Quarterly Climate Impacts and Outlook

Northeast Region
March 2019

National Significant Events – *December 2018–February 2019*

Selected U.S. Significant Climate Anomalies and Events for February and Winter 2018-19

Major winter storms produced hurricane-force winds, heavy snow, and coastal flooding along the Great Lakes and Northeast.

December

WV, PA, MD, DE, NJ, and MA had their wettest year on record.

January

Record snowiest Jan - Caribou, ME: 59.8"

The average winter temperature for the contiguous U.S. was 1.2°F above the 20th century average. Average temperatures for December, January, and February were 2.9°F above average, 2.6°F above average (third warmest), and 1.8°F below average, respectively. Globally, it was the second warmest December, the fourth warmest January, and the fifth warmest February. The contiguous U.S. had its wettest winter on record with 9.01 inches of precipitation, 2.22 inches above average. December, January, and February precipitation was 0.88 inches above average (seventh wettest), 0.18 inches above average, and 1.09 inches above average (second wettest), respectively.

Highlights for the Northeast

- 2018 was the **wettest year** on record for Delaware, Maryland, Massachusetts, New Jersey, Pennsylvania, and West Virginia, and ranked as the second wettest year since 1895 for the Northeast.
- Caribou, ME, had its **wettest and snowiest January** on record. The site was 0.1 inches short of tying its all-time snowiest month, December 1972.
- Mercer County, PA, had its **first January tornado** on record (since 1950) when an EF-1 tornado snapped and uprooted trees on January 8.
- From **January 19–21**, a **major storm** brought up to 24 inches of snow (greatest in New York and northern New England), ice accumulations of up to 0.60 inches (greatest in Connecticut), and up to 4 inches of rain (greatest in southern New England). Storm impacts included downed trees, power outages, travel disruptions, and flooding.
- An Arctic front produced intense snow squalls that led to a few multi-vehicle accidents on **January 30**. Behind the front, **subzero temperatures** and strong winds created **dangerously low wind chills**. From **January 29–February 1**, up to 38 inches of snow fell east of Lakes Erie and Ontario in New York. Whiteout conditions disrupted travel.
- The following week, from **February 4–7**, **high temperatures** ranged from the 50s to 70s. Snow melt, rain, and ice jams caused flooding in parts of New York and western Pennsylvania.
- On **February 24 and 25**, **wind gusts** of up to 88 mph led to downed trees and wires, power outages, and structural damage in the Northeast. A 61 mph wind gust at the Pittsburgh Airport, PA, was the site's highest non-thunderstorm-related wind gust since the airport was built in 1952.

