Environment and Climate Change Canada | Environnement et Changement climatique Canada

Seasonal Summary

North American Arctic Waters

Spring 2024

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

From November 2023 to January 2024, surface air temperatures were 2-5°C above the climatological mean (figure 1). Consequently, sea ice formation occurred later than normal by several weeks over most of Foxe Basin, Hudson Bay, Davis Strait and the Labrador coast. Sea ice thickness was also thinner than normal over most areas at the end of winter and spring of 2024.

At the end of January, most of Foxe Basin contained predominately thin first-year ice. Strong northwesterly winds moved the main ice pack eastwards throughout the month of January. Open water areas and subsequent young ice formation took place in the western section along the coast, adjacent to the consolidated ice. By the end of January this area contained a mixture of young and thin first-year ice with consolidated medium first-year ice present along most of the coasts (figure 3). Foxe Basin is normally covered with medium first-year ice at the end of January (figure 4). Sea ice formation was about a week slower than normal, thickening to medium first-year ice during the first week of February. It took until the third week in April for most of the ice in Foxe Basin to thicken to predominantly thick first-year ice, around 8 weeks slower than the climatological median. However, the western section remained mostly medium first-year ice with smaller areas of grey ice adjacent to the consolidated ice edge. This area thickened to thick first-year ice by mid-May, about 6 weeks slower than normal.

Western Davis Strait contained thin first-year ice with a trace of old ice. The ice edge was further west than normal due to a combination of above normal sea surface temperatures in eastern Davis Strait, strong northeasterly winds, and above normal surface temperatures. Consolidated medium first-year ice was present along the Baffin Island coast (figure 5). Medium first-year ice formed at the beginning of February, about a week later than normal in western Davis Strait. Thick first-year ice (including 1 tenth old ice) formed in the extreme western section of Davis Strait by the end of April, about a month slower than normal and throughout the rest of Davis Strait by mid-May, about 6 weeks slower than normal (figure 8).

Grey-white ice covered most of Cumberland Sound with consolidated thin and medium first-year ice along the coasts. Frobisher Bay contained a combination of thin first-year and young ice (figure 5). Consolidated thin first-year ice was present along most of the coasts and thickened to medium first-year ice by the end of February, about 4 weeks slower than normal. The ice over most of Cumberland Sound and Frobisher Bay alternated between young ice and thin first-year ice throughout the late winter as per normal for these polynya prone areas. However, throughout the month of May, ice concentrations were much lower than normal in both areas with extensive bergy water areas present (figures 8 & 10).

Hudson Strait and Ungava Bay contained a mixture of young and thin first-year ice with consolidated thin first-year ice along the coasts (figure 5). The ice in the western section of Hudson Strait thickened to medium first-year ice towards the end of February, around 4 weeks slower than normal. Medium first-year ice covered most of Hudson Strait and Ungava Bay by the beginning of March, which was near normal but there remained areas of thinner ice along the coast of Baffin Island and the southwestern coast of Ungava Bay. Normally the ice thickens to thick first-year ice over both regions by the beginning of April, however, only portions of western Hudson Strait had thickened to thick first-year ice by early May (figure 8).

Hudson Bay and James Bay contained mostly thin first-year ice (figure 5). Throughout the month of January, persistent northwesterly and westerly winds led to several open water areas where young ice would subsequently form. By the end of January, along the western coast of both Hudson Bay and James Bay and south of Southampton Island, there were extensive areas of young ice. Consolidated medium first-year ice was present along the western coast of Hudson Bay and consolidated thin first-year ice was present along the eastern coast of Hudson Bay and in James Bay (figure 5). The ice over most of Hudson Bay thickened to medium first-year ice by the end of February, around 3-4 weeks slower than normal. In northern James Bay, the ice thickened to medium first-year ice by the beginning of March, which was around 3 weeks slower than normal and it took until the end of April for the southern half of James Bay to thicken to medium first-year ice, about 8 weeks slower than normal. Persistent northeasterly winds over eastern Hudson Bay throughout the months of April and May led to extensive open water areas and overall lower ice concentrations than normal (figures 8 & 10). Normally thick first-year ice covers most of Hudson Bay by the beginning of April. This year the ice thickened to thick first-year ice only over the extreme northern section of Hudson Bay, around 3-4 weeks slower than normal. The ice in the rest of Hudson Bay remained medium first-year ice. Persistent northeasterly and easterly winds throughout the months of April and May led to extensive ice deterioration and many open water areas in eastern Hudson Bay. Ice deterioration in eastern Hudson Bay was at least 6 weeks ahead of schedule and about a week behind schedule in western Hudson Bay since the strong easterly winds transported the ice pack westward (figures 8-10).

Along the Labrador coast, north of 58°N, there was young ice adjacent to the coast and a mixture of grey-white and thin first-year ice further offshore. There was also consolidated thin first-year ice along parts of the coast. South of 58°N and north of 55°N, there was mainly young ice adjacent to the coast and a mixture of young and thin first-year ice further offshore with consolidated thin first-year ice along the coast (figure 5). Normally by the end of January, there is predominately thin first-year ice along the coast from 55°N to 60°N and grey-white ice along the ice edge and along parts of the coast (figure 6). In addition to above normal surface temperatures throughout the winter months, sea surface temperatures were also 1-2°C above normal over portions of the north Labrador Sea and eastern Davis Strait (figure 2). As a result, sea ice formed around 2-3 weeks slower than normal and was on average thinner than normal at the end of January and throughout the late winter and spring months. Normally thick first-year ice is present all along the Labrador coast by the beginning of May, this year the ice remained medium first-year ice (figure 8). Additionally, despite persistent offshore, northwesterly winds from December through March, there was less ice than normal all along the ice edge in the Labrador Sea (figure 7). During the months of April and May, the predominate wind direction shifted to northeasterly or onshore. This combined with thinner than normal ice and above normal temperatures led to extensive deterioration of ice along the eastern ice edge (figure 10).

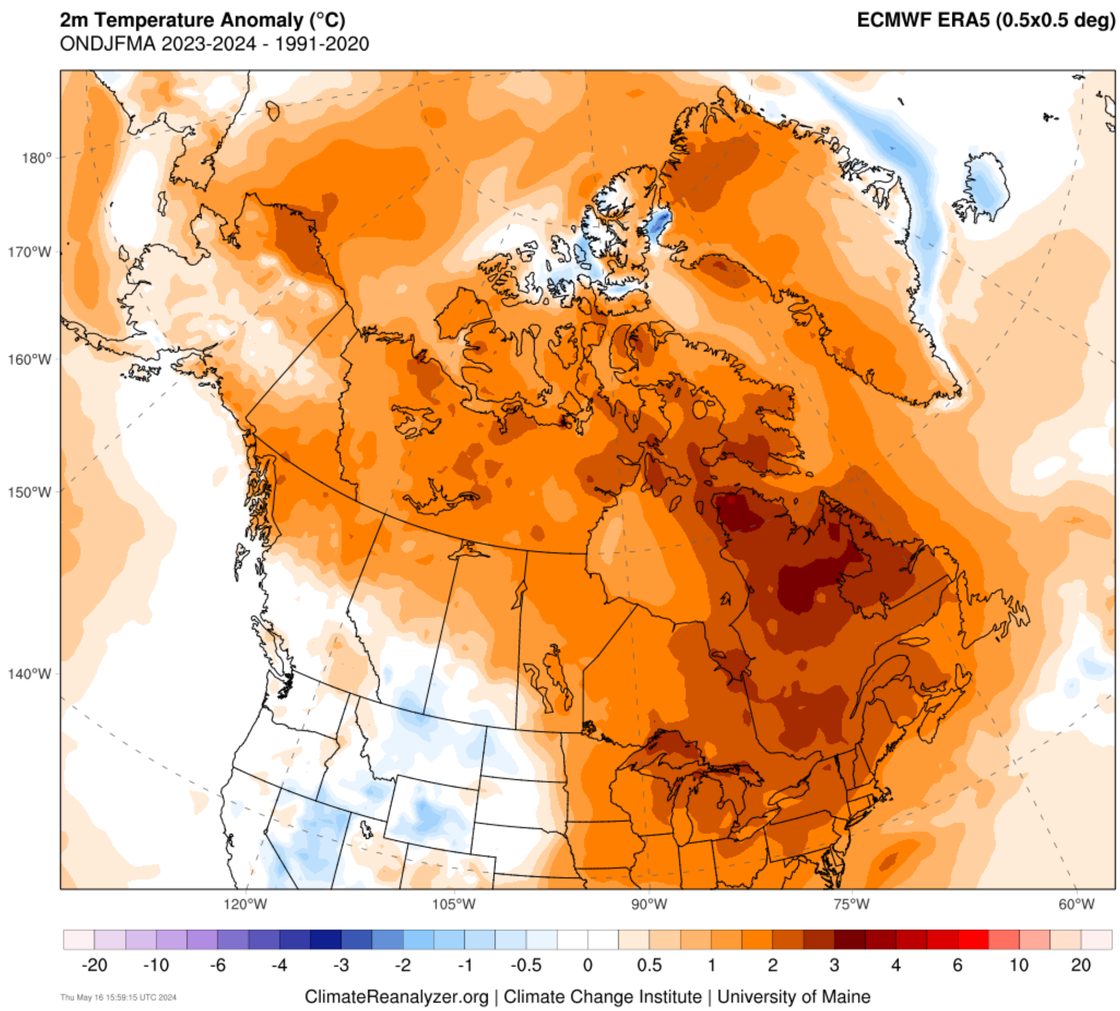


Figure 1 Surface air temperature anomaly - October 2023 to April 2024.

