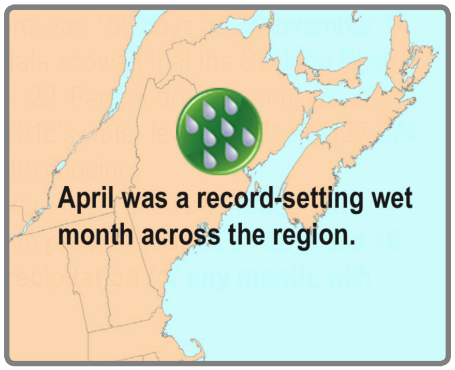
Quarterly Climate Impacts and Outlook

Gulf of Maine Region

June 2019

Gulf of Maine Significant Events – *March–May 2019*



March:

From **March 3 to 5**, an **intense storm** dropped up to 40 cm (16 in.) of snow on the region, with the greatest **snow totals** in eastern Massachusetts and Downeast Maine. The highest **wind gusts** of up to 95 km/h (59 mph) were reported in Nova Scotia, with Les Suêtes winds reaching 167 km/h (104 mph). An aircraft slid off the runway at Halifax Airport in Nova Scotia due to the storm, and a commuter jet missed the runway when attempting to land during the storm at Presque Isle Airport in Maine.

April:

A **powerful storm** moved through the region from **April 3 to 4**. The greatest snow totals of up to 30 cm (12 in.) fell in northern Maine and northern and central New Brunswick, while the greatest rain totals of up to 85 mm (3 in.) were reported in Nova Scotia. Wind gusts of up to 110 km/h (68 mph) knocked down trees and wires, leaving more than 36,000 customers without power in New Brunswick and Nova Scotia. **Whiteout conditions** led to closed roads, stranded vehicles, and accidents.

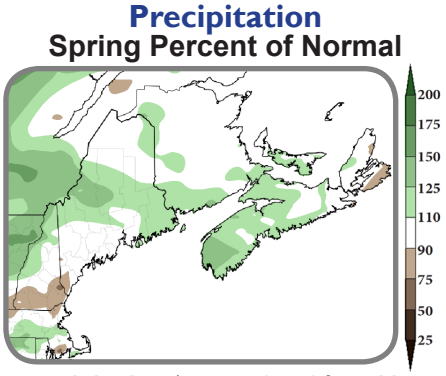
From **mid- to-late April**, a series of storm systems brought **milder temperatures and significant rain** to the region. In the 11-day period from April 18 to 28, up to 130 mm (5 in.) of rain fell in the Maritimes. The snowpack in New Brunswick and Maine melted rapidly. On April 22, the snow depth in Caribou, ME, finally dropped to a trace, making a **record 163 consecutive days** with at least 1 inch of snow on the ground from November 10, 2018 through April 21, 2019. The previous record was 155 days from November 17, 2002 through April 20, 2003. The rainfall, snowmelt, and ice jams led to **flooding**. Preliminary data showed that the St. John River at Ninemile Bridge, ME, had its **largest peak streamflow** in its 67-year period of record on April 22. Farther downstream, the St. John River's **peak water level** in Fredericton on April 23 was 8.374 m (27.474 ft.), surpassing 2018's water level of 8.313 m (27.274 ft.) and making it the **third highest level** on record. See Regional Impacts for more details on the flooding.

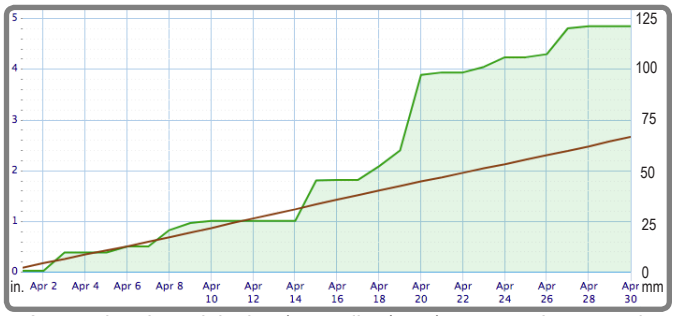
This April ranked as the **wettest on record** at several Maritimes stations, including Fredericton, N.B., and Greenwood, N.S., while Boston, MA, and Concord, NH, had their **greatest number of April days with measurable precipitation** at 21 days and 19 days, respectively. In fact, for Boston it was the **greatest number for any month**, with records back to 1872.

