Environment and Climate Change Canada
Environnement et Changement climatique Canada

Seasonal Summary

North American Arctic Waters

Summer 2023

By the Canadian Ice Service

Canada

Summary over North American Arctic Waters

In general, the North American Arctic Waters experienced above normal temperatures during the summer. This contributed to faster than normal sea ice melt in the western Arctic and Hudson Bay regions. The ice melt in Hudson Bay was approximately 1-2 weeks ahead of normal. In the western Arctic, the Northwest Passage experienced 1-2 week ahead of normal ice melt. There was also significant ice loss in McClintock Channel, Parry Channel, and in the northwestern Beaufort Sea where ice would normally survive the melt season.

The eastern Arctic however experienced above normal sea ice concentrations. This was due to the Nares Strait being open until late March when the ice bridge finally formed. The late formation of the ice bridge resulted in more old ice than normal to be transported into Baffin Bay from the High Arctic. The greater amount of old ice being present resulted in a delay in sea ice melt through parts of Baffin Bay and northern Davis Strait of about 1-2 weeks.

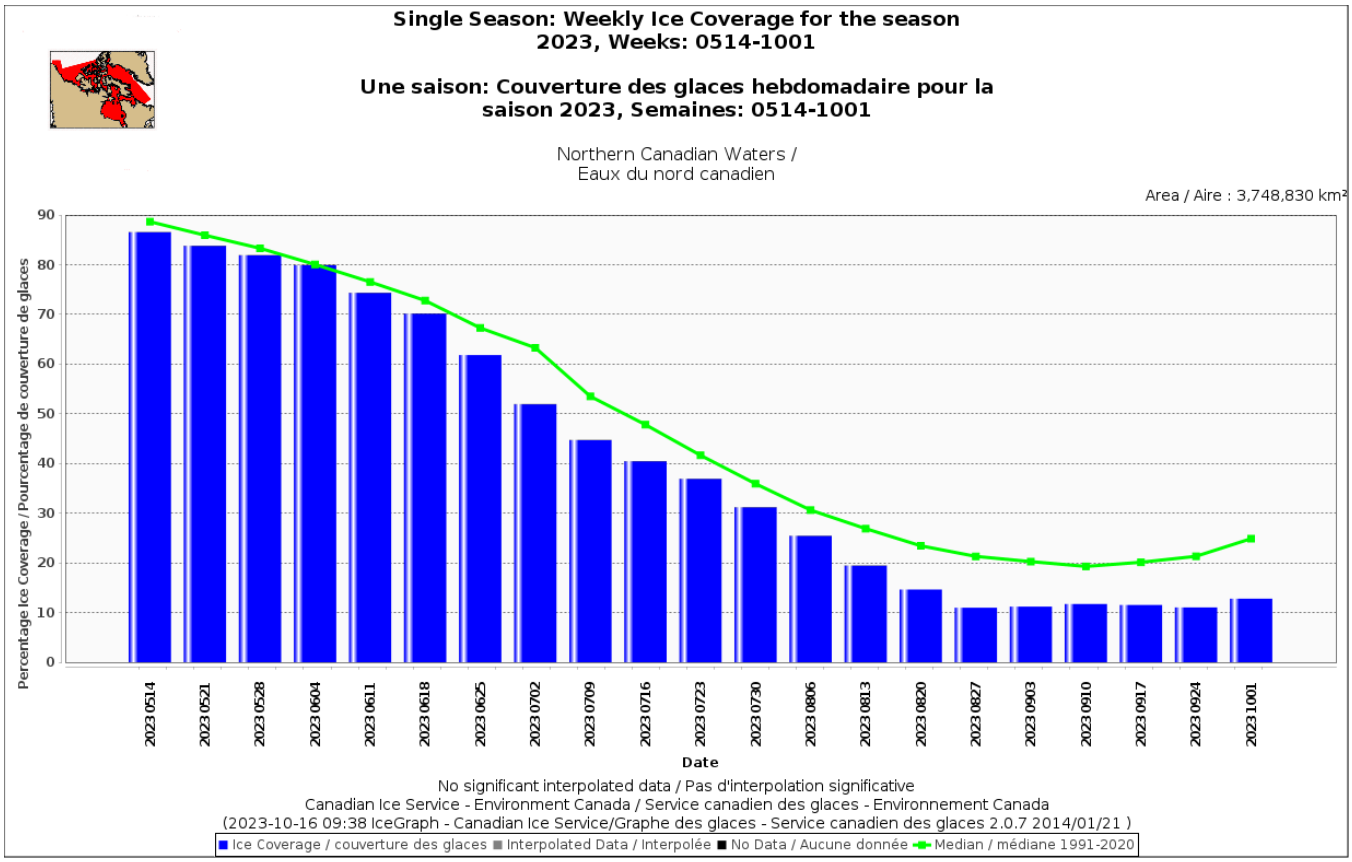


Figure 1 Weekly ice coverage for Northern Canadian waters – 2023 Season

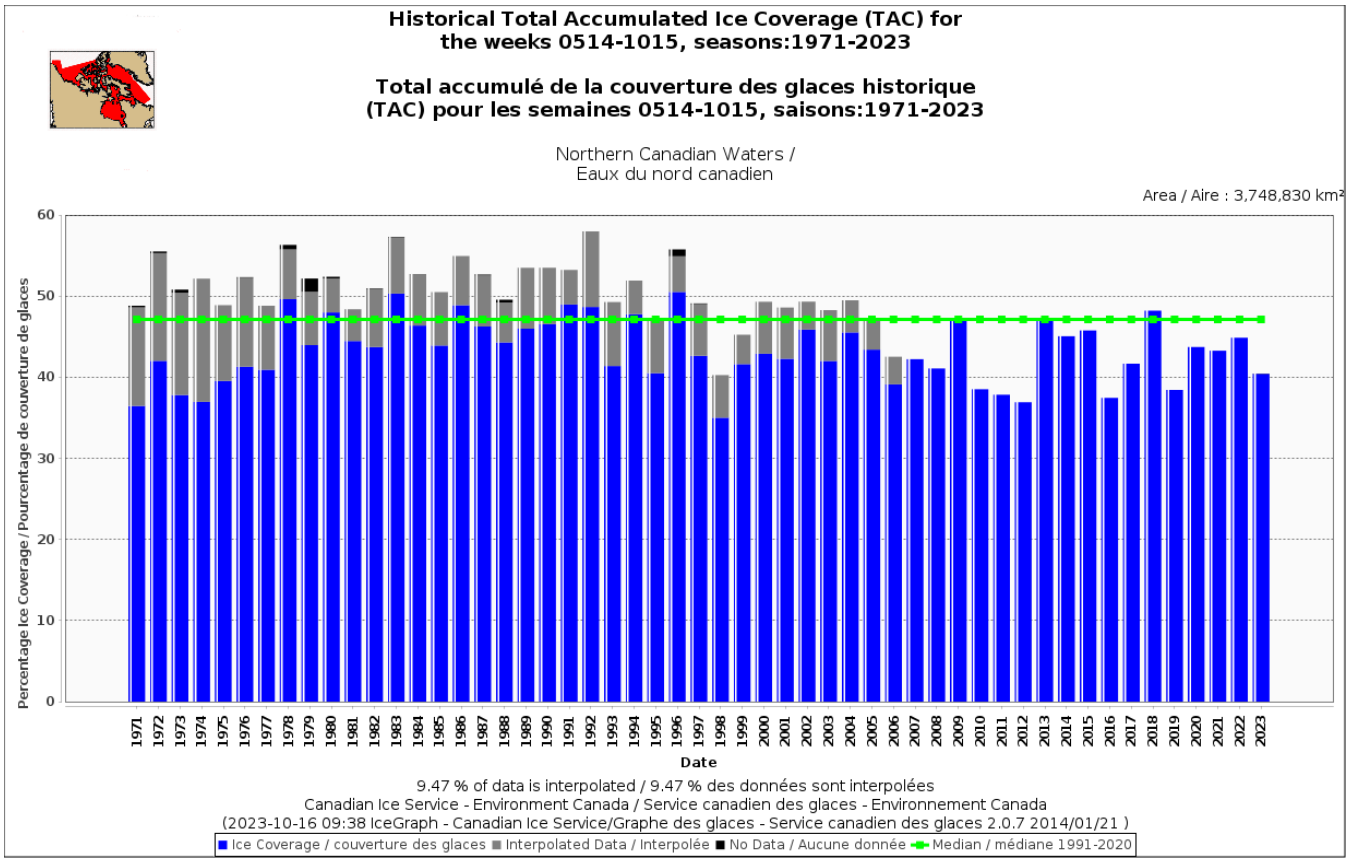


Figure 2 Historical total accumulated ice coverage for Northern Canadian waters

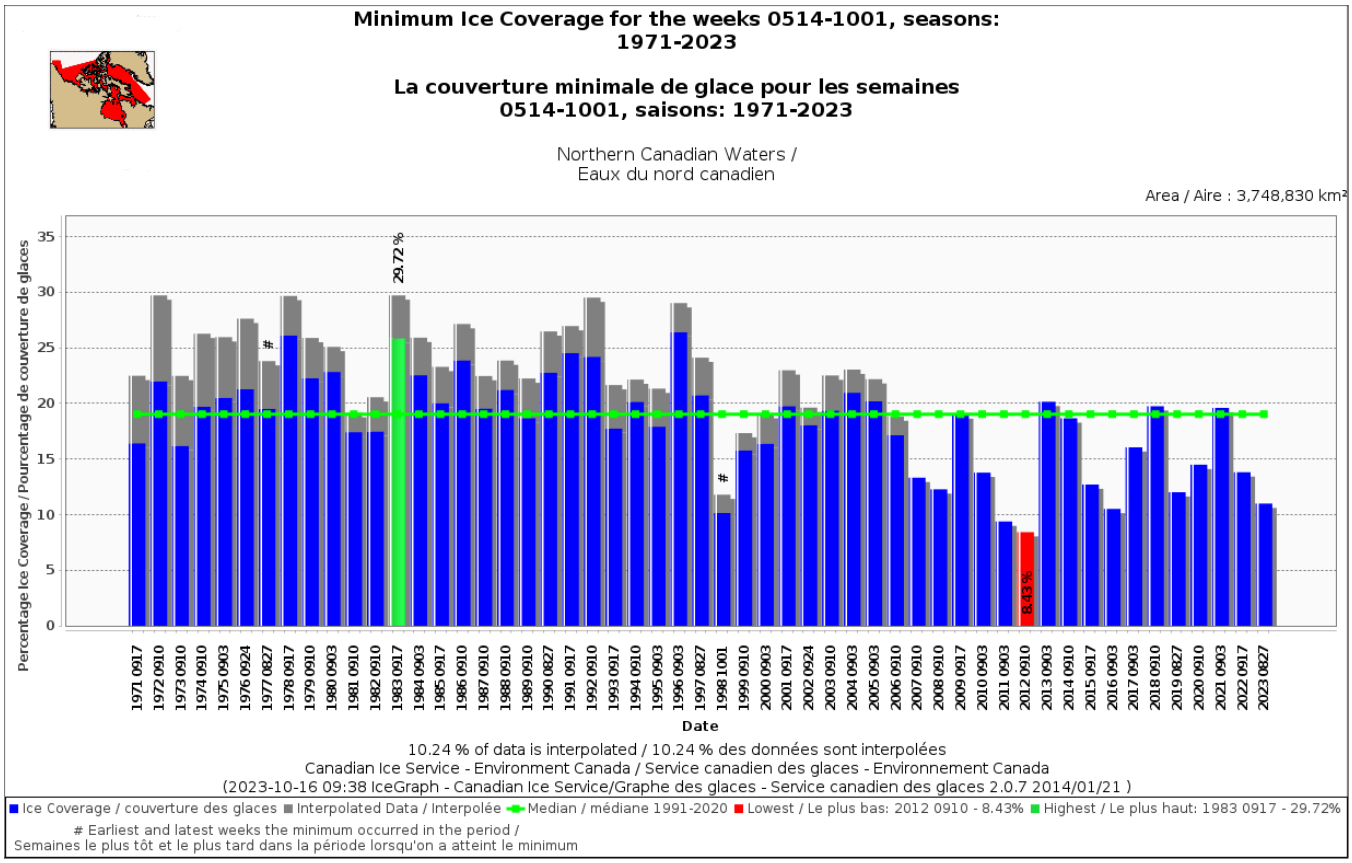


Figure 3 Minimum ice coverage for Northern Canadian waters – 2023 Season

The 2023 minimum ice coverage for northern Canadian waters was the 4th lowest since 1971 at 10.99%. The record lowest minimum ice coverage was in 2012 at 8.43%.

From May 1st to September 30th, 2023, most of the North American Arctic experienced above normal temperatures. Davis Strait, Baffin Bay, Foxe Basin, Committee Bay, Prince Regent Inlet, Lancaster Sound, Jones Sound, the Bering Strait, and the Chukchi Sea were below normal or near normal for the summer.

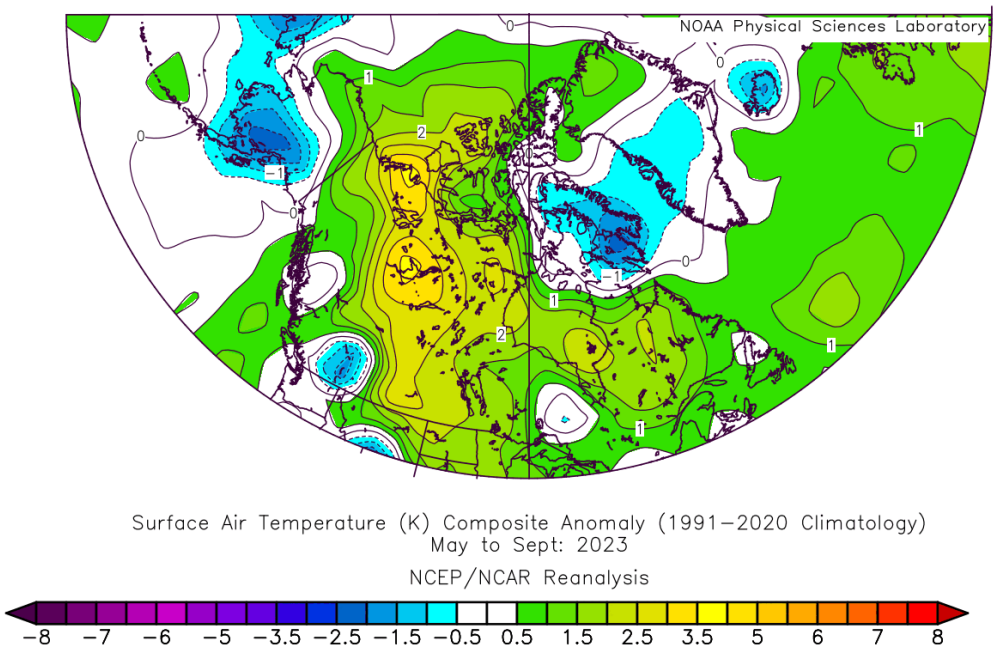


Figure 4 Air temperature anomaly for the North American Arctic from May to September 2023

Hudson Bay and the Labrador Coast

Summer Ice Conditions and Fall Freeze-up

Summer Temperatures: June to September

Surface air temperatures were above normal for Hudson Bay, James Bay, Labrador Coast, and Ungava Bay. Temperatures were below normal for western Hudson Strait, Foxe Basin, Frobisher Bay, Davis Strait, and Cumberland Sound.

