





Environnement et Changement climatique Canada

Newfoundland and Labrador Quarterly Climate Summary: Spring 2019

Summary & significant weather events (March—May):

Overall it was a dry, cold Spring season for much of Newfoundland, with the exception of a snowy April in some places. For Labrador, it was mostly a normal Spring season, though parts of the mid coast remained inundated with snow throughout.

Though it wasn't a terribly stormy March, there were several systems which brought significant rain and snow to the province, along with blustery winds. The Makkovik area continued to get buried in additional snowfall through the month. Marine traffic encoun-

tered many difficulties with sea ice, leading to ferry cancellations and supply shortages.

Though roughly the same number of storms affected the province in April, it did lead to a higher than normal month for precipitation. In particular, it was a fairly snowy month across the province, including snow squall conditions for parts of the island. A couple of storms brought very strong winds to the province as well.

May was a fairly benign month with regards to weather. Conditions were quite dry throughout the month across most of the province, though temperatures were quite chilly. Cold sea surface temperatures and persistent northerly winds allowed a high number of <u>icebergs to migrate</u> towards Newfoundland's east and northeast coasts.

Here is a description of the most significant events:

March 4-7: A deep low pressure system tracked across western Newfoundland and stalled off the Labrador coast.

- Snowfall: 37 cm fell at Nain Airport, while Makkovik Airport received 30 cm. In Newfoundland, Deer Lake, Burgeo, La Scie, and Stephenville received 16-23 cm of snow.
- Wind: Wreckhouse reported a peak wind gust of 170 km/h. Port aux Basques, Burgeo, Bonavista, and St. John's reported peak wind gusts in the 90-100 km/h range.
- Other: Persistent strong westerly winds produced snow squall conditions over western and southern Newfoundland, along with the Avalon Peninsula, through the March 7-8 period.

March 15-17: Another deep low pressure system tracked north of Labrador, bringing a wet and mild spell to Newfoundland and southeastern Labrador, and more snow to the mid coast of Labrador.

- Rainfall: Burgeo received 82.6 mm of rain for the event, while Port aux Basques, the Burin Peninsula, and the Bay St. George area picked up 15-25 mm.
- **Snowfall**: Another 30 cm of snow fell at Makkovik Airport.

March 22-24: More mild conditions for the island thanks to a deep low pressure system tracking through the Gulf of St. Lawrence and across western Newfoundland.

- **Rainfall:** 44.6 mm of rain was reported in St. John's West, while 41 mm fell at St. John's Airport. The Burin Peninsula, as well as Burgeo, picked up 30-36 mm with this storm.
- Wind: Wreckhouse wind gusts peaked at 133 km/h.

April 3-5: An intense low crossed central and eastern Labrador. This brought more rain and <u>very strong winds to the island</u>, more snow to Labrador, and snow squall conditions to western Newfoundland.

- Wind: Wreckhouse winds peaked at 166 km/h, while a peak gust of 134 km/h was reported at Green Island (Fortune Bay). Wind gusts to 89-117 km/h were reported at most other stations across the island.
- Rainfall: 30.1 mm of rain fell in Burgeo.

April 15-17: Yet another deep low slowly tracked across Newfoundland. A mix of precipitation was observed across the island, followed by snow and blowing snow. For Labrador, this storm brought yet another shot of snow.

- Snowfall: The Labrador Strait received 30 cm of snow (30 cm reported at L'Anse au Loup and 29.6 cm at Blanc Sablon Airport). Gander Airport reported 19 cm of snow for the event.
- Rainfall: Burgeo and Port aux Basques reported 30.5 mm and 28.9 mm of precipitation, respectively. The bulk of this precipitation fell as rain.
- Wind: Twillingate recorded a peak wind gust of 102 km/h, while gusts of 93-98 km/h were noted at Blanc Sablon, Pool's Island, L'Anse au Loup, and Bonavista.

April 23-26: A pair of storms brought winter back to most of Newfoundland.

- Snowfall: Gander Airport received snowfall totals of 16 cm and 19 cm with the first and second system, respectively. Deer Lake Airport reported 9 cm of snow with the second low.
- **Freezing rain:** St. John's Airport observed 10+ consecutive hours of freezing rain with the first of the two systems.
- Wind: Wreckhouse gusts peaked at 124 km/h with the first low, and 146 km/h with the second.