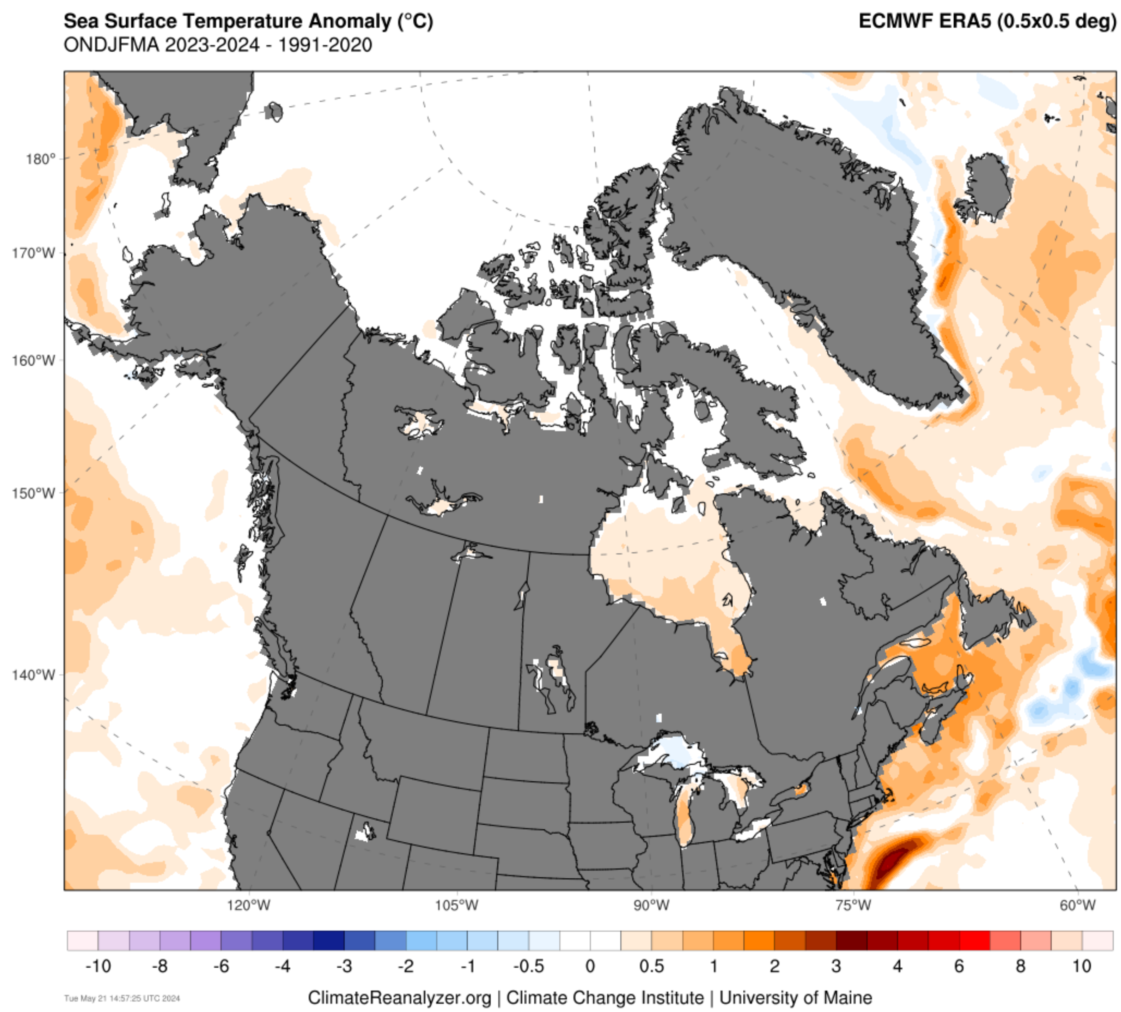


Figure 2 Sea surface temperature anomaly - October 2023 to April 2024.

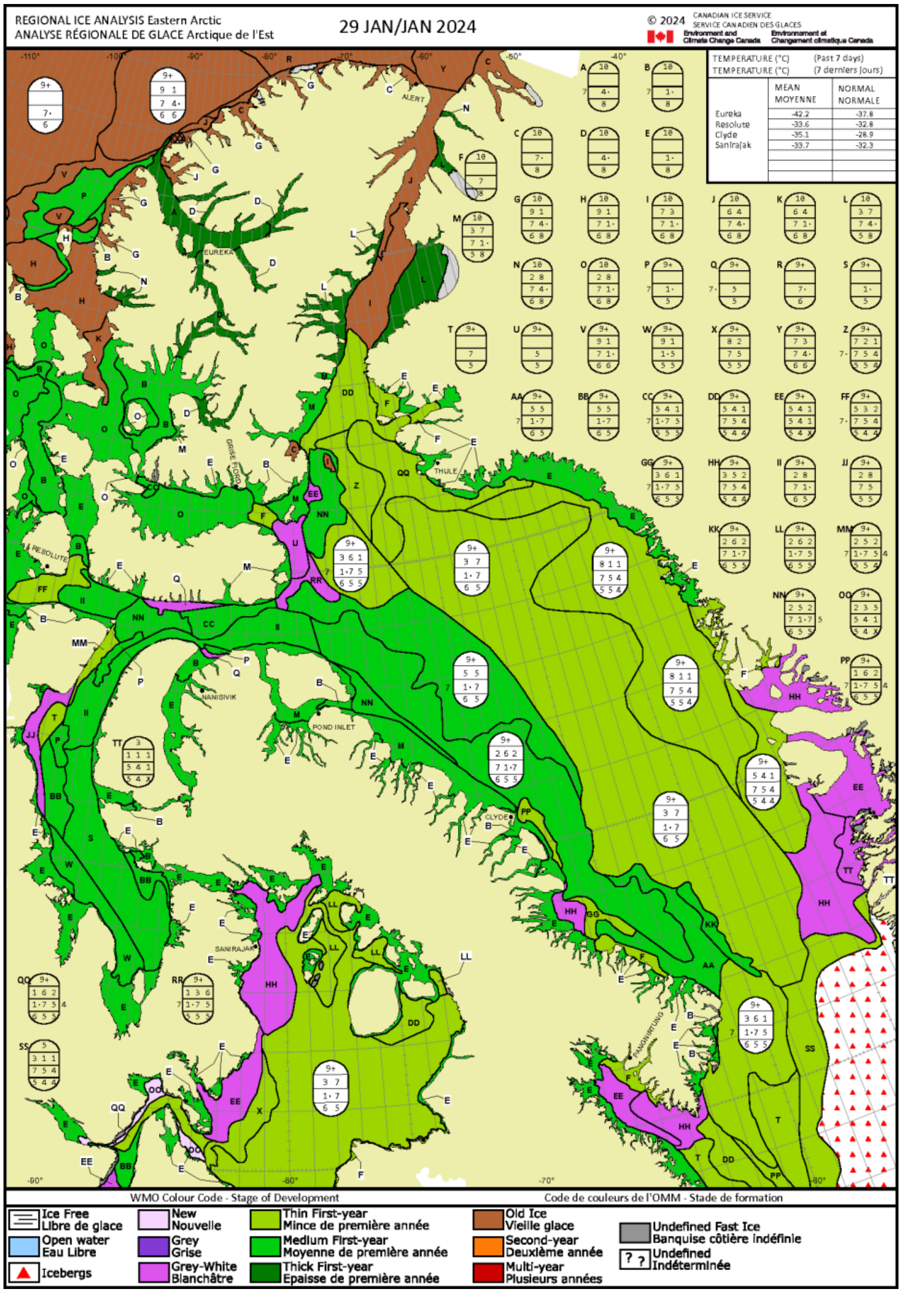


Figure 3 Sea ice stage of development analysis for the Eastern Arctic on January 29, 2024.

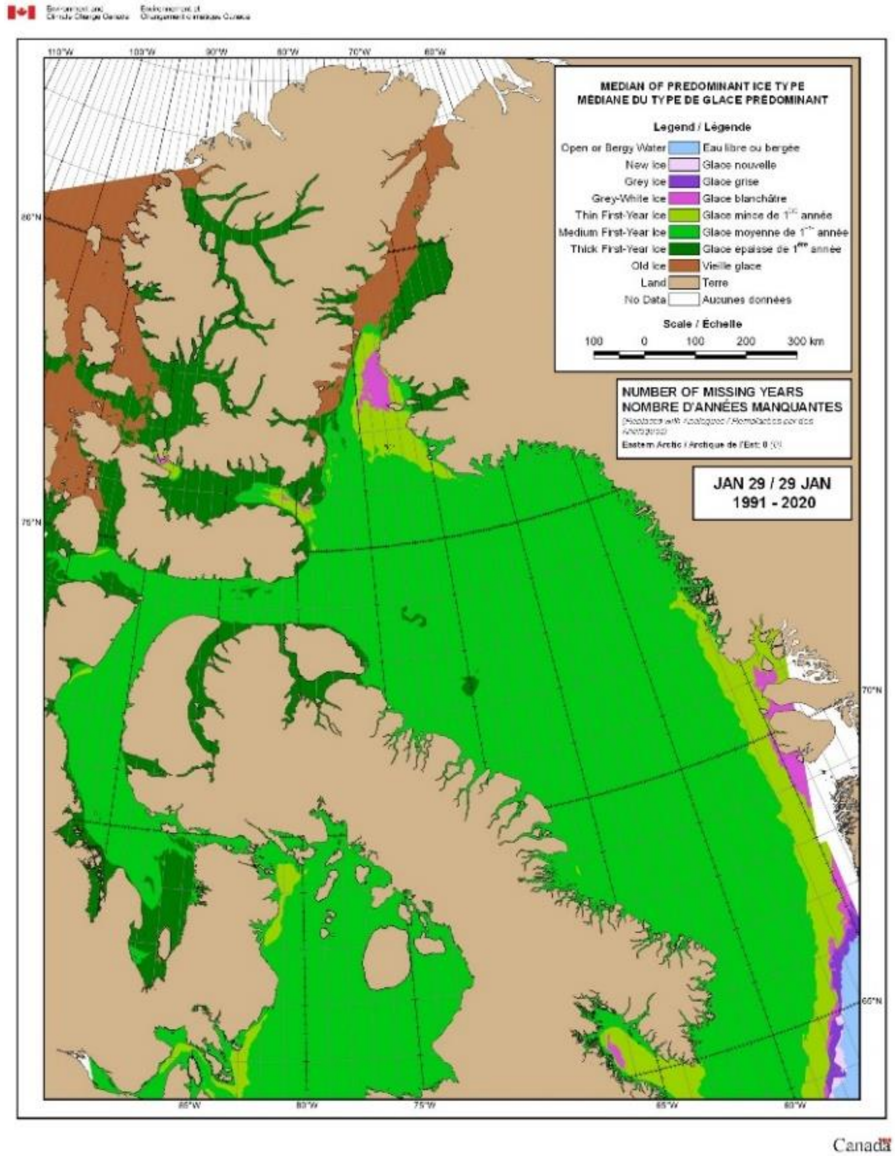


Figure 4 30-year climate median (1991-2020) of predominant sea ice type for the Eastern Arctic for January 29.