Regional Climate Overview – *December 2018–February 2019*

Temperature
Departure from Normal (°F)
December 1, 2018–February 28, 2019

Precipitation
Percent of Normal (%)
**December 1, 2018–February 28, 2019**
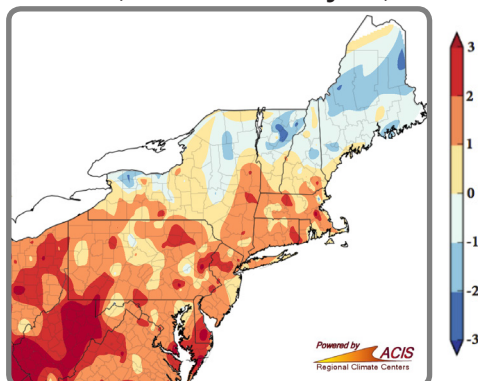
Winter averaged out to be 0.9°F **above normal**, with ten of the Northeast's twelve states being warmer than normal. **December** was 1.7°F **above normal**. All states except Maine had a warmer-than-normal December. Despite eight states being warmer than normal, **January** wrapped up 0.1°F **below normal**. February was 1.2°F **above normal**, with ten states being warmer than normal.
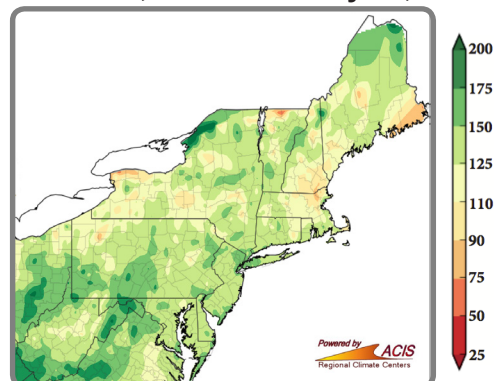
The Northeast received 128% of normal precipitation during **winter**. All states were **wetter than normal**, with two ranking this winter among their ten wettest. **December** precipitation was 117% of normal, and nine states were **wetter than normal**. **January** precipitation was 141% of normal, with all states seeing **above-normal** precipitation. This January ranked among the ten wettest on record for four states. **February** precipitation was 123% of normal. One of the eight **wetter-than-normal** states ranked this February among their 10 wettest.
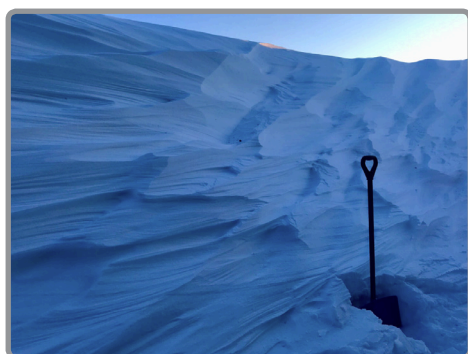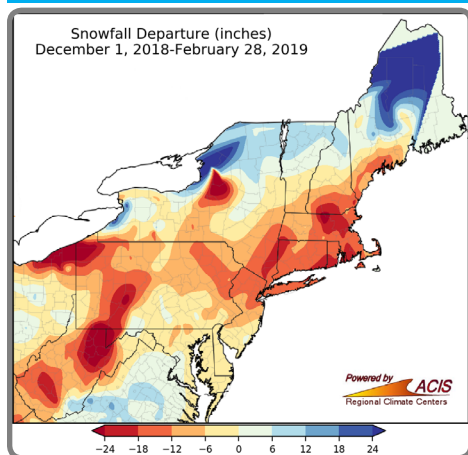
Drought in the Northeast

Northeast Percent Area

Legend:
- D0-D4
- D1-D4
- D2-D4
- D3-D4
- D4
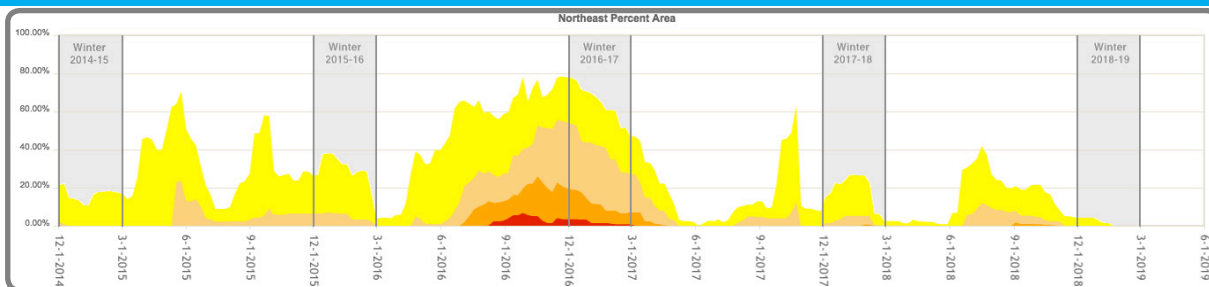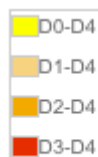
The Northeast was **drought-free during winter**; however, some areas experienced abnormally dry conditions. The U.S. Drought Monitor released on **December** 6 showed abnormal dryness in northern New York, northern Vermont, and northern Maine, totaling 4% of the Northeast. Above-normal precipitation allowed **abnormal dryness to ease** in northern New York in early **January** and in northern New England by late January. The U.S. Drought Monitor released on January 24 showed the Northeast was free of both drought and abnormal dryness for the **first time since June 6, 2017**. The region remained free of dryness for the rest of January, through **February**, and into mid-**March**. NOAA's drought outlook indicates drought development is not likely in the Northeast through June.

