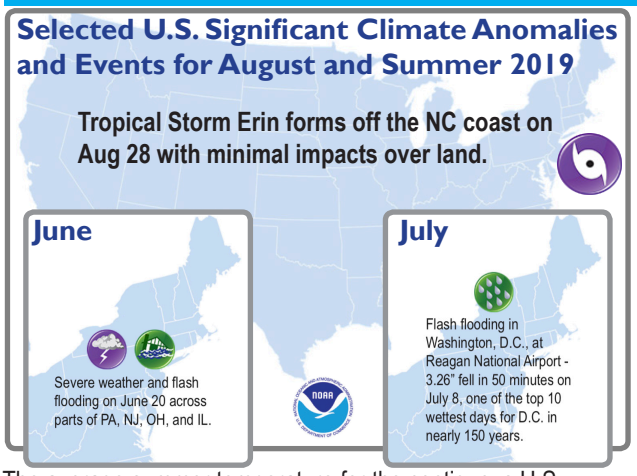
Quarterly Climate Impacts and Outlook

Northeast Region

September 2019

National Significant Events – *June–August 2019*

Selected U.S. Significant Climate Anomalies and Events for August and Summer 2019



The average summer temperature for the contiguous U.S. was 72.4°F, 1.0°F above the 20th century average. Average temperatures for June, July, and August were 0.2°F above average, 1.0°F above average, and 1.8°F above average (13th warmest), respectively. Globally, it was the warmest June, the warmest July, the second warmest August, and the second warmest summer. The contiguous U.S. summer precipitation total was 8.83 inches, 0.51 inches above average. June, July, and August precipitation was 0.37 inches above average, 0.09 inches below average, and 0.12 inches above average, respectively.

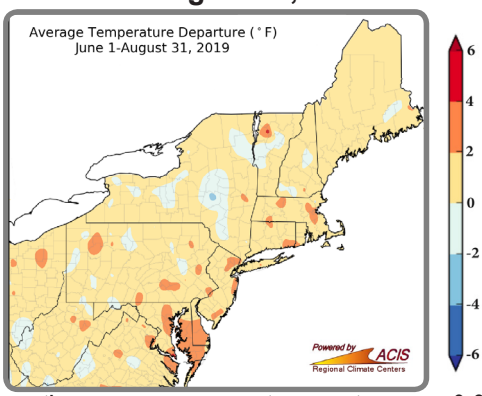
Highlights for the Northeast

- From **June 19–20**, Philadelphia had its **greatest two-day rainfall** total for any June on record with 4.63 inches. In July, a site in Stafford Township, NJ, had two separate days with more than 5 inches of rain. There were several **extreme rainfall events that led to flash flooding** during summer. See Regional Impacts for details.
- There were a few **heat waves** during summer, with the most intense period from **July 19–21**. Max temperatures reached 102°F but it felt as hot as 114°F. Low temperatures were as warm as 83°F, with some sites, including Boston, Lawrence (MA), and the state marina in Atlantic City, setting/tying their **all-time highest minimum temperature** on record (since 1870s). Providence had its **highest minimum temperature for July** since 1904. Humidity levels were unusually high, with dewpoints reaching the upper 70s to low 80s. At 9 PM on July 20, Pittsburgh had a dewpoint of 79°F, tying as the second highest hourly dewpoint at the station since 1948.
- Several **all-time temperature records** were set in July.
  - *Warmest month*: Boston, Hartford, and Portland
  - *Highest monthly average max temperature*: Hartford and Bridgeport
  - *Greatest number of 90°F days for any month*: Hartford
  - *Highest monthly average min temperature*: Boston and Harrisburg
  - *Greatest number of days with a min temperature of 70°F or higher for any month*: Boston and Scranton
- There was **storm damage or flash flashing** somewhere in the Northeast every day except one during the first three weeks of **August**. See Regional Impacts for details.

