

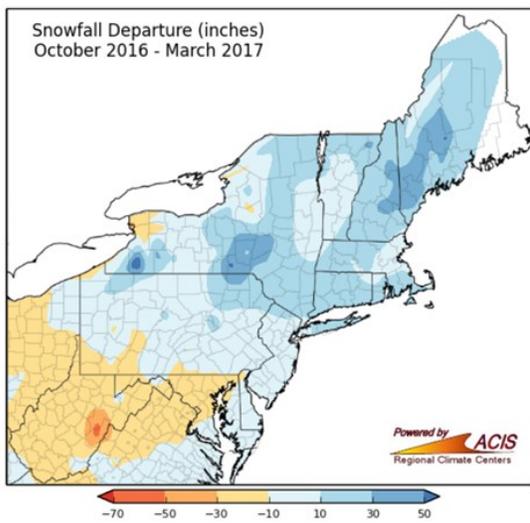
Vermont Forest Health

Insect and Disease Observations—April 2017

Department of Forests, Parks & Recreation
April 2017 vtforest.com

Winter Gives Way to Spring

The winter of 2016-2017 felt more like winter to us Vermonters especially the cold and snowy March. From December 1 to February 28, statewide temperatures were 4 to 8 degrees warmer than normal. With the exception of the NE Kingdom and Chittenden County, the state was drier than normal by -1.5 inches.



Winter snowfall ranged from 10 inches below normal (lightest blue) to 30 inches above normal (medium blue).

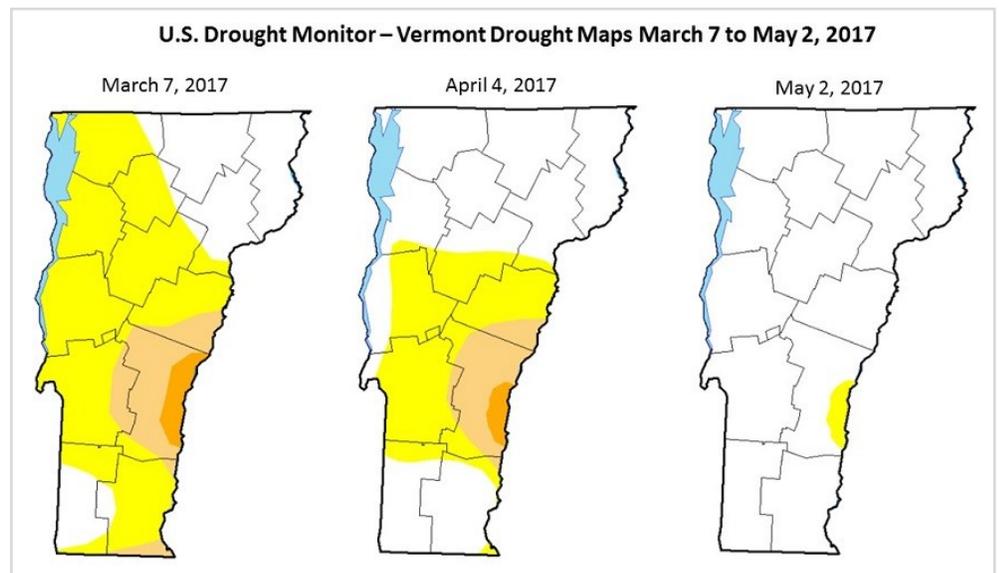
March was cold with temperatures 4 to 8 degrees below normal. Statewide conditions were also wetter than normal except for southern VT and Connecticut River Valley. Much of the precipitation was in the form of snow.

April was warmer and a little drier than normal. At the end of the month, small patches of snow remained in north facing, shaded and wooded areas of the NEK and at high elevations. The week of April 9th was warm and dry enough to elevate fire danger. From April 9 to 15, twelve fires were reported with 7 reported on April 15. This low number of fires and acres is well below normal for April.

Drought conditions have improved over the winter across the northeast region. As of the end of April only a slice of abnormally dry conditions remained in Windsor county.



