

LAKE SIDE

A QUARTERLY PUBLICATION OF NEW HAMPSHIRE LAKES ASSOCIATION

Is Your Favorite Lake Impaired?



Members dedicated to protecting lakes

Volume XVIII, No. 2, Summer 2009

by Bob Estabrook, New Hampshire Department of Environmental Services' Chief Aquatic Biologist

Do you know if a Total Maximum Daily Load (TMDL) exists for your lake? Draft phosphorus TMDLs were recently completed for 30 New Hampshire lakes. These TMDLs were developed for lakes that are impaired because of excessive algal growth. Every two years states are required to submit a Water Quality report to the Environmental Protection Agency (EPA) on the status of their waters. If a waterbody does not support one or more designated uses (Primary Contact (swimming); Secondary Contact (boating); Aquatic Life; Drinking Water Supply; Fish Consumption; Wildlife) the waterbody is listed as "impaired."

How are "impairments" determined?

Excessive algal growth can impair the swimming use. Specifically, for New Hampshire's lakes and using all available data within the past 10 years, if the amount of algae floating through the water as measured by chlorophyll exceeded 15 micrograms per liter in more than 10% of the samples collected and/or a surface scum of cyanobacteria was reported present during the 10 year period, the lake was listed as impaired for the swimming use. Total Phosphorus (TP) was listed as the pollutant causing the impairment. Chlorophyll is the pigment found in all plants and its measurement provides an estimate of the total amount of algae in the water. Cyanobacteria, formerly called blue-green algae, not only can form surface scums that interfere with the aesthetic enjoyment of swimming but some species may produce toxins that can cause adverse health effects. (See <http://des.nh.gov/organization/divisions/water/wmb/beaches/workshops.htm> for more information on cyanobacteria toxins.)

Phosphorus is the plant nutrient that controls the amount of algal growth in New Hampshire lakes and is the pollutant that needs to be reduced in order to reduce algal growth.

What lakes are "impaired?"

Thirty lakes were selected for TMDL development from the 2006 list of lakes impaired by either chlorophyll (CHL) or cyanobacteria (CYANO) or both. Table 1 identifies the lakes and the cause(s) of impairment.

More information on how NH assesses surface waters for designated use support can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/documents/calm.pdf>. More information on currently

Table 1: TMDL lakes and cause(s) of impairment

LAKE	TOWN	CHL	CYANO
BABOOSIC LAKE	AMHERST	*	*
BACK LAKE	PITTSBURG		*
COUNTRY POND	KINGSTON		*
DORRS POND	MANCHESTER	*	
FLINTS POND	HOLLIS	*	
FOREST LAKE	WINCHESTER	*	
FRENCH POND	HENNIKER	*	
GOVERNORS LAKE	RAYMOND	*	
GREENWOOD POND	KINGSTON		*
HALFMOON POND	KINGSTON	*	
HARVEY LAKE	NORTHWOOD	*	*
HOODS POND	DERRY		*
HORSESHOE POND	MERRIMACK	*	*
HUNKINS POND	SANBORNTON	*	*
LONG POND	BARRINGTON	*	
NUTT POND	MANCHESTER	*	
PAWTUCKAWAY LAKE	NOTTINGHAM		*
PEARLY LAKE	RINDGE	*	
PINE ISLAND POND	MANCHESTER	*	
POWDER MILL POND	HANCOCK	*	
ROBINSON POND	HUDSON	*	*
SANDY POND	BEDFORD	*	
SEBBINS POND	BEDFORD	*	
SHOWELL POND	SANDOWN	*	*
SONDOGARDY POND	NORTHFIELD		*
STEVENS POND	MANCHESTER	*	
TOM POND	WARNER	*	
TURTLE POND	CONCORD		*
WEBSTER LAKE	FRANKLIN		*
YORK POND	BERLIN	*	*

Favorite Lake, continued on page 5

Protecting New Hampshire's lakes and watersheds.