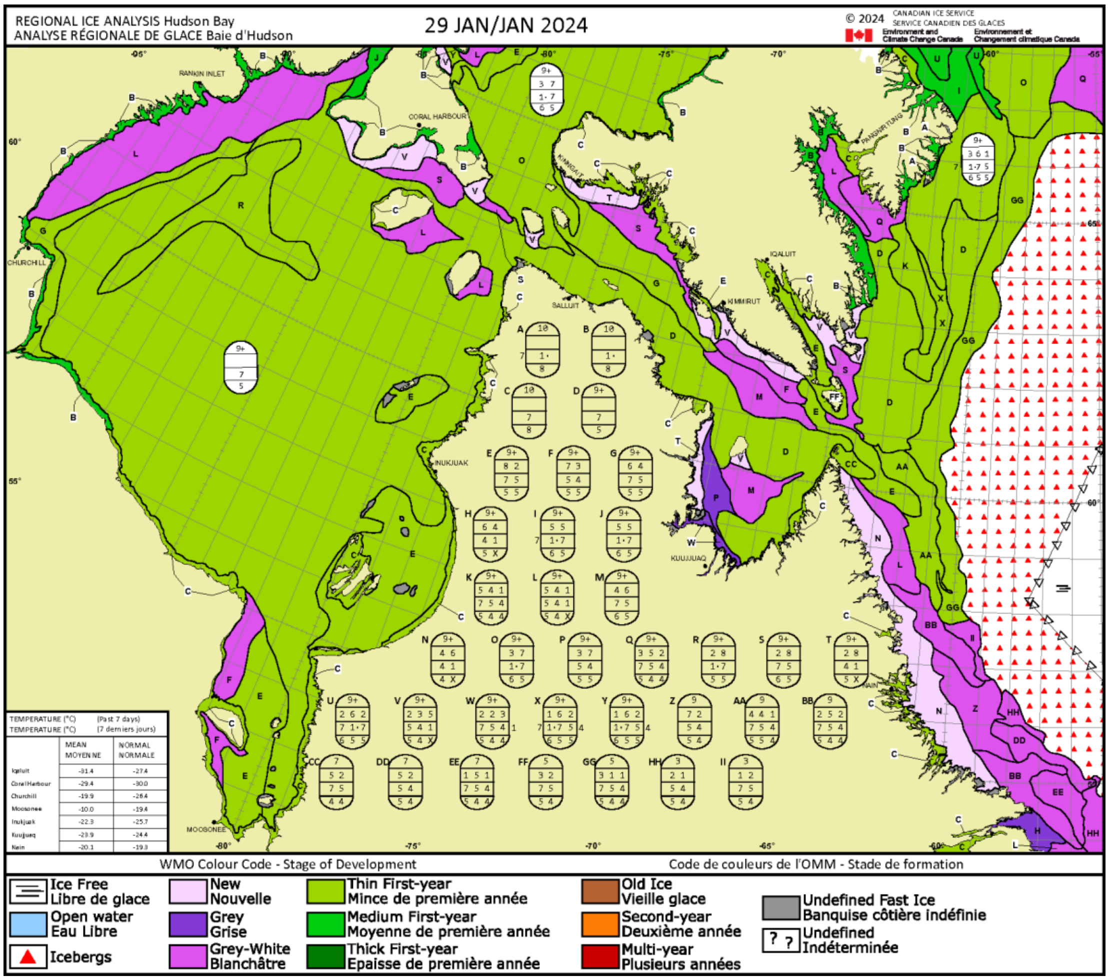


Figure 5 Sea ice stage of development analysis for Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea on January 29, 2024.

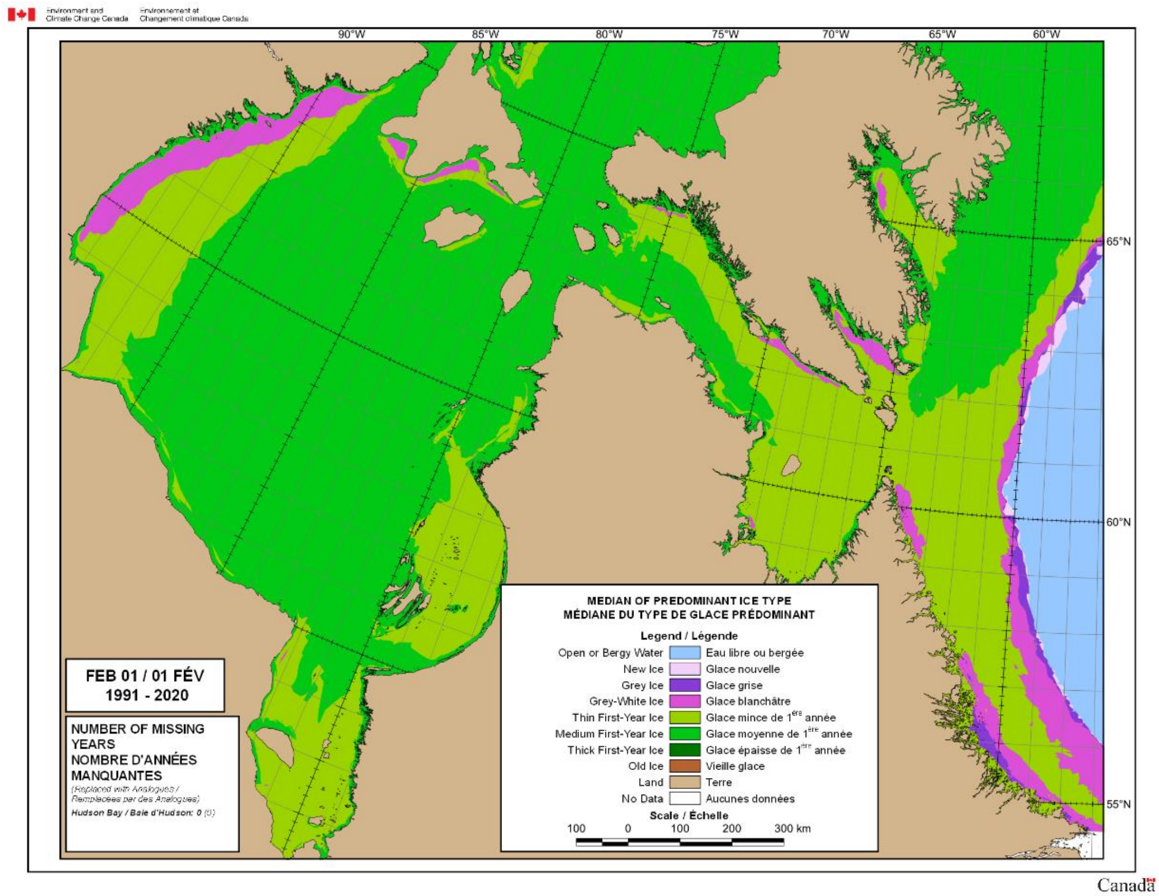
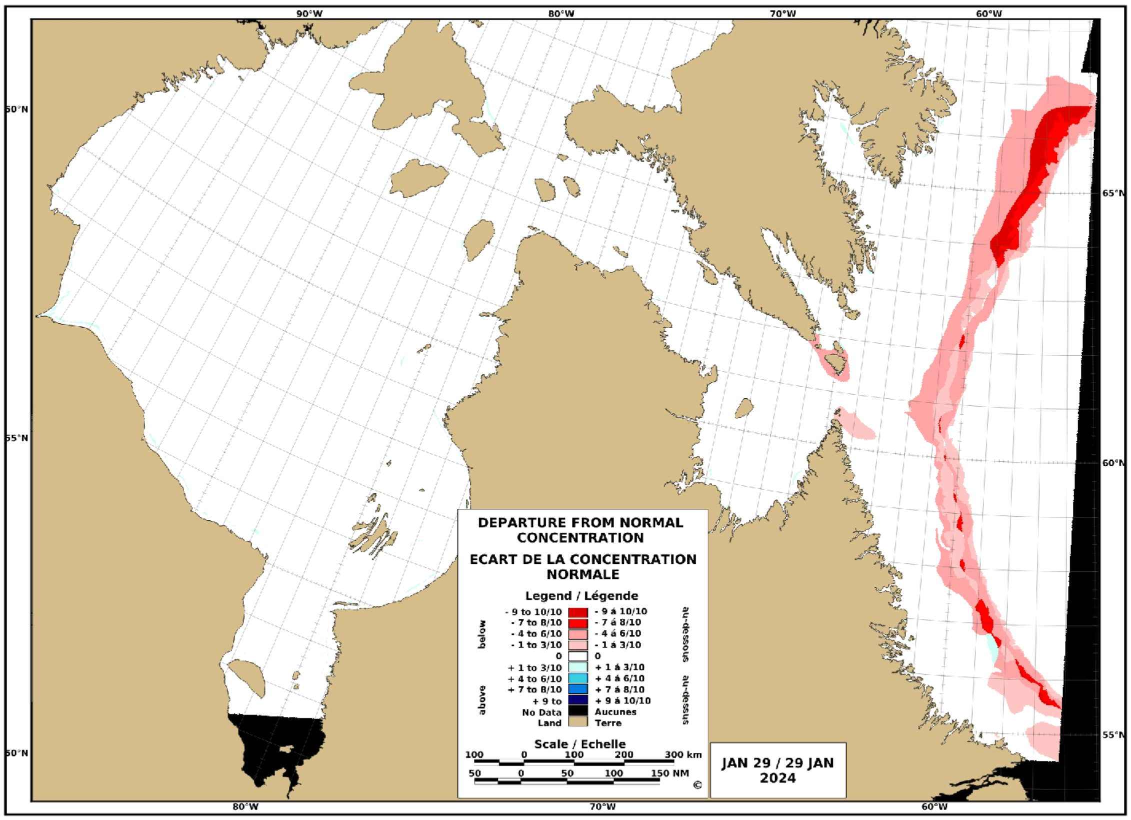


Figure 6 30-year climate median (1991-2020) of predominant sea ice type for Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea for February 1.



