

Conservation Matters

A monthly column focused on conservation education, as the result of collaboration among several area conservation commissions and organizations. If your town's commission or conservation organization would like to contribute articles, please contact Jessica Tabolt Halm jess_tabolt@hotmail.com

Title: Polar Express and El Niño bring extreme weather to NH, breaking cold and warmth records.

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In the grips of one of the strongest El Niño's on records, New Hampshire residents are putting away their barely used skis and snowshoes, and pulling on their gardening boots. Everywhere this winter, ski areas have only been thinly covered with mostly artificial snow, and a host of ice derbies, ice fishing contests, ski races and winter sports events have been cancelled throughout the state. More recently, residents are reporting on the earliest ice outs for New Hampshire lakes and ponds in recorded history. Lake Winnepesaukee, for example, just declared March 18, 2016 to be the earliest ice out on record, beating the old record of March 23, 2012 by five whole days!

At the USDA's Hubbard Brook Experimental Forest in Woodstock, NH, scientists have been studying the weather, streams, and ecology of a 7,800 acre forest and nearby Mirror Lake for over 60 years. Their records highlight the whacky roller coaster weather of the last 12 months.

Although 2015 was by far the warmest year on record globally, 2015 wasn't particularly remarkable *as a whole*, at Hubbard Brook, registering as just the 9th warmest year on record. Looking closer however, scientists documented an extremely cold and snowy start to the year in the winter and spring of 2015. January 2015 was the 17th coldest January in the Hubbard Brook record, February 2015 was *the* coldest February on record (beating the old record from 1968 by 2.7°F), and March was the 7th coldest March on record, all due to the polar vortex. Snow was deep and plentiful, and lasted all the way through April 20, 2015.

All this changed as temperatures started to soar during the summer, as one of the most intense El Niños on record began to affect New Hampshire's weather. All summer, fall, and winter months in 2015 were above average, with some record breakers. September 2015 was the warmest September on record by 1°F and December 2015 was the warmest December by 6.7°F! Additionally, August was the third warmest August and November the fourth warmest November on record. Although not record breaking, warm temperatures prevailed in early winter (January 2016 was the 8th warmest and February 2016 was the 20th warmest January and February on record, respectively). By the end of February 2016, Hubbard Brook scientists could count the period of December, January, and February as the 2nd warmest winter on record, with a mean winter temperature of 20°F, trailing the warmest winter on record of 2002 by just 1.5°F.

In terms of New Hampshire's much loved snow, the winter of 2015/2016 didn't have much to offer, in sharp contrast to the late season snowfalls of the previous winter 2014/2015. The snow pack depth at Hubbard Brook was the lowest in its 60 year record, with a maximum snow depth at the longest running monitoring site coming in at barely nine inches. For those old timers who remember the snowier

winters of yesteryear, this year's snow depth was only one quarter as deep as recorded maximum snow depths at Hubbard Brook in the late 1950's and early 1960's. The duration of snowpack, defined as the number of days with snow on the ground, was also down. The Hubbard Brook valley saw the 2nd shortest period of snow cover on record, with only 63 days of snow cover. The shortest snow cover on record was the winter of 2011/2012, which was only two days shorter (61 days).

Ice anglers didn't have much time for fishing this winter either. Scientists recorded a tie for the latest ice in on record (December 30, 2015, tied with December 30, 2006); and the second earliest ice out (March 19, 2016, secondly only to March 18, 2010). With the late ice in and early ice out, Mirror Lake had the shortest ice cover on record by a whopping 15 days.

Besides affecting our favorite winter outdoor activities, the milder winter and earlier onset of spring can have positive and negative impacts on New Hampshire forests and the creatures that live there. For plants, a later fall and earlier spring means a longer growing season and perhaps more productive forests. The down side, however, is greater vulnerability when weather delivers an early snow or ice storm, which can break branches and even topple trees that still have leaves on them in the fall (as in the Halloween snowstorm of 2011, or a late spring frost, which is devastating to new leaves as they are beginning to unfurl. Indeed, forests at Hubbard Brook lost ~30% of their leaves in a mid-May frost after an unusually warm spring in 2010. These events can make for less productive forests, as more of their stored sugar reserves need to go into wound healing processes, or into rebuilding their leaves.

For our large mammals, like moose and deer, a warm winter with less snow means less cold stress, greater ease of movement, and more exposed food such as shoots, buds, and twigs. On the other hand, for moose, warmer winters also mean more winter ticks. Each moose can have up to 10,000 ticks, which results in a large amount of blood loss. Warm winters with less snow on the ground also mean that white tailed deer in the area will fare better and be able to move around more freely. This increases the chances for contact between moose and deer; although moose are larger, deer carry a parasitic nematode (*P. tenuis*) that causes no harm to the deer, but is lethal to moose.

For our resident birds, an early spring can be good news, with less cold stress and easier access to food. Migratory birds may arrive earlier in the spring, as this could give them an edge with a longer nesting season, as long as their favorite food is around when they arrive. Scientists worry about possible 'asynchronies' or mismatches between the timing of birds arrivals and availability of food.

In sum, weather affects us all, and as New Hampshire faces a generally warmer, wetter climate, citizens need to be braced for more unpredictable weather.

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Ducks delight as ice recedes on March 20, 2016, 1 day after ice out on Mirror Lake, NH (photo by Tammy Wooster).



Open water at Mirror Lake as ice goes out on March 19, 2016. (Photo by Tammy Wooster)