April 29-May 2: An intense low moved off the Labrador coast and stalled, producing more snow for the Makkovik area.

• **Snowfall:** Makkovik Airport received 18 cm of snow.

May 21-23: Late-season snow was reported in parts of Newfoundland due to a slow moving low tracking south of the island.

• Snowfall: St. John's Airport reported 6.6 cm of snow, while Gander Airport received 3.8 cm

Provincial Climate Overview (March—May):

Temperature (Departure from Normal):

The **Spring** temperatures averaged out to generally below normal across the province. The main exceptions to this occurred in southeastern Labrador and the Northern Peninsula, where temperatures averaged out to near normal for the season. Meanwhile, temperatures over the Baie Verte Peninsula were slightly above normal for the 3-month period.

March average temperatures were near normal across most of the province. However, temperatures of 1-3 degrees below normal occurred in western and northern Labrador. The Baie Verte Peninsula area saw temperatures which were roughly a degree above normal.

April average temperatures followed a similar overall trend, with most of the province seeing near normal temperatures. Western Labrador continued to run 1-2 degrees below normal, while a similar colder than normal area cropped up over southwestern Newfoundland. A small area through White Bay saw temperatures that were roughly a degree above normal.

May average temperatures continued to be slightly below normal in extreme western Labrador, and were 1-3 degrees below normal for most of Newfoundland. May 2019 actually ranked as the 3rd coldest on record in the Badger area, and the 4th coldest in the Gander area. The remainder of Labrador, along with the Northern Peninsula, had temperatures which were near normal for the month.

Right: Temperature anomalies for Newfoundland and Labrador for (from top) March-May combined, March, April, May.



Precipitation (Percent above/below Normal):

Spring precipitation was generally 10-25% above normal in extreme southwestern Newfoundland, western Labrador, and the Labrador coast from Postville to Cartwright. The northeast coast of Newfoundland came in roughly 50% below normal for precipitation over the 3-month period. Elsewhere in the province, precipitation was near normal to 25% below normal.

For **March**, we observed a sharp line in precipitation anomaly between Lake Melville and Sandwich Bay. For Newfoundland and southeastern Labrador, roughly 10-60% below normal precipitation fell. The remainder of Labrador north and west of Cartwright observed 10-50% above normal precipitation.

April precipitation told a different story, with extreme northern Labrador and a portion of central Labrador receiving 10-25% below normal precipitation. Elsewhere in the province, roughly 10-50% above normal precipitation was recorded, with the Labrador Strait (Blanc Sablon) seeing its 2nd wettest April on record. Parts of the west coast of Newfoundland, as well as the Makkovik area, received 50-100% above normal precipitation.

May conditions reverted back to drier than normal across Newfoundland and most of Labrador. These areas were generally 25-75% below normal for precipitation. It was the 3rd driest May on record for the St. Anthony area, while Bonavista experienced its 4th driest May. Exceptions to these drier than normal conditions were noted in western and southeastern Labrador. These areas received 10-50% above normal precipitation to round out the Spring.

Right: Precipitation anomalies for Newfoundland and Labrador for (from top) March-May combined, March, April, May.









Snow (Total / Percent above & below Normal):

In Newfoundland, total snowfall for the Spring season varied across the island, generally ranging from 40 to 120 cm. Gander Airport reported the highest total snowfall on the island for the season, at just above 120 cm. In fact, Gander Airport received more snow in April than in February and March combined this year. Total snowfall for the Spring season was in the 100-180 cm range across Labrador. With the exception of a few areas, most of the province received near to below normal snowfall for the March-May period. Most of the island received roughly 10-50% below normal snowfall for the spring period, while parts of western Newfoundland and interior Labrador received near normal snowfall for the season. Contrary to this trend, much of northern Labrador (not shown), the Humber Valley area, and the Labrador Strait received about 25-75% above-normal snowfall.



Left: Total snowfall for select observation sites in Newfoundland and Labrador—March-May combined. Right: Snowfall anomalies (percent above/below normal) at observation sites in Newfoundland and Labrador for March-May combined.

Snow depth

The only significant snow remaining in Newfoundland at the end of May was located in the usual areas atop the Long Range Mountains. In Labrador, considerable snow depths remained in the Mealy Mountains and in the Makkovik area, where snow depths were estimated at 100+ cm. Elsewhere in the Big Land, snow depths were in the 20-50 cm range, with a few pockets in northern, central and southeastern Labrador showing no snow cover.



