



the Beacon

of the Lake Sunapee Protective Association

October 2011



LSPA's headquarters Learning Center is a perfect place for a summer evening gathering. Here, boat owners from the Boat Parade enjoy meeting each other.

What a Summer!

LSPA is a year-round organization, but summer is the busy time, when all of us are focused on the lake. Many of LSPA's programs for adults are held during the summer months, as well as non-school programs for children. For the large number of scientists working in, on and around the lake, summer is field season, and they spend many hours sampling, measuring and collecting, for later analysis in laboratories and on computers. LSPA holds social events, such as the first midsummer Beacon Night party at The Knowlton House, open to all, or the cocktail party for owners of boats featured in the annual Boat Parade. The Association's Annual Meeting is in July, and Love Your Lakes Day in August.

The Beacon cannot recap the content of each of these programs and special events, but the photographs on pages 4-5 will help summarize Summer 2011.

LSPA has been a volunteer organization from its founding, and one constant in every summer is the work done by regular, dependable volunteers: water quality monitoring, weed watching, lake hosting, garden maintenance at The Knowlton House, and all the hours spent in meetings. A salute to all volunteers!

Irene, Rainfall, Runoff and Rain Gardens

Drip, drip, drip. We are all used to hearing the sound of rain falling on our roofs. Gentle summer rains can sound soothing, nurture plant life, and recharge the groundwater. The kind of downpour that came with Tropical Storm Irene has a very different sound and effect. Although New Hampshire had less flooding than severely hit Vermont, our local wetlands, rivers and lakes were full, and much pollution was carried into the waters. Had Irene stalled over us, rather than Vermont, the damage here would have been much worse. (Vermont's was a 500 - 1,000 year rainfall, according to a Dartmouth flood ecology expert.)

Irene

In part of a pattern of increasing amounts of rain in the late summer and fall, on August 27 and 28 the Lake Sunapee area got about 4.5" of rain from Irene. (The average rainfall for NH in August, over 115 years, according to NOAA, is 4". This year's rainfall was 8.68", the highest ever. The other two years with amounts over 8" are 1990 and 1991.)

The water level of Lake Sunapee is managed by the NH Department of Environmental Services Dam Bureau, and in anticipation of the storm, the lake level was lowered. The rainfall and runoff quickly brought the level back up by about a foot. (See graph page 7.) After the storm, the level stayed high as continued runoff

(Rain, Cont. Page 7)



From the Helm: Around the World LSPA Welcomes 100 Scientists!

It is our pleasure and privilege this October 10-14 to welcome 100 scientists from around the world, including the countries of Australia, China, and Norway, to improve our understanding and management of lake ecosystems. This will be the first time LSPA, under the direction of Kak Weathers, LSPA's volunteer Research Director and chair of our Scientific Advisory Committee, is hosting this international conference for GLEON (Global Lakes Ecological Observatory Network). LSPA is proud to have had one of the first water quality data buoys in the United States and one of the few worldwide that is not run by an academic institution. GLEON now includes more than 60 lakes from 20 countries on six continents!

Memorial Contributions

LSPA has recently received contributions honoring the memory of:

**Betsy Farmakis
Remsen Kinne III
Gene Orr
Ann Ray
Robert Saturley
Robert Skelley
John Springer**

Our sincere thanks to the families and friends who thought LSPA an appropriate recipient for these memorial gifts.

What does LSPA's buoy do? The buoy collects data on lake processes, measuring water temperature, oxygen in the lake, sunlight and meteorological characteristics. It then radios the data to LSPA which posts the "live" data on our website and sends them on to GLEON for use in analysis. The data allow us to learn how lakes work and how they respond to environmental influences.

Why do we have a yellow buoy on Lake Sunapee? Fresh water lakes like Sunapee provide drinking water, fisheries, and a host of other ecosystem services, as well as recreation. In order to preserve these precious resources, we need a better understanding of how they work. Is the lake functioning differently over time and if so why? What can we learn from other countries in other continents about their lake changes? What is helpful to lake health and what hurts? How can we work together and share knowledge and disseminate information?