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

Figure 7 Departure from normal sea ice concentration for Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea on January 29, 2024.

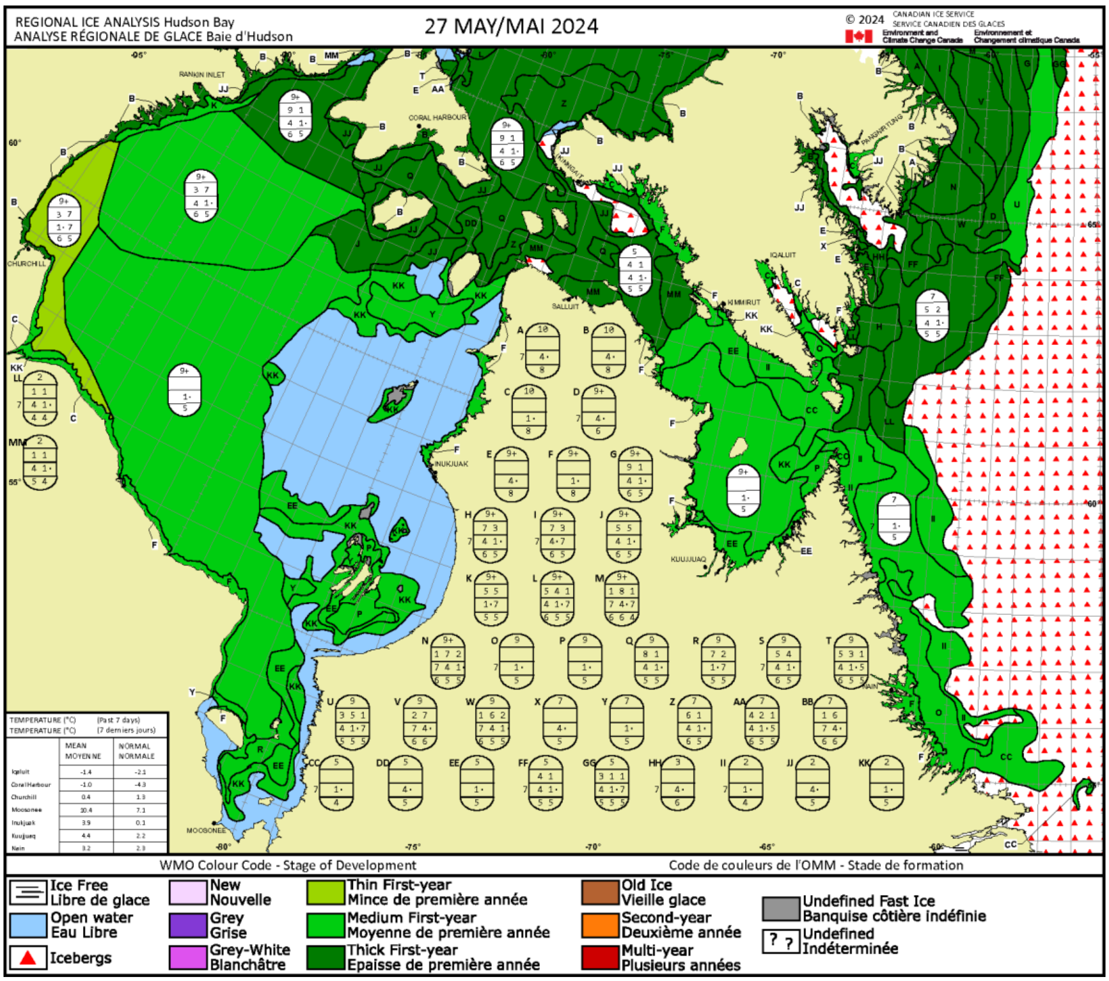


Figure 8 Sea ice stage of development analysis for Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea on May 27, 2024.

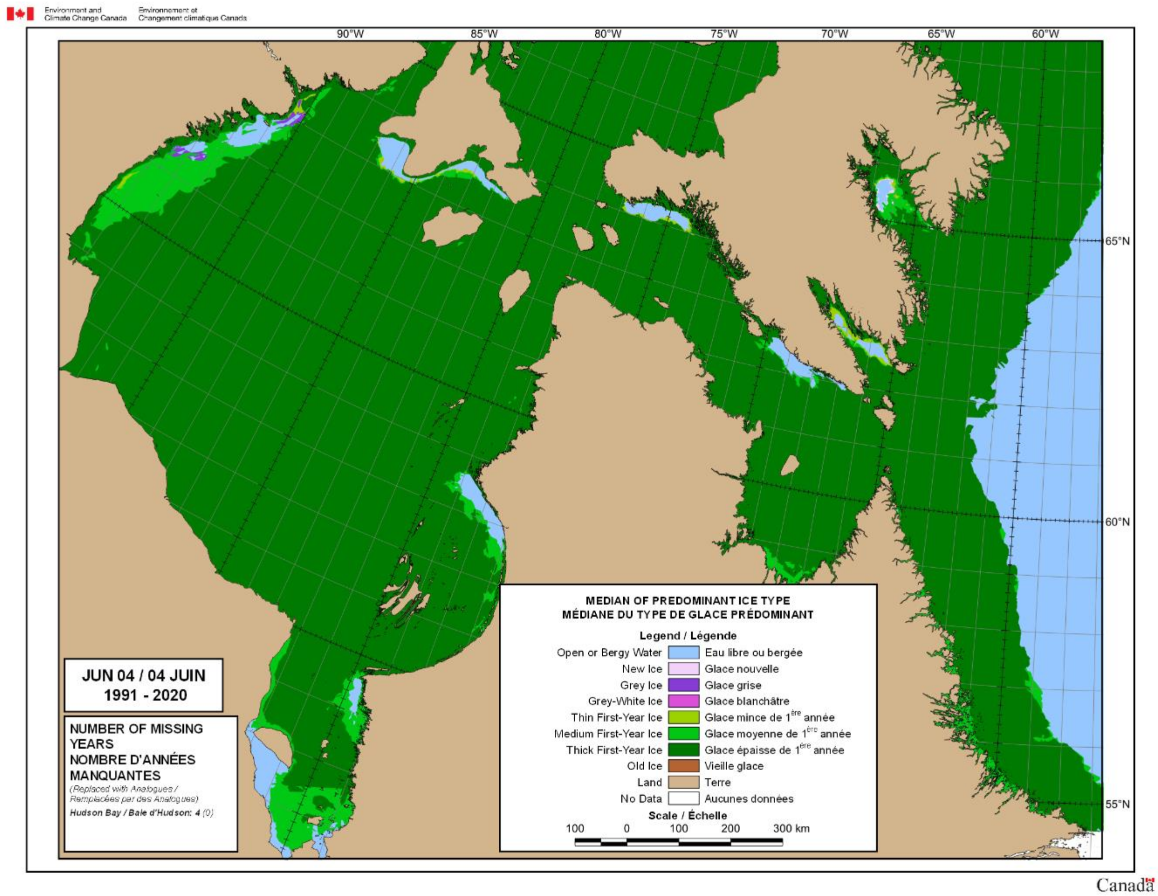


Figure 9 30-year climate median (1991-2020) of predominant sea ice types for Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea for June 4.

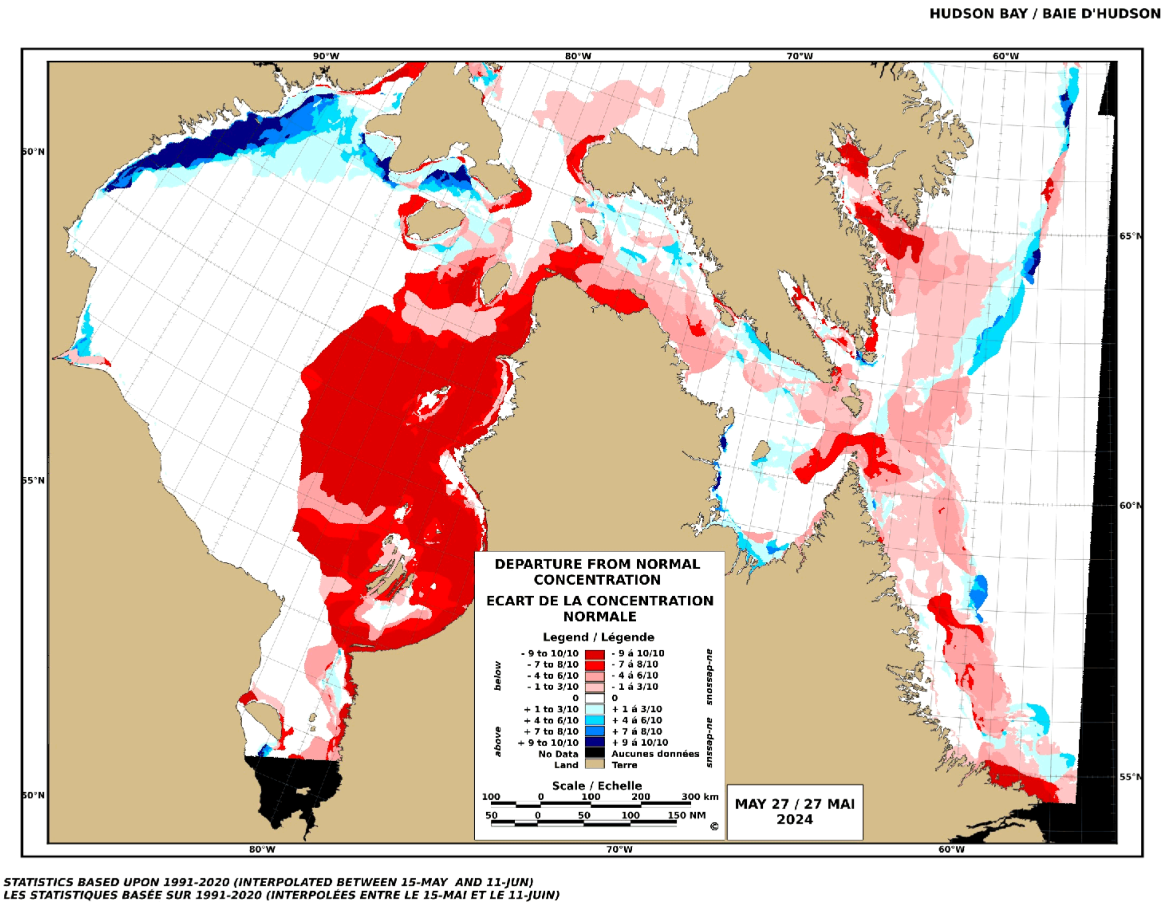


Figure 10 Departure from normal sea ice concentration for Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea on May 27, 2024.

