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Newfoundland and Labrador Quarterly Climate Summary: Winter 2022

Summary & significant weather events (December-February):

The winter of 2022 can be divided into two distinct periods. December, which overall was warm and wet, and January/February where we saw big differences between Newfoundland and Labrador in both temperature and precipitation.

The first period (December) was a little calmer overall than the second period. Two main stories show themselves in that first month of winter.

The region saw overall mild temperatures, with the largest anomalies in Labrador, and significantly above normal precipitation in western and southwestern Newfoundland. Storms, especially in the first half of the month, brought significant snow and rain to those areas.

The second period, January and February, was especially cold and dry in Labrador as winter kicked in. Parts of coastal Labrador had less than 50% of their normal precipitation, with little snow falling across much of the northern areas during the period. Many warnings and periods of extreme cold marked the last part of these months.

Newfoundland had 2 consistent months with slightly above normal temperatures and significantly above normal precipitation, especially along the south and west coast. Multiple winter flooding events occurred due to snow melt and rainfall and caused road washouts. The Great Northern Peninsula reported significant snowfall.

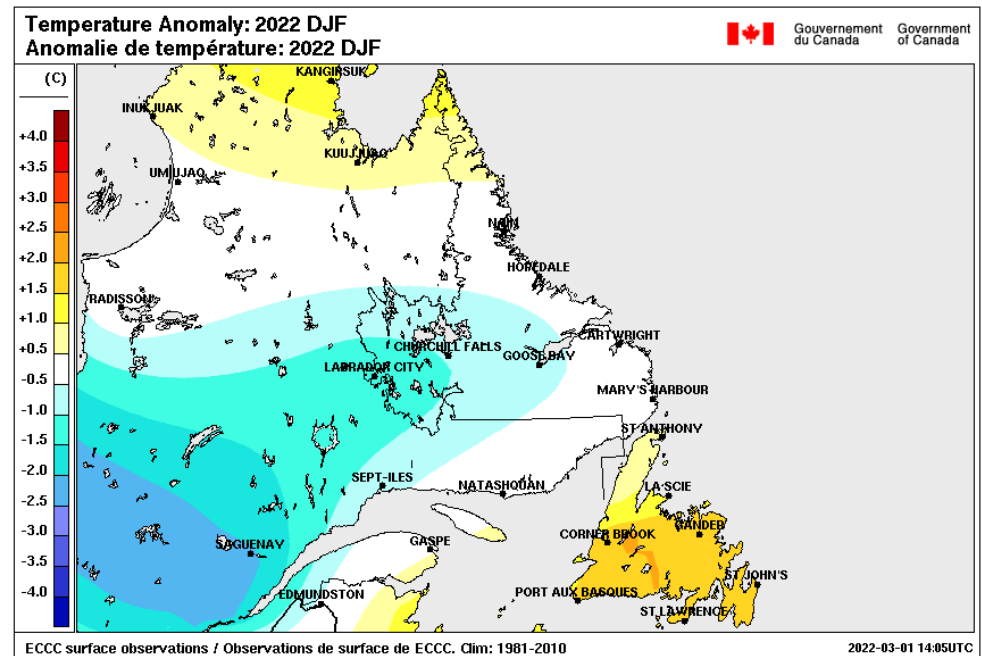
Provincial Climate Overview (December-February):

Temperature (Departure from Normal):

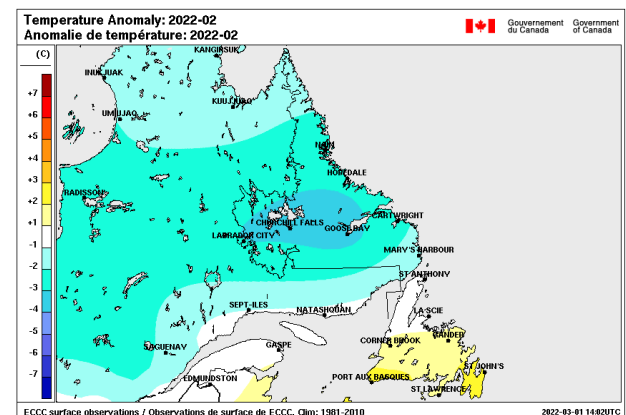
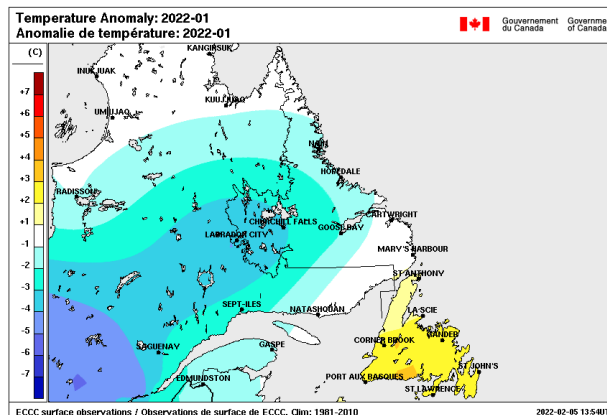
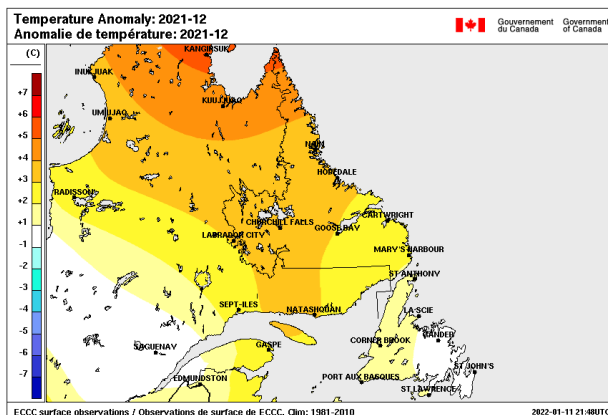
Temperatures for this Winter (averaged over December, January, February) were above normal across Newfoundland (1 to 3 C). Labrador had below normal temperatures (-1 to -2 C) in the western regions and near normal temperatures elsewhere. This is the first season since Spring 2020 where parts of the region have had below normal temperatures.

