Environment and Climate Change Canada | Environnement et Changement climatique Canada

Seasonal Summary

North American Arctic Waters

Summer 2018

By

Canadian Ice Service
Le service canadien des glaces

Canada

Summary over North American Arctic Waters

The early fracture of the southeastern Beaufort Sea, northern Baffin Bay and northwestern Hudson Bay sea ice led to slightly above normal ice melt during the first part of the 2018 season. However, ice melt in the rest of the Canadian Arctic saw delays of about 2 to 3 weeks and in some instances up to 6 weeks later than normal throughout the summer. In particular, areas in the northeastern Hudson Bay, eastern Foxe Basin, southwestern Baffin Bay and northwestern Davis Strait had ice that persisted longer than normal. Meanwhile, by the middle of August, the ice in the northeastern Beaufort Sea began to drift southwards into the western Amundsen Gulf and was close to the Cape Bathurst areas, which flipped from a less than normal regime to greater than normal ice condition. During the latter part of September, moderate to strong winds from the northwest caused a broad area of old ice to block the western entrance to Amundsen Gulf.

Old ice from the northern Canadian Archipelago began to flow into the Parry Channel in early September, which was unusual for that time of year.

Freeze up in the fall was near to slightly earlier than normal across much of the Canadian Arctic.

The minimum sea ice coverage near mid-September was below the median, similar to the minimum from 2013.

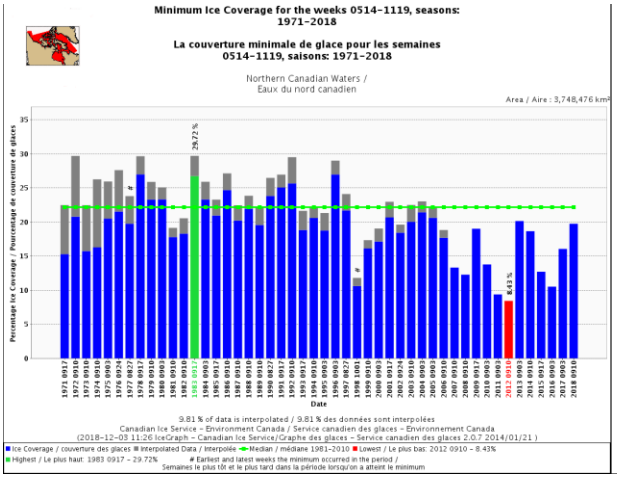

Figure 1: Minimum Ice coverage for Northern Canadian waters in 2018

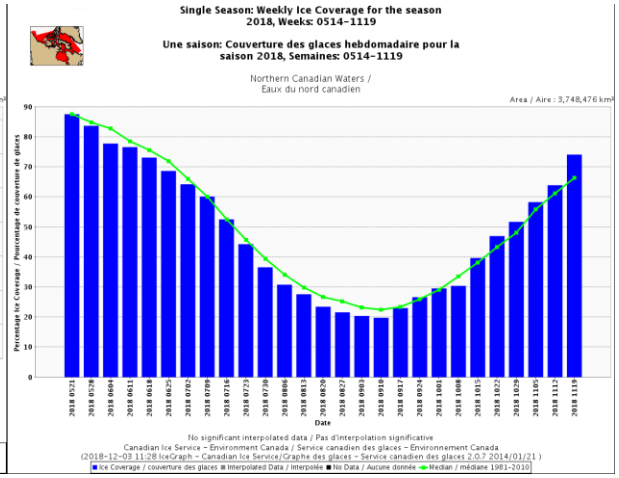

Figure 2: Weekly ice coverage for Northern Canadian waters in 2018

Hudson Bay and the Labrador Coast

Summer Ice Conditions and Fall Freeze-up

Summer Temperatures: June to September

Surface air temperatures were below normal over eastern Hudson Bay, Hudson Strait, northern Labrador Shore and southwestern Davis Strait. Elsewhere, near normal values prevailed (figure 3).

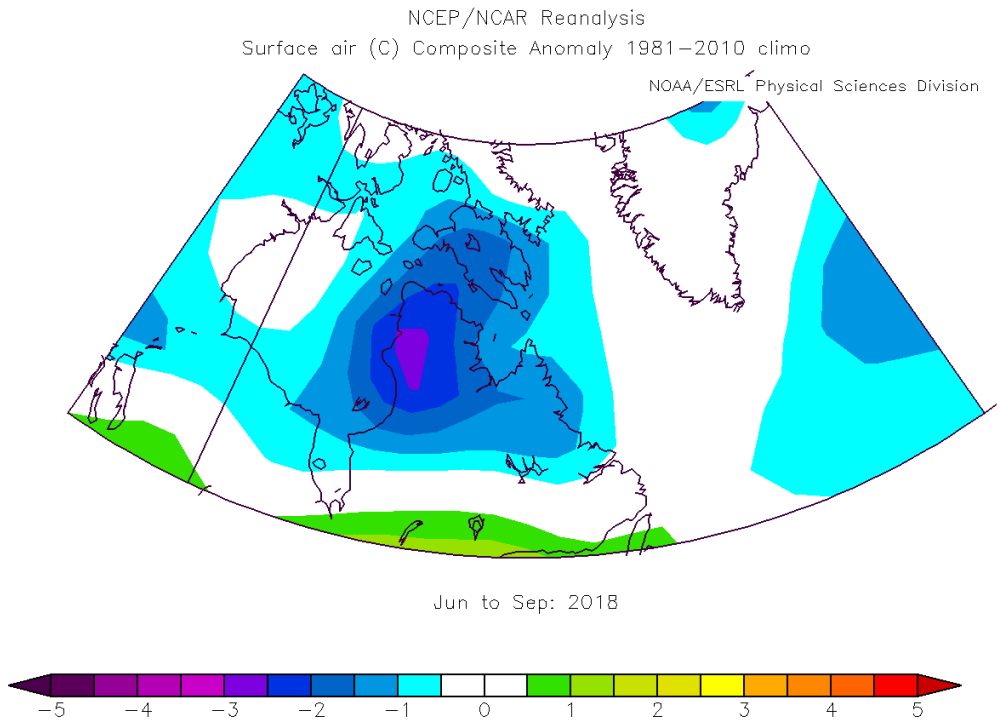

Figure 3: Air temperature anomaly for the Hudson Bay area from June to September

Summary of Ice Conditions:

At the start of June, northwestern Hudson Bay, parts of James Bay and southeastern Hudson Bay had mostly open water to looser ice coverage. Bergy water areas were present in northern Hudson Strait and southwestern Ungava Bay. Elsewhere over the region, close to very close pack ice conditions prevailed. In northwestern Hudson Bay, ice melt through the summer months was generally 1-2 weeks ahead of normal however the southwestern part of the Hudson Bay saw accelerated melt due to southwestern winds and warmer than normal temperatures.

Parts of Hudson Strait, Ungava Bay, Davis Strait and the Labrador region were seeing the ice melt 1-2 weeks later that normal.

By early August small areas of ice remained along the shore in northeastern Hudson Bay, the southeastern section of Hudson Bay, along the shore in southwestern Hudson Strait and in Ungava Bay. It is unusual to see ice in northeastern Hudson Bay and southwestern Hudson Strait at that time of year. Normally ice would have melted in northeastern Hudson Bay and southwestern Hudson Strait by the second week of July while ice in Ungava Bay would have melted by the last week of July. Hence, the northeastern shore of Hudson Bay as well as the shore of southwestern Hudson Strait observed a delay in ice melt of up to 6 weeks. As for the Davis Strait area, the ice melt was about 1 week later than normal. By the middle of September, the ice had completely melted over the entire region, which represented close to normal ice conditions.