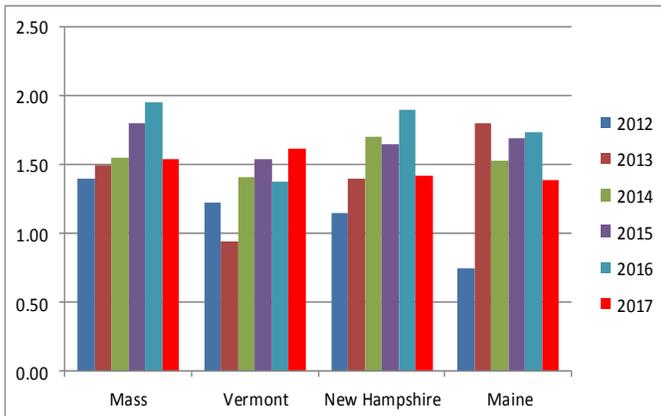
Source: [U.S. Drought Monitor](http://www.drought.gov)



Weather and White Pine

Salt damage is particularly noticeable this year on roadside pines and other conifers. Cold weather and snowy conditions can result in increased use of road salt and de-icers.

A possible down side of being less droughty than elsewhere in the region? A model developed by Stephen Wyka (formerly at UNH) and others predicts **white pine needle damage** for 2017 based on last year's weather and disease incidence. The graph below shows results from this experimental model. Vermont is the only NNE state that is predicted to have an increase in white pine needle damage from 2016, partly based on not having the same level of drought conditions as the other sites did in 2016. We'll know better in late May when symptoms of needle damage will show up on last year's foliage.



An experimental model predicts that white pine needle damage will be less severe in 2017 than in 2016 for Maine, Massachusetts and New Hampshire, but not for Vermont. The y-axis is the average rating prediction from 0 to 3; 0-no damage, 1-one third of the crown affected, 2-one thirds to 2/3 of crown affected, and 3-all of the crown affected.

Graph: S.A. Wyka, Colorado State University

Oozing Orange Slime—Part of the Spring Experience

Seeing [orange slime](#) oozing from a tree is not uncommon in the spring, when yeast fungi may proliferate on sap that exudes from wounds like seams, sapsucker injuries, and pruning cuts. Although conspicuous, [the fungus](#) does not hurt the tree.

The sap exuding from bleeding trees has a high sugar content and can be colonized by many species of bacteria, yeast and fungi. Photo: R. Kelley



Conifer Shoots: Yummy (to Squirrels) or Drought-related?



Conifer shoots on the forest floor were widely observed by late winter. Like the spring of 2010, this may be related to animal feeding or may be abiotic. Squirrels scrambling for food find sustenance in conifer buds, nipping off twigs, and littering the ground beneath to get at the buds. Where there are shoots (particularly hemlock), but no sign of squirrel feeding, the cause may be natural branch shedding (cladoptosis). Abnormal shoot abscission has been linked to dry years, with winter weather bringing down shoots that were disconnected in the fall.

A 90-100 year old Norway spruce in Williston provided some tasty treats for red squirrels. Photo: J. Tessmann

Forest Tent Caterpillar Concerns Continue

Forest tent caterpillar (FTC) populations increased dramatically in 2016 with approximately 25,000 acres of defoliation mapped during statewide aerial surveys. Most defoliation was in Essex, Lamoille, Orange, Orleans, and Washington Counties. Moth catch in pheromone traps in 2016 increased four-fold from 2015, with the statewide average trap catch in double digits for the first time since 2006, the peak of our most recent outbreak.

If this outbreak follows previous trends, we expect defoliation to be more widespread in 2017. The forest tent caterpillar is a native insect whose populations fluctuate between extremes, reaching outbreak proportions every six to 16 years. Typically, an outbreak may begin at a handful of sites, with the area increasing as insects disperse. That means that while populations may be declining in one area, they will be expanding in another.



Forest tent caterpillars are now emerging, seeking newly-expanding sugar maple leaves. Photos: R. Dyer and T. Greaves.

Throughout the winter months, VTFPR conducted overwintering egg mass surveys for concerned sugarmakers in 64 sugarbushes (representing more than 10,200 acres) to predict the level of defoliation that could occur this summer. Of the area surveyed, approximately 5,000 acres at 32 locations were identified as at risk of defoliation.

