

National Significant Events – June–August 2023

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

The Northeast saw 30 tornadoes during August, seven times more than average.

June

More than 8 in. of snow fell on Mount Washington, NH, in June, becoming the snowiest June on record since 1932.

Smoke from Canadian wildfires caused significant air quality issues in parts of the U.S. in June. New York reported the worst air quality of major cities worldwide on June 7.

July

Severe storms brought a record-setting 5.28 in. of rainfall to Montpelier, VT, on July 10, flooding the city and devastating thousands of homes and businesses.

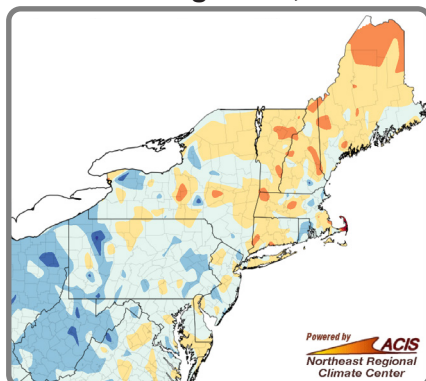
The contiguous U.S. had its 15th-warmest summer with an average temperature of 73.0°F, 1.6°F above the 20th-century average. Average temperatures for June, July, and August were 0.5°F above average, 2.1°F above average (11th warmest), and 2.3°F above average (ninth warmest), respectively. Globally, it was the record warmest June, the record warmest July, the record warmest August, and the record warmest summer. The contiguous U.S. summer precipitation total was 8.35 inches, 0.03 inches above average. June, July, and August precipitation were 0.08 inches below average, 0.08 inches below average, and 0.12 inches above average, respectively.

Highlights for the Northeast

- During much of **June**, little rainfall allowed **dryness to intensify**, with **severe drought** in the Mid-Atlantic. A **wet weather pattern** from **late June through August** helped **ease dryness**. It also produced multiple rounds of **extreme rainfall** and **significant flash flooding** including a devastating event in **Vermont**. Islip, NY, and Williamsport, PA, saw their **wettest July day**, while Hartford, CT, and Albany, NY, had a **record wet July**. Albany also had its **wettest summer** on record.
- **Smoke** from Canadian **wildfires** brought **poor air quality** and hazy skies to the Northeast several times during summer. In **early June**, multiple areas saw their **worst air quality** since records began in 1999, reaching **hazardous levels**. During **June**, a few National Weather Service offices issued a **record number of Air Quality Alerts**.
- **July** was the **all-time hottest month** on record for Caribou, ME, and among the 20 all-time hottest months for [multiple sites](#) including Washington, D.C., Philadelphia, PA, and Newark, NJ.
- There was **limited severe weather** in **June**, with five **tornadoes**. **Severe weather** occurred **almost daily** in **July**, with **12 tornadoes** and straight-line winds of up to 100 mph. **August** featured **frequent severe weather** with **30 tornadoes**, [seven times more than average](#), and many instances of straight-line winds of up to 110 mph. On **August 7–8**, **14 tornadoes touched down**, including an [EF-3 in northern New York](#). There were **seven tornadoes** and [baseball-sized hail](#) on **August 12–13** and **five tornadoes**, including Rhode Island's [strongest since 1986](#), on **August 18**. The **summer tornado count** was 47, **more than double** the summer average of 21.

Regional Climate Overview – June–August 2023

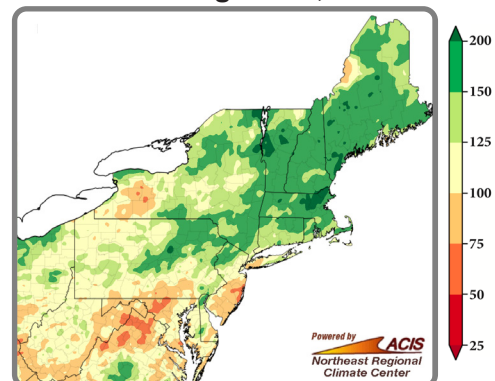
Temperature Departure from Normal (°F) June 1–August 31, 2023