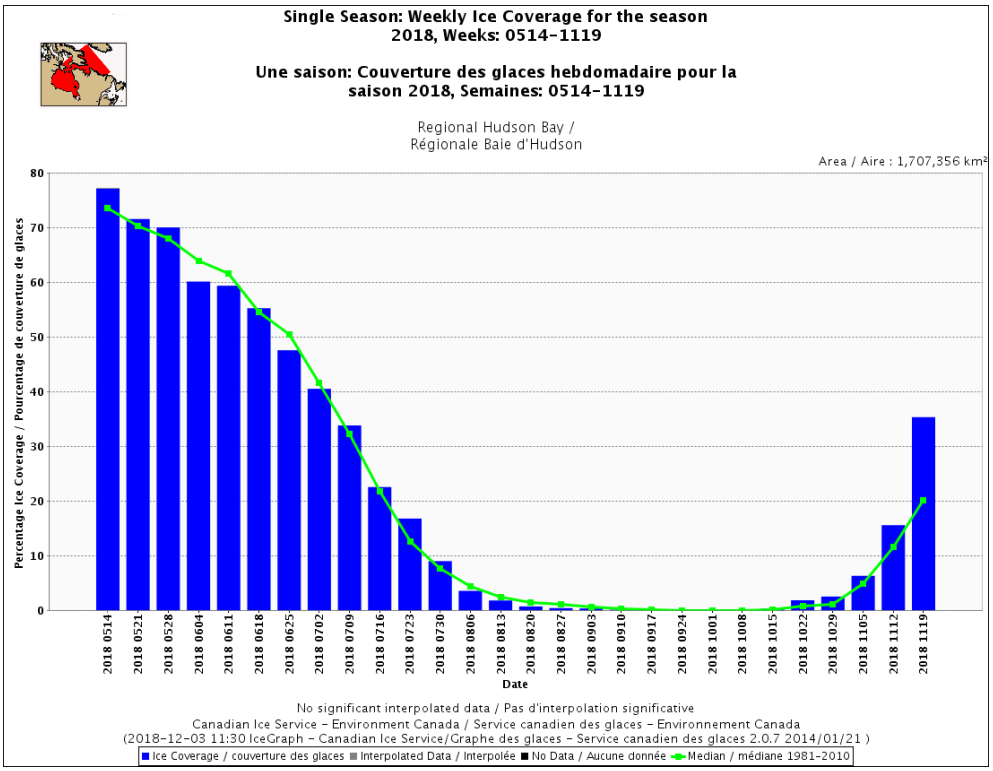

Figure 4: Weekly ice coverage for the Hudson Bay area for the 2018 season

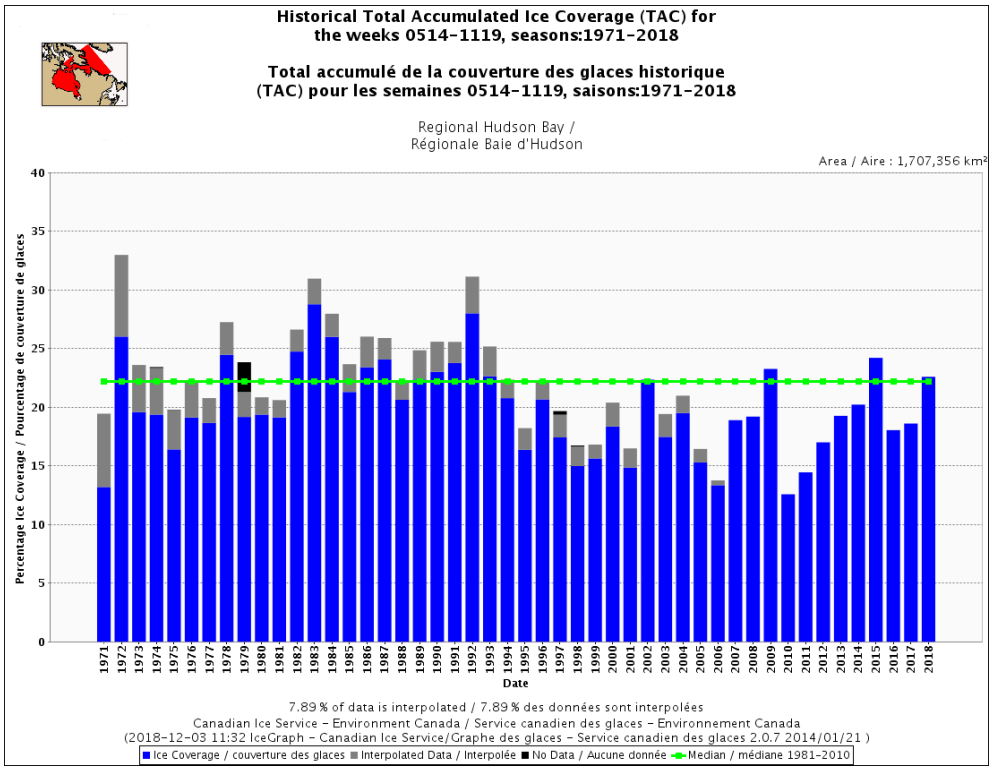

Figure 5: Historical Total Accumulated Ice Coverage for the Hudson Bay area

June Ice Conditions:

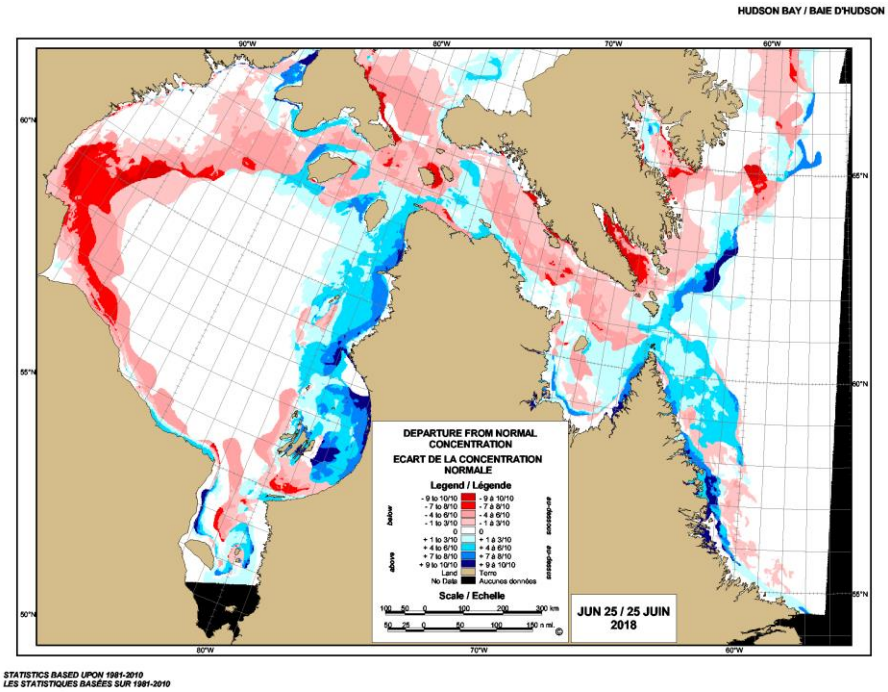

Figure 6: Departure from normal ice concentration for the Hudson Bay area near the end of June

At the beginning of June, the ice pack was within 70 to 140 nautical miles of the Labrador shore. Mostly open drift to close pack with some patches of very close pack first-year ice with a trace of old ice covered the areas. Patches of consolidated first-year ice were present along the shore. By the last week of June, most of the pack ice was north of Hopedale with only a narrow band of ice near the shore south of Hopedale to about Cartwright.

During the first week of June, the consolidated first-year ice in Lake Melville fractured completely. Soon after the middle of the month, the ice completely melted.

The ice in Davis Strait was within 140 nautical miles of the eastern shore of Baffin Island and was mostly very close pack first-year with up to 2 tenths old ice at the beginning of June. Looser ice conditions developed soon afterwards.

The consolidated first-year ice in northwestern Cumberland Sound began to fracture near the middle of June. Elsewhere, mostly bergy water with consolidated first-year ice along the shore.

Frobisher Bay had mostly bergy water with consolidated first-year ice along the shore and in the northwestern section during the month of June.

At the beginning of June, bergy water areas had already developed in northern Hudson Strait and parts of Ungava Bay. Very close pack first-year ice covered the rest of the Hudson Strait and Ungava Bay region. A trace of old ice started to drift into the eastern

entrance of Hudson Strait after the middle of June. Looser ice conditions developed in the pack ice in the southern part of Hudson Strait and most of Ungava Bay however, some bands of very close pack ice prevailed along the shore of southern Hudson Strait and in parts of Ungava Bay at the end of June.

The northwestern part of Hudson Bay already had a large area of open water at the beginning of June. Very close pack first-year ice covered the rest of the bay. At the same time, James Bay also had significant open water areas. Looser ice conditions developed along the southwestern shore of Hudson Bay during the second week while the consolidated ice along the shore fractured soon after mid-month. By the end of the month, the northwestern part of Hudson Bay was mostly open water with some consolidated first-year ice still present along the northwestern shore. The southwestern area also had large areas of close pack first-year ice with a narrow band of open water along the shore. Meanwhile, James Bay was open water along the southern and eastern shores with looser ice in the remainder of the bay.

The ice in the western and southwestern part of Hudson Bay melted faster than normal while the eastern shore of Hudson Bay melted at a slower rate. For the most part cooler than normal temperatures caused a significant slowdown in ice melt over the eastern part of Hudson Bay and southern Hudson Strait as well as the Labrador shore.

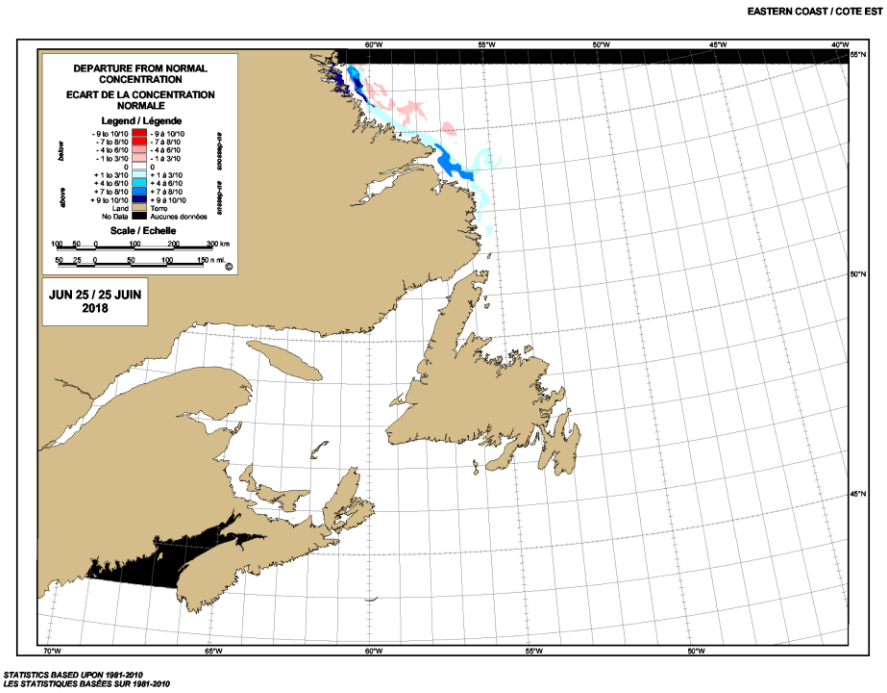

Figure 7: Departure from normal ice concentration for the east coast near the end of June

July Ice Conditions:

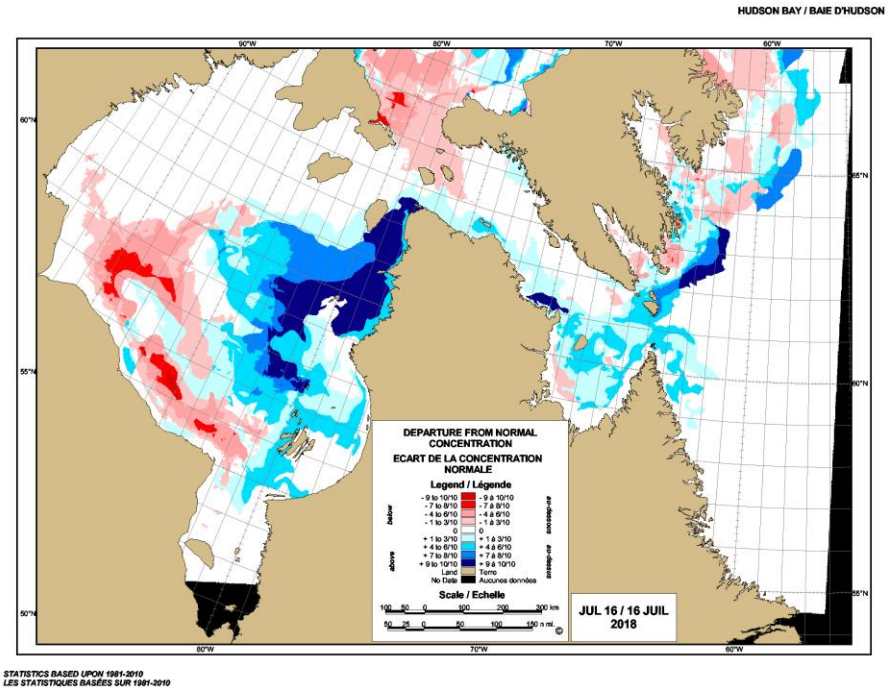

Figure 8: Departure from normal ice concentration for the Hudson Bay area near mid-July

At the beginning of July, the southern ice edge along the Labrador shore was located north of Hopedale. Loose pack first-year ice with a trace of old ice extended about 110 nautical miles from the shore, mostly in the northern section. By mid-month, the leading ice edge had retreaded north of Saglek along the northern Labrador shore. By the end of July, all ice had melted.

