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## Newfoundland and Labrador

### Quarterly Climate Summary: Winter 2022/23

#### Summary & significant weather events (December—February):

Despite a winter-like November month, climatological winter got off to a somewhat delayed start thanks to above-normal temperatures and a few rain events during the early part. Eventually, February ushered in bitter cold temperatures and snow, and the season started to feel a bit more typical.

Newfoundland experienced several storms in December, but many of these produced more rain than snow, with monthly temperatures ending up above normal. Temperature-wise, it was a similar story for Labrador, but wintry precipitation still occurred in the Big Land. This included one seemingly innocent-looking freezing drizzle event which caused considerable utility infrastructure damage in the southeast.

Relatively warm temperatures continued across the province into January. Despite this, the province started to pick up more winter-like precipitation. Two storms in particular provided these conditions for the island: one significant freezing rain event in mid-January, and a classic nor'easter for the Avalon later in the month. This led to higher than normal precipitation for January across much of the island. Labrador started picking up more and more accumulating snowfall through the latter part of the month. To close out January, western Labrador experienced bitter cold temperatures and wind chills, a precursor for things to come.

The relative warmth of December and January was forgotten very quickly in early February. All areas of the province experienced a deep freeze, with very cold temperatures and wind chills everywhere. This occurred in the wake of a very intense storm which brought blizzard conditions to parts of Newfoundland and Labrador. Temperatures steadied around normal during mid-February, with parts of the island even picking up a bit more rain. The end of February went on to provide the province with another round of frigid cold though, bookending a colder-than-normal month to end the season.

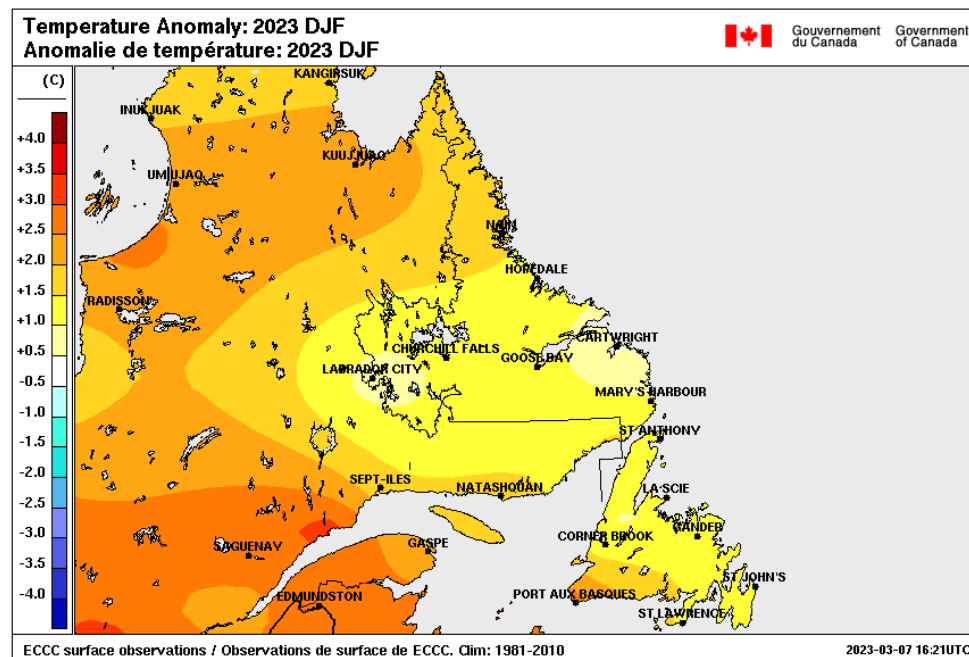
## Provincial Climate Overview (December-February):

### Temperature (Departure from Normal):

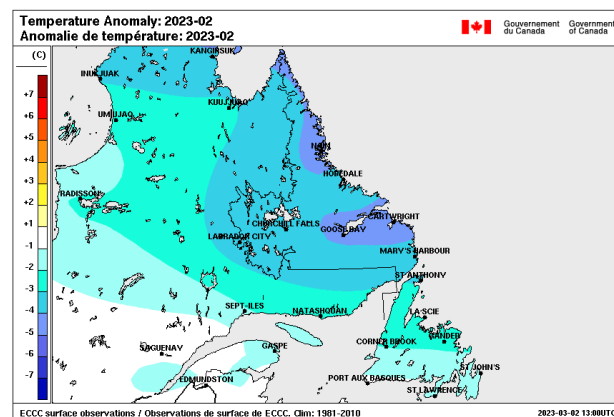
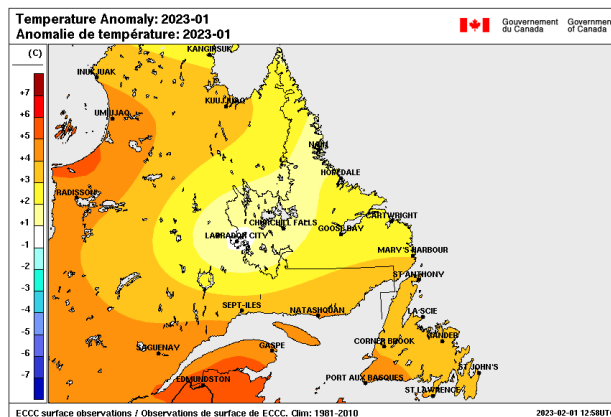
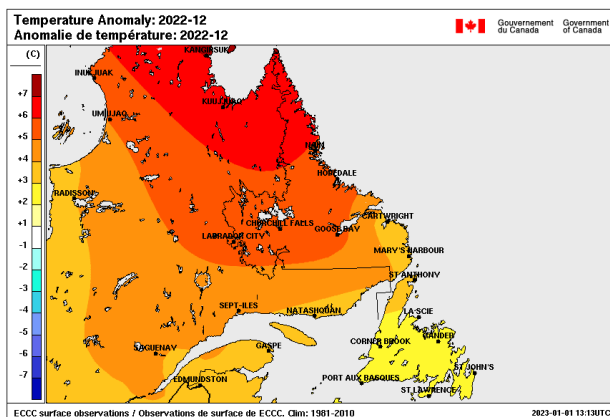
Temperatures for this Winter (averaged over December, January, February) were above normal across the province (generally by 1 to 2 degrees C, except a little less in parts of Labrador and a little more in southwestern Newfoundland).