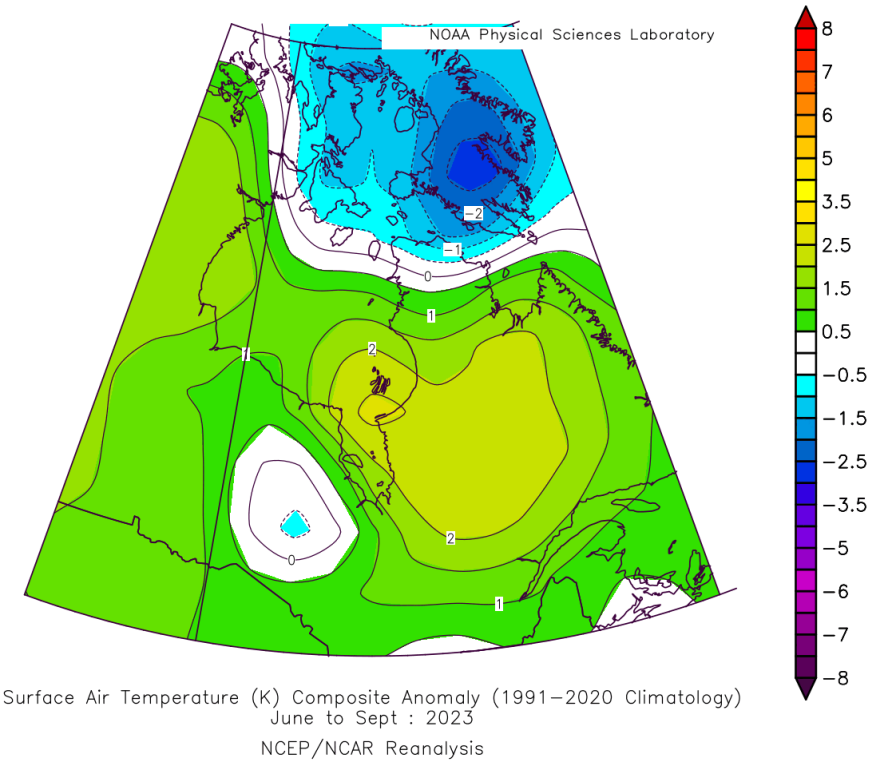


Figure 5 Air temperature anomaly from June to September 2023

Summary of Ice Conditions

At the end of April, lower than normal ice concentrations were observed near Southampton Island, Coats Island, Mansel Island, and the northeastern shore of Hudson Bay. These areas of open water had begun to develop due to offshore winds and were 4-6 weeks ahead of normal. By the end of June and into early July, significant melt begun within central Hudson Bay, 1-2 weeks ahead of normal. Hudson Bay was completely free of ice by the beginning of August.

In Hudson Strait, an area of bergy water and below normal ice concentrations began to develop south of the Foxe Peninsula during the first week of May. The bergy water area continued to expand significantly during the month and was almost to Akpatok Island by the beginning of June. The ice melt here was 2-3 weeks ahead of normal. During June, above normal ice concentrations were observed in the eastern entrance to Hudson Strait near Resolution Island. This was due to the presence of thicker and older ice, which delayed ice melt here by 1-2 weeks. The ice pack in Ungava Bay and near Resolution Island would completely melt by the second week in July. In western Hudson strait, the ice pack was delayed in melting by 1-2 weeks due to the presence of below normal temperatures. By the end of July, Hudson Strait was predominantly bergy water.

The Labrador Sea generally experienced above normal ice concentrations during the month of June. An offshore wind event during the second week of June led to the ice pack being pushed further to the east. This resulted in above normal ice coverage for the region that was 2-3 weeks delayed in ice melt. By the beginning of July, the Labrador Sea was reduced to predominantly bergy water.

Below normal ice conditions were present in Frobisher Bay and Cumberland Sound due to offshore winds in May which continued into June as well. Generally westerly winds would continue over the region, resulting in the ice edge in Davis Strait to be further east than normal. As a result, ice melt in southern Davis Strait would be 2-3 weeks delayed, as was the case with the ice conditions near the Labrador Coast. In northern Davis Strait, the ice pack persisted into the end of July. This was due to the presence of higher concentrations of old ice and below normal temperatures for the region for most of July.

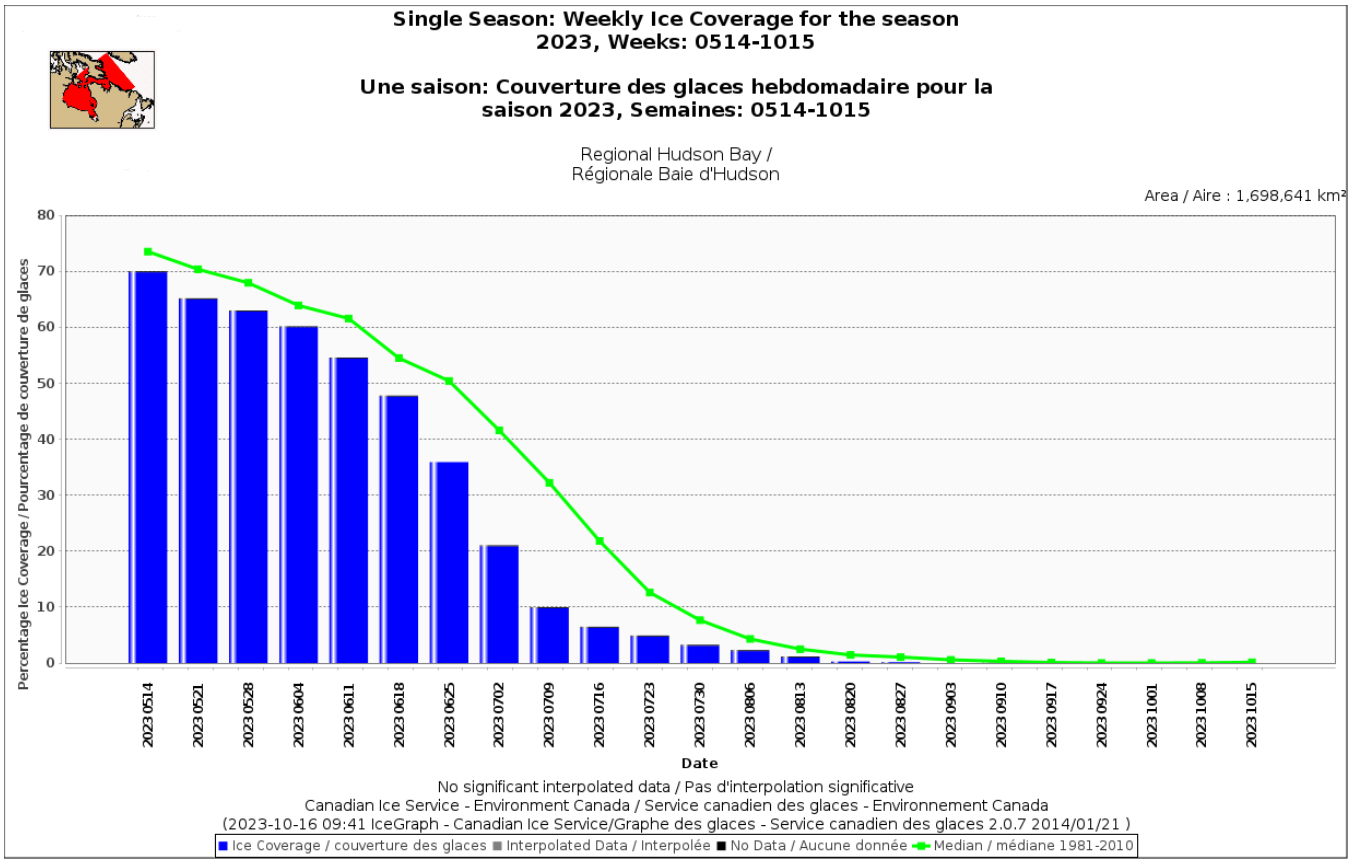


Figure 6 Weekly ice coverage for the Hudson Bay area – 2023 Season

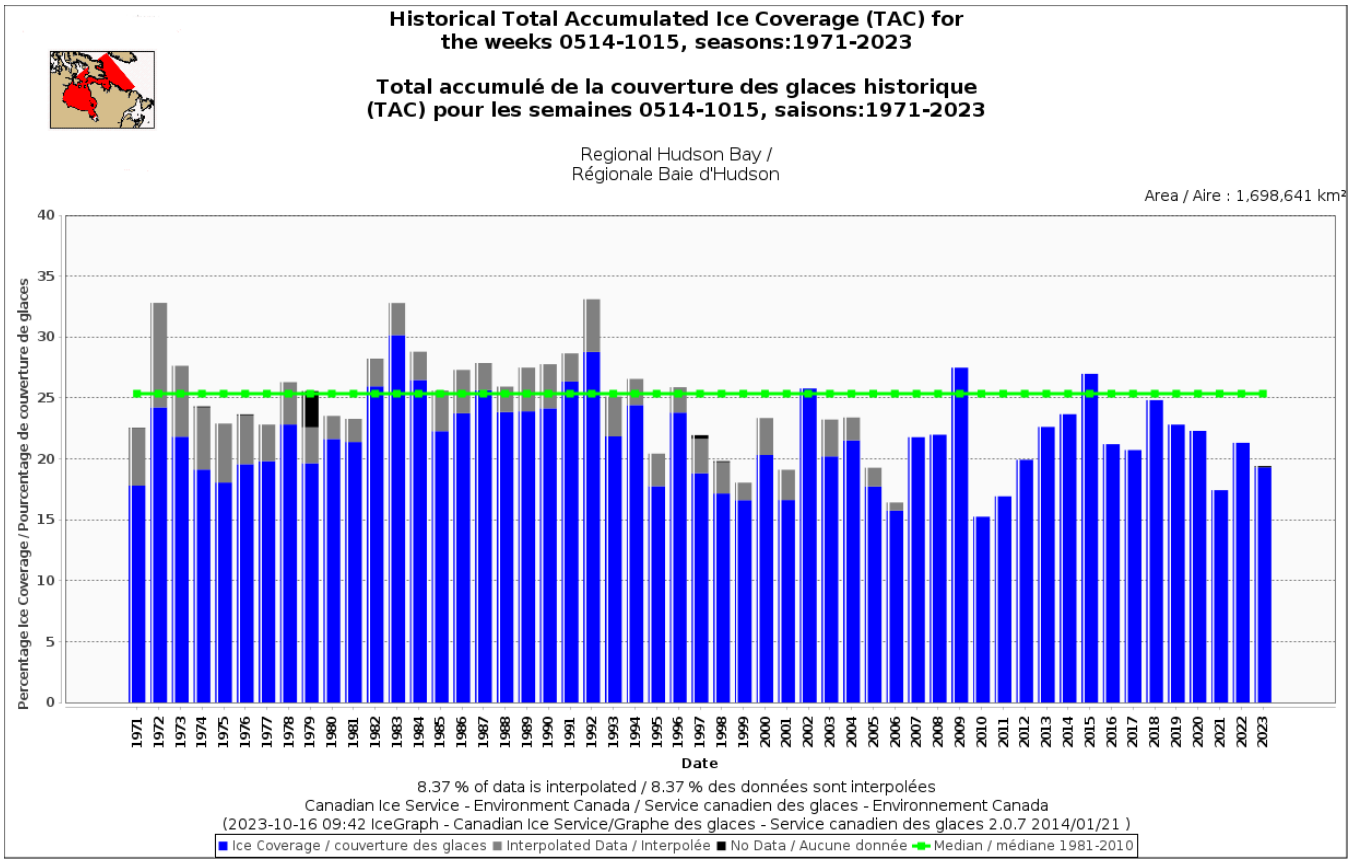
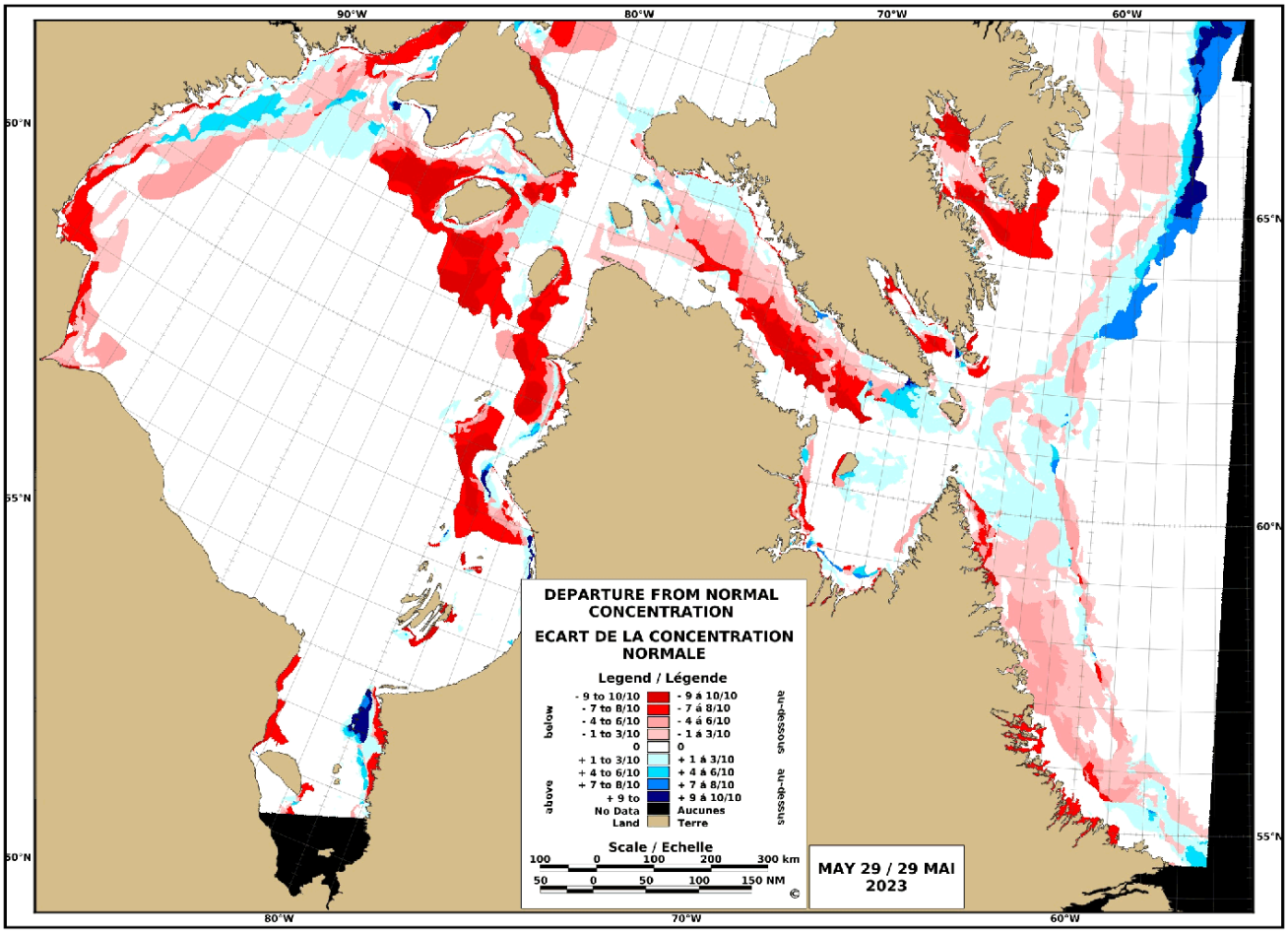


Figure 7 Historical total accumulated ice coverage for the Hudson Bay area

June Ice Conditions



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 8 Departure from normal ice concentrations for the Hudson Bay area – end of May 2023

