



Gulf of Maine Significant Events - December 2017–February 2018

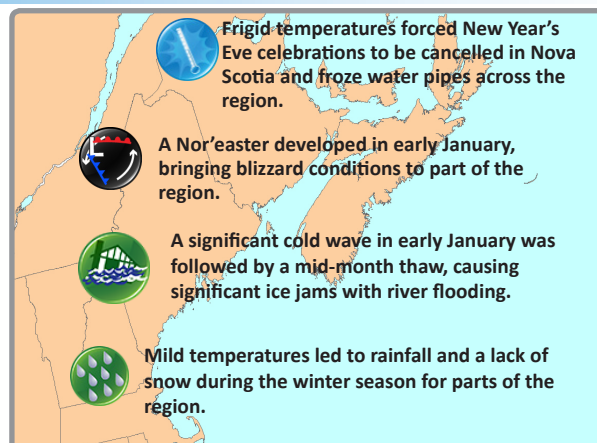
The **first significant storm** of the season, on **December 9-10**, brought 15 to 30 cm (5.9 to 11.8 in.) of snow to parts of New Brunswick. Several thousand customers **lost power** there. The storm was mainly a rain event over Nova Scotia with up to 70 mm (2.8 in.) over Cape Breton.

A complex low-pressure system on **December 23** brought **snow, freezing rain and wind** the region. Several hours of freezing rain occurred over an area extending across Fredericton and Moncton, N.B. and Charlottetown, P.E.I. Areas of Massachusetts saw over 6 mm (0.24 in.) of ice accumulation and more than 20,000 **power outages** were reported in New England. There were numerous vehicle accidents across the region. Grand Etang, N.S. reported peak wind gusts up to 137 km/h (85 mph).

The **December 25-26 Christmas Day/Boxing Day winter storm** brought heavy snowfall to the central and northern New Brunswick area. The greatest snowfall reported was at Bathurst, NB with 46 cm (18.1 in.). High winds brought blizzard conditions, downed poles and trees. Nearly 160,000 customers **lost power** in Nova Scotia which took several days to be restored. New England had reports of snow falling at up to **8-13 cm (3-5 in.) per hour and thundersnow**. Snowfall totals up to 17.8 cm (7 in.) were reported in Massachusetts.

From late **December into early January** there was a **cold snap** with dangerously cold wind chills. Records for **cold temperatures** were broken across the region. **New Year's Eve activities** were cancelled in some communities, **water pipes froze**, and ferries were cancelled. **Thresher sharks were found stranded** in Cape Cod Bay as they tried to swim south to warmer water. The cold snap was followed by an intense Nor'easter **January 4-5 with major impacts across the region**. See Regional Impacts for details.

Mild temperatures and heavy rain led to **flooding January 12-13**. The highest storm total was 130 mm (5.1 in.) in southeast New Brunswick. There were evacuations, **road washouts** and **power outages** in New Brunswick and Nova Scotia. The January thaw created **ice jams and flooding** in New England as well. The mild temperatures were followed by a **rapid freeze**.



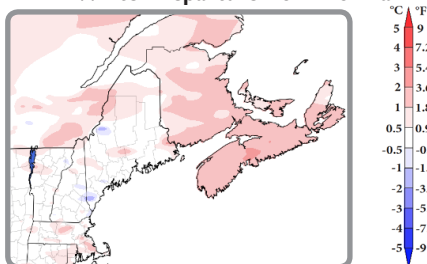
Winds and blowing snow on January 23-24 caused **blizzard conditions** and **school closings** in the Maritimes, while New England received **freezing rain**. On **January 30**, a low-pressure system brought significant snowfall to parts of New Brunswick, causing **slippery roads**. Sites in eastern New Brunswick reported 4 to 7 hours of blizzard conditions.

February had record breaking warmth; see below. Several systems brought **rain and/or snow** throughout the month. On **February 10-12**, a low-pressure system brought mixed precipitation to the Maritimes with Baccaro Point, N.S. receiving up to 70 mm (2.8 in.) of rain.