Highlights:

- First season below normal in Labrador since Spring 2020
- Bonavista area had its 8th warmest DJF season
- St. Lawrence area had its 7th warmest DJF season
- All stations in Newfoundland reported positive temperature anomalies (temperatures warmer than the climate normal)
- Labrador City/Wabush Lake area had its 5th coldest January on record



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



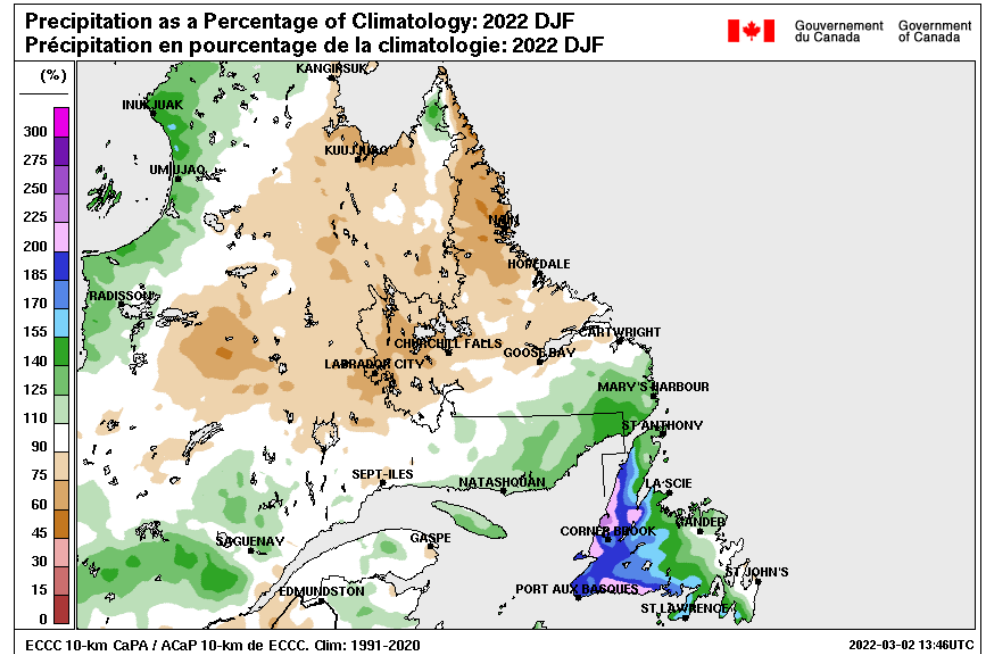
left to right: Temperature anomalies for Newfoundland and Labrador for December, January, February.

Precipitation (Percent of 1991-2020 average):

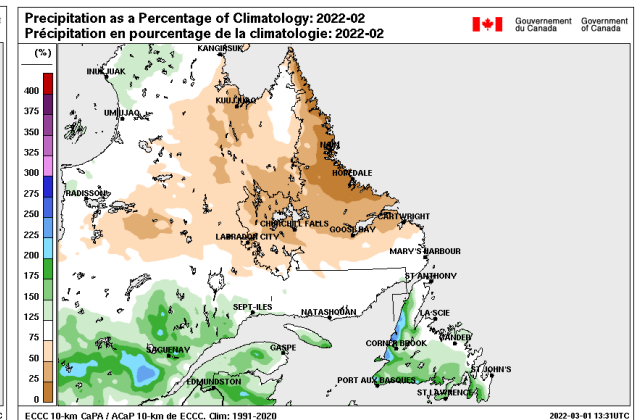
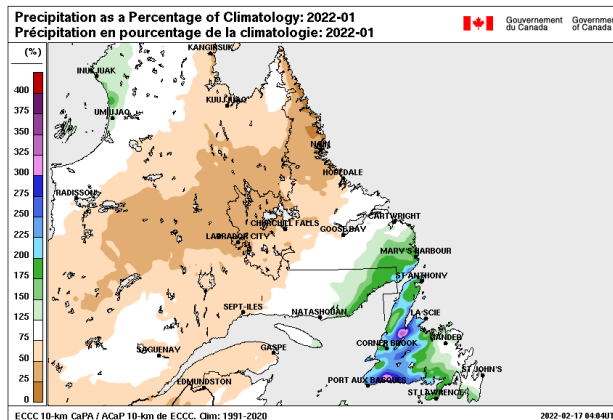
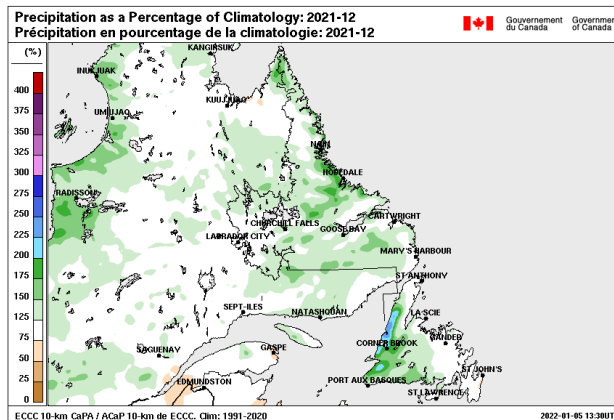
Precipitation this winter (totaled over December, January, February) was well below normal in Labrador and above normal for most of Newfoundland, most notably in the west.

Highlights:

- The west coast of Newfoundland reported 150% of their average total precipitation for the DJF months. Snowfall was especially high along the Great Northern Peninsula.
- January monthly rainfall totals were 5 to 6 times the normal amount in Corner Brook, Stephenville, and St John's. The St. John's area had its rainiest January on record.
- Drought conditions formed in northern Labrador due to little precipitation in January and 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, and February.

