establishing a study. The latest EPA guidance indicates that onsite wastewater treatment systems are the most cost-effective way to treat residential wastewater in rural areas. But is that true of Otsego Lake? To accumulate the data with which we could make an informed decision, we need an engineering study on the various options available. There are at least three major options that would need to be considered. The first is to run a sewer line along Route 80 and connect it into the Cooperstown wastewater treatment plant (WWTP). To service the east side of the Lake with a sewer system, we could build a large cluster system with a dedicated treatment facility. A second option for the west side is to construct several large systems to handle clusters of homes and not send the wastewater to the Cooperstown WWTP. A third option is to go with what we're doing now - decentralized onsite wastewater treatment systems designed for one to three camps each. The options would have to be developed to a preliminary design level in order to obtain good cost estimates. Then, with the installation costs, plus annual operating costs, a life-cycle analysis could be done comparing the three options, and any others that may be proposed. This kind of study would require an engineering firm, and could cost \$30,000 to 50,000. In spite of the costs, discussion is ongoing with local leaders. In the meantime, property owners are being urged to consider shared systems.

Clarke Pond Dam Repaired

After three years of paperwork, construction repairing the Clarke Pond dam and dredging its sediments was completed in January after four months of actual work. This is an important water quality improvement project, and is a major step toward implementing the Plan for the Management of the Otsego Lake Watershed (1998). Clarke Pond, an old mill pond dating back to the late 1700's, is located near the end of Cripple Creek, just to the northeast of the Lake next to the Otsego Golf Club. The pond, with a laid-up limestone dam built in 1847, has served as a detention basin collecting sediment from the 10,000 acre Cripple Creek drainage basin, which is part of the Otsego Lake watershed. In so doing, Clarke Pond has served to protect the lake. The pond was full of sediment and the old dam had deteriorated. The dam has now been repaired and approximately 8 million pounds of sediment have been recovered.

An engineering study was conducted in 2000, and in 2001 a Water Quality Improvement grant request was submitted to the New York State Department of Environmental Conservation (DEC), through the Otsego Soil and Water Conservation District (OSWCD). The total project cost was estimated at \$700,000, and in 2002, the State awarded a grant of \$350,000. The balance of the funding has come from local sources, including \$170,000 from the Otsego County Conservation Association and The Clark Foundation, in-kind services from the SUNY Biological Field Station, and a contribution from the owners of the pond and dam, Robert and Susan Kingsley.

Work on the dam included both repairs and upgrades. Dams in New York are regulated by the DEC. When repairs are needed, a dam has to be rebuilt to current standards to ensure that the dam will function properly for years to come. Removing sediment from the pond restored the pond's capacity to prevent additional sediment from entering the Lake. The construction firm, Tuscarora Construction, based in Pulaski, made the repairs and will complete roadwork and landscaping in the spring. The engineering firm was Schafer Engineering Associates out of Schenectady.

Otsego Lake Festival 2006

Lake Front Park

Saturday, July 8th

The Otsego Lake Festival is an educational and fun event that even wet weather couldn't dampen in 2005. It was an unqualified success in its introductory year and so there is great anticipation for the 2006 event. Our own Scottie Baker will be designing a collectible Festival Poster, the sales of which will fund various Otsego Lake water quality projects. We will be providing demonstrations on buffer strips and sediment traps, and, possibly, on other issues. Your OLA needs a VOLUNTEER member to coordinate our participation in the 2nd Annual Lake Festival. Our esteemed volunteer will receive full support from the OLA board of directors. Contact Scottie Baker (547-5356) to learn details.

Otsego Lake Association

PO Box 13

Springfield Center, NY 13468