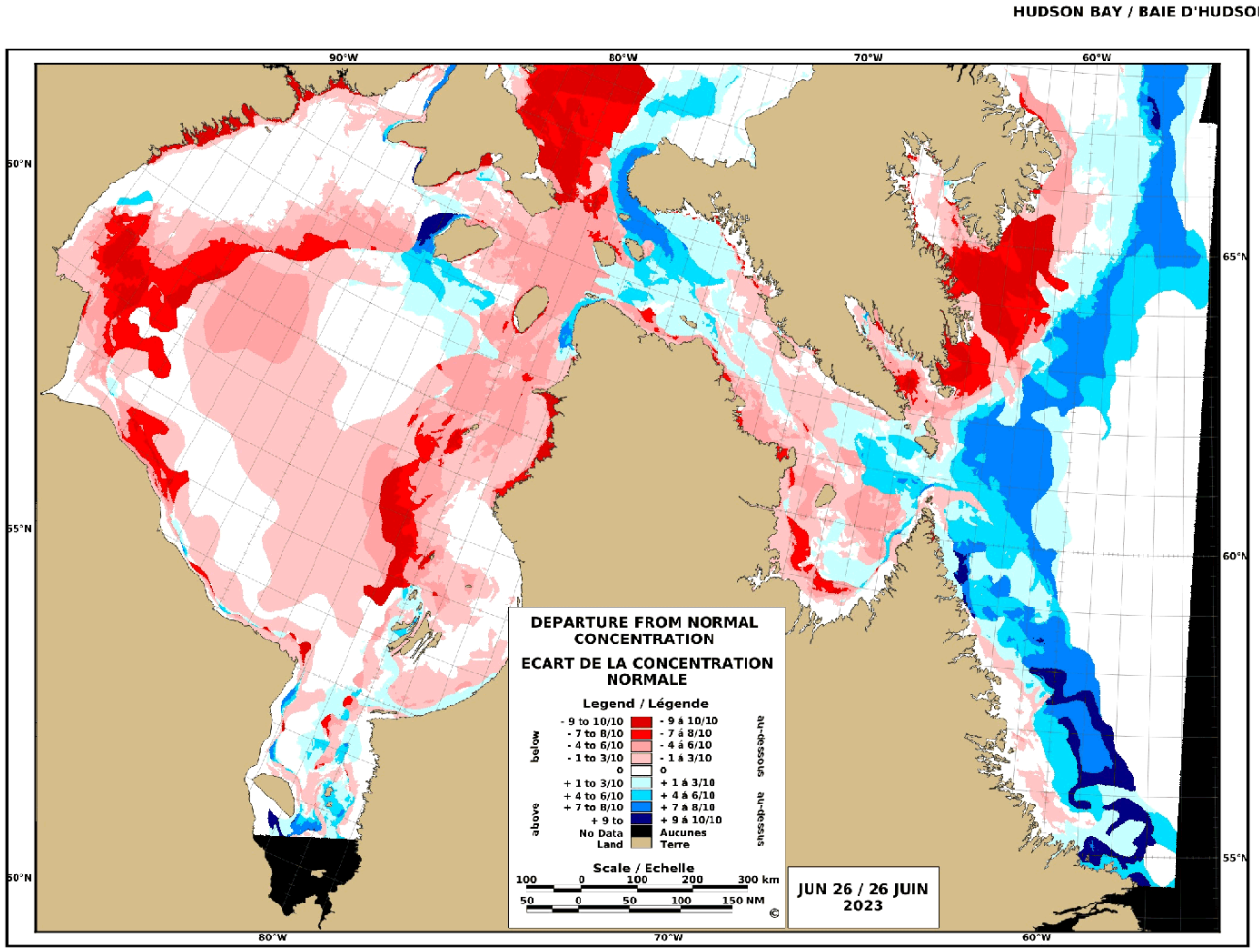


Figure 9 Departure from normal ice concentrations for the Hudson Bay area – end of June 2023

At the beginning of June, close pack to open drift medium and thick first-year ice, with a trace of old ice, was present within 100 nautical miles of the Labrador coast. Some fasted medium first-year ice was also present along parts of the coast. During the month the ice pack was pushed eastwards due to offshore winds, leaving an area of bergy water between the ice pack and the coast that extended from near Saglek southward to near Hopedale. It was during this time that the remaining fast medium first-year ice along the coast fractured. By the end of the month, the ice was close pack to open drift thick first-year ice with a trace of old ice and extended southward to near Groswater Bay. The ice melt was roughly 2-3 weeks delayed compared to normal.

Meanwhile, the ice in Lake Melville had melted 1-2 weeks earlier than normal in mid-May. By the beginning of June, Lake Melville was ice free.

Frobisher Bay and Cumberland Sound were predominantly bergy water at the beginning of June, the ice pack was at this point confined to the entrances of both areas and fasted thick first-year ice was present along the shorelines as well. As the fast ice along the shores fractured throughout the month, the areas of predominantly bergy water conditions changed to very open

drift thick first-year ice, and these conditions continued throughout the month as the fast ice continued to fracture. By the end of the month the remaining fast ice was near Iqaluit and along parts of the northwestern shore of Cumberland Sound.

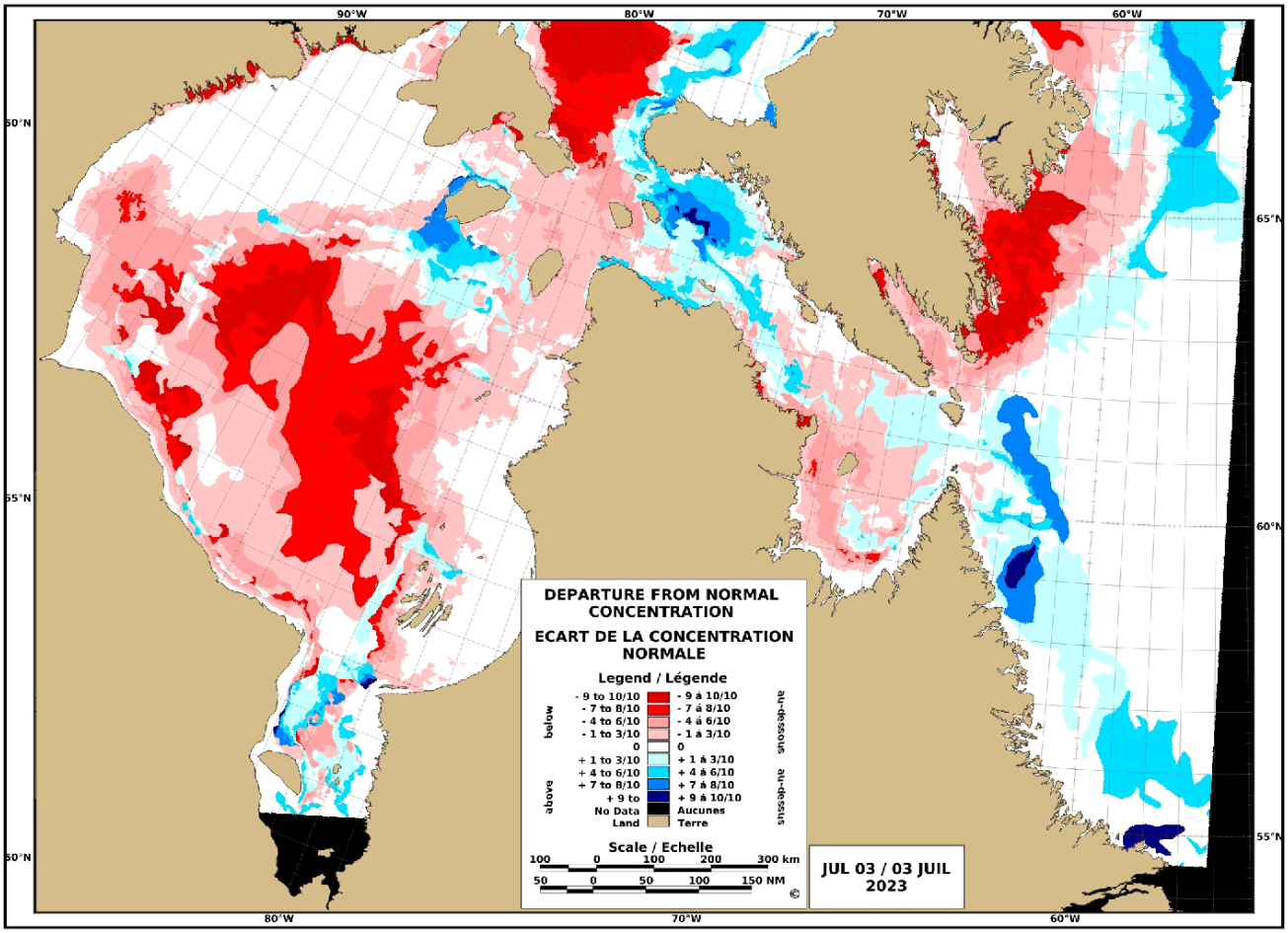
In the Davis Strait, the ice pack was close pack thick first-year and old ice, and the ice edge was further east than normal. The ice remained close pack in the northern section during the month of June but slowly melted in the southern section to open drift ice.

In the Hudson Strait, there was an extensive area of bergy water in the central section, an area of close pack medium and thick first-year ice in the western section and an area of close pack medium and thick first-year ice with a trace of old ice in the eastern section near the entrance to the Hudson Strait at the beginning of June. The ice dispersed and mixed into the area of bergy water throughout the month but was also melting in the process. By the end of the month, the ice conditions in the western and eastern sections were open drift. The ice pack in Ungava Bay was close pack medium and thick first-year ice at the beginning of the month and gradually melted by the end of the month to open drift pack ice.

In Hudson Bay, the ice was close pack medium and thick first-year ice, and fasted thick first-year ice was present along parts of the coast at the beginning of June. Areas of open to very open drift medium and thick first-year ice were already present along the western coast, south of Southampton Island, near Coats Island, and near the northeastern coast. The ice melt near Southampton and Coats Islands in particular, were 3-4 weeks ahead of normal. By mid-June, the ice along the western and eastern coasts had deteriorated to very open drift thick first-year ice. By the end of the month, the Hudson Bay ice pack was confined to the central and southern portions of the Bay while the eastern and western coasts were open water.

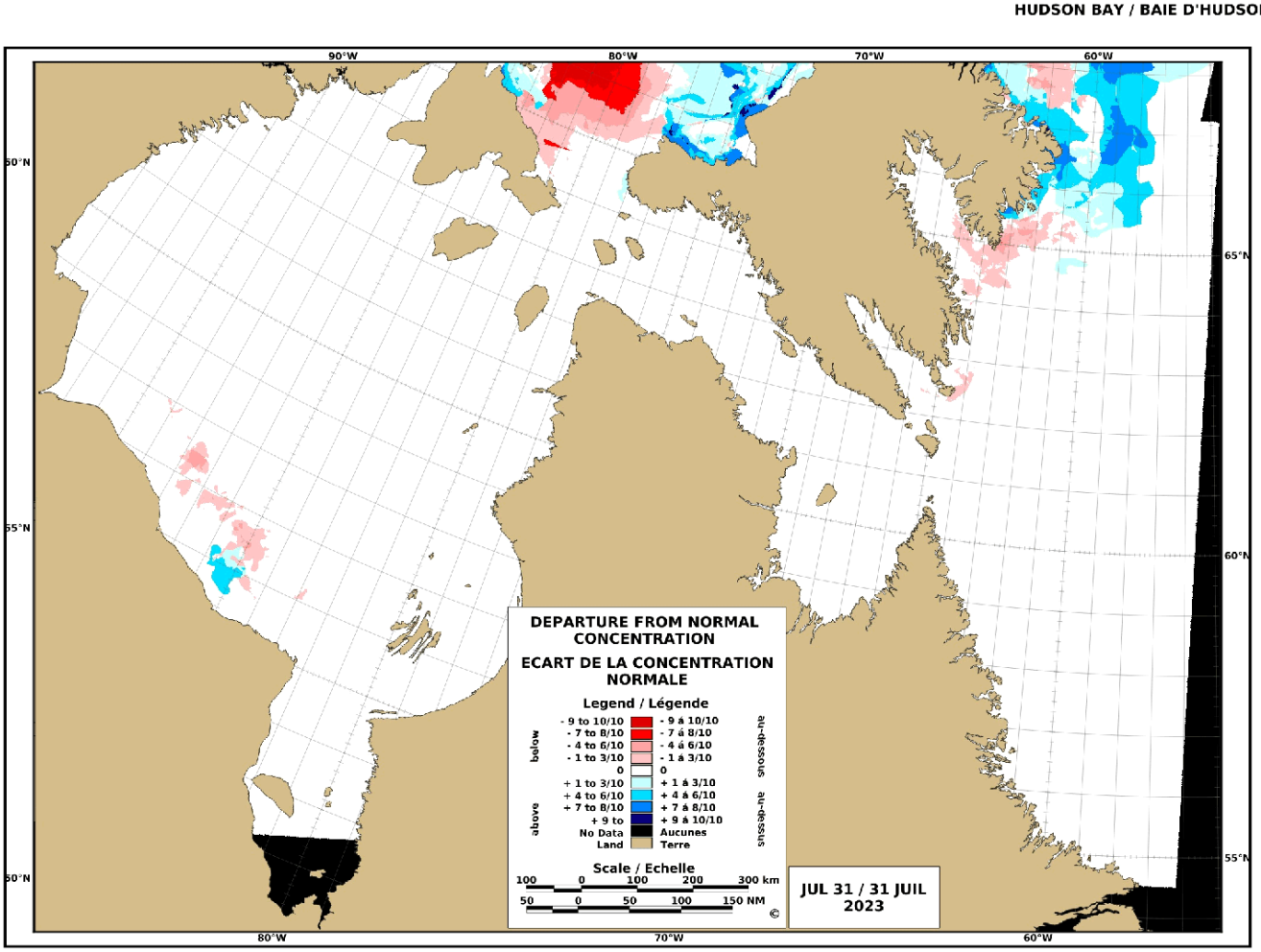
In James Bay, at the beginning of June the ice was predominantly close pack medium first-year ice. There was also some fast medium first-year ice along the northern shore of Akimiski Island which fractured in the first week of June. By the end of the month, the ice was close pack and was predominantly in the northwestern section of the bay. The rest of James Bay was very open drift medium first-year ice.

July Ice Conditions



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

Figure 10 Departure from normal ice concentrations for the Hudson Bay – beginning of July 2023



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

Figure 11 Departure from normal ice concentrations for the Hudson Bay area – end of July 2023

For early July, the open drift thick first-year ice (including a trace of old ice) that was present off the coast of Labrador, had completely melted within a couple of weeks.

Frobisher Bay and Cumberland Sound still had some open drift thick first-year ice or previously fasted ice confined to bays along the shores, which mostly melted within the first two weeks of July as well. Some fast thick first-year ice in one of the bays in Cumberland Sound did persist into the third week but melted shortly after.

In southern Davis strait, the remaining open drift thick first-year and old ice melted within the first two weeks of July. While in the northern Davis strait, ice melted more slowly due to the higher concentrations of old ice present. By the end of July, the ice pack had become open drift and remained confined to the northern section of the Davis Strait.

In Hudson Strait and Ungava Bay, the open drift thick first-year and old ice in the eastern section and the open drift thick-first year ice in Ungava Bay, melted within the first two weeks of July. In the western section of the Hudson Strait, the medium and thick first-year ice melted a little slower

and was confined to the extreme northwestern section by mid-July. By the end of the month, Hudson Strait was most bergy water.

In Hudson Bay, at the beginning of the month, open drift to close pack medium and thick first-year ice was confined to the central and southern sections of the bay. Within the first two weeks of July, the ice pack rapidly melted, 2 weeks ahead of normal, and was reduced to a small area of thick first-year ice near the southern shore by the end of July.

In James Bay, the remaining medium first-year ice pack in the northeastern section melted within the first two weeks of July. James Bay was mostly ice free by the third week of July.

