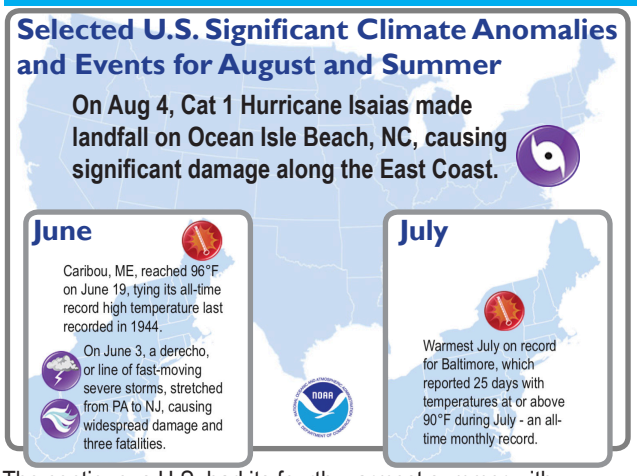
Quarterly Climate Impacts and Outlook

Northeast Region

September 2020

National Significant Events – *June–August 2020*

Selected U.S. Significant Climate Anomalies and Events for August and Summer



The contiguous U.S. had its fourth-warmest summer with an average temperature of 73.6°F, 2.2°F above the 20th-century average. Average temperatures for June, July, and August were 1.8°F above average, 2.1°F above average (11th warmest), and 2.6°F above average (third warmest), respectively. Globally, it was the third-warmest June, the second-warmest July, the second-warmest August, and the third-warmest summer. The contiguous U.S. summer precipitation total was 7.99 inches, 0.33 inches below average. June, July, and August precipitation was 0.21 inches below average, 0.15 inches above average, and 0.27 inches below average, respectively.

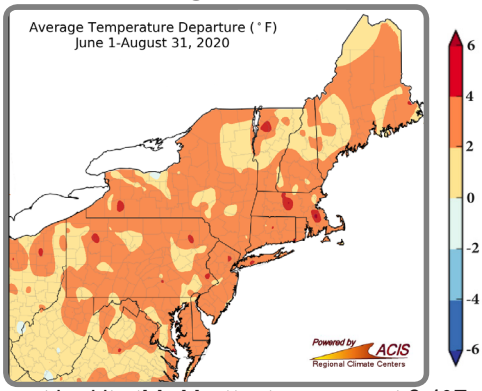
Highlights for the Northeast

- It was a **record-hot summer** for Connecticut, Maine, Massachusetts, Rhode Island, and some climate sites. July was the **all-time hottest month** on record for several sites including Harrisburg (PA); Syracuse (NY); Burlington (VT); Baltimore (MD); Bridgeport (CT); Elkins (WV); and Dulles Airport (VA). Lakes Champlain, Erie, and Ontario saw record high water temperatures. Below-normal rainfall and above-normal temperatures led to **drought conditions**. See Regional Impacts for details.
- Two tropical systems affected the region, with **Tropical Storm Isaias** producing extreme rainfall and tornadoes. There were many summer days with severe storms or flash flooding. See Regional Impacts for details.
- Several **temperature and precipitation records** were set during summer:
  - *Warmest June low temperature*: Dulles Airport, VA (74°F)
  - *Hottest and driest June*: Caribou, ME (64.4°F and 0.88 in.)
  - *Greatest number of 90°F days*: Burlington, VT (7 in June); Portland, ME (6 in August); and Hartford, CT (39 during summer)
  - *Greatest number of 90°F days for any month (in July)*: Washington, D.C. (28); Baltimore, MD (25); Hartford, CT (20); LaGuardia Airport, NY (19); Philadelphia and Scranton, PA (21 and 16); Providence, RI (13)
  - *Longest streak of 90°F days for any month*: Buffalo, NY (8)
  - *Hottest July day*: Buffalo, NY (98°F)
  - *Warmest July low temperature*: Portland, ME (78°F)
  - *Wettest July*: Newark, NJ (11.17 in.)
  - *Driest summer*: Hartford, CT (4.42 in.)

