Abnormal dryness and drought persisted in northern New England during autumn. A few notable storms impacted the region, as well. See Regional Impacts for details.

**September**

September was wet and warm for most areas. Several significant storms impacted the region, including the remnants of Hurricane Ida from September 1 to 3, which brought heavy rain. Parts of Massachusetts, Maine, New Brunswick, and P.E.I. saw two to three times their normal September precipitation. This September was the wettest on record for Bas-Caraquet and Woodstock, N.B., and among the three wettest for Charlottetown and Summerside, P.E.I. In the Maritimes, the excessive rainfall in September made some harvesting more difficult due to wet fields but was good for apple growers. From September 23 to 26, high temperatures of up to 26°C (79°F) resulted in many daily temperatures records being set in the Maritimes. Low temperatures ranging from 13°C to 19°C (55°F to 66°F) set new records for high minimums in the Maritimes and New England.

**October**

A series of high-pressure areas remained over the region for the first half of the month, maintaining mild and dry conditions. Much of the Maritimes and Maine saw less than 5 mm (0.20 in.) of rain, with some sites reporting no precipitation. In fact, Caribou, ME, had its driest October 1-15 period on record. During the second half of the month, several storms dropped heavy rain on parts of the region, with Portland, ME, having its 10th-wettest October. This October was the warmest on record for Charlo, N.B., and among the 10 warmest for many sites across the region. The extreme minimum temperature for October in Fredericton, N.B., was 0.8°C (33.4°F), making it the first October since 1872 that the site remained above 0°C (32°F). Caribou, ME, did not have its first fall frost until October 25, the latest date on record. The first fall occurrence of a temperature less than 10°C (50°F) was the latest on record for Boston, MA. Maritimes weather conditions were favorable for soybeans, potatoes, apples, and corn.

**November**

Similar to October, high pressure led to little precipitation during the first half of November. The second half was wetter, with a storm from November 21 to 24 setting all-time single day rainfall records for at least two stations in Nova Scotia. From November 12 to 14, high temperatures of up to 21°C (70°F) set records at multiple Maritimes sites. Caribou, ME, did not see its first measurable snow until November 15, the fifth latest date on record. The extreme minimum temperature for November in Charlo, N.B., was -5.4°C (22.3°F) and in Bathurst, N.B., was -6.5°C (20.3°F), the sites' warmest low temperatures on record for November. With near- or above-normal temperatures and below-normal precipitation, November snowfall was below normal for many sites.

Autumn was among the three warmest on record for a few sites in the region. Gulf of Maine autumn sea surface temperatures were extremely warm, with October and November being the warmest on record in the high-resolution satellite data (1985 to 2021).

### Regional Climate Overview – September–November 2021

**Temperature**


Daily average temperature departure from normal during autumn at Caribou, ME. Warmer-than-normal days are shaded red and colder-than-normal days are shaded blue.

Autumn (averaged over September, October, and November) was as much as 3°C (5°F) warmer than normal*. This autumn was among the three warmest on record for a few New England sites. September was up to 3°C (5°F) warmer than normal, ranking among the 10 warmest Septembers for a few New England sites. October was up to 4°C (7°F) warmer than normal. This October was near-record or record warm for many sites in the region. November temperatures ranged near normal to 2°C (4°F) above normal for most areas, except parts of Massachusetts which were as much as 1°C (2°F) cooler than normal. A recent climate change report indicates the greatest increases in temperature in Nova Scotia occurred in the autumn months, pushing back the date of first frost.
Regional Climate Overview – September–November 2021

**Sea Surface Temperature**

Autumn sea surface temperature anomalies over the Gulf of Maine were strongly above normal* everywhere (greater than 2.0°C [4°F]), strongest in the western Gulf (greater than 2.5°C [4.5°F]) and over parts of the eastern Gulf and the southern Scotian Shelf (greater than 3.0°C [5.5°F]).

Monthly anomalies were strongest in October and November, with both months the warmest on record in the high-resolution satellite data (1985 to 2021).

*SST normals based on 1985–2014 data

Monthly mean sea surface temperature, averaged over the Gulf of Maine deep basins, for September, October, and November (1985 to 2021). Credit: University of Maine School of Marine Sciences

**Precipitation**

Autumn precipitation (accumulated from September to November) ranged from 50% of normal to 175% of normal*. September precipitation ranged from near normal to more than 200% of normal for most areas, with some sites being record or near-record wet. Western Maine and northern New Hampshire were drier. October precipitation ranged from 25% of normal to near normal in the Maritimes to more than 200% of normal in southeastern Massachusetts. November precipitation ranged from 25% of normal in parts of New England to more than 200% of normal in Cape Breton, N.S.