August Ice Conditions

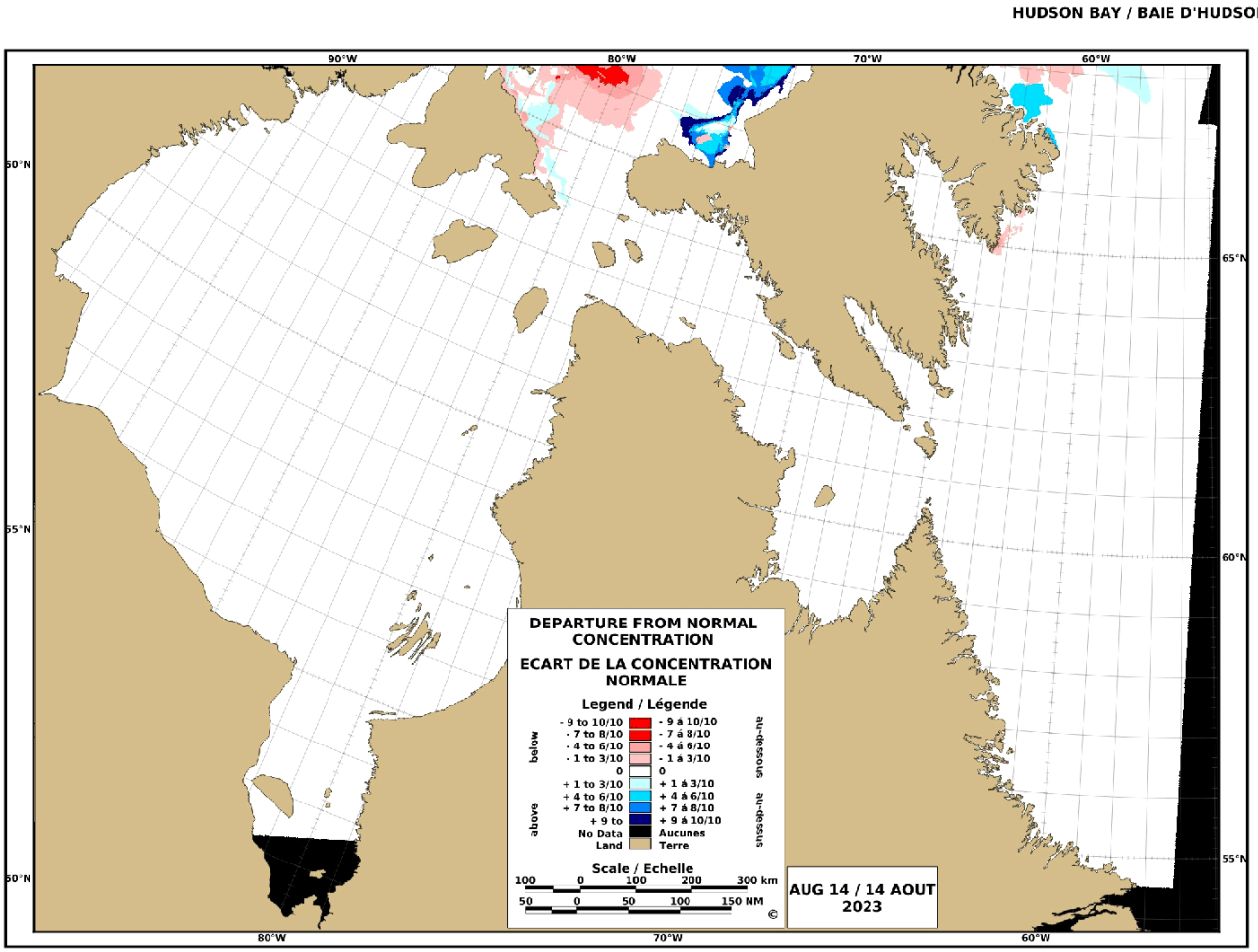


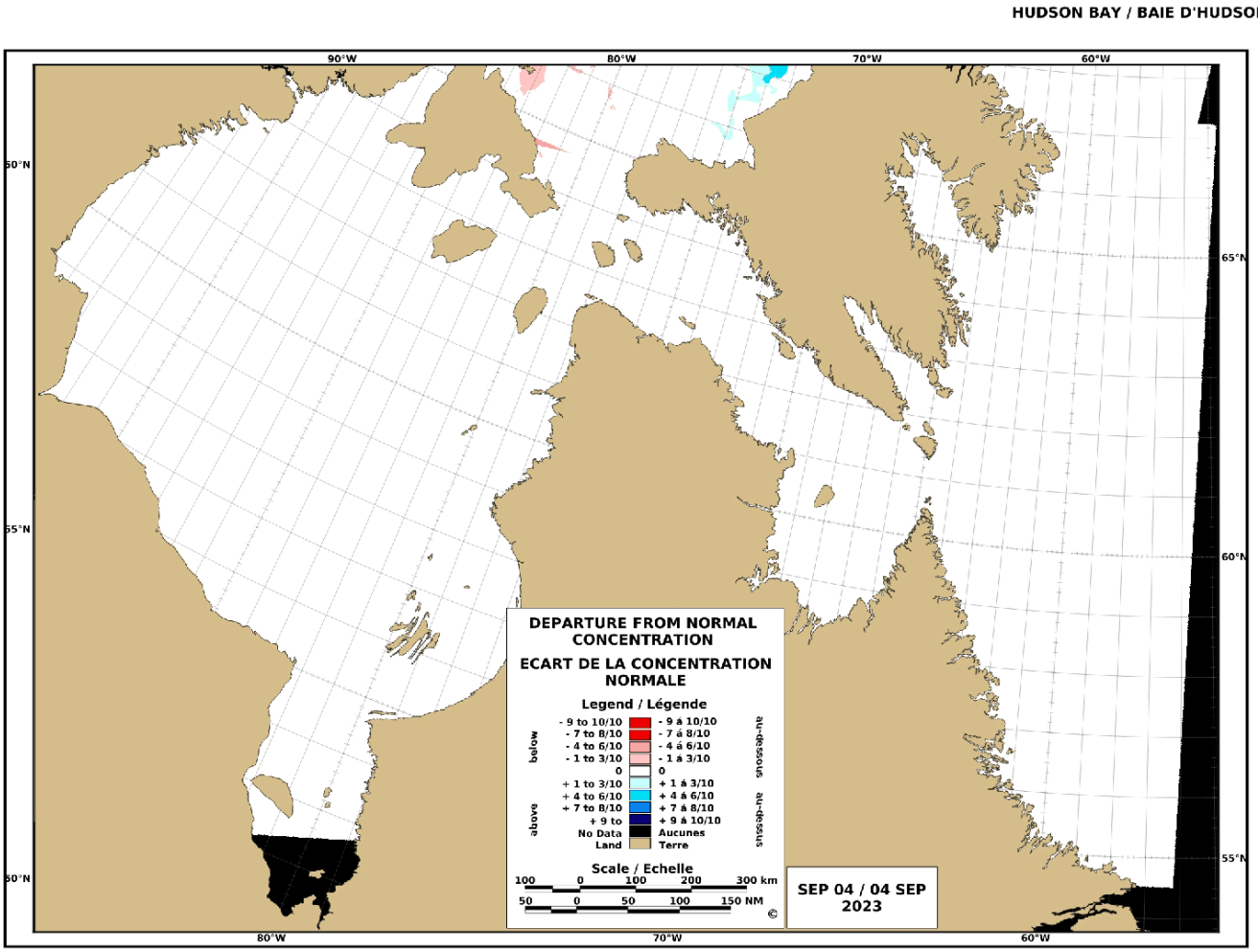
Figure 12 Departure from normal ice concentrations for the Hudson Bay area – mid-August 2023

The Labrador coast, southern Davis Strait, Frobisher Bay, Cumberland Sound, Ungava Bay, and Hudson Strait were all bergy water for the month of August.

In the northern Davis Strait, above normal ice conditions continued at the beginning of August as open drift to close pack thick first-year and old ice persisted. The ice pack began to deteriorate within the first two weeks and was reduced to bergy water by the second half of August.

Hudson Bay was predominantly ice free at the beginning of August, apart from the small area of thick first-year ice that remained near the southern shore. The ice quickly melted in the first week of August and Hudson Bay remained ice free for the rest of the month.

September Ice Conditions



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

Figure 13 Departure from normal ice concentrations for the Hudson Bay area – early September 2023

Bergy water to ice-free conditions continued for all of September for the Labrador Coast, Davis Strait, Hudson Strait, and Hudson Bay.

Eastern Arctic and Canadian Archipelago

Summer Ice Conditions and Fall Freeze-up

Summer Temperatures: June to September

From June to September, surface air temperatures were above normal over the northern Canadian Arctic Archipelago and below normal for the Davis Strait, Southern Baffin Bay, and Gulf of Boothia. Elsewhere, temperatures were near normal.

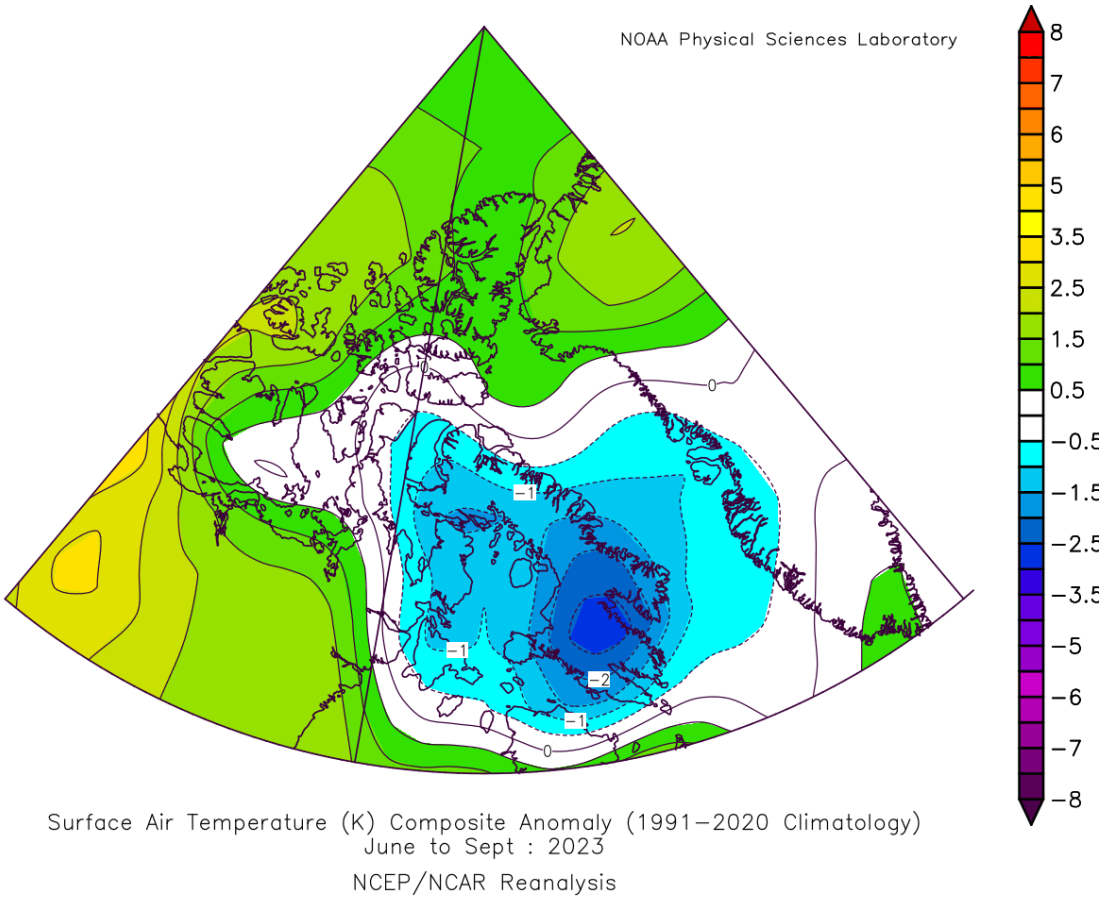


Figure 14 Air temperature anomaly for the Eastern Arctic area from June to September 2023

Summary of Ice Conditions

For the most part, the eastern Arctic experienced a normal ice melt season. However, the late formation of the Nares Strait ice bridge in March led to an area of fragile younger ice forming in Smith Sound late in the freeze-up season, this ice was destroyed by early May and below normal ice concentrations begun to be observed over the region as new ice was no longer developing and old ice continued to be blocked by the Nares Strait ice bridge. The ice bridge fractured in mid June, resulting in old ice being able to flow freely from Kane Basin into northwestern Baffin Bay. In combination with the already present old ice in Baffin Bay from before the bridge's formation, above normal ice concentrations were observed in July and August. By the end of August, Baffin Bay was for the most part bergy water, except for Nares Strait and Smith Sound where ice would persist into the beginning of the freeze-up period.