LAKESIDE

published quarterly by the

NEW HAMPSHIRE LAKES ASSOCIATION
EIGHTY-FOUR SILK FARM ROAD
CONCORD, NH 03301
603.226.0299 FAX 603.224.9442
WWW.NHLAKES.ORG INFO@NHLAKES.ORG

OFFICERS

Ted M. Kramer *Silver Lake*
Chair

George Dana Bisbee *Concord*
Vice Chair

Christopher Devine *Holderness*
Treasurer

Philip J. O'Brien *New London*
Secretary

BOARD OF DIRECTORS

Jane Beaulieu *Manchester*

Laurie Beeson *Holderness*

Gordon W. Cormack *Madison*

Kathleen DiFrancia *Windham*

Joseph Goodnough *Sunapee*

Susan Goodwin *Wolfeboro*

Shirley Green *Enfield*

J. Steve Kahl *Plymouth*

J. "Woodie" Laverack *Asbland*

Jeffrey Schloss *Strafford*

William H. Smith *Moultonboro*

Joy Tarbell *North Conway*

Kenneth Warren *Lebanon*

HONORARY DIRECTORS

Courtland Cross *New London*

Joseph Farrelly *Concord*

Anne Lovett *Holderness*

Sidney Lovett *Holderness*

James Moore *New London*

Philip Parsons *Sandwich*

H. Hallock Richards *Moultonboro*

STAFF

Judy King *Alton*
Administrative Assistant

Andrea LaMoreaux *Bradford*
Education Director

Dyanna I. Smith *Portsmouth*
Development and Special Projects Director

Jared A. Teutsch *Northfield*
President

LAKESIDE PRINTING

Speedy Printing, Concord, NH

NEWSLETTER LAYOUT

Tracey George, Speedy Printing, Concord, NH

LAKESIDE SPONSORS

Belknap Landscape Company, Inc.

Meredith Village Savings Bank, Inc.

Wastewater Alternatives, Inc.

Web-sites.com

Your Home Your World

For information on sponsorship, contact the
NH LAKES office at (603) 226-0299.

From the President...



Once again, we are in the heart of summer enjoying the lakes we love so dearly. Although it started off a little slow, with record rainfall and cool temperatures, the warm summer now beacons to us all. And, summer brings many things to our lakes, including family and friends, new endeavors and events! In case you missed it, we had a spectacular Sixteenth Lakes Congress on Friday, June 26. More than 155 lake enthusiasts came to Colby-Sawyer College in New London, located in the heart of the Lake Sunapee region, to listen to Dr. Steve Kahl kick off the day-long educational and networking event emphasizing how important it is for all us to work together to protect and improve lake quality.

Recognizing the challenging economic climate, and echoing Dr. Kahl's sentiments, NH LAKES has focused on doing *more* with *less* through partnerships this year. In classic old Yankee tradition, we cut costs and figured out creative ways to expand our programs with less funding. Our flagship education program, the Lake Host™ Program, is covering *more* ramps and has greater participation from local groups than ever

before with *less* funding. Our legislative session was successful, with new lake management and protection initiatives being passed. By working with representative Sue Gottling of Sunapee, we initiated and were successful in passing legislation that adds automatic dishwashing detergent to the list of household cleaning products that fall under the statewide phosphate ban—this accomplishment will surely have a positive impact on the quality of our lakes. All of this comes at a time when 30 lakes have recently been listed by the NH Department of Environmental Services as being impaired by phosphorus pollution.

The challenges associated with protecting all of New Hampshire's approximately 1,000 lakes is daunting. But, we can and we will work together through partnerships to conquer the challenges that lie ahead. One way we are doing this is by helping to foster the next generation of responsible watershed and lake stewards through implementing our new Summer Youth Employment Program for Lake Protection which is funded by the American Resource Recovery Act through the Workforce Opportunity Council.

