



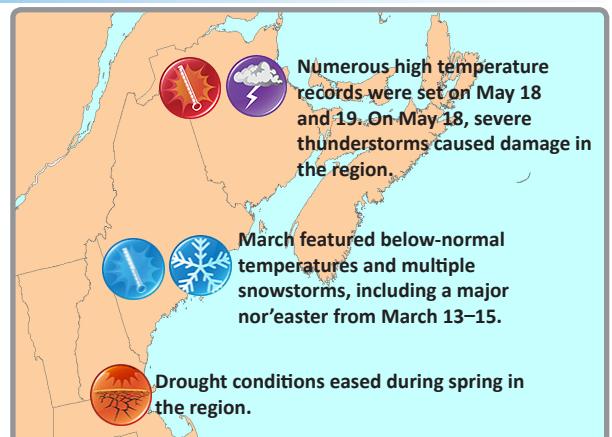
Gulf of Maine Significant Events - March–May 2017

By early May, the three New England states were **free of drought** for the first time since June 2016. Drought conditions also eased in the Maritimes. See Regional Impacts section for details.

From March 13–15, a **major nor'easter** brought up to 61 cm (24 in.) of snow and wind gusts of up to 124 km/h (77 mph) to the region. A peak gust of 156 km/h (97 mph) was recorded in the Cape Breton (N.S.) Highlands. Blizzard conditions occurred for four hours in Lawrence, MA. More than 150,000 customers in the three New England states, and more than 40,000 customers in the Maritimes lost power.

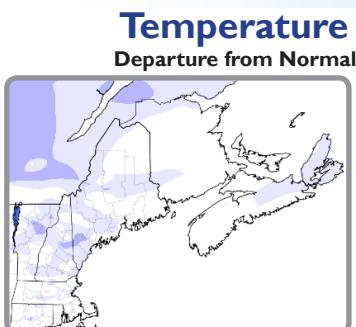
Several other storms hit the region in March. From March 21–22, Nova Scotia received **freezing rain** and up to 25 cm (10 in.) of snow, which left thousands without power. Up to 30 cm (12 in.) of snow and wind gusts of up to 100 km/h (62 mph) created **blizzard conditions** in parts of the Maritimes from March 22–23. A series of low pressure systems brought up to 50 cm (20 in.) of snow and wind gusts of up to 100 km/h (62 mph) to Nova Scotia from March 29–April 4. **Persistent northerly winds** from the storms caused an [unusually large amount of ice](#) to build up around parts of Cape Breton, N.S., and P.E.I.'s North Shore. A ferry was [trapped in the ice](#) off the Cape Breton coast for several hours on April 4, and other ferry crossings were delayed due to ice, high winds, and high seas. In New England, a storm from March 31–April 1 brought up to 48 cm (19 in.) of snow, up to 100 mm (4 in.) of rain, and strong winds, resulting in downed trees, power outages, and some flooding. At the end of March, New Brunswick had almost two times the normal amount of snow on the ground. Caribou, ME, had 30 cm (12 in.) or more of snow on the ground for 132 consecutive days (November 30, 2016–April 10, 2017), which is the **longest stretch on record** and 12 days longer than the previous record set in 1968–69.

Up to 190 mm (7.5 in.) of rain fell in the eastern Maritimes from May 5–11. In Nova Scotia, the **heavy rain washed out roads** and flooded basements in Cape Breton and contributed to Sydney and Ingonish Beach having their wettest May since 1870 and 1950, respectively. There was also localized flooding and erosion in western P.E.I.



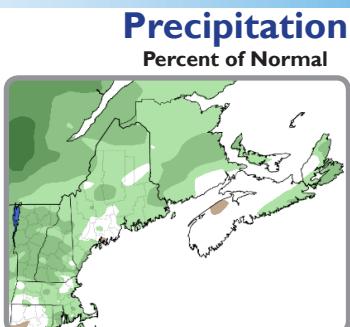
Spring featured several **temperature extremes**. On March 11, Caribou, ME's high of -18°C (-1°F) was its second coldest March high temperature on record. Wind chill values across the region were as low as -36°C (-33°F). On May 18 and 19, highs reached up to 35°C (95°F). A few New England sites had one of their top five warmest spring days. Records were set in the Maritimes as well. On May 18, a strong cold front sparked **severe thunderstorms**. In New England, the storms downed numerous trees. In New Brunswick, winds of up to 190 km/h (118 mph) knocked down power poles, leaving more than 7,000 NB Power customers without power and [cutting off Lamèque Island](#) from the mainland.