May:

There were **no large storms with significant impacts** during May, but **several low pressure systems** brought up to 230 mm (9.00 in.) of rain to parts of the Maritimes during the second half of May, causing minor flooding. Despite an **above-average number of days with measurable precipitation**, monthly precipitation totals varied. For example, Boston, MA, had 19 days with measurable precipitation, a **record number for May**, and 50 spring days with measurable precipitation, tying as the **greatest for the season.** However, the site received only 96% of normal May precipitation. Caribou had its **third snowiest season** (October to May) on record.

Regional Climate Overview – *March–May 2019*





Accumulated precipitation (green line/area) compared to normal (brown line) during April at Caribou, ME.

Spring precipitation (accumulated from March–May) was **near to above normal** in most areas but ranged from 75% to 150% of normal. **March was a dry month**, with precipitation ranging from 25% of normal to near normal for most areas. However, western Nova Scotia was wetter. **April was very wet**, with precipitation ranging from near normal to more than 200% of normal. **May precipitation varied**, ranging from 50% of normal in western New Brunswick, southern New Hampshire, and northern Massachusetts to 175% of normal in western Nova Scotia, western Maine, and northern New Hampshire.

U.S. precipitation normals based on 1981–2010 data; Canadian precipitation normals based on 2002–2018 data.

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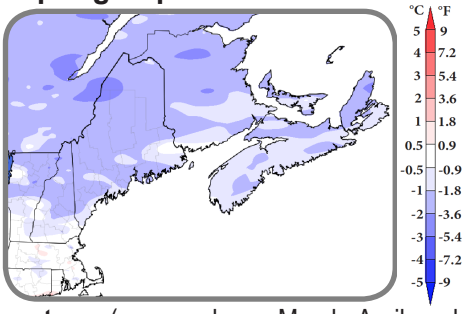
Regional Climate Overview – *March–May 2019*

Temperature

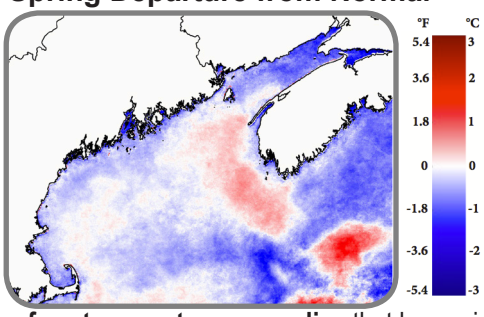
Spring Departure from Normal



Spring temperatures (averaged over March, April, and May) were as much as 3°C (5°F) **below normal**. **March was a cold month**, with temperatures ranging from 3°C (5°F) below normal to near normal. **April temperatures varied**, ranging from 1°C (2°F) below normal in Maine and much of New Hampshire up to 2°C (4°F) above normal in Massachusetts, with most of the Maritimes near normal. **May temperatures** were as much as 4°C (7°F) **below normal**, with the coldest areas in Nova Scotia and P.E.I. This May ranked among the **five coldest on record** for several Maritimes sites.

Sea Surface Temperatures

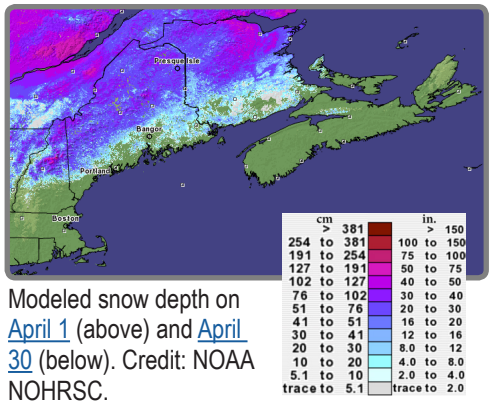
Spring Departure from Normal



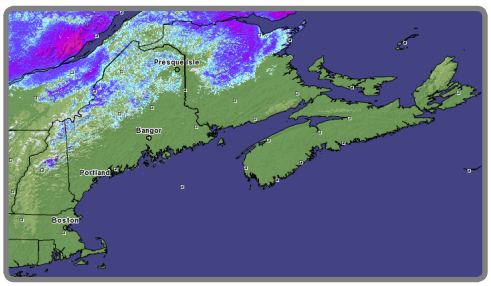
Cold sea surface temperature anomalies that began in winter **continued into spring** with temperatures 1°C (2°F) below the 30-year average over Scotia Shelf and in the Bay of Fundy and around 0.5°C (1°F) below average in coastal regions of the Gulf of Maine and immediately north of Georges Bank. Elsewhere in the Gulf, anomalies were weak and a warm region [around 0.5°C (1°F)] was present southwest of Nova Scotia.