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	1435	2086	69	1.6	0.6
Iqaluit	2967	3653	81	-3.8	0.6
Kuujjuaq	2194	2934	75	3.7	3.5
Inukjuak	2333	3119	75	2.0	3.8
Cape Dorset	2445	3342	73	-3.3	1.7
Churchill	2763	3468	80	1.6	2.3
Hall Beach	3856	4863	79	-7.4	1.7

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

From November 2023 to January 2024, surface temperatures were 1-3°C above the climatological mean (figure 1). Consequently, sea ice formation occurred later than normal by 2-3 weeks over most regions in the eastern Arctic. Sea ice thickness was thinner than normal over most areas for the end of winter and spring of 2024.

At the end of January, predominantly medium first-year ice covered western Baffin Bay with up to 3 tenths old ice. The eastern section contained predominantly thin first-year ice and the northern section contained a mix of grey-white and thin first-year ice. Consolidated medium first-year ice including 3 tenths old ice was present along the coast of Baffin Island and consolidated medium and thin first-year ice was present along the coasts of Greenland (figure 3). Normally, Baffin Bay contains medium first-year ice except for Smith Sound which normally contains young and thin first-year ice (figure 4). It took until the end of February for the eastern section of Baffin Bay to thicken to medium first-year ice, about 4 weeks slower than the climatological median. It also took until the end of April for thick first-year ice to form over the entirety of Baffin Bay, about 8 weeks slower than normal.

The ice bridge in Kane Basin formed across the entire basin by mid-January. At the end of January, Kane Basin contained consolidated thick first-year and old ice in the northern section and consolidated medium first-year ice and old ice in the southern section (figure 3). The southern section thickened to a mix of thick first-year and old ice by early February. From mid-October to early January (before the formation of the ice bridge) old ice was transported from the Lincoln Sea, through the Kane Basin, and southward, leading to higher amounts of old ice than normal throughout portions of the eastern Arctic (figure 11).

Jones Sound, Pond and Navy Board Inlet, Admiralty Inlet, portions of Barrow Strait and the Gulf of Boothia contained medium first-year ice (figure 3). Normally thick first-year ice covers these areas by the end of January (figure 4). It took until mid-February for thick first-year ice to form in Jones Sound this year, about 3 weeks slower than normal. For Pond and Navy Board Inlet, as well as Admiralty Inlet and Pelly Bay, it took until the beginning of March for thick first-year ice to form, about 5 weeks slower than normal and around 6 weeks slower than normal for the rest of the Gulf of Boothia. In western Barrow Strait, thick first-year ice formation was 1 week slower than normal and 2 weeks slower than normal for Lancaster Sound and Prince Regent Inlet. The ice in eastern Barrow Strait consolidated for only two weeks at the beginning of April and became mobile again at the end of April (figure 12). The ice in this region normally consolidates by the beginning of March and remains consolidated until the beginning of July.

The freeze-up in Eureka Sound occurred on schedule this past fall, with ice becoming consolidated grey-white ice (with a trace of old ice in the northern section) around mid-October. The consolidation of ice in Norwegian Bay, however, was about 1 week slower than normal and in McDougall Sound it was about 3 weeks slower than usual. Ice consolidation in Wellington channel was around 4-5 weeks slower than normal.

Overall, ice deterioration was near normal to slightly slower than normal for northwestern and extreme eastern Baffin Bay by the end of May mainly due to below normal temperature throughout the month of May (figure 14).

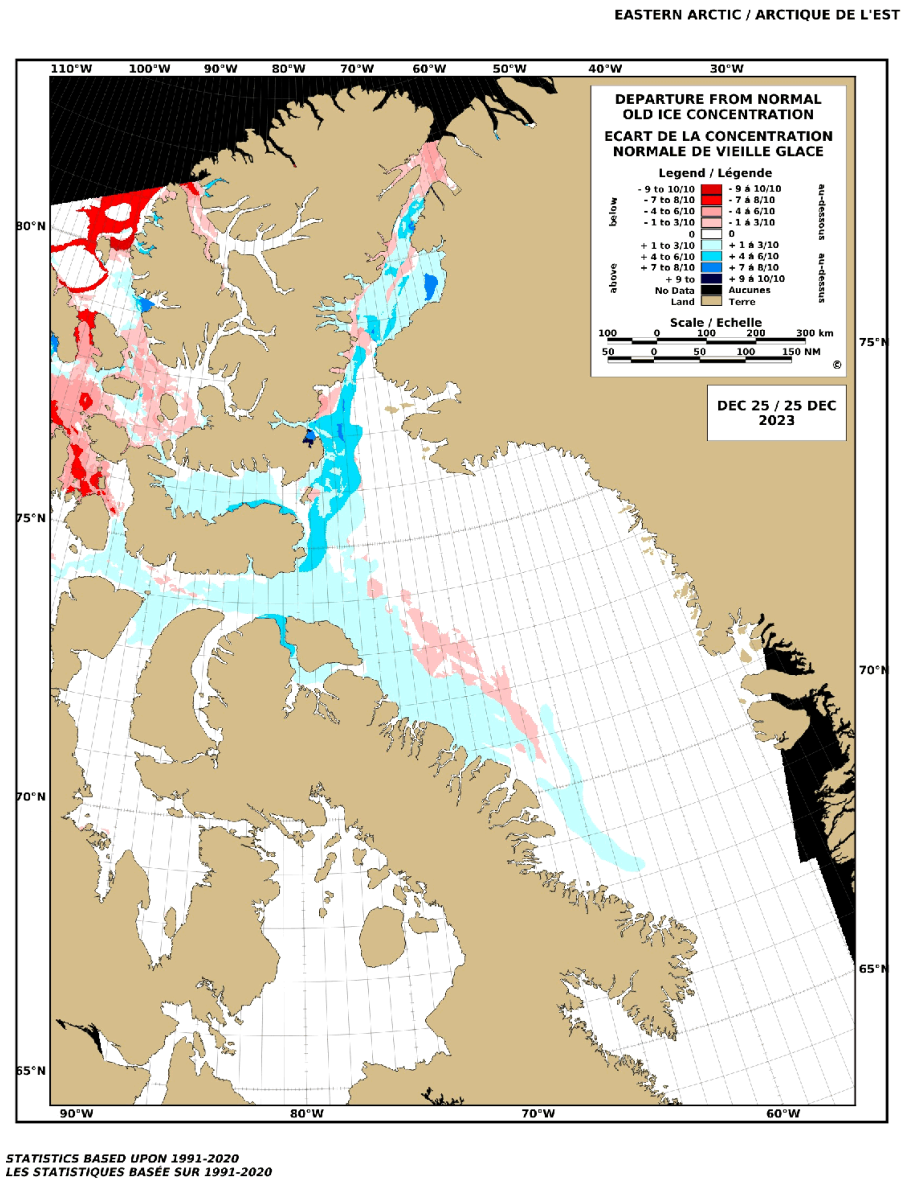


Figure 11 Departure from normal old ice concentration for the Eastern Arctic area on December 25, 2023.

