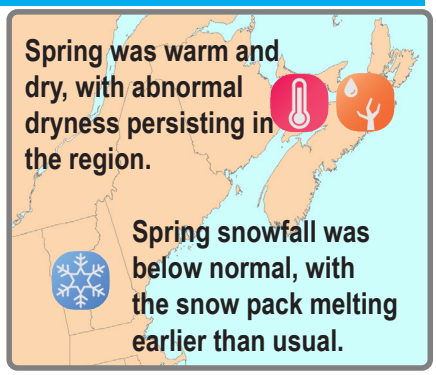
# Quarterly Climate Impacts and Outlook

# Gulf of Maine Region

*June 2021*

## Gulf of Maine Significant Events – *March–May 2021*

**Abnormal dryness** and **moderate drought** persisted in **March** and **April**. **Dryness lingered** in some areas but **improved** in other areas during **May**. See Regional Impacts for details.




**March**

A **March 1 to 2** storm produced up to 40 cm (16 in.) of **snow and strong winds** in the Maritimes and northern Maine. This led to power outages, two fatalities, and difficult travel conditions, resulting in a 17-vehicle pileup. There were two periods of **unusual warmth**, from **March 11 to 13** and **March 23 to 26**, with high temperatures of up to 23°C (74°F) and mild low temperatures setting dozens of daily records. From **March 26 to 27**, thunderstorms in southern parts of the Maritimes produced more than 16,000 **lightning strikes**, resulting in several fires and a fatality. Thousands of customers lost power and localized flooding damaged roads and led to water rescues. A **March 28 to 30** storm dropped up to 20 cm (8 in.) of **snow** in northern New Brunswick and northern Maine and up to 70 mm (3 in.) of **rain** in the rest of the region. **Wind gusts** of up to 97 km/h (60 mph) led to power outages and downed trees, resulting in a fatality. Les Suêtes winds peaked at 160 km/h (99 mph) at Grand Etang, N.S. Mild temperatures and rainfall in late March led to **ice jam flooding** in western New Brunswick and northern Maine.

**April**

An **April 1 to 4** storm brought heavy rain to the region, with up to 170 mm (7 in.) in eastern Nova Scotia where some flooding occurred. A **prolonged period of freezing rain** in parts of Nova Scotia and P.E.I. downed trees and power lines and led to power outages. In **early to mid-April**, warm weather and little snow allowed some **golf courses** in the Maritimes and Maine to have one of their **earliest openings**. From **April 21 to 22**, northern parts of the region saw a **late-season snowstorm** with up to 40 cm (16 in.) of snow, while southern areas saw up to 40 mm (1.50 in.) of rain. On **April 24**, New Brunswick recorded **both daily maximum and minimum temperature records** with a record high of 20.5ºC (68.9°F) in Point Lepreau and a record low of −7.3ºC (18.9°F) in Edmundston. A storm from **April 29 to May 1** brought up to 102 mm (4 in.) of **rain** and **wind gusts** of up to 93 km/h (58 mph) to the region, downing trees and power lines and **delaying the start** of the spring lobster season in the Maritimes.

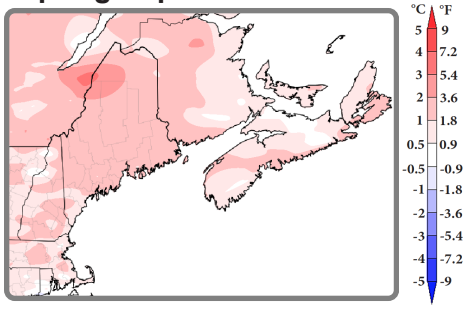
**May**

In late May there were several substantial **temperature swings**, particularly in northern Maine and the Maritimes. For example, **record high temperatures** of up to 31°C (88°F) were set on **May 26** and then **record low temperatures** as low as −4°C (25°F) were set on **May 28 and 29**. In Edmundston, N.B., the temperature dropped 33°C (60°F) in 33 hours. A **few storms** moved through the region during May including a **May 8 to 9** storm that brought up to 60 mm (2 in.) of rain, some snow, and strong winds to the Maritimes and a **May 28 to 31** storm system that dropped as much as 102 mm (4 in.) of **much-needed rain**, with the greatest amounts in Massachusetts. There were also a few **severe thunderstorms** in New England and Nova Scotia.