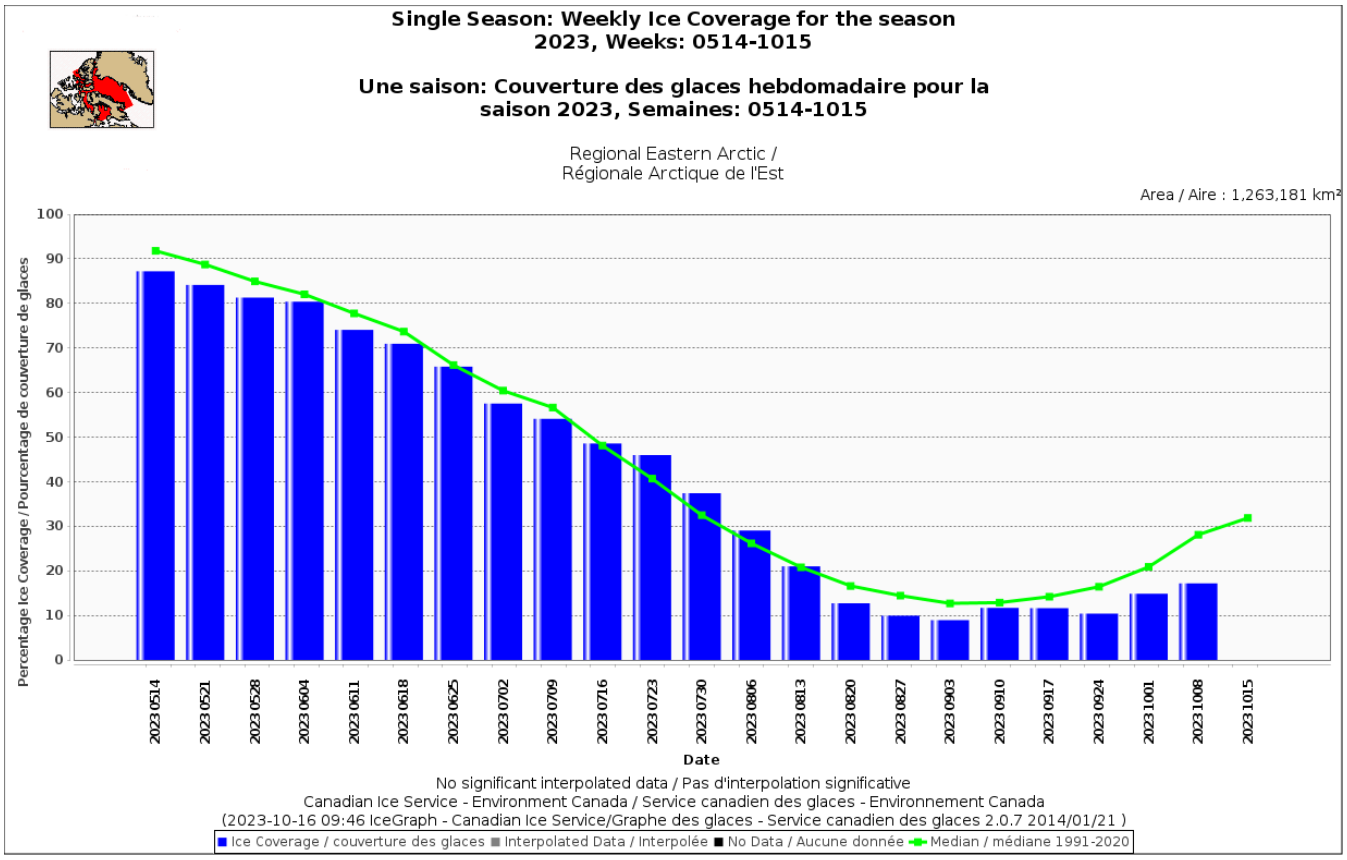


Figure 15 Weekly ice coverage for the Eastern Arctic area – 2023 Season

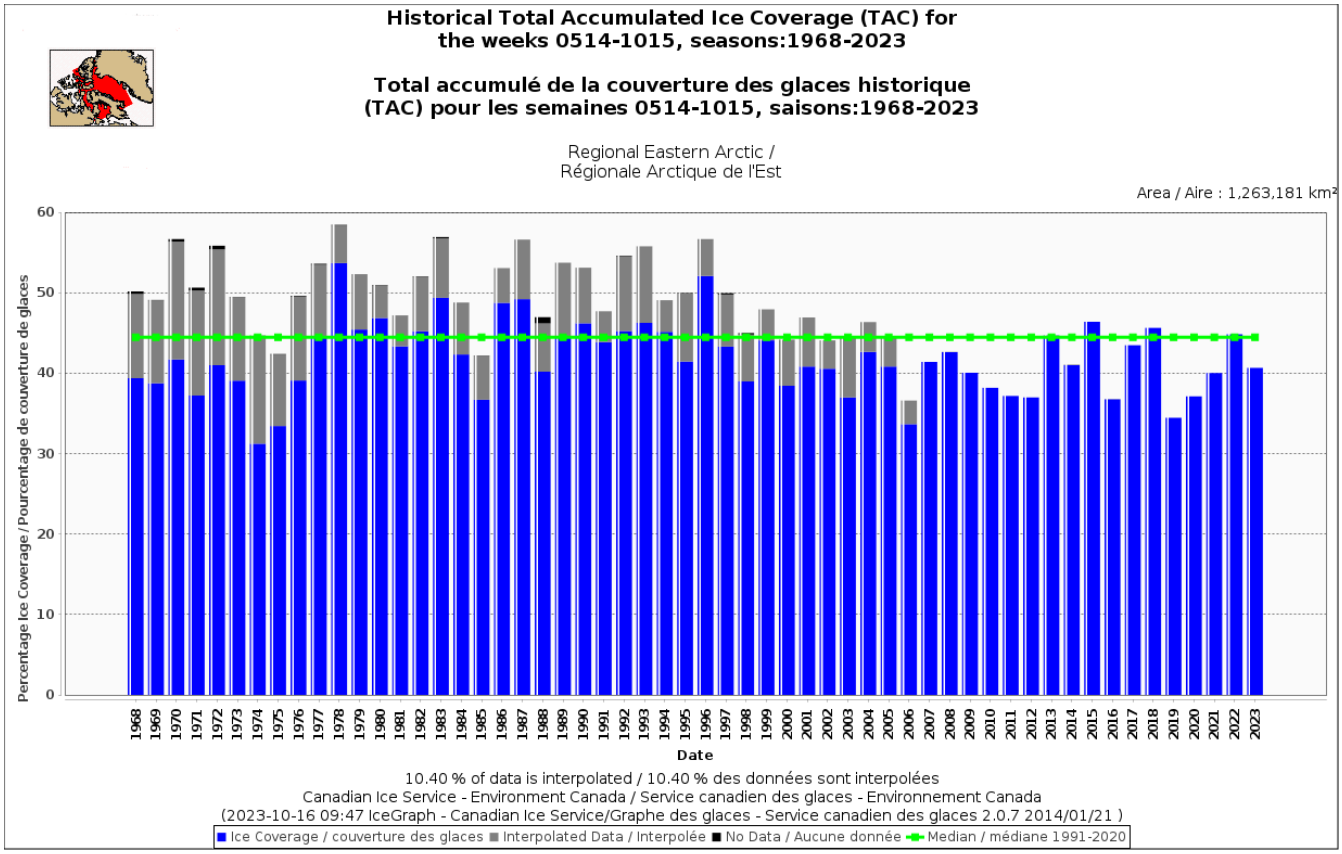


Figure 16 Historical total accumulated ice coverage for the Eastern Arctic area

June Ice Conditions

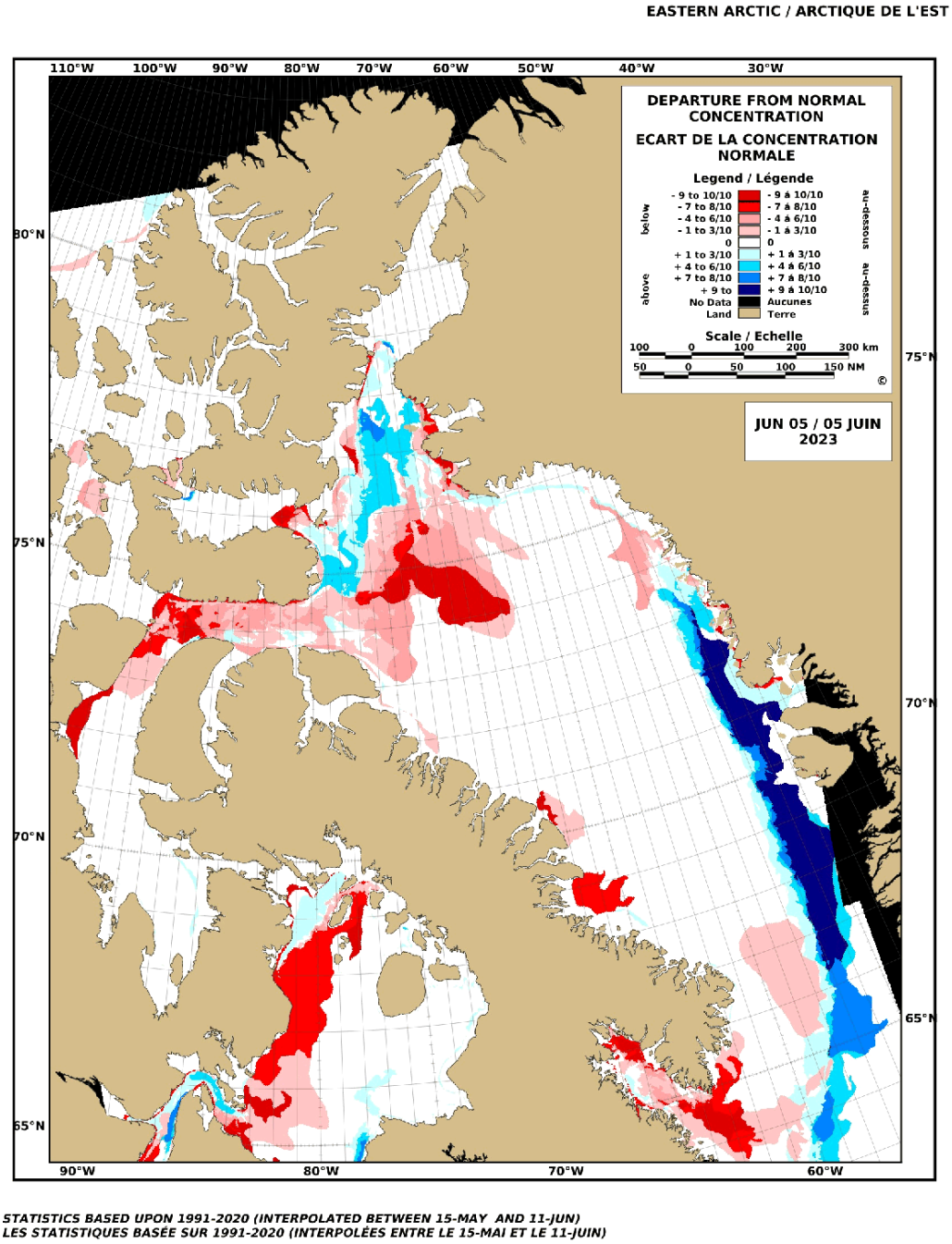


Figure 17 Departure from normal ice concentrations for the Eastern Arctic area – beginning of June 2023

At the beginning of June, very close pack thick first-year and old ice were the predominant ice conditions for Baffin Bay. The ice edge was further east than normal, close to Greenland, due to SW winds pushing the ice pack eastward. Near Smith Sound however, ice concentrations were open drift due to the presence of the Nares Strait ice bridge which had formed late at the end of March and early April. The formation of the ice bridge blocked the southward transportation of

old ice from the Arctic Ocean and as a result young ice began to form in the polynya on the southern side of the ice bridge. With temperatures too warm to support the formation of new ice at the beginning of June and the ice bridge continuing to persist for another couple weeks, ice conditions began to become predominantly bergy water in Smith Sound and the extreme northwestern section of Baffin Bay.

In Lancaster Sound, at the beginning of June the ice pack was open to very open drift thick, medium, and thin first-year ice including a trace of old ice. The ice melted throughout June and became predominantly bergy water by the end of the month. In the western section, near Somerset Island, the fasted thick first-year ice persisted for the month of June.

In Prince Regent Inlet, at the beginning of June the ice pack was predominantly very close pack thick first-year ice with a trace of old ice present in the extreme northern section. By the end of the month, the ice in the extreme northern section had mostly melted and was open drift thick first-year ice with a trace of old ice. The rest of Prince Regent Inlet remained very close pack thick first-year ice for the rest of June.

In Foxe Basin, at the beginning of June the ice pack was predominantly close pack thin, medium, and thick first-year ice in the southern and eastern section. The northwestern section was very open drift thick first-year ice. Throughout the month of June, the ice pack shifted to the eastern section of Foxe Basin and by the end of June an area of open water was present in southern Foxe Basin, 7-8 weeks ahead of normal.

July Ice Conditions

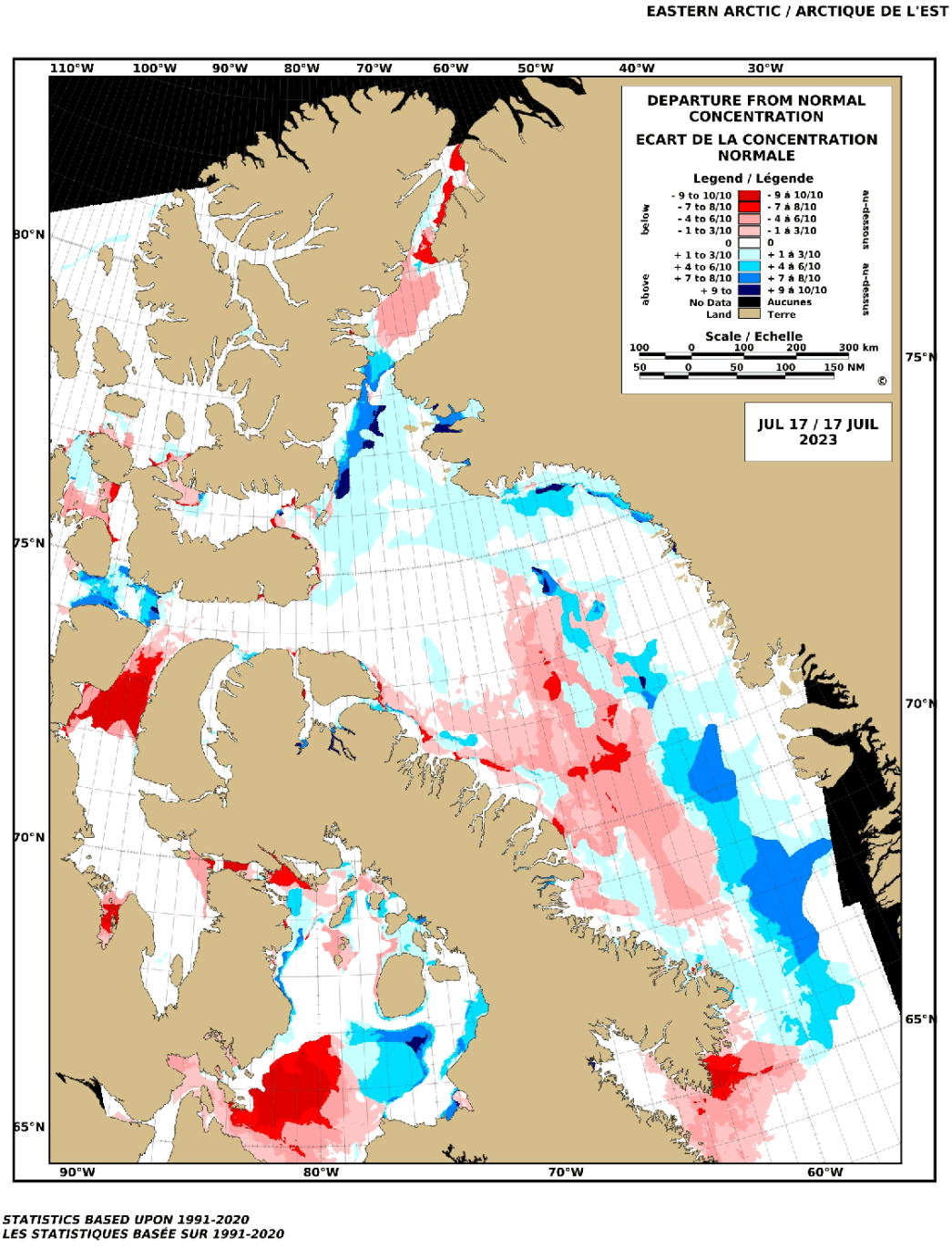


Figure 18 Departure from normal ice concentration for the Eastern Arctic area – mid-July 2023

In the beginning of July, the ice conditions in northwestern Baffin Bay were predominantly very open drift thick first-year and old ice. However, since the Nares Strait ice bridge fractured in June, close pack thick first-year and old ice that was previously being blocked in Kane Basin was now flowing into Smith Sound. Along the ice edge in northern Baffin Bay, open drift to close pack thick first-year and old ice persisted over the course of the month. Similarly for southern

Baffin Bay, where there was a higher concentration of old ice than normal, open drift to close pack ice persisted through July. These two areas would see a delay in ice melt of 2-3 weeks due to the presence of old ice.

In Navy Board Inlet and Pond Inlet, fasted thick first-year and old ice began to fracture at the end of July, with a 1–2-week delay compared to normal.

In Jones Sound, fasted thick first-year and old ice persisted for most of July. In the final week of July, the fast ice fractured and was close pack thick first-year and old ice.

In Lancaster Sound, the ice conditions for July were predominantly bergy water. Two weeks into the month, the fasted thick first-year ice near Somerset Island began to fracture. For the remainder of July, the previously fasted thick first-year ice remained open drift to close pack in the southwestern section of Lancaster Sound, near the entrance to Prince Regent Inlet. Meanwhile in the eastern section, very open drift thick first-year and old ice was drifting in from the northeast near Smith Sound.