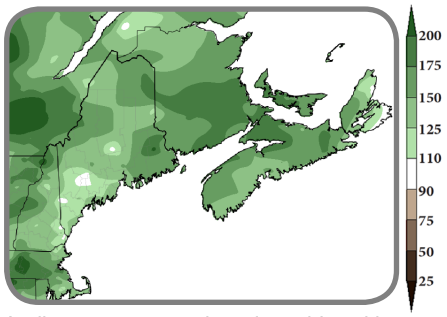
SST normals based on 1985–2014 data
Temperature normals based on 1981–2010 data.

Regional Impacts – *March–May 2019*



Modeled snow depth on April 1 (above) and April 30 (below). Credit: NOAA NOHRSC.





April was a wet month region-wide, with precipitation up to 200% of normal.

Spring Conditions

While **March** temperatures were colder than normal, there was **below-normal precipitation** and, in turn, **below-normal snowfall for most of the region**. Snow depth at the end of March was little to nonexistent for many areas. However, cold temperatures allowed the **deep snowpack** already in place **in northern and western Maine and northern New Brunswick** to linger. In fact, Caribou, ME, had its second highest average snow depth for March at 98.8 cm (38.9 in.). High snowbanks approached power lines in parts of New Brunswick, prompting NB Power to warn people of a risk of electrical shock. The **weight of heavy snow** caused cracks in the walls at Bathurst Mall, N.B., and caused some roofs to collapse in Maine. Persistent winterlike conditions allowed the ice fishing season to be extended by three weeks in northern Maine and caused a slow start to maple season. **Cold water temperatures** caused a die-off of 10,000 Atlantic salmon at a fish farm along Nova Scotia's South Shore. Heavy sea ice in the Northumberland Strait and the Cabot Strait impacted shipping.

During **April**, the **active storm track** was **over the Gulf of Maine region**, leading to **persistently wet conditions** and **above-normal monthly precipitation totals**. The first half of the month was generally cold and snowy, while the second half of the month was warm and rainy. **April snowfall totals varied**, with the largest deficits in P.E.I. and Cape Breton, N.S., and the largest surpluses in southwestern New Brunswick and central Nova Scotia. By the end of the month, there was **little to no snow cover** anywhere except in parts of northern New Brunswick. **High winds** delayed the start of the spring lobster season by several days in P.E.I. The wet April conditions left fields soggy, which caused delays for farmers.

Planting and fieldwork delays continued in May due to **cool temperatures and numerous days with precipitation**. Multiple trails, including the Katahdin trails, in Baxter State Park were **not expected to open until mid-June** due to snow at higher elevations, running water on trails, and high water levels. Similarly, off-highway recreational vehicle trails in parts of New Hampshire opened later than usual. Saturated ground and strong winds caused power outages in Maine. Due to the cool, wet spring, insects were slow to get moving and there could be an increased number of mosquitoes.

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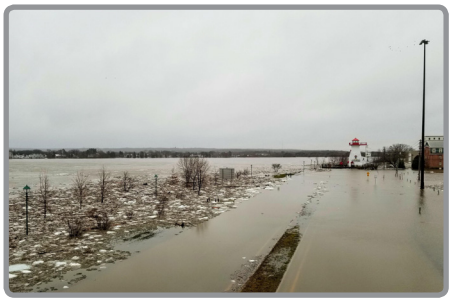
Regional Impacts – *March–May 2019*



Flooding in Fredericton, N.B., on April 23, 2019. Credit: Rick Fleetwood.

An ice jam near Washburn, ME, on April 19, 2019. Credit: NWS Caribou.