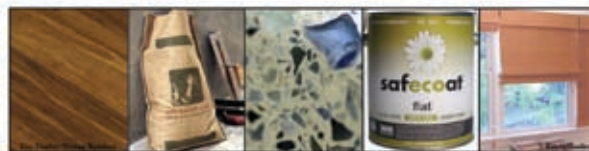
Please partner with us by filling out our annual Lake Issue Survey included in this issue—we want to know what your lake concerns are and how we can help. And, please help us find new partners by sharing the important work of NH LAKES with your neighbors and friends and encouraging them to join the only statewide, member supported organization dedicated to protecting New Hampshire's lakes and watersheds.

NH LAKES gratefully acknowledges the support of:



Your Home Your World

Helping You Create a Beautiful, Earth Friendly, Healthy Home
with Our Green Design Center!



138 N. Main St ~ Concord, NH 03301 ~ 603 223 9867 ~ www>YourHomeYourWorld.com

whose generous contributions underwrite this issue of *Lakeside*.

2009 Legislative Session Update

The 2009 legislative session un-officially wrapped up after the first week of June. In the end, NH LAKES' legislative proposals were successful and added several much needed protections to our state's public water bodies.

Restricting Phosphorus Levels in Automatic Dishwasher Detergents (HB 350) – to be signed by the Governor on July 29th!

- Adds the prohibition of the sale and distribution of automatic dishwashing detergent containing phosphate for residential use to the existing statewide law prohibiting phosphate in household cleaning products. Phosphorus has a significant detrimental impact to lakes, acting as a fertilizer for aquatic vegetation, leading to over-abundant plant and algal growth. Takes effect July 1, 2010. Low-phosphorus and phosphorus-free automatic residential dishwasher detergents are readily available today through most manufacturers.

Amendment that Increases Funding for Exotic Invasive Aquatic Weed Prevention and Control (HB 2)

- Increases the registration fee charged by the state based on the length of the vessel. Allocates an additional \$1.50 per boat registration to invasive exotic aquatic weed control and an additional \$1 for invasive

exotic aquatic weed prevention. Also increases the license fee from \$4 to \$12 and increases the registering agent fee from \$1.50 to \$5.00.

Comprehensive Shoreland Protection Act Clarifications (SB 134) – to be signed by the Governor on July 29th!

- Clarifies the reference line as the surface elevation on natural fresh water bodies and artificial impoundments listed in the Official List of Public Waters maintained by the NH Department of Environmental Services. Adds a reduced permit fee for projects that qualify as a permit by notification. The fee for water quality improvement projects will be \$100 and for all other permit by notification projects the fee will be \$250.

Modify State-Owned Waterfront Leasing Policy (SB 107) – awaiting the Governor's signature!

- Increases the fee for leasing state-owned waterfront managed by the NH Department of Transportation Bureau of Rail and Transit from \$25 per linear foot to \$30, with a Consumer Price Index increase every five years. Additional changes would limit leasing to adjacent parcels that are developed for residential purposes only. All undeveloped parcels after 2011 would not have an opportunity to lease adjacent

state waterfront property. These are needed policy changes that help protect and enhance our lakes and rivers.

If you have any questions, please contact Jared Teutsch, at jteutsch@nhlakes.org or (603) 226-0299. **And, please don't forget to fill-out our annual issues survey included in this newsletter—we need your input to develop our 2010 legislative agenda!**

Upcoming Events

- **November 19 and 20, 2009:** The 2009 New Hampshire Joint Water and Watershed Conference, Grappone Center, Concord.
- **June 25, 2010:** NH LAKES' Lakes Congress, Squam Lakes Natural Science Center, Holderness.

For more information regarding these events, please contact NH LAKES at info@nhlakes.org or (603) 226-0299.

Items Wanted!

As NH LAKES is doing more with less, we are hoping you can help us with our equipment needs. If you would like to donate any of the items listed below, or know someone who would, please contact us at info@nhlakes.org or (603) 226-0299. Your donation will help us do our jobs better and more efficiently!