Seasonal Temperature and Precipitation Tables:

Seasonal temperature averages and precipitation totals compared to seasonal normals for December 2021 to February 2022, for selected locations in Newfoundland and Labrador

Location	Mean Temperature (°C)				Total Precipitation (mm)		
	Seasonal Mean	Average of Monthly Normal Means	Diff.	Rank (Warmest)	Seasonal Total	Total of Monthly Normals	Seasonal Total as % of "Normal"
Bonavista	1.3	-0.2	1.5	8	277.2	326.6	85
Channel-Port aux Basques	1.8	-0.4	2.2	>10	412.8	442.6	93
Corner Brook	0.4	-0.6	1.1	>10	567.0	367.0	154
Gander	-0.7	-1.4	0.7	>10	274.9	345.4	80
St. John's	1.4	0.3	1.0	>10	476.6	450.5	106
St. Lawrence	2.4	0.4	2.0	7	486.7	439.9	111
Stephenville	0.8	-0.5	1.3	>10	611.6	355.6	172
Terra Nova Nat Park	-0.6	-1.3	0.7	>10	388.8	339.8	114
Cartwright	-13.6	-12.2	-1.4	>10			
Happy Valley-Goose Bay	-16.0	-15.3	-0.8	>10	154.6	185.8	83
Hopedale	-15.2	-14.6	-0.6	>10			
L'anse au Loup (Lourdes de Blanc Sablon)				n/a			
Nain	-16.8	-15.6	-1.2	>10			
Wabush	-21.5	-20.1	-1.3	>10			

Above: Temperature difference: cells shaded pink if ≥ 1 °C, blue if ≤ -1 °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

Dec 3-4: A low pressure system tracked along southern Labrador and through the Strait of Belle Isle bringing a warm airmass to the island, strong winds (peak gusts up to 132 km/h at Sagona Island), and max rainfall amounts 30-60 mm along the south coast of Newfoundland.

Dec 6-8: A very intense low pressure system tracked through Labrador. Stations in central and coastal Labrador reported 15 to 25 cm snowfall. Peak wind gusts of up to 121 km/h (with many stations over 100 km/h) were reported at stations in Newfoundland and coastal Labrador. Daily temperature records in the mid teens were set across many stations. [ECCC weather summary for Newfoundland](#) [ECCC weather summary for Labrador](#)

Dec 9-10: The centre of a rapidly intensifying low pressure system passed east of the Avalon Peninsula. [The storm brought](#) large amounts of snow to parts of the province, as well as some rain to eastern sections, and very strong winds. Gander reported snowfall 46 cm. St Johns Intl A reported a peak gust of 119 km/h, while gusts to over 140 km/h were reported in exposed coastal locations. [Crews succeeded in stabilizing a ship at risk of sinking.](#) [ECCC weather summary for Newfoundland](#)

Dec 22-25: A low pressure system strengthened as it moved across the Gulf of St Lawrence and Newfoundland before stalling over southeastern Labrador, bringing with it significant snowfall and strong winds to Labrador and parts of Newfoundland. Behind the low, long lasting snowsqualls formed in western Newfoundland with persistent onshore winds, delivering snowfall over a multiday period to the region. Total snowfall amounts of 35-53 cm fell in eastern Labrador and western Newfoundland. Peak wind gusts above 100 km/h occurred in many locations, mainly on the 23rd and 24th. Peak wind gusts above 100 km/h occurred in many coastal locations (with 150 km/h at Wreckhouse), mainly on the 23rd and 24th.

Significant Weather events:

January

Jan 5-6:

A second low pressure system in the first week of the month tracked along western Newfoundland and brought precipitation to western and southern Newfoundland, with more snow north of the track on the Great Northern Peninsula (with estimated amounts of 20-25 cm). Rainfall amounts of 40-86 mm along the west coast caused local flooding, landslides, and a highway washout. Winds gusted to 90-115 km/h in exposed coastal locations.

Jan 7-8:

The third low in the first week to hit Newfoundland tracked over eastern Newfoundland, moving slower than the previous two lows while deepening in pressure. The further eastward track meant significant snow and blowing snow for most of western and central Newfoundland and southeastern Labrador. Measured snowfall amounts were in the 18-28 cm range. ECCC Weather summary

Jan 15-16:

A low tracked across the island spreading significant rain east of the low and snow and blizzard conditions to the west of the track. Many stations across Newfoundland and southern Labrador reported winds gusting to 100-130 km/h. Significant road closures due to adverse snow conditions occurred in western Newfoundland, including the entire Viking Trail between Deer Lake and St. Anthony. Snowfall amounts were 10-30 cm in western Newfoundland with up to 42 cm in southeastern Labrador. Total precipitation amounts ranged from 30 to 67 mm. Some unofficial observations have higher amounts. ECCC Weather Summary - Newfoundland

Jan 18-19 :

A large storm tracked through southern Labrador bringing rain for Newfoundland and southeastern Labrador and snowfall for the rest of Labrador. Strong southerly winds ahead of the low gusted to 90-120 km/h (Wreckhouse 142 km/h). Total rainfall amounts were highest in southwestern Newfoundland reaching 40-76 mm with 20-40 mm elsewhere. Some local flooding occurred with wharfs reported as underwater in Burgeo at high tide. ECCC Weather Summary

Jan 29-30:

A storm crossed southeastern Labrador bringing torrential rain to southern and eastern parts of Newfoundland while other areas received snow, ice pellets, and freezing rain before it all changed to rain. The storm brought with it very mild temperatures (double digits in places). Precipitation was mainly snow in Labrador with 20-40 cm reported. Strong winds, gusting to 100-149 km/h were felt across most of the island and southeastern Labrador. Rainfall amounts of up to 88 mm, in combination with rapid snowmelt caused significant road washouts and localized flooding in eastern Newfoundland. ECCC Weather Summary - NL ECCC Weather Summary - Lab

Significant Weather events:

February

February 5-6:

A broad [trough of low pressure slowly crossed Newfoundland](#) with initial rain changing to snow for most of the island while remaining mainly a rain and freezing rain event on the Avalon. Freezing rain was observed for up to 30 hours in some eastern areas. Snowfall amounts ranged from 40 to 65 cm. Torrential rainfall caused significant flooding in eastern areas of the island with 100 to 180 mm* (*unofficial observation) of rain measured. [ECCC Weather Summary—Newfoundland](#).