Regional Climate Overview – *June–August 2020*

Temperature

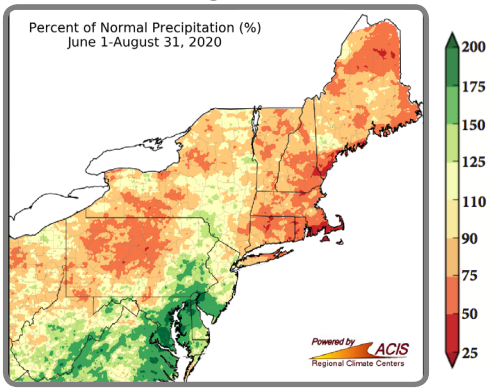
Departure from Normal (°F)
June 1–August 31, 2020



Climate normals based on 1981–2010 data; Rankings based on 1895–2020.

Precipitation

Percent of Normal (%)
June 1–August 31, 2020



The Northeast had its **third hottest summer** at 2.4°F above normal. It was record hot for four states and among the four hottest for seven states. **June** was 1.1°F above normal, ranking in the **warmest third** of all years. It was among the 20 warmest for nine states. The Northeast had its **hottest July** at 4.1°F above normal. It was record hot for four states and among the four hottest for the rest. The Northeast had its **15th hottest August** at 2.0°F above normal. It was among the 20 hottest for eight states.

The Northeast saw 92% of normal **summer** precipitation, ranking in the **middle third** of all years. It was among the 20 driest for five states but Maryland's 13th wettest. It was the **19th driest June** with 71% of normal precipitation. Four states had a top 20 dry June. **July** precipitation was 92% of normal, in the **middle third** of all years. It was Rhode Island's 20th driest but top 20 wet for two states. **August** precipitation was 114% of normal, in the **wettest third** of all years. It was Rhode Island's 13th driest but top 20 wet for three states.

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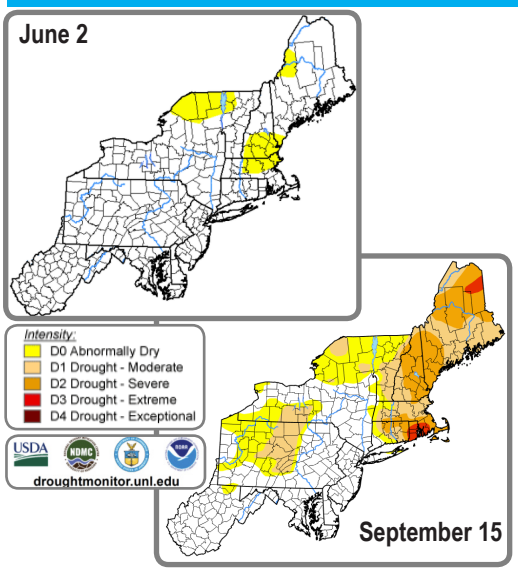
Regional Climate Overview – *June–August 2020*



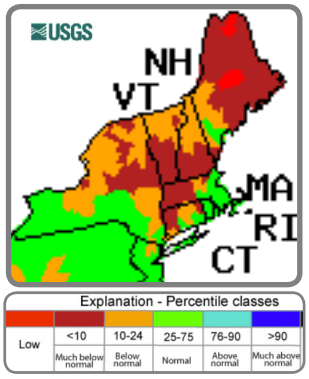
Drought in the Northeast

In **early June**, the U.S. Drought Monitor showed 9% of the Northeast was abnormally dry (map top left). Hot, dry conditions during June led to the **introduction of moderate drought** in New England and New York for the first time since summer/fall of 2018, while abnormal dryness expanded to include parts of every Northeast state. The **June 30** U.S. Drought Monitor showed 14% of the Northeast in a drought and 31% as abnormally dry. Conditions worsened during **July**, with **severe drought introduced** in Maine and New York and pockets of moderate drought and abnormal dryness expanding into most states. The **July 28** U.S. Drought Monitor showed 29% of the Northeast in a drought and 42% as abnormally dry. During **August**, **severe and moderate drought expanded in New England**; however, conditions **improved slightly in the rest of the Northeast**. Conditions **continued to deteriorate** in New England during **September**, with the introduction of **extreme drought** for the first time since February 2017 and expansion of severe and moderate drought. The **September 15** U.S. Drought Monitor showed 34% of the Northeast in a drought and 19% as abnormally dry (map bottom left). For current conditions, see the Northeast DEWS Dashboard.