Regional Climate Overview – *June–August 2019*

Temperature

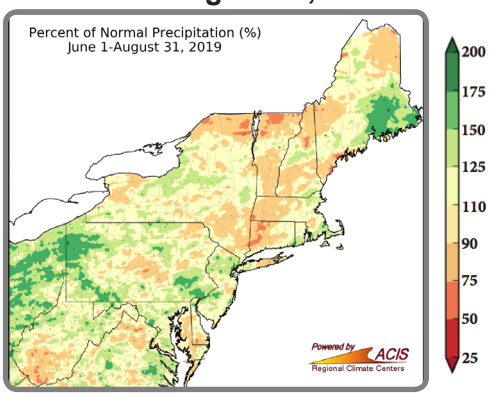
Departure from Normal (°F)
June 1–August 31, 2019



Climate normals based on 1981–2010 data; Rankings based on 1895–2019.

Precipitation

Percent of Normal (%)
June 1–August 31, 2019



The Northeast's **summer** average temperature was 0.8°F **above normal**, ranking in the warmest third of all years. This summer ranked among the 20 warmest for six states. **June** was 0.7°F **below normal**, in the middle third of all years. Delaware had its 10th warmest June. It was the **9th warmest July** at 2.7°F above normal. This July was among the 12 warmest for each state. **August** was 0.5°F **above normal**, in the warmest third of all years. This August was among the 20 warmest for two states.

The Northeast received 108% of normal precipitation during **summer**, ranking in the **wettest third** of all years. Pennsylvania had its 16th wettest summer. It was the **16th wettest June** with 120% of normal precipitation. This June was among the 20 wettest for two states. **July** precipitation was 101% of normal, ranking in the **middle third** of all years. This July was among the 20 wettest for two states. **August** precipitation was near normal, ranking in the **middle third** of all years.

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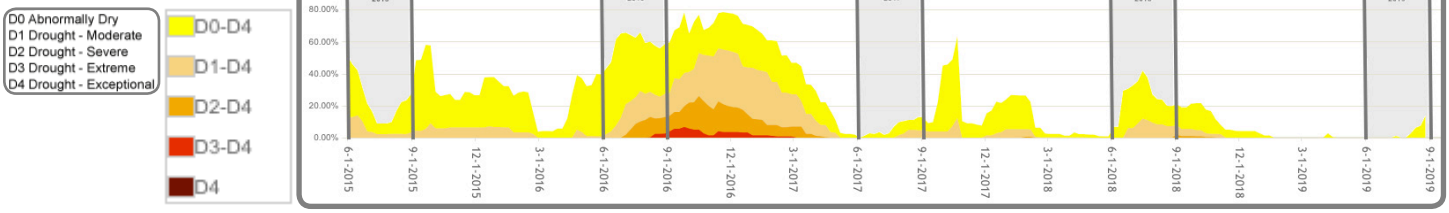
Regional Climate Overview – *June–August 2019*

Drought in the Northeast



Summer precipitation was highly variable in the Northeast. For example, southeastern Pennsylvania was quite wet (see Regional Impacts below) while western Connecticut was quite dry. The Northeast **started the summer free of abnormal dryness** and drought. **By mid-July,** increasing rainfall deficits allowed **abnormal dryness to develop** in a small area totaling 1% of the Northeast, but dryness eased by late July. **Sporadic rainfall in August** led to the **introduction and expansion of abnormal dryness** in parts of New England, New York, Maryland, and West Virginia, with the U.S. Drought Monitor released on **August 29** showing 14% of the Northeast as abnormally dry. In **early September**, parts of New England and New York saw numerous showers and cooler temperatures, allowing **abnormal dryness to improve** in several locations; however, below-normal rainfall and warmer temperatures in Maryland, Delaware, and West Virginia led to the **introduction and expansion of abnormal dryness** in these areas. In fact, a **very small area of moderate drought was introduced** in West Virginia as shown in the U.S. Drought Monitor released on **September 12**.

