

The Beacon

FALL/WINTER 2015

LAKE SUNAPEE PROTECTIVE ASSOCIATION

The Lake Begins At The Top of The Hill!

Sounds crazy? Consider this: Every drop of water that hits the ground travels downhill and continues across driveways, lawns, patios, culverts, and roadways – on its way to the lake. Unless this “stormwater runoff” is absorbed into the ground, it collects whatever is present on the surfaces it covers – pesticides, motor oils, fertilizers, road salt, pet waste, etc. – and carries it into the lake.

Stormwater runoff can be managed. Check out **Clean Water Action Tips** on **page 14**, for simple ways to mitigate the negative effects of stormwater.

Lake water quality matters – and when property development results in unwarranted tree cutting or poor erosion control measures, the lake suffers. The LSPA Watershed Committee is meeting these challenges head-on. See **Tackling Watershed Compliance** on **page 6**.

The use of road salt during the winter affects the aquatic life in the lake. Road salt increases conductivity. To better understand the road salt-connectivity connection check out **State of the Lake** on **page 6**.

Stormwater = phosphorus = cyanobacteria. See **Cyanobacteria - Worldwide and In Our Backyard** on **page 13**.

Water Matters!

Watershed Discovery Day

The day was beautiful, the activities were awesome, the students were animated and the “classroom” was memorable for the **Watershed Discovery Day** held at Mount Sunapee Resort for 259 area fifth graders.

“It was a day filled with healthy, directed energy that was intent on learning,” says Kathleen Stowell, LSPA education director.

On October 1, the fifth graders arrived to participate in a day-long field trip

that immersed them in watershed ecology. The students were guided through various aspects including: “common water”, water properties, the water cycle, water bugs, demonstrations of the effects of flooding, and construction of water filtration devices.



Photo courtesy M. Eliassen



Photo courtesy M. Eliassen

“It was exciting to see all the classes fully engaged in the activities,” says Nancy Heckel, LSPA environmental educator.

LSPA staff were joined by board members, and volunteers from several towns, and presenters from the NH Department of Environmental Services, Department of Transportation, Fish & Game, NH Lakes Association, and the Sullivan County Conservation District.

And, what a classroom setting! Except for one, all the “lesson sites” were located outdoors, giving the students a perspective not found in a traditional classroom.

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Tackling Watershed Compliance

Compliance with land use regulations in the four watershed towns of Newbury, New London, Sunapee and Springfield is the primary focus of the LSPA Watershed Committee. This summer, two multi-town meetings were held to address the problems facing town officials in the area of regulation compliance.

Of particular concern is the impact on the lake of a property owner's non-compliance with town – and state – shoreland regulations. Improper land use leads to untreated stormwater and pollutants and nutrients going directly into the lake and feeding – literally – cyanobacteria. (See "Cyanobacteria – Worldwide and in our Backyard" on page 13) Ignoring the increasing trend of improper land

use is not a long term option for a sustainable lake as we know it.

The meeting, moderated by Nate Miller, executive director of the Upper Valley Lake Sunapee Regional Planning Commission, surfaced similarities – and differences – among the four towns' regulation processes. Potential solutions were discussed and will be addressed at future meetings.

Common concerns include:

- The actions of property owners to circumvent or ignore the local regulations.
- The apparent lack of understanding how specific activities on one's property can negatively affect algae and

unwanted plants.

- The importance of educating the public about the connection between human behavior and water quality.

The Watershed Committee is currently finalizing a Compliance Process document for the four watershed towns to consider. The document details the before/during/post-construction steps to be taken by the homeowners/contractors and the town code enforcement officers.

The Compliance Process document is designed to support the homeowner in his/her goals, achieve compliance with town regulations, and ensure good stewardship of the watershed and water resources.

STATE OF THE LAKE... Conductivity

Specific Conductivity (SC) is the measurement of the ability of water to conduct an electric current. Ions conduct the electric current and conductivity is reported in microSiemens per centimeter ($\mu\text{S}/\text{cm}$).

Ions are dissolved metals, salts and other dissolved materials that occur naturally, based on geology, soils and land cover. Ions also occur as the result of land development.

Examples include:

- Soil disturbance
- Road-related impacts
- Septic systems
- Air pollution
- Water-softener backwash

In New Hampshire waterbodies, ions include calcium, sodium, chloride and iron, among others.

