Environment and Climate Change Canada
Environnement et Changement climatique Canada

Seasonal Summary

North American Arctic Waters

Spring 2023

By

Canadian Ice Service
Le service canadien des glaces

Canada

Foxe Basin, Hudson Bay, Davis Strait and Labrador Coast

End of Winter and Spring Ice Conditions

At the end of January, medium first-year ice covered most of Foxe Basin except along the western coasts and outside of the consolidated ice edge, where there was mainly thin first-year and grey-white ice. The southeastern section had a mixture of thin and medium first-year ice. Thin and medium first-year ice covered most of northern Davis Strait with up to 1 tenth old ice except there was mainly thin first-year ice in the eastern section and consolidated medium first-year ice along the coast. A mixture of grey-white, grey and thin first-year ice covered most of Cumberland Sound with consolidated medium first-year ice along the coast. Thin first-year and grey-white ice covered Frobisher Bay with consolidated medium first-year ice along parts of the coasts. Thin first-year ice covered most of Hudson Strait and Ungava Bay except there was mainly medium first-year ice in the northwestern section and a mix of thin first-year, grey-white and grey ice in the western section of Ungava Bay. A trace of old ice was present in northeastern Hudson Strait by early January. Western Hudson Bay had a mixture of thin and medium first-year ice except there was a mixture of grey-white and grey ice along the coasts. Eastern Hudson Bay had mostly thin first-year ice and a mixture of thin first-year, grey-white and grey ice in western James Bay. The northern portion of the Labrador coast had a mixture of thin first-year and grey-white ice with grey-white and grey ice along the coast (including a trace of old ice). The rest of the Labrador coast had a mixture of grey-white and grey ice with new and grey ice along the coast (figures 1 & 8).

During the early winter months, freeze-up was faster than normal by about 1-2 weeks for western Davis Strait, Cumberland Sound, Frobisher Bay, portions of Hudson Strait and southeastern Foxe Basin. Freeze up was slower than normal by about a week for Ungava Bay and along the Labrador coast (figure 2).

The ice thickened to medium first-year over most of Foxe Basin by the end of January (near the climatological median) but it took until the end of March to reach mostly thick first-year ice, about a month delayed. Over most of Hudson Bay, the ice thickened to medium first-year by the end of February, about a month later than the climatological median. The ice over most of Hudson Bay remained medium first-year this winter/spring except over portions of the west-central section, which thickened to thick first-year ice. Over western Davis Strait, ice thicknesses reached medium first-year with up to 1 tenth old ice near the end of February and mostly thick first-year ice by the end of March, which was near the climatological normal (figure 4). Hudson Strait reached mainly medium first-year ice by the end of February, which was near normal as well. Exceptions to this were over the northeastern section and in Ungava Bay, which took until mid-March to reach medium first-year ice, which was a few weeks later than normal. Ice thicknesses along most of the Labrador coast reached thin first-year by mid-February, about 2-3 weeks later than normal and medium first-year including a trace of old ice by early March, which was near normal (figure 4). It took until the beginning of May for the ice to reach thick first-year ice along most of the Labrador coast, which was near normal for the northern Labrador coast but slower than normal by about a week for the southern Labrador coast (figure 5). In general, the ice was thinner than normal over most of Hudson Bay, Hudson Strait and along the southern Labrador coast (figures 5 & 6).

This spring there was generally less ice than normal along the ice edge, along the Labrador coast and in eastern Davis Strait due to persistent strong northeasterly winds. Some open areas began to emerge by the end of April along the northern coast of Foxe Basin, along the northeastern and northern coasts of Hudson Bay, as well as in the northwestern section of Hudson Strait. These areas of lower concentrations or open water persisted and expanded throughout the month of May, signalling an earlier than normal breakup by about 2-3 weeks. Early break-up and ice melt also occurred in Frobisher Bay and Cumberland Sound by about 2-3 weeks. At the end of May, less ice than normal remained in many areas. In general, ice break-up was 2-3 weeks earlier than normal over the entire area (figure 7).

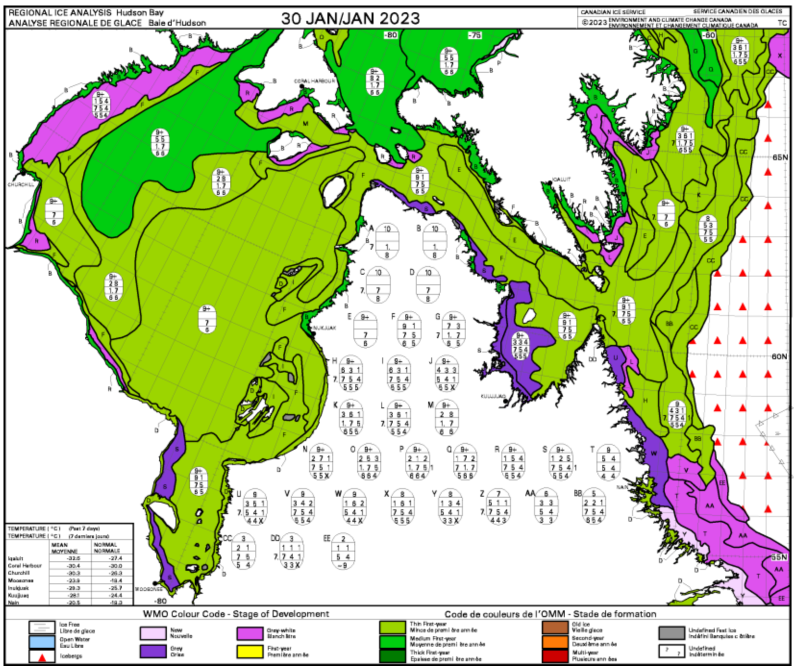


Figure 1 Ice stage of development analysis for the Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea regions on January 30, 2023

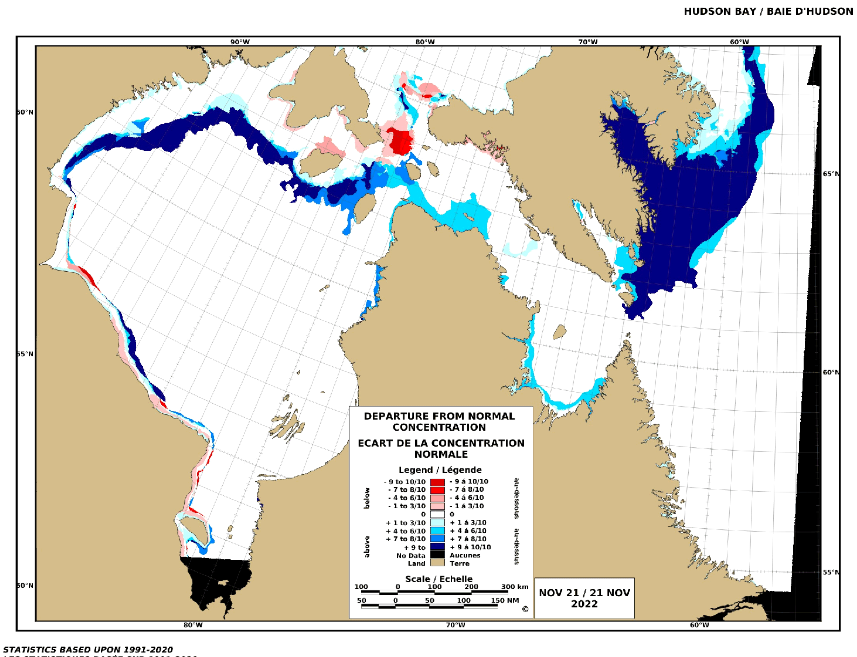
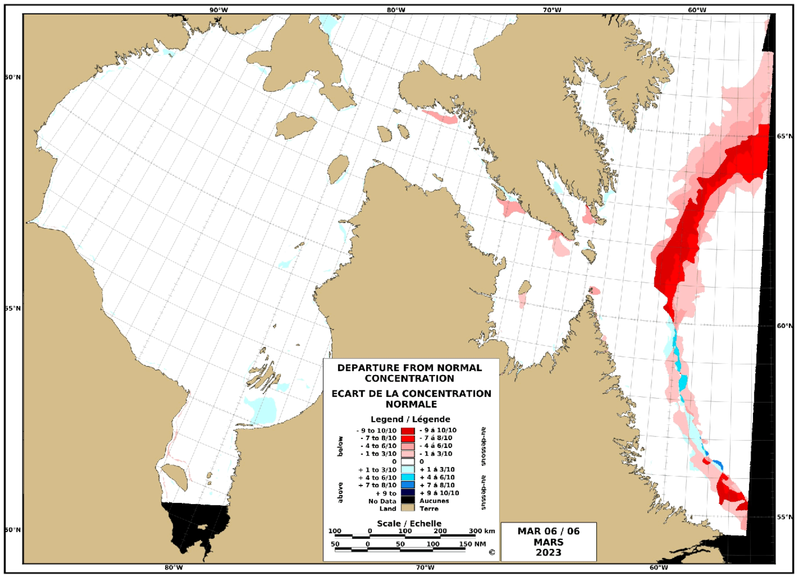


