



Gulf of Maine Significant Events – June–August 2020

Summer was **hotter and drier than normal** across the region. Caribou and Portland, ME; Kejimikujik (National Park), N.S.; and Moncton, N.B., had their **hottest summer on record**, while Concord, NH; Yarmouth, N.S.; and Fredericton and St. John, N.B., had one of their five hottest. Charlottetown, P.E.I., and Bas-Caraquet, N.B., had their **driest summer on record**, while several other sites including Caribou, ME, and Summerside, P.E.I., had one of their five driest. **Drought developed** in the region in June and **intensified during summer**, with **many impacts** noted. A few impressive storms, including three tropical systems, moved through the region during summer. See Regional Impacts for details.

June

There were a few **late-season frosts** in Maine and the Maritimes during the first half of June. On **June 1 and 2**, Caribou, ME, tied its June record for **greatest number of days** with a low of 0°C (32°F) or colder. The Caribou National Weather Service Office issued its first freeze warning for June since 2009. Another frost occurred in the Maritimes on **June 10**, with northern New Brunswick having below-freezing low temperatures through June 15. The late frosts and summer drought **significantly reduced Maine's wild blueberry crop yield**.

The region experienced **unprecedented heat** from **June 17 to 24**. The hottest temperature recorded in New England was 38°C (101°F) in Penobscot County, ME, while the Maritimes' hottest temperature was 37.3°C (99°F) in Kouchibouguac, N.B. Caribou, ME, and four New Brunswick sites had their **hottest temperatures on record** for any month. Elsewhere in the Maritimes, high temperatures ranked as the hottest or among the five hottest for June. Preliminary findings indicated that high temperatures caused **a train derailment** in Saint John, N.B., on June 20. Between June 18 and 23, Caribou recorded four days with a high of at least 32°C (90°F), its second greatest number for June and tied as fourth greatest for all months. Caribou also had its **hottest June** on record and **longest stretch of days** with a high of at least 27°C (80°F). This **June** was the **driest on record** for several sites including Caribou, ME; Sackville and Bas-Caraquet, N.B.; Amherst and Yarmouth, N.S.; and Summerside, P.E.I., and among the five driest for some other Maritimes sites.

July

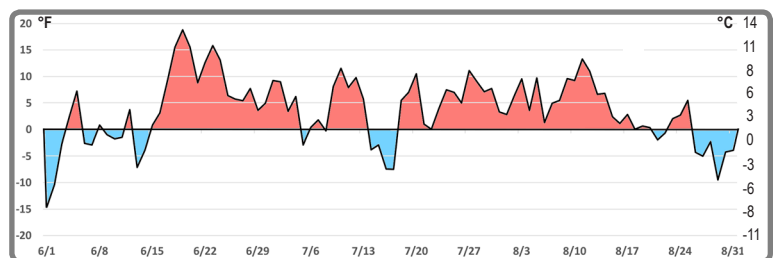
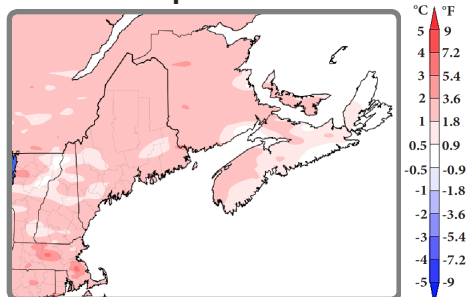
The region experienced **hot and humid** conditions from **July 25 to 29**. On **July 27**, Portland, ME, had a low of 26°C (78°F), its **hottest low temperature** on record for any month. **This July** was the **all-time hottest month** on record for Portland and ranked among the three hottest for Caribou, ME, and Concord, NH. Caribou had its second greatest number of days with a high of at least 27°C (80°F) for any month. Anoxic events in P.E.I. waterways have occurred **earlier than usual this year**, possibly due to above-normal temperatures.

August

August featured several rounds of **unusually hot and humid weather**. Portland, ME, had its **greatest number of days** with a high of at least 32°C (90°F) for August with six days, contributing to Portland's **third hottest August on record**.