Regional Impacts and Updates – *December 2018–February 2019*

Snowfall Departure (inches)
December 1, 2018-February 28, 2019

Powered by *ACIS*
Regional Climate Centers

−24 −18 −12 −6 0 6 12 18 24

Snow drifts as high as 10 feet in Caribou, ME, in late February. Credit: NWS Caribou.

U.S. 2018 Billion-Dollar Weather and Climate Disasters

Winter Snowfall

Most of the Northeast received **below-normal snowfall** in **December**, with the largest deficits of more than 12 inches in northern New England, New York, and northwestern Pennsylvania. The main exception was southeastern West Virginia, which received heavy snow during an early December storm. Despite most of the region being wetter than normal in **January**, temperatures were **variable**, and so was **snowfall**. Monthly totals ranged from 24 inches below normal to more than 24 inches above normal. The greatest snowfall deficits were found in the higher elevations of northern West Virginia. The greatest surpluses were found east of Lake Erie in New York and in northern Maine. In fact, Caribou, ME, had its **snowiest January** on record and its **second all-time snowiest month** on record. In **February**, there was some **correlation between temperature departure and snowfall departure**, with West Virginia being the warmest area and generally having the greatest snowfall deficits (of more than 12 inches) and northern Maine being the coldest area and generally having the largest snowfall surplus (or more than 12 inches). For **winter**, many parts of the Northeast received **less snowfall than normal**, with the largest deficits of more than 24 inches in parts of West Virginia, western Maryland, and western Pennsylvania. However, northern parts of Maine, Vermont, and New Hampshire, as well as lake-effect areas of New York had a **snowfall surplus**, with some areas seeing more than 24 inches above normal. Caribou had its **snowiest October to February** period on record with 147 inches of snow.

Billion-Dollar Disasters

Since 1980, the U.S. has had **241 disasters** that caused at least $1 billion in damage, with the total cost of all those events exceeding $1.6 trillion. In 2018, there were 14 of these disasters that together caused $91 billion in damage. This ranked as the **fourth highest number** of events and the fourth highest total cost since 1980. Eight of the 14 disasters of 2018 **affected the Northeast** in some way: two winter storms, four severe weather outbreaks, and two hurricanes. As for the **two winter storms**, the January 3–5 blizzard produced up to 24 inches of snow, winds of up to 76 mph, and significant coastal flooding, while the March 1–3 storm produced up to 40 inches of snow and winds of up to 93 mph. The **severe weather outbreaks** occurred from April 13–16, May 1–4, May 13–15, and July 19–22. The May 13–15 event was particularly notable as there were at least 10 tornadoes, over 200 wind damage reports, and golf ball- to baseball-sized hail. The **two hurricanes** were Florence and Michael. Florence's rain caused catastrophic flooding in the Carolinas from September 13–16; from October 10–11, Michael devastated parts of the Florida coast and caused severe damage to agriculture and forestry farther inland. In the Northeast, the systems brought heavy rain and flooding.
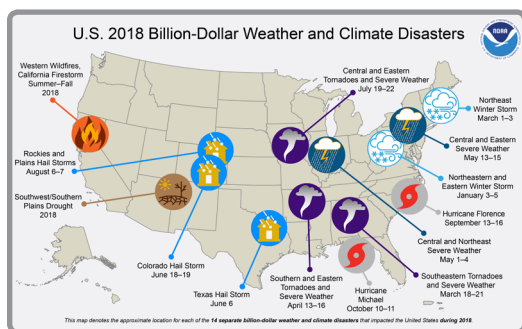
Sea Turtles

A cold-stunned sea turtle. Image courtesy of Spring Beckhorn.