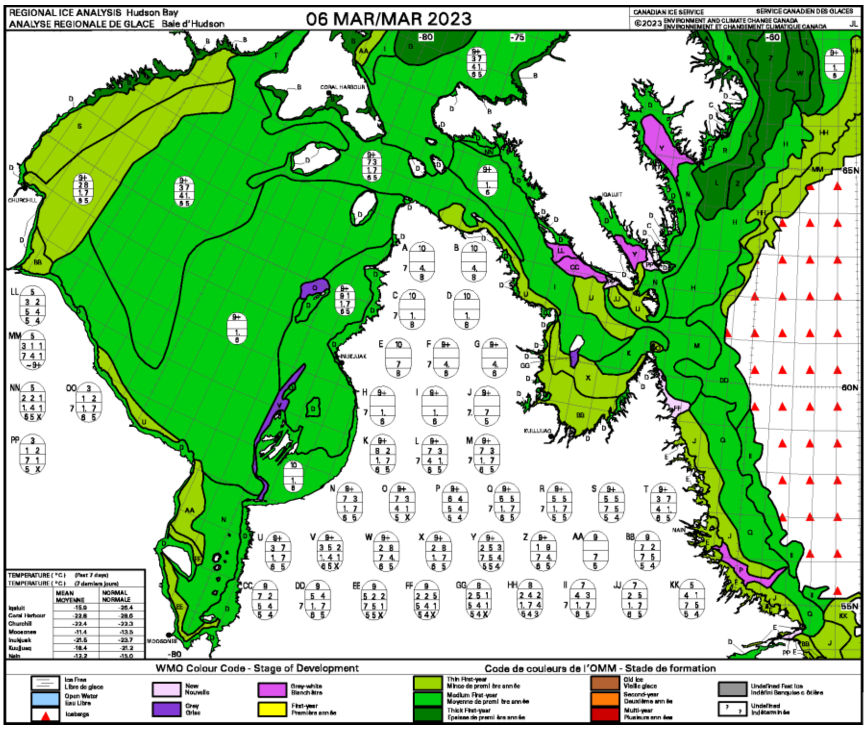
Figure 2 Departure from normal ice concentration for the Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea regions on November 21, 2022

HUDSON BAY / BAIE D'HUDSON



STATISTICS BASED UPON 1991-2020 (INTERPOLATED BETWEEN 01-MAR AND 01-APR)
LES STATISTIQUES BASÉE SUR 1991-2020 (INTERPOLÉES ENTRE LE 01-MARS ET LE 01-AVR)

Figure 3 Departure from normal ice concentration for the Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea regions on March 6, 2023



TEMPERATURE (°C) (Past 7 days) TEMPERATURE (°C) (7 derniers jours)	MEAN MOYENNE	NORMAL NORMALE
Iqaluit	-15.9	-26.4
Coral Harbour	-22.8	-28.6
Churchill	-22.4	-22.3
Moosonee	-11.4	-13.5
Inukjuak	-21.5	-23.7
Kuujjuaq	-18.4	-21.2
Nain	-12.2	-15.0

Figure 4 Ice stage of development analysis for the Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea regions on March 6, 2023

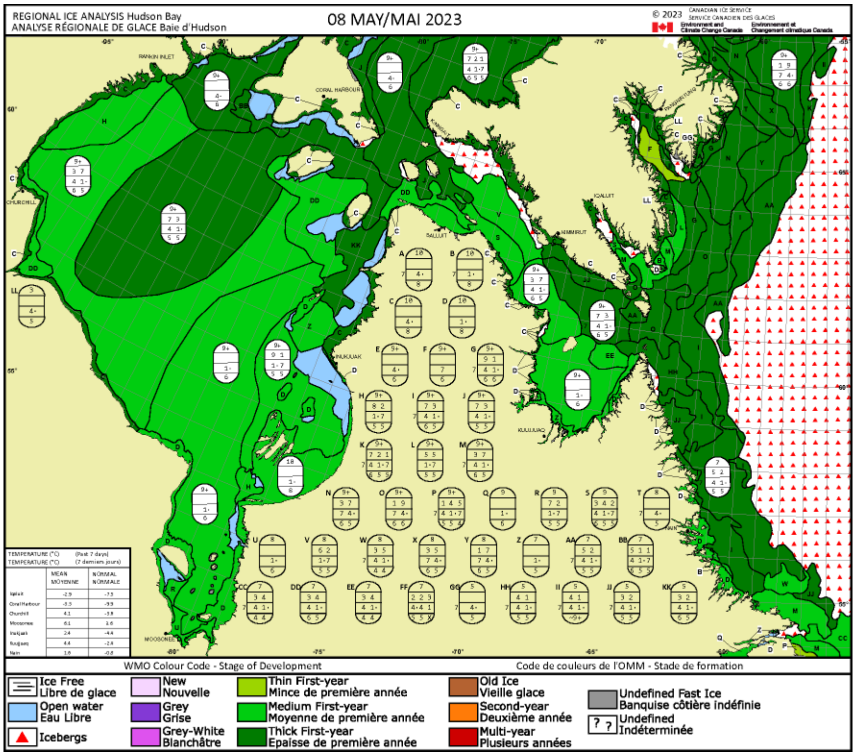


Figure 5 Ice stage of development analysis for the Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea regions on May 8, 2023.

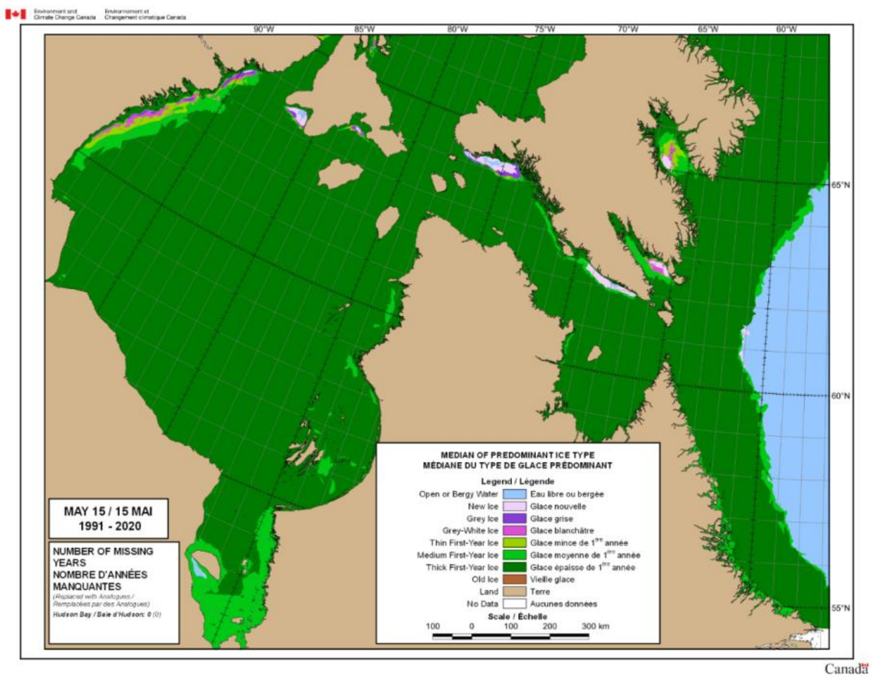
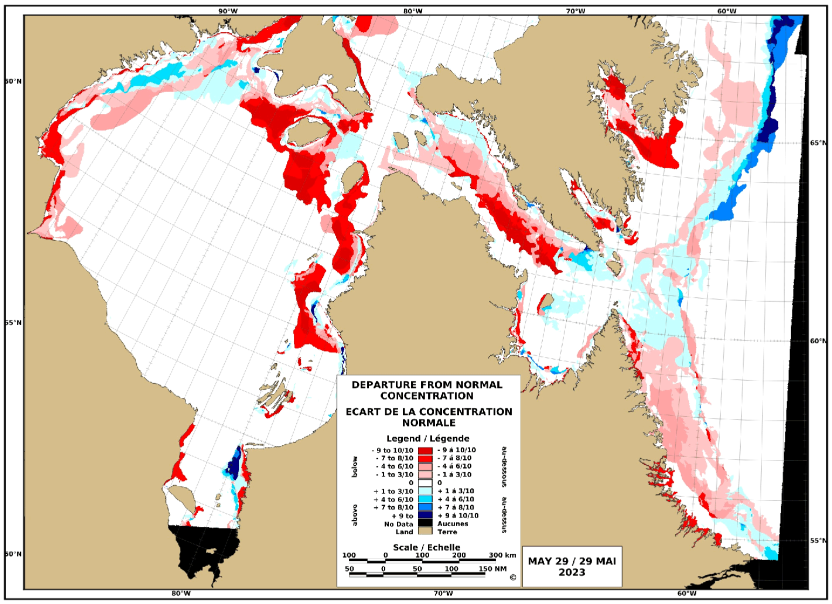


Figure 6 30-year climate median (1991-2020) of predominant ice type for the Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea regions for May 15.