### Highlights:

- 3rd warmest December on record for L'Anse au Loup
- 2nd warmest January on record for Bonavista, Port aux Basques and St. Lawrence
- 5th coldest February on record for Hopedale and Nain



above: Temperature anomalies for Newfoundland and Labrador for December-February combined.



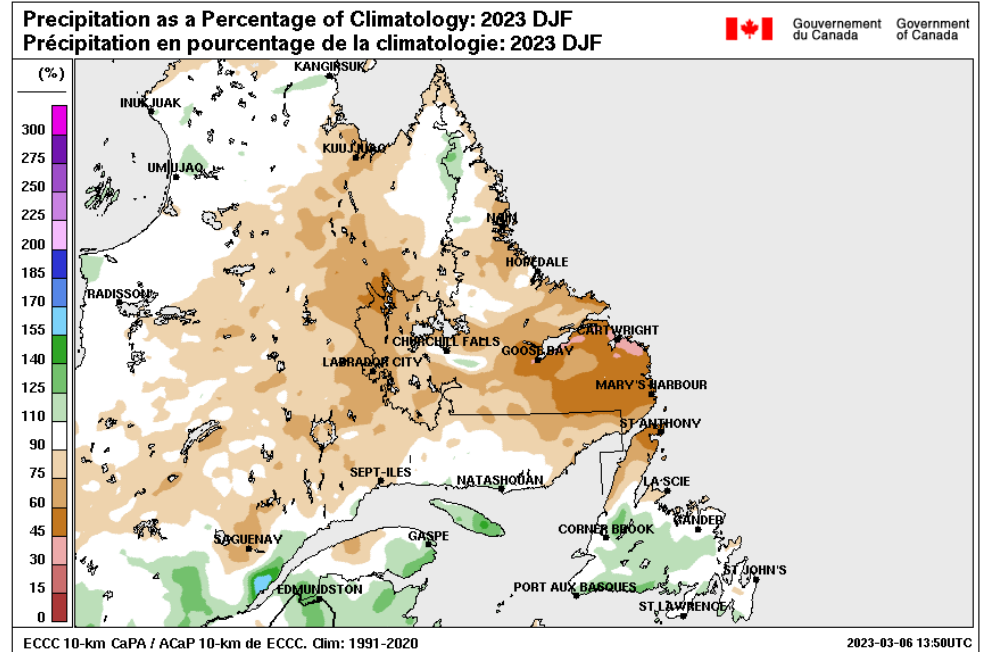
left to right: Temperature anomalies for Newfoundland and Labrador for December, January, February

## Precipitation (Percent of 1991-2020 average):

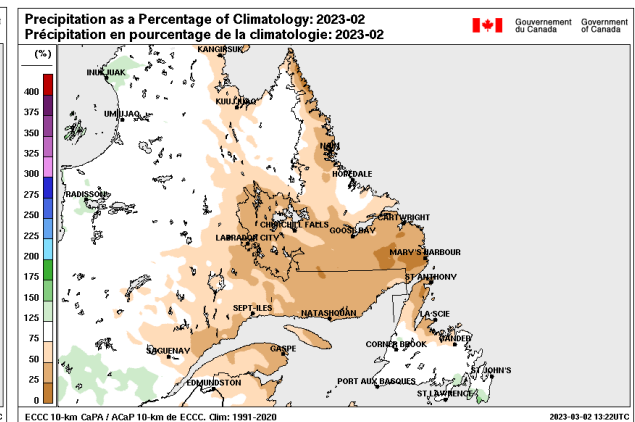
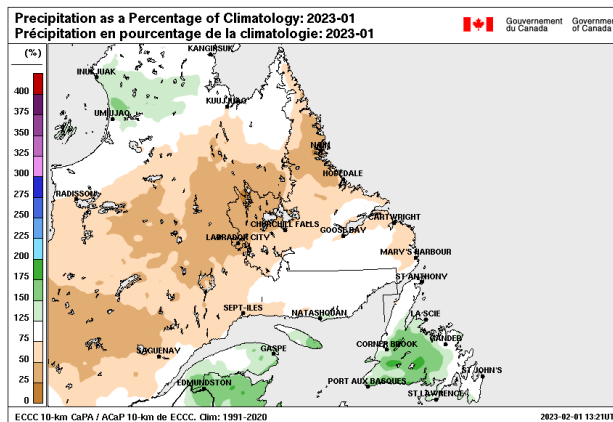
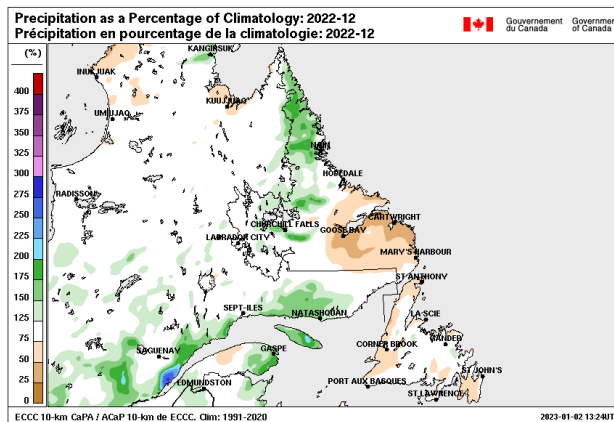
Precipitation this Winter (totaled over December, January, February) was below normal across Labrador, the Northern Peninsula and parts of the northeast coast of Newfoundland. Elsewhere in Newfoundland, precipitation was near to above normal.

### Highlights:

- 5th driest winter on record at Happy Valley-Goose Bay
- Happy Valley-Goose Bay only received about a quarter of its normal monthly precipitation in December
- Many stations across Newfoundland received 2 to 4 times their normal rainfall for January
- Gander and Happy Valley-Goose Bay only received about half of their normal monthly precipitation or less in February



Above: Precipitation as a percentage of 1991-2020 average for Newfoundland and Labrador for December-February combined.