Officers, 2011-2012:

Tanya Wilkie	President
Charlie Forbes	1st. V. Pres.
Dave Macdonald	2nd. V. Pres.
Sue Venable	Secretary
Phil Schulz	Treasurer
Jack Holton	Clerk

Staff:

June Fichter	Executive Director
Robert Wood	Assoc. Exec. Dir.
Kathleen Stowell	Education Dir.
Kak Weathers	Research Dir.
Sue Godin	Office Admin.
Bonnie Lewis	Lab Manager
Geoff Lizotte	Watershed

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As members of LSPA we should all feel very proud of our commitment to science. Understanding lake science is most important to LSPA, and we are privileged to have a Science Advisory Committee whose members are doing research at Lake Sunapee. We have cutting edge research happening in our own back yard! I'm a strong believer that an ounce of prevention is worth a pound of cure. If we can prevent problems from occurring in Lake Sunapee, and other lakes around the world, we can protect ALL of our lakes for future generations.

Best,

Tanya Wilkie, President

A publication of Lake Sunapee Protective Association Founded 1898

All articles prepared by Staff, Officers, *Beacon* committee or *Beacon* Editor Midge Eliassen unless noted. Photos by Midge Eliassen unless credited otherwise.

Annual Meeting Elects Officers and Directors

At the Annual Meeting in July, LSPA's membership elected its officers, two new members to the Board of Directors, and four others to a second three-year term on the Board. Sue Venable was elected to the position of Secretary, while Tanya Wilkie, Charlie Forbes, Dave Macdonald and Phil Schulz were re-elected, respectively, president, first and second vice presidents, and treasurer. Jack Holton was re-elected Clerk of the Association.

Sue Venable has been a member of the LSPA Board, serving as Springfield's representative, since 2006. Venable has been the chair of The Knowlton House committee and a member of the education committee. She comes from a family with a long history on the lake, and has spent summers here all her life. She and husband Gene retired to Springfield not long before she became the town's representative to the LSPA Board. Venable's career was in education, first as a classroom teacher and then as chair of the education department of Sussex County Community College in New Jersey.

New members of the Board are Sue Gottling and Willie McLaughlin. Re-elected were Kristen Begor, Barbara Freeman, Maggie Ford, and Ron Wyman.

New Members of the LSPA Board

Sue Gottling is a Sunapee resident who represented the district in the NH house of representatives for two terms, during which she sponsored many environmental bills. She is now a Sunapee selectman. Gottling was educated at Wilson College and Ohio State University, for her PhD. Her working career was as a teacher, administrator and psychologist. She is involved with ILEAD and the League of Women Voters. Gottling and her husband have been year round Sunapee residents since 1995, and prior to that were summer residents starting in 1972.

William (Willie) McLaughlin is a physician and teacher in the University of Massachusetts Program in Obstetrics and Gynecology. His undergraduate degree is from University of Vermont and his medical degree from Wayne State University. McLaughlin has been coming to Lake Sunapee since the 1950's and worked as a bartender at the Lake Sunapee Yacht Club in the early 1970's. He and his wife have had a second home on the lake since 1984. McLaughlin is an Overseer at Dartmouth Hitchcock Medical Center, a member of the Mount Sunapee Ski Patrol, and a Weed Watcher for LSPA.



Willie McLaughlin and Sue Gottling

Rolf Eliassen Award to Taffy Beckman

The Rolf Eliassen Award, LSPA's recognition of outstanding service to LSPA and Lake Sunapee, was presented this year to Taffy Beckman.

Beckman has served on the LSPA Board since 2001, and has been secretary of the Association (and Executive Committee) since 2006. She also chairs LSPA's education committee, which she will continue to do.

The award citation recognized Beckman's many volunteer roles for LSPA over the years, and her common sense, honesty and good humor.



Taffy Beckman at the Annual Meeting



← Kathleen Stowell helps attendees at the Annual Meeting create and understand a watershed, from which all water flows into the water body at the bottom.

Summer 2011



Scientists Chris Jakubiak and Dan Macdonald launch the instrument that will spend the summer on the bottom of the lake, sending acoustic beams, to determine how water moves between basins in the lake bottom formation.