Regional Climate Overview – June–August 2020

Temperature Summer Departure from Normal

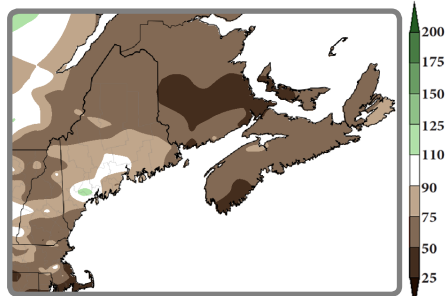


Daily average temperature departure from normal during summer at Caribou, ME. Warmer-than-normal days are shaded red and colder-than-normal days are shaded blue.

Summer temperatures (averaged over June, July, and August) ranged from near normal to **3°C (5°F) above normal**. Through August 31, Truro, N.S., and Moncton and St. Stephen, N.B., had their **greatest number of days** with a high temperature of at least 30°C (86°F), while several other Maritimes locations including Summerside, P.E.I.; Greenwood, N.S.; and Fredericton, N.B., had one of their five greatest. **June** ranged from near normal to **2°C (4°F) above normal**, with the warmest locations generally in New England. **July** ranged from near normal to **3°C (5°F) above normal**, with the warmest locations generally in New England. **August temperatures** ranged from near normal to **3°C (5°F) above normal**, with the warmest locations generally in eastern Massachusetts. Temperature normals based on 1981–2010 data.

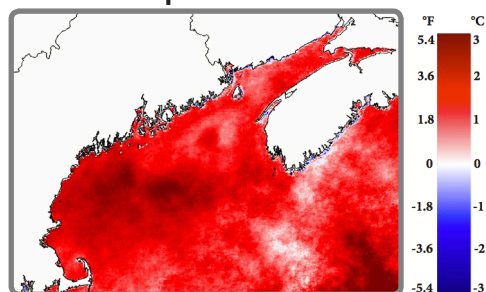
Regional Climate Overview – June–August 2020

Precipitation Summer Percent of Normal



U.S. precipitation normals based on 1981–2010 data; Canadian precipitation normals based on 2002–2019 data. SST normals based on 1985–2014 data

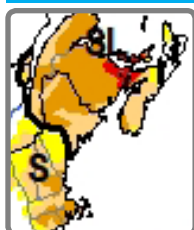
Sea Surface Temperature Summer Departure from Normal



Summer precipitation (accumulated from June to August) ranged from 25% of normal to near normal for most areas, except a few Maine sites which were wetter. **June precipitation** ranged from less than 25% of normal to near normal for most areas, with the driest locations generally in the Maritimes. However, some sites in western Maine and southeastern Massachusetts saw up to 150% of normal precipitation. **July precipitation** ranged from 25% of normal in western New Brunswick and southeastern Massachusetts to 175% of normal in southwestern New Hampshire, western Maine, and Cape Breton, N.S. **August precipitation** ranged from 25% to near normal for most areas, except a few Maine sites which were wetter.

Summer sea surface temperature anomalies over the entire Gulf of Maine were **above normal**, around 0.75°C (1.3°F) in parts of the Bay of Fundy, from 2.0°C to 3.0°C (3.6°F to 5.4°F) in the western Gulf, and around 3.2°C (5.8°F) over the deeper basins in the central Gulf. Scotian Shelf anomalies ranged from 0.1°C (0.2°F) to 1.0°C (1.8°F). Marine species that typically live in the subtropics, such as the [Portuguese man o' war](#), were [seen in the region this summer](#). The Gulf's waters are **warming quickly due to climate change**, with studies indicating the changing conditions could negatively [affect lobsters' health](#) and cause American lobsters and sea scallops to [seek colder waters](#).