HUDSON BAY / BAIE D'HUDSON



STATISTICS BASED UPON 1991-2020 (INTERPOLATED BETWEEN 15-MAY AND 11-JUN)
LES STATISTIQUES BASÉE SUR 1991-2020 (INTERPOLÉES ENTRE LE 15-MAI ET LE 11-JUIN)

Figure 7 Departure from normal ice concentration for the Hudson Bay area on May 29, 2023.

Station	Actual end of April FDD	Median end of April FDD (1981-2010)	Percent of normal FDD	May average temperatures (°C)	May departure from normal (°C)
Nain	1730	2254	77	2.1	1.1
Iqaluit	3505	4019	87	-3.4	1.0
Kuujjuaq	2545	3188	80	2.4	2.2
Inukjuak	2886	3316	87	0.7	2.5
Cape Dorset	3139	3424	92	-3.7	1.3
Churchill	3423	3638	94	5.5	6.2
Hall Beach	4988	5229	95	-6.9	2.2

Table 1 End of April freezing degree-days (FDD) and May temperatures for the Hudson Bay area.

Eastern and Northern Arctic

End of Winter and Spring Ice Conditions

At the end of January, there was predominantly medium first-year ice in Baffin Bay with up to 4 tenths old ice in the western section. In the extreme northern section, there was a mix of thin and medium first-year and grey-white ice and along the western coast of Greenland there was mainly thin first-year ice. The Gulf of Boothia and Prince Regent Inlet contained mostly medium first-year ice. A trace of old ice was also present in northern Prince Regent Inlet. Most of Lancaster Sound had medium first-year ice including a trace of old ice. Eastern Barrow Strait contained medium first-year ice while western Barrow Strait had consolidated medium first-year ice (normally old ice is also present). Most of Jones Sound had consolidated medium first-year ice with up to 2 tenths old ice and consolidated medium first-year ice covered most of Admiralty Inlet (figure 10).

In early October, during the freeze up period, significant amounts of ice (including old ice) was transported southwards from Kane Basin, along the eastern entrance of Lancaster Sound and into Pond and Navy Board Inlet (figure 8). This ice subsequently consolidated by the end of November and at the end of January, this area contained mostly consolidated medium first-year ice with up to 4 tenths old ice except for Eclipse Sound, which had only a trace of old ice. In the Arctic Archipelago, consolidated thick first-year and old ice was present (figure 10). There was also more old ice than normal in central Baffin Bay, Jones Sound, McDougall Sound, southern Norwegian Bay and in Pond and Navy Board Inlet (figure 11).

At the end of February, the ice over most of Baffin Bay remained as medium first-year ice when normally that area has thick first-year ice at that time of year (figure 12 & 13). There was also up to 7 tenths old ice in the western section which was more old ice than normal. The ice in Prince Regent Inlet remained mobile when normally it consolidates over the northern half by the beginning of April.

The ice bridge in Kane Basin normally forms throughout the entire basin by the end of February. This year the ice bridge formed at the very end of March and only over the southern section of the basin (figure 14). The total lack of an ice bridge in 2022 and the late formation in 2023 has allowed for a prolonged southward transport of old ice from the Lincoln Sea. As a result, there is a greater than normal presence of old ice in portions of Baffin Bay and western Davis Strait.

By the end of April, the ice in western Baffin Bay thickened to thick first-year ice with up to 4 tenths old ice but the ice in eastern Baffin Bay remained medium first-year. Mostly thin first-year ice with a trace of old ice was present over northwestern Baffin Bay (figures 15 & 16).

At the beginning of May, ice began to break-up over portions of Lancaster Sound and northwestern Prince Regent Inlet, a month earlier than normal. Northern Baffin Bay also saw earlier and more extensive breakup than normal. Early breakup continued throughout the month in these areas, with open water areas present by month’s end, which was 2-3 weeks earlier than normal.

In general, ice melt over the eastern Arctic was near climatology (1991-2020) over southern Baffin Bay and earlier than normal over northern Baffin Bay, Lancaster Sound, Prince Regent Inlet and Cumberland Sound.

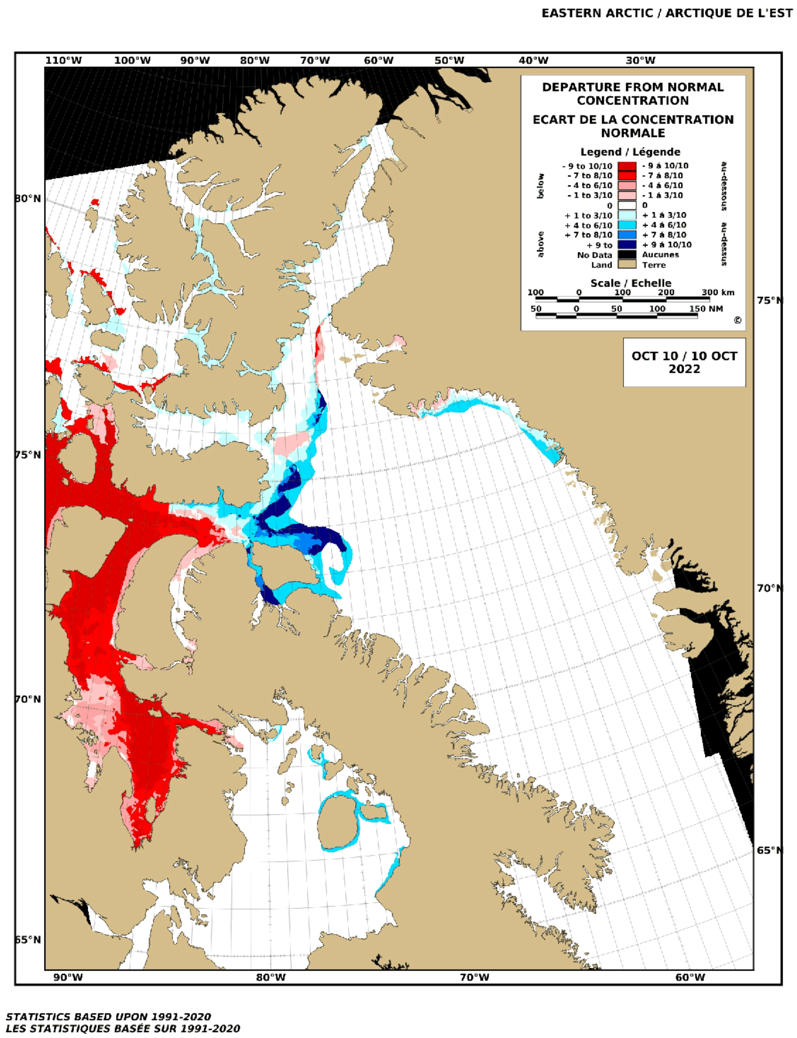


Figure 8 Departure from normal ice concentration for the Eastern Arctic area on October 10, 2022

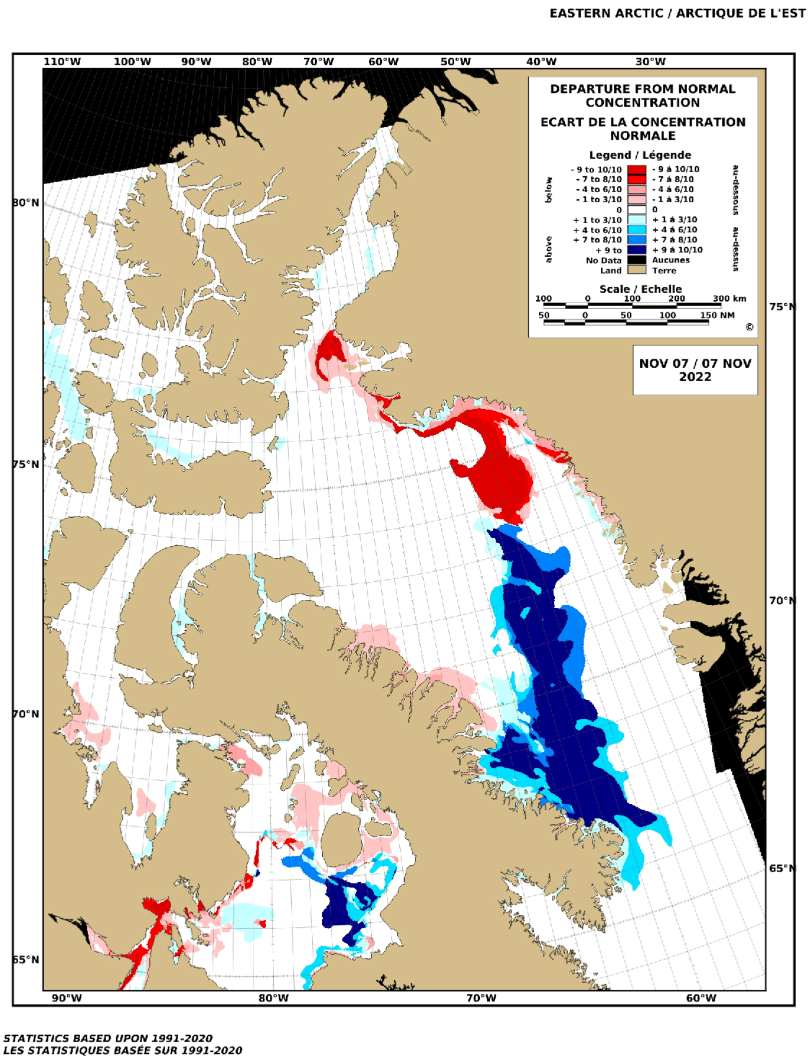


Figure 9 Departure from normal ice concentration for the Eastern Arctic area on November 7, 2022