Above left to right: Precipitation anomalies for Newfoundland and Labrador for December, January, February

## Seasonal Temperature and Precipitation Tables:

Seasonal temperature averages and precipitation totals compared to seasonal normal (1981-2010) for December 2022 to February 2023,  
for selected locations in Newfoundland and Labrador

	Mean Temperature (°C)				Total Precipitation (mm)		
Location	Seasonal Mean	Average of Monthly Normal Means	Diff.	Rank (Warmest)	Seasonal Total	Total of Monthly Normals	Seasonal Total as % of Normal
Bonavista	-2.0	-4.4	2.4	9	353.5	332.3	106
Channel-Port aux Basques	-2.2	-4.5	2.3	10	478.8	449.0	107
Corner Brook	-3.8	-5.1	1.3	>10	473.0	399.6	118
Gander	-4.8	-5.9	1.1	>10	267.0	343.2	78
St. John's	-2.3	-3.6	1.3	>10	450.7	443.5	102
St. Lawrence	-1.3	-3.6	2.3	7	456.7	428.4	107
Stephenville	-3.4	-5.0	1.6	>10	318.6	353.3	90
Terra Nova Nat Park	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cartwright	-11.8	-12.2	0.4	>10	N/A	N/A	N/A
Happy Valley-Goose Bay (Goose A)	-14.0	-15.3	1.2	>10	103.2	185.8	56
Hopedale	N/A	N/A	N/A	N/A	N/A	N/A	N/A
L'anse au Loup (Lourdes de Blanc Sablon)	-9.3	-10.9	1.6	9	189.6	280.6	68
Nain	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wabush	-19.4	-20.1	0.8	>10	N/A	N/A	N/A

Above: Temperature difference: cells shaded pink if  $\geq 1^\circ\text{C}$ , blue if  $\leq -1^\circ\text{C}$ . Precipitation as a percent of normal: cells shaded green if  $\geq 125\%$  of normal, yellow if  $\leq 75\%$  of normal

## Significant Weather events:

### December

**December 1-2:** A long frontal system brought rain and [strong winds](#) to much of the island. Peak wind gusts in the 87-129 km/h range were observed, with Wreckhouse winds peaking at 144 km/h. A few stations in southwestern Newfoundland reported 24-57 mm of rain.

**December 9:** A persistent freezing drizzle and fog event led to many [broken utility poles](#) in southeastern Labrador due to [heavy ice buildup](#).

**December 13-15:** An intense low south of Newfoundland tracked northwestward across Cape Breton Island. Rain and snow were the result, along with very strong easterly winds. Peak wind gusts in the range of 92-156 km/h were observed across parts of the west, south and east coasts of Newfoundland. Rainfall amounts ranged from 30 to 70 mm in eastern and northeastern Newfoundland, with Port Rexton receiving 76 mm.

**December 24-25:** A broad frontal trough associated with a [massive winter storm](#) tracked across the province Christmas Eve. A mix of wintry precipitation and very strong winds occurred across the island with this feature, while Labrador received accumulating snowfall. Coastal gusts across Newfoundland, as well as the Labrador Strait, peaked at 95-120 km/h. Wreckhouse gusts maxed out at 157 km/h. Rainfall amounts across southern Newfoundland ranged from 24 to 60 mm. In Labrador, snowfall amounts of 18 cm, 12 cm, and 8 cm were observed at Blanc Sablon, L'Anse au Loup, and Wabush respectively.

## Significant Weather events:

### January

**January 13-19:** A frontal wave tracked over the island and stuck around for several days, meandering north and south over this period before moving northwestward into Labrador. A [long duration freezing rain event occurred](#) across [much of the island](#), as well as southeastern & central Labrador. Meanwhile significant rainfall fell across southern & eastern regions of the island, and accumulating snowfall occurred in parts of Labrador. Rainfall totals across the southern half of the island were in the 45-150 mm range, while mixed precipitation totals 65-109 mm were observed in central and western Newfoundland. Measured or estimated snow and ice pellet accumulations of 10-37 cm occurred in areas of Newfoundland and Labrador. Finally, Wreckhouse winds peaked at 121 km/h.

Weather summary: [Newfoundland](#)

**January 20-21:** Parts of eastern Newfoundland experienced a classic nor'easter. [Snowfall totals in eastern Newfoundland varied 18-61 cm](#), with the [higher totals falling on the Avalon Peninsula](#). Peak gusts near 90 km/h were also observed at several stations on the Avalon.

Weather summary: [Newfoundland](#)

**January 23-25:** An intense storm tracking northeastward across western Newfoundland brought rain or snow, along with strong winds to parts of Newfoundland and Labrador. Peak gusts along parts of the east and south coasts of the island were in the 90-115 km/h range, with Wreckhouse winds hitting 118 km/h. Snowfall amounts of 12-14 cm fell along the Labrador Strait and along parts of the west coast of the island, while observed rainfall of 25-50 mm occurred in areas of southern & eastern Newfoundland.

**January 26-27:** Another intense storm produced very strong southeasterly winds across Newfoundland, along with a mix of precipitation. Most of Labrador received significant snowfall and strong winds. Peak gusts across Newfoundland and parts of the Labrador coast were in the [87-152 km/h range](#), causing some [wind damage in areas of western Newfoundland](#). Rainfall amounts of 21-55 mm fell across the south coast of the island, while snowfall totals of 34 cm and 24 cm were observed at Makkovik and Goose Bay respectively.

Weather summaries: [Newfoundland](#) [Labrador](#)

**January 30-31:** A period of very cold temperatures and wind chill values occurred in western Labrador. Overnight low temperatures were in the minus 40's C, with minimum wind chill values reaching minus 52 and minus 45 in Wabush Lake and Churchill Falls, respectively.

## Significant Weather events:

### February

**February 3-5:** A deepening system tracked across Labrador before intensifying into a powerful storm just off the Labrador coast. [Blizzard conditions resulted across many areas of Labrador](#), as well as portions of Newfoundland under intense snow squalls. Very strong winds and [bitter cold temperatures produced frigid wind chills province-wide](#) as well. Wind gusts across the province peaked in the 89-154 km/h range. Labrador and western Newfoundland received 17-34 cm of fresh snowfall, with Makkovik picking up 54 cm. Wind chill values bottomed out near minus 50 in western & northern Labrador, and in the range of minus 40 to minus 28 elsewhere.

**February 14-15:** A deep system passing east of the island produced [winter storm conditions across eastern Newfoundland](#). [Snowfall amounts of 22-43 cm fell over parts of the region](#). Peak wind gusts in the 80-122 km/h range occurred along the south & east coasts.

Weather summary: [Newfoundland](#)

**February 20-21:** Another low tracked across Labrador, producing mainly rain and strong winds across Newfoundland, mainly snow for Labrador. Peak wind gusts along parts of the coast of Newfoundland were 90-121 km/h, while parts of the island received 20-80 mm of rain.

**February 23-28:** A frigid air mass settled in over the province, providing bitter cold temperatures and wind chill values.