Regional Impacts and Updates – *June–August 2020*

Drought Conditions

During summer, parts of the Northeast saw **record-setting heat** and **sporadic rainfall**. For instance, Aroostook County, ME, had its **driest June**; July was the **all-time hottest month** on record for several locations; and Essex County, VT, and Barnstable County, MA, had their **driest summer** on record. These conditions led to the introduction and expansion of **abnormal dryness and drought**.



Moisture stress affected crops across the Northeast, slowing their growth and reducing crop yields, particularly hay. Dry conditions also prevented farmers from planting crops. Use of irrigation was widespread; however, in some locations it was expensive or water supplies ran low. Some cattle farmers thinned their herds earlier than usual or bought supplemental feed; however, **affordable feed supplies were limited** due to drought conditions in other Northeast states. **Drought stress** also caused leaves to turn color and drop earlier than usual in parts of the Northeast. In Maine, dry conditions caused a fungus that kills the pupa of the browntail moth caterpillar to **grow too late** this year, allowing the caterpillar, which defoliates trees and causes health issues, to spread farther into central Maine. By late July, Maine had seen around 800 wildfires, the state's **greatest number of fires in a decade**. New Hampshire officials noted an **increased amount of dry vegetation** that could fuel wildfires, while Massachusetts officials said fires could burn deeper and take longer to put out.

In early summer, some New York and New England waterways, including Lake Champlain, had **low flows** more typical of late summer and early fall (map above). Lake levels dropped in New Hampshire, with many small hydropower plants **no longer able to generate power** due to reduced dam releases. In late summer, several waterways, including the Aroostook, Penobscot, and St. John rivers in Maine, had **record or near record low water levels**. **Water restrictions** were in place for hundreds of locations in Massachusetts and New Hampshire, as well as some locations in Connecticut and New York. There were also reports of **dry wells** in Maine and Vermont.


Tornado damage in Beaver County, PA, on June 10. Credit: NWS PBZ

Summer Storms

There were several severe weather and flash flood events during summer. On June 3, a **derecho** with wind gusts of up to 93 mph caused **widespread damage** in Pennsylvania and New Jersey, downing trees and wires, knocking out power to more than 500,000 customers, and causing four deaths. Beaver County, PA, had its **strongest tornado in over 30 years** when an EF-2 tornado touched down on June 10. A **flash flood emergency** occurred near Philadelphia, PA, on July 6 when 3–6 inches of rain fell in two hours, resulting in road closures, submerged vehicles, and water rescues. **Tropical Storm Fay** made landfall near Atlantic City, NJ, on July 10. Fay produced damaging winds, dropped up to 7 inches of rain from Maryland to Connecticut, and helped spawn a tornado in Maine. On August 7, just a few days after Isaias' **excessive rainfall**, strong storms produced heavy rain and more flash flooding in southeastern parts of the region. Winterthur, DE, saw 4.11 inches of rain, **more than a month's worth**, in an hour, with 1.03 inches of that falling in five minutes, qualifying as a 1,000-year storm event. Northern Delaware experienced some of its worst flash flooding in at least 15 years. In southeastern Pennsylvania, Chester Creek rose to its fourth highest water level on record, exceeding its previous fourth highest level set days earlier. **Tornado activity** was below average in June (one tornado) and July (three tornadoes) but above average in August (12 tornadoes).