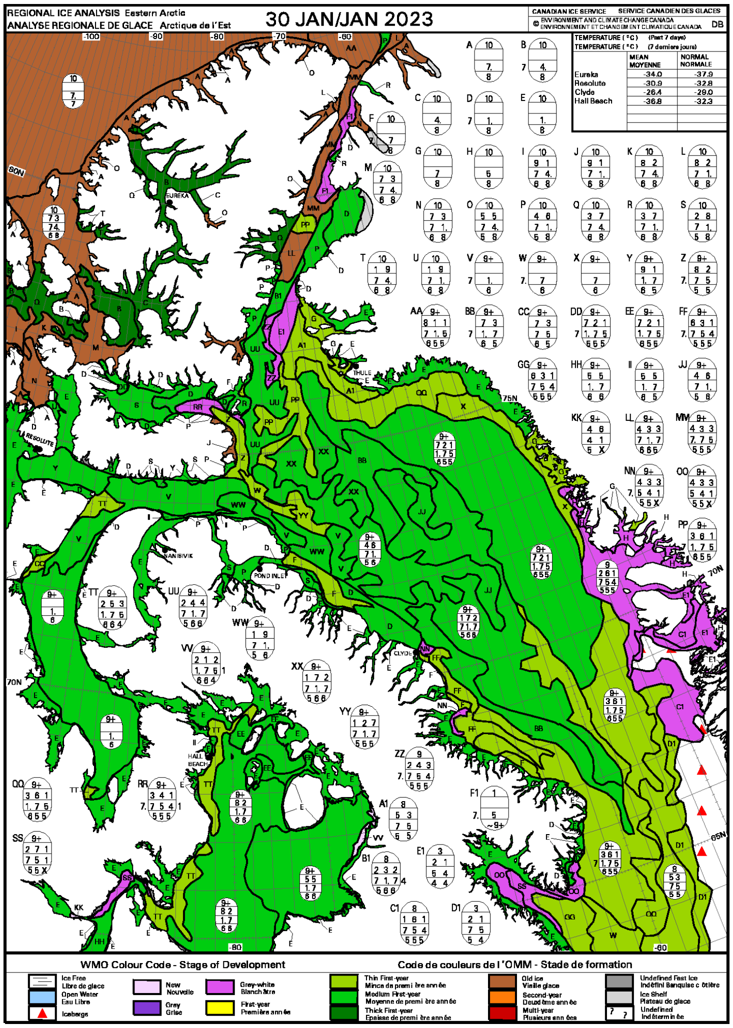
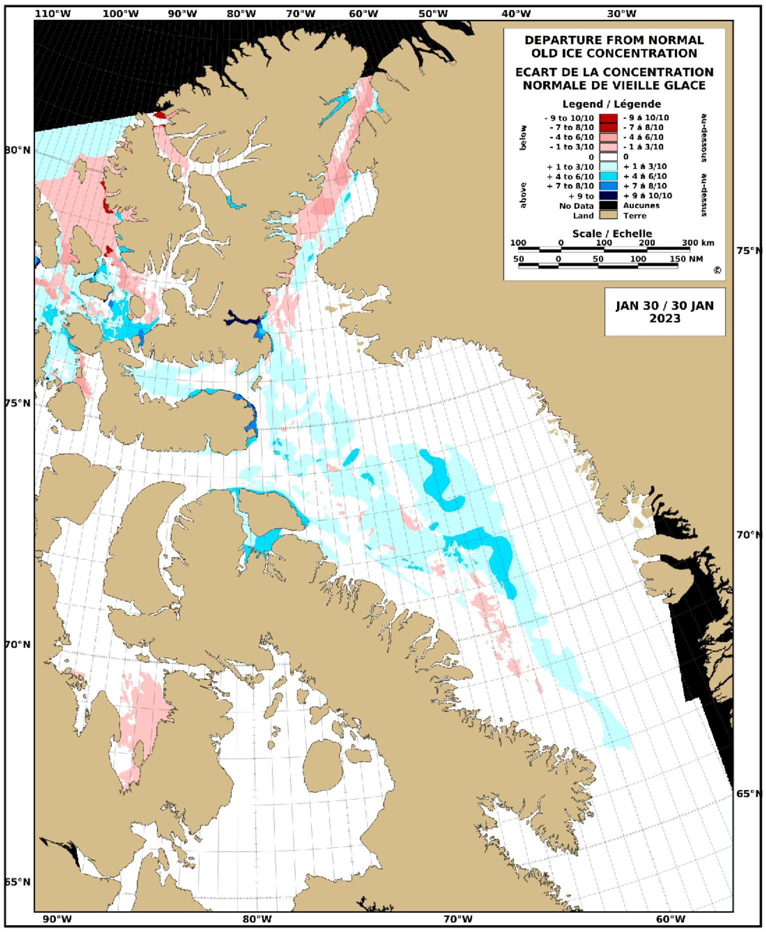


Figure 10 Ice stage of development analysis for the Eastern Arctic area on January 30, 2023

EASTERN ARCTIC / ARCTIQUE DE L'EST



STATISTICS BASED UPON 1991-2020
LES STATISTIQUES BASÉE SUR 1991-2020

Figure 11 Departure from normal old ice concentration for the Eastern Arctic area on January 30, 2023

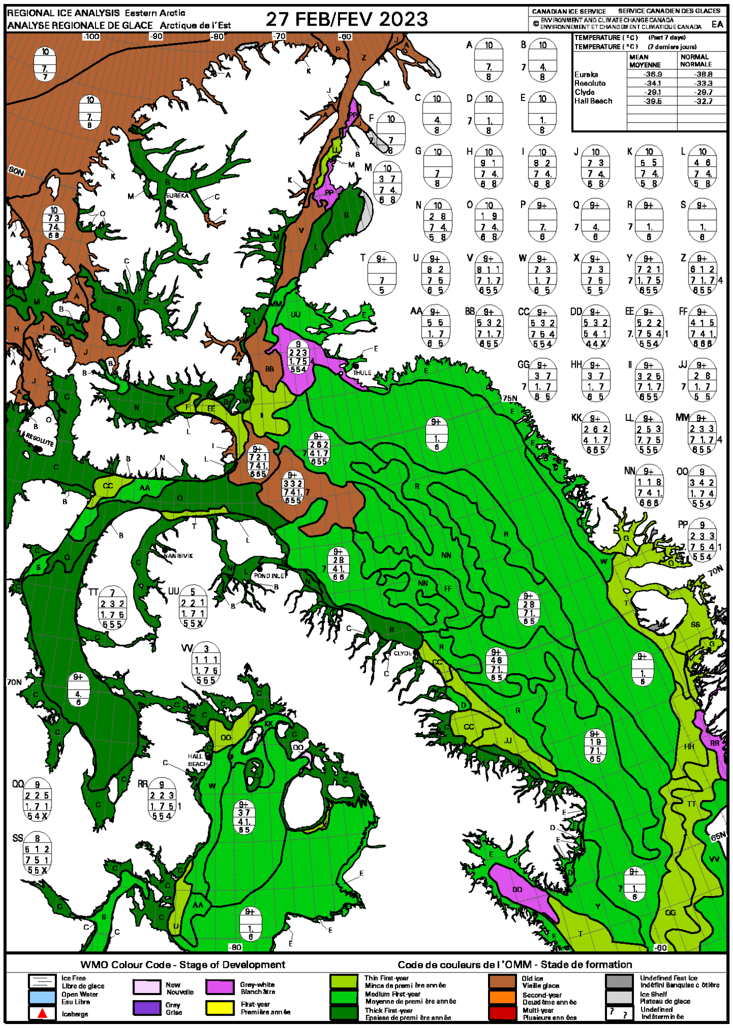


Figure 12 Ice stage of development analysis for the Eastern Arctic area on February 27, 2023