Weather summaries – daily minimum temperature records:

Newfoundland: [23](#), [24](#), [25](#), [26](#), [27](#), [28](#)

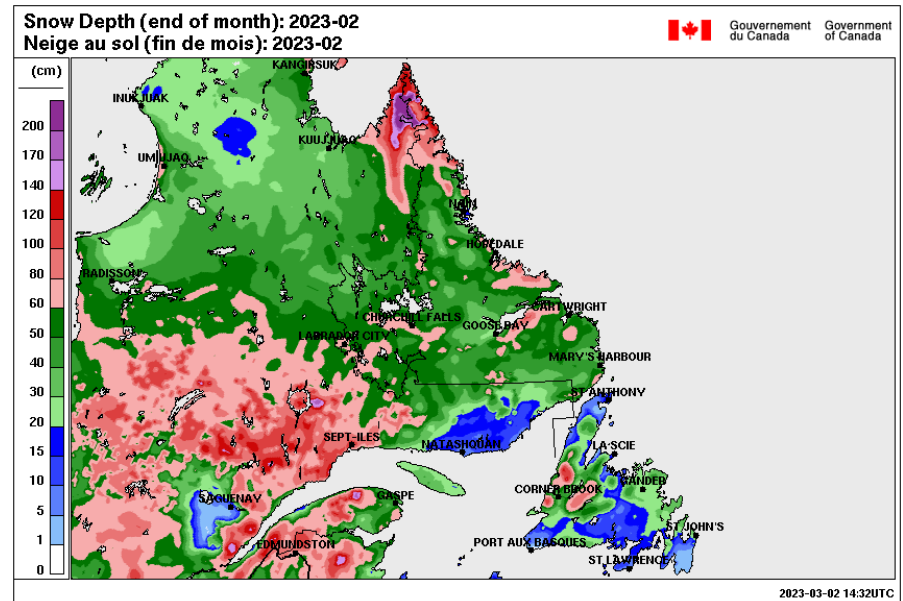
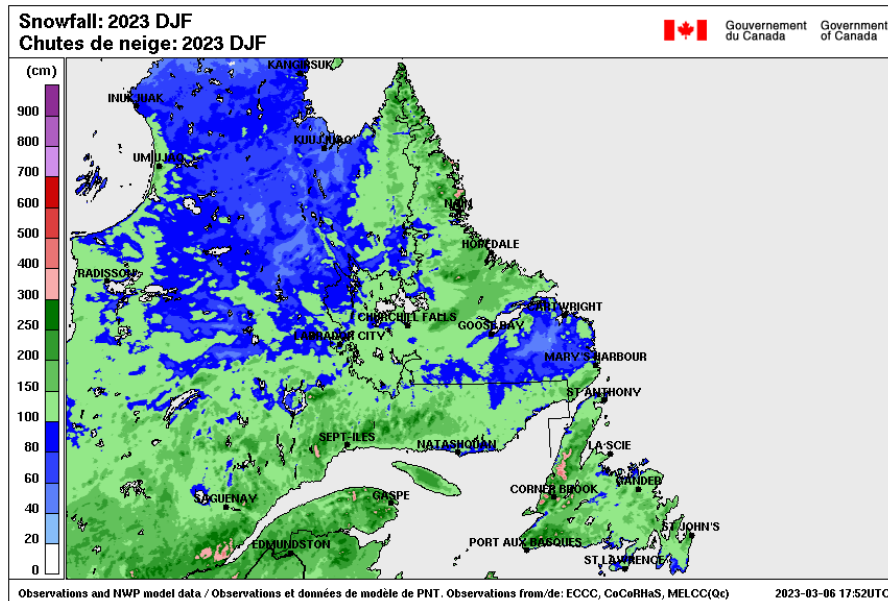
Labrador: [23](#), [24](#), [25](#), [26](#)



## Total Snowfall and Snow Depth:

In general, total snowfall for the winter season was in the 70-200 cm range across Newfoundland and Labrador. The Long Range Mountains received estimated snowfall totals of 300 cm or more.

Snow depths were highly variable across Newfoundland at the end of the season. Areas of the Avalon Peninsula, southwest coast, and Northern Peninsula had estimated snow depths of less than 5 cm. Conversely, parts of western Newfoundland had estimated snow cover of 60-100 cm. Elsewhere on the island, snow on ground was estimated in the 10-60 cm range. Total snow depths were generally 30-80 cm across Labrador at the end of February. Snow depths were by and large below normal across the province, with many areas well below normal. Though there were a few localized areas in western Newfoundland and along the mid coast of Labrador where snow depths were higher than normal.



Left: Total snowfall (estimated) for December 2022, January 2023 and February 2023 combined.

Right: Snow depth (estimated) for Newfoundland and Labrador at the end of February 2023



## Sea Surface Temperature (SST) (Departure from Normal—last week of each month):

### December

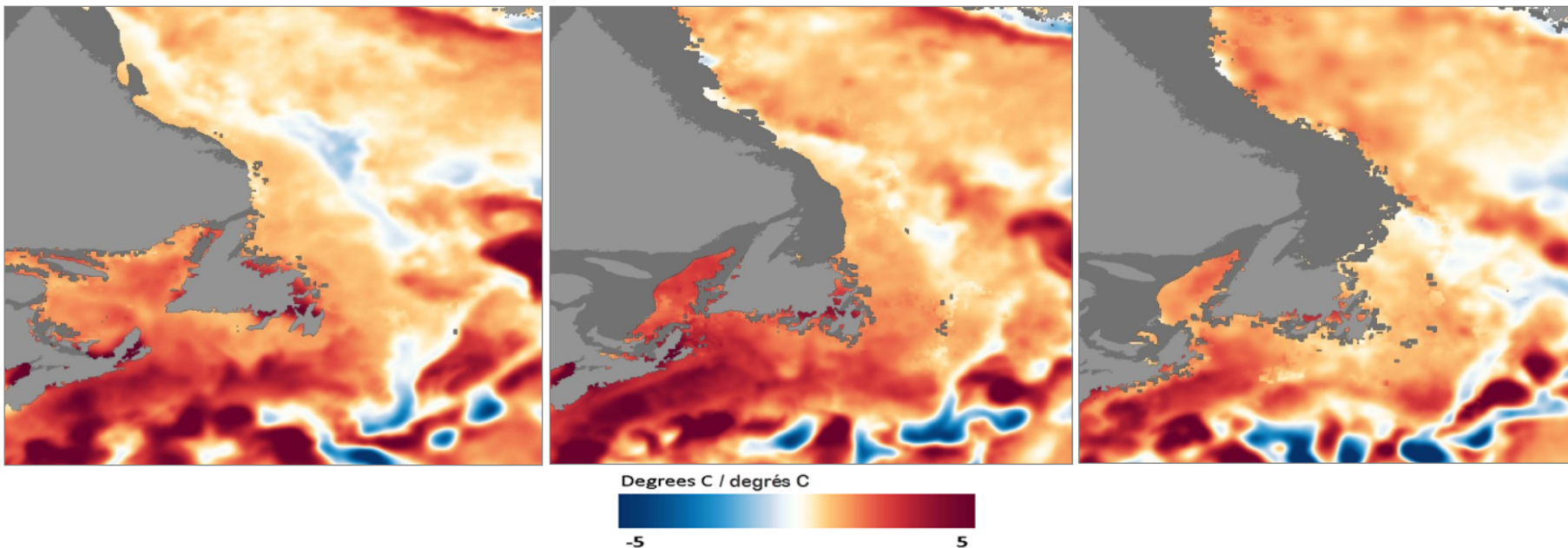
- \* Most SST warmer than normal by 2-5 C
- \* Areas of 1-2 C below normal off north-east coast of Newfoundland and portion of Labrador Sea