In Davis Strait, ice remained within 60 to 140 nautical miles of the eastern shore of Baffin Island during the entire month of July. Ice concentration continued to decrease however, some patches of very close pack first-year with up to 2 tenths old ice remained embedded in the pack ice during the month.

In Cumberland Sound, all of the consolidated first-year ice along the shore had fractured by the end of the first week of July. Mainly bergy water prevailed in the sound after mid-July. However, occasional areas of first-year ice with up to 1 tenth old ice entered the sound from Davis Strait during the month.

The consolidated first-year ice in Frobisher Bay fractured completely early in the second week of July. Mostly bergy water prevailed in the remainder of the bay however occasional areas of first-year ice with up to 1 tenth old ice entered the sound from Davis Strait during the month.

The consolidated first-year ice, mostly along the shore in the northwestern section of Hudson Strait, fractured during the second week of July. The area of bergy water in the

northern part of the strait continued to expand southwards. Very close pack first-year ice in the southern section of the strait decreased during the first half of the month. Areas of first-year ice with up to 1 tenth old ice were present in the eastern entrance to Hudson Strait throughout the month. By the end of July, mainly bergy water conditions prevailed with only a few patches of first-year ice along the northwestern shore of Quebec.

In Ungava Bay, very close pack first-year ice prevailed in the western section during the first half of July with looser ice or bergy water elsewhere in the bay. By the end of the month, mainly bergy water conditions persisted with very open drift first-year ice in the southwestern section of the bay.

The open water in the northwestern part of Hudson Bay continued to expand southeastwards during the month. The consolidated ice along the northwestern shore fractured before the end of the second week of July. The very close pack first-year ice became looser during the month in the central part of the bay with only a few patches of very close pack first-year ice by the end of July, especially along the northeastern shore of Quebec.

James Bay continued to clear from south to north during the month. By the last week of July, the bay was open water to ice free.

The ice melt was slower than normal over the northern region of the Labrador shore as well as the central and northeastern part of Hudson Bay during the entire month of July. This was due to cooler than normal temperatures in the eastern part of Hudson Bay.

August Ice Conditions:

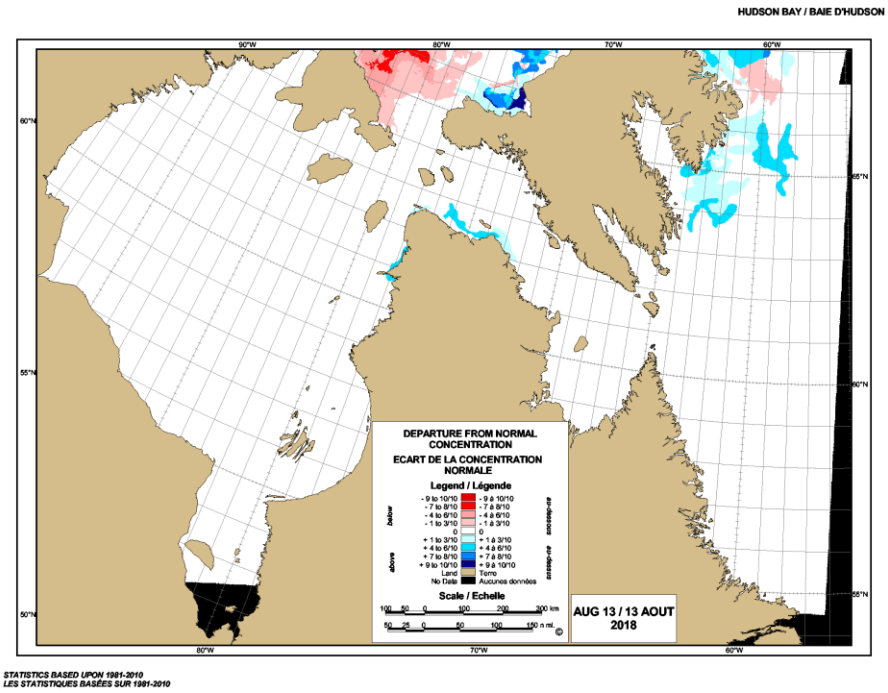

Figure 9: Departure from normal ice concentration for the Hudson Bay area near mid-August

The ice edge in Davis Strait continued to retreat northwards and was located near the entrance to Cumberland Sound at mid-August. Mostly open to very open drift first-year with up to 2 tenths old ice was within 120 miles of the eastern Baffin Island shore. By the end of the third week of August, all the ice was located north of Cape Dyer and by the end of the month, all the ice had melted.

Hudson Strait had mostly bergy water except for patches of close to very close pack first-year ice along the in the southwestern part of the strait. The ice originated from northeastern Hudson Bay and was push eastwards along the shore due to persistent western and northwesterly winds. Eventually all the ice melted by the end of the third week of August.

In Hudson Bay, the ice in the south-central part of the bay melted during the second week of August. Only the northeastern shore of Hudson Bay had any ice left in the area. Eventually the last of the ice melted during the last week of August.

Overall, the ice melt was slower than normal during the month due to cooler than normal temperatures in August. Northwesterly winds, mostly over the northeastern Hudson Bay area, also contributed to the slower than normal ice melt. The delays in Davis Strait, northeastern Hudson Bay and southwestern Hudson Strait were around 1 to 2 weeks later than normal with up to 6 weeks, especially in the northeastern Hudson Bay area, based on the 1981-2010 CIS ice climatology.

September Ice Conditions:

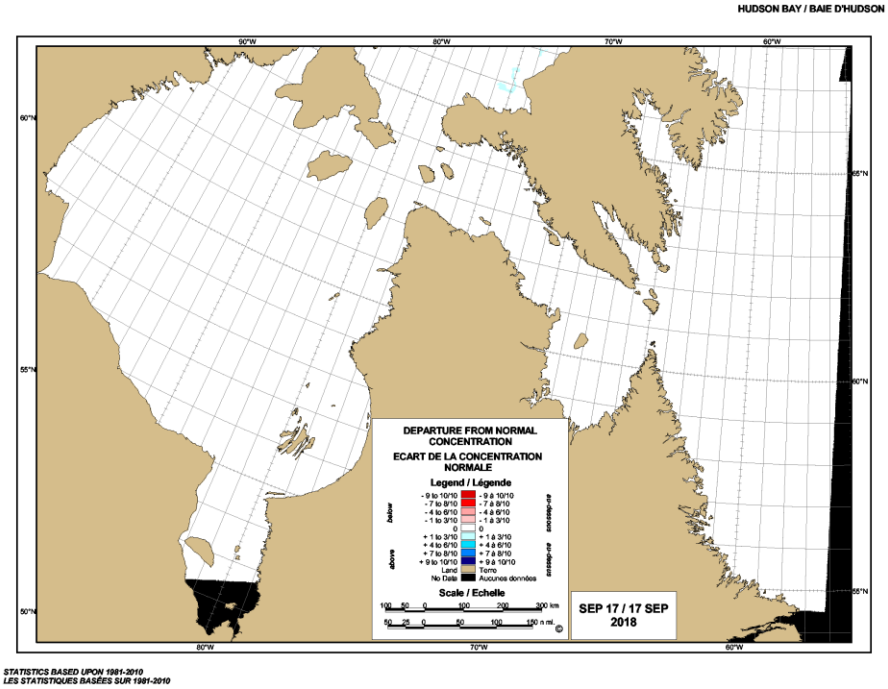

Figure 10: Departure from normal ice concentration for the Hudson Bay area near mid-September

Over most of the region, ice free or bergy water conditions prevailed during the month of September.

Eastern Arctic and Canadian Archipelago

Summer Ice Conditions and Fall Freeze-up

Summer Temperatures: June to September

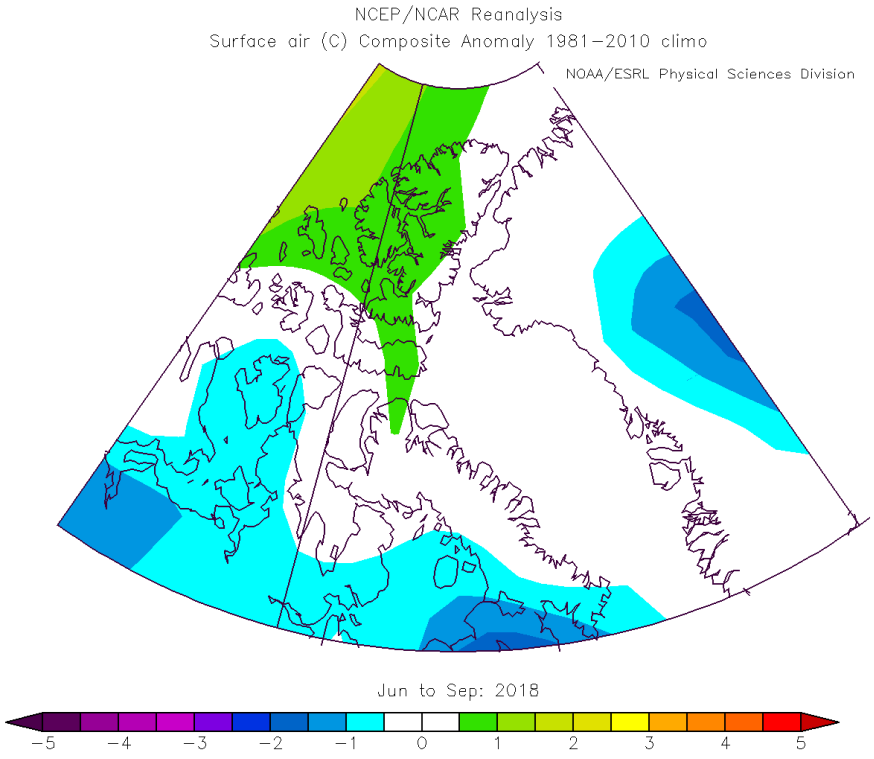

Figure 11: Air temperature anomaly for the Eastern Arctic area from June to September

From June to September, surface air temperatures were near normal over most locations except over the Ellesmere Island area where above normal temperatures prevailed.

Summary of Ice Conditions:

At the beginning of June, the ice melt in northern Baffin Bay had already started and conditions were mainly bergy water at that time. Ice conditions in central and southern Baffin Bay were very close pack first-year ice with up to a tenth of old ice. In the archipelago, ice remained consolidated. Lancaster Sound saw an early breakup and melt of sea ice. However, by mid-summer ice from Barrow Strait invaded Lancaster Sound and maintained higher than normal ice concentrations for most of the season. Foxe Basin saw a slightly earlier than normal ice melt in the northwestern section of the region. At the end of the melt season, ice remained in the waterways of Nares Strait, in southern Prince Regent Inlet, Gulf of Boothia and Committee Bay, and patches of ice lingered around the Cumberland Peninsula and Home Bay along the eastern shore of Baffin Island as well as the eastern side of Foxe Basin. Ice melt remained 1-2 weeks

ahead of normal with full ice melt by early September with the exception of some ice that drifted in from Fury and Hecla Strait.