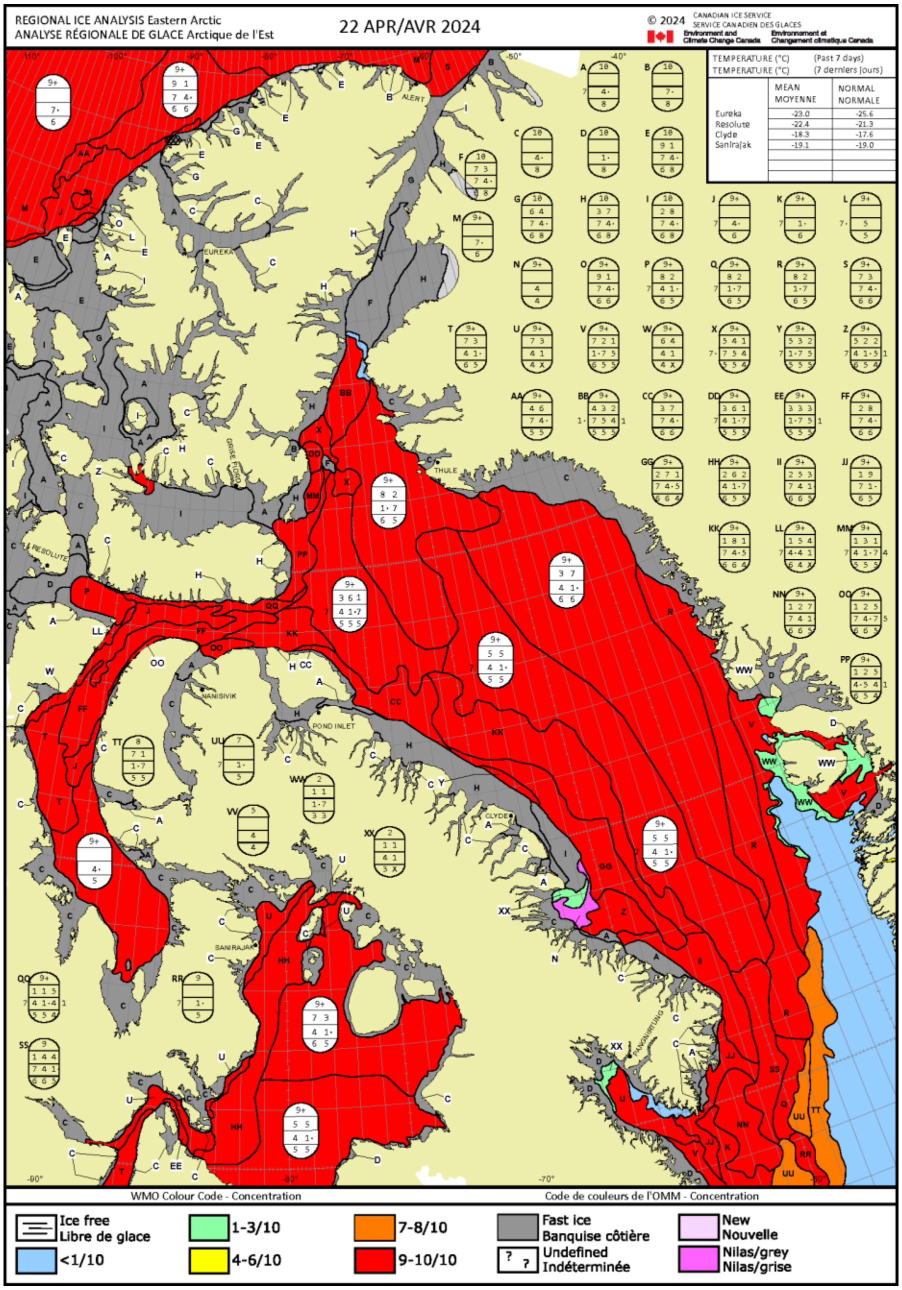


Figure 12 Sea ice concentration analysis for the Eastern Arctic on April 22, 2024.

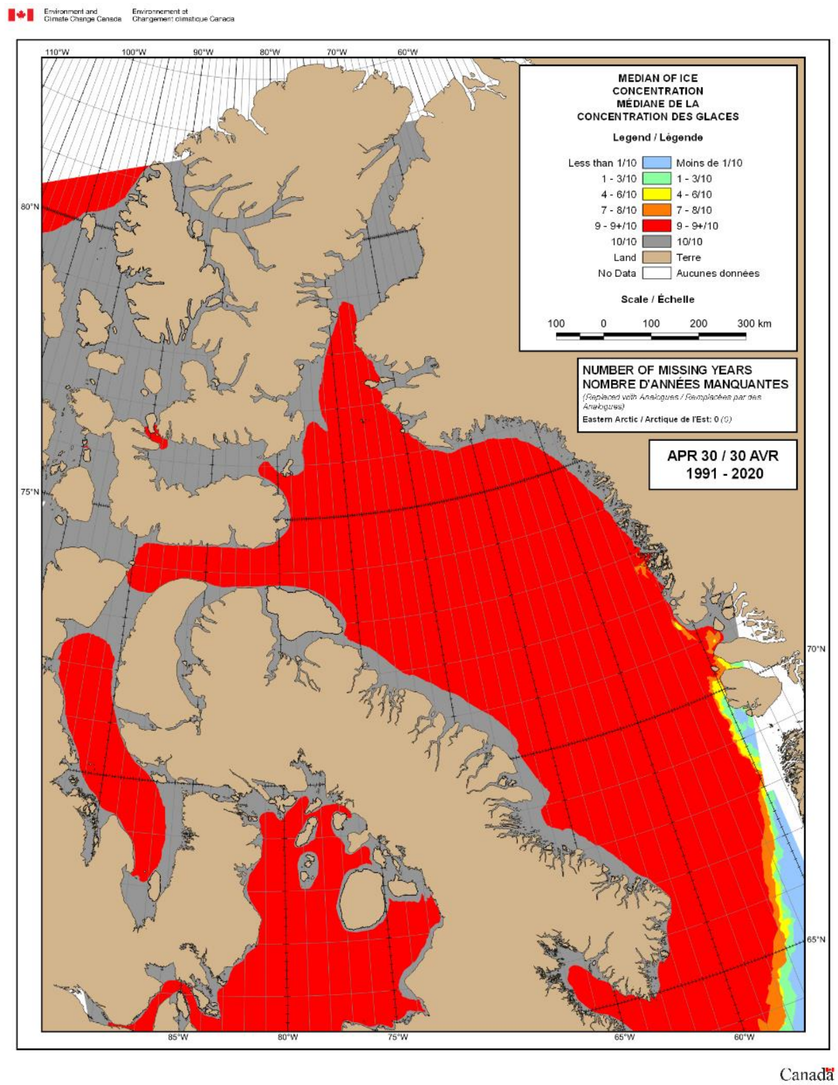


Figure 13 30-year climate median (1991-2020) of sea ice concentration for Hudson Bay, Hudson Strait, Davis Strait and Labrador Sea for April 30.

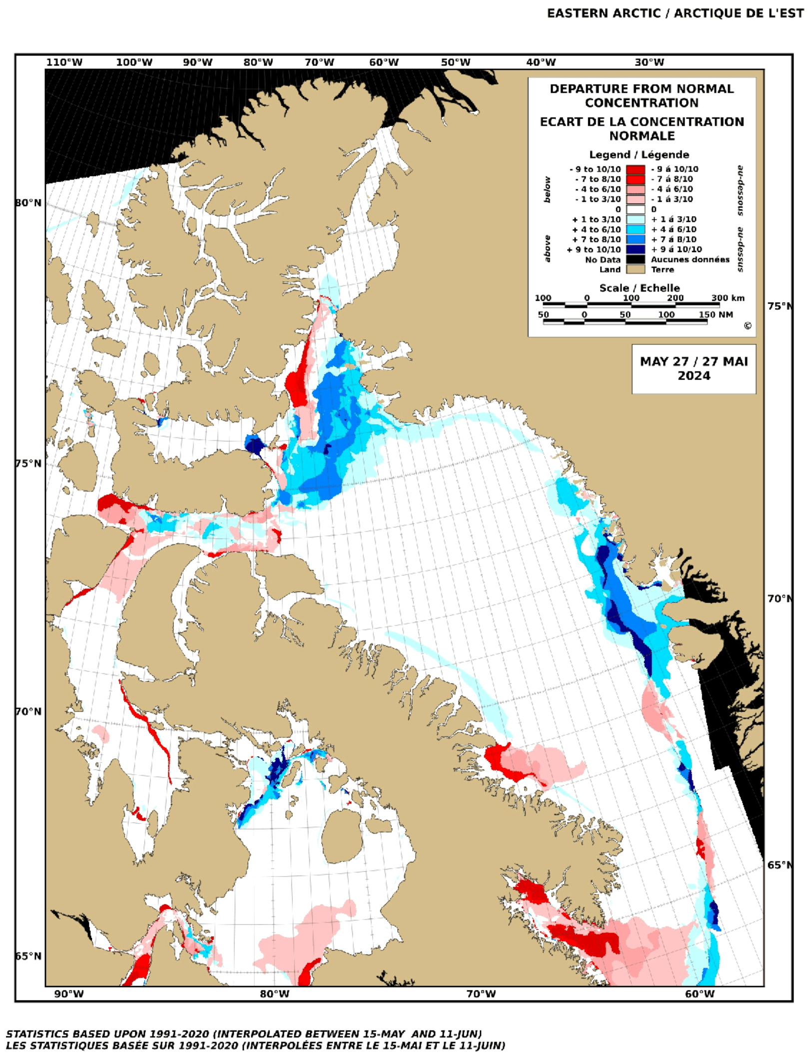


Figure 14 Departure from normal sea ice concentration for the Eastern Arctic area on May 27, 2024.

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	3637	4508	81	-7.8	0.4
Pond Inlet	4171	5322	78	-8.1	1.1
Resolute	4546	5520	82	-8.9	1.9
Eureka	6200	6720	92	-9.0	2.0

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

Western and Central Arctic

End of Winter and Spring Ice Conditions

From November 2023 to January 2024, surface temperatures were 1-3°C above the climatological mean (figure 1). Consequently, sea ice formation occurred later than normal by 2-3 weeks over most regions in the western Arctic. Sea ice thickness was thinner than normal over most areas for the end of winter and spring of 2024. There remained significantly less old ice than normal over many areas (figure 15).

At the end of January, mostly thin first-year ice covered the southwestern Beaufort Sea outside of the consolidated ice edge (figure 16). Normally this area would contain predominately medium first-year ice and old ice (figure 17). It took until mid-February for this area to thicken to medium first-year ice, around 6 weeks slower than normal and thin first-year ice remained along the consolidated ice edge until early March. Predominately medium first-year ice including a trace of old ice was present in the southeastern section of the Beaufort Sea. Medium first-year consolidated ice was present along the coast of Alaska, Yukon, and NWT. Consolidated medium first-year ice including a trace of old ice was present along the western coast of Banks Island and in southern Prince of Wales Strait. A mixture of consolidated old and medium first-year ice was present in northern Prince of Wales Strait (figure 16). The consolidated ice along the northern coast of Alaska, Yukon and NWT did not thicken to thick first-year until the end of March, around 4 weeks later than normal. The mobile ice in the southern Beaufort Sea and along the Alaskan coast thickened to thick first-year ice by mid April, around 7-8 weeks later than normal.

Amundsen Gulf contained predominately medium first-year ice and Coronation Gulf contained consolidated medium first-year ice (figure 16). The ice thickened to medium first-year ice in these areas around 2 weeks later than normal.

The ice in the southern Arctic Ocean contained a mixture of predominately medium first-year ice and old ice (figure 16). Normally this area would have predominately old ice and lesser amounts of thick first-year ice at the end of January (figure 17).