### January

- \* Most SST warmer than normal by 2-5 C
- \* SST near normal to a degree below off northeast coast of Newfoundland and portion of Labrador Sea

### February

- \* Most SST warmer than normal by 1-5 C
- \* SST near normal to a degree below off northeast coast of Newfoundland

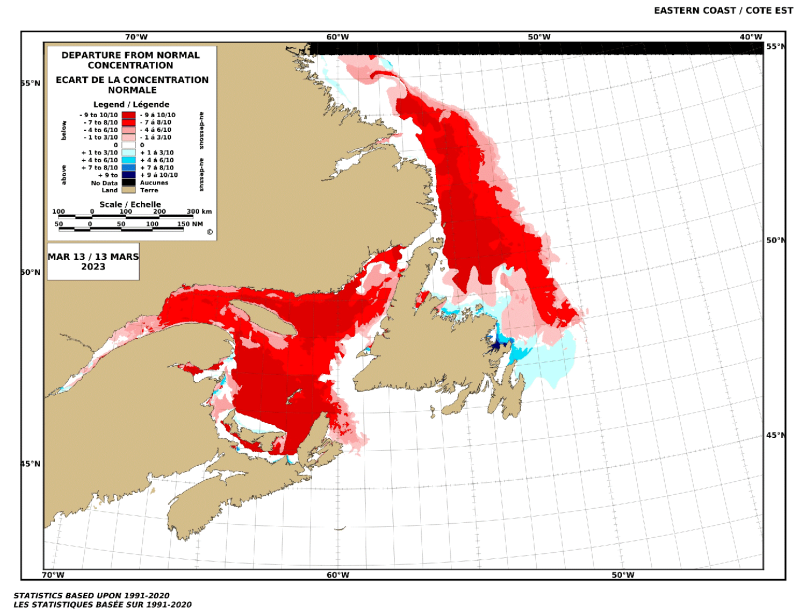
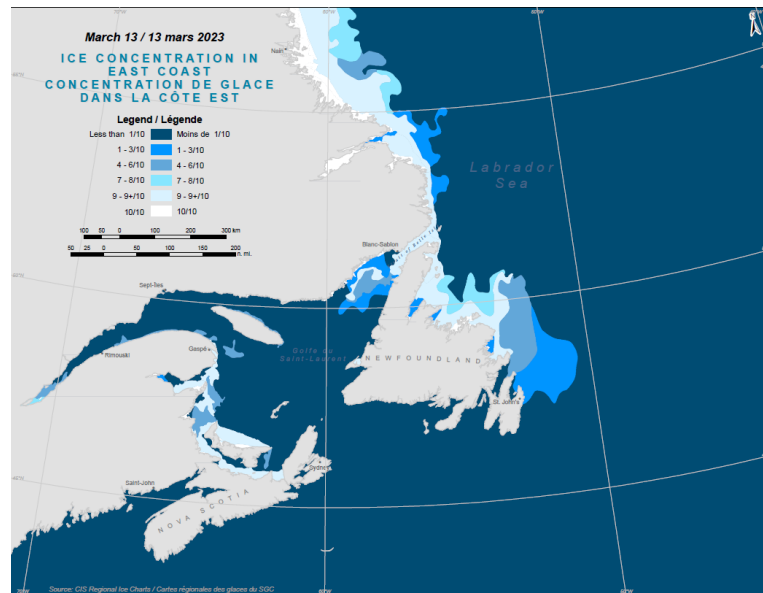


NOAA weekly mean SST anomaly map (based on 1981-2010 Normals) for the last week of December 2022 (left), January 2023 (middle), and February 2023 (right)  
<https://www.nnvl.noaa.gov/view/globaldata.html#SSTA>