Regional Climate Overview - March–May 2017



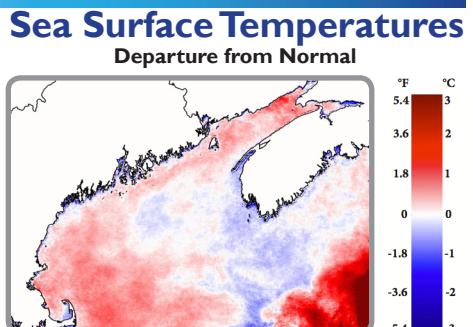
Spring temperatures (averaged over March, April, and May) ranged from 2°C (4°F) below normal to near normal. **March** temperatures ranged from 4°C (7°F) below normal in portions of Maine and New Hampshire to near normal in northeastern P.E.I. and Cape Breton, N.S. **April** temperatures ranged from near normal in much of the Maritimes to 3°C (5°F) above normal in eastern Massachusetts and parts of Maine and New Hampshire. Numerous temperature records were set in the Maritimes when highs reached 26°C (79°F) from April 10–12, lows dropped to -9°C (16°F) on April 19, and highs reached 25°C (77°F) from April 27–29. **May** temperatures ranged from 2°C (4°F) below normal to near normal for most of the region, with the coolest spots in southern New Hampshire, southern Maine, and Cape Breton, N.S.

Temp and precip normals based on 1981–2010 data.



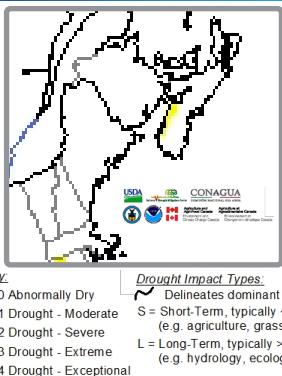
Spring precipitation (accumulated from March–May) ranged from 75% to 150% of normal. **March** precipitation ranged from 50% of normal to near normal for a majority of the region, with the main exceptions being far northern Maine and portions of northern New Brunswick and Cape Breton, N.S. **April** precipitation ranged from less than 50% to more than 175% of normal. The driest areas were portions of southern New Brunswick, central and eastern P.E.I., and Cape Breton and northern Nova Scotia. Eastern Massachusetts was the wettest area. **May** was quite wet, with precipitation generally ranging from 110% to more than 200% of normal. The wettest areas were in eastern Nova Scotia, eastern New Brunswick, and much of P.E.I.

Sea surface temperature anomalies based on 1985–2017.
Mean SST anomalies from NOAA AVHRR data. Credit:
University of Maine School of Marine Sciences and NERACOOS



Spring sea surface temperatures were around 0.5°C (1°F) warmer than normal over most of the western Gulf of Maine, the Bay of Fundy, Georges Bank, and areas greater than 5 km (3 miles) off the Maine coast. Over much of the eastern Gulf of Maine and the southern Scotian Shelf, temperatures were up to 0.3°C (0.5°F) below normal. In waters close to the Maine coast and eastern Cape Cod Bay, temperatures were around 0.5°C (1°F) below normal. While the two-year-long trend of region-wide warm anomalies continued in March, the cold anomalies were primarily the result of colder surface temperatures developing in April and May. Above-average sea surface temperatures over the past few years in the Bay of Fundy contributed to an increased number of [sea lice outbreaks](#) since 2012, including one in 2016 that resulted in the death of more than 500,000 farmed salmon.

Regional Impacts - March–May 2017



Above: May 2017 North American Drought Monitor. Below: Typical minor spring flooding along the St. John River in Fredericton, NB, on April 29, 2017.
Credit: Rick Fleetwood.



Drought

While March [average streamflow](#) was generally normal or below normal in the three states (except in northern Maine), April and May average streamflow was normal or above normal. Groundwater and reservoir levels increased, returning to normal or above normal in most areas, but remaining below normal in a few areas. The Massachusetts Water Resources Authority continued to urge customers to conserve water as the Quabbin Reservoir was at 82.1% of capacity on April 1 and 85.7% on May 1, which was below normal. On April 20, Manchester, NH, officials lifted voluntary water restrictions that had been in effect since October 2016 as the city's water supply had returned to full capacity. With improving conditions, [drought declarations eased in Massachusetts](#). Even though drought conditions improved, impacts from it continued to be reported. Scientists estimate it could take Maine's wild brook trout population [up to four years to recover](#) from the drought, which dried up waterways, led to low water levels, and made stranded trout easy prey. The drought killed winter ticks by depriving them of moisture, which in turn helped more moose calves in Maine and New Hampshire survive the winter. Preliminary data from [New Hampshire](#) and [Maine](#) indicated there was a dramatic reduction in moose calf mortality this year compared to last year.