McClure Strait was covered in mostly consolidated medium first-year ice with a trace of old ice and up to 2 tenths old ice in the southern section (figure 16). Normally there would be thick first-year ice and a higher concentration of predominately old ice throughout most of the Strait (figure 17). From the end of January to early March, the ice alternated between consolidated and mobile, in the western section, and remained mobile for the duration of the spring. Normally the ice in this area consolidates by the end of February and remains so until early to mid-June. Viscount Melville Sound contained consolidated medium first-year ice and old ice. McClintock Channel and western Barrow Strait contained consolidated medium first-year ice. Normally there would be mostly old ice in McClintock channel and a mix of thick first-year ice and old ice in Barrow Strait (figure 17). The ice in Barrow Strait thickened to thick first-year ice by early March, around 5 weeks slower than normal and McClure Strait, Viscount Melville Sound and McClintock Channel were 6 weeks slower than normal.

Peel Sound, Victoria Strait and Queen Maud Gulf contained medium first-year ice. Normally there would be thick first-year ice present in these areas (figures 16 & 17). The ice progressed to thick first-year ice in Peel Sound 5 weeks later than normal and 6 weeks later than normal in Victoria

Strait/Larsen Sound and in Queen Maud Gulf. The medium first-year ice in the Arctic Ocean progressed to thick first-year ice by mid-March, around 5-6 weeks slower than the climatological median.

From mid-March to mid-April and again throughout the month of May strong southeasterly winds and above normal temperatures occurred over southeastern Beaufort Sea and the Amundsen Gulf. This led to areas of open water and young ice formation along the consolidated ice edge in southeastern Beaufort Sea, west of Banks Island, in western McClure Strait and in the central Amundsen Gulf. By the end of May, there were extensive open water areas in these regions and overall ice break up was around 2-3 weeks earlier than normal (figures 18 & 19).

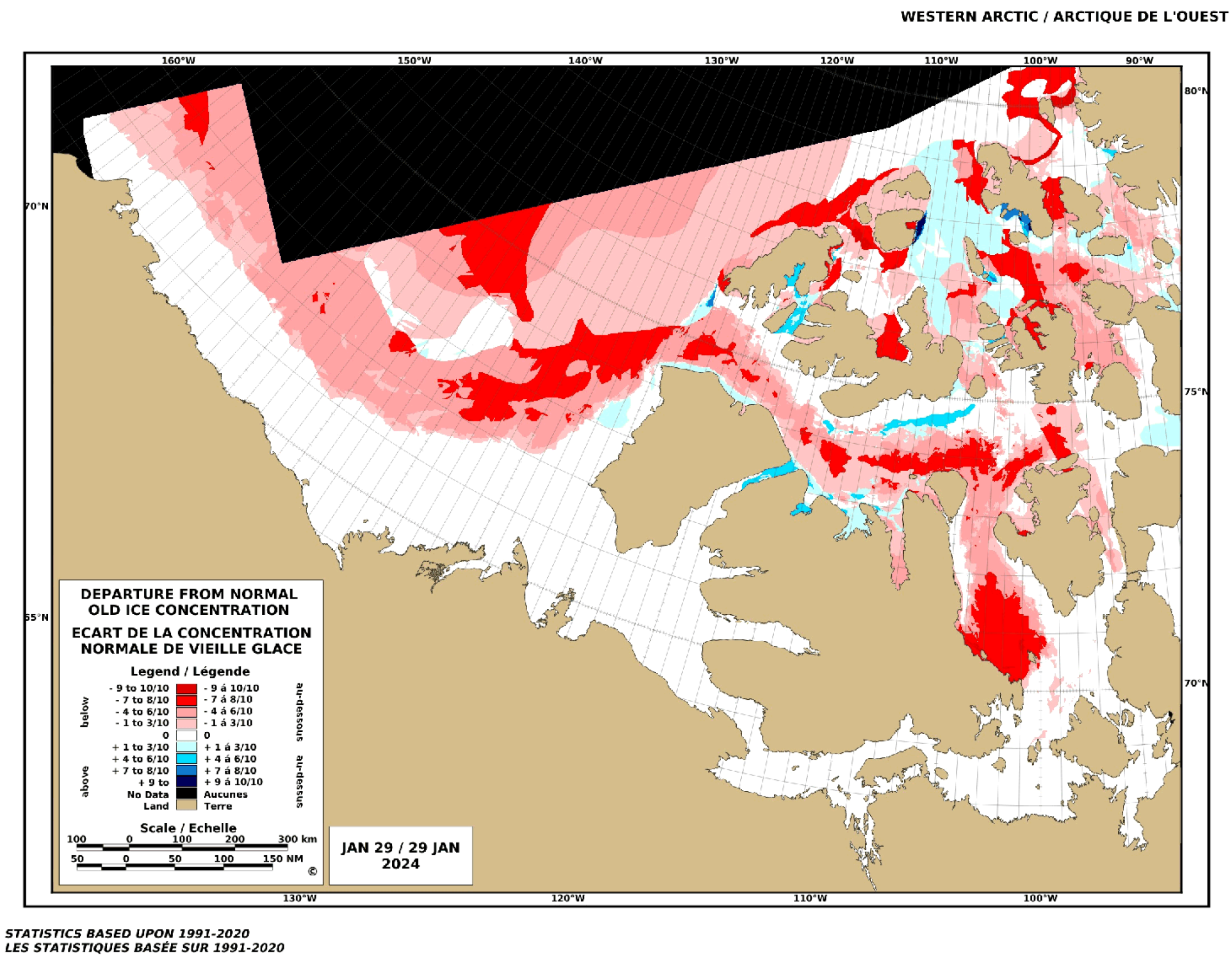


Figure 15 Departure from normal old ice concentration for the Western Arctic on January 29, 2024.

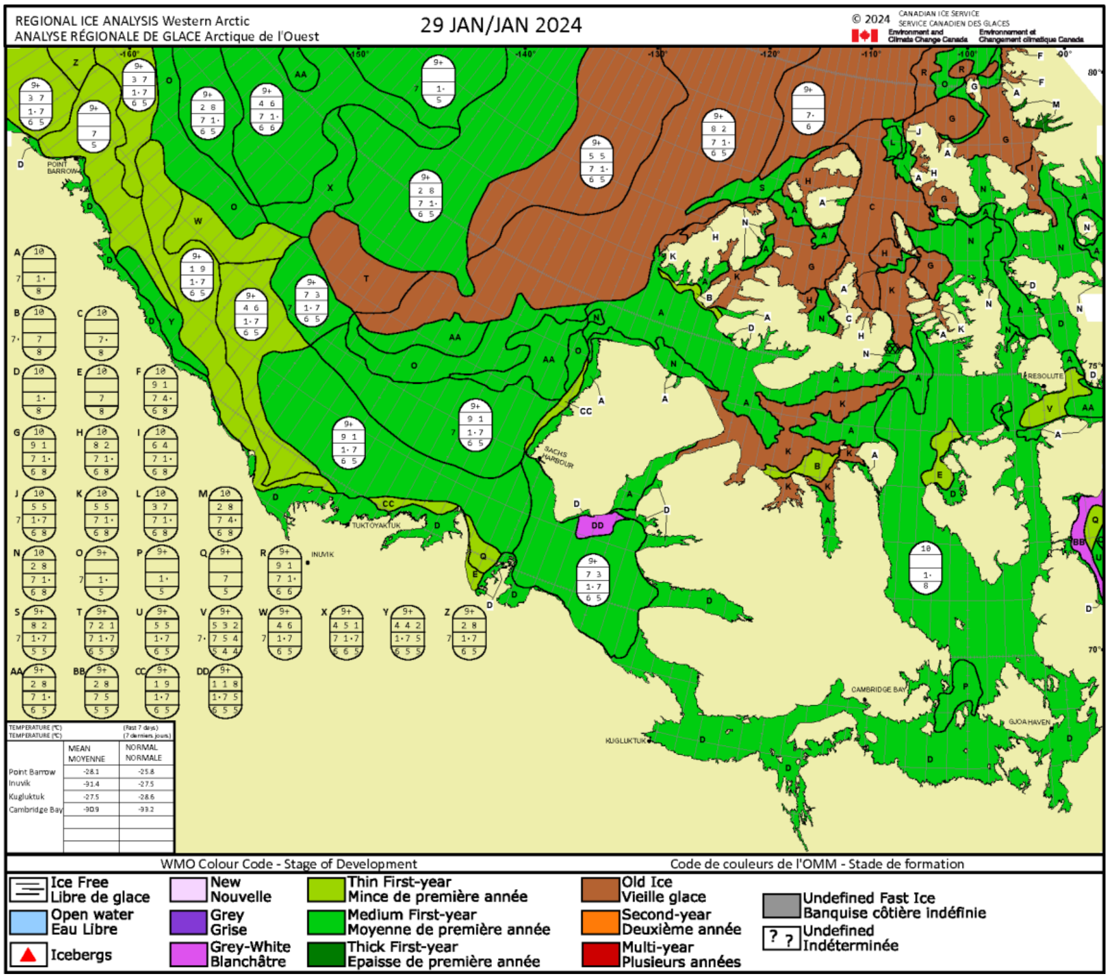


Figure 16 Sea ice stage of development analysis for the Western Arctic on January 29, 2024.