**Note:** Grey areas along much of the coast may represent either gaps in data or presence of sea ice.

## Sea Ice Coverage: (Analysis / Concentration departure from normal/seasonal coverage charts)

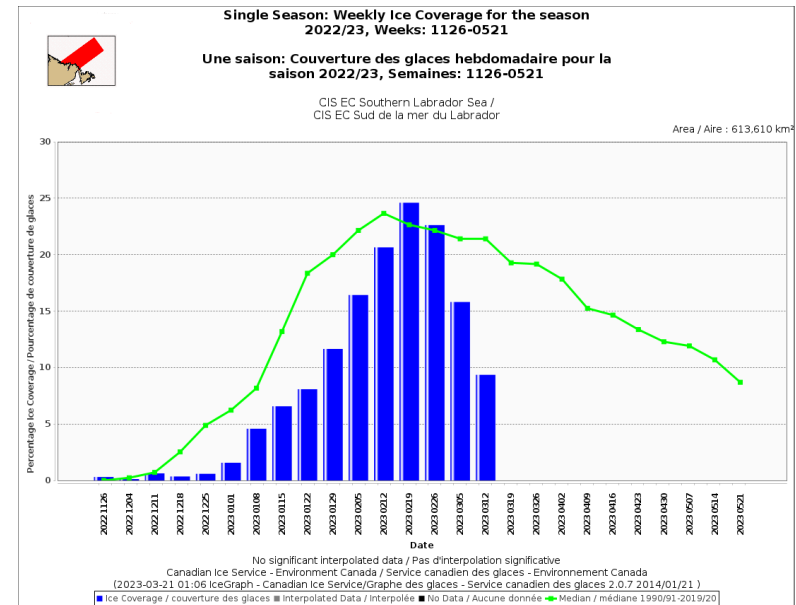
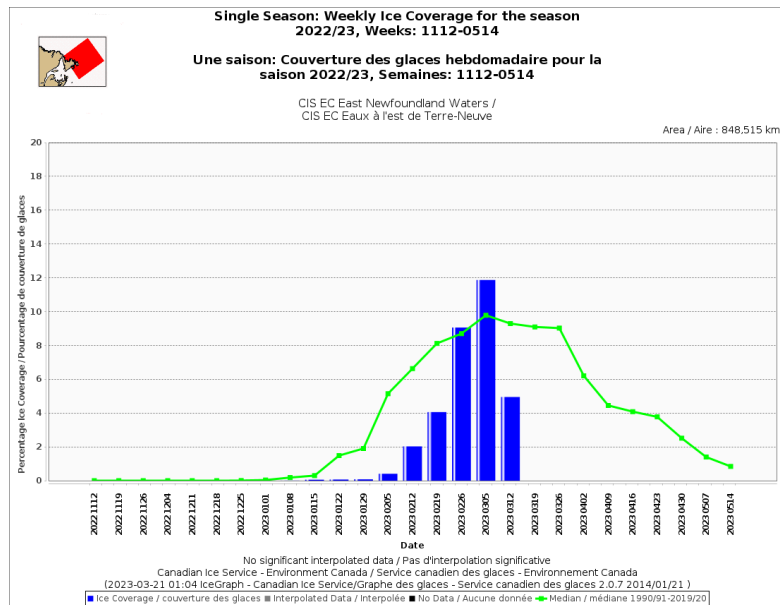
Sea ice in the East Newfoundland Waters started February with almost no ice coverage. By the second week colder temperatures and ice flowing southwards from Labrador increased the ice concentration quickly from almost no ice to almost half of the normal amount of ice (4% while the average is near 8%). The reason for the large increase in ice in the waters of northeast Newfoundland was due to ice off the north Labrador coast moving south into the Newfoundland waters. Recent storms have pushed the ice along the north coast of Newfoundland. There are also several icebergs embedded in the ice near the Newfoundland shore. The sea ice will act to protect the bergs from waves as they move southwards.



Sea ice analysis charts March 13, 2023: Concentration of ice (left) and departure from normal concentration (right)

## Sea Ice Coverage: (Analysis / Concentration departure from normal/seasonal coverage charts)

After a slightly slower start to the season sea ice concentrations along the Labrador coast are trending very much like the average concentration chart shown. On the 19<sup>th</sup> of February ice coverage was almost 25% which is slightly higher than the average for the period of near 22.5%. Ice moving southwards along the Labrador Coast from Northern Labrador increased the concentration to near normal and overcoming the slower than normal start to the season due to warm air temperatures. This ice off of the coast of Labrador had formed in Davis strait at the start of the season when temperatures over Davis Strait were colder than normal and sea ice started to form there 4-6 weeks ahead of normal allowing it to thicken that much longer. Several storms compacting the ice along the coast accounts for the reduced ice coverage in early March with concentrations on March 12<sup>th</sup> just under 10% or half of the seasonal normal of 20%. The ice however is fairly thick being mainly medium first year or between 70-120 cm.



*Weekly ice coverage for the season up to the week of March 12, 2023: East Newfoundland waters (left) and Southern Labrador Sea (right)*

## River Flows:

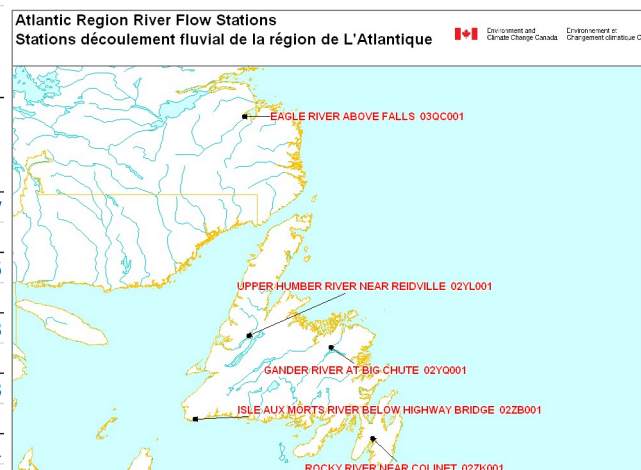
In **December**, excessive flow was reported for Gander River, likely aided by rain and thaw conditions during the later part of the month. Flow rates were slightly above median values in the Upper Humber and Isle aux Morts Rivers, likely also due to similar thaw conditions. Conversely, the Eagle and Rocky Rivers exhibited rates slightly below median values for the month.

A relatively rainy **January** helped to produce excessive flow rates in the Gander and Rocky Rivers, and record high flow rates in the Isle aux Morts River. Flow rates were near median values in the other two rivers.

River flow rates were near to above normal for **February**, with Rocky River reporting excessive flow thanks to above normal precipitation on parts of the Avalon Peninsula.

The Upper Humber and Eagle Rivers had cumulative run-off values slightly below median values. Conversely, the other three rivers exhibited cumulative values which were slightly above the median.

River Flow Station		December 2022		January 2023		February 2023		Cumulative Run-off from Oct 1
Station Number	Drainage Area (km <sup>2</sup> )	Mean Flow (m <sup>3</sup> /s)	% of Median	Mean Flow (m <sup>3</sup> /s)	% of Median	Mean Flow (m <sup>3</sup> /s)	% of Median	% of Median
<b>EAGLE RIVER ABOVE FALLS</b> 03QC001	10900	70.7	77	58.6	104	33.7	86	77
<b>GANDER RIVER AT BIG CHUTE</b> 02YQ001	4400	187	161	222	248	113	165	115
<b>ISLE AUX MORTS RIVER BELOW HIGHWAY BRIDGE</b> 02ZB001	205	15.3	139	24.3	506	5.54	155	133
<b>ROCKY RIVER NEAR COLINET</b> 02ZK001	301	12.1	83	27.7	202	18.8	161	123
<b>UPPER HUMBER RIVER NEAR REIDVILLE</b> 02YL001	2110	53.8	130	35.2	135	33.5	213	71
* Runoff accumulates from October 1st								
E - Excessive (> 75th percentile (based on 30-years, 1981-2010))								
D - Deficient (< 25th percentile (based on 30-years, 1981-2010))								
R - Record (provisional new extreme (preliminary data subject to review), compared to period of record up to 2010)								



**Preliminary monthly runoff summary for selected River sites in Newfoundland and Labrador (location map above) for December, January, February courtesy of ECCC Water Survey of Canada. Note: Record values provisional and may change after the data is reviewed.**

