Highlights for the Northeast

- While Northern New York and northern New England experienced dry conditions during autumn, the rest of the region was exceptionally wet. In fact, the Northeast had its wettest autumn since 1895. Ten major climate sites also had a record wet autumn. 2018 is the wettest year on record for Baltimore, MD; Washington, D.C.; and Charleston, WV.

- Twenty-six tornadoes touched down in the Northeast during October, which is very unusual. See Regional Impacts for more details.

- The remnants of two hurricanes, Florence in September and Michael in October, brought heavy rain to the region. Totals from Florence were up to 6 inches, while Michael dumped 4-8 inches on parts of the Mid-Atlantic. The rain caused flooding and led to water rescues and some evacuations.

- An early season winter storm from November 15–16 brought rain, ice, and up to 18 inches of snow to the region. Newark, NJ, and Kennedy Airport, NY, had their greatest 1-day November snowfall. It was Central Park, NY, and Newark's earliest 6+ inch snowstorm. Thundersnow occurred in southern New England. The storm caused major travel disruptions and contributed to a snowier-than-normal November for many areas, including Kennedy Airport, which was record snowy.

- An unseasonably cold air mass settled over the Northeast for the Thanksgiving holiday from November 22–24. Temperatures were as much as 35°F below normal. These were some of the all-time coldest November temperatures on record for the Northeast. Six major climate sites had their all-time coldest November temperature on record.

Regional Climate Overview – September–November 2018

The average autumn temperature for the contiguous U.S. was 0.2°F above the 20th century average. Average temperatures for September, October, and November were 2.9°F above average, 0.3°F below average, and 1.6°F below average, respectively. It was the fourth warmest September and the third coldest November. Globally, it was the sixth warmest September and the second warmest October. The contiguous U.S. had its second wettest autumn with precipitation 2.73 inches average. September, October, and November precipitation was 1.0 inch above average, 1.21 inches above average, and 0.41 inches above average, respectively. It was the third wettest September, the sixth wettest October, and the third wettest November.

Autumn averaged out to be 0.3°F above normal for the Northeast. It was the third warmest September at 4.3°F above normal. Delaware, Maryland, and West Virginia were record warm. Elkins, WV, and Atlantic City, NJ, had their warmest Septembers on record. October was 0.4°F warmer than normal. Erie, PA, tied its all-time warmest October temperature on record. November was 3.9°F colder than normal, with all states being colder than normal.

The Northeast had a record wet autumn with 148% of normal precipitation. Maryland, New Jersey, Rhode Island, and West Virginia were record wet. It was the third wettest September with 169% of normal precipitation. West Virginia was record wet, and five major climate sites had their wettest September on record. October precipitation was 115% of normal. November precipitation was 161% of normal. Delaware, Maryland, and Massachusetts were record wet.

Contact: Ellen Mecray (Ellen.L.Mecray@noaa.gov)
Samantha Borisoff (sgh58@cornell.edu)
The U.S. Drought Monitor released on September 6 showed 8% of the Northeast in a severe or moderate drought and 13% of the region as abnormally dry. These areas included parts of New York and New England. Much-needed rain during the month improved conditions slightly, except in eastern Maine and northern New York. In early October, 5% of the Northeast was in a moderate or severe drought and 17% of the region was abnormally dry. While rainfall during the month allowed dry conditions to slowly ease, streamflow and groundwater levels remained below normal in parts of northern New York and northern New England. The U.S. Drought Monitor released on November 1 showed 2% of the Northeast in a moderate or severe drought and 9% of the region as abnormally dry. Due to a wet November, drought was erased by mid-month and abnormally dryness continued to shrink. The U.S. Drought Monitor released on November 29 showed 4% of the Northeast as abnormally dry. In December, conditions generally remained unchanged, with lingering long-term abnormal dryness in northern New York and northern New England.

**Fall Conditions**

A large portion of the Northeast experienced extremely wet conditions during autumn. One of the consequences of heavy rain in parts of Massachusetts was the discharge of sewage into waterways. The wet autumn also affected agriculture. Growers reported saturated, muddy fields, which led to harvest delays. Excess moisture led to mold growth and sprouting of soybeans and some corn. In central New York, there were prevented planting claims because fall grains could not be planted. Reports from central Pennsylvania noted quality issues with apples and concerns that the apples would rot in storage. Early season snow also affected agriculture.