Wish List

- Lake water sampling equipment
- Photocopy machine
- Projector for showing PowerPoint presentations

Super Wish List

- Car or SUV (preferably hybrid)
- Pontoon boat

NH LAKES is a 501 3(c) organization and your charitable donation is tax-deductible to the extent allowed by law.



2009 Squam Lake Regatta. (Photo courtesy of Dan Stack.)

Are there Freshwater Jellyfish in Your Lake?

by Alicia Carlson, NH Department of Environmental Services' Source Water Protection Education Coordinator,
and NH LAKES Education Committee Member

Picture this... it's late August, you're swimming in your local lake, when you see something small and shimmery float by. Hmm, that's odd, you think. Then, you see another, and another. Suddenly, you're surrounded by quarter-sized, clear organisms. But, what could they be?

What you've just witnessed are freshwater jellyfish, and you should feel privileged to have seen them! Freshwater jellyfish are not a common sight in New Hampshire's lakes and ponds. And, when they appear in a lake one year, they may not necessarily be there again the next. So, you're probably wondering, what is the deal with these things?! Well, I'll explain.

Freshwater jellyfish (*Craspedacusta sowerbyi*) are not a true jellyfish but are in the same basic classification as the true jellyfish. Both freshwater jellyfish and true jellyfish are in the Phylum Cnidaria, but *C. sowerbyi* are in the Class Hydrozoa, while true jellyfish are in the Class Scyphozoa. They have very similar life cycles, spending part of their lives as both polyps and as medusa, or the "jellyfish" form. Because the polyp stage of the life cycle occurs in a water body's substrate and the polyps are nearly invisible to the naked eye, this stage will not often be found in nature. They can spend several years in the polyp

stage. This makes sighting a colony much less likely from year to year.

While the medusa form of *Craspedacusta sowerbyi* does contain stinging tentacles like the true jellyfish, it is commonly believed that these organisms cannot harm humans. They are just too small! Their main prey includes small fish and zooplankton. And, the only known predator of the medusa stage is the crayfish.

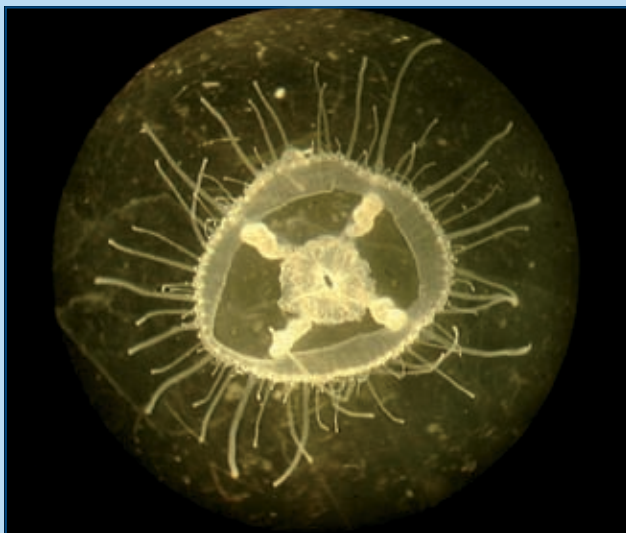
A native to the Yangtze River region in China, freshwater jellyfish are a non-native (exotic!) species in North America. The first known sighting of a freshwater jellyfish colony in North America occurred in the early 1900s. They have been reported in 44 states but tend to proliferate in the eastern temperate states. The New Hampshire Department of

Environmental Services has collected information about sightings around the state since the early 1980s and has a list of more than 20 lakes and ponds where freshwater jellyfish have been found.

Although this species is non-native to New Hampshire, there has been no research done to prove there may be a detrimental effect on native zooplankton populations. Researchers in other regions have proposed that the presence of freshwater jellyfish may influence zooplankton populations, but their overall impact in North America is unclear.