## Canadian Drought Monitor (produced by Agriculture and Agri-Food Canada):

### December

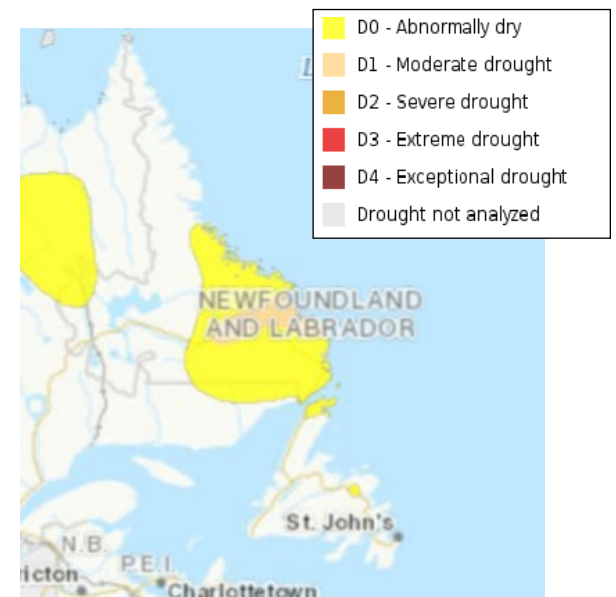
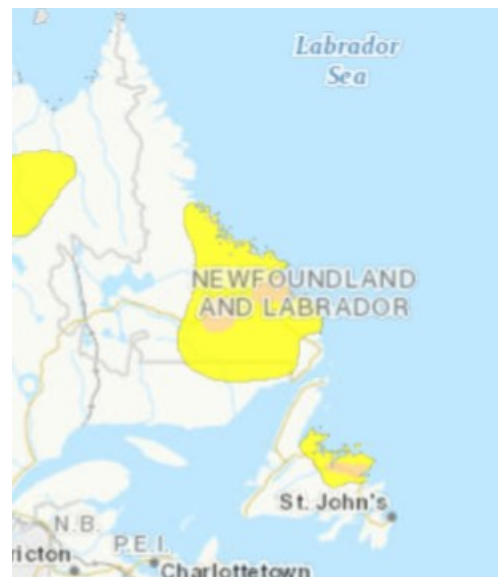
- \* Abnormally dry to severe drought conditions across central & northeastern Newfoundland
- \* Abnormally dry to moderate drought conditions across much of eastern & central Labrador
- \* No drought conditions elsewhere

### January

- \* Abnormally dry to moderate drought conditions across much of eastern & central Labrador, as well as northeastern Newfoundland
- \* No drought conditions elsewhere

### February

- \* Abnormally dry to moderate drought conditions continuing across much of eastern & central Labrador
- \* Small areas of abnormally dry conditions in northeastern Newfoundland and on the Northern Peninsula
- \* No drought conditions elsewhere



Canadian Drought Monitor Map for December 2022 (left), January 2023 (middle), and February 2023 (right). Drought maps courtesy of Agriculture and Agri-Food Canada-  
<https://agriculture.canada.ca/en/agricultural-production/weather/canadian-drought-monitor>



## Provincial Impacts (December-February):

### Winter, Winter go away...and it actually did for awhile...

November became known for accumulating snowfall and wintry conditions, initially indicating an early start to the winter season. Alas this did not prove to be the case. The first few December storms produced rain across portions of the island, and much of the snow that had accumulated on the island melted away. This caused [Marble Mountain to delay opening](#) for the season. Even a [high-profile pre-Christmas storm](#) didn't bring much of the snow back to Newfoundland, though it did produce snowfall across portions of Labrador. The Big Land, while warmer than normal through much of December, did not quite escape impacts from more wintry precipitation. A seemingly innocent-looking freezing drizzle and fog event in the second week of the month was significant enough to [break utility poles in southeastern Labrador](#).

Above-normal temperatures were observed across the province in December, and this continued into January. In spite of this, [Marble Mountain finally opened in early January](#). A mid-month storm also brought some snow back to western areas of the island, though this didn't help get [the snowmobiling season off the ground in Gros Morne](#). Furthermore, this storm brought a messy mix of freezing precipitation and rain elsewhere on the island, the former leading to [scattered power outages](#), school closures and the [temporary suspension of mail delivery](#) over many areas of the island. A brief appearance of a more typical snow-filled winter did occur later in January with a classic [east coast winter storm bringing a hefty amount of snow](#) to eastern Newfoundland. Despite temperatures generally being warmer than normal, Labrador did pick up more and more snowfall through the month of January. By the end, western Labrador was in the grip of a deep freeze, which became a precursor for the following month.

### ...but it did come back.

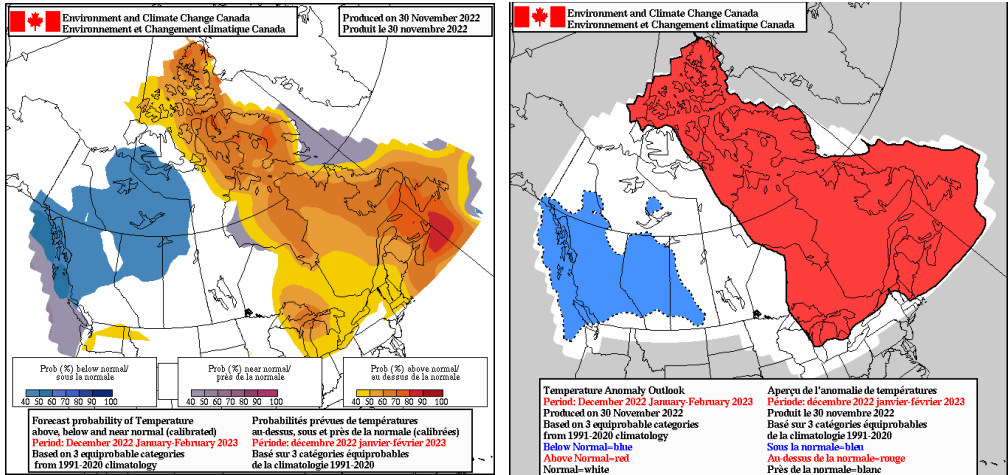
If December and January were known for being relatively warm, February certainly became known for being bitterly cold at times. Early in the month, a very intense storm parked itself off the Labrador coast and enveloped the province in heavy winds and bitterly cold temperatures. This led to a reported [all-time peak in electricity consumption for Newfoundland and Labrador Hydro](#), as households did what they could to stay warm. This intense storm also gave rise to intense snow squalls for portions of the island, particularly the west coast where blizzard conditions occurred in some regions.