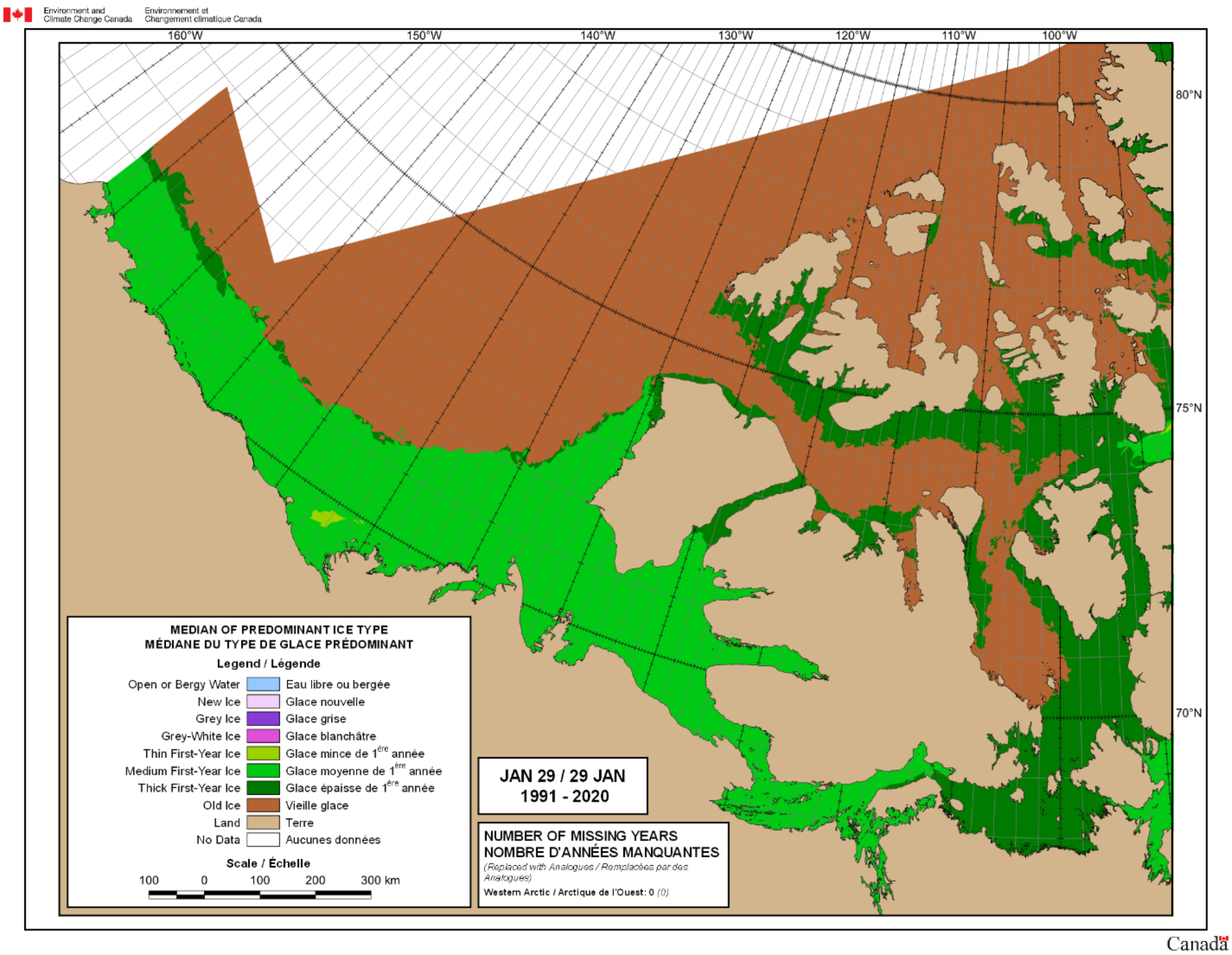


Figure 17 30-year climate median (1991-2020) of predominant sea ice type for the Western Arctic on January 29.

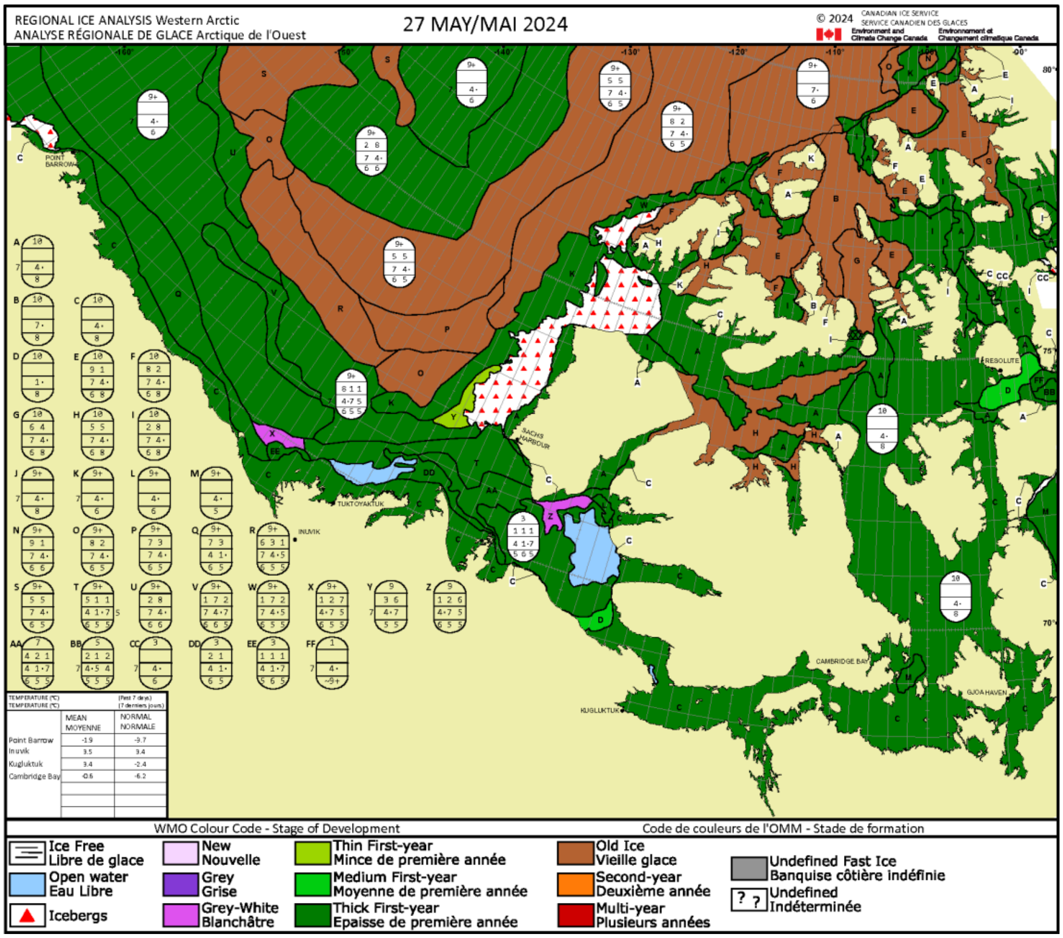


Figure 18 Sea ice stage of development analysis for the Western Arctic on May 27, 2024.

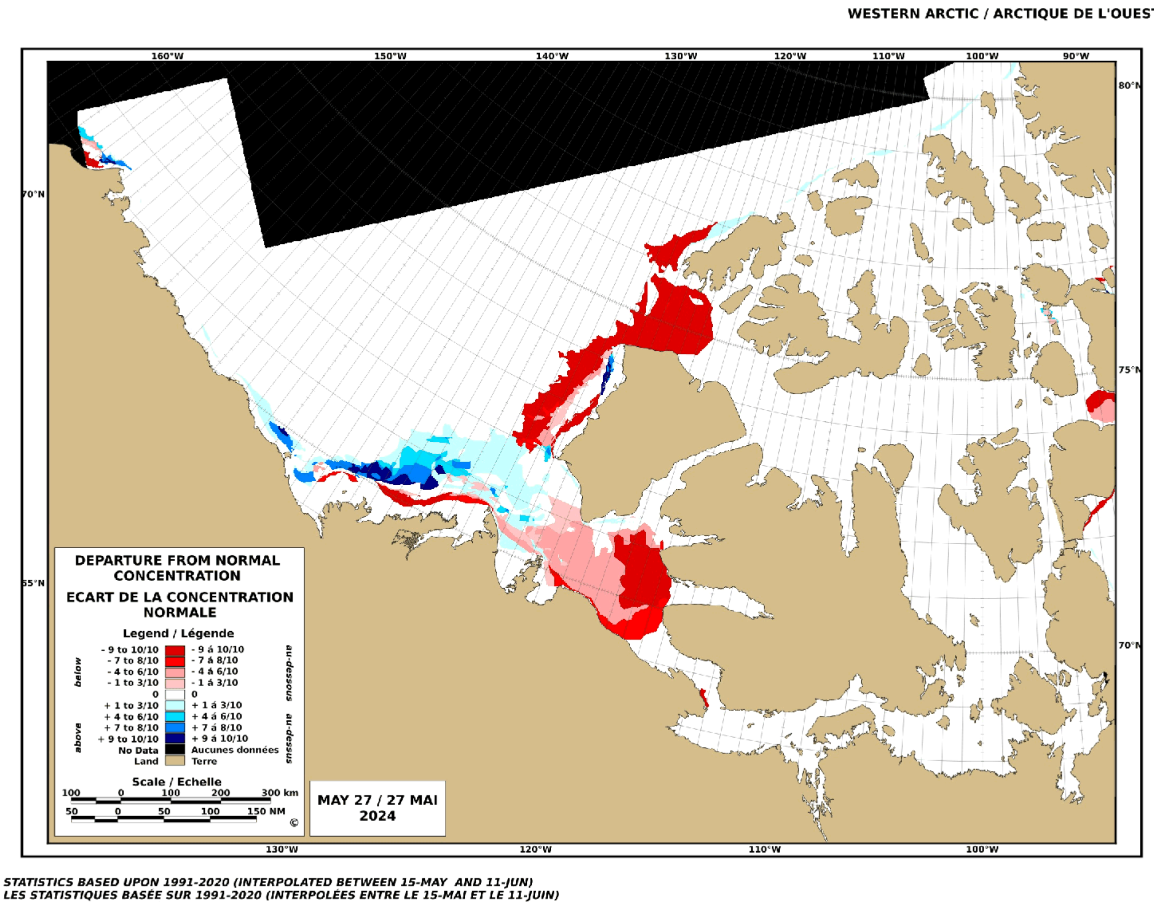


Figure 19 Departure from normal sea ice concentration for the Western Arctic on May 27, 2024.

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	4938	5701	87	-8.4	2.5
Cambridge Bay	4244	5191	82	-4.1	5.0
Kugluktuk	3565	4290	83	1.0	6.0
Tuktoyaktuk	3699	4178	89	-2.6	1.6

Table 3 End of April freezing degree-days (FDD) and May temperatures for the Western Arctic area.