



National Significant Events – September–November 2023

Selected U.S. Significant Climate Anomalies and Events for November and Autumn

On Nov 27–29, the first significant lake-effect snowstorm of the season dropped more than 40 in. of snow in portions of NY.

September

Hurricane Lee, TS Ophelia, and a slow-moving coastal low brought record-breaking precipitation and widespread flooding across parts of the East Coast.

October

Record warmth impacted part of the Northeast during early Oct. On Oct 4, the Burlington Airport in VT reached 86°F and set a new all-time Oct record high temperature—breaking a long-standing record-high temperature of 82°F set back in 1891.

The contiguous U.S. had its sixth-warmest autumn with an average temperature at 2.5°F above the 20th-century average. Average temperatures for September, October, and November were 2.9°F above average (seventh warmest), 2.0°F above average (18th warmest), and 2.7°F above average (19th warmest), respectively. Globally, it was the warmest September, the warmest October, the warmest November, and the warmest autumn. The contiguous U.S. had its 15th-driest autumn at 1.22 inches below average. During September, October, and November, precipitation was 0.39 inches below average, 0.05 inches below average, and 0.85 inches below average (12th driest), respectively.

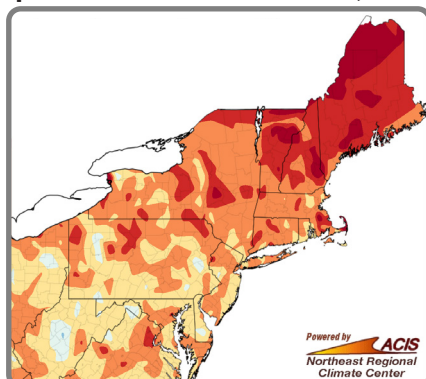
Highlights for the Northeast

- **Early September** and **early October** were **unusually mild**. Dulles Airport, VA, saw its **hottest September** temperature of 100°F, while Syracuse, NY, and Burlington, VT, saw their **warmest October temperatures** of 89°F and 86°F, respectively. Islip, NY, and Caribou, ME, had **record warm low temperatures for September** of 77°F and 67°F, respectively. Some sites had their warmest temperatures of the year in September, which is unusual.
- The season's **first autumn frost** arrived in late October or early November for many areas, up to a **month later than usual**. For instance, it was the second-latest first frost for Caribou, ME, and Burlington, VT.
- In **late September**, **Tropical Storm Ophelia's remnants** brought heavy rain, flooding, and high water levels to coastal areas. Kennedy Airport, NY, had its **all-time wettest day on September 29** with 8.05 inches of rain and its **wettest September** with 13.01 inches of precipitation. LaGuardia Airport, NY, had its **wettest September** with 12.76 inches of precipitation and its **wettest autumn** with 19.71 inches. Meanwhile, below-normal precipitation in October and November led to the **expansion of drought and dryness** in parts of New York and the Mid-Atlantic.
- **Smoke from wildfires** burning in Canada returned to the Northeast a few times in **September and early October**, producing hazy skies and, in some locations, reduced air quality. Dry conditions contributed to multiple large wildfires in Virginia in November, with smoke from these fires producing poor air quality and [smoky skies](#) in parts of the Northeast.

Regional Climate Overview – September–November 2023

Temperature

Departure from Normal (°F)
September 1–November 30, 2023

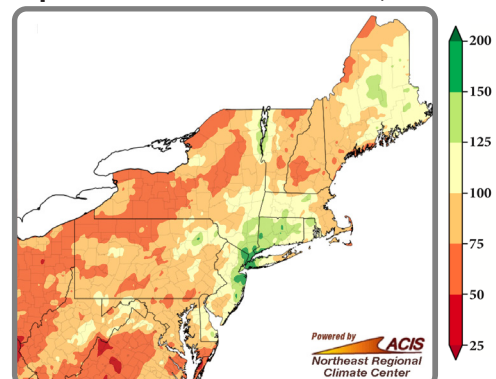


Climate normals based on 1991–2020 data; rankings based on 1895–2023.

The Northeast had its **12th-warmest autumn** at 1.4°F above normal. It was among the 20 warmest autumns for 10 states. The region had its **14th-warmest September** at 1.7°F above normal. It was among the 20 warmest Septembers for six states. The region had its **seventh-warmest October** at 4.0°F above normal. It was among the 20 warmest Octobers for 11 states. **November** was 1.6°F below normal, in the **middle third** of all years.

Precipitation

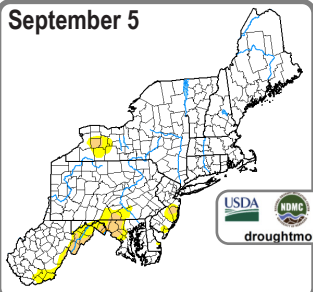
Percent of Normal (%)
September 1–November 30, 2023



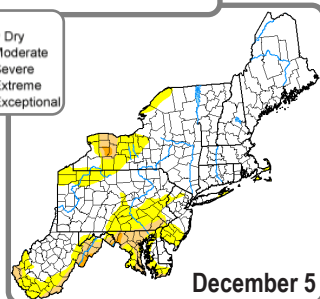
The Northeast saw 86% of normal **autumn** precipitation, in the **middle third** of all years. **September** precipitation was 103% of normal, in the **wettest third** of all years. It was among the 20 wettest Septembers for five states. **October** precipitation was 85% of normal, in the **middle third** of all years. It was among the 20 driest Octobers for two states. **November** precipitation was 68% of normal, in the **driest third** of all years. It was among the 20 driest Novembers for five states.

