

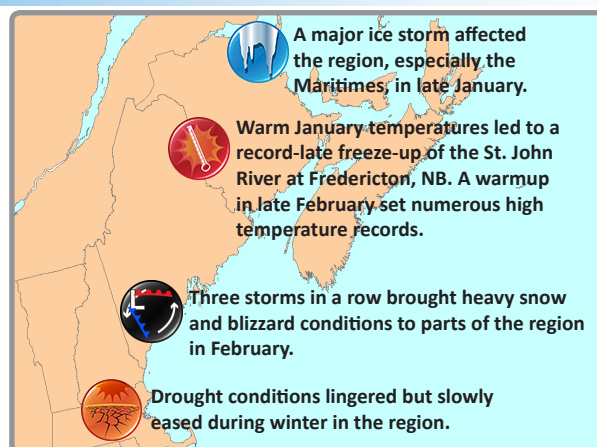


Gulf of Maine Significant Events - December 2016–February 2017

Drought conditions lingered but slowly improved during winter in New England and parts of the Maritimes. By early January, extreme drought had eased in eastern Massachusetts and New Hampshire. By late January, severe drought had eased in eastern Massachusetts and Maine, while moderate drought had eased in New Brunswick and much of Nova Scotia. Conditions continued to improve in Maine during February. See Impacts section for more details.

Three blizzards affected the region in February. The first storm brought up to 61 cm (24 in.) of snow and wind gusts of up to 113 km/h (70 mph) from **February 9–10**. Blizzard conditions occurred for several hours in eastern Massachusetts and southern New Brunswick. Snowfall rates of 5–8 cm (2–3 in.) per hour were reported in New England, as was thundersnow. The second storm brought up to 102 cm (40 in.) of snow and wind gusts of up to 146 km/h (91 mph) from **February 12–14**. There was at least one location in every Maine county that saw at least 61 cm (24 in.) of snow. Blizzard conditions occurred in Nova Scotia and southeastern New Brunswick for 6–10 hours. All public roads in central and southern New Brunswick were restricted to emergency vehicles only. Plowing operations in portions of New Brunswick and Maine were temporarily suspended due to poor conditions. More than 100,000 customers lost power in the region. From **February 15–16**, the third storm brought up to 60 cm (24 in.) of snow and wind gusts of up to 80 km/h (50 mph). Blizzard conditions occurred in parts of New Brunswick for 6–9 hours. On February 16, Andover, ME, had 201 cm (79 in.), or 2 m (6.6 ft.), of snow on the ground, which was the [second greatest one-day snow depth](#) on record for Maine. Due to the storms, February snowfall totaled over 1 m (3 ft.) for many areas in the three provinces and Maine.

A major ice storm brought mixed precipitation and wind gusts of more than 100 km/h (62 mph) from **January 24–26**. Southern New Brunswick experienced 6–12 hours of freezing rain. Northern New Brunswick experienced a prolonged freezing rain event, with some coastal areas reporting 24–30 hours of freezing rain and up to 50 mm (2 in.) of ice accumulation. See Impacts section for details.

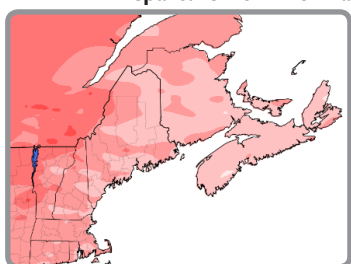


A powerful storm brought mixed precipitation and wind gusts of up to 158 km/h (98 mph) to the region from **December 29–31**. Thundersnow was reported in parts of New England. Snowfall rates were up to 15 cm (6 in.) per hour. The greatest snow totals of up to 69 cm (27 in.) were reported in Maine, where more than 100,000 customers lost power. The weight of the snow caused an air-supported indoor practice dome at the University of Maine to collapse. More than 45,000 customers lost power in the Maritimes. Strong winds and storm surge [washed up a large number](#) of lobsters, crabs, and clams on the beach in Val-Comeau, NB.