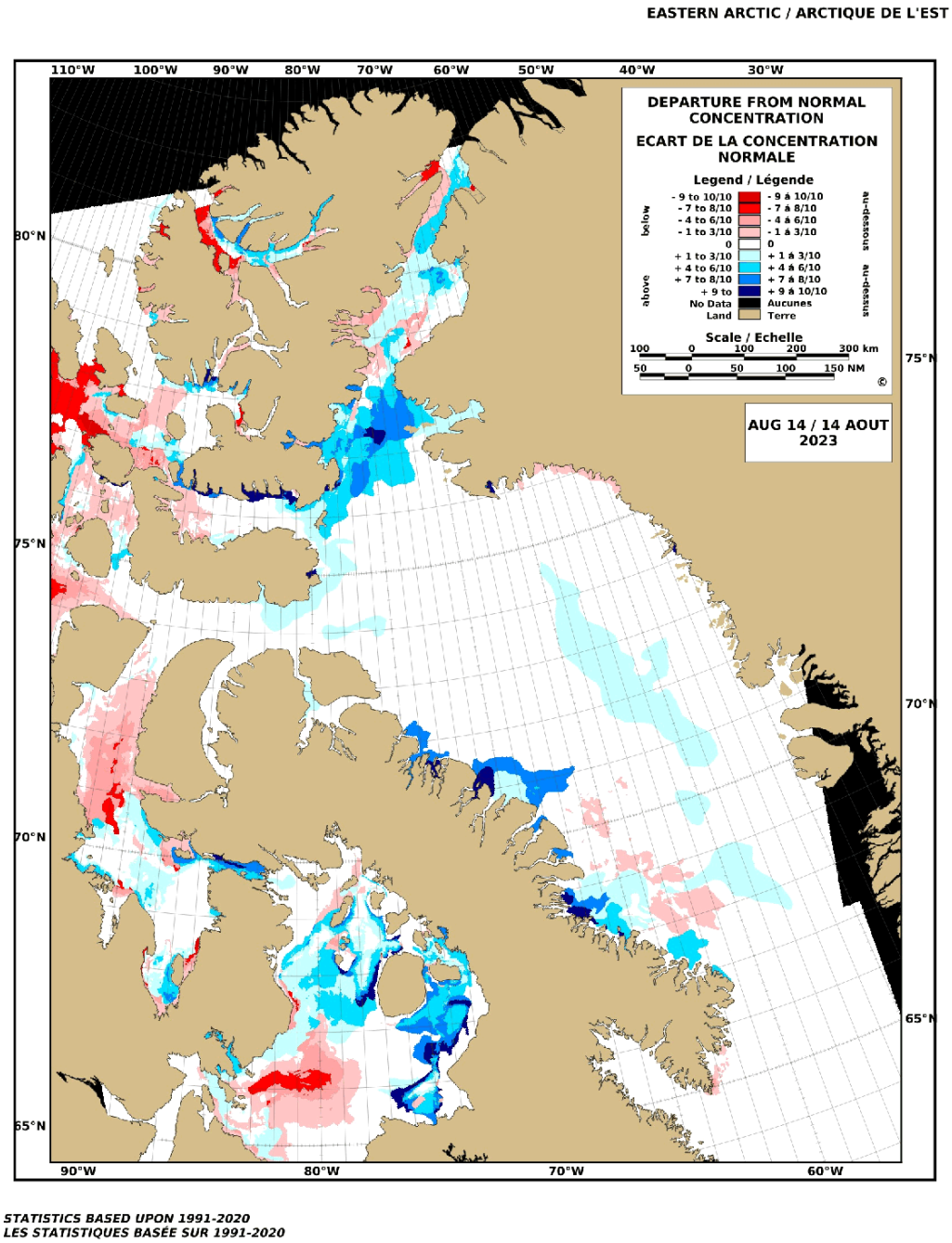
In Prince Regent Inlet, the ice melt in the northern section was 3-4 weeks ahead of normal. By the end of the month Prince Regent Inlet was very open drift thick first-year ice including a trace of old ice.

In Pelly Bay, at the beginning of the month there was fasted thick first-year ice that began to fracture within the first week. The ice rapidly melted, roughly 1 week ahead of normal, and was very open drift thick first-year ice by the third week of July. By the end of the month, Pelly Bay was predominantly open water.

In Admiralty Inlet, fasted thick first-year ice persisted for most of July. By the end of the month, the ice fractured and was open drift to close pack thick first-year ice.

In Foxe Basin, the area of open water that was present in the southern section, just northeast of Southampton Island, persisted into July. Medium first-year and thick first-year ice remained in the eastern section for all of July, while in the northwestern section, the ice melted to very open drift thick first-year ice. The fasted thick first-year ice in Fury and Hecla Strait fractured halfway through the month, then rapidly melted and became predominantly bergy water by the end of July, roughly 1 week ahead of normal.

August Ice Conditions



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

Figure 19 Departure from normal ice concentrations for the Eastern Arctic area – mid-August 2023

In Baffin Bay, the fasted thick first-year ice including a trace of old ice that was present along the Baffin Island coast began to fracture during the first week of August. The remainder of the ice pack was in the southern and eastern sections of Baffin Bay and was open to very open drift thick first-year and old ice. By the third week of August, the only remaining ice in Baffin Bay was a small area of very open drift thick first-year ice near Cape Hooper. By the end of August, Baffin

Bay was predominantly bergy water. Due to the presence of old ice, ice melt was about 2 weeks delayed along the ice edge and along the Baffin Island coast.

In Pond Inlet, due to higher-than-normal concentrations of old ice, the progression of ice melt was about 2 weeks delayed. The close pack old and thick first-year ice that was previously in Eclipse Sound and Navy Board was confined to Pond Inlet and eastern Eclipse Sound by the first week of August. By the third week the ice was reduced to bergy water.

In Admiralty Inlet, close pack to open drift thick first-year ice was reduced to bergy water by the second week of August. Ice melt was roughly one week delayed compared to normal.

In Jones Sound, close pack to open drift thick first-year and old ice was mostly destroyed due to an onshore wind event that pushed the ice pack against the coast of Ellesmere Island during the first two weeks of August. For the remainder of August, Jones Sound was very open drift thick first-year and old ice, some which entered from the northeast originating from Smith Sound.

In Norwegian Bay, fasted thick first-year and old ice were the prevailing ice conditions for the first week of August. Halfway through the month, the ice had completely fractured and was close to very close pack thick first-year and old ice. By the end of August, most of the ice was close pack and was confined to the western section of Norwegian Bay, with some of it flowing into western Jones Sound.

In Smith Sound and Kane Basin, close pack medium first-year, thick first-year and old ice was present at the beginning of the month. Midway through August, the winds shifted to predominantly easterly over the area and resulted in most of the ice pack being pushed towards the coast Ellesmere Island. By the end of the month, both Smith Sound and Kane Basin were predominantly open drift medium first-year, thick first-year, and old ice with close pack thick first-year and old ice along parts of the Ellesmere Island coast.

In the Gulf of Boothia and Committee Bay, at the beginning of the month the ice conditions were predominantly very close pack thick first-year ice and these conditions persisted for the first half of August. During the last two weeks of August the ice pack deteriorated to open drift and was mostly confined to Committee Bay. By the end of the month, the Gulf of Boothia had been reduced to predominantly bergy water.

During the month of August, the thick first-year ice pack from the Gulf of Boothia and Committee Bay was transported into Fury and Hecla strait which was previously bergy water. As the ice moved eastward through the strait it would melt and by the end of August the ice was mostly melted with some very open drift thick first-year ice remaining.

In Foxe Basin, at the beginning of August the ice was confined to the eastern and central sections of Foxe Basin and was open drift to close pack thick first-year ice. There was also some open drift thick first-year ice near the northern shore of Southampton Island. By the third week of August the ice near Southampton Island had been reduced to open water, while the remaining ice pack was pushed to the northeast and had been reduced to very open drift to open drift thick first-year ice by the end of the month.

September Ice Conditions

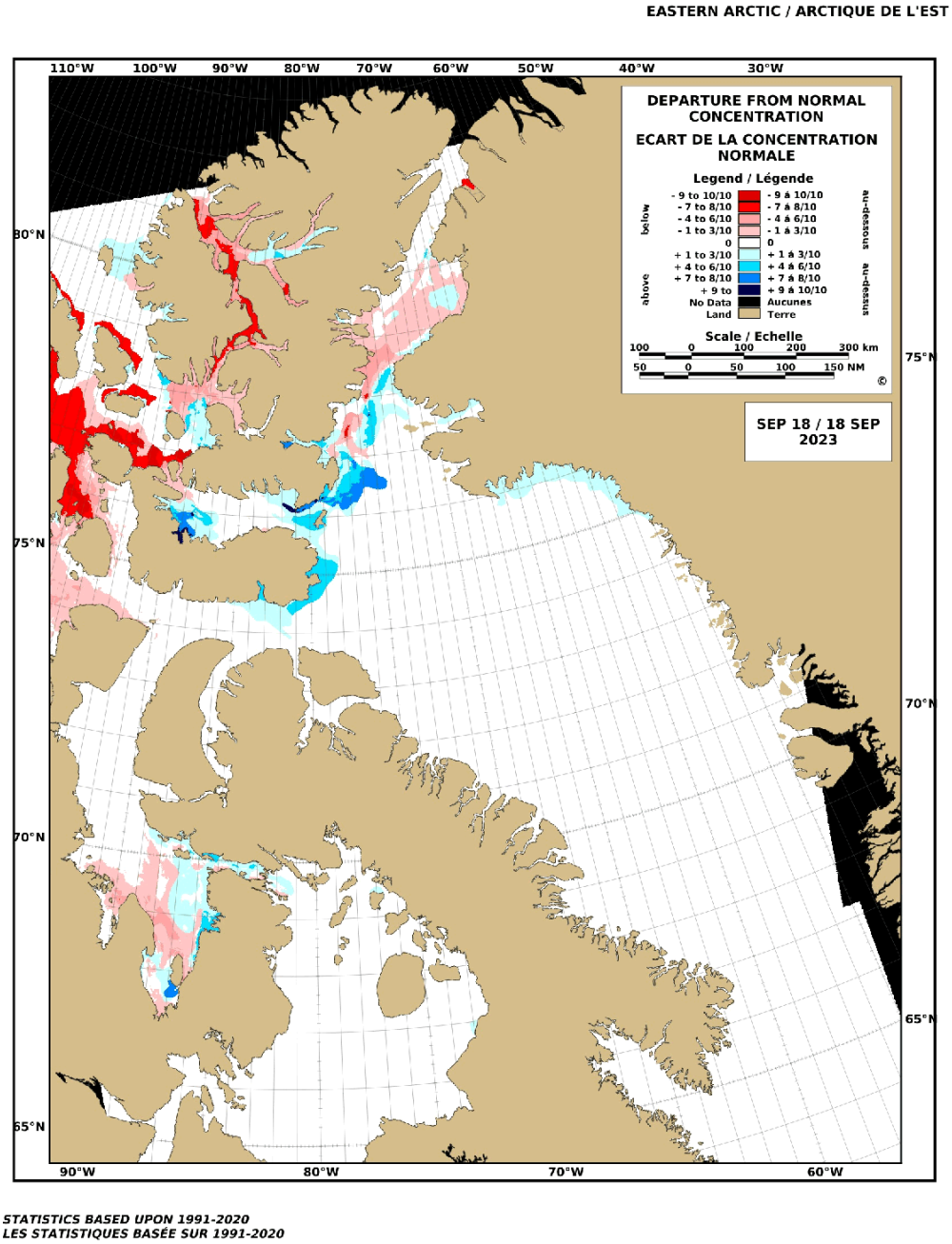


Figure 20 Departure from normal ice concentrations for the Eastern Arctic area – mid-September 2023

At the beginning of September, most of Baffin Bay, Pond Inlet, Lancaster Sound, Admiralty, Prince Regent Inlet, and the Gulf of Boothia were predominantly bergy water.

In the extreme northwestern section of Baffin Bay and Smith Sound, the ice conditions for the beginning of September were for the most part open to very open drift thick first-year and old ice. By the second and third week of September, new ice began to develop in between the old and thick first-year ice floes in Kane Basin and Smith Sound. By the end of September, Kane

Basin was close pack grey, thick first-year, and old ice. Smith Sound and the extreme northwestern section of Baffin Bay were very open to open drift new and old ice.

In Jones Sound, throughout the month the ice conditions varied between very open drift and open drift thick first-year and old ice as ice would enter in the west from Norwegian Bay and in the east from Smith Sound.

In Committee Bay, the remaining ice pack was confined to the eastern section where some of the ice was continuing to exit into Fury and Hecla strait. The ice conditions started September as open drift to close pack thick first-year ice and throughout the month as ice melted or exited through Fury and Hecla strait, the ice pack was reduced to very open to open drift thick first-year ice.

In Foxe Basin, the ice conditions were predominantly open water, the ice pack that did remain was open to very open drift thick first-year ice in the northeastern section at the start of September. By the second week of September, the ice pack was reduced to a few small areas of very open drift strips and patches of thick first-year ice. By the end of the month, Foxe Basin was predominantly free of ice.

Western Arctic

Summer Ice Conditions and Fall Freeze-up

Summer Temperatures: June to September

From June to September, all areas experience above normal temperatures except in Larsen Sound, McClintock Channel, and Peel Sound where temperatures were near normal.

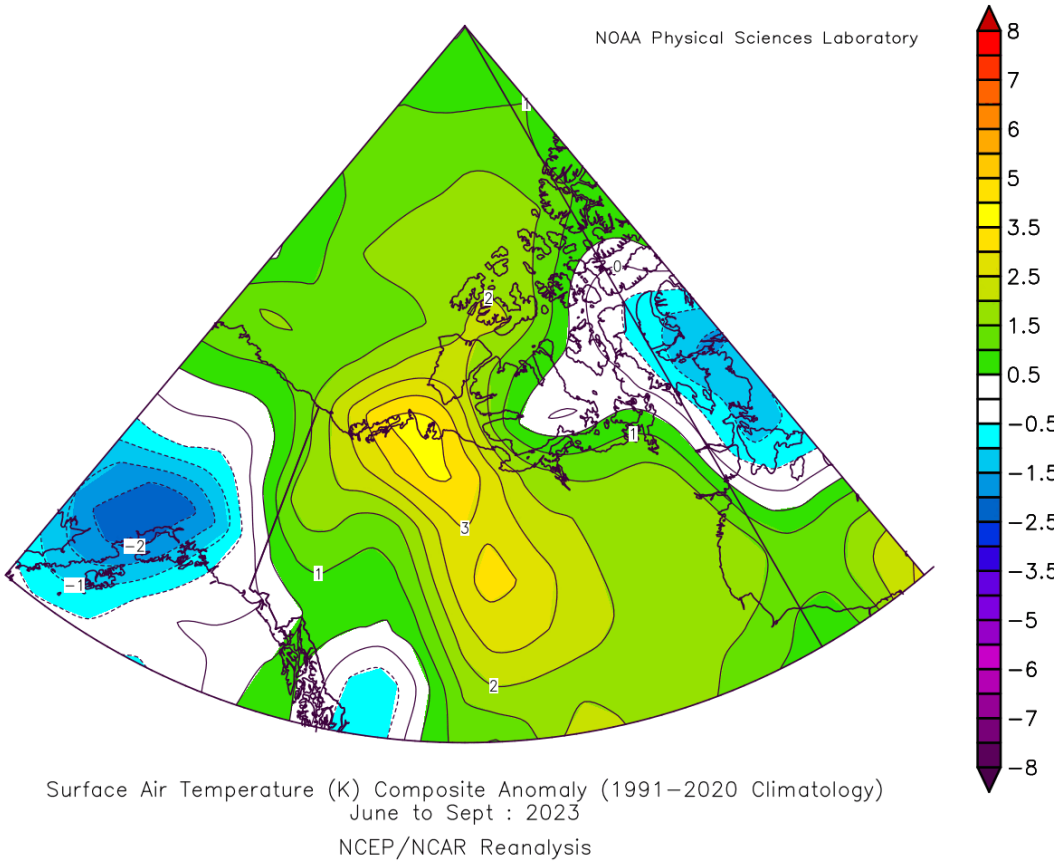


Figure 21 Air temperature anomaly for the Western Arctic area from June to September 2023

Summary of Ice Conditions

Generally, the western Arctic experienced a warmer than normal summer. Significant offshore wind events near the Tuktoyaktuk Peninsula during the last week of June and first weeks of July led to the ice pack retreating further north than normal. And while the fast ice in the Amundsen Gulf began to fracture during a relatively near normal time frame at the end of May, the melt rate through the rest of the Northwest Passage accelerated during July, melting 1-2 weeks ahead of normal. This year the Northwest Passage was ice free by September 3rd.

Significant ice loss was observed in Parry Channel and McClintock Channel this summer. The fast ice in western Parry Channel began to fracture in early July which was near normal. The ice loss in late July and August however led to significantly below normal ice conditions for both regions. This was in part due to the lower concentrations of old ice in these regions due to last summer's melt season. This year the northern Northwest Passage route through Parry Channel experienced its second lowest sea ice minimum on record at 5.96% total ice coverage in late August. The lowest sea ice minimum on record occurred in 2011 at 4.30% total ice coverage.

The northwestern Beaufort Sea also experienced significant ice loss, During the last weeks of August and early September, the region experienced several significant southeasterly wind events. These events contributed to deteriorating the ice pack and by late September the ice edge was significantly further northeast than normal. This year the Beaufort Sea experienced its third lowest sea ice extent minimum on record in late September at 9.62% total ice coverage. The lowest on record occurred in 2012 at 2.22% total ice coverage.