Regional Climate Overview - December 2017–February 2018

Temperature

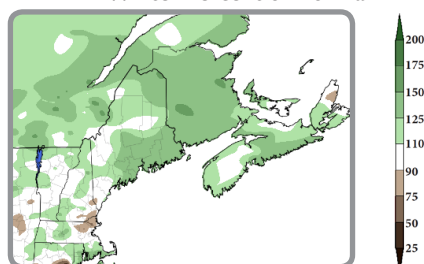
Winter Departure from Normal



Winter temperatures (averaged over December, January, and February) ranged from 1°C (2°F) colder than normal to 2°C (4°F) warmer than normal. **December** temperatures were normal to 4°C (7°F) below normal. The month started warm but was well below normal during the last week. **January** temperatures ranged from 2°C (4°F) below normal to 3°C (5°F) above normal. There were significant fluctuations in January, with sites setting both coldest and warmest daily temperature records. **February** temperatures ranged from 1°C (2°F) to 5°C (9°F) above normal. Boston, MA had its warmest February on record and three sites in Nova Scotia had their second warmest. Concord, NH and Portland, ME had their record warmest single February day. Point Lepreau, N.B. was 4.5°C (8°F) above normal.

Precipitation

Winter Percent of Normal

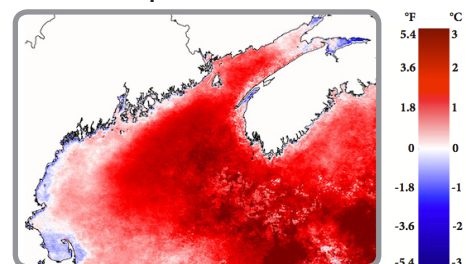


Winter precipitation (accumulated from December–February) ranged from 75% to more than 150% of normal. Caribou, ME had its third wettest winter on record. **December** precipitation ranged from 50%–150% of normal. Precipitation was generally near to below normal across the Maritimes. In **January**, most of the region was normal to wetter than normal. Precipitation ranged from 75% of normal to more than 200% of normal in Maine and New Brunswick. The highest amount was reported at Mechanic Settlement, N.B. with 296 mm (11.65 inches). **February** precipitation ranged from 50% of normal to 200% of normal. Oak Point, N.B. received 196 mm (7.7 in.) of precipitation.

*Temp and precip normals based on 1981–2010 data.
Sea surface temperature anomalies based on 1985–2014.
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 were well above normal over the eastern Gulf of Maine at >2°C (4°F), above normal over the Scotian Shelf and Bay of Fundy at >1°C (2°F), and weaker in the western Gulf of Maine and along the coastal areas of Maine. In the shallowest regions close to the New Hampshire and Massachusetts coasts temperatures were colder than normal, likely a result of strong atmospheric cooling during the cold periods of December and January.

There were 28 **minke whale deaths** in 2017, which is considered an “unusual mortality event” causing the National Oceanic and Atmospheric Administration to launch an investigation. By the end of January there had already been an **additional death** reported, that of a right whale. This is an area of research that will continue to be monitored.

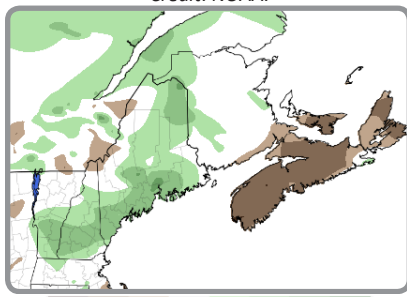
Regional Impacts - December 2017 - February 2018



Credit: NOAA.



Satellite view of January 4 Nor'easter.
Credit: NOAA.



Winter snowfall percent of normal map.

Extreme Temperature Swings

There were [extreme temperature swings](#) from mid December through January. Unusually warm temperatures in December were followed by an unusual cold snap in early January. These back and forth temperatures continued, wreaking havoc on infrastructure, [transportation](#), winter recreation/retailers, and [lawns](#). The agricultural community is also concerned for their [winter crops](#). Cold outbreaks are not uncommon in North American winters, but this year's was [highly unusual](#). Warming winter temperatures have caused more precipitation to fall as rain, creating poor [snowmobile](#) and [ski](#) conditions.