Regional Climate Overview – September–November 2023

September 5



Intensity:
D0 Abnormally Dry
D1 Drought - Moderate
D2 Drought - Severe
D3 Drought - Extreme
D4 Drought - Exceptional

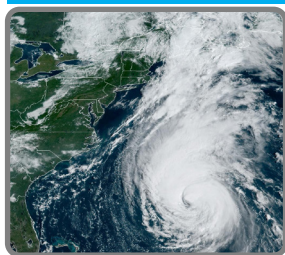


December 5

Drought in the Northeast

As of [September 5](#), the [U.S. Drought Monitor](#) showed 3% of the Northeast in drought and 5% as abnormally dry. In September, **drought and abnormal dryness expanded** in interior areas but **contracted** in the Mid-Atlantic. The [October 3](#) U.S. Drought Monitor showed 2% of the Northeast in drought and 15% as abnormally dry. In October, **conditions improved** in some interior locations but **deteriorated** in the region's southeast corner. The [November 7](#) U.S. Drought Monitor showed 3% of the Northeast in drought and 17% as abnormally dry. A dry November allowed drought and dryness to generally **persist or expand** in the region. The [December 5](#) U.S. Drought Monitor showed 6% of the Northeast in drought and 19% as abnormally dry. During fall, parts of New York and the Mid-Atlantic saw **record low** streamflow and/or groundwater levels, with [some water suppliers](#) implementing [mandatory water use restrictions](#). **Wells ran dry** in [part of western New York](#). Daily drought monitoring operations were in place and **special water supply outlooks** were issued for [the Potomac River](#) upstream from Washington, D.C. Low water levels [affected rural firefighting operations](#) in western New York and southern Pennsylvania. Dry conditions in West Virginia contributed to multiple wildfires, including one that [burned over 2,000 acres](#). For current conditions, see the [Northeast DEWS Dashboard](#).

Regional Impacts and Updates – September–November 2023



Satellite image of Hurricane Lee off the East Coast on September 14. Credit: NOAA

Autumn Conditions

During September, the Northeast was impacted by **several flash flood events** and **two tropical systems**. For instance, flash flooding in northeastern Pennsylvania caused [millions in damage](#) and resulted in [two deaths](#) on **September 9** and up to 9.50 inches of rain on **September 11** led to a **Flash Flood Emergency** in central Massachusetts affecting [hundreds of buildings](#) and likely causing [over \\$30 million in damage](#). In mid-September, **Hurricane Lee** brought wind gusts of 40–60 mph to Maine, where downed trees and wires led to [thousands of power outages](#) and resulted in [one death](#). Eastern Maine saw up to 6.50 inches of rain, which flooded roads and basements. **Tropical Storm Ophelia and its remnants** affected the Northeast from **September 22–28**. Coastal areas in the Mid-Atlantic experienced [multiple days of higher-than-usual water levels](#), resulting in [erosion and flooding](#). The **highest wind gusts** reached 40–60 mph, with scattered reports of downed trees and wires, while the **greatest rainfall totals** of over 4 inches were in coastal New Jersey. Ophelia's remnants merged with another storm, producing up to 9 inches of rain and **major flash**

flooding in the New York City area on **September 29**. Kennedy Airport had its **all-time wettest day** with 8.05 inches of rain, qualifying as a **100-year storm event** with a 1% chance of occurring in any given year, and its **wettest September** with 13.01 inches of rain. Travel was nearly impossible due to [flooded roadways](#), suspension of bus services, the shut down of roughly [half of the city's subway system](#), and flight delays and cancellations. Reports noted there were [multiple water rescues](#) and [at least 150 city schools](#) experienced flooding. In parts of New England, above-normal precipitation and temperatures in September coupled with a wet summer [delayed and/or muted the colors](#) of fall foliage. The Northeast saw **five tornadoes in September**, [two more than average](#); however, they all occurred in states that average no tornadoes during September, particularly Rhode Island, which [saw three](#).