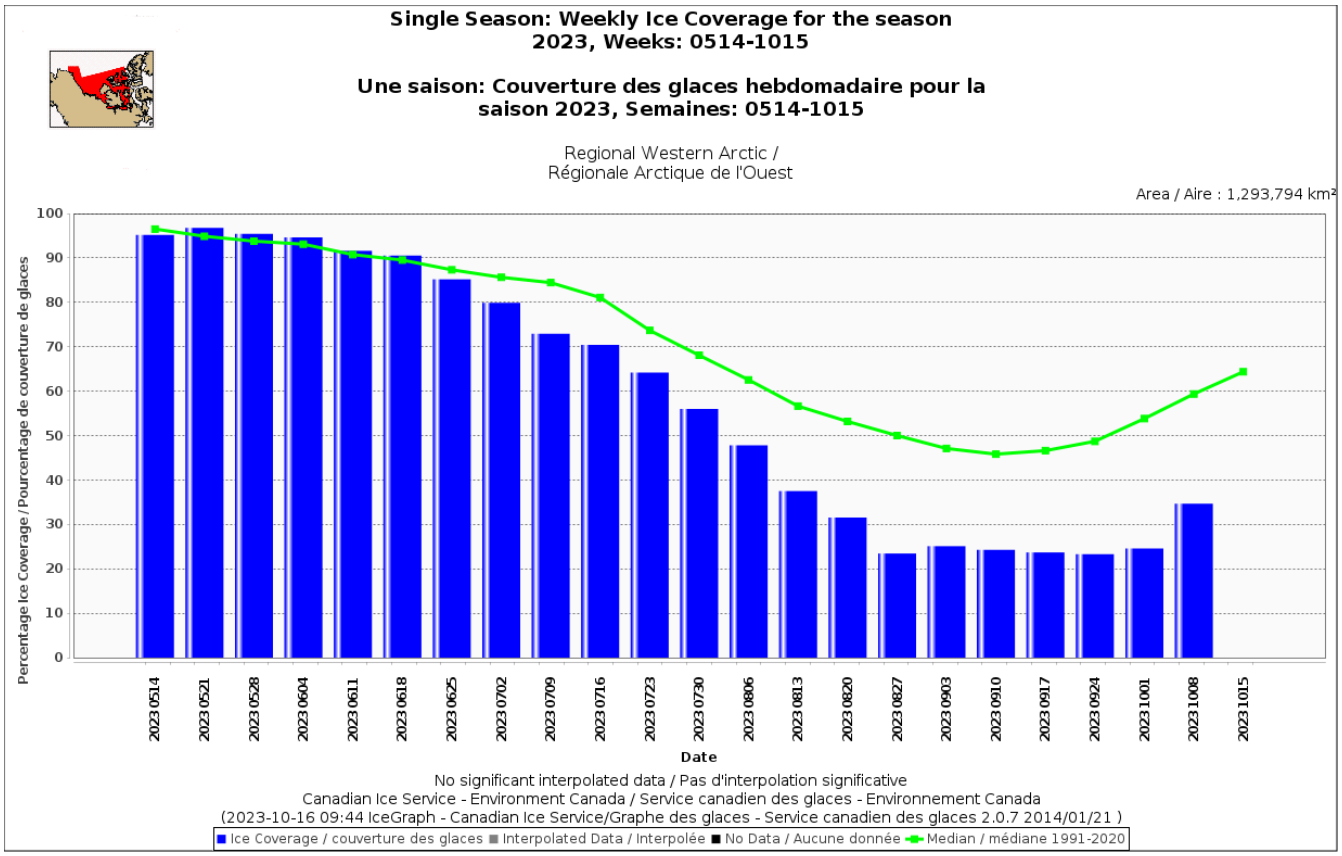


Figure 22 Weekly ice coverage for the Western Arctic area – 2023 Season

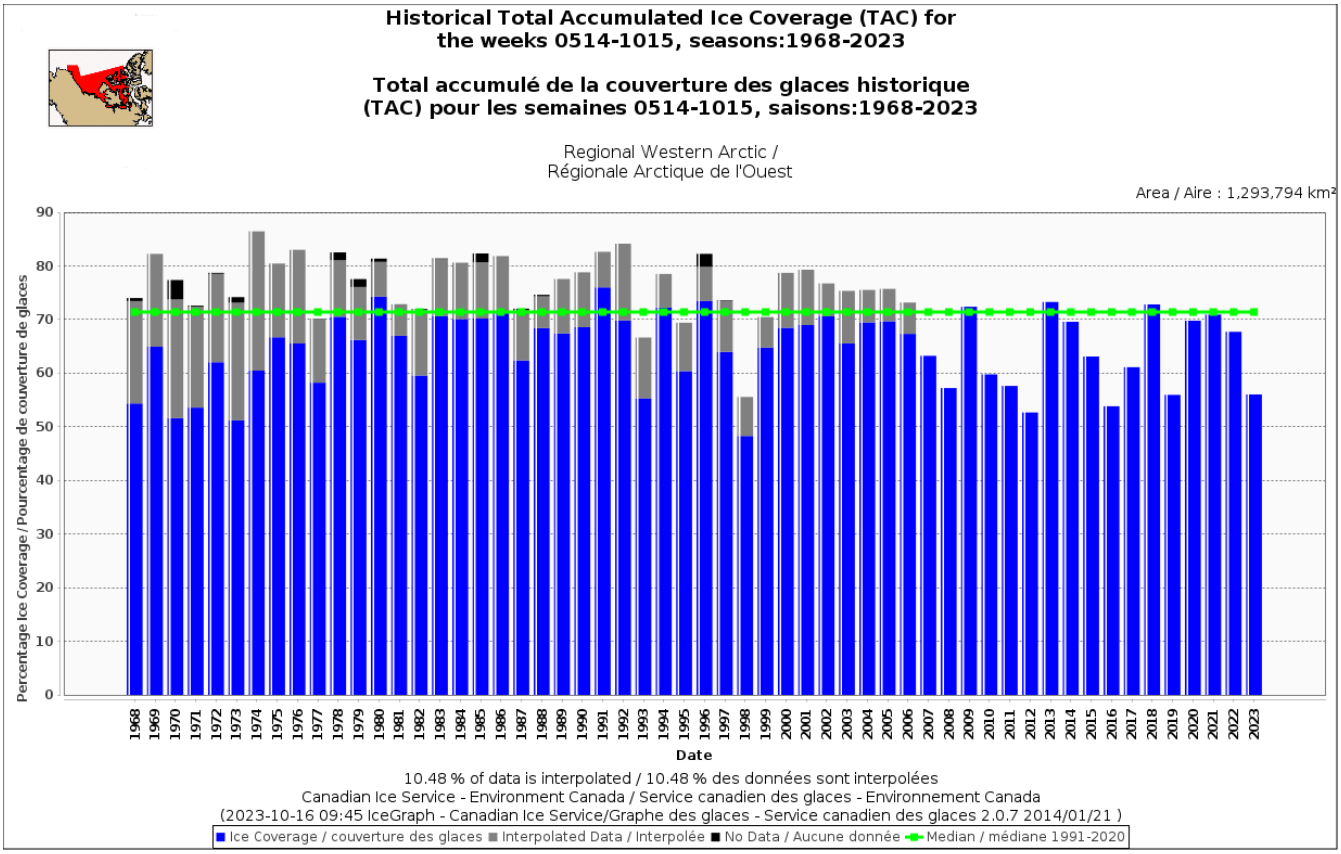


Figure 23 Historical total accumulated ice coverage for the Western Arctic area

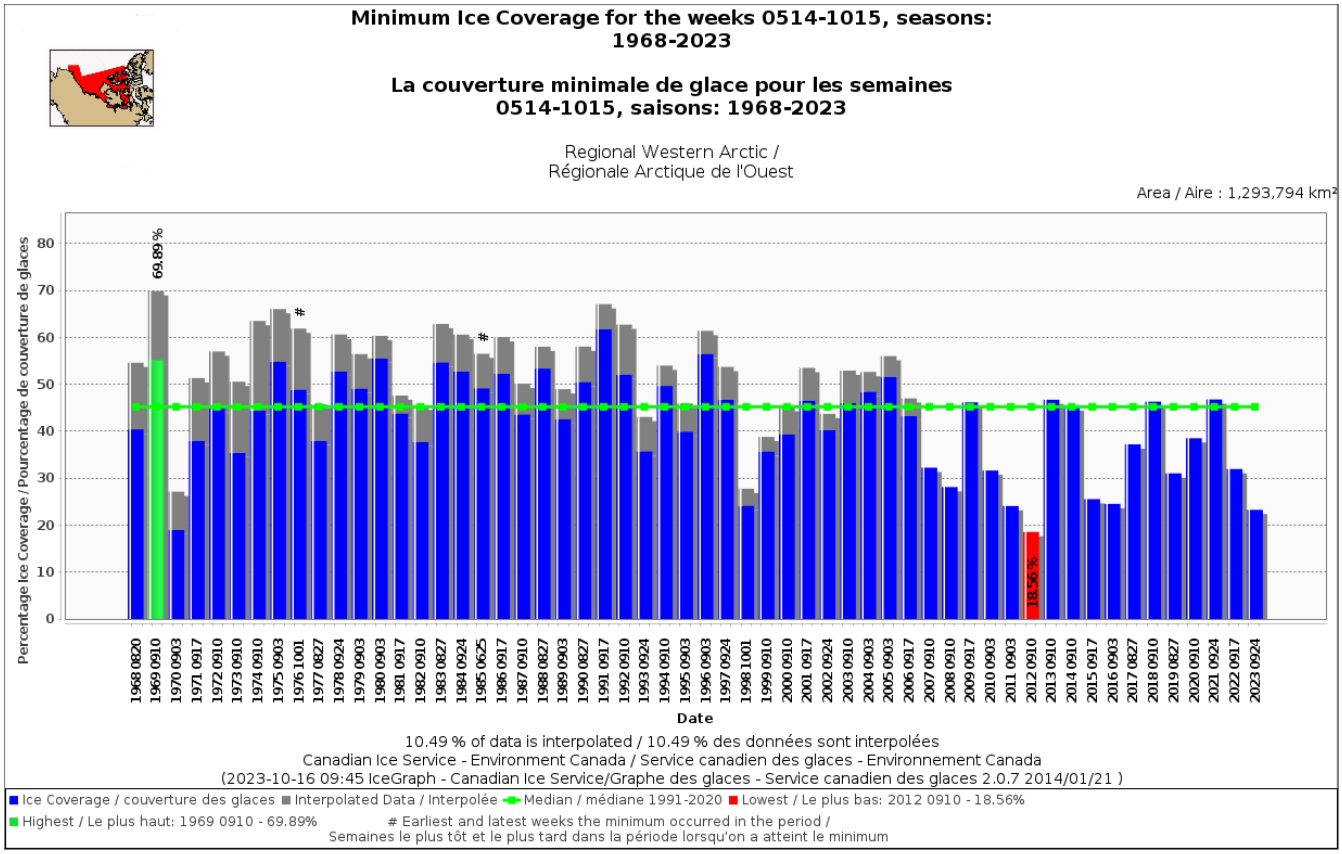
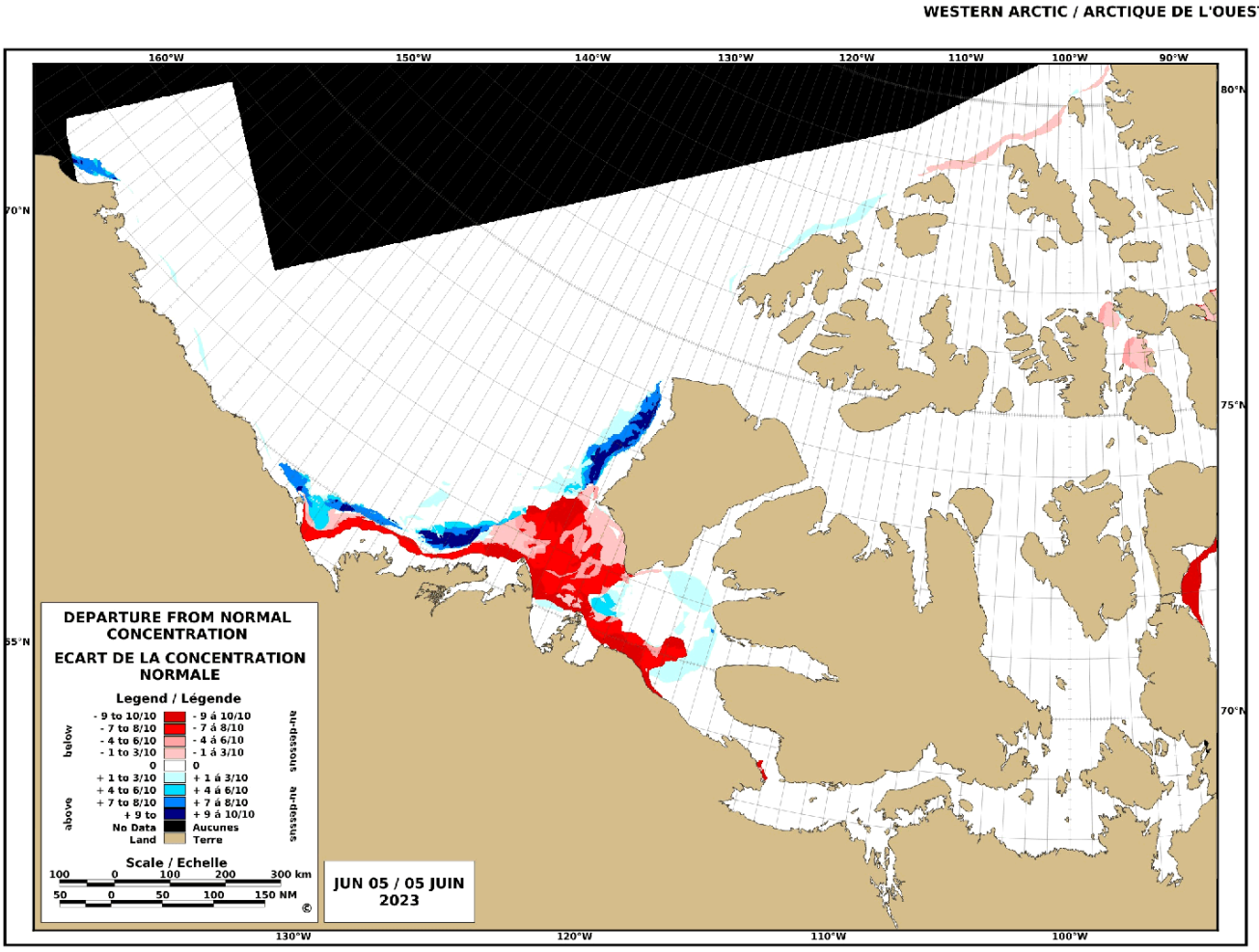


Figure 24 Historical minimum ice coverage for the Western Arctic area – 2023 Season

