Vermont Forest Health

Insect and Disease Observations— September 2017

Department of Forests, Parks & Recreation
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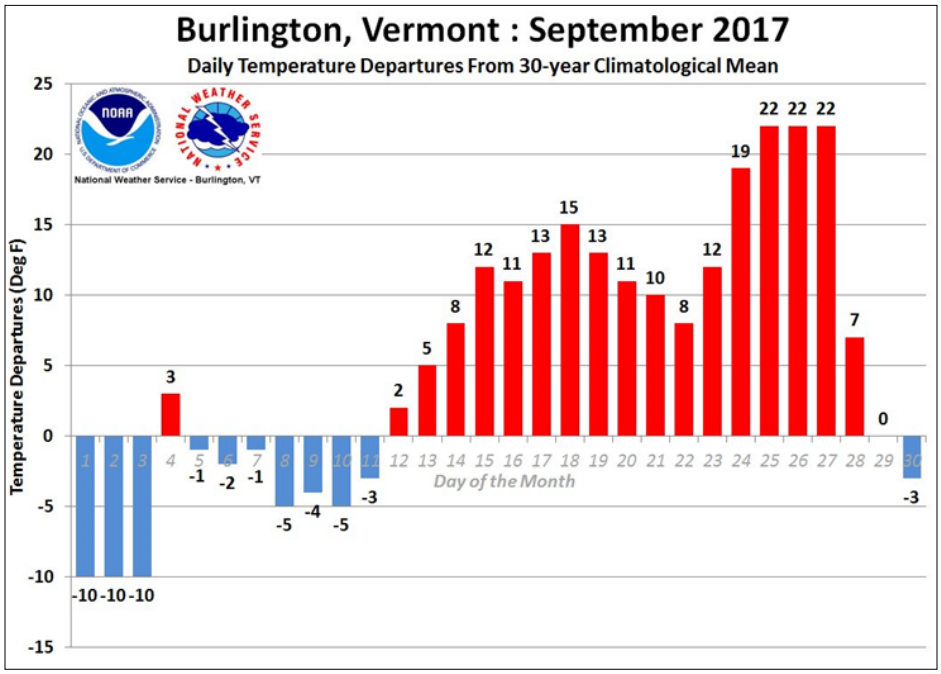
September Weather Out of Whack

Vermonters generally know what to expect by the time September rolls around… chilly nights, maybe even some frost on the pumpkins, comfortable daytime temperatures, and if we're lucky, sunny days to bring on brightly colored leaves. Instead, September 2017 produced a late month heat wave, an abnormally dry swath through Rutland and Windsor Counties, and where was the color?



September temperatures averaged above normal.

This graph from the National Weather Service (NWS) in Burlington shows daily temperature departures through the month. (Blue bars are below normal, red bars are above).

Monthly temperatures statewide followed a similar pattern with below normal temps through the early part of the month to well above normal near the end of the month. Even Mt. Mansfield had 21°, 23° and 23° departure on September 25, 26, and 27, respectively.

The month started on the chilly side with September 2nd morning temps in the 30's and low 40's, and below freezing in the colder spots. A period of sunny days from September 10 to 17 started the foliage color change. By mid-month, though, warmer temperatures arrived. Burlington tied a high temperature record on September 18 with 87°. The previous record was set in 1946.

Then it warmed up even more, and records were broken, some even shattered.

Maximum Temperature Records				
Location	**Record Temperature**	**New Record Date**	**Previous Record Temperature**	**Previous Record Year**
Burlington*	91°	9/24	84°	1961
Montpelier	84°	9/24	83°	1961
St. Johnsbury	89° (tied record)	9/24	89°	1961
Burlington	92°	9/25	85°	1961
Montpelier	88°	9/25	85°	2007
St. Johnsbury	91°	9/25	88°	1920
Burlington**	91°	9/26	84°	1934
Montpelier	87°	9/26	83°	2007
St. Johnsbury	91°	9/26	88°	1920
Burlington	90°	9/27	83°	1908 (tied in 1920)
Montpelier	85°	9/27	80°	2007
St. Johnsbury***	90°	9/27	84°	1933

**The latest occurrence of 90° or warmer. The previous latest occurrence was September 15, 1939 (then on September 25, 26, & 27, 2017).*

***The 3rd consecutive day of 90° or warmer, thus an official heat wave. This is the latest heat wave on record in Burlington. The previous occurred September 8-10, 2002.*

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Burlington NWS also noted that the 90° high in Burlington on September 27 tied the record for the most 90° or greater days during the month of September. The record of 4 days had only been reached once before, in 1945.

