



The Sampler

December 24, 2014

The Sampler is a monthly e-newsletter produced by the Volunteer Lake Assessment Program.

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Web Highlights

This month's featured lake website is [Franklin Pierce Lake](#), Hillsborough, NH

[Lake Group Introducing Anti-Invasive Species Legislation](#)

[Monitoring During Extreme Events \(Floods, Droughts\)](#)

[Global Change and Local Solutions: Tapping the Unrealized Potential of Citizen Science for Biodiversity Research](#)

[This Season, Let's Celebrate Clean Water](#)

[Closing in on ALS? Link Between Lethal Disease and Algae Explored](#)

Upcoming Events

[NHANRS Annual Meeting](#)
January 30, 2015
8:30 a.m. - 4:00 p.m.
Grappone Conference Center
70 Constitution Ave.
Concord, NH 03301

[2015 Winterfest](#)
February 14, 2015
Squam Lakes Association
534 Route 3
Holderness, NH 03245

Our New Hampshire Lakes: A Winter Wonderland of Chemical and Biological Activity

The majority of our summer visitors have packed up and seasonal camps have closed, while full-time lake residents and the lake itself prepare for the long winter months ahead.

First, fall turnover occurs. Reduced solar energy no longer warms surface waters, and the upper layer of the water column cools. Each lake cools at a different rate; smaller, shallower lakes cool quicker than large, deeper lakes. Cold water is denser than warm water and as the upper water cools and the lake's thermal layers weaken, wind activity causes lower and upper waters to mix. This process typically occurs during the months of October and November. After fall turnover, water temperatures and nutrient concentrations are essentially the same from top to bottom and the lake is said to be isothermal. By the end of November many New Hampshire lakes have reached their maximum density at 39° F (4 ° C). The coldest water temperatures (1 ° to 3 ° C) cover the top of the lake. The lake usually freezes over with its first permanent ice layer on a cold calm night.

Fall turnover also cues seasonal changes for aquatic life. Aquatic animals decrease metabolic rates and plant photosynthesis is slowed by the changes in day length and cooler temperatures. The activity of cold blooded aquatic animals drops during the winter months, but does not entirely stop. The drop in water temperature reduces their body temperature and signals them to seek appropriate shelter. Some frogs may survive over winter by burrowing down in leaf litter, while others head for the bottom of the lake. Reptiles, like the snapping turtle, continue their normal routine of eating and mating. Fish increase their level of body glucose to build up tolerance to the cold. This acclimation period can be a stressful time for fish, and although fish remain active throughout the winter months, their movement is restricted.

Algae, or phytoplankton, go through many changes as winter approaches. Winter algae populations are affected by nutrient availability, cold water temperature and decreased sunlight penetration. The winter algae community is typically dominated by small and often motile algae. These species are cold-water and low-light tolerant and are found in a narrow layer of light penetration beneath the ice cover. In New Hampshire, Diatoms are typically the dominant winter algae. Cyanobacteria typically don't do well under winter conditions and some produce akinetes or special resting cells. These specialized cells allow cyanobacteria to over-winter in lake sediments and live off of the stored nutrients. Planktonic animals, or zooplankton, are dominated by three major groups: Rotifers, Cladocera, and Copepoda. Over the winter months, perennial zooplankton lower population densities and

[NEAEB Annual Conference](#)
March 18-20, 2015
Attitash Grand Summit Hotel
Bartlett, NH 03812

[Northeast Natural History Conference](#)
April 18-20, 2015
Springfield, MA 01108

Grants

[New England Grassroots Environment Fund](#)
Grow Grants
March 15, 2015

Limno Lingo

Diurnal: An event that occurs or re-curs daily within a 24 hour period. In lakes, diurnal vertical migration is typically triggered by light intensity and can be affected by lake clarity, turbulence, season, and predation. The Cladocerans, a group of zooplankton, exhibit diurnal vertical migration in the water column. Darkness triggers vertical migration from deep water to surface waters with daylight triggering migration back to deeper water.

female adults become predominant; while other zooplankton produce resting eggs during unfavorable winter conditions.

Many plant species remain active during the winter months and continue to photosynthesize under the ice. Hardy winter plants like Pondweed and Arrowhead help to oxygenate the water and provide habitat for fish and wildlife. Other plant species have a different means of winter survival. Some plants produce an abundance of protected seeds before the frost. These seeds remain dormant in the sediment until the spring. Bladderwort and Milfoil have special vegetative structures called turions. These winter buds develop during the late summer and early fall. In some species, the buds detach from the plant, while in others they may remain attached and the buds sprout green shoots in the spring. Water lilies contain a rhizome shoot structure, in which a modified stem called a rhizome, stores carbohydrates and nutrients in order to survive the winter.

Luckily, New England lakes have a high specific heat. This property allows lakes to go through slow temperature changes and allows aquatic species time to adapt to seasonal changes, making them a perfect place to call home.

New England Association of Environmental Biologists 2015: Partnerships for Environmental Progress

The New Hampshire Department of Environmental Services (NH DES) with assistance from US EPA and the New England Interstate Water Pollution Control Commission (NEIWPCC) is hosting the 2015 New England Association of Environmental Biologists (NEAEB) annual conference. We are also pleased to partner with Plymouth State University Center for the Environment (PSU CFE) to combine NEAEB 2015 with the annual N.H. Water and Watershed Conference. You won't want to miss this event!

[NEAEB 2015](#) aims to promote partnerships and the exchange of practical information regarding environmental biology, water quality, water pollution control, and resource management between participants throughout New England. These annual conferences attract over 200 attendees from local, state and federal agencies, NGO's, academic institutions, students, researchers, watershed associations, and environmental consultants. This great opportunity for partnerships, networking and business development will occur over three days at the Attitash Grand Summit Hotel and Conference Center in Bartlett, NH. We hope that you or a representative from your organization will join us from March 18th – 20th, 2015.

NH DES Wetlands Protection Grant Awardees

Congratulations to the Lake Wicwas Association, in partnership with the Lakes Region Conservation Trust (LRCT) for receiving a [Wetlands Protection Grant](#) to protect 27.44 acres of land and one mile of shoreline on Lake Wicwas in Meredith.

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