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

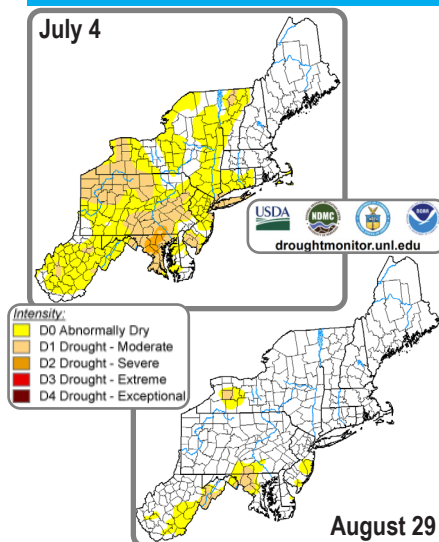
The Northeast's **summer** average temperature was 0.3°F below normal, in the **middle third** of all years. It was among the 20 warmest summers for two states. **June** was 1.9°F below normal, in the **coolest third** of all years. West Virginia had its ninth-coolest June. The region had its **12th-warmest July** at 1.9°F above normal. This July was **record warm** for Maine and among the 20 warmest for eight other states. **August** was 1.0°F below normal, in the **middle third** of all years.

Precipitation Percent of Normal (%) June 1–August 31, 2023



The Northeast had its **third-wettest** summer with 127% of normal precipitation. Summer was **record wet** for New Hampshire and Vermont and among the 20 wettest for six other states. **June** precipitation was 100% of normal, in the **wettest third** of all years. It was West Virginia's 16th-driest June but among the 20 wettest for northern New England. The region had its **third-wettest July** with 152% of normal. It was among the 20 wettest for eight states. The region had its **12th-wettest August** with 130% of normal. It was among the 20 wettest for four states.

Regional Climate Overview – June–August 2023



Drought in the Northeast

As of [June 6](#), the [U.S. Drought Monitor](#) showed 20% of the Northeast in drought and 47% as abnormally dry. During much of **June**, **conditions deteriorated** due to little rainfall, low streamflow and groundwater levels, and dry soils. **Severe drought** was introduced in Pennsylvania and Maryland, while moderate drought and/or abnormal dryness expanded in the Mid-Atlantic, New York, and Connecticut. Growers relied on irrigation; however, some seeds [failed to germinate](#), crops [grew slower than usual](#), and [pastures turned brown](#). A few states saw [an uptick in wildfires](#), with [burn bans](#) enacted in some areas. **Locally heavy rain** in late June allowed areas of drought and dryness to contract in the Mid-Atlantic and New York. The [July 4](#) U.S. Drought Monitor showed 20% of the Northeast in drought and 41% as abnormally dry. Most areas saw **above-normal rainfall** during **July**, allowing drought and dryness to **continue to ease**. The [August 1](#) U.S. Drought Monitor showed 4% of the Northeast in drought and 11% as abnormally dry. **Wet weather** in **August** allowed drought and abnormal dryness to **contract or ease** in multiple areas; however, **drier conditions** in eastern West Virginia caused drought and dryness to **expand**. The [August 29](#) U.S. Drought Monitor showed 2% of the Northeast in drought and 6% as abnormally dry. For current conditions, see the [Northeast DEWS Dashboard](#).

Regional Impacts and Updates – June–August 2023



Floodwaters engulf Montpelier, VT. Credit: [U.S. Dept. of Defense/Air Force Senior Master Sgt. Michael Davis](#).

July Extreme Rainfall

Extreme rainfall and flash flooding affected multiple parts of the Northeast in July. A widespread event occurred from **July 9–10** when as much as 4–9 inches of rain fell on an area from Pennsylvania to New Hampshire. Some of the greatest totals were in Vermont and southeastern New York, which both experienced **devastating flooding** and **significant impacts**. West Point, NY, saw 9.50 inches of rain in a day, a [200-year storm event](#) with a 0.5% chance of occurring in a given year, while Middlesex, VT, saw 8.03 inches of rain in two days, a **500-year storm event** with a 0.2% chance of occurring in a given year. These rainfall totals ranked among the **greatest on record for July** in their respective states. The National Weather Service issued a rare **Flash Flood Emergency**, signifying a dangerous, life-threatening situation, for a few areas.