Feb 8-9:

A weakening low crossed the western half of the island, affecting Newfoundland and southeastern Labrador. The biggest impacts were strong easterly winds ahead of the low, gusting from 90 to 110 km/h across many coastal locations causing some power loss and downed power poles in southwestern Newfoundland. Wreckhouse wind gusts peaked at 162 km/h.

February 14-15:

An elongated low pressure area tracked just southeast of Newfoundland and brought snowfall to the Island. Snowfall was greatest on the Avalon, with St John's airport reporting 44 cm, and tapered from east to west, with amounts of 25 cm in Gander and 9 cm in Stephenville. [ECCC Weather Summary - Newfoundland](#)

February 17-19:

A low tracked across the southern part of the Great Northern Peninsula and brought heavy snow and blowing snow to areas north of its track, a narrow band of freezing rain near its track and rain and strong winds. Wind gusts of 100 to 130 km/h were reported at many locations. A transport truck overturned near Chance Cove. Significant snowmelt enhanced localized flooding, [washing out roads](#) and flooding basements. Total rainfall amounts varied from 20 to 100+ mm. Snowfall in southern Labrador and the northern part of the Great Northern Peninsula, north of the low's track, accumulated up to 50 cm. Flash freeze conditions in the wake of the low as temperatures dropped rapidly caused icy and dangerous roads. [ECCC Weather Summary - Newfoundland](#)

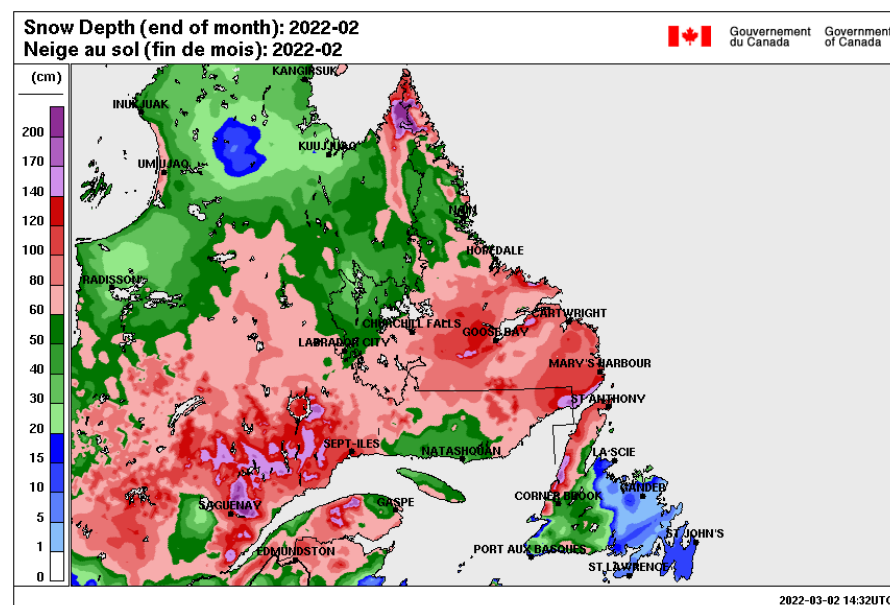
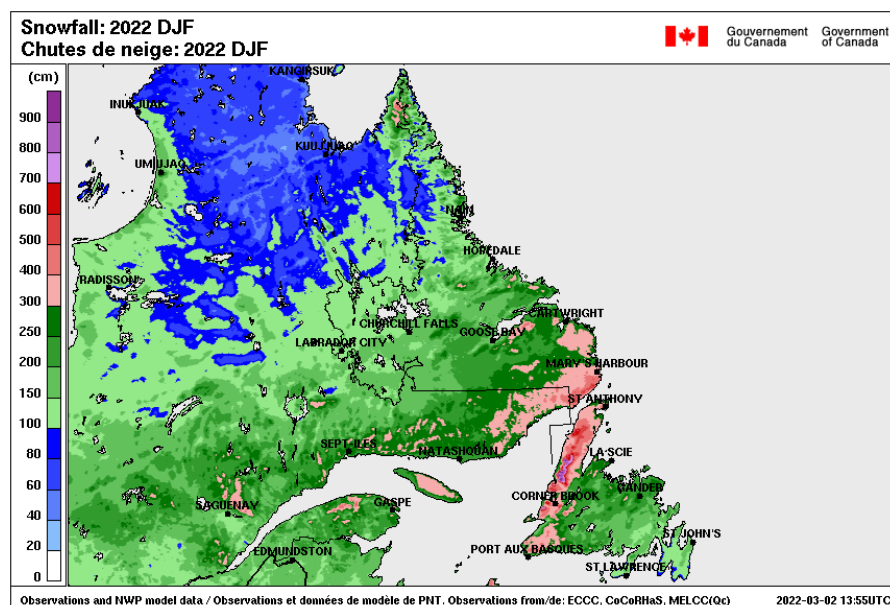
February 23-24:

A broad storm moved across the Gulf of St. Lawrence and across the Great Northern Peninsula with snowfall to its north and rain to its south. Snowfall amounts 24 to 40 cm were measured on the Labrador side of the Strait of Belle Isle. Total precipitation amounts along the west and south coast of Newfoundland were in the 20 to 30 mm range, mainly falling as rain. A few coastal stations reported wind gusts near 100 km/h (Bonavista and Nain).

Total Snowfall and Snow Depth:

The Great Northern Peninsula (GNP), as well as western and southwestern Newfoundland had consistent and significant snowfall through much of the winter due to the storm path across the western part of the Island. Lots of snow fell and piled up with a few rain events causing some abnormal melt and flooding. Eastern Newfoundland had a light season for snowfall with much of the winter precipitation falling as rain in St John's. Snowfall varied from 100 cm in eastern Newfoundland to more than 500 cm (modelled and observed) on the GNP. Snow depth at the end of the winter season varied from under 20 cm on the Avalon Peninsula to more than 120 cm on the GNP.