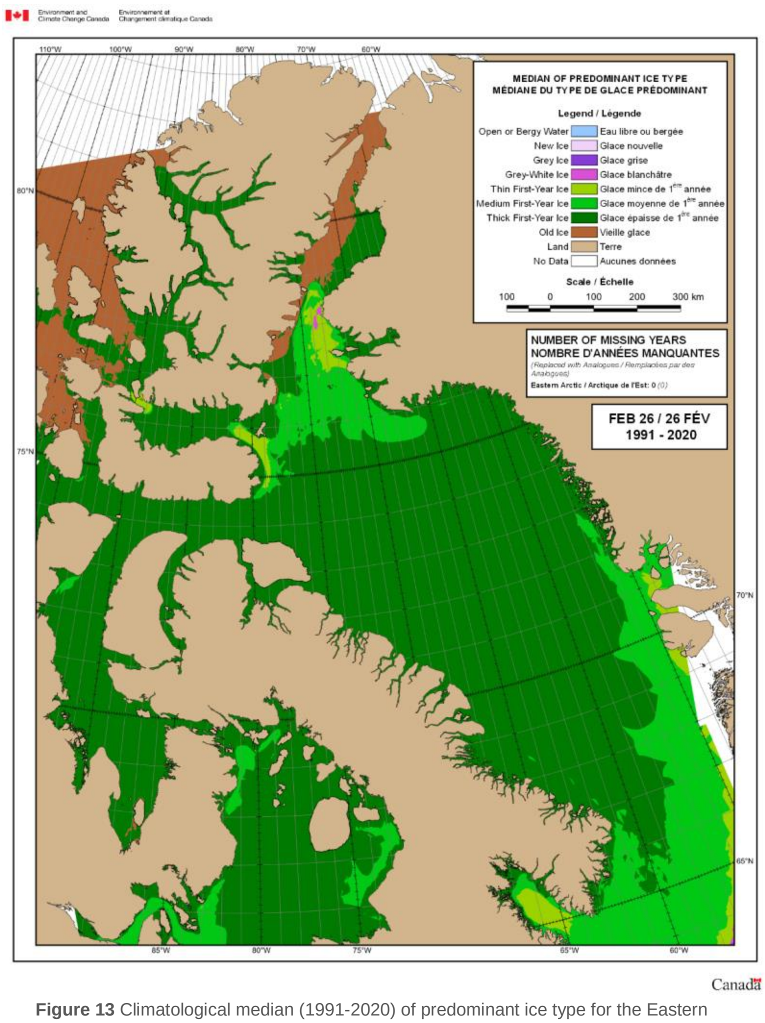


Figure 13 Climatological median (1991-2020) of predominant ice type for the Eastern Arctic area on February 26

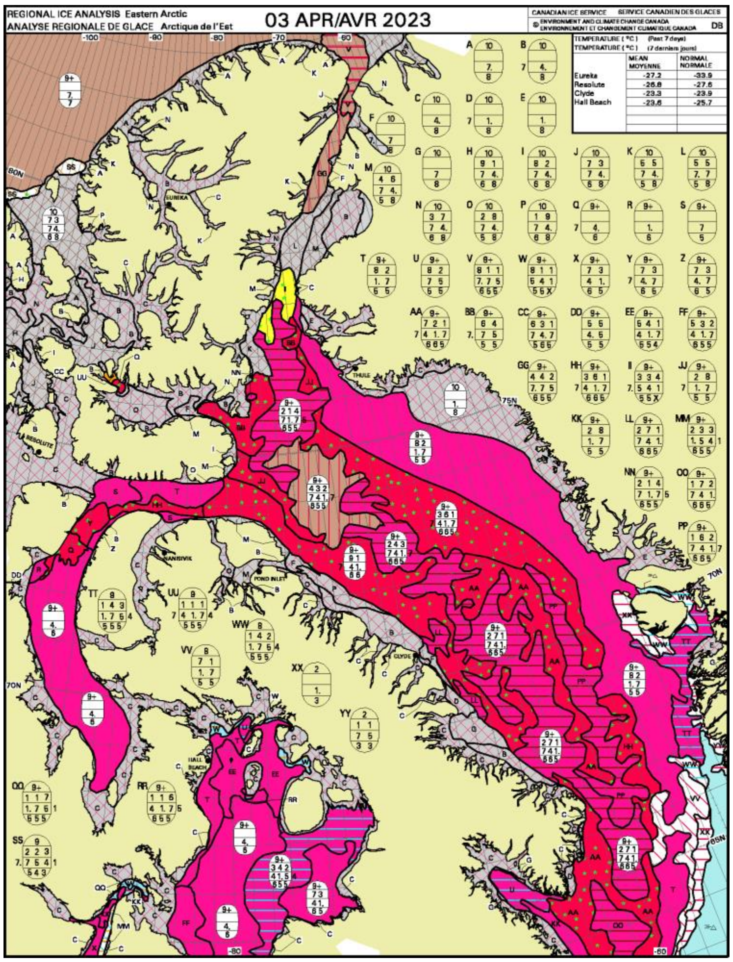


Figure 14 Ice stage of development analysis for the Eastern Arctic area on April 3, 2023

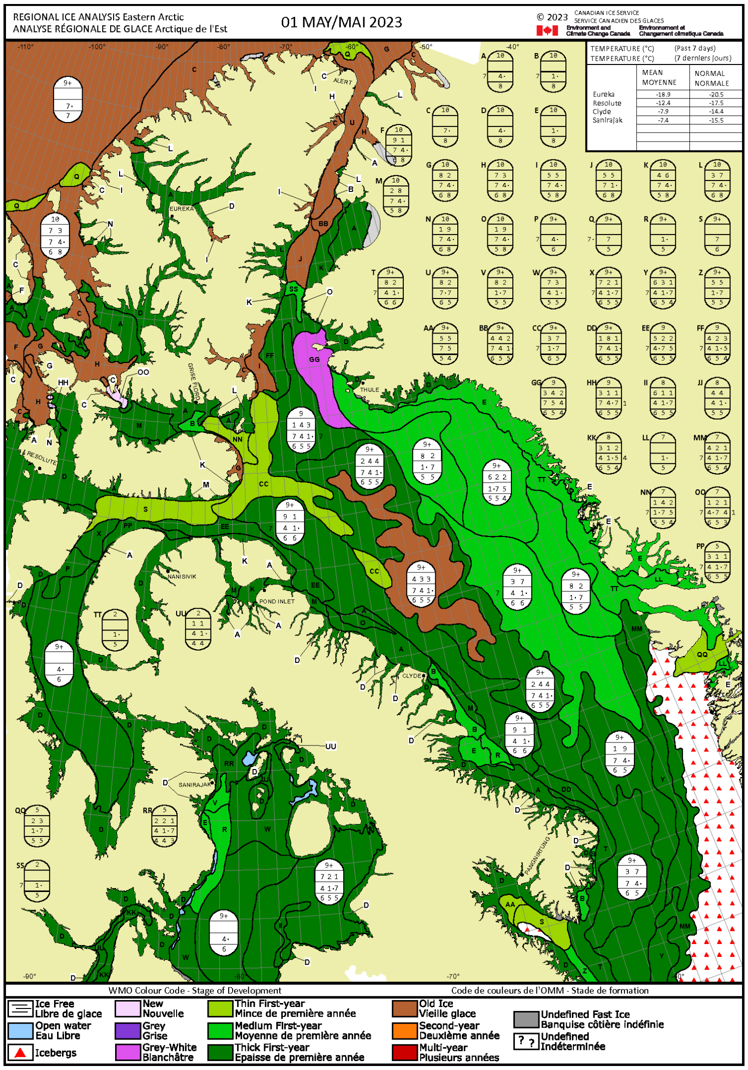


Figure 15 Ice stage of development analysis for the Eastern Arctic area on May 1, 2023