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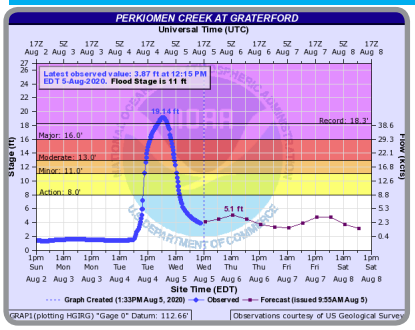
Regional Impacts and Updates – *June–August 2020*



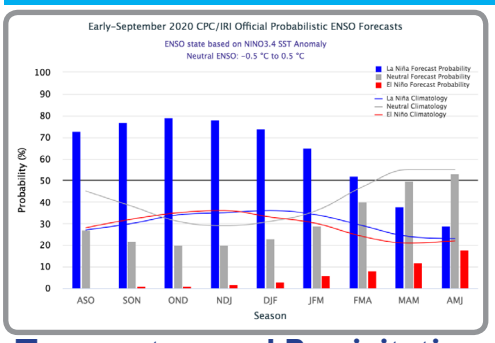
Tropical Storm Isaias

Tropical Storm Isaias, the earliest "I" named storm on record, produced **extreme rainfall**, tornadoes, and damaging winds in the Northeast on August 4. The greatest rain totals ranged from 4–9 inches, with Allentown, PA, having its **wettest August day** with 4.92" of rain. **Significant flooding** occurred, particularly in southeastern Pennsylvania where several waterways recorded their **highest water levels on record**. For instance, the Perkiomen Creek at Graterford, PA, reached 19.14 feet, nearly a foot higher than its previous record from 1935 (image left). Across the region, there were hundreds of closed roads, stranded vehicles, water rescues, and buildings affected by flooding. Preliminary estimates indicated millions of dollars in damage from flooding along the Schuylkill River near Philadelphia, PA.

Isaias produced **17 tornadoes** in the region (ten in Maryland, three in Delaware, two each in Pennsylvania and New Jersey, and one in Connecticut), with the strongest rated EF-2. One tornado in Delaware was on the ground for over 35 miles, the state's **longest tornado track** on record. The storm's **highest wind gusts** ranged from 60–78 mph. Mount Washington, NH, had its **highest August wind gust** of 147 mph. The tornadoes and wind gusts caused structural damage and downed numerous trees. More than 2.5 million customers lost power, making it **one of the largest storm-related outages** for two energy companies. Power outages lasted five days in some locations. There were at least five storm-related deaths. Preliminary damage estimates in Delaware exceeded $20 million.

Tornado damage in Stockton, MD. Credit: NWS AKQ

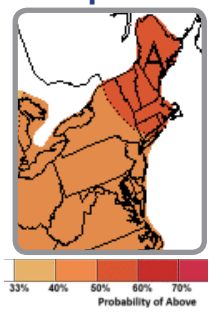
Regional Outlook – *Autumn 2020*



ENSO

During August, **La Niña conditions** were observed in the equatorial Pacific Ocean. NOAA's Climate Prediction Center indicates there is a 75% chance La Niña conditions **will continue through winter 2020–21**.

Temperature and Precipitation



Normal October–December average temperatures range from the 30s in northern New England to the 50s in the Mid-Atlantic. NOAA's Climate Prediction Center favors **above-normal temperatures** for **October–December** in the Northeast (map above).

Equal chances of below-, near-, or above-normal **precipitation** is favored for **October–December** for the Northeast. Normal October–December precipitation ranges from less than 8 inches in central New York and eastern West Virginia to more than 14 inches in northern/eastern New York and New England.

Atlantic Hurricane Season

	Updated 2020 Atlantic Outlook (from August)	Initial 2020 Atlantic Outlook (from May)	Average Season
Number of Named Storms	19-25	13-19	12
Number of Hurricanes	7-11	6-10	6
Number of Major Hurricanes	3-6	3-6	3

NOAA's updated 2020 Atlantic hurricane season outlook indicates an **above-normal season** is most likely, with "19–25 named storms, of which 7–11 could become hurricanes, including 3–6 major hurricanes." This is due to several factors including warmer-than-average sea surface temperatures and reduced vertical wind shear. In an average season, there are only seven named storms by mid-September, but this year there were a record-setting 20 named storms. On September 14, five tropical systems were in the Atlantic, tying as the most in the basin at one time. The season runs from June 1–November 30, peaking from mid-August–late October. For more information on the hurricane outlook, see the NOAA Eastern Region Climate Services webinar recording from August 2020.

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

NOS, National Centers for Coastal Ocean Science

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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