Regional Climate Overview - December 2016–February 2017

Temperature

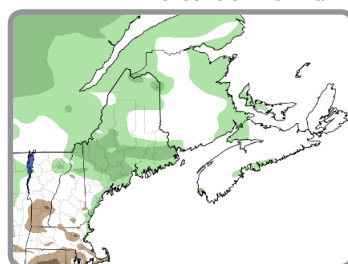
Departure from Normal



Winter temperatures (average of December–February) were 1°–3°C (2°–5°F) above normal. **December** temperatures ranged from 2°C (4°F) below normal to 2°C (4°F) above normal, with most areas within 1°C (2°F) of normal. **January** temperatures were 1°–5°C (2°–9°F) above normal. January's warmth contributed to the St. John River at Fredericton, NB, having its latest freeze-up (since 1825) on February 2, 2017. In 2016, the river had its second earliest ice break up (Feb. 20), resulting in the longest open water season (348 days) in more than 190 years. **February** temperatures were 1°–3°C (2°–5°F) above normal. From **February 23–26**, more than 60 max temperature records were set, with some sites setting records three days in a row. With highs near 20°C (68°F), Boston, MA; Concord, NH; and Greenwood, NS, had their warmest February day on record on the 24th or 25th.

Precipitation

Percent of Normal



Winter precipitation (accumulated from December–February) ranged from 75% of normal in parts of eastern Massachusetts to 150% of normal in portions of Maine, with most areas seeing near to above-normal precipitation. **December** precipitation ranged from 50% of normal in southeastern Massachusetts, southern New Brunswick, and northern Nova Scotia to 150% of normal in the western half of Maine. **January** precipitation ranged from 50% of normal in central and southern New Hampshire to 200% of normal in Cape Cod, MA and northwestern New Brunswick to 175% of normal in parts of Maine.

Temp and precip normals based on 1981–2010 data.

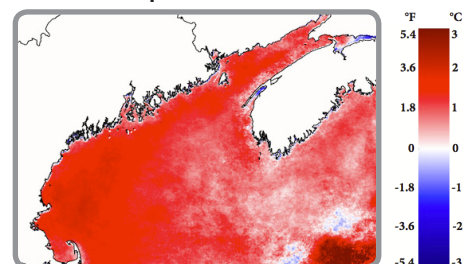
Sea surface temperature anomalies based on 1985–2017.

Mean SST anomalies from NOAA AVHRR data. Credit:

University of Maine School of Marine Sciences and NERACOOS

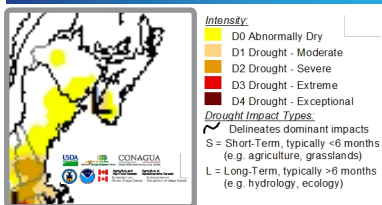
Sea Surface Temperatures

Departure from Normal



Winter sea surface temperature anomalies in the Gulf of Maine were warmer than average over most of the region (except the eastern Minas basin and some Gulf Stream-influenced regions outside the Gulf of Maine). Temperatures over coastal areas of eastern Maine, New Brunswick, and Nova Scotia were 0.5°C (0.9°F) to 1.5°C (2.7°F) above average. Off the coast of western Maine, Massachusetts, and in Wilkinson basin, temperatures were 2.0°C (3.6°F) above average. Temperatures were 0.5°C (0.9°F) to 1.5°C (2.7°F) above average over Jordan basin, in the central Gulf of Maine, and Scotian Shelf. There was a general trend of warmer anomalies in western portions of the central Gulf of Maine. These warm anomalies continue a region-wide warm surface ocean period that began in September 2015.

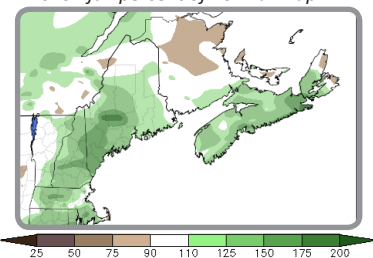
Regional Impacts - December 2016–February 2017



Above: February 2017 North American Drought Monitor.



Above: Ice on a pole near Miramichi, NB. (Credit: Rick Fleetwood). Below: Winter snowfall percent of normal map.



Drought

Streamflow on New England's waterways was near to below normal in December and near to above normal in January and February. Streamflow also returned to near to above normal in the Maritimes. Groundwater and reservoir levels increased slowly during winter, returning to near normal in some areas, but remaining below normal in other areas. For instance, the Emergency Declaration issued for Ipswich, MA, in mid-September due to a water supply shortage was terminated on January 26 because the town's [water supply had recharged](#). However, the Massachusetts Water Resources Authority continued to urge its customers to conserve water as the Quabbin Reservoir hovered just below normal capacity since mid-November.