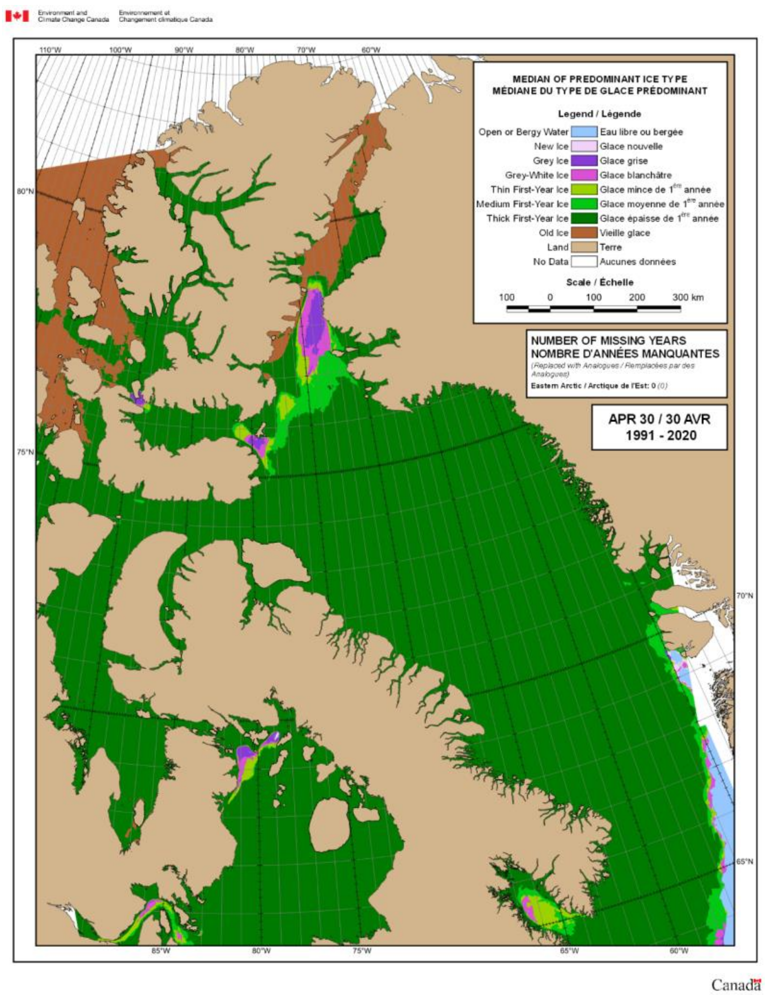


Figure 16 Climatological median (1991-2020) of predominant ice type for the Eastern Arctic area on April 30

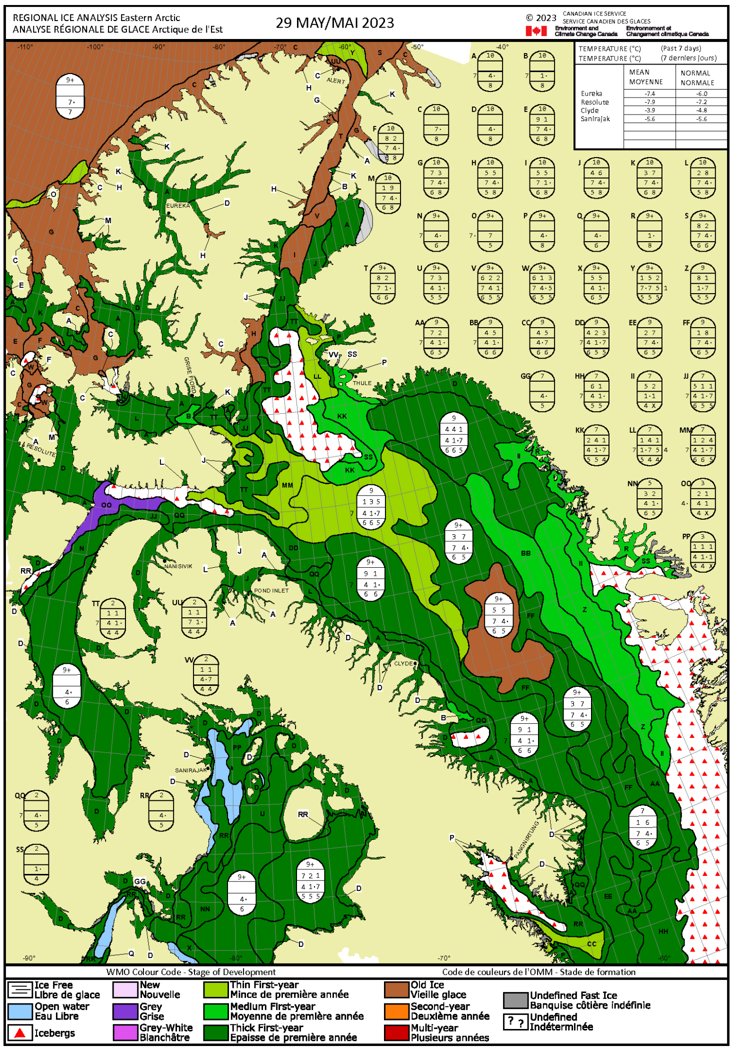
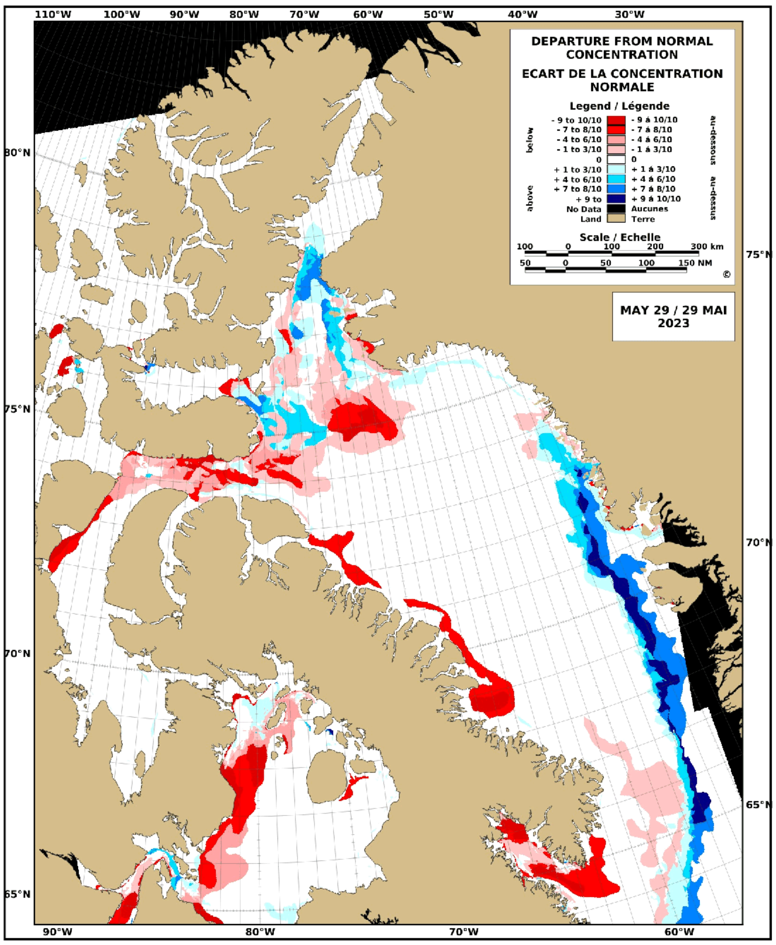


Figure 17 Ice stage of development analysis for the Eastern Arctic area on May 29, 2023

EASTERN ARCTIC / ARCTIQUE DE L'EST



STATISTICS BASED UPON 1991-2020 (INTERPOLATED BETWEEN 15-MAY AND 11-JUN)
LES STATISTIQUES BASÉE SUR 1991-2020 (INTERPOLÉES ENTRE LE 15-MAI ET LE 11-JUIN)

Figure 18 Departure from normal ice concentration for the Eastern Arctic area on May 29, 2023

Station	Actual end of April FDD	Median end of April FDD (1981-2010)	Percent of normal FDD	May average temperatures (°C)	May departure from normal (°C)
Clyde	4387	4678	94	-5.7	2.5
Pond Inlet	5164	5433	95	-7.6	1.6
Resolute	5343	5797	92	-8.3	2.5
Eureka	6383	7131	90	-10.7	0.3

Table 2 End of April freezing degree-days (FDD) and May temperatures for the Eastern Arctic area

Western and Central Arctic

End of Winter and Spring Ice Conditions

At the end of January, there was mainly medium first-year ice with a trace of old ice in the southern Beaufort Sea. The northern Beaufort Sea and the Arctic Ocean had predominantly old ice with medium first-year ice also present in lesser amounts. McClure Strait had predominately-medium first-year ice with a trace of old ice. The west coast of Banks Island, outside of the consolidated ice edge had mainly grey-white ice. Most of the Amundsen Gulf had a mixture of thin first-year, medium first-year and grey-white ice. By the end of January, Parry Channel and McClintock Channel normally contain a combination of old and thick first-year ice. This winter, mainly consolidated medium first-year ice was present in both areas. One exception to this was in Viscount Melville Sound, which had a combination of consolidated old and medium first-year ice (figures 19 & 27). Consolidated thin and medium first-year ice was present along most of the Alaska, Yukon and NWT coasts as well as throughout the shipping route from Dolphin and Union Strait to the Queen Maud Gulf and into Peel Sound. There was predominantly consolidated medium first-year ice along the west coast of Banks Island and consolidated medium first-year and old ice in Prince of Wales Strait and throughout the rest of the central Arctic Archipelago (figure 20).

