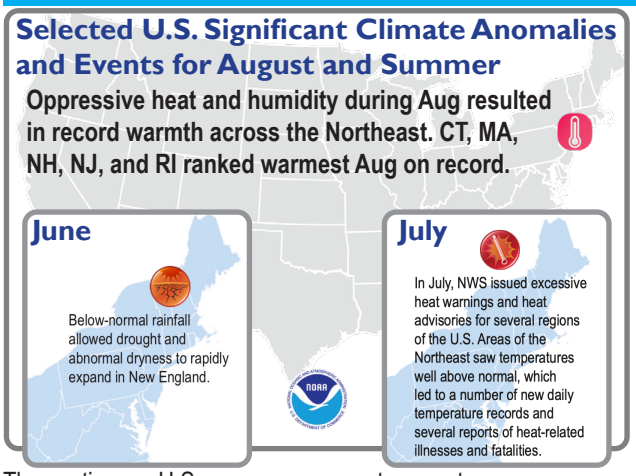
Quarterly Climate Impacts and Outlook

Northeast Region

September 2022

National Significant Events – *June–August 2022*

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



The contiguous U.S. summer average temperature was 73.9°F, 2.5°F above the 20th-century average. Average temperatures for June, July, and August were 2.2°F above average (15th warmest), 2.8°F above average, and 2.5°F above average (eighth warmest), respectively. Globally, it was the sixth-warmest June, the sixth-warmest July, the sixth-warmest August, and the fifth-warmest summer. The contiguous U.S. summer precipitation total was 8.18 inches, 0.14 inches below average. June, July, and August precipitation were 0.60 inches below average (12th driest), 0.04 inches below average, and 0.42 inches above average (19th wettest), respectively.

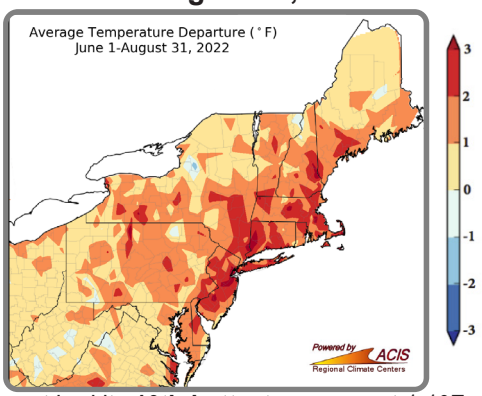
Highlights for the Northeast

- **Summer** was among the **10 hottest** on record for seven states and multiple sites, including Newark, NJ, which was **record hot**. **July and August** featured a **record-setting** number of hot days and/or nights. For instance, Newark saw five straight days (**July 20–24**) with a high of at least 100°F for the **first time on record**. New Brunswick, NJ, had its **all-time hottest three-week period** since 1896 from **July 21–August 10**. Five states and several climate sites including Philadelphia, PA; Albany, NY; and Providence, RI, had their **hottest August on record**. The intense heat resulted in an increased risk for public health.
- The Northeast experienced **precipitation extremes** during **summer**, with **drought intensifying** in northern and coastal areas but **record wetness** and flash flooding in West Virginia. For example, Newark, NJ, had its **second driest summer** while Charleston, WV, had a **record wet summer**. Similarly, Newark had its **driest July** on record, while Beckley, Charleston, and Huntington tied their **greatest number of July days** with measurable precipitation (at least 0.01 in.). Both drought and flooding had **significant impacts**.
- **Summer** featured multiple rounds of severe weather, including tornadoes, **damaging straight-line winds**, and **record-setting large hail**.
- Abundant sunshine, low humidity, and gusty winds from **June 18–21** helped fuel New Jersey's largest **wildfire** since 2007. The fire scorched over 13,500 acres, closing roads, forcing evacuations, and **spreading smoke** into densely-populated areas such as Philadelphia, PA, and Atlantic City, NJ.