Research shows that freshwater jellyfish prefer shallow, stagnant artificial water bodies, such as reservoirs and quarries, but can also be found in natural lakes and ponds. The latter

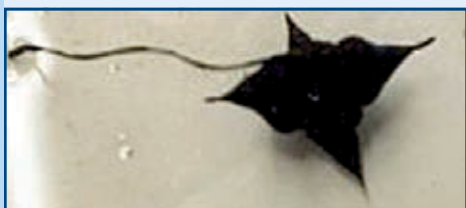
seems to be the preferred habitat of New Hampshire's population of jellyfish. For the list of New Hampshire water bodies with previous sightings of this elusive organism, check out the DES fact sheet number BB-51, "Freshwater Jellyfish in New Hampshire." Go to www.des.nh.gov and search for "freshwater jellyfish." Some information for this article was found on the U.S. Geological Survey's Nonindigenous Aquatic Species website at <http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=1068>.



Freshwater jellyfish are beautiful creatures. (Photo courtesy of the North Carolina Museum of Natural Sciences.)

Lake Hosts Continue to "Save" Our Lakes from Devastating Exotic Aquatic Plants

Despite the rain which plagued most of early summer 2009, approximately 600 Lake Hosts reported to their local boat ramps for duty to help prevent the spread of devastating exotic aquatic plants from lake to lake. At least one lake is extremely lucky to have Lake Hosts protecting it...



The exotic water chestnut seed has barbs which easily allow it to hitchhike from lake to lake.

On Wednesday, June 24, before she arrived for Lake Host duty at 6 a.m., Alicia Copatch found what appeared to be an exotic water chestnut seed attached to the bumper of a trailer parked at the Wellington boat ramp on Newfound Lake. The seed was removed and sent to the New Hampshire Department of Environmental Services (DES) for identification—the experts agreed that it was, indeed, an exotic aquatic seed which could have caused a serious mess in the pristine lake. Martha Twombly, Newfound Lake Region Association Program Director stated, "Vigilance is ever important in the prevention of the spread of exotic spe-

Lake Hosts, continued on page 5

Favorite Lake, continued from page 1

impaired lakes including watershed report cards can be found at <http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm>

How does a TMDL work?

A TMDL, or Total Maximum Daily Load, is the total amount of a pollutant that can enter a waterbody each day such that the waterbody can still meet water quality criteria to support its designated uses. For the 30 TMDLs, total phosphorus (TP) was the pollutant. Briefly, the TMDLs determined the sources and amounts of TP currently entering the lake causing the impairments, and the reductions required to these TP inputs (called TP loads) such that the lake will no longer be impaired.

First the amount of in-lake TP that will not cause a swimming impairment needed to be determined. A statistical analysis of TP concentrations in New Hampshire lakes determined that 12 ug/L TP (summer, median, upper waters) was the general boundary separating lakes impaired and unimpaired for the swimming use. This value was used as the in-lake target value unless modeling indicated that the number was exceeded under natural conditions, in which case the natural conditions value was used.

The second task was to establish the relationship between the existing TP loads to the lakes

and the in-lake TP concentrations. Models, called phosphorus loading models, do this. They predict in-lake TP concentrations based on the amount of TP entering the lake along with lake characteristics such as size, depth and flushing rate (number of times a volume of water equal to the lake's volume passes through the lake in one year). The models can then be used to predict in-lake TP concentrations based on reduced TP loadings.

The first step in developing this relationship was to determine the existing TP loading to the lakes. Studies have been conducted and data exist in the scientific literature that predict the amount of TP that runs off from various land uses (types of agriculture, residential development, etc). Using appropriate literature values for watershed TP runoff along with estimates of TP inputs from atmospheric deposition, waterfowl, septic systems and release from bottom sediments, the existing TP loads to the lakes were determined. The models were calibrated such that the existing loads predicted the existing in-lake concentrations. The models also predicted mean and peak chlorophyll concentrations and algal bloom probabilities. Recommended reductions in controllable TP sources were made in a step-wise fashion until the models predicted an in-lake TP concentration of 12 ug/L (the target or goal value).

