Seasonal Summary

for the Canadian Arctic

Summer 2010

Produced by the Canadian Ice Service
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Executive Summary

The 2010 Canadian Arctic summer season was characterised by early ice fracture and melt in all areas. This was primarily due to warmer than normal air temperatures and winds which at times played a significant role in the retreat of the ice. As a result of extensive clearing of the ice, the 2010 summer melt season set a record for lowest *seasonal average* ice coverage (for the Canadian Arctic as a whole). The previous record was set in 1998. However, the *minimum ice coverage* at the very end of the melt season, which was similar to that of 2007, did not break the record set for the Canadian Arctic in 2008.

Hudson and Foxe

May 2010

Mean air temperatures in May, leading up to the melt season, were above normal throughout the region, except below normal along the west coast of Hudson Bay. Correlated with these warm temperatures were lower than normal ice concentrations along the outer margin of the ice pack in Davis Strait and the Labrador Sea. Lower than normal ice concentrations were also evident in Frobisher Bay, in Hudson Strait, in Foxe Channel, in eastern Hudson Bay and in James Bay. Many of these areas already contained zones of open or bergy water at this time. These lower than normal ice concentrations indicated that break-up, melt and retreat of the ice was proceeding at a faster pace than normal and was 2 to 3 weeks ahead of normal in these areas. Lower than normal ice concentrations and open water were also found in northwest Hudson Bay, where mean air temperatures were below normal in May. However these lower ice concentrations were the result of stronger than normal northwesterly winds in this area during the month of May, which served to push the ice pack offshore.

June 2010

Mean air temperatures were near normal over most parts of the region in June, except in James Bay, where they were below normal, and along an axis extending from southern Baffin Island towards southwestern Hudson Bay, where they were above normal (see Table 1 and Figures 1 to 3). Winds played a greater role than temperatures in the continued break-up and retreat of the ice during this period. Winds over Hudson Bay in June were predominantly from the northwest, which continued to push the pack ice away from the shore and which contributed to less than normal ice concentrations and open water areas in northern and western sections of the bay. Along the Labrador Coast winds came predominantly from the east in June, diverging northwards towards Frobisher Bay and southwards towards Newfoundland. This caused the pack ice to compress along the Labrador and southeastern Baffin Bay coasts, leading to a narrower pack and resulting in bergy water where normally the outer margins of pack would still prevail. This wind pattern also caused the ice along the mid-Labrador coast to drift southwards and prevented it from spreading outward into warmer offshore waters and melting, leading to greater than normal concentrations along the southern Labrador coast and delaying the ice melt by 1 to 2 weeks in this area. The general wind patterns for June are indicated by the mean sea level pressure patterns shown in Figure 33. As a result of the winds, the 2 week advance in break-up and retreat initiated in May was maintained throughout June, in spite of near normal temperatures in most places. Mid-June ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 4 and Figure 5, respectively.

July 2010

Mean air temperatures were above normal across the entire region in July, with the greatest departures from normal occurring along the eastern margins of Hudson Bay and in northern Foxe Basin (see Table 1 and Figures 1 to 3). The prevailing wind pattern over Hudson Bay completely reversed from that observed in May and June: in July winds were predominantly from the east over the southern half of the bay and from the southeast over the northwest section of the bay. The general wind patterns for July can be inferred from the mean sea level pressure patterns shown in Figure 34. As a result of the warm air temperatures and the winds, the ice pack in Hudson Bay melted at a record pace in the first two weeks of July so that only remnant areas of ice could be found along the southern and western shores by mid-month, when normally nearly half of the bay would still be ice-covered. Elsewhere, in Hudson Strait, in Davis Strait, along the southeast coast of Baffin Island and in Foxe Basin, ice melt and retreat continued to occur 2 to 3 weeks ahead of normal except in isolated locations where winds and currents served to temporarily pack the ice shoreward, leading to pockets of greater than normal ice concentrations (e.g. in parts of Cumberland Sound, parts of Frobisher Bay, northwestern Foxe Basin and Frozen Strait). All ice cleared from the Labrador Coast in the first week of July and from Hudson Strait by mid-July. Mid-July ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 6 and Figure 7, respectively.

August 2010

Mean air temperatures in August were above normal across the region except near normal along the southwestern Hudson Bay coast (see Table 1 and Figures 1 to 3). These warm temperatures, combined with prevailing southerly winds, served to clear all ice from Davis Strait and the southeastern Baffin Island coastal areas (including Frobisher Bay and Cumberland Sound) in the first week of August. All remaining ice patches in southern Hudson Bay also cleared away by the first week of August, 3 weeks earlier than normal. Accelerated ice melt and retreat continued in Foxe Basin, which was mostly open water by mid-August (resembling conditions normally found in the first week of September), except in the vicinity of Frozen Strait where ice had been packed to greater than normal concentrations by periods of easterly winds. Ice extending eastward from the pack in Frozen Strait prevented the main route to Hall Beach from clearing and becoming open water along its entire length until the last week of August, although this was still a week earlier than normal. The general wind patterns for August can be inferred from the mean sea level pressure patterns shown in Figure 35. Mid-August ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 8 and Figure 9, respectively.

September 2010

Mean air temperatures in September continued to be above normal across the region, especially over southern Baffin Island and over Foxe Basin (see Table 1 and Figures 1 to 3). As a result, all remaining ice cleared out of Foxe Basin in the first week of September, 2 to 3 weeks earlier than normal, and the entire region was ice free in mid-September. The Hudson Bay and Foxe Basin region thus broke the record for the lowest seasonal average ice cover in the CIS ice chart record (spanning the period 1971-2010). Mid-September ice conditions (or rather the lack of ice) as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 10 and Figure 11, respectively.