Spring Flooding

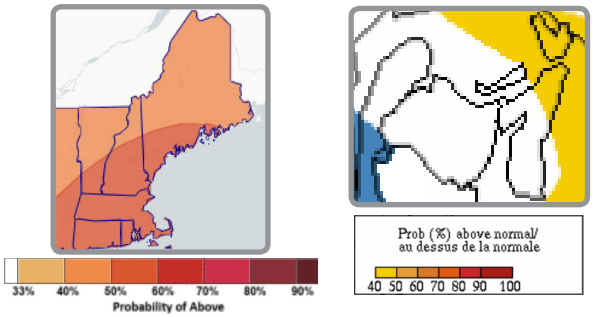
Rainfall, snowmelt, and ice jams caused flooding in the region from **mid-April to early May**. Several gauges along the St. John River in New Brunswick had near-record water levels, resulting in **significant flooding**. Houses, businesses, and parking lots were inundated, and hundreds of residents evacuated. More than 145 **roads were closed**, including a portion of the Trans-Canada Highway, and ferries were suspended. Schools and offices were closed. Ice struck five power poles, snapping them and causing a power outage. The river at many locations remained **near or above flood stage for about 2 weeks**. High water levels, **large waves**, and ice also caused damage to homes and roads around Grand Lake, N.B. Financial assistance is available to New Brunswick residents affected by flooding. **Minor to moderate flooding** occurred in Maine and New Hampshire, with high water closing roads and bridges and damaging several homes. Preliminary data from the U.S. Geological Survey showed that **peak streamflow** ranked among the 10 largest on record at 15 sites in Maine and four sites in New Hampshire.

Climate Change in Canada

Two Canadian **climate change reports** were recently released. The Department of Fisheries report found climate change is leading to declines in some species of sea life but increases in others due to **warmer sea temperatures**. Another report led by Environment and Climate Change Canada found that "The **effects of widespread warming** are evident in many parts of Canada and are projected to intensify in the future."

Regional Outlook – *Summer 2019*

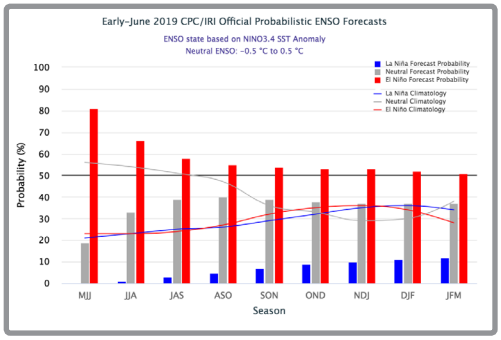
Temperature and Precipitation



For **June–August**, NOAA's Climate Prediction Center (CPC) favors above-normal temperatures for New England. Environment and Climate Change Canada (ECCC) predicts an increased chance of above-normal temperatures for Cape Breton and eastern Nova Scotia, with equal chances of below-, near-, or above-normal temperatures for the rest of the Maritimes. ECCC favors above-normal precipitation for June–August for much of New Brunswick. Equal chances were forecast for the rest of the region.

CPC temperature map (above left) produced May 16.
ECCC temperature map (above right) produced May 31.

ENSO



Weak El Niño conditions formed in January and **persisted through May**. NOAA's Climate Prediction Center indicates there is an 66% chance that the weak El Niño will continue through summer and a 50% to 55% chance it will continue through fall and winter.

Atlantic Hurricane Season

NOAA's 2019 Atlantic hurricane season outlook says **a near-normal season is most likely**, with "a likely range of 9 to 15 named storms [winds of 63+ km/h (39+ mph)], of which 4 to 8 could become hurricanes [winds of 119+ km/h (74+ mph)], including 2 to 4 major hurricanes [Category 3, 4, or 5; winds of 179 km/h (111+ mph)]." The season started early with the short-lived Subtropical Storm Andrea in May. The season runs from June 1 to November 30, peaking from mid-August to late October.

	2019 Atlantic Season Outlook	Average Season
Number of Named Storms	9-15	12
Number of Hurricanes	4-8	6
Number of Major Hurricanes	2-4	3

Contacts

National Oceanic and Atmospheric Administration

Environment and Climate Change Canada

Northeast Regional Climate Center

To receive this publication every quarter:
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National Integrated Drought Information System

Northeast Regional Association of Coastal Ocean Observing Systems

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