What happens next?

The 30 draft lake TP TMDLs are currently

under internal review at the NH Department of Environmental Services. When completed, the reports will be posted electronically at <http://des.nh.gov/organization/divisions/water/wmb/tmdl/index.htm>, stakeholder groups and municipalities will be notified and a 30 day public comment period will follow. For more information on the public review process or to obtain a paper copy of a report, contact the TMDL coordinator at Margaret.foss@des.nh.gov or at 603-271-5488. When completed, final reports will also be posted on the website listed above.

Then the hard work begins—the implementation of the TP reduction recommendations to meet the TMDL goals. While the TMDL provided recommended percent TP reductions from the various sources, specific sites still need to be identified and reduction projects designed. Projects are anticipated to be implemented in an iterative process over many years. The success of the TMDL implementation effort depends largely on the willingness and motivation of lake and watershed stakeholders and local officials to become involved, and the availability of federal, state and local funds. If you are such a stakeholder and want to become involved, the first step is to contact Margaret Foss (above) to be put on the mailing list to receive the report when released. Information on available funds for implementation projects can be found at <http://des.nh.gov/organization/divisions/water/wmb/was/categories/grants.htm>.



The construction of drainage improvement projects on the landscape, like this one which includes the installation of vegetated swales and stone check dams, allow polluted runoff water to soak into the ground instead of flowing into surface waters and degrading water quality. (Photo courtesy of NH Dept. of Environmental Services. Project design by Geosyntec Consultants www.geosyntec.com.)

Lake Hosts, continued from page 4

cies...as far as we know, Newfound still has no infestations of exotic species.” Amy Smagula, DES Exotic Species Program Coordinator added, “This ‘save’ is a good reminder that hitchhiking invasives come in large and small sizes, from big green stems of plants to small brown ‘bumps’ on trailer bunks that are hard to see. Kudos to the Lake Hosts on Newfound for finding the water chestnut seed!” (To learn more about water chestnut, visit <http://des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-43.pdf>.)

As of July 17, 2009, 98 “saves” had been made statewide through the NH LAKES 2009 Lake Host Program. For a listing of participating groups, where the “saves” have been made, and to learn more about the Lake Host Program, visit, <http://www.nhlakes.org/lake-host-program.htm>. If your favorite lake is not being protected by the Lake Host Program, or if you would like serve as a volunteer Lake Host this summer or in future summers, please contact NH LAKES at lakehost@nhlakes.org or (603) 226-0299.



Lake Host Alicia Copatch.
(Photo courtesy of the Newfound Lake Region Association.)

Stimulus Funds Awarded for Youth Lake Protection Jobs with NH LAKES



Just in time for the busy lake season, NH LAKES was chosen to receive American Recovery and Reinvestment Act, Workforce Investment Act, stimulus funds to provide participating disadvantaged youth with six weeks of academic and occupational learning focused on lake protection and “green jobs” in the communities of Laconia, Lebanon, Meredith and Pittsburg.

From late June to mid-August, NH LAKES’ “Summer Youth Employment Program for Lake Protection” is employing approximately 36 youth for 15 hours a week through its existing Lake Host™ Program, and as Crew Members of current and future Lake Conservation Corps™ projects. The youth are also being provided with five hours of academic instruction each week, learning about lake ecology, watershed management and protection, and green jobs.

A recent economic study coordinated by NH LAKES revealed that the economic impact of swimming, fishing and boating in our surface waters generates \$378 million in sales, \$134 million in income annually and provides 5,990 jobs.

This summer, make that 6,026 jobs!



Lebanon Youth learn how to analyze lake water collected from Crystal Lake in Enfield.



TransCanada joins the Tillotson Fund in Support of North Country Lakes Partnerships

For the second year, NH LAKES is able to continue its programming in the North Country due, in part, to the generosity of the Tillotson Fund and TransCanada.