Table 1: 2010 Temperatures and departures from normal (ºC) for Hudson Bay

	June		July		August		September	
Stations	Temp.	Depart.	Temp.	Depart.	Temp.	Depart.	Temp.	Depart.
Nain	6.8	0.7	11.6	1.5	14.4	3.8	9.0	2.3
Iqaluit	5.3	1.8	9.2	1.7	9.1	2.3	5.1	2.9
Kuujjuaq	7.0	0.0	12.8	1.5	14.7	4.2	7.9	2.3
Cape Dorset	3.1	0.8	8.8	1.7	8.4	2.6	5.0	3.6
Churchill	8.0	1.4	14.2	2.4	11.2	-0.3	7.0	1.3
Moosonee	10.3	-2.1	18.1	2.4	17.5	2.6	10.0	-0.5
Kuujjuarapik	6.8	-0.1	13.8	3.2	14.5	3.2	9.1	1.8
Hall Beach	0.8	0.2	7.9	2.1	6.9	2.4	2.9	3.4

Figure 1: 2010 Air Temperatures for Churchill from June 1st to September 30th

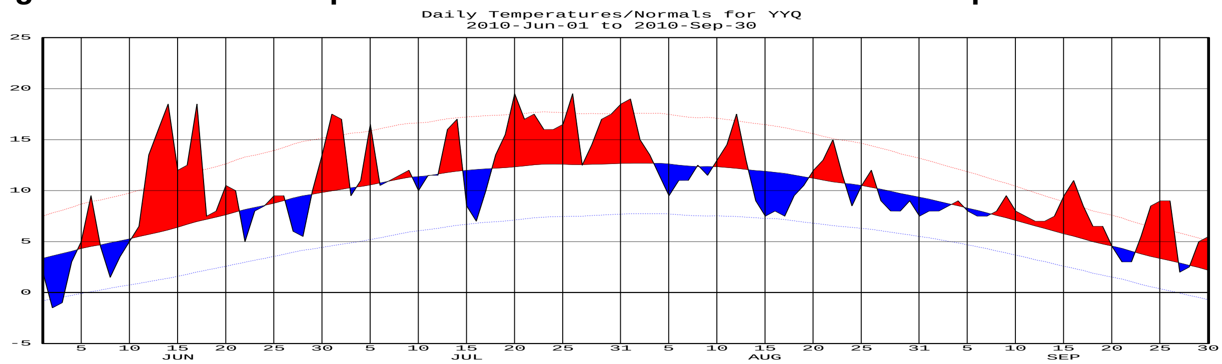


Figure 2: 2010 Air Temperatures for Iqaluit from June 1st to September 30th

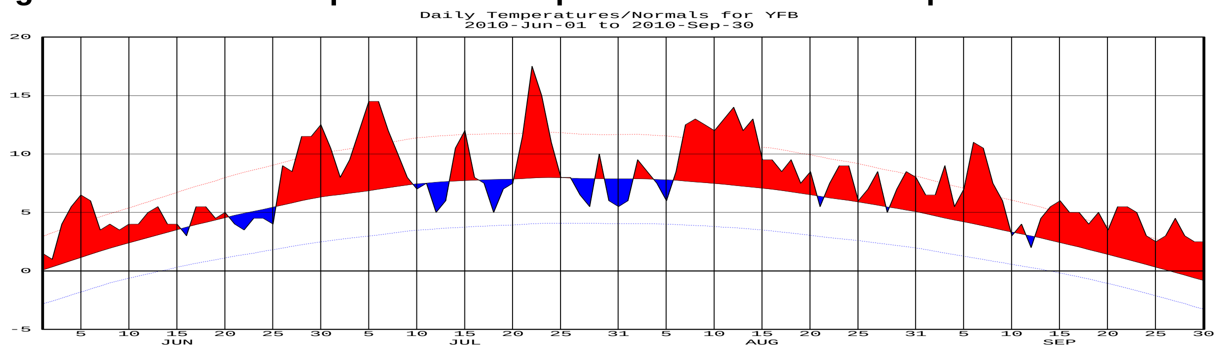


Figure 3: 2010 Air Temperatures for Hall Beach from June 1st to September 30th

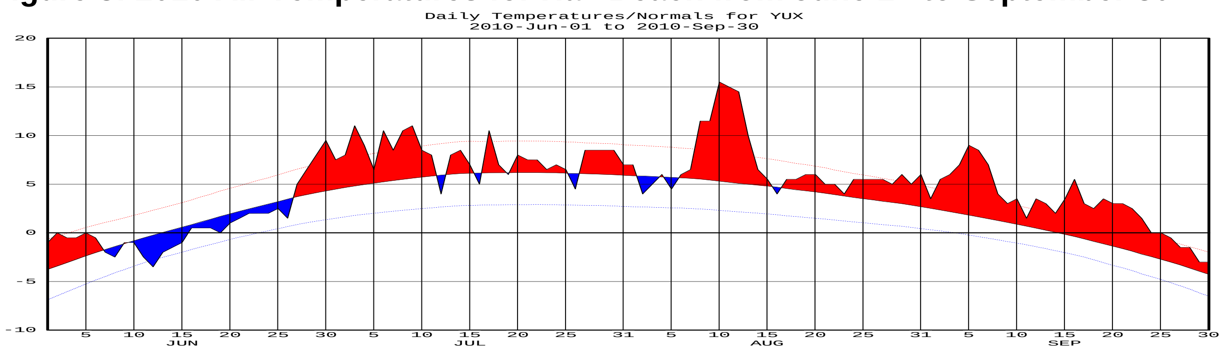


Figure 4: Hudson Bay Regional chart - June 14th, 2010

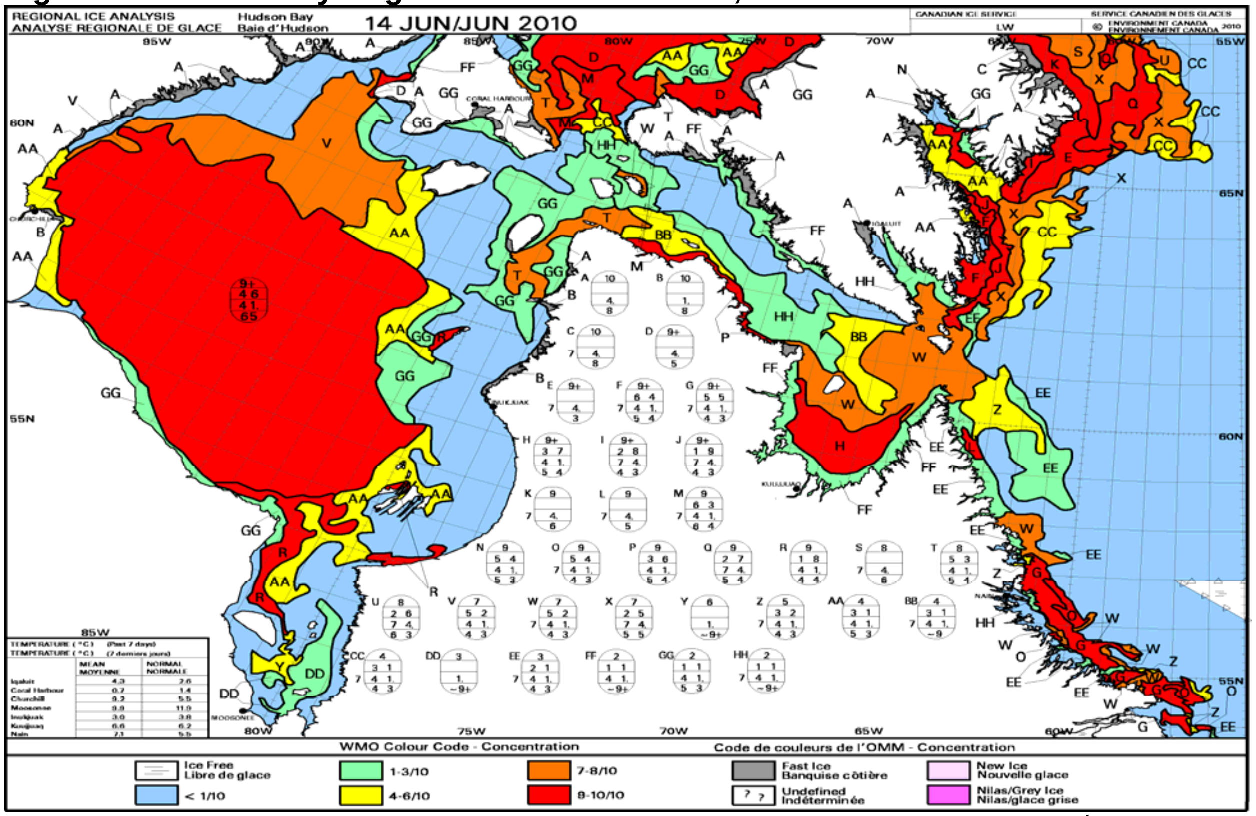


Figure 5: Departure from normal ice concentration for Hudson Bay - June 14th, 2010