By the end of February, the consolidated thin and medium first-year ice was much further west than normal in the western part of the Amundsen Gulf (figure 21). Most of the mobile and consolidated medium first-year ice progressed to thick first-year ice over all areas except in the Amundsen Gulf and in the Beaufort Sea. The mobile ice in the southern Beaufort Sea and west of Point Barrow remained medium first-year ice, which was thinner than normal for this time of year (figures 22 & 23). There remained a trace of old ice near Point Barrow and in some areas in the southern Beaufort Sea. Most of the medium first-year ice in the southern Beaufort Sea thickened to predominantly thick first-year ice by the beginning of April.

By the end of March, prolonged offshore southerly winds resulted in open areas and younger ice formation in the southeastern Beaufort Sea and along the coast of western Banks Island (figure 24). The ice in these areas re-thickened to thin first year ice by the beginning of May. Throughout the month of May, the main icepack in the Beaufort Sea moved southeastward and towards Banks Island but several open water areas remained in the southeastern Beaufort Sea. Break-up of the consolidated ice in the Amundsen Gulf began at the end of May and continued into early June (figure 25).

Overall, the western Arctic experienced near normal ice melt throughout the month of May and early June when compared to climatology except greater than normal ice melt in the southeastern section (figure 26).

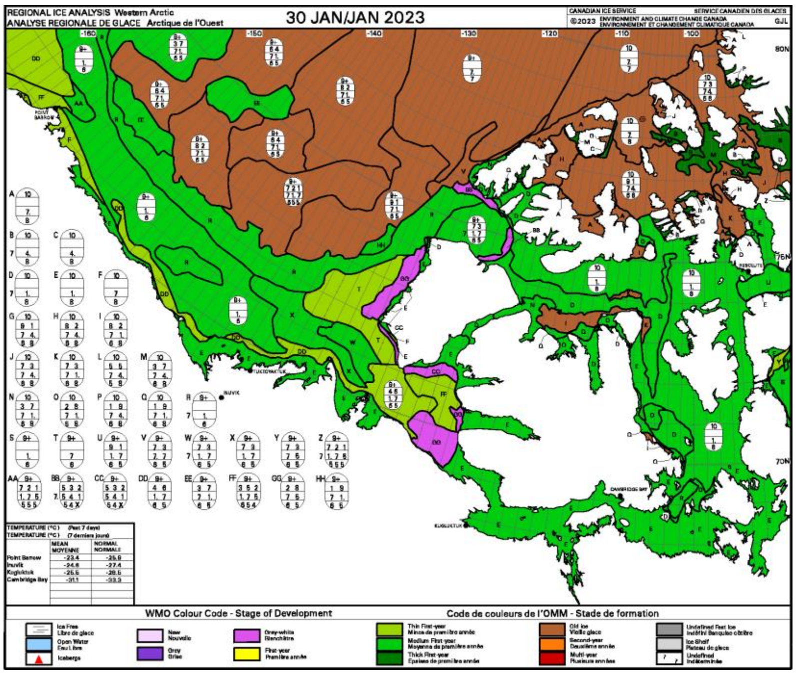


Figure 19 Ice stage of development analysis for the Western Arctic area on January 30, 2023

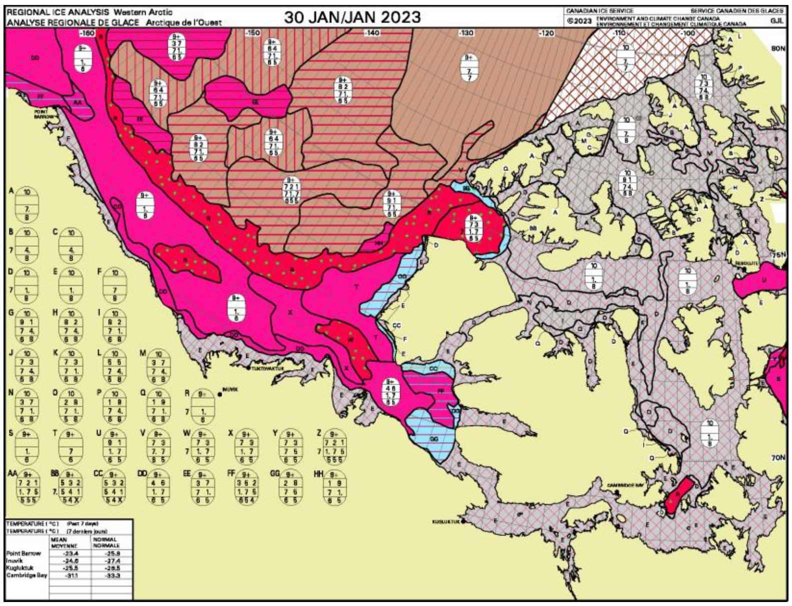


Figure 20 Ice stage of development analysis for the Western Arctic area on January 30, 2023

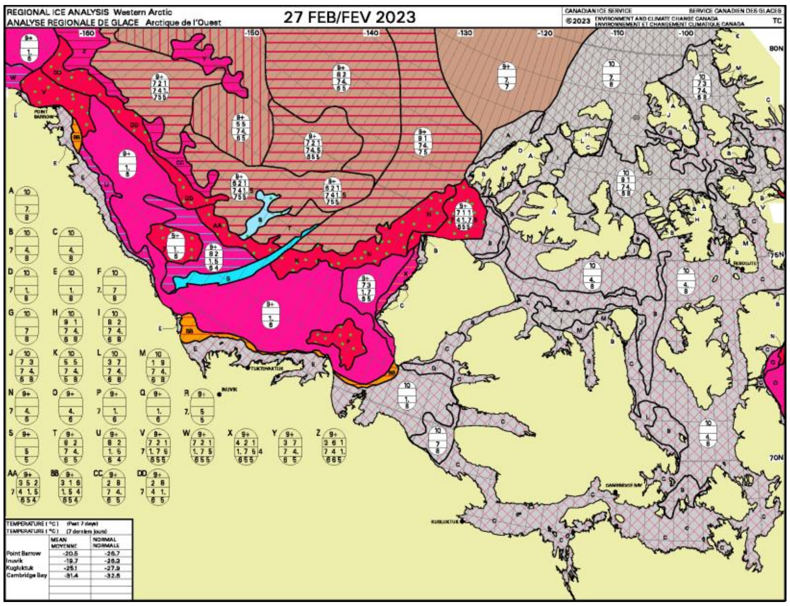


Figure 21 Ice stage of development analysis for the Western Arctic area on February 27, 2023

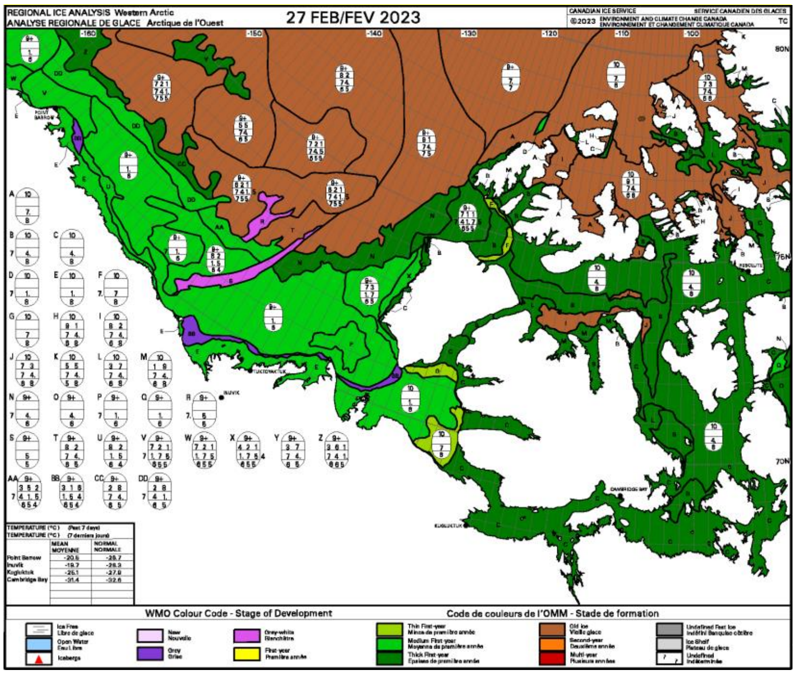


Figure 22 Ice stage of development analysis for the Western Arctic area on February 27, 2023