TransCanada is supporting the “Protecting North Country Lakes Through Community Partnerships” project which is protecting Pittsburg’s lakes from exotic aquatic plants through the Lake Host Program. The TransCanada award provides partial matching funds for a \$15,000 grant award received earlier this year from the Tillotson Fund, supporting NH LAKES’ efforts to empower the Pittsburg community as they take ongoing stewardship action.



Thanks to generous funding from TransCanada, both First and Second Connecticut Lake will now be better protected from the spread of devastating exotic aquatic plants

Davis Conservation Foundation Funds Maine & New Hampshire Lakes Partnership Project

In June, the Davis Conservation Foundation awarded \$20,000 to NH LAKES, supporting our new efforts to partner with two Maine lake organizations: Maine Congress of Lakes Associations (Maine COLA) and Maine Lakes Conservancy Institute (MLCI).

As economic support tightened for many nonprofits this year, NH LAKES recognized a



unique opportunity to share the skills of its staff to help fulfill an unmet need with other like-minded nonprofit organizations working to carry out their similar missions—critical to protecting our natural resources. NH LAKES approached the Davis Conservation Foundation for funding to unite Maine and New Hampshire’s lake protection activities for increased mission activity, capacity building and organizational efficiencies. By providing salary support for NH LAKES’ Development and Special Projects Director, Dyanna Smith, the award initiates a staff-sharing agreement, allowing Dyanna to act as the liaison to NH LAKES, MLCI and Maine COLA, dedicating time and expertise toward shared program focus.

With the successful funding of this innovative project, all three organizations hope to unite urgent lake protection activities across Maine and New Hampshire that will enable a broader reach for development and outreach beyond political boundaries.

The award represents the largest grant given this year by the foundation.

View the 2009 Lakes Congress Presentations on-line

NH LAKES' 2009 Lakes Congress, held on Friday, June 26, 2009, at Colby-Sawyer College in New London, in the heart of the Lake Sunapee Region, was a success! A record-breaking 155 individuals were in attendance at the all-day educational and networking event which focused on the theme of "Partnerships Protecting New Hampshire's Lakes." Lake enthusiasts, lake association members, state agency personnel, researchers, lake and watershed management professionals, students and political leaders exchanged information, ideas and experien-

es about how we can all work together to manage and protect New Hampshire's approximately 1,000 lakes and ponds.

If you missed out on the conference, or if you attended and would like to see other presentations that were given during the day, be sure to check out the conference proceedings at www.nhlakes.org.

And, please save the date for the 2010 Lakes Congress which will be held on Friday, June 25, at the Squam Lakes Natural Science Center in Holderness!



Attendees at the 2009 Lakes Congress Project WET session enjoyed participating in hands-on interactive lake education activities.

Sign up to receive Shorelines, our new monthly e-news blast

This summer, NH LAKES introduces *Shorelines*, our new monthly e-news blast. *Shorelines* is a quick way for us to talk to you about the most current lake issues, announcements, legislative updates and activities we are involved with. It is a place for us to share stories, links and interesting lake facts, and to feature you—our Lake Hosts, volunteers, and supporters. If you haven't seen *Shorelines*, it's because we don't have a current email address for you! To join the email distribution list, use the "Shorelines Sign Up" button on our home page at www.nhlakes.org.



Membership Matters

New Members – April 22, 2009 through July 15, 2009

Individuals

Thomas and Judith Brewer • Gerald Cooper • Thomas Crane, Jr. • Richard M. Denise
Gregory Gingeleskie • Derek and Deborah Hunt • Peter Johnson
Robert and Susan Morse • Gary Surprenant

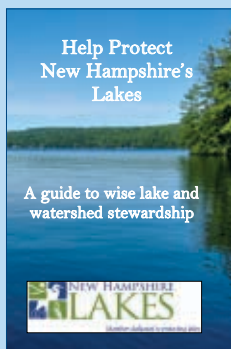
Businesses

AE Diving • Cormack Construction Management, Inc.
JCBDesignscapes, LLC • Springledge Farm

Grants (9/11/08 – 7/15/09)

Davis Conservation Foundation • French Foundation • NH Charitable Foundation
NH Department of Environmental Services • TransCanada • Tillotson Fund
Workforce Opportunity Council/ARRA/NH Dept. of Education

Purchase our popular Lake Book for just \$1!