Snow depth (estimated) for Newfoundland and Labrador as of 9:30 am NDT June 1, 2019

Sea Ice Coverage (Analysis / Concentration departure from normal):

Sea ice charts for the East Coast at the end of the Spring season show some ice cover lingering in the Strait of Belle Isle, with an ice edge extending off the Labrador coast. Over these areas, above normal concentration of sea ice was present at the end of May. Below normal concentration was noted well off the Mid Labrador Coast into the South Labrador Sea. The iceberg limit at the end of May extended well southeast of the Grand Banks, with the International Ice Patrol (IIP) classifying the 2019 season as an extreme iceberg season. The IIP reported 1468 icebergs sighted or drifted below latitude 48° N at the end of May.



Left: Sea ice analysis chart for May 27, 2019. Right: Sea ice concentration departure from normal: May 27, 2019

Sea Surface Temperature (Departure from Normal):

Note: We are excluding the area over the southern Grand Banks where the Labrador Current and the Gulf Stream meet. This area is extremely variable even in normal conditions. Grey areas along much of the coast may represent either gaps in data or presence of sea ice.

For March, April, and May, sea surface temperatures were generally about 1 to 4 °C warmer than average over Labrador waters, and the same for waters well northeast of Newfoundland. Sea surface temperatures across remaining Newfoundland waters were near normal for March and April, but dipped to roughly 1 to 2 °C below normal for May.



NOAA monthly mean SST anomaly map (based on 1981-2010 Normals) for Mar 2019 (left), Apr 2019 (middle), and May 2019 (right) - https://www.nnvl.noaa.gov/view/globaldata.html#SSTA

Provincial Impacts (March—May):

Spring snowfall:

After last Spring, certainly folks in <u>Newfoundland and Labrador would be used to some late-season snow</u>. Though it was a relatively dry March for the island, parts of the Labrador north were pounded and buried by several low pressure systems. When the calendar flipped to April, much of the island and <u>the Labrador Strait saw snowy conditions</u> return, <u>prompting the delay of the studded tire removal deadline</u>. Cold temperatures lingered into May, with another dusting of snow for parts of the island late in the month.

Difficult ice season and icebergs aplenty:

Persistent severe ice conditions posed some major problems this past Spring for marine traffic in the province. In particular, the Strait of Belle Isle ferry service saw numerous cancellations due to the ice, with the MV Qajaq W unable to get through even with icebreaker assistance. This led to food and supply shortages in Labrador, particularly through the month of March. In response, Canadian Coast Guard had to make use of one of its icebreakers to deliver provisions to Labrador communities while the ferry had to remain docked. The ice near the Northern Pen-insula didn't produce all bad news, however, as strong winds pushed an ice wall onshore in Port aux Choix. But, in turn, this did delay the open-ing of the Red Bay National Historic Site.

Adverse ice conditions were not just confined strictly to the Strait of Belle Isle, as <u>heavy sea ice caused a petroleum tanker to lose its</u> steering off the southwest coast of Newfoundland. Ice in this area also caused a <u>navigational buoy to shift and block the Port aux Basques Har</u>bour entrance, causing further Cabot Strait ferry cancellations after a difficult Winter season.

An extended period of northerly winds was instrumental in pushing <u>icebergs near parts of Newfoundland's east and northeast coasts</u>. This meant <u>good news for tourism outfits in Bonavista</u> and other coastal communities. Though with the number of icebergs off the coast, and the iceberg limit pushing well southeast of Newfoundland, this created delays in fishing season start dates and shipping traffic concerns.

Provincial Impacts (March—May):

Flooding situation averted:

The annual Spring thaw began in earnest in May for Labrador. Unfortunately, an ice jam in the Churchill River allowed <u>water levels to rise</u> <u>near the community of Mud Lake</u>. Flood watches and warnings were issued as water levels remained high in the Lower Churchill River, near the community and Mud Lake Road, during the May long weekend. A flooding situation like 2017 was ultimately avoided, as water levels started to recede later that weekend.

Start to forest fire season:

May 1 marks the start of the forest fire season in Newfoundland, while the season commences May 15 in Labrador. Through the first month of the season, <u>50 fires were reported</u>. At the end of May, roughly 13 active fires were noted by the Canadian Wildland Fire Information System (graphic below). Southwestern and (parts of) central Newfoundland had moderate fire danger classification by the end of May. Elsewhere in the province, there was low to no risk of wildland fires at the end of the month.