Dot Gordon and Sue Venable wave from the Dorothy G during the Antique and Classic Boat Parade.



One of many evening talks: Douglas Cygan, NH Department of Agriculture, discusses control of invasive plants on land.



Kathleen Stowell shows two young program attendees how to do an ecology game on the lawn at LSPA's Education Center.



LSPA "Benefactor" donors were treated to a pig roast on a beautiful summer evening.
Photo by Kristen Begor



Students working with Nick Baer, right, Colby-Sawyer College and LSPA Board, check to see what "critters" he has netted. Their work is part of a grant to study mercury in macroinvertebrates in Lake Sunapee's tributary streams.



Students from a Dartmouth summer biology class participate in a "sediment blitz" during which they took samples of sediment all over Herrick Cove, as part of the work to understand better the cyanobacterium "Gloeo" that blooms in the lake.

Summer 2011



A very popular activity at Love Your Lakes Day is the opportunity to go out to the LSPA water quality buoy and learn how water quality monitors sample the lake.



A team works together to briefly shock the fish in a tributary stream, so that they can be netted, classified, weighed, measured, and some analyzed for mercury content. (Most are put back in the stream, unharmed.)



Master Gardener Kiki Schneider points out a feature during one of several tours she gave to explain LSPA's new demonstration rain garden and infiltration "train". (See article page 1.)



Children and parents flock to the activity tent at Love Your Lakes Day to learn more about the lake and make take-home items.



Scientists gathered for "Gloeo summit" discussions and intensive field work enjoy a pasta dinner they cooked up at The Knowlton House.



Jessica Trout-Haney and ET Traver, part of the team studying Gloeo, work at a lakeside dock to count Gloeo colonies as part of a study on the effects of density on the cyanobacterium. *Photo by K. Cottingham*

It Can Be Done — Two New Houses Are Built to Control Water Runoff

Two lakefront homeowners have recently undertaken major construction projects, building their new homes with careful consideration of managing the flow of water on their lakeshore sites. Their properties have different challenges, but each has planned with their builders and landscapers various ways to limit the amount of water that runs off the land and into the lake. Both have built on sites where older homes long existed, and runoff was not as well managed as it is now.

There are many common aspects to their solutions, from rain gardens and use of crushed stone, to native plantings. Key to both efforts was watching the property to see how water flowed, and then working to control runoff better than it had been in the past, despite building new and larger homes. Understanding the prior history of building and landscaping on their properties helped both these families lessen their impact.

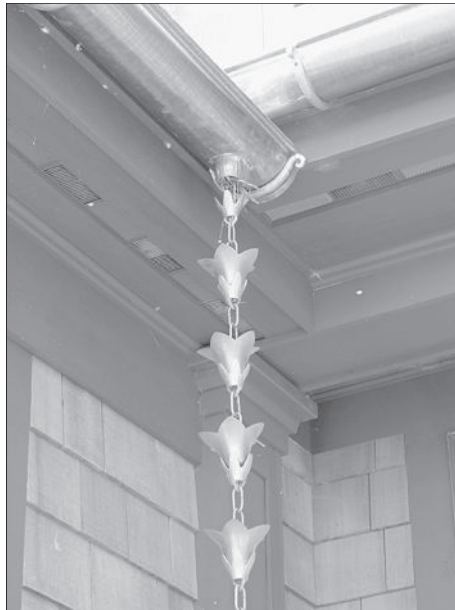
Both families talk about having built for the following generations, who they hope will love Lake Sunapee as much as the generations before them. They want to leave not only the new home, but a legacy of thoughtful care to lessen impact on the lake.

Details follow, in hopes that others will be inspired to follow their examples of careful control of water runoff.

Property 1

One family had owned the property since the 1940's when the first house was built. It was a piece of an old estate, and the land was open and landscaped, with a lawn to the lake. As the years went by, the elder generation learned from LSPA that lawns are bad for the lake, and incorporated large perennial flower beds to take up runoff. Later, when they had the possibility to connect to the New London/Sunapee sewer line, they did so.