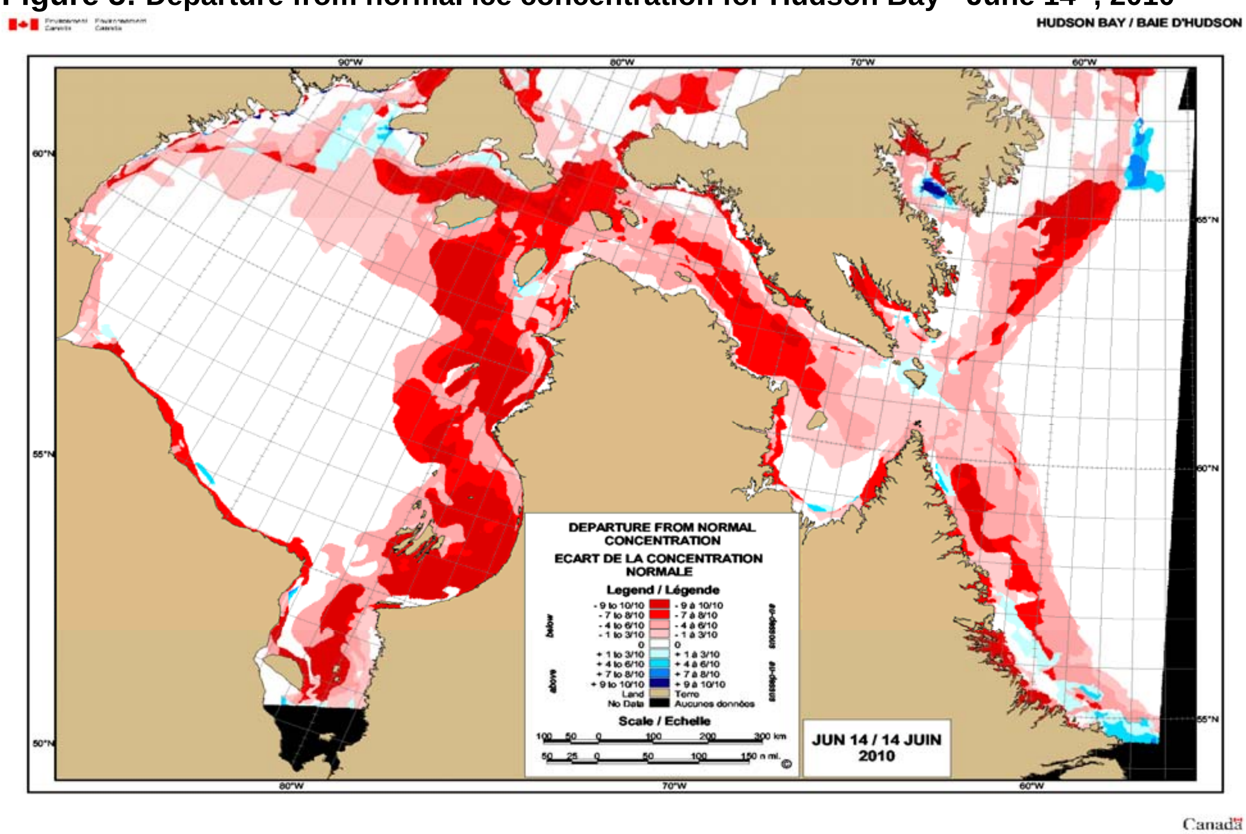


Figure 6: Hudson Bay Regional chart - July 12th, 2010

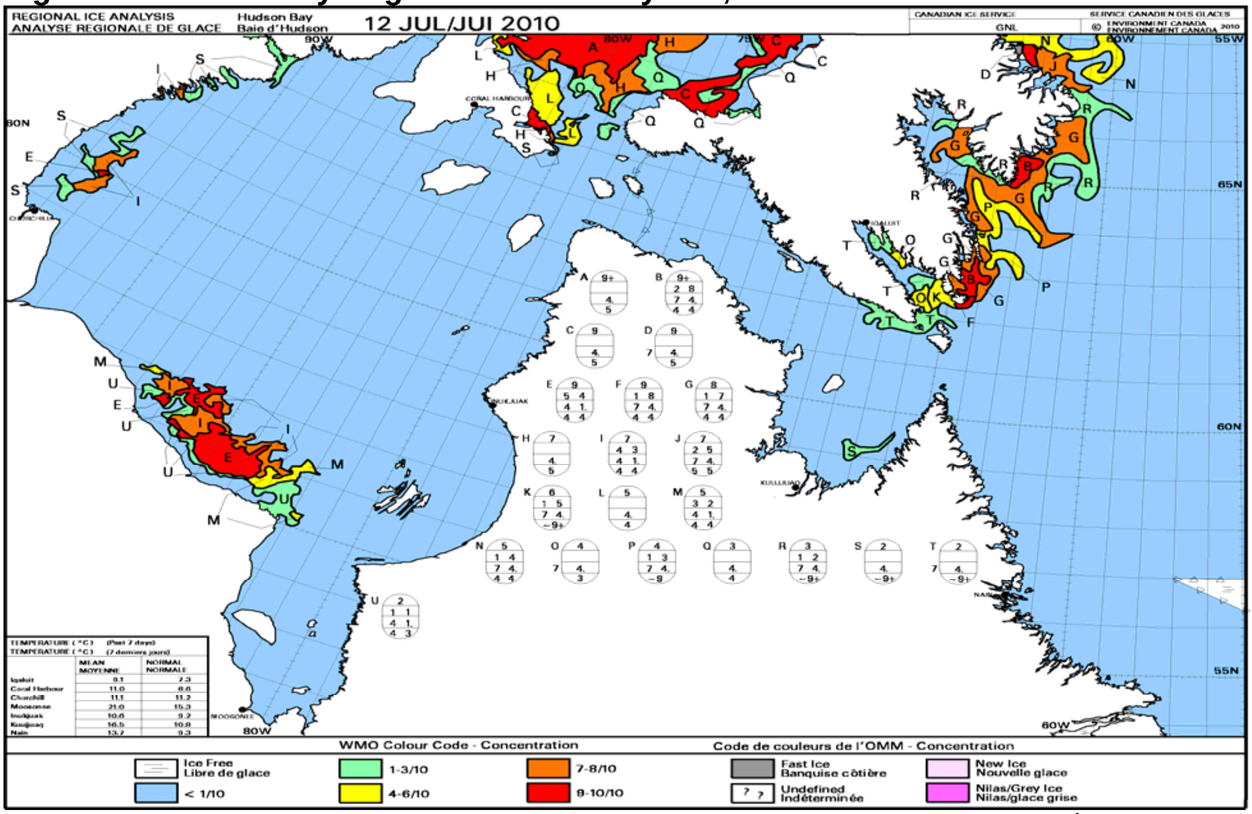


Figure 7: Departure from normal ice concentration for Hudson Bay - July 12th, 2010