Temperatures returned to more normal values, or even a bit above, during the middle portion of February. A couple of storms passed through the region, including another rain-maker for parts of Newfoundland. But as February started cold, it also ended cold. Another frigid air mass settled in over the province, ending the winter season on a chilly note.



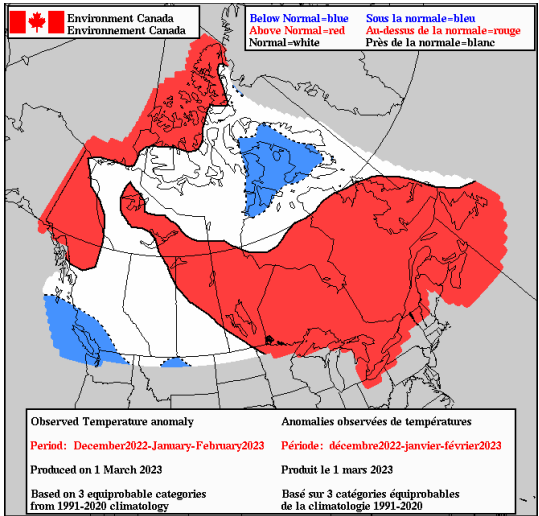
# **Winter Season (Period: December-January-February) Temperature Outlook Performance:**

The winter temperature forecast called for a moderate to high probability of warmer than normal temperatures across all of Newfoundland and Labrador.



Left: Probability of above, below and near normal: Produced November 30, 2022 – Right: Forecast Temperature Anomaly: Produced November 30, 2022

The forecast worked out very well for the province, as it was a warmer than normal winter season for Newfoundland and Labrador.

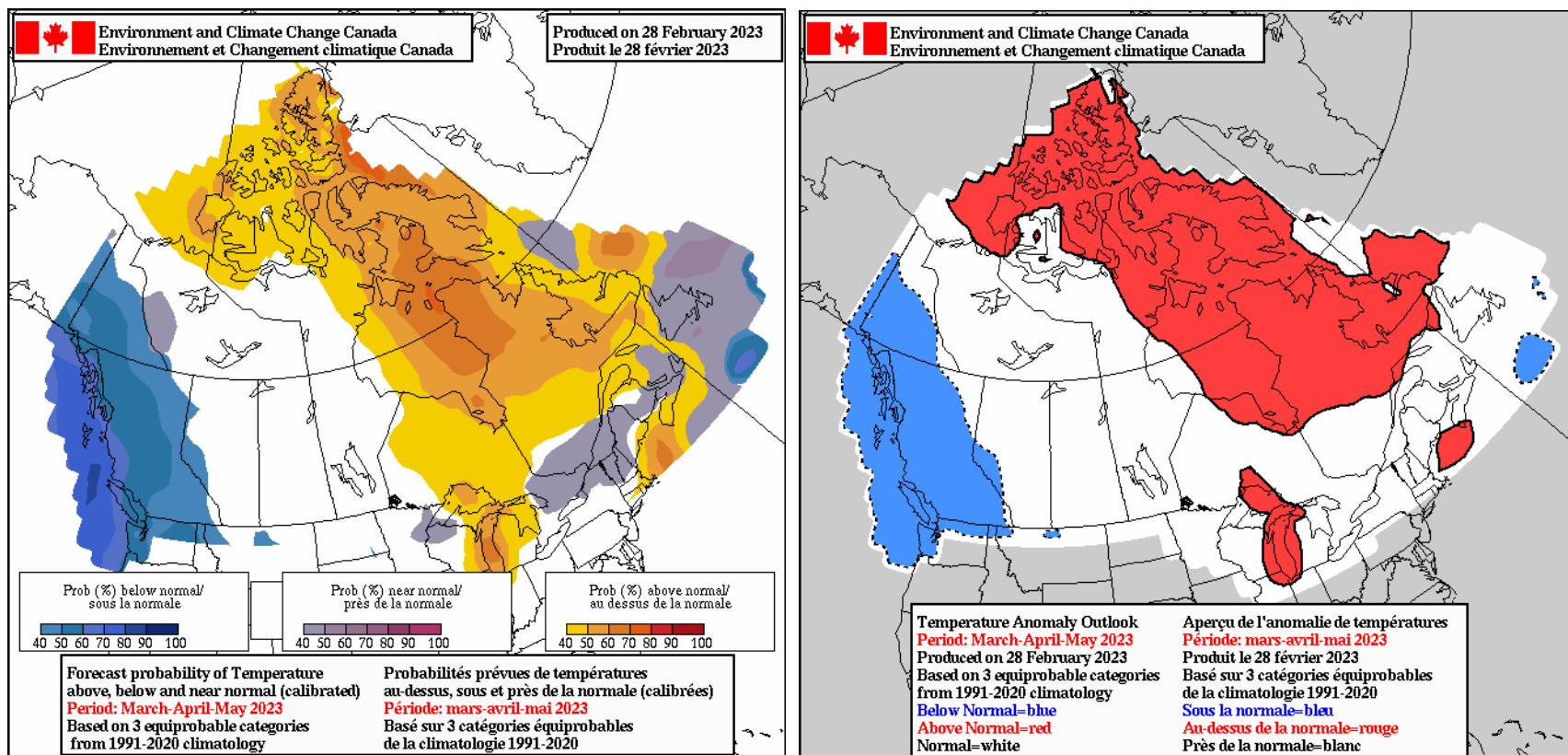


Above: Observed Temperature Anomaly (based on model analysis) compared to 1991-2020 climatology: issued March 1, 2023

## Spring Season (Period: March-April-May) Temperature / Precipitation Outlook:

For the Spring season, there is a low to moderate chance of above normal temperatures across Labrador. In Newfoundland, there is generally a low probability of near normal temperatures for the March-May period.

With regards to precipitation, guidance shows a low chance of below normal precipitation in southwestern Newfoundland. Elsewhere in the province, there is no clear signal in terms of precipitation. Once again, we are excluding the precipitation maps as they typically verify less than 40% of the time.



Left: Probability of above, below and near normal temperature: Produced February 28, 2023 – Right: Temperature Anomaly Outlook: Produced February 28, 2023

[https://weather.gc.ca/saisons/index\\_e.html](https://weather.gc.ca/saisons/index_e.html)

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Twitter: [@ECCCWeatherNL](https://twitter.com/ECCCWeatherNL)

Previous summaries can be found here: <https://www.arctic-rcc.org/>