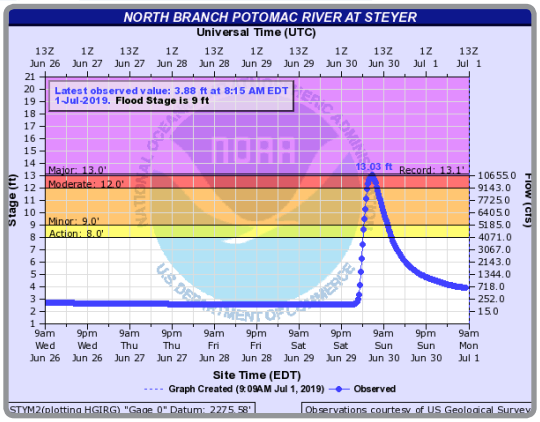
Regional Impacts and Updates – *June–August 2019*

Extreme Rainfall and Flash Flooding

There were several instances of **heavy rainfall and flash flooding** this summer, leading to numerous closed roads, flooded homes and buildings, stranded vehicles, evacuations, water rescues, and at least three deaths. The National Weather Service issued a rare Flash Flood Emergency three times in the region. A few notable events included:

- **June 19–20**: Parts of New Jersey and eastern Pennsylvania received up to 8 inches of rain. Philadelphia had 4.04 inches of rain, **more than a June's worth, in a three-hour period**. The North Branch Rancocas Creek at Pemberton, NJ, had its **second highest crest** on record and stayed above major flood stage for almost a day.
- **June 29–30**: Up to 5 inches of rain fell in a few hours in western Maryland and eastern West Virginia. Bayard, WV, had 4.71 inches of rain on June 30, making it their **second all-time wettest day** on record.
- **July 8–9**: The greatest 24-hour rain totals across parts of Maryland, Virginia, and West Virginia approached 6 inches. Washington National, D.C., received 3.30 inches of rain, **nearly a July's worth, in an hour**. For D.C. this hourly event exceeded the 100-year return period, meaning rainfall of that magnitude has a 1% chance of occurring in a given year.
- **July 11–12**: Parts of the region, including Pennsylvania, Maryland, Massachusetts, and New Hampshire, saw up to 6 inches of rain, with reports of up to 2.50 inches in an hour. Cockermouth River in Groton, NH, **rose almost 8 feet in just over an hour**.
- **August 6**: Around 4 inches of rain fell in an hour in Baltimore, which qualifies this as a **500-year storm event** with a 0.2% chance of occurring in a given year.

The heavy rain had several impacts. Lakes Erie and Ontario had their all-time highest monthly mean water levels on record (since 1918) in early June, as well as their **highest July monthly mean water level**. The elevated water levels on Lake Ontario and the St. Lawrence River caused **flooding, erosion**, and problems for boaters. Some beaches were closed, with lost revenue for businesses. For more information see the Great Lakes Summer 2019 Quarterly. Heavy rain and warm temperatures contributed to harmful algal blooms, with numerous **lakes closed** for recreational activities and some New England shellfish farms closed also. The wet conditions contributed to an abundant mosquito population, increasing the **risk of contracting mosquito-borne viruses**. Excessive moisture in June hampered farming activities and **slowed crop progress**, but in July growers dealt with heat and declining soil moisture.



The water level (blue line) on the North Branch Potomac River at Steyer, MD, rose rapidly due to heavy rain from June 29–30. Image courtesy of NOAA.

Much of the Northeast, and the nation, experienced a wetter-than-normal pattern over the past year. **July 2018–June 2019 ranked as the wettest** July–June period since 1895 for the Northeast at 15.57 inches above average (1901–2000). For any 12-month period, it ranked as third wettest. Nine of the 12 Northeast states had their wettest July–June period, while several climate sites, including Wilmington, Allentown, Scranton, and Williamsport had their **wettest 12-month period**. Records were also set at several other time scales.