Regional Impacts – September–November 2021

**Autumn Storms**

There were several storm events during autumn. The remnants of Hurricane Ida affected the region from September 1 to 3. Rainfall totals ranged from less than 25 mm (1 in.) to 175 mm (7 in.), with the greatest amounts in P.E.I. and southeastern Massachusetts. Brier Island, N.S., and Summerside and Stanhope, P.E.I., had their all-time wettest day on record, while Charlottetown and St. Peters, P.E.I., had their third wettest. Localized flooding resulted in closed/washed out roads, stranded vehicles, and a few homes with significant basement flooding. Heavy rain also caused much of P.E.I.’s shoreline to be closed to shellfishing. Maximum wind gusts reached 80 to 120 km/h (50 to 75 mph) in the Maritimes, particularly in P.E.I., resulting in power outages. An EF-0 tornado and straight-line winds of up to 130 km/h (80 mph) blew down trees and caused minor damage to homes in southeastern Massachusetts. Severe thunderstorms in New England on September 15 and 16 produced a funnel cloud, hail, and strong winds that flipped over a few small sailboats. A frontal system and moisture from Post-Tropical Storm Odette dropped up to 65 mm (2.50 in.) of rain on eastern Nova Scotia from September 18 to 19. From September 25 to 26, a slow moving storm brought up to 150 mm (6 in.) of rain to the region. The greatest amounts were in Maine and central/northwestern New Brunswick, where localized flooding and road washouts occurred.

A series of disturbances from October 13 to 18 brought 40 to 130 mm (2 to 5 in.) of rain to northern Maine and the Maritimes, with Doyleville, N.B., reporting 80 mm (3 in.) in a day, leading to localized flooding. From October 25 to 28, a nor’easter rapidly intensified along the New England coast then moved south of the Maritimes, dropping as much as 95 mm (4 in.) of rain and producing wind gusts of 50 to 80 km/h (30 to 50 mph). Wind gusts of 110 to 145 km/h (70 to 90 mph) in Massachusetts downed trees and wires, leaving more than 485,000 customers without power, in some cases for several days. From October 29 to 31, a storm dropped 100 to 175 mm (4 to 7 in.) of rain in Maine, where localized flooding led to road closures. Southern Nova Scotia saw wind gusts of up to 95 km/h (60 mph).

From November 21 to 24, an intense storm system brought torrential rain, strong winds, and some coastal flooding to the Maritimes. At least two Nova Scotia sites set all-time daily rainfall records. The greatest storm rainfall totals were 150 to 290 mm (6 to 11 in.) in Cape Breton, N.S., and 50 to 125 mm (2 to 5 in.) in the rest of the Maritimes. Winds gusted above 100 km/h (62 mph) in eastern Nova Scotia, with max gusts of 140 km/h (87 mph) in Cape Breton. Storm impacts included power outages, widespread flooding, and washouts.

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Warm Water Temperatures

Unusually warm water temperatures in Cape Cod Bay, MA, delayed the start of turtle stranding season by two weeks and have been implicated in the formation of low-oxygen zones. Low water levels and warm water temperatures have led to an increase in fish diseases and deaths at a Nova Scotia fish hatchery. Warm water temperatures in P.E.I.’s West River have been linked to fish deaths from fungal infections, with the problem possibly becoming more common due to climate change. A recent report indicates that future sea level rise could threaten more than 3,500 parcels of land valued at more than $645 million in York County, ME.

Drought and Abnormal Dryness

During September and October, dryness eased in Massachusetts but lingered in Maine, New Hampshire, and northeastern New Brunswick. In Nova Scotia, dryness eased in September but was reintroduced in October. During November, drought and dryness persisted in western Maine and northern New Hampshire; however, abnormal dryness persisted in the Maritimes. Impacts in New England included below-normal streamflow and/or groundwater levels, some dry wells, and pine trees dropping more needles than usual.

Hurricane Season

Eight named storms formed in September. After more than three weeks of no tropical activity in October, Subtropical Storm Wanda formed on the last day of the month. Wanda was the last name on the list for 2021, making it the third time ever the full list of names was used. In addition, it was the first time on record that all 21 storm names were used in consecutive hurricane seasons. No tropical systems formed in November. Overall, the Atlantic hurricane season wrapped up on November 30 with 21 named storms of which seven became hurricanes including four major hurricanes. An average season produces 14 named storms of which seven become hurricanes including three major hurricanes. This was the third most active season in terms of named storms. It was the sixth consecutive year with above-normal tropical activity in the Atlantic Ocean. Eight named storms entered the Canadian Hurricane Centre’s Response Zone this season. However, only six storms had impacts on land: Elsa, Fred, and Henri during summer and Ida, Larry, and Odette during autumn.

Regional Outlook – Winter 2021

Temperature and Precipitation

During November, La Niña conditions continued in the equatorial Pacific Ocean. NOAA’s Climate Prediction Center indicates there is a 95% chance La Niña conditions will continue through winter 2021–22, with a 60% chance of a transition to ENSO-neutral conditions during spring 2022 (graph below). A moderate strength La Niña is favored for the November through January period. For more information on potential impacts from La Niña in the Northeast U.S., see the NOAA Northeast Winter Climate Patterns and Outlook from November 2021 and the NOAA Eastern Region Climate Services webinar recording from November 2021.

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