In Labrador, southeastern areas did see significant snowfall as lows crossed in the Strait of Belle Isle and provided snowfall after snowfall in January and February. By contrast northern areas of Labrador saw some December snow but little snow in January and February under cold and dry conditions. Snowfall depth barely changed between January and February and ended the season with amounts of up to 120-140 cm in the southeast and under 50 cm in parts of northern areas.



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

Right: Snow depth (estimated) for Newfoundland and Labrador at the end of February 2022

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

December

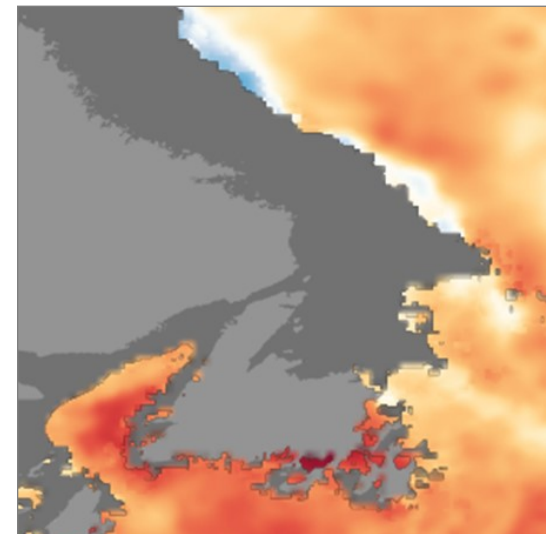
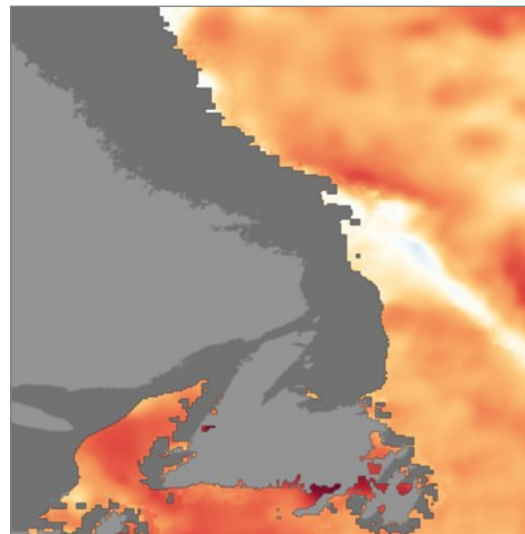
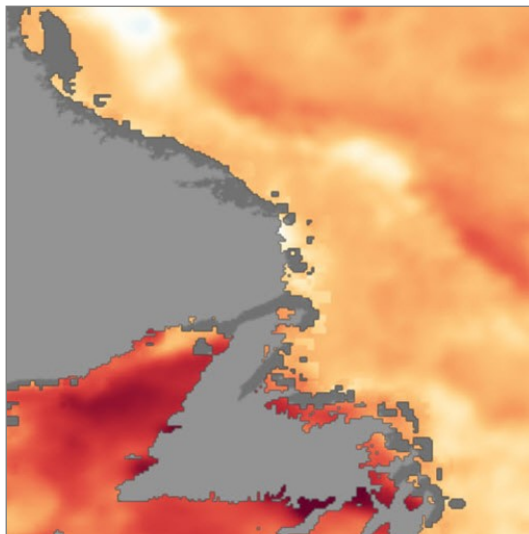
- * Ice forming along the Labrador coast and in the Strait of Belle Isle.
- * Temperatures near to slightly above normal in the Labrador Sea and northeast of Newfoundland
- * Inland bays along the coast of Newfoundland were 2 to 4 C above normal, and 3 to 5+C south of the island.

January

- * Significant sea ice cover.
- * Labrador sea above normal temperature (outside of ice edge).
- * Bays along southern and northeastern Newfoundland slightly cooler than December but still 1 to 3 C above normal.

February

- * Significant sea ice cover. Temperatures near the ice edge near to below normal.
- * Little change in anomaly temperatures otherwise. SST in bays of Newfoundland still above normal (1 to 3 C)



Degrees C / degrés C

-5

5

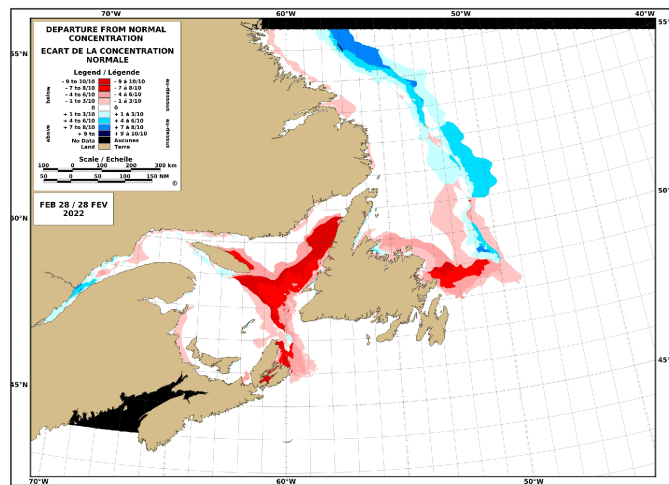
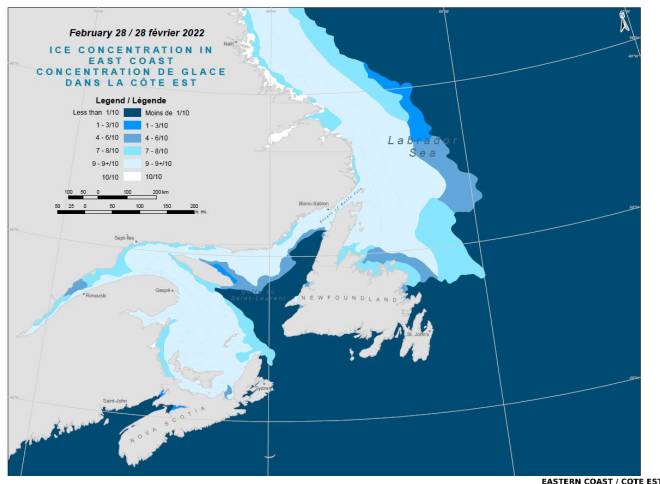
NOAA weekly mean SST anomaly map (based on 1981-2010 Normals) for the last week of Dec 2021 (left), Jan 2022 (middle), and Feb 2022 (right)

<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.