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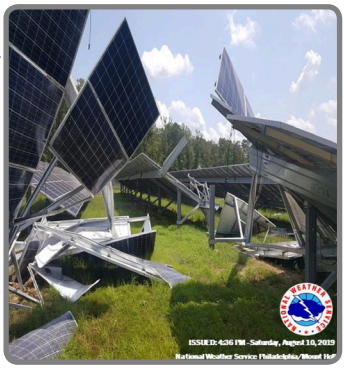
Regional Impacts and Updates – *June–August 2019*



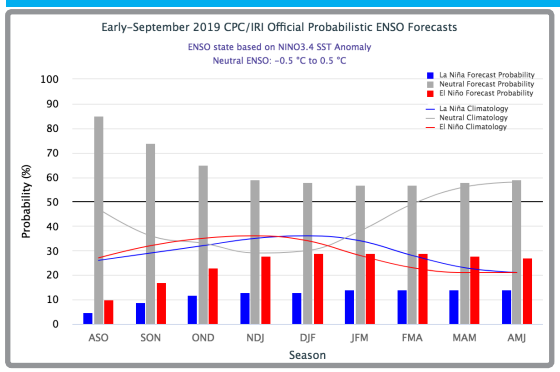
Damage from a microburst in Bucks County, PA, on June 2 (above) and an EF-0 tornado in Cumberland County, NJ, on August 7 (right). Images courtesy: NWS Mount Holly.

Severe Weather

There were numerous days during summer with severe thunderstorms, some of which produced straight-line winds of up to 100 mph and golf ball-sized hail. These storms downed numerous trees, damaged buildings, impeded travel, and left hundreds of thousands of customers without power. Severe weather contributed to at least four deaths and more than 40 injuries across the region this summer.

June tends to be an active month for tornadoes in the Northeast, with an average of 10 (1989–2013 data). However, the **June 2019 tornado count was slightly lower than average** at eight: three in Pennsylvania, two each in New Jersey and West Virginia, and one in Maryland. There were only five tornadoes in **July**, **well below the Northeast's average** of 13. Mount Laurel, NJ, saw two, while Cape Cod, MA, had three. There have only been three other tornadoes reported in Cape Cod since 1950. **August** averages five tornadoes but August 2019's count **was slightly higher** at seven: three in New Jersey, two in New York, and one each in Vermont and Maine. Pennsylvania is having **one of its most active years on record for tornadoes** with 34, while New Jersey's eight tornadoes ties as the state's third most active year for tornadoes since 1950.

Regional Outlook – *Autumn 2019*



ENSO

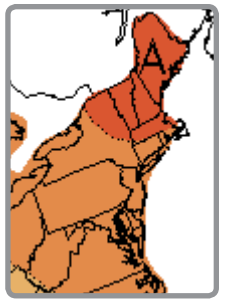
During August, **ENSO-neutral conditions** were observed in the equatorial Pacific Ocean. NOAA's Climate Prediction Center indicates there is a 75% chance that ENSO-neutral conditions will continue through winter 2019–20 and a 55%–60% chance that these conditions will continue through spring 2020.

Atlantic Hurricane Season

	2019 Atlantic Season Outlook	Average Season
Number of Named Storms	10-17	12
Number of Hurricanes	5-9	6
Number of Major Hurricanes	2-4	3

NOAA's updated 2019 Atlantic hurricane season outlook indicates an **above-normal season is most likely**, with "10–17 named storms (winds of 39+ mph), of which 5–9 will become hurricanes (winds of 74+ mph), including 2–4 major hurricanes (Category 3, 4, or 5; winds of 111+ mph)." The increase is because El Niño, which typically suppresses hurricane activity, has ended and other favorable conditions are already in place. 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 2019.

Temperature and Precipitation



Normal October–December average temperatures range from the low 30s in northern New England to the low 50s in the Mid-Atlantic. NOAA's Climate Prediction Center favors **above-normal temperatures** (map right) for **October–December** for the Northeast. **Above-normal precipitation** is favored for southeastern parts of the region for **October–December**, with **equal chances** of below-, near-, or above-normal **precipitation** elsewhere. 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.

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

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