Through the summer season, the eastern arctic ice melt was roughly 2 weeks ahead of the climate normal. However, there were a few areas where the ice melt was lagging climatology. In particular, the area along the central shore of Baffin Island as well as Lancaster Sound, Barrow Strait and Foxe Basin. The overall minimum ice coverage was slightly lower than the climate normal.

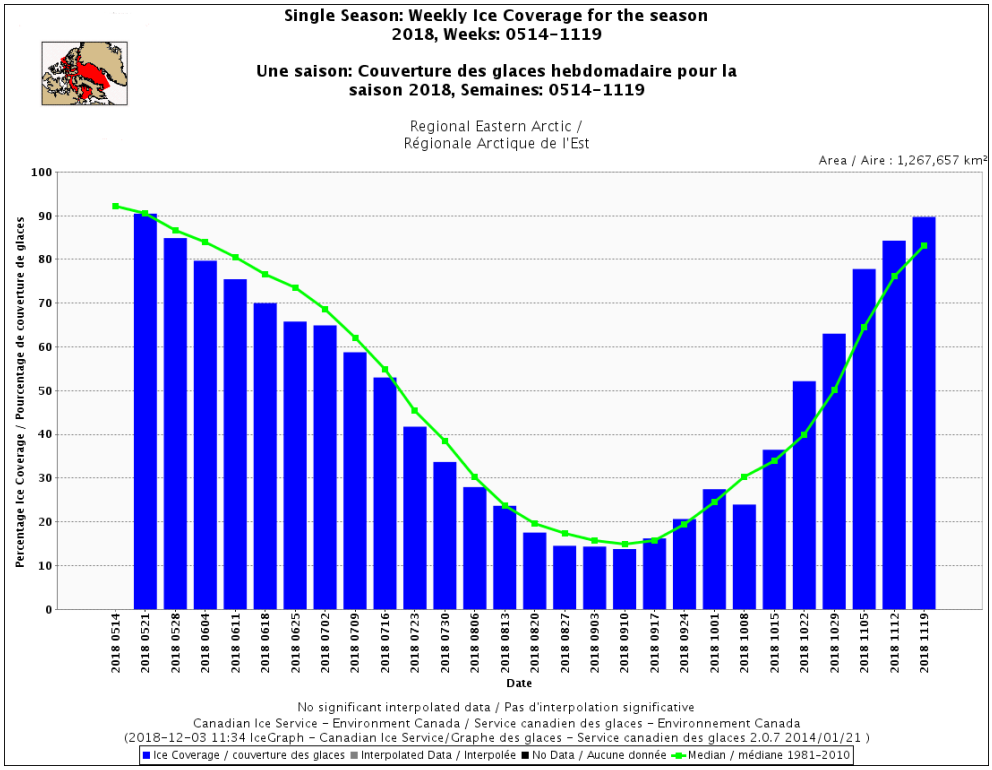

Figure 12: Weekly ice coverage for the Eastern Arctic area for the 2018 season

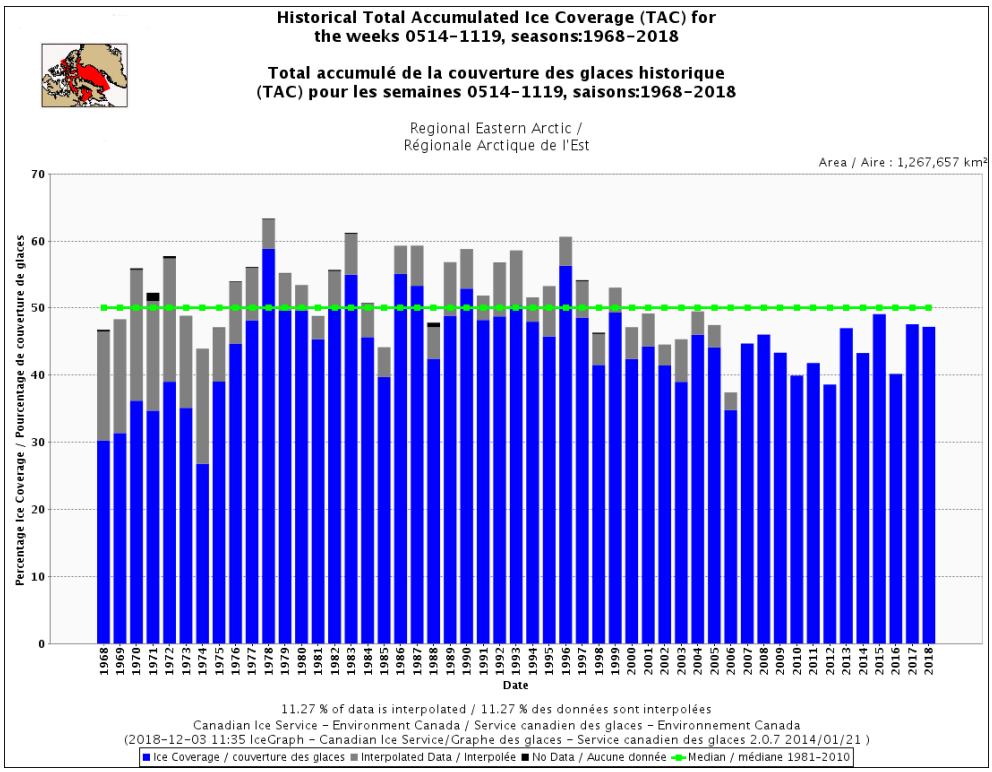

Figure 13: Historical Total Accumulated Ice Coverage for Eastern Arctic area

June Ice Conditions:

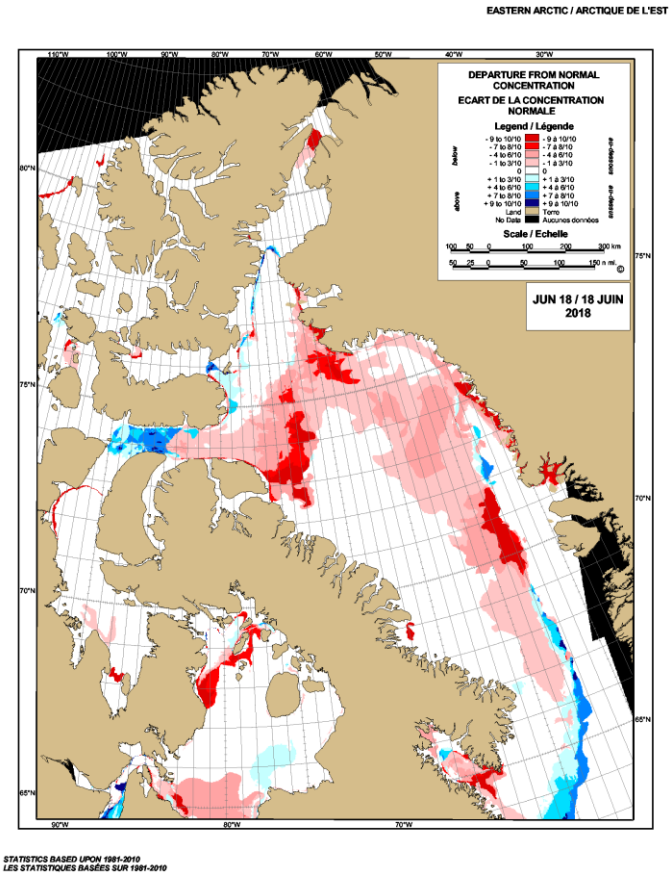

Figure 14: Departure from normal ice concentration for the Eastern Arctic area near mid-June

At the beginning of June, the bergy water area along the central Greenland shore extended northward, just south of Melville Bay. Bergy water continued to extend northwards along the Greenland shore during the month and reached the southeastern portion of Melville Bay by the end of the month. The very close pack first-year ice in eastern Baffin Bay became looser.

The extreme northwestern Baffin Bay already had mostly bergy water at the beginning of the month, and continued to expand southwards during the month to reach an areas just east of Bylot Island by the end of June. The areas southeast of Bylot Island in western Baffin Bay was mostly very close pack first-year ice with up to 3 tenths old ice during the month.

In eastern Lancaster Sound, bergy water with areas of very open drift first-year ice including a trace of old ice prevailed during the first half of June while the rest of the sound remained consolidated with first-year ice and a trace of old ice. During the third week, the consolidated ice in central Lancaster Sound fractured and by the end of June, the remainder of the consolidated ice in the sound fractured. Barrow Strait remained

consolidated first-year ice with a trace of old ice until the last few days of the month where the eastern section fractured.

During the first half of June, consolidated first-year ice with areas of 1 tenth old ice covered the northern portion of Prince Regent Inlet while the southern portion had very close pack first-year ice with areas of 1 tenth old ice. By the end of the third week, the consolidated ice fractured in the northern section of the inlet. By the end of June, close to very close pack first-year ice with up to 1 tenth old ice covered most of the inlet with some areas of bergy water to very open drift first-year ice with up to 1 tenth old ice in the southwestern section and in the extreme northwestern section.

The Gulf of Boothia remained very close pack first-year ice with areas of up to 1 tenth old ice during the entire month of June. Consolidated first-year ice remained intact along the shore.

Fury and Hecla Strait remained consolidated with first-year ice with a trace of old ice during the entire month.

In Foxe Basin, open water areas with looser first-year ice conditions had already started to develop in the northwestern and southwestern sections. Looser conditions continued to expand northeastwards in the southwestern section of the basin during the month of June while the open water area in the northwestern section remained unchanged. The rest of the basin had close to very close pack first-year ice during the entire month.

Most of Jones Sound, Norwegian Bay and Eureka Sound remained consolidated first-year and old ice during the month of June. The exception was the Cardigan Strait and Hell Gate area where open water to some areas of first-year and old ice prevailed.

Overall, ice melt was faster than normal over large portions of Baffin Bay and portions of Foxe Basin. Meanwhile Lancaster Sound saw slower than normal ice melt. The amount of old ice was also slightly greater than normal in most of the Canadian Arctic Archipelago as well as portions of Baffin Bay at the end of June.