Regional Climate Overview – *June–August 2022*

Temperature

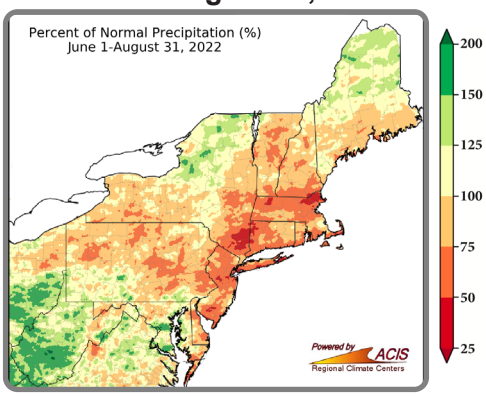
Departure from Normal (°F)
June 1–August 31, 2022



Climate normals based on 1991–2020 data; rankings based on 1895–2022.

Precipitation

Percent of Normal (%)
June 1–August 31, 2022



The Northeast had its **10th-hottest summer** at 1.1°F above normal. Summer was among the 20 hottest on record for 11 of the 12 Northeast states. **June** was 0.3°F below normal, in the **middle third** of all years. **July** was 1.1°F above normal, in the **warmest third** of all years. This July was among the 20 hottest for seven states. It was the **fifth-hottest August** at 2.4°F above normal. This August was **record hot** for five states, including New Jersey, and among the 20 hottest for six other states.

The Northeast saw 89% of normal **summer** rainfall, ranking in the **middle third** of all years. Summer was among the 20 driest on record for three states but was West Virginia's 10th wettest. **June** rainfall was 82% of normal, in the **middle third** of all years. **July** rainfall was 87% of normal, in the **middle third** of all years. July was among the 20 driest for four states but was West Virginia's 13th wettest. **August** rainfall was 100% of normal, in the **middle third** of all years. Maine and West Virginia had their 13th wettest August.

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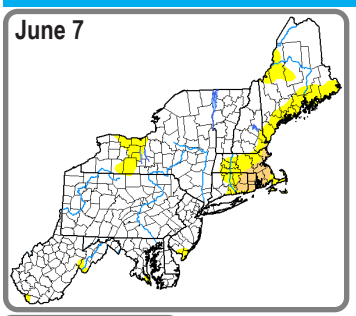
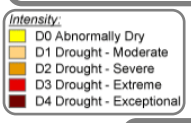
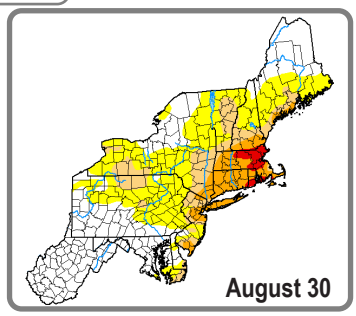
Regional Climate Overview – *June–August 2022*







Drought in the Northeast

As of June 7, the U.S. Drought Monitor showed 2% of the Northeast in moderate drought and 12% as abnormally dry. **During June, moderate drought and abnormal dryness expanded** in New England, New York, New Jersey, and northern Pennsylvania due to short-term precipitation deficits, below-normal streamflow and groundwater levels, and declining soil moisture. However, moderate drought eased in western Maine. The July 5 U.S. Drought Monitor showed 13% of the Northeast in drought and 24% as abnormally dry. **Conditions deteriorated during July** due to factors such as increasing precipitation deficits, reduced streamflow, below-normal groundwater levels, low soil moisture, and above-normal temperatures. **Severe drought was introduced** in New England and moderate drought and abnormal dryness was introduced/expanded in New England, New York, Pennsylvania, New Jersey, and Delaware. The August 2 U.S. Drought Monitor showed 23% of the Northeast in drought and 26% as abnormally dry. **Conditions deteriorated further during August** as rainfall, streamflow, groundwater levels, and soil moisture continued to be well below normal. **Extreme drought was introduced** in southern New England, while severe/moderate drought and abnormal dryness were introduced/expanded across the Northeast except in West Virginia, western Maryland, and portions of Maine which were wetter. The August 30 U.S. Drought Monitor showed 24% of the Northeast in drought and 35% as abnormally dry. A **wetter weather pattern** during the first half of **September** allowed drought and abnormal dryness to contract in multiple parts of the region. For current conditions, see the Northeast DEWS Dashboard.