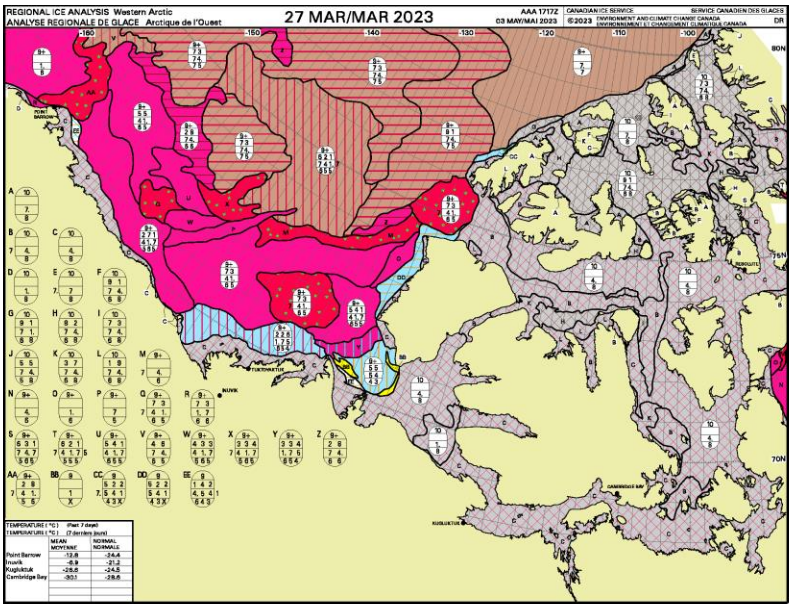


Figure 23 Ice stage of development analysis for the Western Arctic area on March 27, 2023

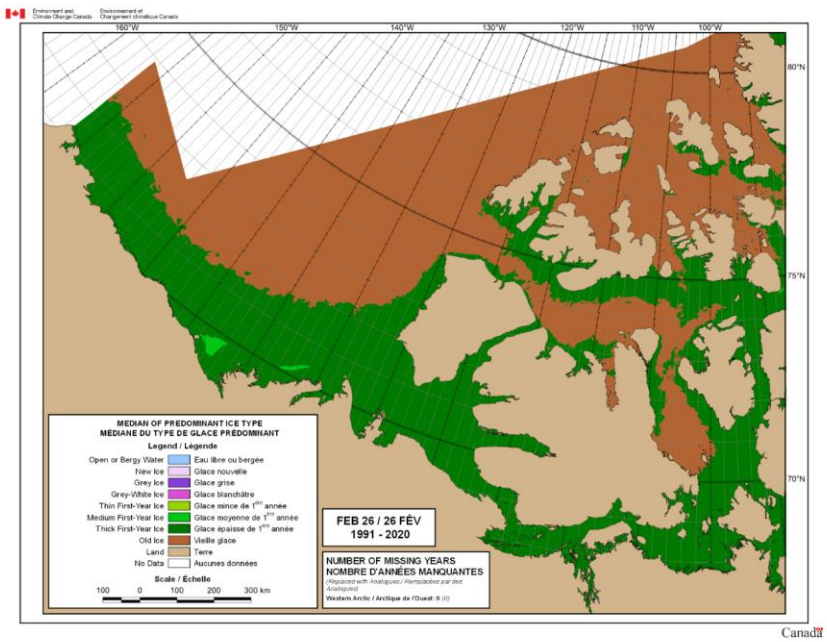


Figure 24 Climatological median (1991-2020) of predominant ice type for the Western Arctic area on February 26th

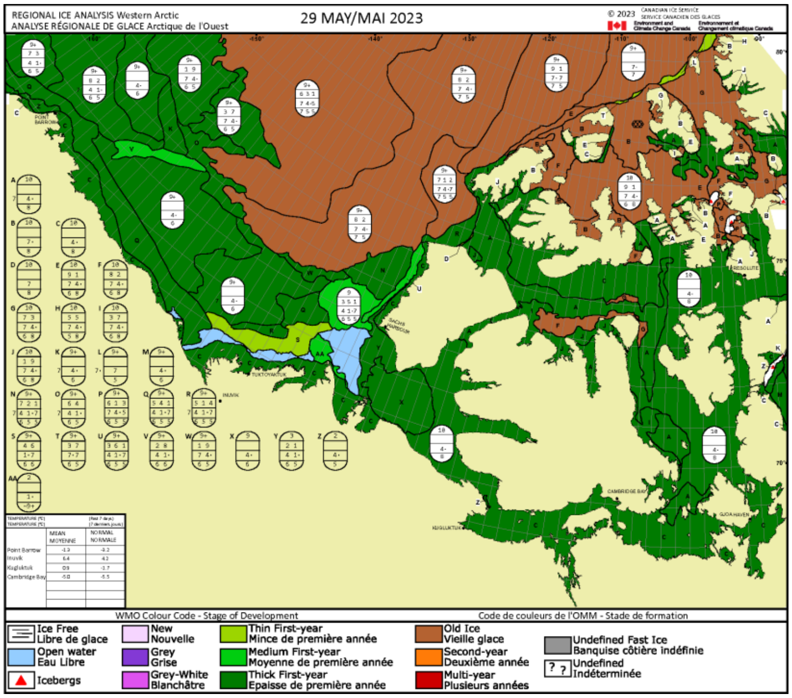


Figure 25 Ice stage of development analysis for the Western Arctic area on May 29, 2023

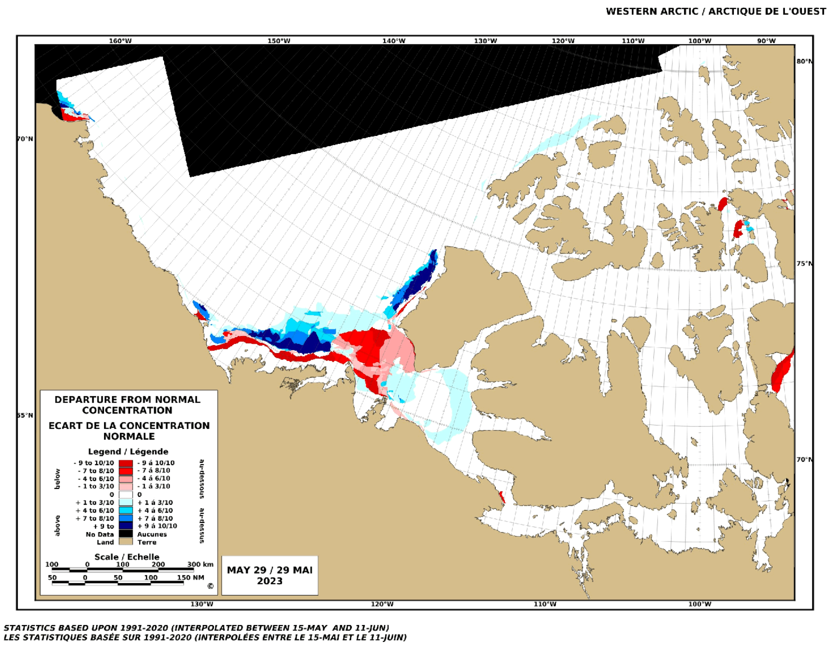


Figure 26 Departure from normal ice concentration for the Western Arctic area on May 29, 2023

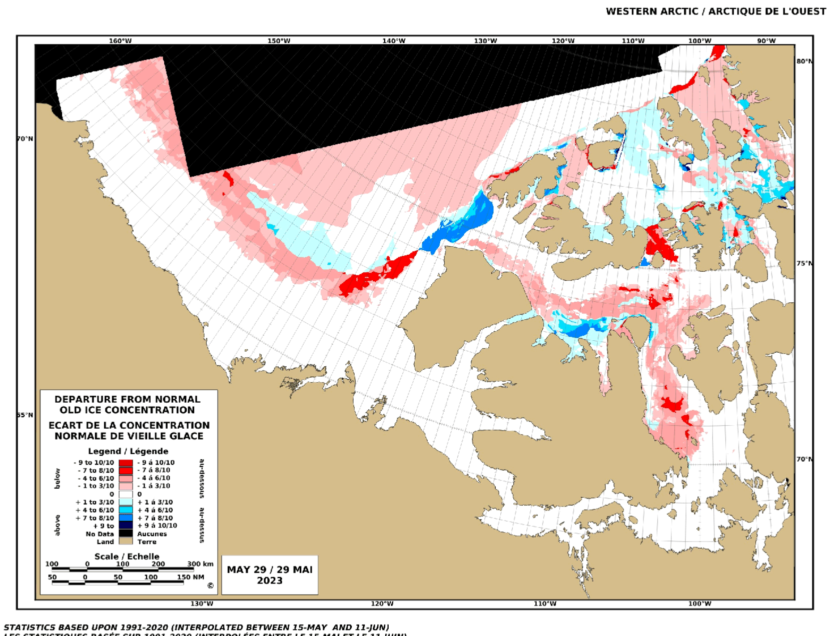


Figure 27 Departure from normal ice concentration for the Western Arctic area on May 29, 2023

Station	Actual end of April FDD	Median end of April FDD (1981-2010)	Percent of normal FDD	May average temperatures (°C)	May departure from normal (°C)
Mould Bay	5627	6148	92	-6.3	4.6
Cambridge Bay	5283	5513	96	-3.7	5.4
Kugluktuk	4331	4598	94	1.4	6.4
Tuktoyaktuk	4062	4271	95	0.6	4.8

Table 3 End of April freezing degree-days and May temperatures (FDD= Freezing Degree Days)