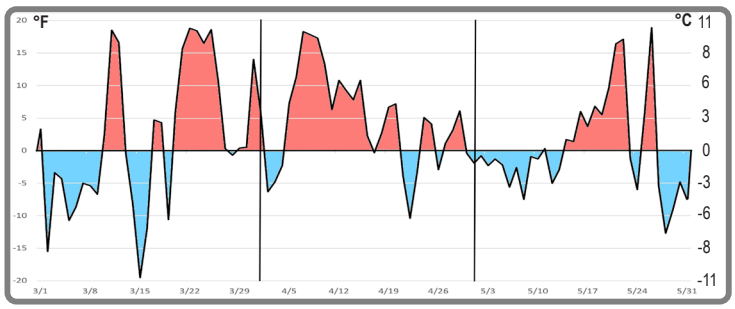
## Regional Climate Overview – *March–May 2021*

### Temperature

**Spring Departure from Normal**




*U.S. temperature normals based on 1991–2020 data; Canadian temperature normals based on 1981–2010 data.




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

**Spring** (averaged over March, April, and May) was up to 3°C (5°F) **warmer than normal***. Portland, ME, had its fifth-warmest spring. **March** was as much as 3°C (5°F) **warmer than normal**, with the warmest locations in parts of New England and Cape Breton, N.S. **April** temperatures were as much as 3°C (5°F) **warmer than normal**, with the warmest locations in Nova Scotia, New Brunswick, and Maine. It was the **warmest April on record** for Eskasoni, Ingonish, and Malay Falls, N.S., and among the three warmest for a few sites in New Brunswick and Maine. **May** temperatures ranged from 2°C (4°F) below normal in Nova Scotia to 2°C (4°F) above normal in coastal New England.

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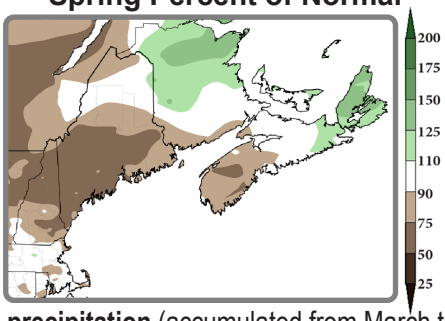
Gulf of Maine Council on the Marine Environment
Canada and the United States working together for a healthy environment

# Regional Climate Overview – *March–May 2021*

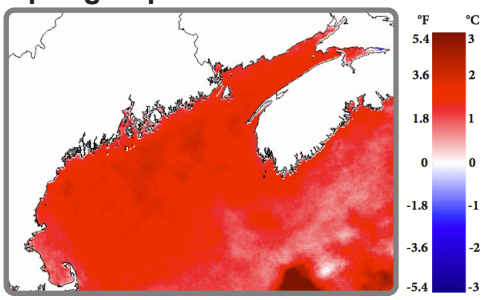
## Precipitation
### Spring Percent of Normal




*U.S. precipitation normals based on 1991–2020 data; Canadian precipitation averages based on 2002–2020 data.

SST normals based on 1985–2014 data

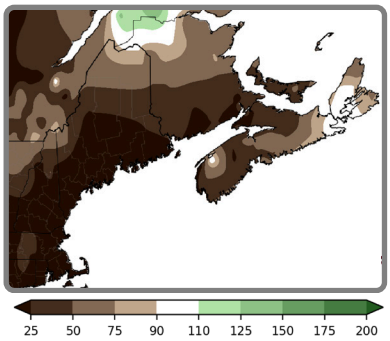
## Sea Surface Temperature
### Spring Departure from Normal




**Spring precipitation** (accumulated from March to May) ranged from 50% of normal to 150% of normal*. **March precipitation** ranged from 25% of normal to near normal for most areas, with Cape Breton, N.S., seeing up to 175% of normal. **April precipitation** ranged from 50% of normal in Maine to more than 200% of normal in Cape Breton. Sydney, N.S., had its **wettest April** since 1870, while Ingonish Beach, N.S., had its second wettest. **May precipitation** ranged from 25% of normal in New Hampshire to 175% of normal in Massachusetts and northern Nova Scotia.

**Sea surface temperature (SST)** anomalies over the entire Gulf of Maine and Bay of Fundy were **strongly above normal** (greater than 2°C [4°F]) for the **spring** season. Anomalies were only slightly weaker around Cape Cod (around 1.5°C [3°F]) and over the Scotian Shelf (around 1.0°C [2°F]). These patterns and the strengths of the **warm anomalies** were **very consistent** over the **three-month period**. As the Gulf has warmed, American lobster have moved farther offshore and some warm-water species have moved into the Gulf. **Climate change projections** suggest these shifts will continue as the **Gulf continues to warm**.