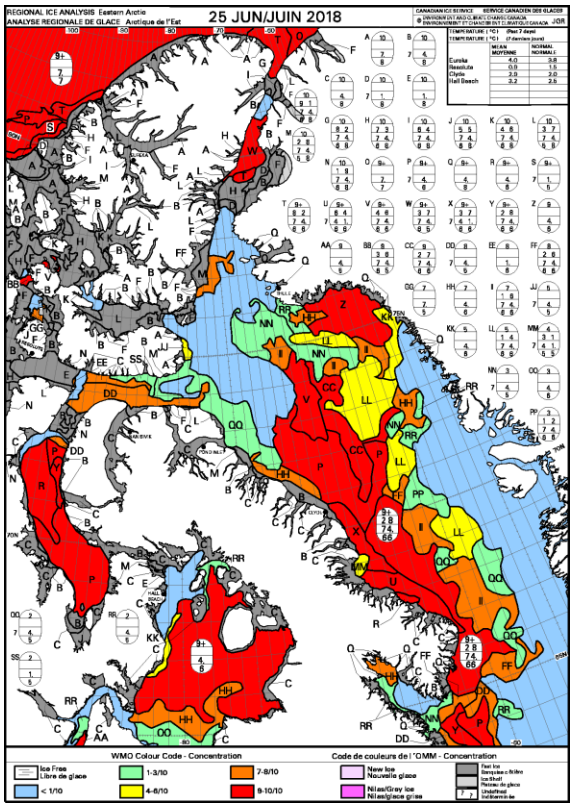

Figure 15: Eastern Regional ice chart near the end of June 2018

July Ice Conditions:

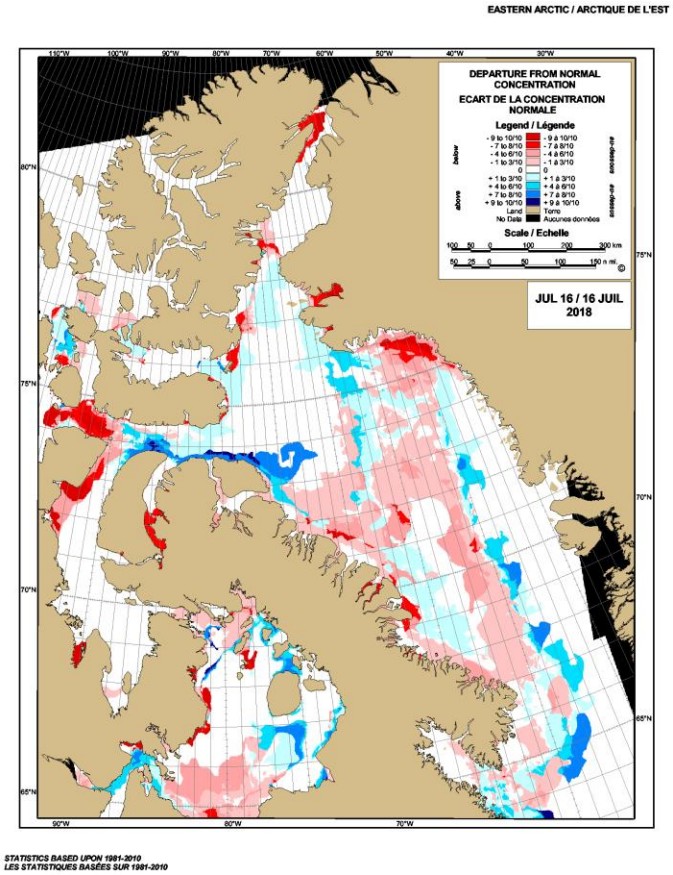

Figure 16: Departure from normal ice concentration for the Eastern Arctic area near mid-July

Bergy water along the western shore of Greenland continued to extend northwards and expand westward during the month of July. Elsewhere in central Baffin Bay, open drift to close pack first-year ice with areas of up to 4 tenths old ice prevailed. During the third week, a bergy water route across the northern portion of Baffin Bay began to emerge. Meanwhile, the northwestern Baffin Bay area continued to have mostly bergy water with occasional patches of close pack first-year and old ice originating from the Nares Strait area during the entire month. Overall the ice in the southwestern part of Baffin Bay continued to loosen so that by end of July bergy water with areas of very open to open drift first-year and old ice prevailed, mostly along the shore.

The consolidated first-year ice in Navy Board and Pond Inlets started to fracture during the second week. By the end of the third week, most of the consolidated ice had fractured. Mostly open to very open drift first-year ice with patches of very close pack ice prevailed at the end of July. Up to 2 tenths old ice was observed in the northern portion of Navy Board.

The consolidated first-year ice in Admiralty Inlet began to fracture in the extreme northern and southern sections during the first week of July. At the end of the third week, all the consolidated ice had fractured. Bergy water with bands of very close pack first-year ice covered the sound at the end of the month.

Lancaster Sound and eastern Barrow Strait saw a gradual decrease in ice concentration during the month. However the fracturing of the consolidated first-year and old ice in western Barrow Strait area, during the third week of July, caused an increased in ice concentration, mostly in the western section of Lancaster Sound.

The western section of Prince Regent Inlet became bergy water during the first three weeks of July however the last week saw an influx of first-year and old ice from Lancaster Sound into the northwestern part of the inlet. The eastern part of the sound, covered with very close pack first-year ice with a trace of old ice, began to loosen during the last week of the month.

The Gulf of Boothia remained covered with first-year ice including a trace of old ice however, signs of loosening appeared during the last week of July. Some of the consolidated ice began to fracture during the first week. By the end of the third week, most of the consolidated ice had fractured. Open water developed in Pelly Bay during the second week.

The consolidated first-year ice with a trace of old ice Fury and Hecla Strait fractured during the second week of July. By the end of the month, bergy water with areas of open drift first-year ice with a trace of old ice, mostly in the southern section, prevailed.

In Foxe Basin, ice concentrations continued to decrease during the entire month however, the eastern side of the basin continued to have areas of very close pack first-year ice by the end of July.

The consolidated first-year ice with up to 3 tenths old ice in Jones Sound began to fracture during the month. The last of the consolidated ice fractured by the last week of July.

The southern part of Norwegian Bay and parts of Eureka Sound began to fracture during the second week of July.

At the end of July, Baffin Bay and Foxe Basin had a mix of earlier and later than normal ice melt. Meanwhile most of Prince Regent Inlet and the Gulf of Boothia had earlier than normal clearing. Later than normal melting was observed in Lancaster Sound and parts of Navy Board and Pond Inlets. Again, the amount of old ice remained slightly great than normal in most of the Canadian Arctic Archipelago, Barrow Strait and Lancaster Sound as well as portions of Baffin Bay at the end of July.

August Ice Conditions:

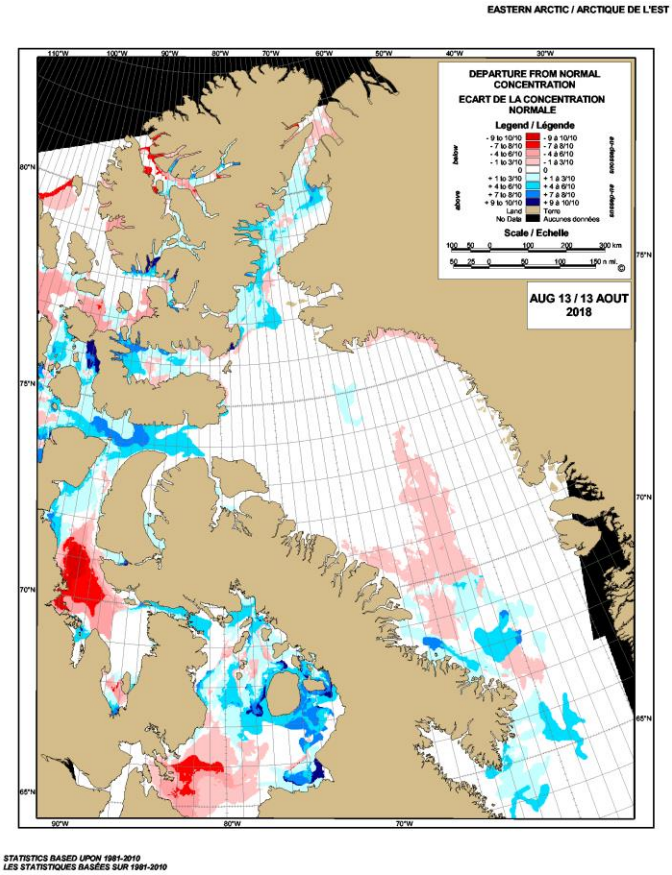

Figure 17: Departure from normal ice concentration for the Eastern Arctic area near mid-August

In Baffin Bay, the ice continued to decrease in concentration and extent. By the end of the first week of August, only a few large area of very open drift old ice were present in the northern part of the bay. Meanwhile, the southwestern section of Baffin Bay, near Baffin Island, had generally open to very open drift first-year and old ice. By the last week, mainly bergy water conditions prevailed over the bay with occasional patches of close pack old ice in the extreme northwestern section as ice from Nares Strait drifted southwards into the area.

Navy Board and Pond Inlets finally became bergy water during the third week of August.

The ice in Admiralty Inlet continued to decrease and finally melted during the third week of August however, old ice from Lancaster Sound started to drift into the northern portion of the sound.

Prince Regent Inlet had very open drift to open drift first-year and old ice during the first half of August however, some areas of bergy water developed during the last two weeks of August.

The area of very close pack first-year with a trace of old ice continued to shrink and was sequestered to the Committee Bay area of the Gulf of Boothia region by the end of August. Large areas of bergy water developed in most of the Gulf of Boothia however, some areas of very open drift first-year ice with a trace of old ice persisted in the western and southwestern sections.

Fury and Hecla Strait continued to have open to very open drift first-year ice with a trace of old ice throughout the month of August.

Ice in Foxe Basin continued to decrease during the month however the eastern portion of the basin had areas of open drift to very close pack first-year ice at the end of August. Areas of first-year ice with a trace of old ice from Fury and Hecla Strait drifted into the extreme northwestern part of Foxe Basin during the entire month.

The consolidated first-year and old ice in northern Norwegian Bay and parts of Eureka Sound fractured during the first week of August. Areas of bergy water developed in the third week of the month. By the end of August, most of Eureka Sound was bergy water while large areas of very close pack first-year and old ice prevailed in Norwegian Bay.

Fractured consolidated ice from the Canadian Arctic Archipelago combined with the mobile ice from Viscount Melville Sound caused greater than normal ice concentrations to plague Barrow Strait and most of Lancaster Sound during the entire month of August. Both greater than normal ice and greater than normal old ice prevailed based on the CIS climate data.