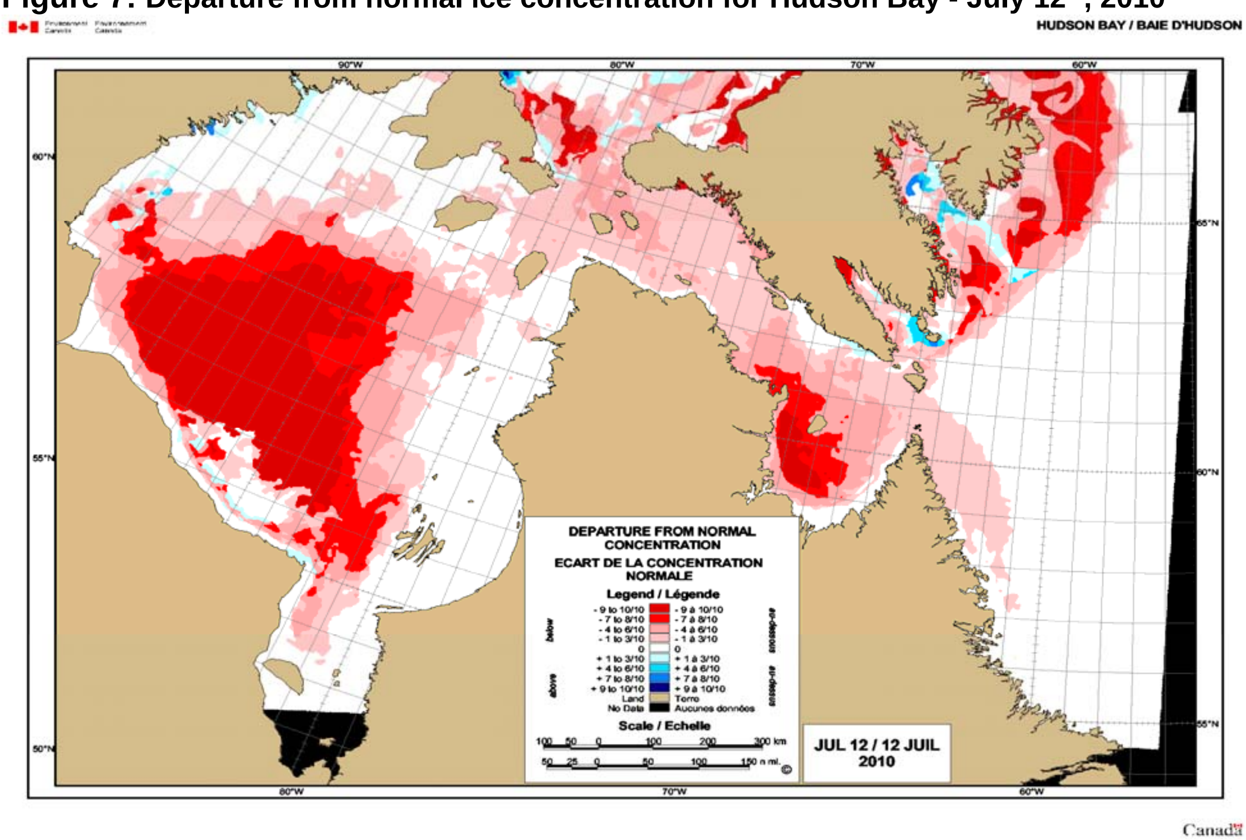


Figure 8: Hudson Bay Regional chart - August 16th, 2010

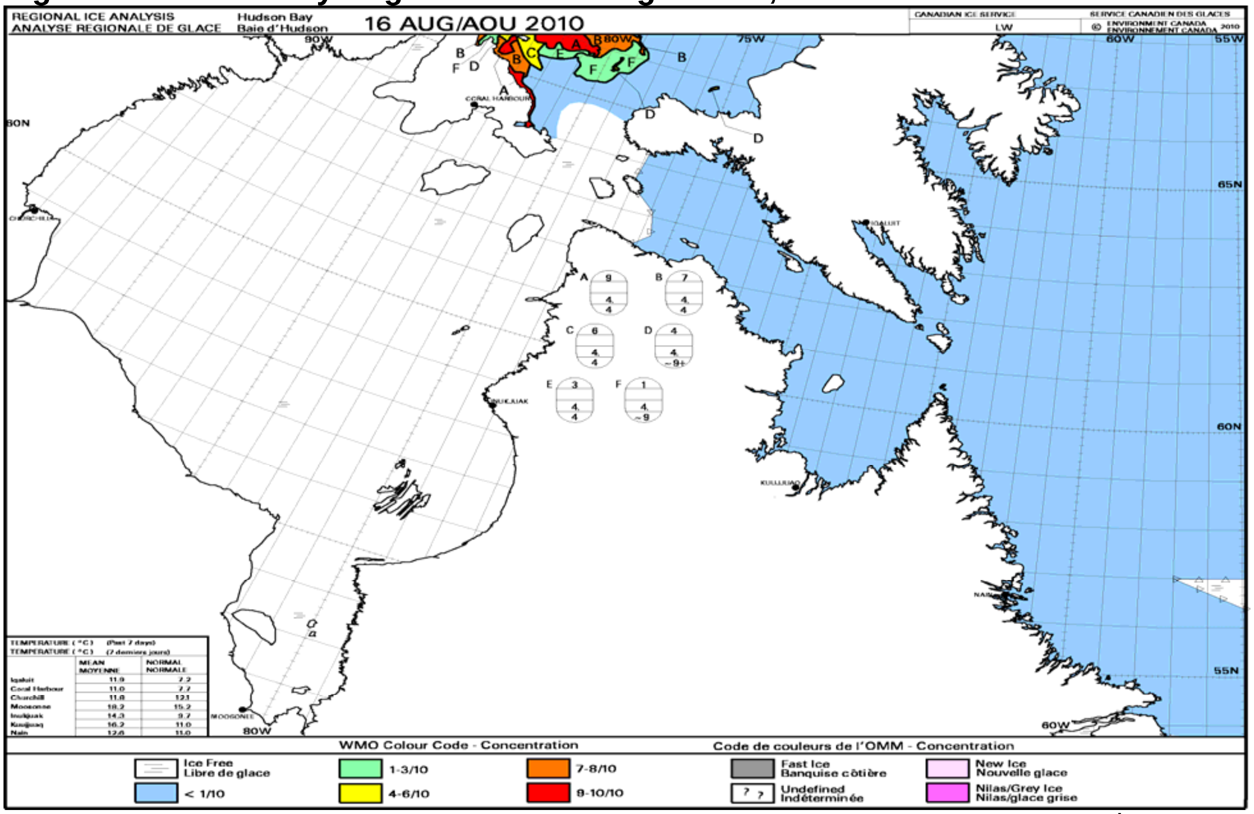