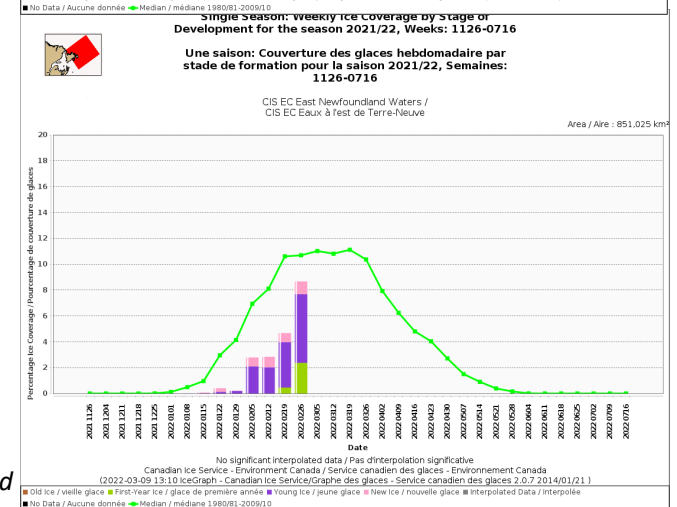
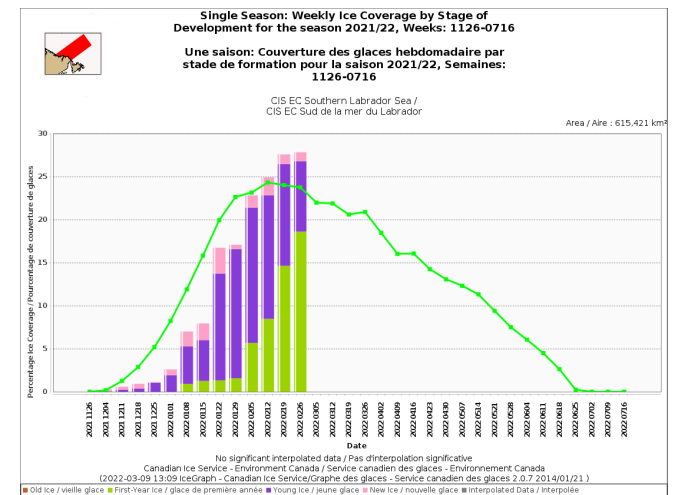
Sea Ice Coverage: (Analysis / Concentration departure from normal/seasonal coverage charts)

Sea ice had a slow start to the season with warmer than normal temperatures in December keeping ice formation to a minimum. Ice formed 2-3 weeks behind schedule in the south Labrador Sea area in January and grew from 2% cover at the start of the month to 17% by the end of the month. Cold temperatures in the Labrador area enabled significant continued ice growth through February with cover rising to 28% at the end of the month, 6% higher than the longer term median.



STATISTICS BASED UPON 1981-2010
 LES STATISTIQUES BASÉES SUR 1981-2010

Ice formation in Newfoundland waters was delayed 2-3 weeks through the winter. By the end of February cover remained 2% under the climate normal of 11% and very close to the normal for the last decade. Winter 2022 saw significantly more ice than the two previous winters.



Sea ice analysis charts Feb 28, 2022:
 Left top—Concentration of ice
 Left bottom—Departure from normal concentration
 Right top—Ice coverage South Labrador Sea
 Right bottom—Ice Coverage East Newfoundland waters

River Flows:

In **December**, due to significant monthly precipitation across Newfoundland, all the river gauges reported excessive flow. Record flow was recorded at Eagle River.

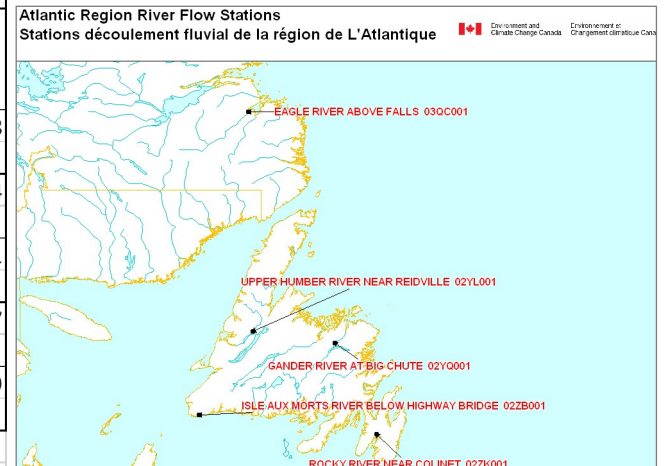
For the second month in a row all rivers in Newfoundland recorded excessive flow in **January**. Isle Aux Morts recorded record flow for the month and ended with flow 554% of the median. Excessive precipitation and snow melt combined to keep river flows excessive.

Continuing the trend, **February** recorded excessive flow across Newfoundland as precipitation continued to be above normal on the Island. Stations reported from 156% to 492% of their normal flows.

Not surprisingly, given the excessive flow each month, the total cumulative run-off was higher than the median for the season.