September Ice Conditions:

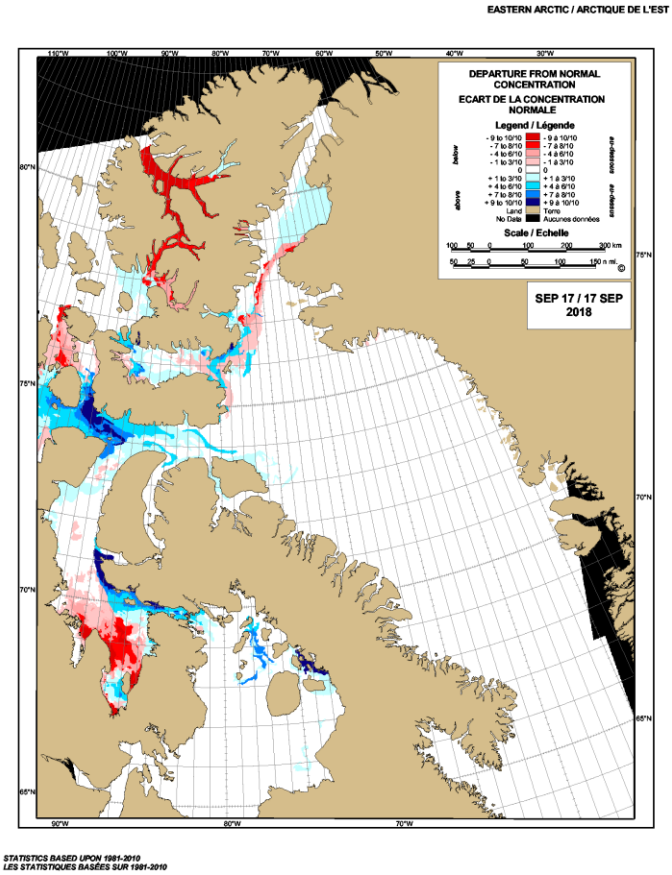

Figure 18: Departure from normal ice concentration for the Eastern Arctic area near mid-September

Bergy water conditions prevailed in Baffin Bay except for areas of open drift first-year and old ice drifted into the extreme northwestern section. Ice from Lancaster Sound began to drift into western Baffin Bay during the second week of September. After mid-September, new and grey ice began to form between the ice floes in northwestern Baffin Bay.

Areas of very open drift old ice drifted into Navy Board Inlet during the first week of September. By the end of the month, some old ice drifted into Eclipse Sound while new and grey ice began to form in Navy Board.

The northern part of Admiralty Inlet continued to have very open drift old ice from Lancaster Sound while the rest of the inlet had bergy water. Some new ice formed between the floes during the last week of September.

Lancaster Sound had open drift first-year and old ice with areas of bergy water while Barrow Strait had open drift to close pack first-year and old ice during the first half of September. New and grey ice began to form around the floes during the second half of the month.

Prince Regent Inlet had bergy water with areas of open to very open drift first-year and old ice. A band of first-year ice with up to 2 tenths old ice along the southeastern shore appeared after mid-September. New and grey ice began to form during the third week of the month.

The Gulf of Boothia was mostly bergy water except for close to very close pack first-year and old ice in the southeastern section and in Committee Bay during the first half of September. However, after mid-September, the ice in the southeastern section began to migrate northwards along the northwestern shore of Baffin Island. In the wake, open to very open drift prevailed in the southeastern section and in Committee Bay. During the last week of the September, new and grey ice began to form among the drifting ice.

A net increase in ice concentration of first-year and old ice occurred in Fury and Hecla Strait at the beginning of September. By mid-month, very close pack ice covered the entire length of the strait. These high concentrations of ice prevailed for the most part during the latter part of September.

The ice in Foxe Basin, composed mostly of first-year ice, continued to melt to mainly open water to ice free conditions by the end of the month. However, patches of first-year ice prevailed in the eastern side of the basin. In the meantime, first-year and old ice from Fury and Hecla continued to drift into the extreme northwestern part of the basin during the entire month.

First-year and old ice from Hell Gate and Cardigan Strait drifted into western Jones Sound and spread into the remainder of the sound during the month of September. New and grey ice began to form after mid-September.

Ice in Norwegian Bay remained mostly open drift to very close pack old ice during September with new and grey ice forming after mid-month.

Eureka Sound became mostly bergy water by mid-September. The lack of patches of old ice during the first part of the month was due to the consolidated old ice plug in the western end of Nansen Sound. The plug prevented the entry of old ice from the Arctic Ocean into Nansen Sound and Eureka Sound. However soon after mid-September, new and grey ice began to form.

During the first half of September, most areas had greater than normal ice concentrations with the exception of the Gulf of Boothia, southern Norwegian Bay and Eureka Sound where less than normal ice conditions prevailed. The last half of September had greater than normal ice due to an earlier than normal freeze-up, especially in Lancaster Sound and the eastern side of Prince Regent Inlet and the Gulf of Boothia where concentrations where significantly greater than normal. The amount of old ice was also greater than normal at the end of September. The regions affect were Prince Regent Inlet, Lancaster Sound, Barrow Strait, the northwestern Baffin Island as well as most areas in the Canadian Arctic Archipelago.

Western Arctic

Summer Ice Conditions and Fall Freeze-up

Summer Temperatures: June to September

From June to September, surface air temperatures were below normal stretching from the Alaskan shore eastwards into Amundsen Gulf, Coronation Gulf, Queen Maud Gulf, Larsen Sound, Peel Sound, and M'Clintock Channel. The northern part of the Beaufort Sea, Chukchi Sea and the Arctic Ocean had above normal temperatures during the same period.

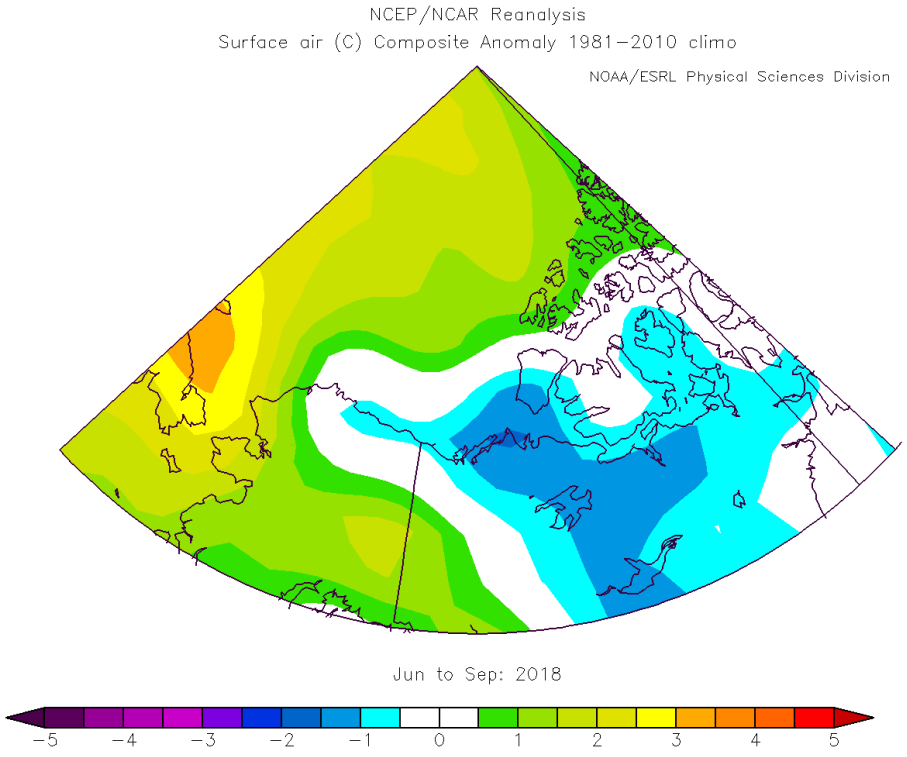

Figure 19: Air temperature anomaly for the Western Arctic area from June to September

Summary of Ice Conditions:

Ice began to break up earlier than normal in Amundsen Gulf and the southeastern part of the Beaufort Sea at the beginning of June. However, by the beginning of July, this area started to see greater than normal ice concentration. These areas of greater than normal ice concentration prevailed during much of the summer melt season. However, by the beginning of September, persistent northwesterly winds pushed the pack ice, located west and northwest of Banks Island, into the western entrance to Amundsen

Gulf with close to very close pack ice. By the end of September and into early October, the very close pack ice was into Franklin Bay, onto Cape Bathurst and the Tuktoyaktuk Peninsula.

The ice along the Alaskan Shore started showing signs of slower than normal ice melt around the middle of July. Very close pack ice persisted until just after mid-August along a significant portion of the Alaskan shore. Near the end of the melt season or early in the freeze-up period, some ice was still present offshore of the Alaskan shore.

Meanwhile, the area stretching from north of the Mackenzie Delta to the northwestern Beaufort Sea and the southwestern Arctic Ocean had lower than normal ice concentration. Melting began in the south-central Beaufort Sea area around mid-June and propagated northwestward. By the middle of July, lower than normal concentration began to appear in the northwestern Beaufort Sea and southwestern Arctic Ocean. Near the mid-August timeframe, open water areas developed and by early September, open water conditions prevailed.

The southern route of the Northwest Passage, from eastern Amundsen Gulf to Queen Maud Gulf, saw ice fracture and melt that were near to slightly earlier than normal. Just after the first week of August, this area was generally open water to ice free.

The Larsen Sound and Peel Sound began to fracture during the last week of July, which was slightly earlier than normal. However by mid-August, ice was melting at a slower than normal rate, especially in Peel Sound. Ice concentrations remained greater than normal over most of the area until freeze-up began near the end of September.

The Canadian Arctic Archipelago and the Parry Channel consolidated ice fractured earlier than normal. Looser ice conditions developed in the latter part of August. By the beginning of September greater than normal ice concentration began to appear, due mostly from the old ice drifting from the Canadian Arctic Archipelago as well as the eastern Beaufort Sea.

Freeze up began in northern regions before mid-September and extended into the southern regions during the third week of September.