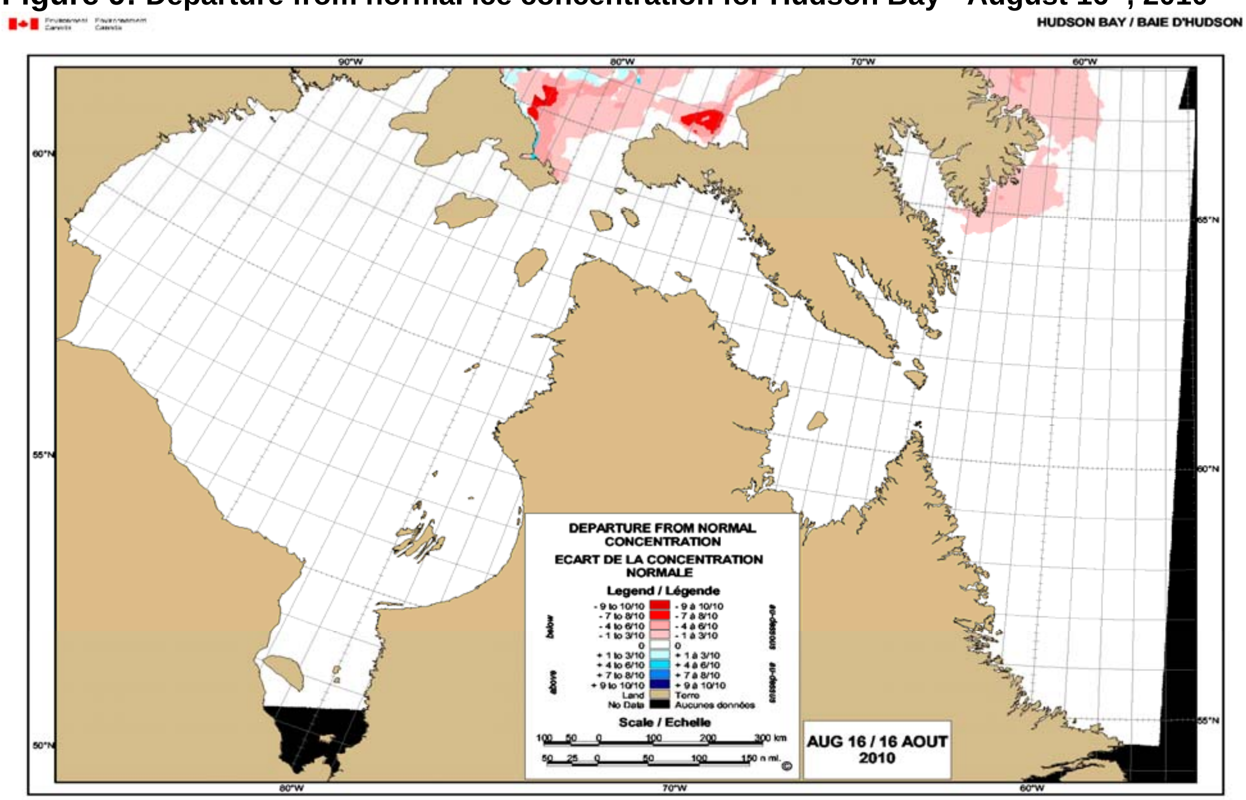


Figure 9: Departure from normal ice concentration for Hudson Bay - August 16th, 2010