Regional Impacts – June–August 2020



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

Drought Impact Types:
 S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
 L = Long-Term, typically >6 months (e.g. hydrology, ecology)

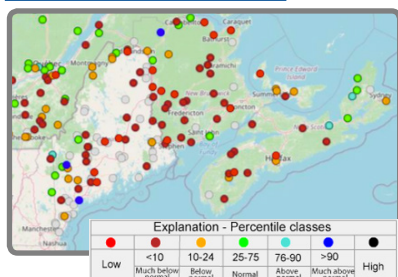
Drought Conditions

Moderate drought [developed in the region](#) in June and intensified to **severe to extreme drought** during summer. The Maritimes had the **worst drought conditions in Canada** as of late August, experiencing extreme drought for the **first time** since monitoring began in 2002.

Agriculture: Drought conditions **stressed crops** and caused some growers to be [unable to plant crops](#). A community garden in P.E.I. that usually yields 20,000 pounds of produce is expecting [only 1,000 pounds this year](#). **Potato yields** are expected to be [reduced by as much as 50%](#) in the Maritimes. [Hay yields were down](#) region-wide, **by as much as 50%** in the Maritimes, with some farmers [purchasing feed](#) or [selling cattle early](#). A few Maine farmers applied for an [emergency haying and grazing waiver](#). Use of [irrigation was widespread](#); however, in some locations [it was expensive](#) or water supplies [ran low](#) or [dried up](#). In addition, **drought stress** caused leaves to [turn color and drop earlier than usual](#) in parts of New England.

Fires: [Fire risk was elevated](#) in the region this summer. In June, New Brunswick enacted a [provincial-wide fire ban](#) and [closed crown lands](#). By early July, [fires had burned](#) through **more than five times more acreage** of New Brunswick forest than the 10-year average. By late July, Maine had seen [around 800 wildfires](#), the state's **greatest number of fires in a decade**. An [air quality alert was issued](#) for fires in Nova Scotia, while [air tankers aided firefighters](#) in New Brunswick.

Above: August 31, 2020 [North American Drought Monitor](#). Below: June 29, 2020 [North American Water Watch](#) streamflow



Explanation - Percentile classes

Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

Water Resources: In June, dam releases were reduced in New Hampshire due to **dropping lake levels**, resulting in [small hydropower plants no longer being able to generate power](#). The Aroostook, Penobscot, and [St. John rivers](#) had [near record low water levels](#) in late July, and there was [exposed riverbed](#) in the St. John River in mid-August. York Water District in Maine [temporarily siphoned water](#) from Kittery Water District. Some **wells went dry** in [Maine](#) and [Nova Scotia](#). In late **August**, nearly 300 public water suppliers in [Massachusetts](#) and [New Hampshire](#) had **water restrictions** in place, with restrictions also [enacted for private wells](#) in a few New Hampshire locations. Warm, dry conditions contributed to the **growth of blue-green algae** in [lakes and rivers](#) in the Maritimes. **Health advisories** were issued for several locations including the [Lake Major watershed](#), which serves over 103,000 residents in the Dartmouth, N.S., area.

Wildlife: Dry conditions in Maine caused a fungus that kills the pupa of the browntail moth caterpillar to **grow too late this year**, allowing the caterpillar, which defoliates trees and can cause health problems, to [spread farther into central Maine](#). Another fungus [turned drought-stressed grass black](#). There was an **increased number of bear complaints** in Maine due in part to dry conditions [reducing the bears' food supply](#). **Worms, birds, and aquatic species** were [affected by the drought](#) in northern Maine. Several dam releases were conducted in the Lamprey River watershed in New Hampshire to [help stressed aquatic species](#).

Regional Impacts – June–August 2020

Summer Storms

Several notable storms moved through the region during summer. On **June 5**, **severe thunderstorms** near Fredericton, N.B., produced estimated wind gusts of up to 130 km/h (81 mph), causing [significant tree and property damage](#). **Hundreds of trees were uprooted**, and some trailer homes were moved or **lost sections of their roofs**. More than 13,000 customers lost power. Nearly 29 mm (1.14 in.) of rain fell in 15 minutes, making it a **100-yr storm event** and resulting in [flash flooding and street washouts](#). From **June 28 to July 1**, a stalled storm system brought **highly variable rainfall amounts** to New England, from less than 3 mm (0.10 in.) in northern Maine to 178 mm (7 in.) in southern Maine. Some locations experienced **flash flooding**, with closed roads, [water in buildings](#) and yards, and cars stuck in floodwaters. The rain temporarily helped alleviate drought conditions in [parts of Maine](#) and New Hampshire. On **July 14**, **hail as large as ping pong balls** [damaged 1,000 vehicles](#) at a car dealership near Sanford, ME, piling up enough to be plowed off the lot. Nearby, around [\\$10,000 of blueberries](#) were damaged. **Heavy rain** poured into the [hospital operating room](#) in Woodsville, NH, causing dozens of procedures to be cancelled. On **August 22**, [severe storms in Carroll County, NH](#), produced an EF-0 tornado, straight-line winds of up to 129 km/h (80 mph), and a waterspout over Lake Winnepesaukee.