However, areas such as northern New York and parts of northern New England missed out on the heavy precipitation. These areas experienced drought and abnormally dry conditions. Farmers in northern New York reported decreased hay and pasture production. In Aroostook County, ME, dry conditions contributed to a hay shortage and allowed bedstraw, an invasive plant species, to flourish, reducing the number of acres of hay for some farmers. Springs and private wells continued to run dry in parts of northern Vermont during September. One of Stowe’s two primary wells was around ten feet lower this year (mid-September) compared to last year. Water levels at two dams on the Lamoille River were too low to make electricity. Companies that drill, deepen, or replenish wells saw increased business. The wet November helped dry conditions improve in these areas.

### Rare October Tornadoes

On October 2, 14 tornadoes touched down in Pennsylvania, making it the state’s largest single-day tornado outbreak since June 2, 1998. From 1950–2017, only 13 October tornadoes had been reported in the state. The last time the state had an EF-2 tornado in October was more than 25 years ago. The same storm system also produced three tornadoes in New York and two in Connecticut. The most recent October tornado in Connecticut was in 1979. The tornadoes downed hundreds of trees and caused structural damage. On October 20, another tornado touched down in New York. On October 23, storms spawned three tornadoes in Massachusetts and one in Rhode Island. Only 11 tornadoes had been reported since 1950 in Rhode Island, with only one of those being an October tornado. The tornado on the 23rd is the latest tornado in the calendar year for the state. For Massachusetts, there were only seven other October tornadoes, with the last one occurring in 1970. Tornadoes struck again on October 29, with one in Connecticut and one in New York.
Regional Impacts and Updates – September–November 2018

National Climate Assessment
The Fourth National Climate Assessment was released in late November. This report discusses climate change impacts, risks, and adaptations. There are five key messages for the Northeast:

1. Mild winters and the early arrival of spring are adversely affecting the economies, ecosystems, and environments of rural areas. Further changes are expected.
2. The economy, ecosystem services, and livelihoods of coastal communities are threatened by warming ocean temperatures, sea level rise, and ocean acidification. Adaptation to increasing climate risks will determine environmental and societal outcomes.
3. Infrastructure, economies, and historic sites in the urban Northeast are being negatively impacted by the changing climate. These impacts are expected to become more common.
4. Warmer temperatures, extreme weather, sea level rise, and reduced air and water quality present threats to human health. These threats will vary across the region with individual and community demographics.
5. Northeast communities are already planning for and adapting to climate change. For more information, see a recording of NOAA’s Eastern Region Climate Services December webinar.

Regional Outlook – Winter 2018–19

ENSO
ENSO-neutral conditions continued in November. NOAA’s Climate Prediction Center indicates there is a 90% chance that El Niño will form and continue during winter and a 60% chance it will continue into spring. This El Niño is expected to be weak. For more information on El Niño’s potential impact on winter conditions, see the Northeast El Niño Impacts and Outlook and NOAA’s Eastern Region Climate Services November webinar.

Temperature and Precipitation

For precipitation (right map), CPC favors an increased chance of above-normal precipitation for much of Maryland, all of Delaware, southeastern Pennsylvania, most of New Jersey, and western Long Island. Equal chances were forecast for the rest of the region. Normal January–March precipitation ranges from less than 6 inches in portions of central and northeastern New York to more than 13 inches in southeastern Massachusetts and higher elevations of West Virginia.

The seasonal outlooks combine many factors including dynamical models, the effects of long-term trends, and soil moisture, in addition to past El Niño patterns. While the outlooks resemble weather patterns typically seen during El Niño winters, they may not match exactly.

Projected shifts in dates of last spring freeze and first fall freeze. Source: NCA4.

Regional Partners

National Oceanic and Atmospheric Administration offices including:
NEDDIS/National Centers for Environmental Information
NWS, Eastern Region
NWS, Climate Prediction Center
NWS, National Operational Hydrologic Remote Sensing Center
NMFS, Fisheries Science Centers and Regional Office, Atlantic
NOS, Office for Coastal Management
OAR, Climate Program Office and Geophysical Fluid Dynamics Lab
OAR, National Sea Grant Office
NOAA’s North Atlantic and Great Lakes Regional Collaboration Teams
And the following other offices:
Northeast Regional Climate Center
National Integrated Drought Information System
Consortium of Climate Risk in the Urban Northeast
Cooperative Institute for the North Atlantic Research
Northeast Region State Climatologists
Mid-Atlantic RISA

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