Canada

Figure 10: Hudson Bay Regional chart - September 13th, 2010

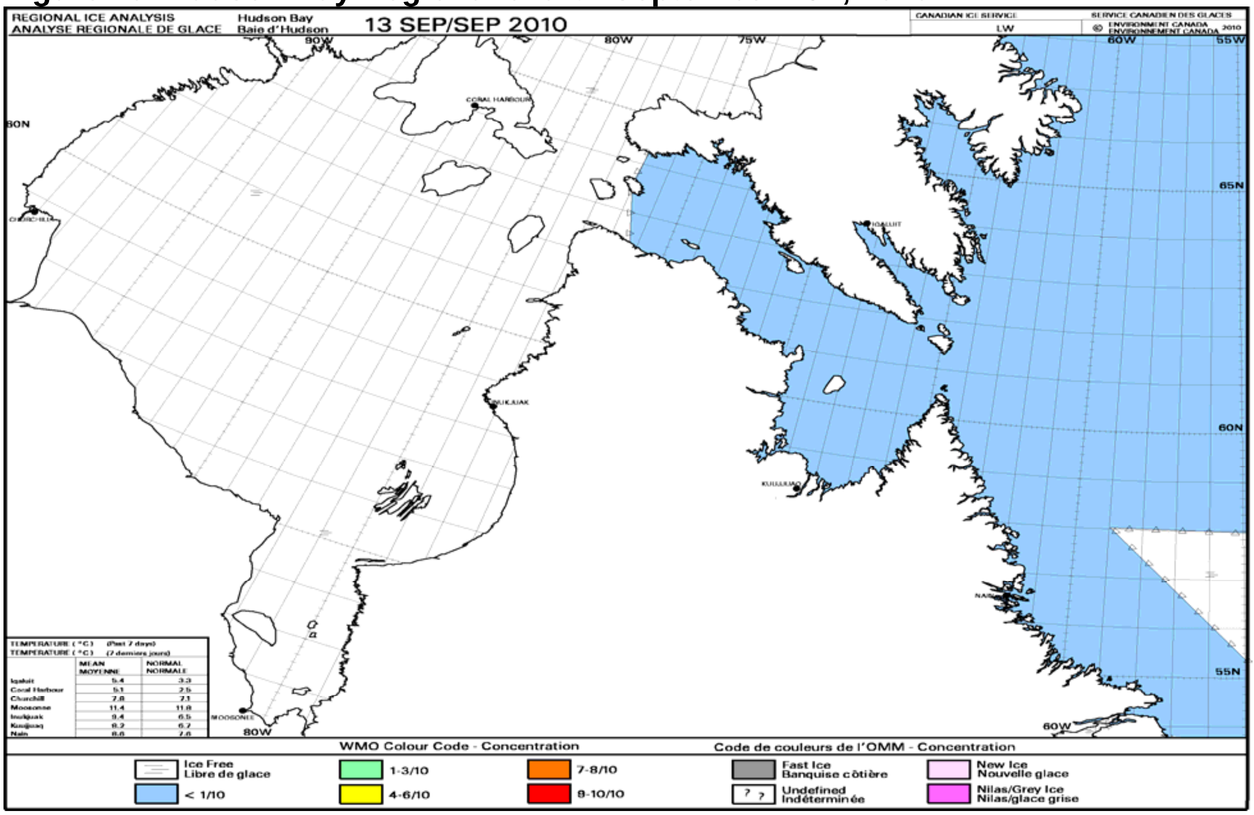
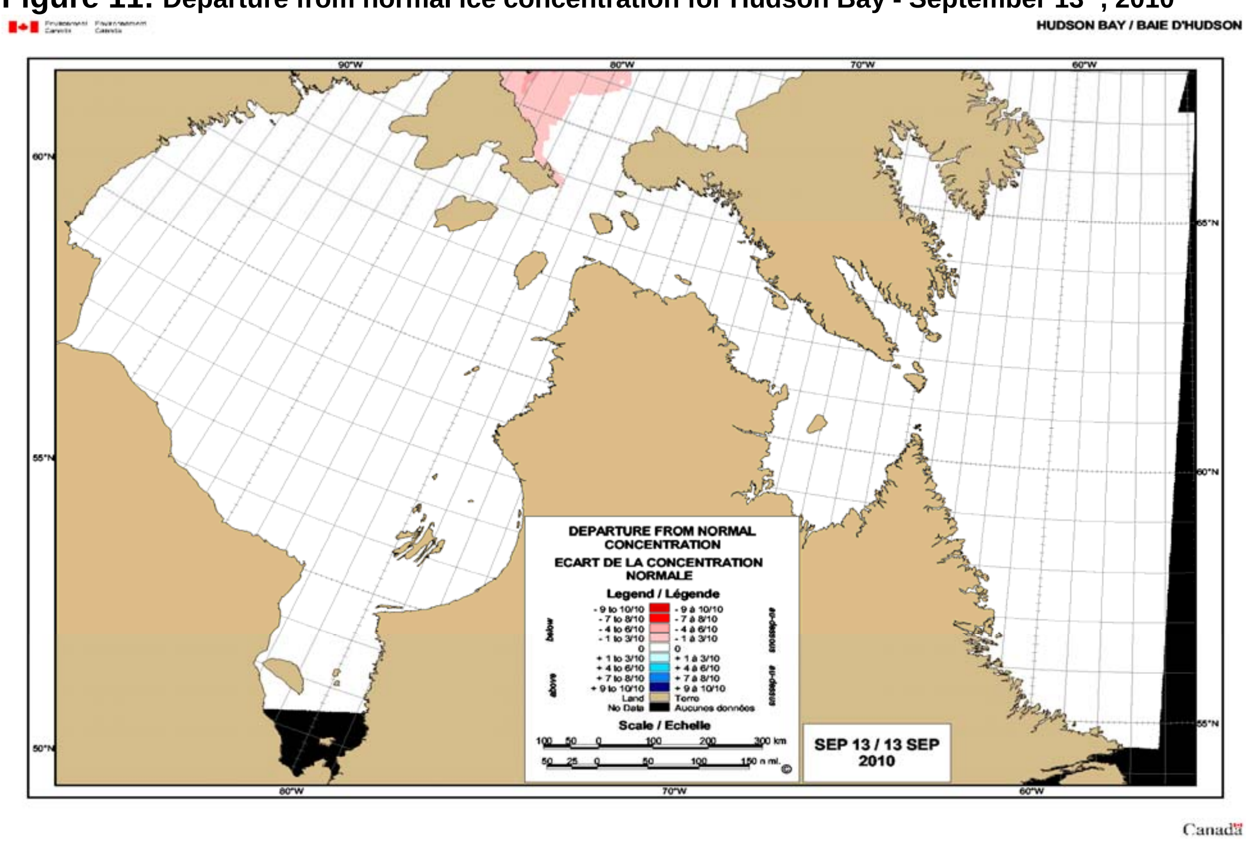