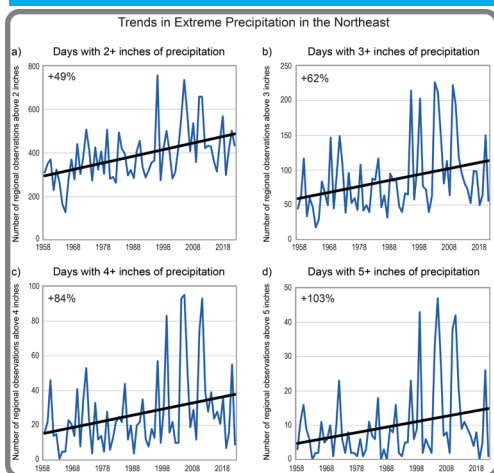
October was a **quiet month** with respect to significant storms and severe weather. On **October 7**, a strong cold front swept across the Northeast, producing up to 5 inches of rain in parts of New York that led to localized flash flooding. Burlington, VT, had its third wettest October day with 2.80 inches of rain. The next day, the frontal system interacted with **Post-Tropical Storm Philippe**, bringing 4–6 inches of rain to coastal Maine where a few roads sustained flood damage. Wind gusts of 30–55 mph resulted in downed trees and power outages in that state. A report indicated that part of Maine was in the National Hurricane Center's storm track forecast cone [more frequently](#) this hurricane season than typical areas like Florida. A few sites saw their **first measurable snow** in late October. Totals were a few inches or less, but it was enough to make this October one of the **20 snowiest** on record for Erie, PA, Caribou, ME, and Buffalo, NY.

There was **little storm activity** during **November**. Some sites had one of their driest **November 1–20** periods, with **record dryness** for Newark, NJ, with a trace, and Harrisburg, PA, with 0.02 inches. The month's first notable storm occurred from **November 21–22**, bringing a few sites one of their **10 wettest November days** including Harrisburg with 2.31 inches. Additionally, the **season's first major lake-effect snow event** occurred from **November 27–29**, producing up to 46 inches of snow east of Lake Ontario and up to 23 inches of snow east of Lake Erie.



Fall foliage in Meriden, CT, on October 23, 2023. Credit: Chris Stachelski

Regional Impacts and Updates – September–November 2023



Credit: USDA Forest Service, Drexel University, NOAA NCEI, and CISS NC

increased flood risk, more frequent heavy snowfalls, [shifting distributions](#) of ocean species, and **more rapid intensification** and slower decay of tropical cyclones. Under future scenarios, warmer ocean temperatures are expected to lead to **stronger tropical cyclones**, while increased sea level rise is expected to result in higher water levels during flooding from storms.

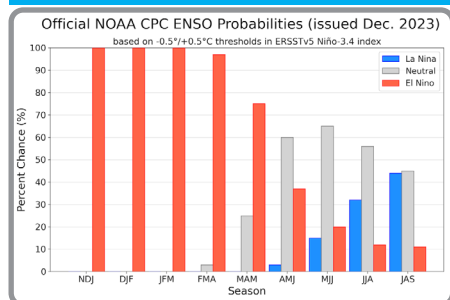
U.S. Fifth National Climate Assessment

The recently-released [U.S. Fifth National Climate Assessment](#) reported that **temperatures** in the Northeast continue to get **warmer**, with average annual temperatures in some locations having warmed by more than 2°F (2002–2021 compared to 1901–1960). There have been **fewer cold days, more warm nights**, and heatwaves are happening more frequently, lasting longer, and becoming more intense. These trends are expected to **continue in the future**, with heat-related deaths projected to increase in urban areas.

Precipitation has increased annually and in all seasons. In fact, the Northeast has seen a roughly 60% increase in the number of days with extreme precipitation, the **largest increase of all U.S. regions**. The intensity of these events has also increased. The Northeast is expected to see more precipitation under all global warming scenarios, along with an **increased risk of flooding**.

Ocean waters along the Northeast coastline are “warming faster than in most other regions.” This is contributing to **higher rates of sea level rise**, “with the highest rates between 1993 and 2020 observed along the Gulf and Mid-Atlantic Coasts (greater than 2.4 inches per decade of sea level rise).” **Ocean warming** has been linked to an

Regional Outlook – Winter 2023–24



ENSO

Strong El Niño conditions were present in the equatorial Pacific Ocean during November. NOAA's [Climate Prediction Center indicates](#) there is a 54% chance of this event becoming **historically strong** for the November–January period. El Niño conditions were expected to persist through winter, with a 60% chance of ENSO-neutral conditions during April–June 2024. During El Niño winters, **storms** often [move up the U.S. East Coast](#), generally leading to **above-normal precipitation** and possibly

snowfall. This increased storminess is also expected to produce [more high-tide flooding days](#) in New England this year. The NOAA Eastern Region Climate Services [webinar](#) in November focused on El Niño and the winter outlooks.

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](#)

Temperature and Precipitation



Normal January–March average temperatures range from the teens in northern New England and northern New York to the 40s in parts of the Mid-Atlantic. [NOAA's Climate Prediction Center \(CPC\)](#) favors **above-normal temperatures** for **January–March** for almost the entire Northeast (map left). Equal chances of below-, near-, or above-normal temperatures were predicted far southern West Virginia.

Normal January–March precipitation ranges from less than 6 inches in western/central New York to more than 13 inches in several locations including Rhode Island, southeastern Massachusetts, and higher elevations of West Virginia. **Below-normal precipitation** is favored for **January–March** in western New York, western Pennsylvania, and northwestern West Virginia. Meanwhile, **above-normal precipitation** is predicted for an area stretching from southern Maryland up to southeastern Massachusetts (map right), tied to the favored El Niño storm track along the East Coast. **Equal chances** of below-, near-, or above-normal precipitation were forecast for the remainder of the Northeast.