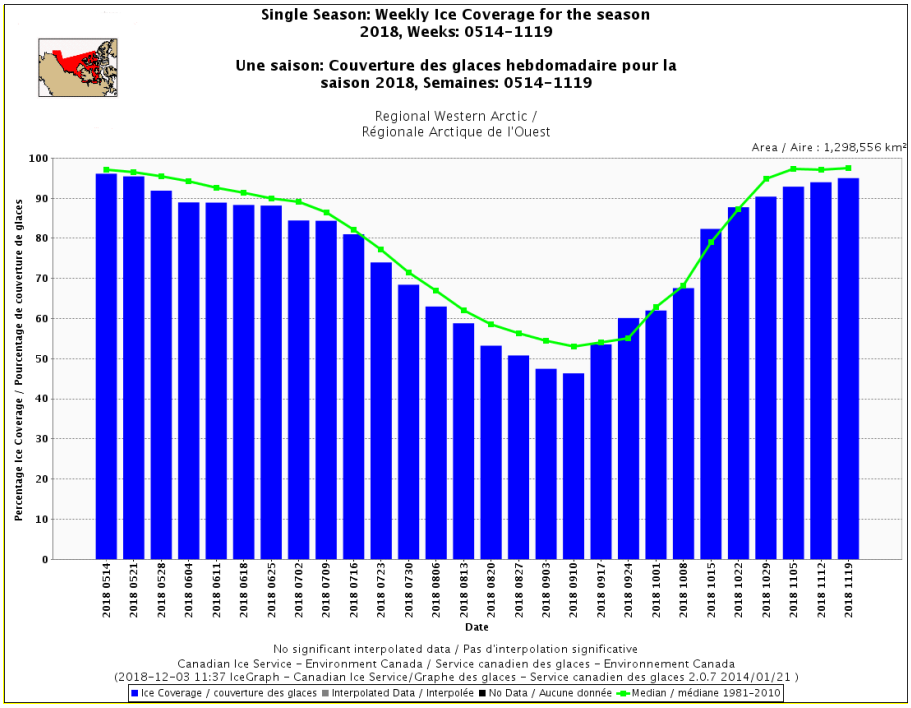

Figure 20: Weekly ice coverage for Western Arctic area for the 2018 season

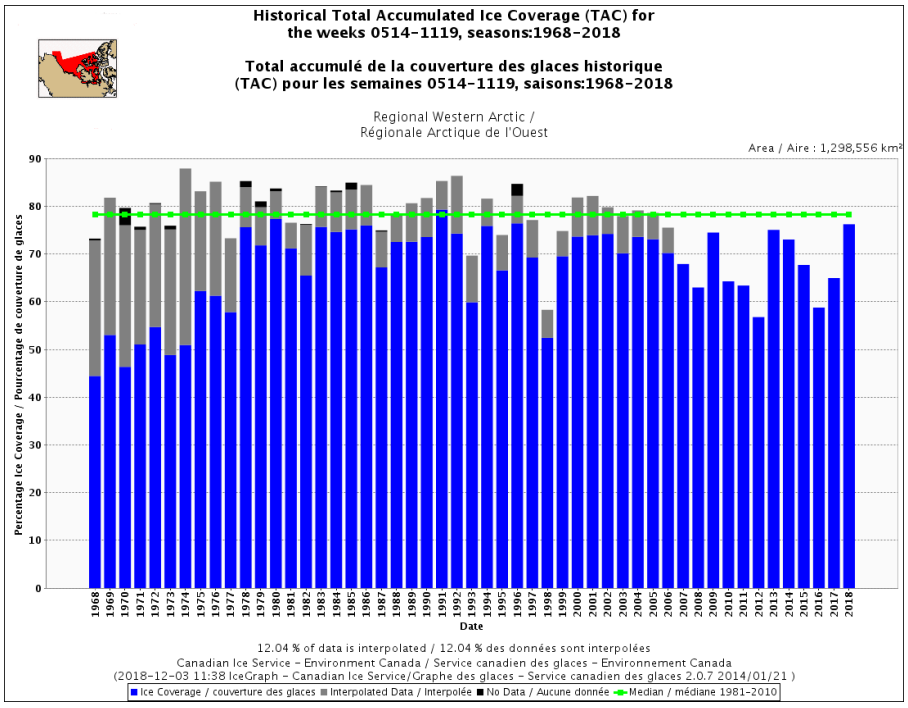

Figure 21: Historical Total Accumulated Ice Coverage for Western Arctic area

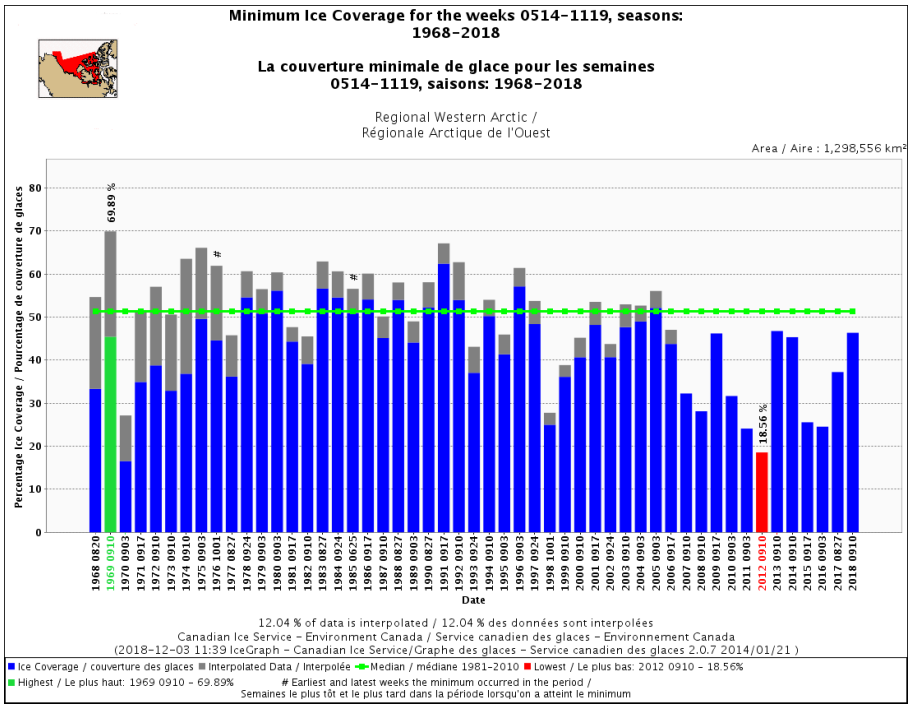

Figure 22: Minimum Ice Coverage for the Western Arctic area, 1968-2018

June Ice Conditions:

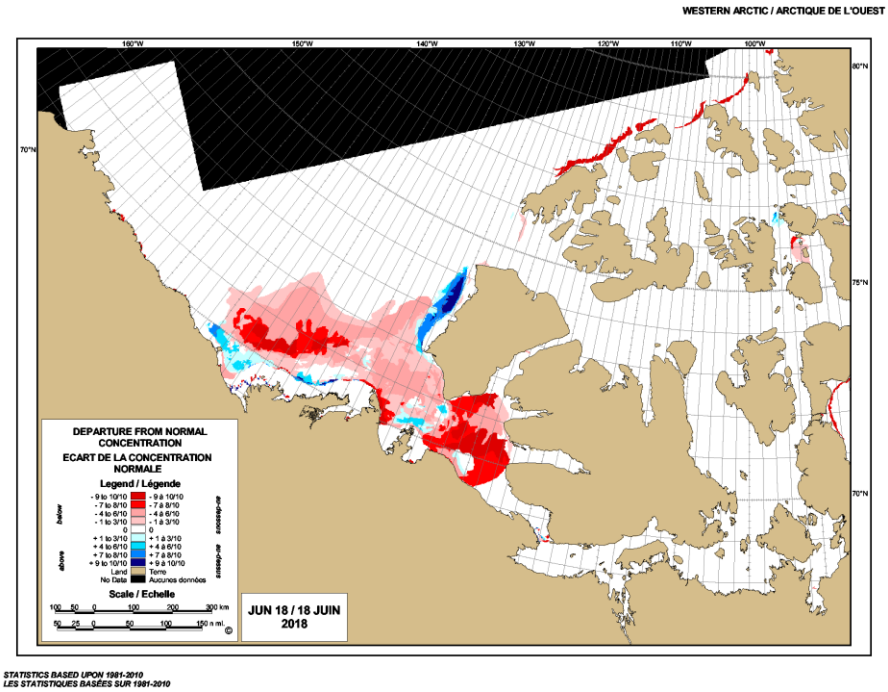

Figure 23: Departure from normal ice concentration for the Western Arctic area near mid-June

Areas of open water were already present over the southeastern Beaufort Sea and Amundsen Gulf area at the beginning of June. Looser ice conditions expanded northwestwards during the month of June however the area of ice to the west of Banks Island remained very close pack first-year and old ice.

Consolidated old ice was present in the Queen Elizabeth Island while mainly consolidated first-year and old ice in the Parry Channel as well as McClintock Channel prevailed. Consolidated first-year ice covered most of Coronation Gulf and Queen Maud Gulf. Early in June, M'Clure Strait started to fracture in the western section and extended into the central part of the strait after the middle of the month.

Fracture of consolidated first-year ice along the southern shore of Amundsen Gulf and along parts of the Tuktoyaktuk Peninsula began during the last week of June. Ice melt was faster than normal in the southeastern Beaufort Sea and most of the Amundsen Gulf by the end of June. However,the western coast of Banks Island experienced greater than normal ice concentrations. Elsewhere, the ice situation was evolving as usual.

July Ice Conditions:

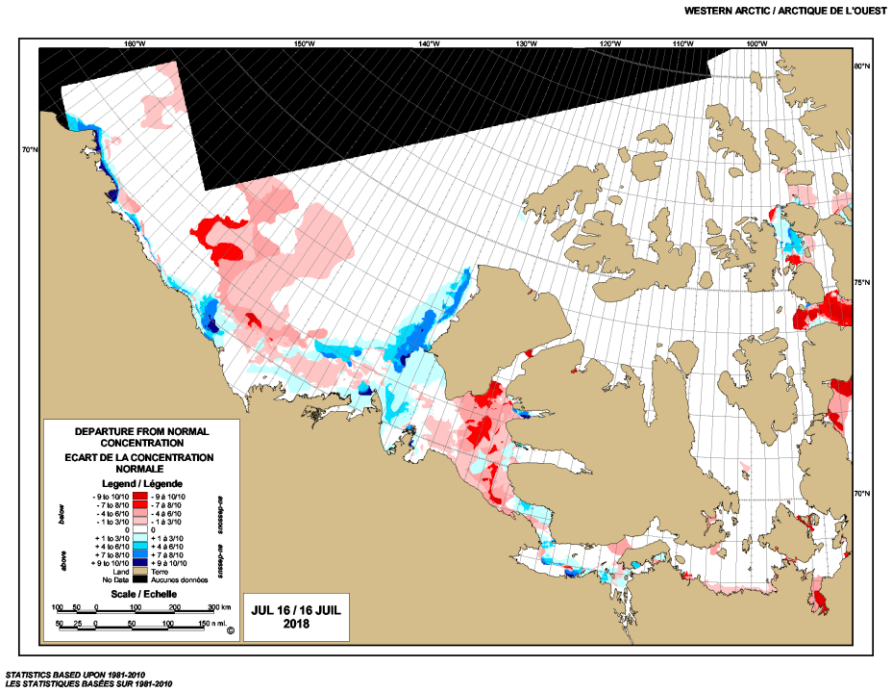

Figure 24: Departure from normal ice concentration for the Western Arctic area near mid-July

The ice southwest of Point Barrow began to melt and gave way to open water conditions around the third week of July. In the western Beaufort Sea, looser ice conditions began to emerge around mid-July and spread southeastwards by the end of month.

Ice conditions remained generally unchanged along the Alaskan shore area during the month except for the consolidated first-year ice along the shore which melted at a slower than normal pace. However, by the end of the month nearly the entire length of the Alaskan shore had a narrow band of open water except for the area east of Prudhoe Bay to Herschel Island, which continued to have very close pack first-year ice with a trace of old ice.

The last of the consolidated ice along the Tuktoyaktuk Peninsula eastwards to Liverpool Bay and near Cape Bathurst fractured soon after the middle of July. The first-year ice near the peninsula and further north continued to melt and was mostly open water by the last week of the month. However, mostly old ice slumped southwards from the southeastern Beaufort Sea and was located about 30 to 50 nautical miles north of the peninsula.