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

River Flow Station		Dec 2021		Jan 2022		Feb 2022		Cumulative Run-off from Oct 1
Station Number	Drainage Area (km ²)	Mean Flow (m ³ /s)	% of Median	Mean Flow (m ³ /s)	% of Median	Mean Flow (m ³ /s)	% of Median	% of Median
EAGLE RIVER ABOVE FALLS 03QC001	10900	228 ER	247	86.9 E	155	61.2 E	156	138
GANDER RIVER AT BIG CHUTE 02YQ001	4400	185 E	159	228 E	255	240 E	350	154
ISLE AUX MORTS RIVER BELOW HIGHWAY BRIDGE 02ZB001	205	24.8 E	225	26.6 ER	554	17.6 E	492	241
ROCKY RIVER NEAR COLINET 02ZK001	301	18.5 E	127	23.4 E	171	33.7 E	288	157
UPPER HUMBER RIVER NEAR REIDVILLE 02YL001	2110	105 E	254	91.7 E	353	66.8 E	425	189
* 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)								
Dec analysis produced Jan 28, 2022								
Jan analysis produced Feb 22, 2022								
Feb analysis produced Mar 24, 2022								



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

December

- * No drought conditions across the region
- * The two abnormal drought areas from November (central Newfoundland and northern Labrador) improved due to abnormally high precipitation amounts in those two areas.



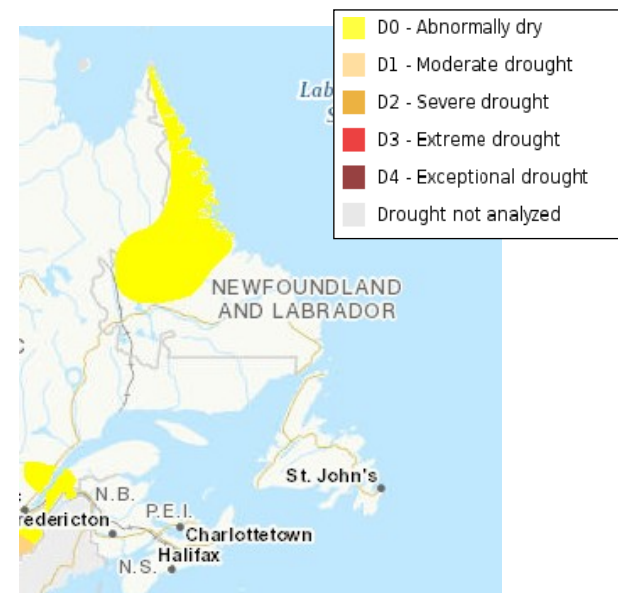
January

- * No change from December with no areas of drought across the region.



February

- * Due to very dry conditions in January and February abnormally dry conditions have developed in most of northern Labrador



Canadian Drought Monitor Map for December 2021 (left), January 2022 (middle), and February 2022 (right). Drought maps courtesy of Agriculture and Agri-Food Canada - <https://agriculture.canada.ca/en/agriculture-and-environment/drought-watch-and-agroclimate/canadian-drought-monitor>

Provincial Impacts (December—February):

Although some events in December related to snowfall and wind occurred they weren't particularly unusual for Newfoundland and Labrador, especially given the milder than normal temperatures and near to slightly above normal precipitation across the region.

Winter Rain, snow melt, and flooding

Although there were many things that can be said about the 2021-2022 winter, the impacts of many storms and events through January and February had a similar story: Rain in Newfoundland. Although not unusual to have rain in the winter the magnitude of rain was record in some locations. St. John's had its rainiest January on record.

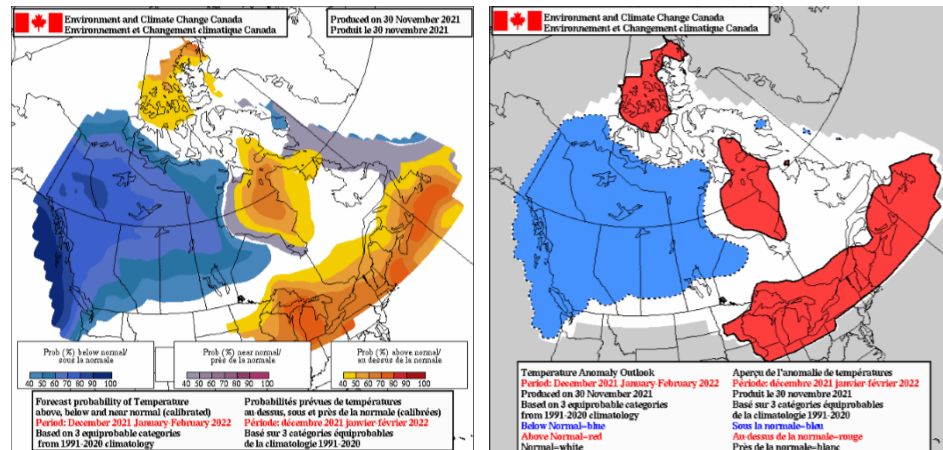
With each rain event came reports of localized flooding, highway washouts, flooded basements, and wharves underwater. Snow that fell, especially in eastern Newfoundland, helped contribute to flooding events due to rain as the added snow melt increased total water amounts in the area. Storm tracks across the western part of the island contributed to this excess rainfall while providing a healthy amount of snow to western Newfoundland, the Great northern peninsula, and southeastern Labrador. Significant road closures occurred at multiple times through the months as a result of this snowfall.

More sea ice than recent years

The prolonged cold in Labrador through January and February allowed ice formation to reach coverage levels it hasn't seen in years at the end of February/early March. Coverage at the end of Feb/early March in the southern Labrador Sea sat at 28%, 6% higher than the long term median. The amount of sea ice was almost double that of the previous year, was the highest since 2016, and the second highest amount since 1996.