Regional Impacts and Updates – *June–August 2022*

Summer Conditions

July and **August** were **notably hot** for much of the Northeast, featuring a **record-setting number of unusually hot days** (highs at or above 90°F) and **nights** (lows at or above 70°F). Newark, NJ, had five straight days (July 20–24) with a high of at least 100°F for the **first time on record**, while Atlantic City, NJ, had five consecutive days (July 20–24) with a high of at least 95°F, tying its **longest streak**. Philadelphia, PA, and Newark, NJ, saw a high of at least 90°F during more than half of August, 19 days and 18 days, respectively, their **greatest number for August**. Sites such as Philadelphia (July 18–27); Kennedy Airport, NY (July 19–25); and Bridgeport, CT (August 5–10), did not drop below 75°F for multiple days in a row, tying their **longest such streaks**. Philadelphia had 15 total days with a low at or above 75°F in July, tying as the site's **greatest number for any month**, and saw 11 such days in August, its **greatest number for August** and fifth greatest for all months. Meanwhile, Hartford, CT, had three such days in August, tying as its **greatest for any month**. This August was the **hottest August** on record for multiple climate sites, with several also ranking this July and/or August among their 10 all-time hottest months. **Summer** was **record hot** for Newark and among the 10 hottest on record for multiple sites. Providence, RI, had 10 summer days with a high of at least 95°F, tying as its **greatest number** for the season. Philadelphia had 57 days during summer that the low remained at or above 70°F, tying its **record for summer**, and 26 summer days with a low at or above 75°F, setting a **new record for the season** and beating the old record by five days.

July and **August** featured **precipitation extremes**. Northern and coastal areas were **particularly dry**, with Newark, NJ, having its **driest July** and **second driest summer** on record. The **hot, dry weather** allowed **drought to persist, expand, or intensify** in many parts of the Northeast, with numerous impacts (see page 3 for details). However, **West Virginia** was **notably wet**, with Beckley (20 days), Charleston (19 days), and Huntington (18 days) tying their **greatest number of July days with measurable precipitation** and Charleston having its **wettest summer** on record. Parts of the state experienced **significant flash flooding**. For example, Charleston saw **more than a month's worth** of rain, 4.20 inches, in six hours on August 14–15. Flash flooding damaged more than 100 buildings, bridges, and roads and led to more than 20 water rescues in Kanawha and Fayette counties.

Summer had multiple rounds of severe weather, including **tornadoes**, damaging straight-line winds, and **record-setting large hail**. One notable event occurred from **July 12–14**. **Two weak tornadoes** and a **23-mile long path of straight-line winds** of up to 105 mph in Hampshire County, WV, caused **extensive damage** to trees and farm buildings, snapped power poles, and leveled cornfields. **Wind-driven large hail** also defoliated trees and damaged vehicles. A swath of **straight-line winds of up to 110 mph** from Caroline County, MD, to Sussex County, DE, caused considerable tree and utility pole damage and some **structural damage** to outbuildings. There were also multiple instances of damaging straight-line winds of up to 90 mph across other parts of the Northeast.

On July 28, an EF-2 tornado caused an estimated $1.2 million in damage in Wyoming County, NY, the county's first tornado in over 20 years. Credit: NWS BUF

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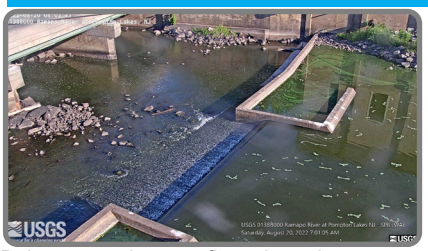
Regional Impacts and Updates – *June–August 2022*