Spring Conditions

Snow removal costs went [further over budget](#) in Bangor and Portland, ME, due to multiple snowstorms in March. A few New England ski resorts were able to remain open through mid-April due to a deep snow pack. Colder-than-normal conditions during March contributed to [a slow start](#) to the elver (young eel) season in Maine, but allowed the ice fishing season in northern parts of the state to be extended by two weeks (from April 1 to April 16). The cold March and a warm April negatively [affected maple syrup production](#). Seasonal snowmelt, ice jams, and several rounds of heavy rain led to [minor flooding](#) in parts of New Brunswick and northern Maine in late April and early May. The main impacts were [flooded basements and closed roads](#). Residents in Doaktown, N.B., were under a boil water advisory [for several weeks](#). Wet conditions in April and May [delayed planting](#) and field work in the region, but helped [pastures green up](#). Due to saturated ground, [spring weight restrictions](#) were left in place for an extra week in northern New Brunswick. In April, the start of fire season was [delayed in New Brunswick](#) due to wet conditions and in late May, burned forested area was only 10% of the 10-year average. However, drier conditions in May in Nova Scotia led to increased fire risk, burn restrictions, and [several forest fires](#). Cool, stormy conditions in May contributed to [lower lobster landings and higher lobster prices](#) in P.E.I.

Regional Outlook - Summer 2017

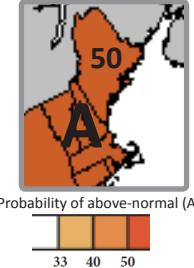
Temperature and Precipitation

For June–August, [Environment and Climate Change Canada \(ECCC\)](#) and [NOAA's Climate Prediction Center \(CPC\)](#) are calling for an increased chance of above-normal temperatures for the entire region. For precipitation, CPC is predicting equal chances of below-, near-, or above-normal precipitation for June–August, while ECCC is forecasting an increased chance of below-normal precipitation in the southern half of Nova Scotia and equal chances elsewhere. With [ENSO-neutral conditions](#) expected during summer, ENSO was not a major factor in the outlooks. The forecast for New England was based on computer models and long-term climate trends.

New England and southwestern Nova Scotia were drought-free as of early June, but [conditions continue to be monitored](#) as drought could redevelop if there were a long period of dryness and unusually warm temperatures.



ECCC temperature map (left) produced on May 31. CPC temperature map (right) produced on May 18.



Atlantic Hurricane Season

	2017 Atlantic Season Outlook	Average Season
Number of Named Storms	11–17	12
Number of Hurricanes	5–9	6
Number of Major Hurricanes	2–4	3

NOAA's 2017 Atlantic hurricane outlook indicates there is a 45% chance that this season will be more active than normal, a 35% chance the season will be near-normal, and a 20% chance the season will be below normal. With an above-normal season most likely, the outlook calls for "a 70% likelihood of 11–17 named storms (winds of 63 km/h [39 mph] or higher), of which 5–9 could become hurricanes (winds of 119 km/h [74 mph] or higher), including 2–4 major hurricanes (Category 3, 4 or 5; winds of 179 km/h [111 mph] or higher)." The Atlantic hurricane season runs from June 1 through November 30, with a peak from mid-August to late October. However, there has already been a tropical system this year (which was accounted for in the forecast): Tropical Storm Arlene in April. The system was short-lived and did not impact land, but according to NOAA's National Hurricane Center, it was only the second tropical storm in April since satellite data began.

Factors leading to the forecast for an above-normal season included near- to above-average sea surface temperatures in the main area of the Atlantic where hurricanes develop, near- to weaker-than-average vertical wind shear (change in direction and/or speed with altitude) in this main development area, and expected ENSO-neutral or weak El Niño conditions.

Gulf of Maine Region Partners

Environment and Climate Change Canada

www.ec.gc.ca

Northeast Regional Climate Center

www.nrcc.cornell.edu

National Oceanic and Atmospheric Administration

www.noaa.gov

National Centers for Environmental Information

www.ncei.noaa.gov

National Operational Hydrologic Remote Sensing Center

www.nohrc.noaa.gov

NOAA Sea Grant Network

www.seagrant.noaa.gov

Northeast River Forecast Center

www.erh.noaa.gov/nerfc

Climate Prediction Center

www.cpc.ncep.noaa.gov

Regional Climate Services

www.ncdc.noaa.gov/rcsd

Gulf of Maine Research Institute

www.gMRI.org

State Climatologists

www.stateclimate.org

National Integrated Drought Information System

www.drought.gov

Cooperative Institute for the North Atlantic Region

www.cinar.org

Gulf of Maine Council on the Marine Environment, Climate Network

www.gulfofmaine.org/climatennetwork

Northeastern Regional Association of Coastal and Ocean Systems

www.neracoos.org

University of Maine, School of Marine Sciences

www.umaine.edu/marine

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