Left: Map of active fires in Newfoundland and Labrador on May 31, 2019. Right: Fire danger map for Newfoundland and Labrador for May 31, 2019. Source: Canadian Wildland Fire Information System, NRCan, <u>http://cwfis.cfs.nrcan.gc.ca/interactive-map</u>

River Flows / Drought Conditions:

River flow rates in Newfoundland and Labrador were below normal for March, with Gander and Eagle Rivers reporting deficient flow. In contrast to this trend was the Isle aux Morts River, which ran above normal for the month.

Flows for April returned to near normal for the Gander and Isle aux Morts Rivers, but remained deficient in Eagle River. Deficient flow rates were noted in Rocky River, while slightly above normal flows were recorded in the Upper Humber.

River flow rates continued to be deficient for Rocky River in May, joined by the Upper Humber in that category. Eslewhere, flow rates were near to below normal thanks to a relatively dry month.



F

- Excessive D - Deficient

R - Record

STATION	DRAINAGE		MEAN FLO		% OF
NUMBER	AREA			(M3/S)	
EAGLE				23.7	71
03QC001	10900	KM2		D	
GANDER				53.4	49
02YQ001	4400	KM2		D	
ISLE AUX	MORTS			9.16	173
02ZB001	205	KM2			
ROCKY				11	76
02ZK001	301	KM2			
UPPER HI	JMBER			28.1	88
02YL001	2110	KM2			

STATION	DRAINAGE		MEAN FLO		% OF
NUMBER	AREA			(M3/S)	MEDIAN
EAGLE				18.6	39
03QC001	10900	KM2		D	
GANDER				254	96
02YQ001	4400	KM2			
ISLE AUX	MORTS			26	107
02ZB001	205	KM2			
ROCKY				11.1	68
02ZK001	301	KM2		D	
UPPER HU	JMBER			119	119
02YL001	2110	KM2			

STATION	DRAINAGE		MEAN FLO		% OF
NUMBER	AREA			(M3/S)	MEDIAN
EAGLE				731	90
03QC001	10900	KM2			
GANDER				177	74
02YQ001	4400	KM2			
ISLE AUX	MORTS			29.9	100
02ZB001	205	KM2			
ROCKY				4.83	55
02ZK001	301	KM2		D	
UPPER HU	UPPER HUMBER			204	82
02YL001	2110	KM2		D	

Right: Monthly runoff summary for select river sites in Newfoundland and Labrador (map above) for Mar. 2019 (top), Apr. 2019 (middle), and May 2019 (bottom) - tables courtesy of ECCC Water Survey of Canada The Avalon and Bonavista Peninsula areas were classified as unusually dry by the end of May thanks to a drier-than-normal month. Elsewhere, abnormally dry conditions were not analyzed throughout the spring.



Canadian Drought Monitor Map for March 31, 2019 (left), April 30, 2019 (middle), and May 31, 2019 (right). Drought maps courtesy of Agriculture and Agri-Food Canada- <u>http://www.agr.gc.ca/eng/programs-and-services/list-of-programs-and-services/drought-watchcanadian-drought-monitor/?id=1463575104513</u>

Spring Season (Period: March-April-May) Temperature Outlook Performance: For the most part, spring in western Labrador was forecast to be warmer than normal, while eastern Newfoundland and parts of the Labrador coast were forecast to be colder than normal.



Left: Probability of above, below and near normal: Produced February 28, 2019 – Right: Forecast Temperature Anomaly: Produced February 28, 2019

In actuality, observed temperatures did not work out as expected over most areas, as a colder-than-normal Spring season ensued province-wide. The outlook worked out fine for eastern Newfoundland and parts of the Labrador coast, but it was an overall miss elsewhere in the province. The main culprit over Newfoundland was a colder than expected May, while all three months had contributions to a colder than forecast season for Labrador.



Above: Observed Temperature Anomaly - Issued on June 1, 2019

Summer Season (Period: June-July-August) Temperature / Precipitation Outlook:

The summer temperature outlook for Newfoundland and Labrador shows generally a 40-50% chance of above normal temperatures for the western half of the island. The same probability exists for western and southeastern Labrador. The remainder of Labrador is predicted to be above normal for temperatures as well, with a probability of 50-70%. The eastern half of Newfoundland has a 40-50% chance of near normal temperatures for the season.