Floodwaters [inundated roads and buildings](#), trapping people, with **over 200 rescues** in Vermont. Sections of roads [were washed away](#), with a few Vermont roads closed for [over three weeks](#). Water levels [along some Vermont waterways](#) reached one of their **five highest on record** including the Winooski River at Montpelier which reached its **second-highest level** since the early 1900s. Vermont residents were advised to boil water, [have well water tested](#), and avoid bodies of water due to **potential contamination** or other flood-related hazards. Notable flooding and impacts also occurred in other areas that saw extreme rainfall or were downstream including [eastern Pennsylvania](#), western Connecticut, and [western Massachusetts](#). Some debris from the Vermont floods made its way into Long Island Sound, posing a [danger for boaters and swimmers](#). Storm [clean up](#) and [repairs](#) continued into autumn in some areas.

With wet antecedent conditions and more heavy rain, another **flash flood event** occurred from **July 15–16**. Up to 8 inches of rain fell in eastern Pennsylvania, where **floodwaters swept away vehicles** resulting in [at least six deaths](#). In western New Jersey, flash flooding and a mudslide displaced about 100 residents, left [some homes uninhabitable](#), and caused a state highway to be [closed for two weeks](#).

As much as 8 inches of rain in southern Delaware [inundated roads](#), vehicles, [and homes](#). In rain-soaked Vermont, another 4 inches of rain washed out roads and triggered a mudslide that destroyed a house. Up to 6.50 inches of rain fell in New Hampshire, where floodwaters damaged [more than 125 roads](#) and residents were warned about potentially [contaminated wells and swimming areas](#).

During July, a few National Weather Service offices including those in [Philadelphia, PA](#), [New York, NY](#), and [Burlington, VT](#), issued their **greatest number of flash flood warnings for any month** since records began in the mid-1980s. Several states saw significant flood damage ranging from **destroyed roads** to [hundreds of uninhabitable homes](#) to losses of [thousands of acres of crops](#). Damage assessments are ongoing; however, preliminary data indicated **losses in the millions** for multiple areas. For instance, the flood damage in West Point, New York, could be [over \\$100 million](#), while Vermont had already spent [over \\$35 million](#) as of late July to repair flood-damaged roads and early estimates from Connecticut indicate [at least \\$21 million](#) in crops were lost. [Dozens of beaches](#) in New England were closed due to **unsafe water quality** caused by high levels of bacteria, likely from heavy rain runoff causing wastewater systems to overflow.

This July was the **wettest on record** for Hartford, CT, and Albany, NY, and among the 20-wettest Julys for multiple sites. July 2023 also ranked among the **20 all-time wettest months** on record at a few sites including Boston, MA, Rochester, NY, and Williamsport, PA.



Flooding damage in Londonderry, VT. Credit: [USGS New England Water Science Center](#).

Regional Impacts and Updates – June–August 2023



An orange, smoky sky in central New York on June 7. Credit: [NWS Binghamton](#).

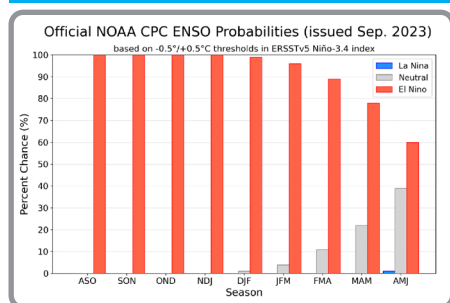
as intense as the early June event, **air quality** from **June 28–30** reached **unhealthy or very unhealthy levels** in some states including [Pennsylvania](#) and [West Virginia](#). Thick smoke sent [outdoor activities inside](#), reduced visibilities, and [closed some outdoor spaces](#). During June, several National Weather Service offices including [Pittsburgh, PA](#), and [Albany, NY](#), issued their **greatest number of Air Quality Alerts for any month** since records began in the late 2000s. [Multiple Air Quality Alerts](#) were issued again in July, particularly around **July 17 and 18** when a plume of smoke, this time from wildfires burning in western Canada, [reduced air quality](#) and produced hazy skies in the Northeast. **Air quality** reached **unhealthy levels** in several areas, with New York City and Washington, D.C., having **some of the most polluted air of major cities across the world**. The smoke led to a **spike in asthma-related emergency room visits** during spring and summer, particularly on June 7 when New York saw an [82% increase](#). Additionally, multiple times during summer, [smoke high in the atmosphere](#) created hazy skies in the Northeast.