January 4-5 Intense Nor'easter

A [Nor'easter](#) deepened explosively off the East Coast **January 4-5** and brought blizzard conditions, heavy snow, and high winds with hurricane force gusts to the region. It caused cancelled flights and disrupted travel across the region. Downed trees and wires led to [power outages](#). In Nova Scotia, 280,000 customers lost power. There were snowfall rates up to 7.6 cm/h (3 in./h) and thundersnow in northern Maine, eastern Massachusetts, and southwest Nova Scotia. The highest snowfall total, 58.6 cm (23.07 in.) was reported in Bathurst, N.B. The intense drops in pressure resulted in record or near-record low surface pressures in southwestern Nova Scotia and New Brunswick. Extreme high water levels and pounding surf from the storm caused significant flooding and damage along the New England coast and the Atlantic coast of Nova Scotia. Boston, MA had its highest tide on record.

Seasonal Snowfall

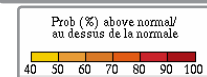
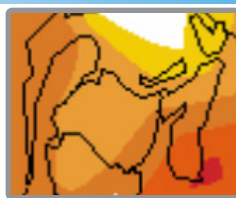
December snowfall ranged from less than 25 to more than 200% of normal. Lack of cold temperatures and snowfall by mid-December [delayed the opening of many ski hills](#) in New Brunswick. Snowfall was well below normal in much of Nova Scotia and P.E.I. Snowfall was near to above normal in New Hampshire and Maine, but near to below normal in Massachusetts. In **January**, snowfall ranged from 25 to 175% of normal. By the end of January, Bathurst and Aroostook, N.B. reported in excess of 100 cm (39 in.) of snow, well above normal. Snowfall in New England ranged widely from 15 cm (6 in.) below normal to 10 cm (4 in.) above normal. **February** snowfall ranged from less than 25 to more than 150% of normal. Part of New England had above-normal February snow due to two [early storms](#) while a majority of the Maritimes had [below-normal snowfall](#). At the end of February there was no significant snow on the ground south of Fredericton, N.B. Averaged over three months, **winter** snowfall ranged from 50% of normal over [Nova Scotia](#) and parts of [P.E.I.](#) to over 150% of normal over parts of New England and western New Brunswick.

Regional Outlook - Spring 2018

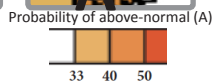
Temperature and Precipitation

For March–May, the [Environment and Climate Change Canada \(ECCC\)](#) and [NOAA's Climate Prediction Center \(CPC\)](#) temperature outlooks favor above-normal temperatures.

ECCC had no conclusive signal for March–May precipitation for the Maritimes. CPC was forecasting an increased chance of above-normal precipitation for New England.

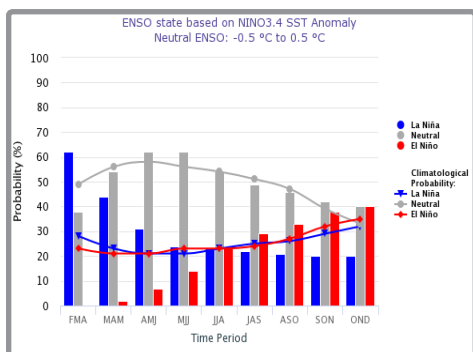


ECCC temperature map (left) produced on February 28.
CPC temperature map (right) produced on February 15.



La Niña

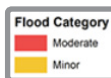
La Niña conditions were present in the equatorial Pacific Ocean from mid-December through February. According to CPC, a transition from [La Niña to ENSO-neutral](#) is most likely (55%) during spring.



Early-Mar CPC/IRI Official Probabilistic ENSO Forecasts

Spring Flood Potential

Spring [flood potential](#) is low across New England and there is no significant concern at this time for flooding in New Brunswick. Three early-March coastal storms have led to generally near to above-normal river flows and soil moisture. Dry conditions carrying over from the summer and fall of 2017 have created an increased capacity for winter melt and spring rain, reducing the potential for flooding. Very heavy rain can cause flooding at any time of the year, even in areas experiencing dry conditions or that have little to no snow on the ground.



Spring Flood Potential Outlook

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.nohrsc.noaa.gov
NOAA Sea Grant Network
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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/climatenetwork
Northeastern Regional Association of Coastal and Ocean Systems
www.neracoos.org
University of Maine, School of Marine Sciences
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