June Ice Conditions



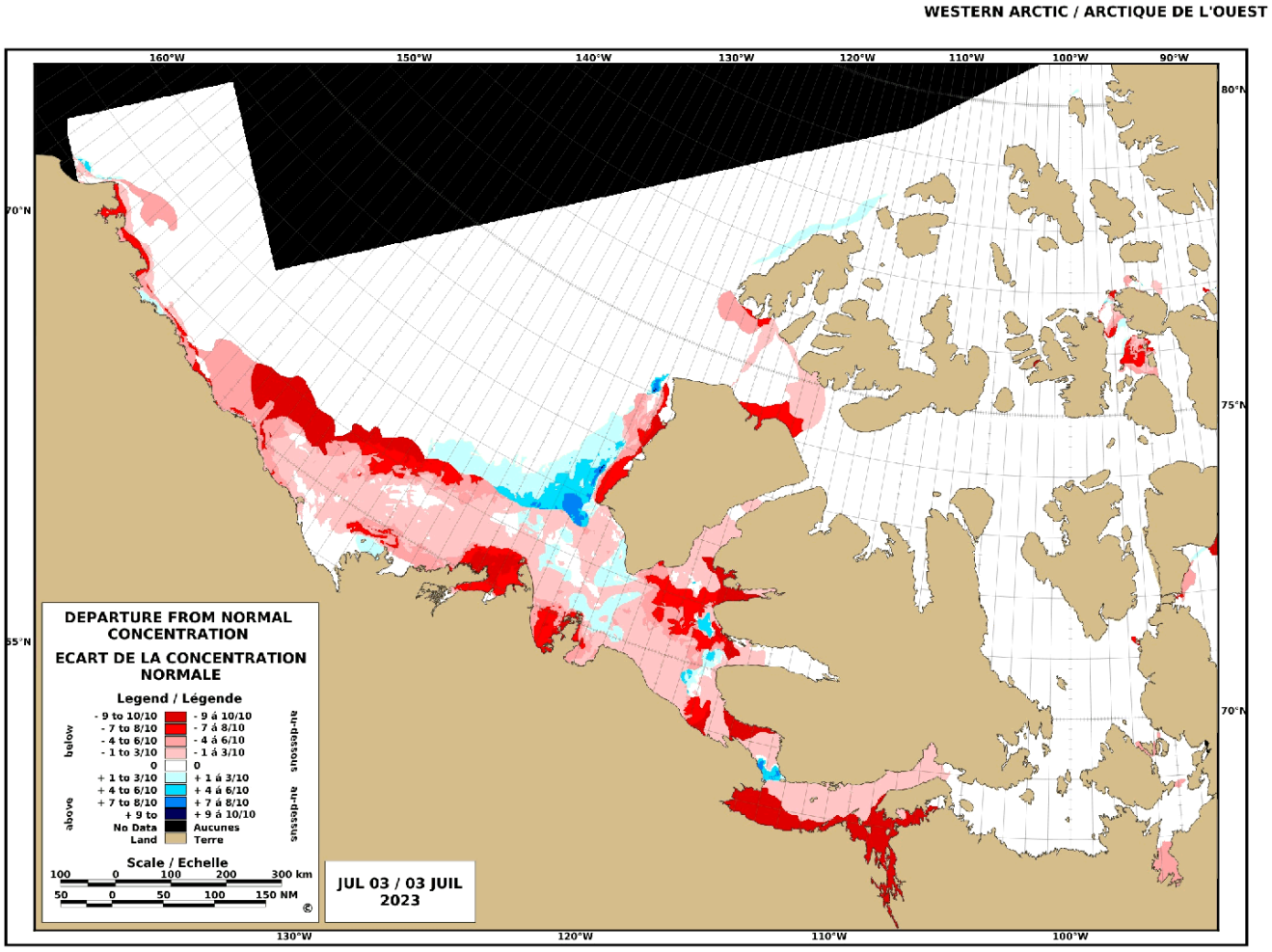
STATISTICS BASED UPON 1991-2020 (INTERPOLATED BETWEEN 15-MAY AND 11-JUN)
LES STATISTIQUES BASÉE SUR 1991-2020 (INTERPOLÉES ENTRE LE 15-MAI ET LE 11-JUIN)

Figure 25 Departure from normal ice concentrations for the Western Arctic area – beginning of June 2023

In the last week of May, the fasted thick first-year ice in the Amundsen Gulf began to fracture. By the first week of June, the fast ice had fractured up to the entrance of Dolphin and Union Strait. In the last 2 weeks of June, the ice pack in the Amundsen Gulf deteriorated to open drift thick first-year ice. Along the Yukon coast and near the Tuktoyaktuk Peninsula, the Beaufort Sea ice pack was subjected to SE winds and warmer than normal temperatures, resulting in the ice pack shifting further north and west, and by the end of the month the very close pack thick first-year ice was roughly just north of 71N. In between the Beaufort Sea ice pack and the coast, the ice was very open drift thick first-year ice.

Further east, in the last two weeks of June the fast ice in Coronation Gulf and Bathurst Inlet began to fracture. Ice fracturing in these areas was roughly 2 weeks ahead of normal.

July Ice Conditions



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

Figure 26 Departure from normal ice concentrations for the Western Arctic area – beginning of July.

In the beginning of July, very open drift thick first-year ice in Coronation Gulf and Amundsen Gulf rapidly melted, leaving an area of open water for these regions by the second week of July. At the end of July, the waters between the Yukon Coast and Cambridge Bay were ice free.

Around the same time the fast thick first-year ice in the Queen Mauld Gulf, Victoria Strait, and St. Roch Basin began to fracture and rapidly melted 1-2 weeks ahead of normal. By the end of the month, the ice in these regions was reduced to very open drift thick first-year ice.

In Larsen Sound, fasted thick first-year ice began to fracture during the second week of July. By the end of the month, there was an area of open water on the eastern side of Larsen Sound, and the remaining ice to the west was very close pack thick first-year ice.

Further north in Parry Channel, at the beginning of July the fast thick first-year ice in McClure Strait began to fracture. Along the northern shore of Victoria Island, there was old ice mixed in

with the fasted thick first-year ice. In the second week of July, the old ice fractured along side most of the remaining thick first-year ice present through Parry channel. By the end of the month most of the northern Northwest Passage's fast ice had fractured into very close pack thick first-year or old ice and the mobile thick first-year and old ice in McClure Strait was very open drift.

In Prince of Wales Strait, the fasted thick first-year ice in the southern section began to fracture at the end of June. During the first week of July, the fast ice continued to fracture in the northern section where old ice was also present. Midway through the month, the thick-first year ice melted and mixed with the old ice that was previously confined to the northern section. By the end of the month, Prince of Wales Strait was reduced to open drift thick first-year and old ice.

In the western Beaufort Sea, very close pack thick first-year and old ice began to deteriorate at the end of July forming an area of open drift thick first-year and old ice in the waters north of Point Barrow.

August Ice Conditions

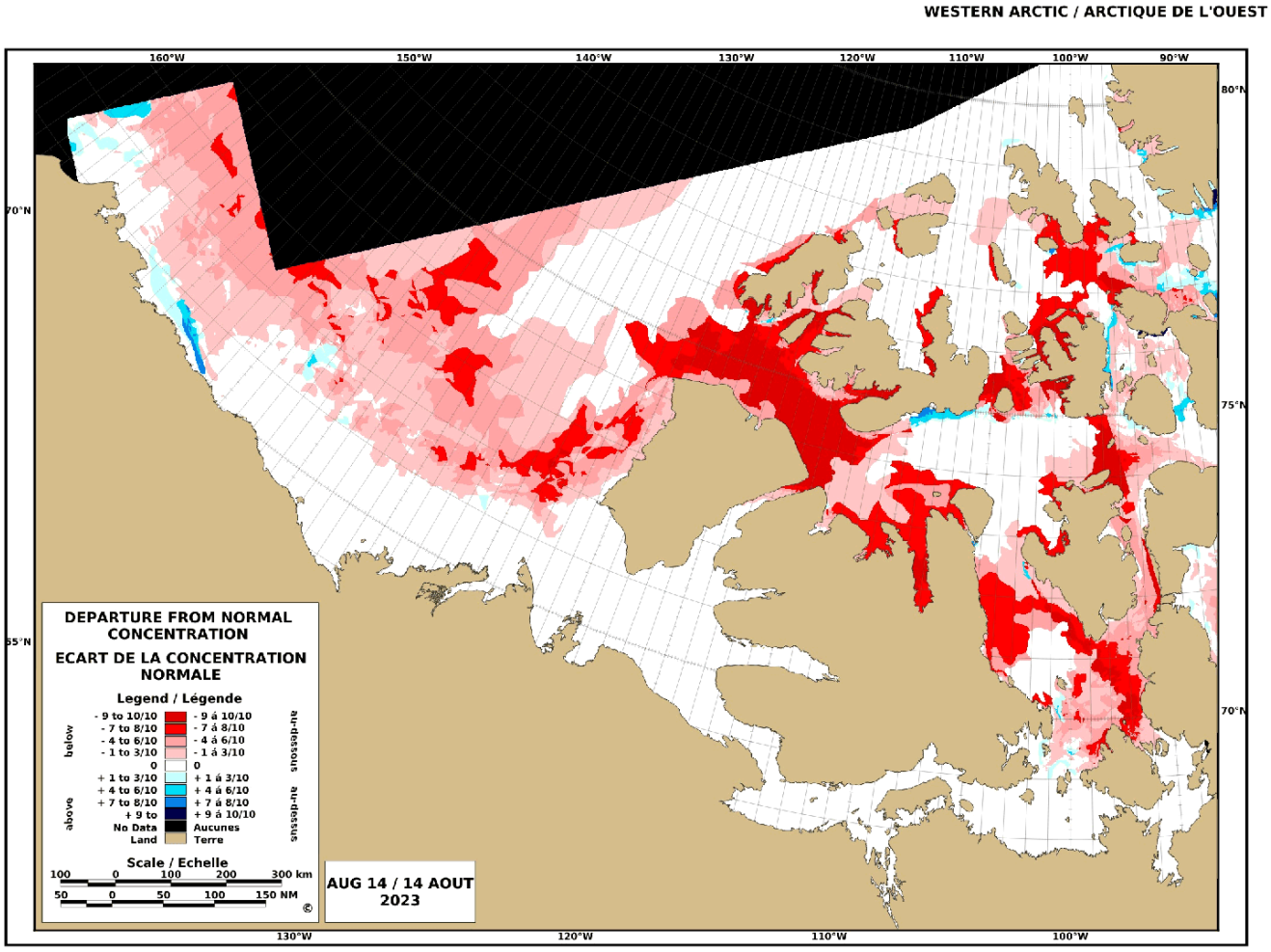


Figure 27 Departure from normal ice concentrations for the Western Arctic area – mid-August 2023

Most of the remaining fast ice in the Queen Elizabeth Islands fractured within the first two weeks of August. In eastern Sverdrup Basin and western Belcher Channel, the close to very close pack old and thick first-year ice was reduced to open drift old ice by the end of the month. Meanwhile, the rest of the ice pack surrounding the Queen Elizabeth Islands for the most part remained close to very close pack old and thick first-year ice for the rest of August.

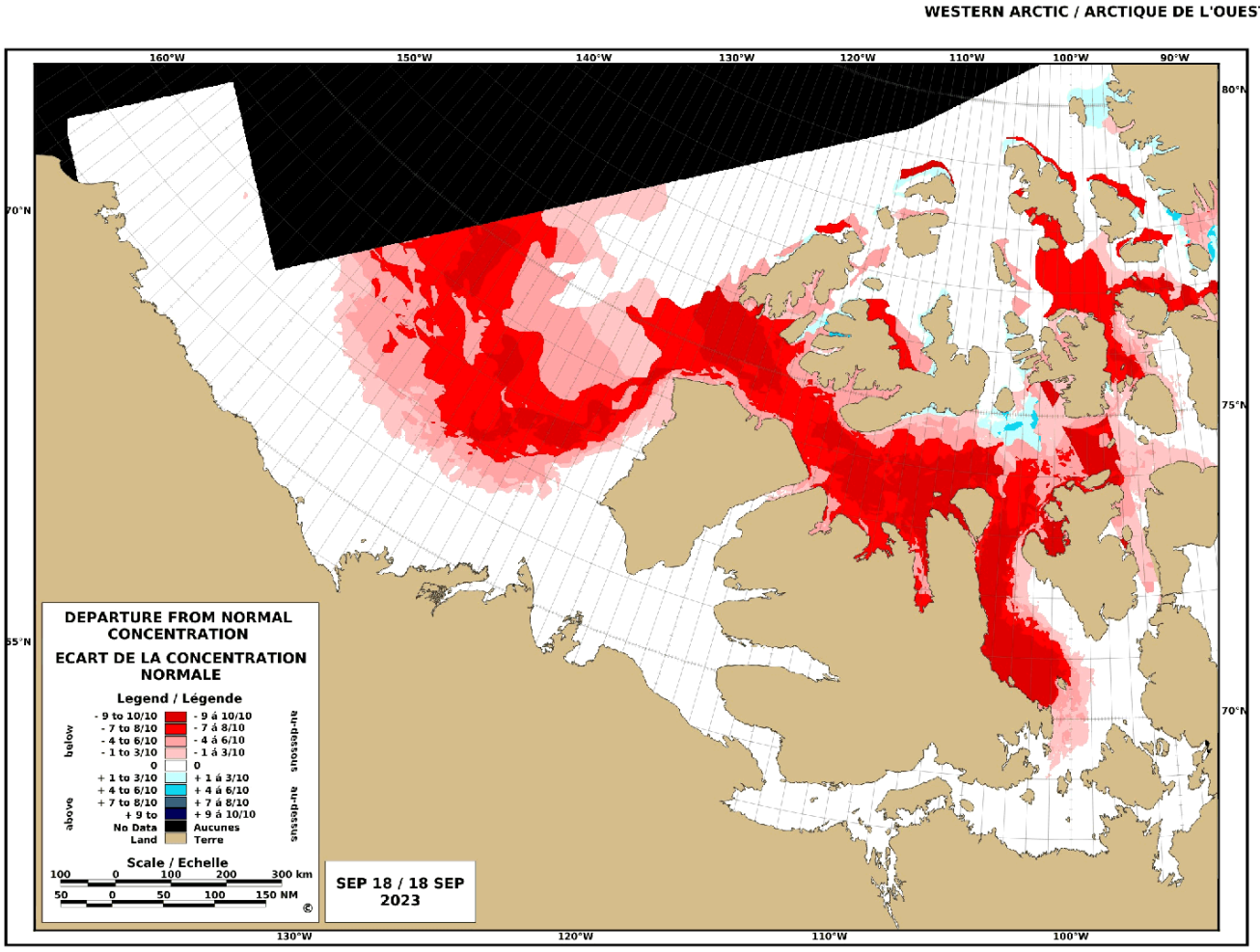
In McClure Strait, very open to open drift thick first-year ice including a trace of old ice conditions continued for the month of August.

Further east, near McClintock channel, Larsen Sound, and the rest of Parry channel, close to very close pack thick first-year including a trace of old ice melted throughout the month of August. By the third week of August, the ice pack was reduced to open drift thick first-year ice including a trace of old ice. By the end of the month, these regions were reduced to predominantly open water.

Peel Sound started with generally open drift thick first-year ice at the beginning of August, with very close pack thick first-year ice in the northern end. This ice rapidly melted by the second week of August roughly 2 weeks ahead of normal. By the end of the month, the region was ice free.

In the western Beaufort Sea, the area of open drift thick first-year and old ice north of Point Barrow expanded as ice continued to melt during the month of August. By the third week of August, the area was mostly open water with some very open drift old and thick first-year ice. Further east, most of the very close pack old ice began to melt at the beginning of the month. By the second week of August, the ice pack was reduced to open drift to close pack old ice. By the end of the month, the northwestern Beaufort Sea experienced a significant loss of old ice and was reduced to very open drift old ice.

September Ice Conditions



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

Figure 28 Departure from normal ice concentrations for the Western Arctic area – mid-September 2023

The western Beaufort Sea remained predominantly open water for the month of September. On the eastern end of the Beaufort Sea, the ice pack was predominantly open drift to close pack old ice for the first half of the month. During the last two weeks, new ice began to develop between the old ice floes.

In western Parry Channel, the area remained very open drift old ice throughout the month of September. New ice began to develop within the very open drift old ice by the end of the month.

The very open drift old ice that remained along the coast of Victoria Island in McClintock channel melted during the first two weeks of September. The very open drift old ice along the northern shore of Victoria Island and in the Prince of Wales strait melted as well during the first two weeks of September.

The remaining waters from the Alaskan Coast to Peel Sound, remained open water or ice free for September.

Notes:

TAC (Total Area Coverage): The "Total Accumulated Ice Coverage" (TAC) represents the average quantity of ice (ice coverage) over a geographical area for a specified time period. It is expressed as a fraction or percentage of the region with values ranging from 0 (no ice) to 100% (area (not volume) fully covered with ice over the entire time period). It is a good indication of average ice conditions during the winter and for year-to-year comparison of ice conditions.

NCEP/NCAR Reanalysis charts and Sea surface temperature anomalies *from The NOAA Physical Sciences Laboratory (PSL)*

All other charts and data are found at https://iceweb1.cis.ec.gc.ca/