At the time of the new construction, the next generation had a goal from the beginning of lessening impact on the lake despite new construction and landscaping. They too credit LSPA's education about maintaining



Copper gutters and a decorative chain serving as a downspout bring an aesthetic touch to the transfer of rain water from roof to crushed rock infiltration area below.

water quality for making them aware of this goal. In excavating for the foundation, they went further than the minimum in order to establish foundation drainage to catch runoff. The area was filled back with sand topped with gravel and then crushed stone, to allow water to infiltrate the soil and

enter the ground water. A stone terrace was prepared with an entire filtration bed under it, and porous crushed stone between the larger rocks. The house has gutters and down spouts which take roof runoff into the filtration beds. A leach field, almost new when the old home was connected to the sewer, became part of the water control design. Any overflow from the filtration bed goes into the leach field for further dispersal.

The heavy rains of Irene gave this family an opportunity to see how well they had done in controlling runoff, even though their landscaping was incomplete. The only area that had water running off into the lake was flow from a neighbor's property; they are now installing a couple of gravel beds and a gravel path to allow that water to penetrate the soil and then flow through a planted area.

Property 2

This family found that the older home (early 1930s) they had bought had what became a flow-through basement every spring. The old rock foundation passed through it the water running down their sloped property from the state road (and



A carefully constructed and planted rain garden catches water from roof and driveway and lets it settle into the ground.

(Cont. from Page 6)

probably also from Interstate 89). They lived here and watched the movement of water for several years. They realized that, over time, the earlier owners had altered wetlands on the large property and that the house probably should never have been built where it was. It was obvious that the old house was not viable to renovate, with the state of the water flow and the porous rock walled basement.

The owners knew they faced big challenges, so they engaged soil scientists to examine the property and help define the wetlands, old and new. At the time they were planning the new construction, the new Comprehensive Shoreland Protection Act was being drafted. The family's engineers and other experts worked closely with the changing regulations, with their plans becoming a model project.

From the start of construction, measures were taken to handle the water flowing on the site and to reconnect some of the altered wetlands. The house was moved further back from the shore than the one torn down. Piping and sand and gravel beds were installed in all places where stone walls were built along the sloping driveway. In the driveway, where water flow is inevitable, a pattern of granite cobblestones, like the old French drains, intercepts any water that flows across the surface, traps sediment, and lets water flow down into the fine sand between the stones. Water from the roof also falls into gravel beds around the foundation, and is permitted to settle into the soil beneath or is piped to rain gardens on either side of the house.

The rain gardens are depressions in the soil that have been carefully prepared to hold water and let it settle into the ground. The bed of the rain gardens is made of layers of sand, gravel and then hay, beneath the soil, all of which trap sediment particles as the water filters through. The plantings chosen for the rain garden are ones to soak up water and stabilize the soil. Any water that does reach the lake after flowing through the rain

(Rain, Cont. from Page 1)

reached the lake, and the Dam Bureau controlled the amount of water going down the Sugar River. (Starting October 10, the fall drawdown will begin, lowering the lake to its winter level.)

Runoff

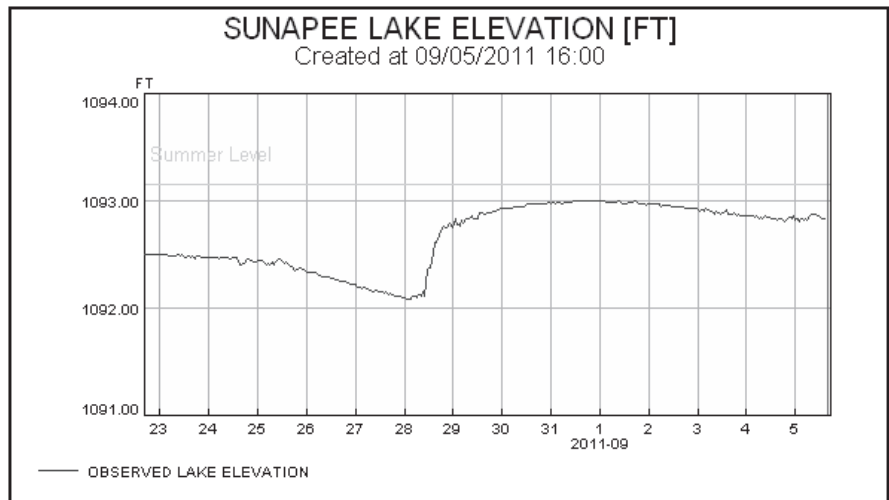
Over the years, we have all learned from lake scientists that runoff from the land is one of the most threatening problems for lakes. As land is developed, water that used to be absorbed by bushes and trees runs across the land, carrying pollutants into the lake. These pollutants range from chemicals to soil and sediment, to excess nutrients that feed unwanted algae and plant growth in the lake.