Learn simple ways that lake recreationists, watershed and shoreline residents can help protect the state's lakes in our newest educational publication—*Help Protect New Hampshire's Lakes*:

A guide to wise lake and watershed stewardship. This 39 page booklet features attractive photos of New Hampshire's lakes and includes a wealth of information. This publication is regularly on sale for \$5 each, but in celebration of Lakes Appreciation Month in July, we made it available at just \$1 each. **Due to an overwhelming positive response, we are extending this offer until further notice.** (Shipping

will be added, unless you pick your order up at our Concord office.) **This is great resource for Associations and Realtors to give out to their members or new home owners on the lake—and great for anyone looking for one source of information on wise lake stewardship!** To order your Lake Books, email info@nhlakes.org with your order details.

84 SILK FARM ROAD, CONCORD, NH 03301



NON-PROFIT ORG.
US POSTAGE
PAID
PERMIT #1494
CONCORD, NH

Members dedicated to protecting lakes

Inside this issue

Is *Your* Favorite Lake Impaired?

From the President

2009 Legislative Session Update

Upcoming Events

Lake Hosts Continue to "Save" Our Lakes from Devastating Exotic Aquatic Plants

Are there Freshwater Jellyfish in *Your* Lake?

Stimulus Funds Awarded for Youth Lake Protection Jobs with NH LAKES

Davis Conservation Foundation Funds Maine & New Hampshire Lakes Partnership Project

TransCanada joins the Tillotson Fund in Support of North Country Lakes Partnerships

View the 2009 Lakes Congress Presentations on-line

Sign up to receive *Shorelines*, our new monthly e-news blast

Membership Matters

Purchase our popular Lake Book for just \$1!

Lakes in Summer

Printed on stock that is 30% recycled fiber with chlorine free pulp, using timber from managed forests.

Lakes In Summer

Have you noticed that when you swim down into the depths of some of New Hampshire's deeper lakes the water gets colder the deeper you go? If you have observed this phenomenon, then you have experienced summer lake stratification!

As the sun beats down on the surface of the lake in May through early August, the surface waters of the lake heat up. During mid-summer, if the lake is shallower than approximately 20 feet, the temperature of the water column from the top to the bottom of the lake will be approximately the same. This is because sunlight, which warms the water, can usually shine through the lake down to the bottom sediment, causing the water to reach its maximum temperature in late July or early August. In these relatively shallow lakes wind currents mix the entire water column from top to bottom and nutrients and oxygen are evenly distributed throughout the water and the lake may support a warm water fishery. But, in lakes deeper than approximately 20

feet, summer stratification usually occurs. Due to particles present in the water column and the physics of light, sunlight is not typically able to penetrate in our deeper lakes past a maximum of approximately 30 to 40 feet. In these lakes, three thermal layers are usually formed during the summer. A cold, dense layer (hypolimnion) is found near the lake bottom, while a warm, less dense layer (epilimnion) is near the lake surface. Between the hypolimnion and epilimnion, a layer of water with rapidly changing temperature and density (metalimnion—commonly referred to as the "thermocline") is found. Due to density differences between these three thermal layers, wind currents do not mix the entire water column, so vital nutrients and oxygen are not evenly distributed throughout the lake. As the summer

continues and algae and plants fall down to the lake bottom and decompose, the oxygen may become depleted in the hypolimnion which could cause problems for the coldwater fishery that the lake may support.

Luckily, as the water temperature cools in early fall, the lake will experience a rejuvenation as "fall turnover" occurs—once again, oxygen and nutrients will be evenly distributed throughout the lake.