Current SC levels in Lake Sunapee are approximately $90 \mu\text{S}/\text{cm}$ and

have been in that range for a few years. In the mid-1980s LSPA **first recorded SC data** and the lake values at that time were **in the $60 \mu\text{S}/\text{cm}$ range**. By 2005 the levels topped out around $105 \mu\text{S}/\text{cm}$.

Nearly all of that **increase can be attributed to the use of road de-icing salts** – a practice that gained popularity after WWII.

Conductivity in **streams that are heavily affected by road de-icing** include Herrick Cove tributaries at the northeast portion of Lake Sunapee. The Cove is subjected to increased road salt by de-icing on Interstate 89, Route 103A, and town roads. In low-flow periods (which means less dilution and higher ion concentrations) those streams can have **SC levels over $1,400 \mu\text{S}/\text{cm}$** . Sustained levels in that range can be **harmful to**

aquatic life.

The good news: Heightened awareness of the negative impact of road salt on aquatic life and improved de-icing techniques have reduced road salt use. The result is decreased conductivity in the lake and streams – a step in the right direction for aquatic life.

Cyanobacteria - Worldwide and In Our Backyard

During this past summer, NH Dept. of Environmental Services (DES) issued four alerts for cyanobacteria scum in four ponds – Downing Pond in New Durham, Nippo Pond in Barrington, Keyser Pond in Henniker, and Otternick Pond in Hudson. Cyanobacteria can appear as a blue-green scum or as dispersed cells floating either on the surface or suspended in the water column. Also, cyanobacteria occur naturally in waterbodies throughout the world.

Signs of Trouble

When excess nutrients – namely, phosphorus – enter the water, cyanobacteria cell concentration may increase. Once a bloom or surface scum forms, cyanobacteria can present a potential health risk to humans and pets. DES advises against swimming in any waters experiencing a cyanobacteria bloom, and pets and children especially should not make contact with the water.

The prevalent type of cyanobacteria in Lake Sunapee has been *Gloeotrichia echinulata* (“Gloeo”), which has some unique behaviors. It is emerging in clear lakes worldwide, and there is evidence of it being in Lake Sunapee in the 1800s, following the eras of sheep farming and logging.

What Can You Do?

According to DES, the only way to decrease the likelihood of a cyanobacteria bloom is through continued **watershed management practices that reduce nutrients (phosphorus) from reaching the water.**

Here are some ways to cut off the flow of phosphorus into the lake:

1. Assess your surroundings and your habits.
2. Get to know the Shoreland Protection Act.
3. Maintain buffers, trees, shrubs, and plants that can slow down or prevent storm water runoff.
4. Use no fertilizer within 25 feet of the shoreline high water line.
5. Use limestone, low phosphate, or slow release nitrogen fertilizer 26 feet or more from the shoreline high water line.
6. Pick up after your pets.
7. Make sure your septic system is functioning well.
8. Check out “Clean Water Action Tips” on page 14.

Summer Sightings

This summer, cyanobacteria (Gloeo) was once again evident in Lake Sunapee. It was not reported as surface scum, but rather as dispersed particles throughout the lake. The LSPA Scientific Advisory group continues to study this confounding species, but one thing is certain: **If stormwater runoff into Lake Sunapee is not controlled, and phosphorus continues to enter the lake, a cyanobacterial surface scum bloom is probable.** Our storms are increasing in intensity – and in frequency – which makes stormwater management even more important to the health of our

lakes and ponds.

It's Not Just Us

In Georgia, VT, a cyanobacteria bloom was reported on Lake Champlain, NY, in August which made the lake un-swimmable for several property owners and their families. National organizations are also taking full notice of cyanobacterial problems across the United States and Lake Erie's situation has gained national media coverage.

Property Values

The values of some properties in the Lake Champlain bloom area have been reduced which means a reduction in the tax revenue for the municipality. Media coverage indicates that the Georgia, VT, town administration worries that the property de-valuation problem could get bigger.

We Need Your Help!

LSPA needs more people to report sightings of cyanobacteria in the lake from June through September. Our new website makes this activity easy. Here's how you can help:

- Go to the LSPA website <http://www.lakesunapee.org/record-observation>.
- Click the “Record Your Location” icon in the pull-down menu.
- Enter the cyanobacteria density after looking at the cyano density scale.

It's that easy! Your record will help us build a database of densities which will provide guidance for any management steps that might be available in the future.

Remember: Stormwater = Phosphorous = Cyanobacteria. It's that simple.