Figure 11: Departure from normal ice concentration for Hudson Bay - September 13th, 2010



Eastern and High Arctic

May 2010

Mean air temperatures in May, leading up to the melt season, were above normal across the region, with the largest deviations from normal occurring along the east coast of Baffin Island and in northern Baffin Bay. Consequently, evidence of advanced ice melt and retreat was observed along the margins of the ice pack in Davis Strait and Baffin Bay and reduced ice concentrations were also evident in Nares Strait, which once again did not consolidate over the winter months. Ice conditions in Nares Strait resembled those seen in 2007. While overall ice concentrations within the strait were less than normal, greater than normal amounts of multi-year ice were observed downstream in Baffin Bay as a result of the unconstrained influx of ice from the Arctic Ocean into the strait throughout the winter. Barrow Strait, Prince Regent Inlet, and the western half of Lancaster Sound also did not consolidate during the winter of 2009-2010. As a result of the mobility of the ice in these regions, areas of greatly reduced ice concentrations were periodically evident along the coasts of these waterways in May, depending on the strength, duration and direction of the winds over these areas.

June 2010

Mean air temperatures in June continued to be above normal across the Eastern and High Arctic, except over Committee Bay where they were near normal (see Table 2 and Figures 12 to 14). As a result, increased rates of melt and retreat were evident in most areas and mid-June ice extents and concentrations in Baffin Bay and Davis Strait resembled those normally seen in the first week of July. Because the ice did not consolidate in Barrow Strait over the winter, eastward ice drift out of this area produced lower than normal mid-June ice concentrations in both Barrow Strait and western Lancaster Sound but resulted in somewhat increased ice concentrations in eastern Lancaster Sound. Southward drift of the mobile multi-year ice in Nares Strait was responsible for greater than normal ice concentrations downstream of the strait, from Smith Sound to the east coast of Devon Island. Furthermore, as a result of this ice drift, areas of greater than normal concentrations of multi-year ice continued to be found within the ice pack in Baffin Bay. Mid-June ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 15 and Figure 16, respectively.

July 2010

Mean air temperatures in July continued to be above normal everywhere in the region, particularly over northern Baffin Island (see Table 2 and Figures 12 to 14). As a result, accelerated melt and retreat of the ice continued, most notably in Jones Sound and along the eastern and southern margins of the ice pack in Baffin Bay and Davis Strait. Ice extents and concentrations in these areas resembled conditions normally observed 1 to 2 weeks later in the season. The ice in a large section of Eureka Sound, extending from Slidre Fiord to Bay Fiord also fractured 2 to 3 weeks early (see Figure 17). Continued ice drift southwards out of Nares Strait and eastwards out of Barrow Strait, while resulting in greatly reduced ice concentrations in these source areas, jointly contributed to a large area of greater than normal ice concentrations in northwestern Baffin Bay and in Lancaster Sound. Periods of easterly winds were also partly responsible for the elevated ice concentrations in Lancaster Sound as these prevented the ice from freely flushing into Baffin Bay. Greater than normal multi-year ice concentrations also continued to be found in the remaining Baffin Bay ice pack as a result of the ice flushing out of Nares Strait. Elsewhere, ice concentrations in Wellington Channel, the Gulf of Boothia and Committee Bay were normal, although the very southern part of Pelly Bay fractured a week earlier than normal. Mid-July ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 17 and Figure 18, respectively.

August 2010

Mean air temperatures in August continued to be above normal everywhere, again particularly over northern Baffin Island (see Table 2 and Figures 12 to 14). The above normal temperatures, in conjunction with persistent southerly winds over Baffin Bay and easterly winds over Jones Sound, served to clear most of the ice out of these areas by mid-August (2 weeks early) except for a remnant area of very open drift to open drift ice in the central sections of Baffin Bay. Easterly winds also helped maintain an area of greater than normal ice concentration in western Lancaster Sound, where ice that had exited Barrow Strait and Wellington Channel was prevented from flushing eastward and outward. Ice attempting to exit Prince Regent Inlet into western Lancaster Sound was also affected by this situation and, as a result, greater than normal ice concentrations were also observed in the inlet in the first half of August. Further north, northern and eastern Norwegian Bay became entirely ice free by mid-August, as a result of the prevailing east-northeasterly winds. This, in turn, resulted in greater than normal ice concentrations in southern and western Norwegian Bay as well as in Hell Gate. Nansen Sound and Greely Fiord also became ice free by mid-August, except near the mouth of Nansen Sound where a narrow ice plug remained until the third week of the month. When this plug fractured, it then allowed for very open drift areas of ice to flood back eastward into Nansen Sound. The ice that flushed southward out of Nansen Sound and Greely Fiord in the first half of the month in turn produced slightly greater than normal concentrations of ice in parts of Eureka Sound for a couple of weeks. In the south, lower than normal ice concentrations were observed in the Gulf of Boothia and Committee Bay as melt continued to proceed at an accelerated pace in these areas. Greater than normal concentrations of multi-year ice drifted into Nares Strait from the Arctic Ocean in August, but only trickles of this reached the entrance to Jones Sound – most of this ice melted on its voyage southward through the Strait. The Petermann Glacier, in northwest Greenland, calved the largest ice island seen in the Arctic in decades (~300 km^2) at the beginning of August. This then exited the fiord into Nares Strait at the end of August. Along the north coast of Ellesmere Island, the Ward Hunt Ice Shelf lost ~50 km^2 from the seaward edge of its eastern half in the third week of August. The ice islands from this calving did not drift far as no persistent open water lead formed between the Ellesmere coast and the Arctic pack ice in August. Mid-August ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 19 and Figure 20, respectively.