Below-normal streamflow along the Ramapo River at Pompton Lakes, NJ, on August 20. Upstream in Rockland County, NY, the river's low streamflow led to mandatory water restrictions. Credit: USGS

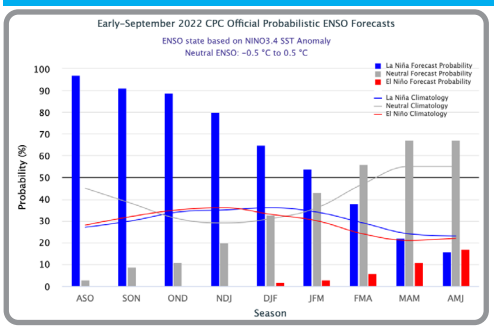
Drought

Water Resources: **Record or near-record low flows** were observed on multiple waterways in New England, New York, and New Jersey, stressing fish, affecting recreational activities, and contributing to harmful algal blooms. Low water levels also led to issues such as reduced water pressure, discolored water, or difficulty meeting demand. **Wells ran dry** in New England, with over 80 dry wells in Maine. **Water restrictions** were in effect in many drought-stricken areas including for more than 100 water systems in New Hampshire.

Agriculture: Farmers in dry areas across the Northeast relied heavily on irrigation, **increasing labor and costs** of operation. In some locations, irrigation water supplies dried up or had water quality issues. **Crop losses**, including Christmas trees, were reported in several areas. Hay quality and yields were reduced, with some farmers getting **only one cutting** instead of three and some using supplemental feed, further increasing operational costs. Some farmers also hauled in water, adding additional costs.

Fire: There was **increased wildfire risk** in drought-stricken areas, with an uptick in drought-induced fire activity and **fires burning deeper** and more difficult to extinguish. Dry shrubs and grass **increased fuels** available to fires, while below-normal or dry waterways meant **limited water supplies** to fight fires. During August, Massachusetts saw over 100 wildfires while Maine saw more than 50.

Regional Outlook – *Autumn 2022*



ENSO

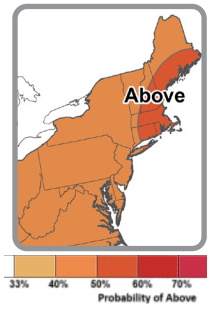
During August, **La Niña conditions continued** in the equatorial Pacific Ocean. NOAA's Climate Prediction Center indicates there is a 91% chance La Niña will continue through September–November and a 54% chance of La Niña in January–March 2023. According to NOAA, this would be "only the third time with three La Niña winters in a row in our 73-year record" and "the first not to follow a strong El Niño event."

Atlantic Hurricane Season

	2022 Updated Atlantic Season Outlook	1991-2020 Average Season
Number of Named Storms	14-20	14
Number of Hurricanes	6-10	7
Number of Major Hurricanes	3-5	3

In August, NOAA released an updated hurricane season outlook which favors an **above-average season**, with "14–20 named storms, of which 6–10 could become hurricanes, including 3–5 major hurricanes." The season got started quickly, with three named storms by early July. However, due in part to Saharan dust plumes, there were no named storms between July 3 and August 30 for the **first time since 1941**. The fourth named storm, Danielle, formed on September 1 and became the season's first hurricane on September 2, **three weeks later than average**. Hurricane season peaks from mid-August to late October and ends on November 30. NOAA Eastern Region Climate Services webinar in August 2022 focused on the updated hurricane outlook.

Temperature and Precipitation



Normal October–December average temperatures range from the low 30s in far northern New England to the upper 40s in the region's southeastern corner. NOAA's Climate Prediction Center (CPC) favors **above-normal temperatures** for **October–December** for the entire Northeast (map above), driven by long-term climate trends and dynamical model forecasts.

Normal October–December precipitation ranges from less than 9 inches in western New York and eastern West Virginia to over 15 inches in northern New York and northern New England. **Equal chances** of below-, near-, or above-normal **precipitation** were forecast for **October–December** for the whole region. CPC's drought outlook shows drought conditions are expected to improve across the region.

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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