In the last week of April, we began to see caterpillars hatching from their egg masses in areas defoliated in 2016. These caterpillars will begin feeding on sugar maple leaves soon after they emerge, and will continue to do so through the month of June. This spring we are monitoring the phenology of both FTC emergence and sugar maple leaf expansion in the areas affected in 2016. Weekly data from these sites can be found on the FPR website at the following link: http://fpr.vermont.gov/forest/forest_health.

FTC can adversely impact tree health, especially on sites with poor nutrition and after multiple defoliations. Options for minimizing impacts include managing a diverse forest (e.g., FTC will not typically feed on red maple, among other species) and delaying thinning or other disturbance. Multiple defoliations are more likely in sugarbushes because they are dominated by sugar maple and their widely spaced trees increase caterpillar survival. (In open forests, caterpillar diseases spread slowly and parasitic insects are more vulnerable to predation.) Where defoliation is predicted *and* if trees were defoliated last year or if tree health is at risk due to other factors, sugarmakers should consider the pros and cons of management alternatives. These include aerial treatment with an organically-certified insecticide and leaving defoliated trees untapped next spring.

More information on management options and the biology of the insect can be found here: http://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Forest_Health/Library/VTFPR%20Forest%20Health%20Leaflet-Forest%20Tent%20Caterpillar_2016.pdf.

Oak Wilt

In 2016, **oak wilt**, a vascular disease caused by the fungus *Ceratocystis fagacearum*, was detected in several new locations in New York state. Some of the NY infection centers have been traced to firewood movement. Oak wilt is closely related to Dutch elm disease, and rapidly kills infected trees. It has not had the same impact as Dutch elm disease, so far, because the insects that spread oak wilt are less effective vectors than the elm bark beetles. This makes it even more important to eliminate human-caused spread. A [quarantine](#) has been established restricting movement of oak and other woody materials from designated protective zones in New York.

Since small infection centers can be successfully eradicated, early detection is particularly important for oak wilt. Information on identifying oak wilt is available at [vtinvasives.org](#). Please report red oaks with leaves that start to wilt or show marginal browning in June or July and wilt completely in just a few weeks.

Spring, when new vessel wood is being formed, is the main period of infection for oak wilt. Symptoms in red oak can occur as early as May, and include leaves turning dull green or bronze, appearing water-soaked, wilting, and then turning yellow or brown.

Photo: C.E. Seliskar, [Bugwood.org](#)

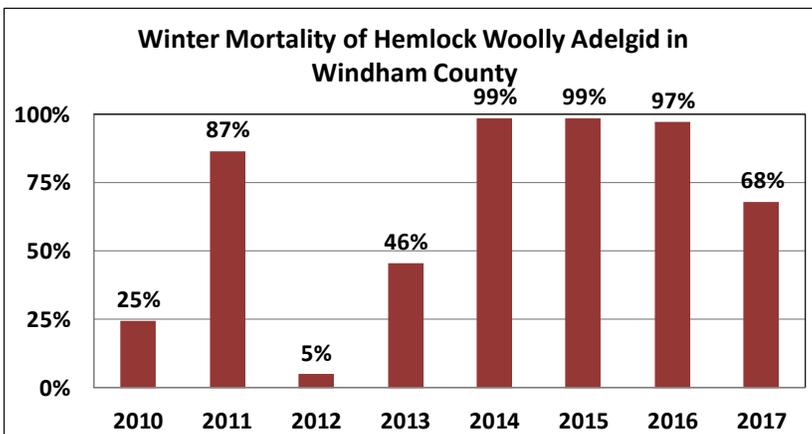


Beech Leaf Disease

[Beech Leaf Disease](#) (BLD), discovered in Lake County, Ohio in 2012, appears to be quickly spreading eastward, with occurrences in additional sites in Ohio, NW Pennsylvania, and SW New York. No causal agent has been identified. For additional information and photos, visit [Penn State Extension](#).

Hemlock Woolly Adelgid

After three years of high overwintering mortality of [hemlock woolly adelgid](#), evaluations made in March, 2017, indicated increased survival. As a result, we expect to see the insect in new locations in 2017, and more hemlock decline in infested areas.



The hemlock woolly adelgid infestation in Vermont remains centered in Windham County, with a small spot in Springfield (Windsor County) and an isolated stand in the town of Pownal in Bennington County.