# Regional Impacts – *March–May 2021*

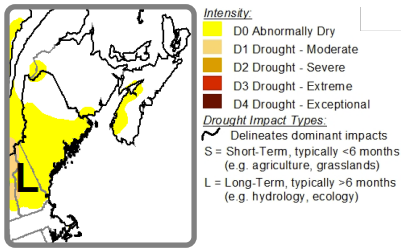



Spring percent of normal snowfall.

## Spring Snow and Ice

**March snowfall** was **below normal**, ranking as the second-least snowy March on record for Portland, ME, and Concord, NH, and among the 10 least snowy for Boston, MA. The **snow depth** at the end of March was **well below normal** across the Maritimes. **April snowfall** was **below normal** for most of the region, except northwestern New Brunswick and northern Maine. There was **little to no snow on the ground** in the Maritimes as of April 30. The snow pack **melted much earlier than normal** in parts of New Brunswick, which normally have a snow depth of up to 20 cm (8 in.) at the end of April. There was **little snowfall** during **May**, somewhat less than what is typical. **Spring snowfall** ranged from 25% of normal to near normal for most areas, except northern New Brunswick, which was snowier (map left). Concord, NH, had its **least snowy spring** on record, seeing only a trace, while Boston, MA, and Portland, ME, had one of their five least snowy springs.

The Saint John River at Fredericton, N.B., iced up on January 20 and cleared of ice on March 25, making this the **10th-shortest ice season** since 1825. The river's **peak spring freshet water level** occurred on April 2, the **second-earliest date** for peak water level at Fredericton. The early peak was due to milder-than-normal weather and below-normal snowfall. In early **March**, the **Gulf of Saint Lawrence** was **just 17% ice covered**, well below the median of 42%, and in early April, was only 0.2% ice covered, well below the median of 17%. The Gulf was ice free by mid-April, **ending the ice season around six weeks early** and representing the **second-lowest ice season** on record. The reduced sea ice coverage made mussel harvesting easier in P.E.I. and allowed New Brunswick's snow crab fishery to start up to four weeks early, potentially **increasing revenue** and **reducing risks for right whales**.




North American Drought Monitor from May 31, 2021.

## Drought Conditions

During **March**, **moderate drought** persisted in New Hampshire. **Abnormal dryness** expanded in New England and lingered in P.E.I. and Nova Scotia. During **April**, **conditions worsened** in New England and abnormal dryness lingered in the Maritimes. During **May,** dryness eased in much of Massachusetts and P.E.I., was introduced in New Brunswick, and persisted in Nova Scotia, Maine, and New Hampshire. **Dry conditions** enhanced the risk of **fires** during spring, with an early start to the season and a large number of fires in Maine. Nova Scotia implemented burning restrictions in March due to **several grass fires**. In March, New Hampshire farmers noted **low groundwater levels** were not able to meet the demands of livestock. The aquifers that provide drinking water to Dover, NH, were around 0.6 m (2 ft.) in early spring. Some New England locations such as Ipswich and Falmouth, MA, enacted **water restrictions**. Low streamflow was found in parts of Maine, which affected recreational activities. **Low lake and stream levels** were also found in western Nova Scotia. Some Maritimes growers were able to get into fields that are typically too wet in April, with field activities taking place **1 to 2 weeks earlier** than usual. Dry conditions may limit the deer tick population despite numerous dog ticks this spring.

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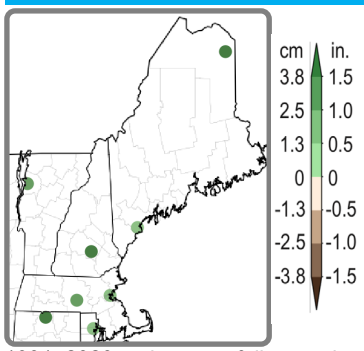
# Regional Impacts – *March–May 2021*

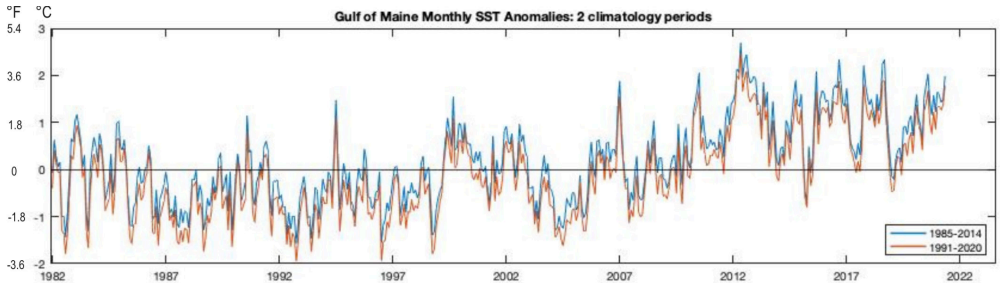



1991–2020 spring snowfall normals minus 1981–2010 spring snowfall normals.