The stifling heat was accompanied by high humidity as well, resulting in an elevated heat index (a measure to express discomfort felt by the combination of temperature and humidity). Normal temperatures with lower humidity returned on September 28. The 24-hour drop in maximum temperature ranged from 16° in Springfield to 28° in Newport.

September's record heat resulted from a huge ridge of high pressure, and a northward bulge in the jet stream. This ridge stalled in place due to lack of strong winds, bringing warm air north and blocking remnants of Hurricane Irma and the northern progress of Hurricanes Jose and Maria.

Foliage Follow-Up

While most hillsides remained green going into October, premature leaf drop of sugar maple was reported from locations throughout Vermont, and throughout the northeast. Most commonly observed on roadsides, openings, river corridors, and edges, the leaf drop has been attributed to a "perfect storm of factors". A sequence of weather conditions is responsible, starting with the drought in 2016. That led to an abundant seed crop in 2017, with the trees diverting their energy reserves from leaf growth to flower and fruit production. It may also have led to some fine root mortality, making trees more sensitive to the hot, dry weather in September.

In between these two dry periods, there was lots of rain, and the cool wet weather that promotes fungus diseases. The UVM Plant Diagnostic Lab has identified Anthracnose and an abundance of Phyllosticta Leafspot on fallen sugar maple leaves, and symptoms resembling Septoria Leafspot have been reported. Once leaves are compromised by disease infection they are more likely to brown and drop early under dry conditions. Sometimes this is a direct result of disease, as damaged leaves are no longer able to move water. But often it is indirect, as the tree drops leaves to recycle nutrients and conserve a limited water supply for tissues that are still healthy.

The fungus diseases, anthracnose (right above) and Phyllosticta leaf spot (below left), have been identified in sugar maple leaves. Top photos: B. Schultz; lower left, J. O'Brien, USDA Forest Service, Bugwood.org

Though early fall foliage in some areas has been described as “muted”, a fishing colleague remarked that brook trout colors have been pretty muted as well. Both were expected to “orange-up” soon.

Early defoliation of ash, along with a bumper crops of cones on white pine, have produced a unique skyline in some areas this fall. Photos: B. Schultz

Defoliated white ash were also common by late September. Although ash did not produce a large seed crop in 2017, the species is particularly sensitive to changes in water availability. Since the leaf drop is occurring late in the season, we don’t expect major consequences from the loss of foliage. Nonetheless, it’s good to remember the “the drought of 2016” may be a distant memory to us, but is still very much a factor in tree health.

It’s a different story where sugar maples are bare following forest tent caterpillar defoliation. The failure of some defoliated stands to refoliate suggests that the trees are under substantial stress. We are continuing to investigate this situation.

Sugar maple response to defoliation by forest tent caterpillar was variable. Some trees began to refoliate within a few weeks of heavy defoliation, often with smaller than normal leaves. In some trees, this foliage was later affected by foliar diseases, maple leafcutter, maple trumpet skeletonizer, and maple webworm. Some trees, like the ones shown here, failed to refoliate at all.

Photo: B. Schultz

Watch List Species Spotlight: Autumn Olive and Russian Olive

Autumn olive (*Elaeagnus umbellata*) and Russian olive (*Elaeagnus angustifolia*) are deciduous shrub species within the Oleaster family, Elaeagnaceae, and are both considered invasive in New England. Autumn olive originates from eastern Asia, and Russian olive originates from southern Europe and western Asia.

The first introductions of Autumn olive and Russian olive were in the early 1800s as ornamental plantings. From the 1940s until quite recently, their invasive tendencies weren't identified, and they were heralded as conservation plants for their ability to provide shelter and food for wildlife, and to stabilize soils. Autumn olive has now spread across much of the entire east coast and central US. Moving west, it also occurs in Montana, Washington, and Oregon. Russian olive has spread across most of the continental US and adjacent Canadian Provinces.

These plants can be found in prairies, fields, open woods, roadsides, forest edges, and disturbed areas. Both are prolific seed producers, have seeds with high germination rates, tend to sprout when cut, are tolerant of shade and sun, are spread by wildlife, and fix nitrogen which can disrupt nutrient cycling. These attributes add up to significant impacts on native plant composition and wildlife habitat. Russian olive is particularly impactful in riparian areas, where it spreads and becomes the dominant cover species, reducing habitat diversity. This documented behavior, and the continued spread in Vermont, are reasons these species are listed on Vermont's unofficial invasive plant "watchlist".

Left: Leaves of both species are arranged alternately and are elongate to lanceolate. Center: Young fruit and branches of autumn olive have scales and are silver/brown in color. (Photos: E. Spinney) Right: Russian olive flowers are yellow and have four petals. Photo: N. Frank

The most effective way to tell the plants apart is by the leaves. Autumn olive leaves have silver scales on the lower leaf surface and undulating margins, while Russian olive leaves have scales on both sides.