Sea turtles forage in Northeast coastal habitats in the summer and early fall while water temperatures are warm enough to support them. When water temperature drops each fall, **sea turtles must migrate south** or they can **become "cold-stunned,"** similar to hypothermia in people, and strand on shore. Massachusetts is a hot spot for cold-stunned sea turtle strandings due to the geography of Cape Cod trapping turtles in the Bay, delaying their southward migration and leading them to strand by the hundreds in November and December. Cold-stunned sea turtles have decreased breathing and heart rates, lethargy, reduced appetite, and suppressed immune systems, leading to infections such as pneumonia, weight loss, and a myriad of medical problems. There is a network of dedicated responders and rehabilitation facilities that document and care for cold-stunned turtles. Likely due to multiple factors, including **climate change** and an **increase in sea turtle populations**, there is an **upward trend in cold-stunned strandings** in the Northeast. In the last five years (2014–2018), there have been 3,881 cold-stunned sea turtle strandings in the region (Maine to Virginia). The annual average is 776 turtles. Of those, the majority (85%) were Kemp's ridley sea turtles, but green and loggerheads also consistently stranded in lower numbers. The fall of 2018 was the **second largest cold stun season** on record (behind 2014) with 895 sea turtle strandings. Responding to and caring for this many stranded turtles is a huge effort that takes the collaboration of response and rehabilitation facilities throughout the East and Gulf coasts, as well as hundreds of dedicated volunteers.

Regional Outlook – *Spring 2019*
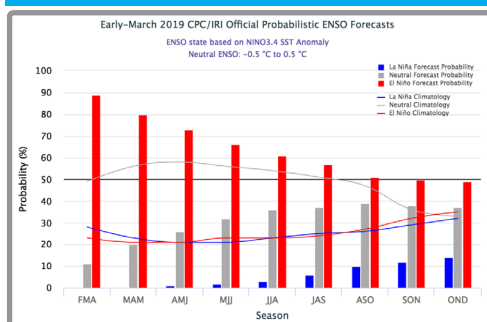
ENSO

Weak **El Niño conditions formed** in January **and continued** during February. NOAA's Climate Prediction Center indicates there is an 80% chance that the weak El Niño will continue through spring and a 60% chance it will continue through summer.

Temperature and Precipitation

Normal April–June average temperatures range from the upper 40s in New England to the mid 60s in Maryland. NOAA's Climate Prediction Center (CPC) is calling for **above-normal temperatures** (left map) for April–June for the Northeast. CPC favors **above-normal precipitation** (right map) for Pennsylvania, West Virginia, and the Mid-Atlantic, with **equal chances** of below-, near-, or above-normal precipitation for New York and New England. Normal April–June precipitation ranges from less than 10 inches in parts of New York to more than 14 inches in parts of West Virginia.

Spring Flood Potential

Flood Category
- Major
- Moderate
- Minor
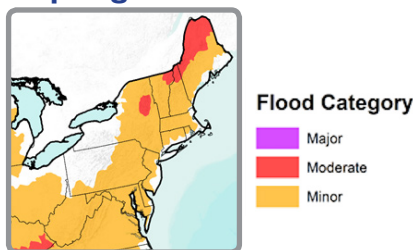
The **river flood potential** during spring is generally near or above normal for the Northeast due to a wet winter, saturated soils, and above-normal streamflow. Minor flooding is possible in most areas, but moderate flooding is possible in areas with a deeper snowpack such as parts of New York and northern New England. There is also widespread **potential for ice jam flooding** in parts of New York and northern New England. Very heavy rain can cause flooding at any time of the year, even in areas experiencing drought or that have little to no snow on the ground.

Northeast Partners

National Oceanic and Atmospheric Administration offices including:

NESDIS/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

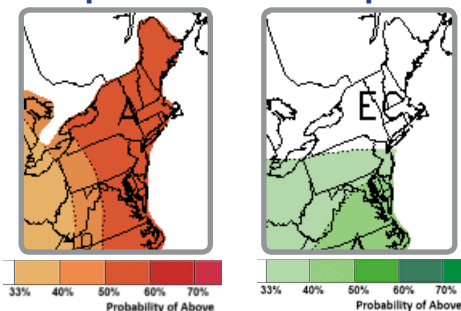And the following other offices:

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