Air Quality

From **June 5–7**, northerly winds funneled **thick smoke** from wildfires burning in nearby Canada into the region. **Air Quality Alerts** were issued as the air quality index, which ranges from 1 to 500, exceeded 151 (unhealthy), 201 (very unhealthy), or 301 (hazardous) in most Northeast states, with [some locations topping 400](#). Multiple locations, including New York City and [Philadelphia](#), had their **poorest air quality** since records began in 1999. **Visibilities were reduced to as little as a half-mile** at times, [affecting air traffic](#) at major airports such Newark, LaGuardia, Kennedy, and Philadelphia. In many areas, outdoor events were [cancelled or moved indoors](#) and [outdoor spaces such as zoos](#) were closed. **High temperatures** were **slightly cooler** due to the [thick smoke blocking the sun](#). While not

as intense as the early June event, **air quality** from **June 28–30** reached **unhealthy or very unhealthy levels** in some states including [Pennsylvania](#) and [West Virginia](#). Thick smoke sent [outdoor activities inside](#), reduced visibilities, and [closed some outdoor spaces](#). During June, several National Weather Service offices including [Pittsburgh, PA](#), and [Albany, NY](#), issued their **greatest number of Air Quality Alerts for any month** since records began in the late 2000s. [Multiple Air Quality Alerts](#) were issued again in July, particularly around **July 17 and 18** when a plume of smoke, this time from wildfires burning in western Canada, [reduced air quality](#) and produced hazy skies in the Northeast. **Air quality** reached **unhealthy levels** in several areas, with New York City and Washington, D.C., having **some of the most polluted air of major cities across the world**. The smoke led to a **spike in asthma-related emergency room visits** during spring and summer, particularly on June 7 when New York saw an [82% increase](#). Additionally, multiple times during summer, [smoke high in the atmosphere](#) created hazy skies in the Northeast.

Regional Outlook – Autumn 2023



Atlantic Hurricane Season

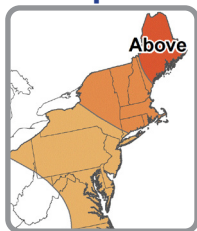
	2023 Atlantic Season Updated Outlook	1991-2020 Average Season
Number of Named Storms	14-21	14
Number of Hurricanes	6-11	7
Number of Major Hurricanes	2-5	3

NOAA's [updated 2023 Atlantic hurricane season outlook](#) favors an **above-normal season** due to multiple factors including **record-warm Atlantic sea surface temperatures**. There were four tropical cyclones by June 30, three more than average. The season's first hurricane, Don, was July's only storm, **formed nearly a month earlier than average**, and was the third longest-lived named storm in July in roughly 50 years of records. In **August**, there were **six named storms** (1991–2020 average is 3-4), with two becoming major hurricanes (average 1-2). The season runs from June 1–November 30, peaking from mid-August to late October. NOAA Eastern Region Climate Services webinar in [August 2023](#) focused on the updated hurricane outlook.

ENSO

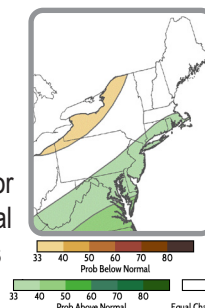
El Niño conditions strengthened in the equatorial Pacific Ocean during August. NOAA's [Climate Prediction Center indicates El Niño](#) will **continue** through winter, likely peaking as a [strong event](#). The U.S. East Coast tends to see **above-normal precipitation** and possibly snowfall [during El Niño winters](#). The region is also expected to see [more high-tide flooding days](#) this year due in part to increased storminess related to El Niño.

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 most of the Northeast (map above). 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 coastal Maine. **Below-normal precipitation** is favored for **October–December** near the Great Lakes, while **above-normal precipitation** is favored for some southern and coastal areas, with equal chances in between (map right).



Northeast Partners

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