Three tropical systems affected the region. On **July 11**, **post tropical cyclone Fay** helped spawn an EF-0 tornado in southern Maine. **Tropical Storm Isaias** moved through western New England on **August 4** and north of the Maritimes on **August 5**. The storm's **highest wind gusts** ranged from 64 to 97 km/h (40 to 65 mph). Mount Washington, N.H., had its [highest August wind gust](#) of 237 km/h (147 mph). The strong winds [downed trees and wires](#), particularly in New Hampshire where [more than 120,000 customers lost power](#), some for several days. The **greatest rain totals** of up to 50 mm (2 in.) were in the higher elevations of central New Hampshire. The **remnants of Hurricane Laura** combined with another storm system to bring up to 50 mm (2 in.) of rain to the region from **August 29–30**.



Storm damage in Fredericton, N.B., on June 5. Credit: Rick Fleetwood

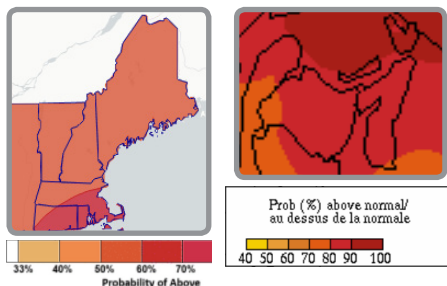
Regional Outlook – Autumn 2020

Temperature and Precipitation

For **September–November**, [NOAA's Climate Prediction Center \(CPC\)](#) and [Environment and Climate Change Canada \(ECCC\)](#)

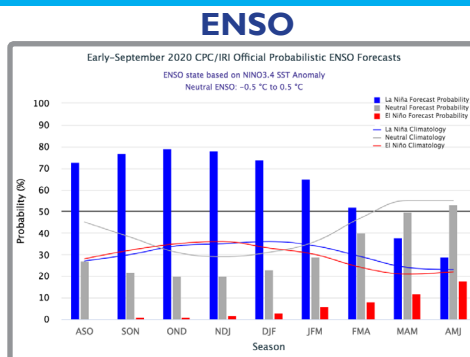
favor increased chances of **above-normal temperatures** for the region. **Equal chances** of below-, near-, or above-normal precipitation were predicted for most areas for **September–November**, with a tilt toward drier conditions in parts of Nova Scotia and wetter conditions in northern New Brunswick.

Atlantic Hurricane Season
NOAA's [updated 2020 Atlantic hurricane season outlook](#) indicates an **above-normal season** is most likely, with "19–25 named storms, of which 7–11 could become hurricanes, including 3–6 major hurricanes." This is due to several factors including warmer-than-average sea surface temperatures and reduced vertical wind shear. By the end of August, there were a [record 13 named storms](#). Four of these storms reached hurricane status, which is above the 50-year average for this time of year. 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 2020](#).



CPC temperature map (above left) produced August 20.

ECCC temperature map (above right) produced August 31.



During August, **La Niña conditions** were observed in the equatorial Pacific Ocean. NOAA's [Climate Prediction Center indicates](#) there is a 75% chance La Niña conditions **will continue through winter 2020–21**.

	Updated 2020 Atlantic Outlook (from August)	Initial 2020 Atlantic Outlook (from May)	Average Season
Number of Named Storms	19-25	13-19	12
Number of Hurricanes	7-11	6-10	6
Number of Major Hurricanes	3-6	3-6	3

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