## Updated Climate Normals

Climate "normals" are **three-decade averages of climatological variables** that represent average climate conditions at a location and serve as a baseline to show how current (and predicted) conditions compare to those average conditions. Normals are updated every decade, with an update for the **30-year period of 1991–2020** occurring in May in the U.S. (updated normals for Canada are still being calculated). The 1991–2020 normals show that the **Northeast U.S. has warmed**, due in large part to climate change. With warmer normals, New England may not see as many above-normal days because the **baseline for comparison got warmer**. Above-normal days of the past have now become more normal. Changes in precipitation vary. **March snowfall increased** in New England, contributing to a **slight increase** in **snowfall** for the three-month **spring** period.

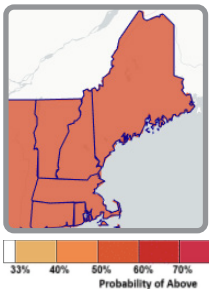
The graph below shows monthly **sea surface temperature** (SST) anomalies averaged over the Gulf of Maine and Bay of Fundy using two different 30-year climatological periods: 1985–2014 (blue) and 1991–2020 (orange). Because of **steadily rising SSTs** in the region, anomalies from the warmer 1991–2020 period are weaker, but still show almost **continuous positive (warm) anomalies** beginning around 2010.

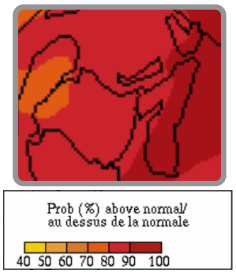



Thirty-year averages were also updated for the **Atlantic hurricane season**. See Regional Outlook section for details.

# Regional Outlook – *Summer 2021*

## Temperature and Precipitation

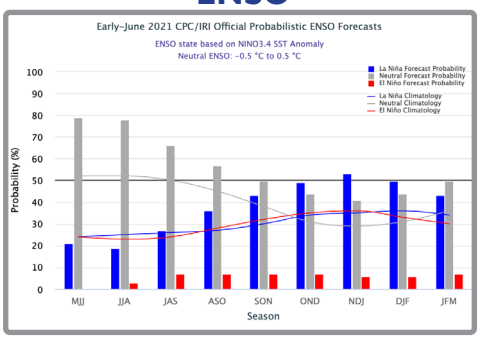



For **June–August**, NOAA's Climate Prediction Center (CPC) and Environment and Climate Change Canada (ECCC) favor **above-normal temperatures** for the entire region. CPC predicts an increased likelihood of **above-normal precipitation** for New England, while ECCC favors **below-normal precipitation** for much of the Maritimes.

CPC temperature map (above left) produced May 20. ECCC temperature map (above right) May 31.

## ENSO




During May, **ENSO-neutral conditions** continued in the equatorial Pacific Ocean. NOAA's Climate Prediction Center indicates there is a 78% chance ENSO-neutral conditions **will continue** during summer and a 50% chance of ENSO-neutral conditions during fall.

## Atlantic Hurricane Season

Thirty-year averages were updated for the **Atlantic hurricane season**, with the average season now having 14 named storms, including seven hurricanes and three major hurricanes. This is an increase of two named storms and one hurricane.

| | 2021 Atlantic Season Outlook | 1991-2020 Average Season | 1981-2010 Average Season |
|---|---|---|---|
| Number of Named Storms | 13-20 | 14 | 12 |
| Number of Hurricanes | 6-10 | 7 | 6 |
| Number of Major Hurricanes | 3-5 | 3 | 3 |

In mid-May, NOAA released the **2021 Atlantic hurricane season outlook** which indicates an **above-normal season** is most likely, with "a likely range of 13–20 named storms, of which 6–10 could become hurricanes, including 3–5 major hurricanes (Category 3 or higher)." An above-average season is favored due to several factors including ENSO-neutral conditions, warmer-than-normal sea surface temperatures, and weaker trade winds. The season runs from June 1–November 30, peaking from mid-August–late October. The **season started early** for the **seventh consecutive year**, with Tropical Storm Ana forming on May 22.

## Contacts

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