The precipitation forecast (not shown) has a 40-50% chance of higher than normal precipitation over interior Labrador and a portion of Newfoundland's west coast. Otherwise, there is no signal over the province. The seasonal precipitation forecast typically does not perform as well as the seasonal temperature forecast, so the graphics are not included.



Left: Probability of above, below and near normal temperature: Produced May 31, 2019 – Right: Temperature Anomaly Outlook: Produced May 31, 2019 https://weather.gc.ca/saisons/index_e.html

Temperature Outlook: Next 4 Weeks

Temperatures across the province remained generally near to below normal for the first half of June across Labrador, and near normal across Newfoundland. This result was overall decently captured by our Global Ensemble Prediction System, with one main exception: the northeast coast of Newfoundland average out to below normal for the first half of June, though the area was predicted to be near to above normal. Here are the predictions for the next 4 weeks.

Week 1 (June 17 to 24):

Temperatures for week 1 have a roughly 50-80% chance of being above normal for central Newfoundland, and a 50-60% chance of above normal for interior Labrador and the Labrador Strait. Elsewhere in the province, the forecast calls for near normal temperatures as we move into the first days of Summer.

Week 2 (June 24 to July 1):

A similar story is forecast for the last days of June, with the exception of a roughly 50% chance of below normal temperatures for northern Labrador. A 50-70% chance of above normal temperatures is predicted for central and western Newfoundland, as well as interior Labrador. Otherwise, the remainder of the province is expected to have near normal temperatures as the calendar turns to July.

Right: Forecast probability of above or below normal temperature from the Canadian Global Ensemble Prediction System for week 1 (top) & week 2 (bottom): Produced June 13, 2019



Week 3 (July 1 to 8):

The warm trend is anticipated to continue for the first full week of July, with a 50-70% probability of above normal temperatures for most of Labrador, central and western Newfoundland, and the Northern Peninsula. The rest of the province is expected to have near normal temperatures again.

Week 4 (July 8 to 15):

Nice, warm temperatures are again predicted as we move into mid-July. A 50-70% chance of above normal temperatures is predicted for most of Newfoundland, interior Labrador, and parts of southeastern Labrador. The remainder of the province is, once again, forecast to be near normal for temperatures.

Right: Forecast probability of above or below normal temperature from the Canadian Global Ensemble Prediction System for week 3 (top) & week 4 (bottom): Produced June 13, 2019



2018 Hurricane Season Review / 2019 Hurricane Season Outlook:

The next graphic shows a review of the 2018 Hurricane season. The actual number of observed storms ended up being on the high end of the predictions last year for named storms and Hurricanes, while the actual number of Major Hurricanes fell pretty much in the middle of the forecast range. The two most noteworthy and destructive Hurricanes from last year's season were Hurricane Florence, which pounded the Carolinas on September 14, and Hurricane Michael, which made landfall over the Florida Panhandle on October 10 as a dangerous Category 5 Hurricane.

© 2018 Atlantic Tropical Cyclone Season Review					
Named Storms: Hurricanes: Major Hurricanes:	<u>Predicted</u> 10-16 5-9 1-4	<u>Actual</u> 15 8 2			

Newfoundland was not entirely spared from the 2018 Tropical Cyclone season. Chris tracked through Placentia Bay on July 12, 2018, producing up to 80 mm of rain for eastern and northeastern sections of the island. Chris also produced wind gusts near 100 km/h. Several days after Chris moved away from the island, the remnants of subtropical storm Beryl affected a small portion of the Avalon Peninsula.

The 2019 season marks the 5th straight year with a named storm forming prior to June 1, as subtropical storm Andrea formed on May 20. Looking ahead, the National Hurricane Center is predicting a similar season to what was predicted last year. Canadian waters generally see about 32% of the total named storms each year, so our forecast would be between 2 and 5 named storms. The latest long range guid-ance predicts a moderate chance of a mild El Nino later this summer, which would lead to a suppressed hurricane season. At the same time, warmer-than-average sea surface temperatures in the Tropical Atlantic and Caribbean Sea would favour hurricane activity. This leads to the expectation of a near normal Atlantic hurricane season for 2019.



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