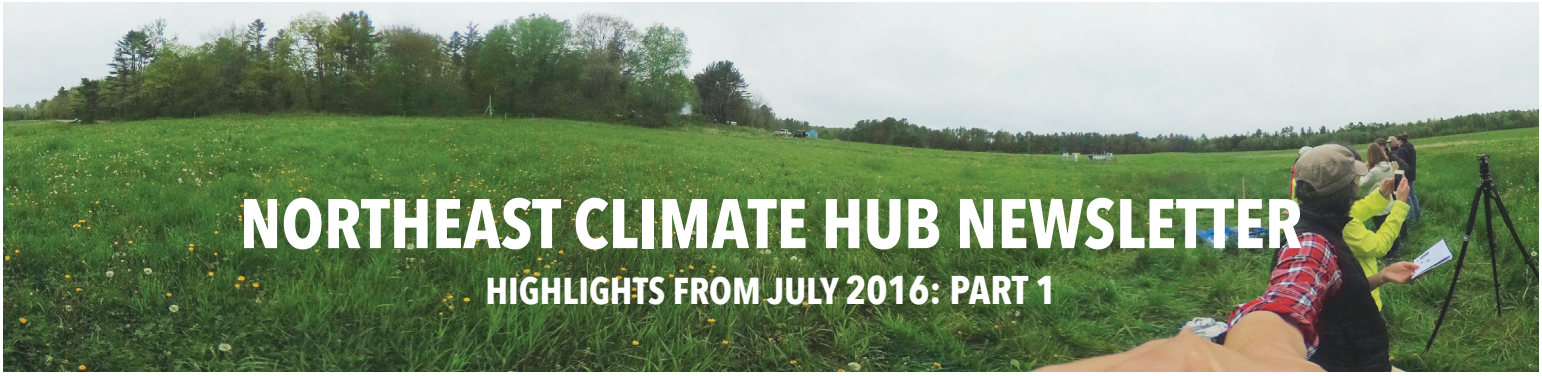


NORTHEAST CLIMATE HUB NEWSLETTER

HIGHLIGHTS FROM JULY 2016: PART 1

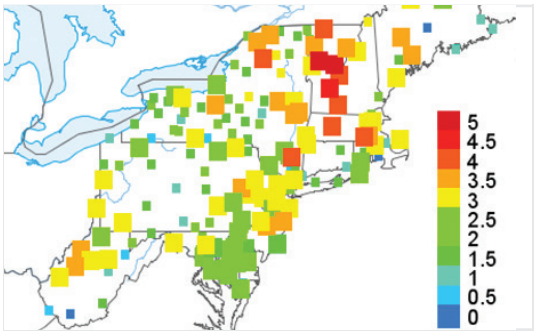
Working as a collaboration to promote climate informed decisions on farms and forests in the Northeast

CLIMATE TRENDS: WARMER WINTERS AFFECT SPRING DEVELOPMENT AND SUMMER PESTS

David Hollinger, Director, USDA Northeast Climate Hub

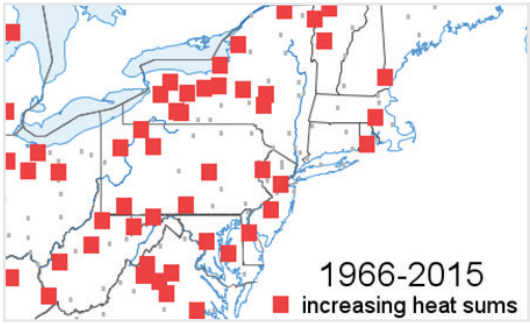
The Northeast has been warming for a number of years with the largest change being an increase in winter temperatures, especially daily minimum temperatures. Over the last 50 years, average January minimum temperatures have risen across the Northeast by about 2.3^{0}F, with larger increases in Massachusetts, New Jersey, parts of New York, and Vermont (see Figure 1; the large symbols in the figure indicate stations from the U.S. Historical Climatology Network where an increasing trend is significant at the 90% level or above). The most recent climate models suggest that this trend in the Northeast will accelerate, and that by the middle of this century, winter minimum temperatures could be more than 10^{0}F above the values measured for 1951-1980.