January 24–26 Ice Storm

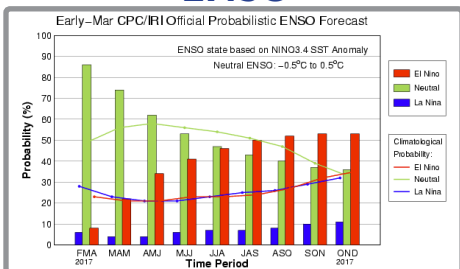
A major ice storm affected the region in late January. Up to 50 mm (2 in.) of ice accumulated in New Brunswick, downing trees, poles, and wires. NB Power estimated up to [400 power poles were brought down](#) and in need of replacement. [More than 200,000](#) NB Power customers lost power, surpassing Hurricane Arthur in 2014 to become the [worst crisis in NB Power history](#). Some customers were without power for up to 12 days. Residents of Port Elgin and Miramichi were asked to conserve water until power was restored to the communities' pumps, while water and [food supplies ran low](#) in Tracadie. Gas stations with power had long lines, with some running out of gas. Two died and 45 people were hospitalized for carbon monoxide poisoning. Several communities declared a state of emergency and the military provided assistance. About [12,000 customers](#) in Nova Scotia and 1,600 Maritime Electric customers in PEI [lost power](#). In New England, wind gusts of up to 100 km/h (62 mph) and rough seas caused coastal flooding and beach erosion. Caribou, ME received 106.7 mm (4.2 in.) of sleet. The National Weather Service said, "It was likely one of the biggest sleet storms in northern Maine during the past 75 years." At least [4,500 customers lost power](#) in Maine.

Seasonal Snowfall

December snowfall ranged from near normal to more than 200% of normal, except in eastern Massachusetts, which saw less. [In a news report](#), the National Weather Service estimated that "most roofs in northern and central Maine have 60–90% of the total weight they are designed to handle...", which is more typical of late February. In January, snowfall ranged from less than 25% of normal to near normal, except in Cape Cod, which saw more. In February, snowfall ranged from near normal to more than 200% of normal, except in northern New Brunswick, which saw less. The snowfall [boosted business](#) for Maine ski resorts. Winter snowfall (accumulated from December–February) ranged from 75%–200% of normal.

Regional Outlook - Spring 2017

ENSO



In February, sea surface temperatures in the equatorial Pacific Ocean and atmospheric conditions indicated ENSO-neutral conditions were present. NOAA's Climate Prediction Center [indicates](#) there is around a 60% chance that ENSO-neutral conditions will continue through spring. After that, the chances of El Niño increase to around 50% by autumn.

Spring Flood Potential

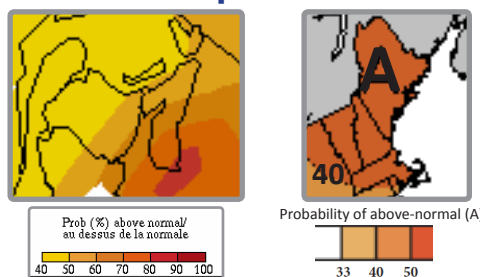


Flooding Type

Major
Moderate
Minor

With near to below-normal precipitation this winter, the flood threat during spring is low in southern New Hampshire and Massachusetts. For much of Maine and northern New Hampshire, [minor flooding is possible](#) due to a deep snowpack and extensive river ice. Very heavy rain can cause flooding at any time of the year, even in areas experiencing drought or that have little to no snow on the ground.

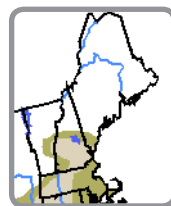
Temperature and Precipitation



For March–May, [Environment and Climate Change Canada \(ECCC\)](#) and [NOAA's Climate Prediction Center \(CPC\)](#) are both calling for an increased chance of above-normal temperatures. CPC calls for equal chances of below-, near-, or above-normal precipitation, while ECCC calls for an increased chance of above-normal precipitation for parts of the Maritimes.

Environment and Climate Change Canada map (above left) produced on February 28. NOAA's Climate Prediction Center map (above right) produced on February 16.

Drought



Drought persists
Drought remains but improves
Drought removal likely
Drought development likely

The [U.S. Drought Outlook](#) for March 16–June 30, 2017 indicates that drought conditions are expected to ease in Maine and eastern Massachusetts. Drought conditions are expected to remain but improve for much of southern New Hampshire.

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
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NOAA Sea Grant Network
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Northeast River Forecast Center
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Climate Prediction Center
www.cpc.ncep.noaa.gov
Regional Climate Services
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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/climatenetwork
Northeastern Regional Association of Coastal and Ocean Systems
www.neracoos.org
University of Maine, School of Marine Sciences
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