The ice conditions in the southeastern part of the Beaufort Sea continued to loosen during the first part of July. However, after the midpoint of the month, a predominantly northwesterly circulation started to push the mostly old ice pack southeastwards

causing the ice concentration to increase in the area. These conditions with respect to ice concentration and the presence of old ice in the extreme southeastern Beaufort Sea were unusual for that time of year.

The last of the consolidated first-year ice in Franklin and Darnley Bays fractured mostly in the first week of July.

Amundsen Gulf experienced a general decrease in ice with mostly open water prevailing near the end of the month. The exception was the western entrance to the gulf where northwesterly winds pushed the old ice pack into the area. Ice reached the Cape Parry area. These ice conditions where unusual for that time of year.

The consolidated first-year ice in Prince Albert Sound, Minto Inlet and consolidated first-year ice with up to 3 tenths old ice in Prince of Wales Strait started to fracture soon after the first week of July. By the end of the third week, the remaining consolidated ice fractured. Either open water or a few patches of mostly first-year ice prevailed at the end of the month in Prince Albert Sound and Minto Inlet. Open water with a few patches of old ice were present in the southern and central part of Prince of Wales Strait. The northern reaches of Prince of Wales Strait had very close pack old ice.

The consolidated first-year ice in Dolphin and Union Strait as well as Coronation Gulf began to fracture during the first week of July. By mid-July, the remaining consolidated ice fractured. The residual ice quickly melted before the end of the month.

The consolidated first-year ice with a trace of old ice in Queen Maud Gulf began to fracture just before the middle of July. By the end of the third week, the remaining consolidated ice fractured. At the end of the month, most of the ice had melted except for some bands of first-year ice with a trace of old ice in the eastern part of the gulf which originated from the Victoria Strait area.

The consolidated first-year ice with up to 3 tenths old ice Victoria Strait, Larsen Sound and Peel Sound started to show signs of fracturing during the second week of July. The consolidated old ice in M'Clintock Channel also fractured during the second week. By the end of the last week of July, all the consolidated ice fractured.

The consolidated first-year and old ice in Viscount Melville Sound as well as the eastern part of M'Clure Strait began to fracture soon after mid-July. Nearly all the consolidated ice had fractured by the end of the month.

The area of the Northwest Passage from eastern Amundsen Gulf to Peel Sound had fracture events or melting that were near to slightly earlier than normal during the month of July.

August Ice Conditions:

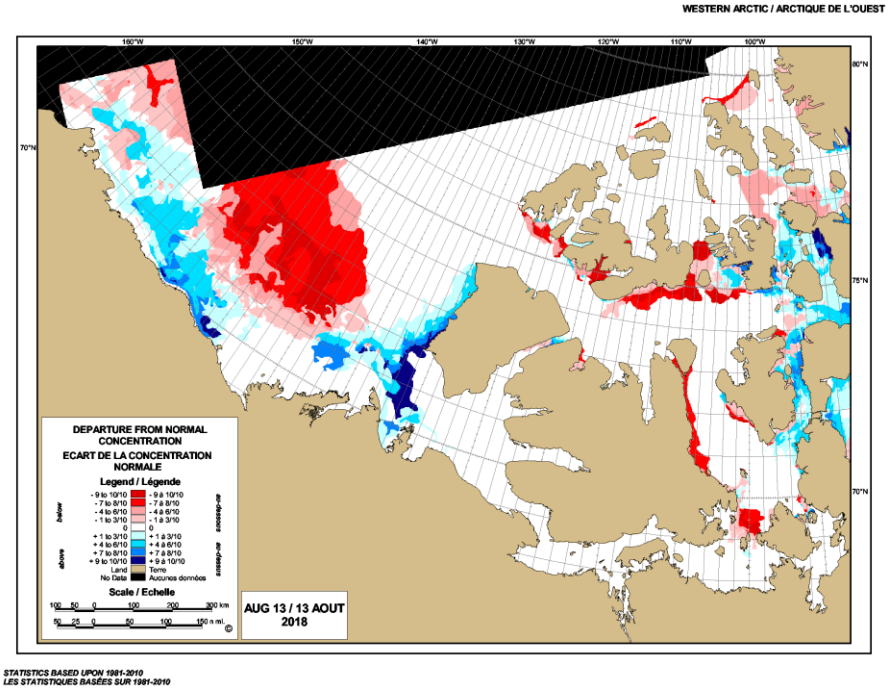

Figure 25: Departure from normal ice concentration for the Western Arctic area near mid-August

The open water area west of Point Barrow prevailed during the month of August except for a few episodes of open drift first-year and old ice.

The ice concentration in the western and south-central Beaufort Sea section continued to decrease during the month with open water areas developing during the latter part of August. Normally this area would have relatively high concentration of ice at that time of year.

Stubborn first-year and old ice prevailed just off the northern Alaskan shore during the month of August due to cooler than normal air temperatures over the area.

The Mackenzie Bay area was generally open water during the first half of August however westerly winds caused the ice along the Alaska/Yukon shore to drift into the western part of the bay during the second part of the month.

The southeastern part of the Beaufort Sea continued to have higher than usual old ice with occasional areas of ice reaching the Baillie Island/Cape Bathurst areas during most of the month of August. Ice concentrations decreased somewhat during the latter part of the month.

Amundsen Gulf was mainly open water except for the western section where old ice from the southeastern part of the Beaufort Sea prevailed during the month. Franklin Bay had some areas of old ice during the first half of August while some patches of old ice

drifted along the southern shore of Amundsen Gulf, mostly during the second half of the month.

From Dolphin and Union Strait to western Queen Maud Gulf, mainly open water to ice free conditions prevailed during the entire month.

Ice in eastern Queen Maud Gulf eventually melted by mid-August and gave way to open water conditions until the end of the month.

Ice concentration of first-year and old ice in Victoria Strait and Larsen Sound decreased somewhat during the month.

In Peel Sound, very close pack first-year ice with up to 1 tenth old ice decreased slightly during the first week however during the remainder of the month, ice concentrations were greater than normal due to westerly winds.

M'Clintock Channel, Viscount Melville Sound and M'Clure Strait had a general decrease from the very close pack first-year and old ice during the month of August.

A few key areas in the Beaufort Sea area had unusual ice conditions. First, the large area of looser than normal ice developed in the west-central portion of the Beaufort Sea. Normally this area would have higher concentrations of ice at the end of August. The second region, along the western shore of Banks Island and the western section of Amundsen Gulf, had higher than normal presence of ice. A northwesterly circulation pushed the ice into these regions and kept temperatures cooler than normal. Lastly, the area of ice just offshore of the Alaskan shore was still present. Normally concentrations would be lower by the end of August. These areas with higher than normal ice concentration also experienced higher than normal old ice concentration.

The Peel Sound and parts of Larsen Sound continued to be afflicted with greater than normal ice due to cooler than normal temperatures over the area for the month of August.

September Ice Conditions:

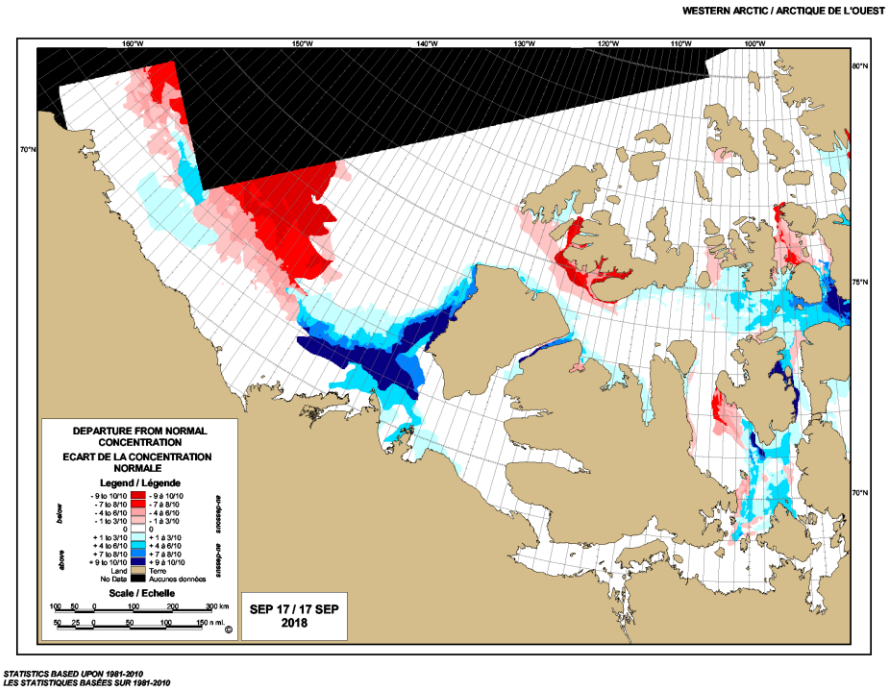

Figure 26: Departure from normal ice concentration for the Western Arctic area near mid-September

The Chukchi Sea was open water however, some patches of ice prevailed in the southwestern part of the Beaufort Sea for the month of September.

From the western Beaufort Sea to the south-central Beaufort Sea, mostly open water with occasional patches of old ice covered the area for the month of September. Again, this area should have higher concentration of ice at that time of year.

The area of ice just north of the Alaskan and Yukon shores slowly melted and decreased in extent while also moving further offshore during the month.

The ice in southeastern Beaufort Sea began to slump slowly southwards towards the shore during the first half of the month. However moderate northerly to northwesterly winds caused a broad area of old ice to drift towards the shore from near Baillie Island to eastern Mackenzie Bay during the second half of September. The formation of new ice began to form during the last week of September.

The western Amundsen Gulf had looser ice conditions during the first half of September. However, northerly to northwesterly winds during the second half of the month pushed the ice from the southeastern Beaufort Sea into western Amundsen Gulf area. By the end of the month, old ice completely filled Franklin Bay while the rest of the southwestern part of the gulf had some patches of old ice.

The area from eastern Amundsen Gulf to Queen Maud Gulf was ice free for most of the month. New ice growth began to form along the shore of Queen Maud Gulf during the latter part of the month.

During the month of September, ice concentrations decreased slowly in Victoria Strait and Larsen Sound. Cooler than normal temperatures prevailed over the area during the period. By the third week, new and grey ice began to form within the pack ice

Peel Sound experienced periodic easterly or westerly winds that caused ice to accumulate along the shores. Overall, ice concentrations remained greater than normal for September. New and grey ice began to form in the pack ice after mid-September.

M’Clintock Channel, Viscount Melville Sound and M’Clure Strait had looser ice conditions or open water areas in the northern or northeastern section while the southern section had mostly close to very close pack old ice during the first half of September. New and grey ice began to form after mid-month. Some high concentration of old ice trickled southwards from Byam and Austin Channels into eastern Viscount Melville Sound mostly during the last week of September.