The ongoing trend of minimum temperature increase is a concern because cold extremes are believed to limit the ranges of a number of weeds and insects. Warmer winters are believed to contribute to the range expansions of significant tree pests in the Northeast, including the hemlock woolly adelgid and southern pine beetle (first seen in NY in 2014 and now present in MA). Troublesome weeds such as kudzu may become even more widespread, as they are also believed to be partly kept in check by winter cold.



Increase in Minimum January Temperatures, 1966 - 2015

^{0}F Increase



Increasing Heat Sums Before Last Cold (<25 ^{0}F)

Another aspect of warmer winters is an earlier start to plant growth and flowering in the spring. For example, flowering and fruit set in fruit trees is partially determined by the amount of accumulated warmth (growing degree days). As tree buds swell and development progresses, their ability to tolerate cold temperatures declines, increasing vulnerability to spring cold snaps. Surprisingly, in much of the Northeast, the number of growing degree days that occur before a final cold snap also seems to have been increasing. In the figure below (Figure 2), the large red symbols indicate stations where there has been a statistically significant increase in the number of growing degree days (base 41 ^{0}F) before the last occurrence of temperatures below 25 ^{0}F, while the smaller grey symbols indicate locations with no significant change. It appears from the data that these conditions which make fruit trees more susceptible to frost and/or freeze damage are becoming more common in parts of the Northeast, echoing the recent experiences of many growers.

SCAN QR CODE TO DISCOVER THE OTHER SECTIONS OF OUR LATEST E-NEWSLETTER, SUCH AS SHARED REGIONAL RESEARCH, MEDIA AND UPCOMING EVENTS, FOR A FOCUSED DIGEST ON CLIMATE, AGRICULTURE AND FORESTRY IN THE NORTHEAST.

FSA CROP LOSS DATA IN THE NORTHEAST: A SNAPSHOT OF CURRENT CONDITIONS

Mary Carey, FSA Project Liaison, USDA Northeast Climate Hub

Northeast Climate Hub FSA liaison Mary Carey has been analyzing recent loss data from FSA's Non-insured Crop Disaster Assistance Program (NAP), which provides financial assistance to producers of noninsurable crops to protect against losses due to natural disasters or adverse weather conditions. Carey specifically reviewed acreage affected in the Northeastern U.S. to determine which causes of loss have affected FSA NAP participants most. Much of what she has found is consistent with the observed weather trends.

In the years analyzed (2013 – 2015), excess moisture and precipitation (combined with both warm and cold temperatures) was the leading primary cause of agricultural crop losses for FSA NAP participants. On average, excess moisture and precipitation accounted for nearly 50% of affected crop acres. This is a concern because the Northeast has been getting wetter in recent years and predictions are for these trends to continue. The majority of the crop acreage affected by excess moisture and precipitation occurred in 2013 especially for berries and vine fruits, field crops, and vegetables and pulse crops. In 2013, field crops were more heavily affected by excess moisture and precipitation in New England and New York (80%), while berries and vine fruits were affected more in the mid-Atlantic and West Virginia region (93%).

In addition, NAP loss data highlight the observed paradox where the same regions may be affected by conflicting causes of loss. Approximately 17% of the affected acres in the Northeast were associated to heat and drought, and the same percentage to frost and freeze, totaling 34% of affected acres on average across all three years. It has been observed that in some instances, acreage within a county was affected by both of these adverse conditions within one crop year, which can occur with abnormal temperatures and temperature fluctuations. Of note is the extent to which frost and freeze has impacted New England and New York more significantly than the mid-Atlantic. For example, in 2014, over 90% of the frost/freeze-affected acres in the Northeast were in New England and New York alone. FSA's NAP program, as well as crop insurance where available, are just some of the tools available to producers in the Northeast to manage risk against adverse weather, or even more acute events such as flooding or hurricanes.

"CLIMATE CHANGE IS ONLY AN ABSTRACTION UNTIL IT MANIFESTS ITSELF IN ECOSYSTEM AND WEATHER CHANGES; AT WHICH POINT IT BECOMES ALL TOO REAL."

Glen Koehler, University of Maine Cooperative Extension, Pest Management Office