Spotlight: Japanese Barberry

Japanese barberry (*Berberis thunbergii*) is a member of the barberry family (Berberidaceae), which includes native species like Blue cohosh (*Caulophyllum thalictroides*) and mandrake (*Podophyllum peltatum*), but there are no native members of the *Berberis* genus in New England. Species within the barberry family are perennial herbs or woody shrubs, all which have alternately arranged leaves. The woody shrub species in this family have spines located at nodes along the stems.

Japanese barberry originates from Japan, and has historically been a popular landscaping shrub. It can be found in forest edges, forests, meadows, fields, and disturbed areas. Japanese barberry is spread throughout the East Coast, the Atlantic Provinces, and is spreading west. It can send up sprouts from shallow-growing rhizomes, and the long bending canes of this shrub can also root if they bend enough to touch the ground.



Japanese barberry in the woods through the seasons in Connecticut ([Spring](#), [Summer](#), [Fall](#)).
Photos: Leslie J. Mehrhoff, University of Connecticut, CC by 3.0.

Leaves of the Japanese barberry are small (~1"), green, spatula shaped, with smooth margins, grouped in clusters along each cane. The flowers and red oblong fruit hang below the cane, and fruit can be produced in sun or shade.

This plant is on Vermont's noxious weed quarantine, and is listed on prohibited species lists across New England. Japanese barberry can have an impact on forest soil cycling by raising soil pH and increase nitrate levels, and these changes can persist long after the barberry is removed. It can also alter the humidity of the understory by growing so densely the plants increase ground level humidity to 80%. Combined with the shade these thickets create, this makes good nursery habitat for larval ticks. This plant also has the potential to alter forest successional patterns in stands where it has invaded.

Good times to scout for Japanese barberry in the woods are the spring and fall. Here are a few tricks for finding barberry during these seasons: barberry plants will leaf out earlier in the spring than many native species, and will stand out as pops of green hue through the greys and browns; the plants will also hold onto their leaves into the fall, turning red, and will have bright red berries (See images on the following page.)

To learn more, check out the [USDA NRCS Plants Database](#); [Pennsylvania DCNR](#); [Michigan Department of Natural Resources](#); [Invasive Plant Atlas of New England](#); [Go Botany New England](#); [National Park Service](#); [Maine Natural Areas Program](#); [NH Department of Agriculture](#); and [the US Forest Service](#).



Japanese barberry on April 21st, 2017 in Burlington, VT, showing bud break and leaves starting to emerge, as well as overwintered fruit. Photos: E. Spinney

Shorts: ALB, Cellophane Bees and Winter Ticks

Well-Fed, Older Asian Longhorned Beetles Fly Farther, May Require New Quarantine Zones: Researchers have come up with more precise quarantine borders for **Asian Longhorned Beetles** by studying flight, age, and nutritional health of the invasive beetle. Qualities like mating status, body size, and sex didn't have a significant effect on flight distance. Older beetles that fed had the longest flight performance and made more attempts to fly. These greater flight distances (up to 8.5 miles) are dictating new quarantine recommendations.

Early activity by **ground-dwelling bees** often draws the attention of nature lovers. An inquiry this spring about low-flying bees over a dirt road ended up involving the so-called "Unequal Cellophane Bee", *Colletes inaequalis* (identified by Sam Droege at Patuxent USGS). The life history of the bee is fascinating.



Between 50-100 of these bees were actively nesting, and though they were "pretty quarrelsome amongst themselves," they ignored their human observers. Photo: E. Wolfe

Many of us at the VT Forest Health Information Meeting were intrigued with Pete Pekins' (from UNH) presentation on the effects of the winter tick, *Dermacentor albipictis*, on moose populations in the northeast. Vermont's winter tick surveillance comprises several monitoring options, including cameras at roadside salt licks to ascertain the level of tick-related hairloss.



A single moose may host tens of thousands of winter ticks. Vermont Fish and Wildlife gathers data on moose health in a number of ways, including assessing each moose that is brought into a check station during hunting season for the number of winter ticks present. Photo: C. Alexander



For more information, contact the Forest Biology Laboratory at 802-879-5687 or:

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