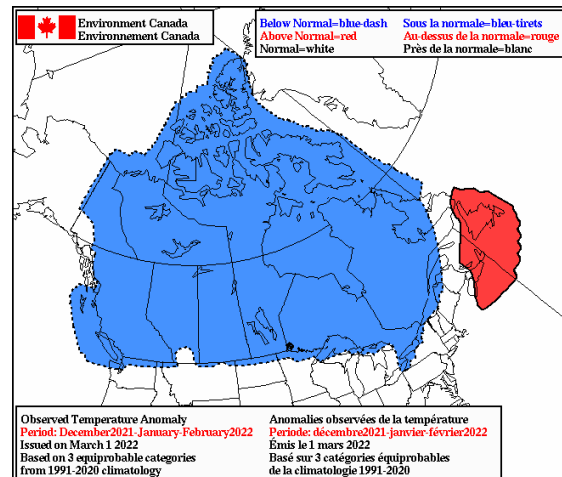
Winter Season (Period: December-January-February) Temperature Outlook Performance:

The winter temperature forecast called for a moderate to high probability of warmer than normal temperatures across most of the island. Elsewhere in the province, there was no clear signal.



Left: Probability of above, below and near normal: Produced November 30, 2021 – Right: Forecast Temperature Anomaly: Produced November 30, 2021

The observed temperature anomaly matched the outlook very well across the island. In Labrador, temperatures ended up being below normal across western and northern regions.

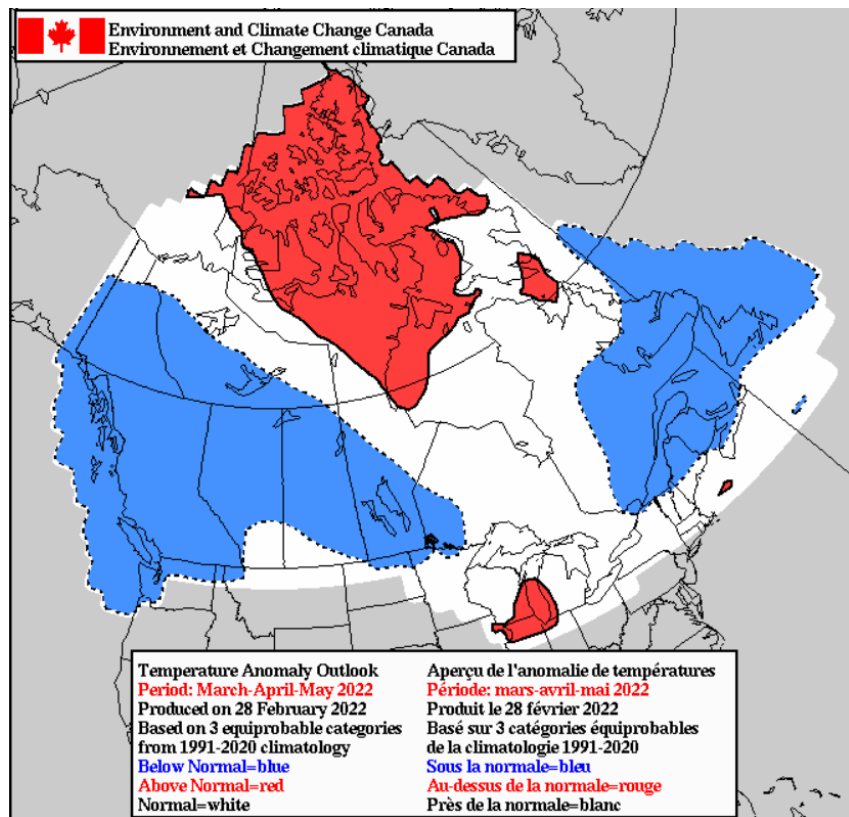
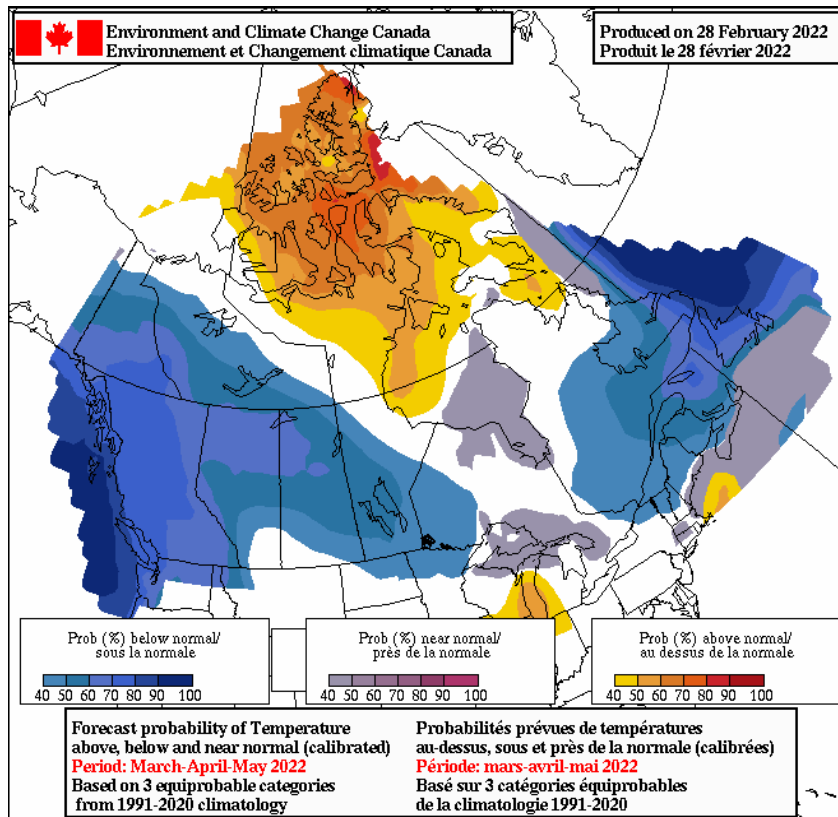


Above: Observed Temperature Anomaly– Issued on March 1, 2022

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

Looking ahead to spring, there is a low to moderate chance of below normal temperatures in western and northern Labrador. Elsewhere in the province, the probability of below normal temperatures is moderate to high for the spring season.

With regards to precipitation, guidance shows a low to moderate chance of drier than normal conditions for Labrador. In Newfoundland, 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, 2022 – Right: Temperature Anomaly Outlook: Produced February 28, 2022

https://weather.gc.ca/saisons/index_e.html

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