Controlling runoff has become a priority for those concerned with water quality. All the Clean Water Act section 319 grants LSPA received from 1995-2003 helped the highway departments reduce runoff flow from roads. LSPA Associate Executive Director Robert Wood's design for the "Sunapee Swirler" catch basins

reduces the fine sediment reaching the lake. The major NOAA grant, headed by Michael Simpson and recently completed, has enabled the Lake Sunapee towns to understand just which culverts in our watershed are inadequate for the bigger storms we keep getting. Planners are calling for more "low impact development" where runoff is kept on the site to settle into the ground, rather than allowing it to be directed onto the road or the neighboring property.

Rain Gardens

LSPA's new rain garden and water infiltration "train" (a sequence of depressions with plantings to trap runoff) form a demonstration area to help homeowners develop their own gardens to help trap runoff. Recently, some homeowners with new construction projects around the lake were very conscientious about limiting runoff. Two of these are described in the article on page 6, in hopes of inspiring others to look at and deal with runoff on their own properties, whether or not new construction is taking place.



Lake Sunapee water levels around the time of tropical storm Irene. Summer level is lake level after spring runoff. See the LSPA website for data on water temperature and winds during the storm (www.lakesunapee.org/templates/details.html?x=251)

From the NH DES website

garden's bed is by that time clear of sediment.

This family now has a dry basement, water flowing from the roads bordering their land moves through the carefully studied and reconnected

wetlands, and water from their new house and drive flows into various filtration traps before reaching ground water or lake.

LSPA

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International GLEON Conference At Sunapee October 10-14

LSPA will be hosting the 13th conference of scientists who are part of the Global Lake Ecological Observatory Network (GLEON). GLEON is a grassroots organization of people who study lakes and their management. Many of the scientists coming to Sunapee have buoys like LSPA's water quality buoy, that collect and transmit data about lake processes and local weather.

Kak Weathers, LSPA's volunteer Research Director, is co-chair of the GLEON Steering Committee, and leader of the conference.

There will be over 100 scientists at Lake Sunapee, including representatives from 20 countries. The prior three GLEON conferences were held in Israel, Brazil and China.

LSPA will entertain the visitors at a couple of social events at its headquarters in Sunapee Harbor, and the GLEON student workshop, focused on communication, will also be held at LSPA. Other larger workshop sessions will be held at the Mount Sunapee Resort.

The visiting scientists will participate in field trips in the local area on Friday October 14. If you see any of them, please extend Lake Sunapee's welcome.

Conference Sessions Open to Public

Poster Session

Tuesday October 11, 5-6:30pm, at Mt. Sunapee Resort
Individual scientists will be available to explain topics of lake science on which they are doing research, and some of their findings.

Lecture, Panel, and Questions and Answers

Wednesday, October 12, 7pm, at Mt. Sunapee Resort
Dr. Justin Brookes, of the University of Adelaide, Australia, will speak on the Global Water Crisis, followed by a panel including lake scientists from New Zealand, China, Ireland, and the U.S. There will be time for questions from the public, and a dessert reception will follow. RSVP to LSPA 763-2210 if you would like to attend.



LSPA's 2011 Full Moon Cruise produced a gorgeous evening and moonrise, and a fun nature quiz developed by Kathleen Stowell, right, sharing a laugh with President Tanya Wilkie.

This issue of *the Beacon* has been sponsored by:

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LSPA appreciates this support.

The Mission of Lake Sunapee Protective Association (LSPA)

LSPA, founded in 1898, is a member-supported nonprofit organization dedicated to preserving and enhancing the special environment of the Lake Sunapee region, through education, research and collaborative action.