To learn more, check out these resources: **Autumn Olive -** The Nature Conservancy; Michigan Dept. Natural Resources; Invasive Plant Atlas; National Park Service; Invasive Plant Atlas of New England; Penn State Extension; Maine Natural Areas Program and UMaine Extension; Adirondack Park Invasive Plant Program; UCONN; VTinvasives.org. **Russian Olive -** VTinvasives.org; Minnesota Dept Natural Resources; USDA Forest Service; USDA Forest Service x2; National Park Service; Invasive Plant Atlas; Texas Invasive Species Institute; Ohio State University Extension; Univ. of Wyoming Extension; CABI.

Weather and Hemlock Wooly Adelgid

Will the prolonged warm spell we experienced in September have an effect on when hemlock woolly adelgid (HWA) becomes active? Nymphs of the 2nd ("sistens") generation enter a period of dormancy (aestivation) during the summer months. These nymphs will be the overwintering generation. Sistens nymphs which survive the summer (there is evidence that exposure to sunlight may increase summer mortality of HWA) become active in the fall, when they resume feeding and development. This year, nymphs in the town of Jamaica were still aestivating in late September. We will continue to gather phenological observations on HWA in Vermont, such as when they break aestivation and when they lay eggs, to help target biological control efforts.

A settled hemlock woolly adelgid nymph. HWA enters a period of dormancy during the summer months. Once temperatures cool down, usually in October, the adelgids resume feeding and continue to do so throughout the winter months. Photo: K. Oten, North Carolina Forest Service, Bugwood.org

In the Bag

Arborvitae bagworm (*Thyridopteryx ephemeraeformis*), imported from out-of-state on nursery stock, was observed in three locations on Grand Isle this fall. The insect, normally limited to southern coastal areas of southern New England, had successfully overwintered in one of those sites, though it does not appear to be established on local native trees.

Though the arborvitae bagworm appears unable to successfully overwinter in northern climes, milder winters might allow the insect to spread. Photo: Pennsylvania Department of Conservation and Natural Resources - Forestry , Bugwood.org

Honey Mushrooms

Heavy production of honey mushrooms has been observed statewide. This is the fruiting body of the Armillaria root rot fungus, which attacks stressed trees, and suggests the fungus has been thriving on roots that were drought-stressed in 2016.

Armillaria fungi are parasitic on hardwoods and conifers, and can live as saprophytes on stumps, dead roots, and occasionally on fallen branches. Photo: K. Jones

Ever So Many Caterpillars

A number of caterpillars, commonly known as **tussocks**, have been seen recently by people throughout the state. The milkweed tussock (*Euchaetes egle*), hickory and spotted tussocks (*Lophocampa caryae and L.maculata*), banded tussock (*Halysidota tessellaris*), white-marked, (*Orgyia leucostigma*), rusty (*O. antingua*), and definite tussock (O*. definita*) were among them.

Other caterpillars, in the family Notodontidae (the so-called "**prominents**"), were also reported. These observations included the orange humped mapleworm (*Symmerista leucitys*) from Bennington and Windsor Counties, the red humped oakworm (*S.canicosta*), which was numerous in some locations in Windsor and Windham Counties, with noticeable feeding and large leaf fragments on the forest floor, and the red-humped caterpillar (*Schizura cocinna*).



Part of the cornucopia of caterpillars encountered in September included the milkweed tussock, red humped oakworm, glorious habrosyne and bedstraw hawkmoth. Photos left to right: J. Halman; E. Czerwinski, Bugwood.org; G. Kellman; T. Greaves.

Other caterpillars that drew attention in September included the velvety brown "glorious habrosyne" (*Habrosyne gloriosa*) and the bedstraw hawkmoth (*Hyles gallii*).

Also Observed

The migration of the butterfly known as the painted lady was so sensational that it even showed up on National Weather Service radar in some parts of the country.

Intriguing rose pincushion galls, initiated by the mossy rose gall wasp, provide "a sheltered, luxurious life surrounded by a ready source of food" for the gall wasp's offspring.

Above: The migration of painted lady butterflies was tracked by the Vermont Center for Ecostudies. Photo: G. Salmon; Below: Mossy pincushion galls are not harmful. Photo: O. Zicha

For more information, contact the Forest Biology Laboratory at 802-879-5687 or:	Windsor & Windham Counties..... Bennington & Rutland Counties..... Addison, Chittenden, Franklin & Grand Isle Counties..... Lamoille, Orange & Washington Counties..... Caledonia, Orleans & Essex Counties.....	Springfield (802) 289-0613 Rutland (802) 786-0060 Essex Junction (802) 879-6565 Barre (802) 476-0170 St. Johnsbury (802) 751-0110

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