September 2010

Mean air temperatures in September were again above normal everywhere across the region, with the greatest departures from normal centred over the Committee Bay area (see Table 2 and Figures 12 to 14). During this period, northerly winds prevailed over nearly the entire region. These winds enhanced the influx of Arctic multi-year ice into Nares Strait, maintaining greater than normal ice concentrations in this area. The Petermann Ice Island in Nares Strait broke in two near mid-September and the two halves then drifted southwards, further fragmenting upon entering northern Baffin Bay in October. In the first half of the month, the northerly winds also maintained the large area of bergy water in the northern and eastern parts of Norwegian Bay by pushing sea ice southwestward, and therefore also maintained greater than normal ice concentrations in the southern and western parts of the bay as well as in Hell Gate. Winds served to push some of the ice from the southern part of the Gulf of Boothia into Pelly Bay, so that increasing ice concentrations were observed where open water existed during the month of August. Lower than normal ice concentrations (primarily open drift as opposed to very close pack) continued to be observed in Committee Bay as a result of the much warmer than normal air temperatures centred over this area, in spite of the winds. North of 77°N, freeze-up and new ice formation began in the third week of September. By the end of the month, the new ice north of 77°N had thickened to mostly grey ice and new ice formation was extending southwards into Penny Strait and Wellington Channel and along the Greenland coast down to 75°N. Mid-September ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 21 and Figure 22, respectively.

Table 2: 2010 Temperatures and departures from normal (ºC) for Eastern Arctic

	June		July		August		September	
Stations	Temp.	Depart.	Temp.	Depart.	Temp.	Depart.	Temp.	Depart.
Eureka	4.0	2.3	6.9	1.4	3.5	1.1	-6.2	1.7
Resolute	2.2	2.6	5.3	1.3	4.5	3.1	-3.0	2.0
Pond Inlet	3.5	1.9	8.0	2.2	6.6	2.6	0.5	2.3
Clyde	2.0	1.5	6.9	2.7	5.6	1.8	1.6	1.9
Hall Beach	0.8	0.2	7.9	2.1	6.9	2.4	2.9	3.4
Kugaaruk	3.1	0.2	12.2	3.5	9.3	2.9	2.8	2.7

Figure 12: Air Temperatures for Resolute from June 1st to September 30th, 2010

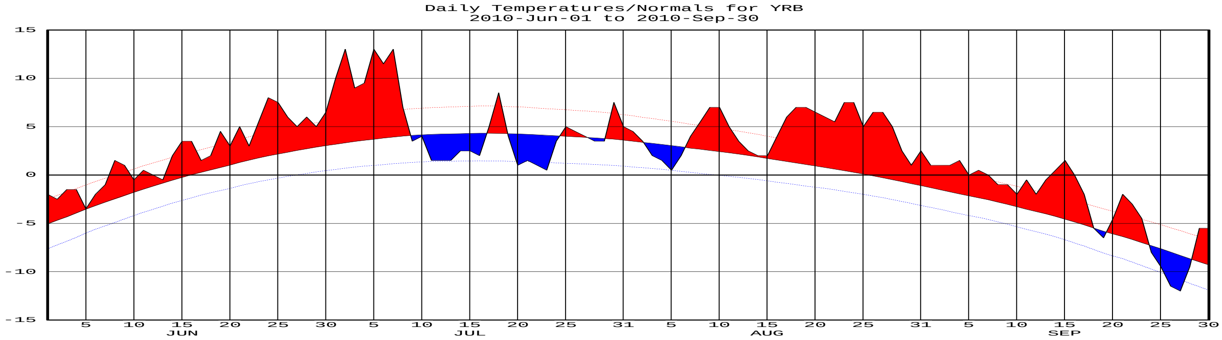


Figure 13: Air Temperatures for Clyde from June 1st to September 30th, 2010

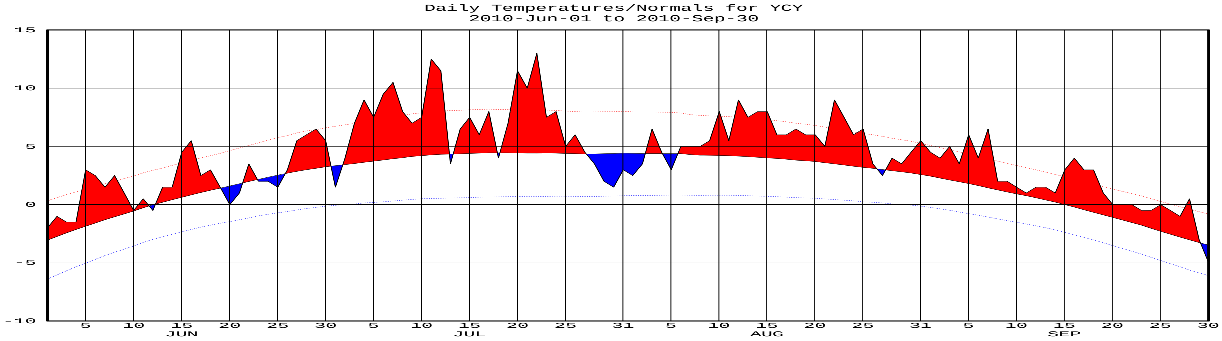


Figure 14: Air Temperatures for Kugaaruk from June 1st to September 30th, 2010

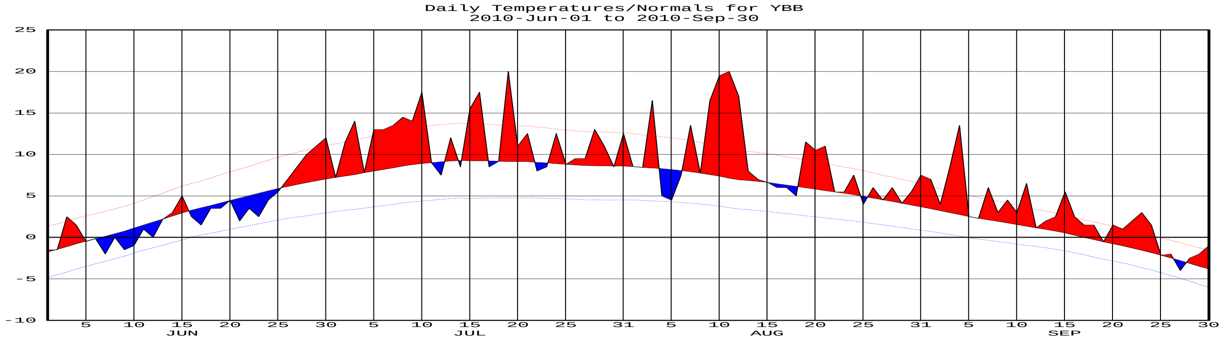


Figure 15: Eastern Arctic Regional chart - June 14th, 2010

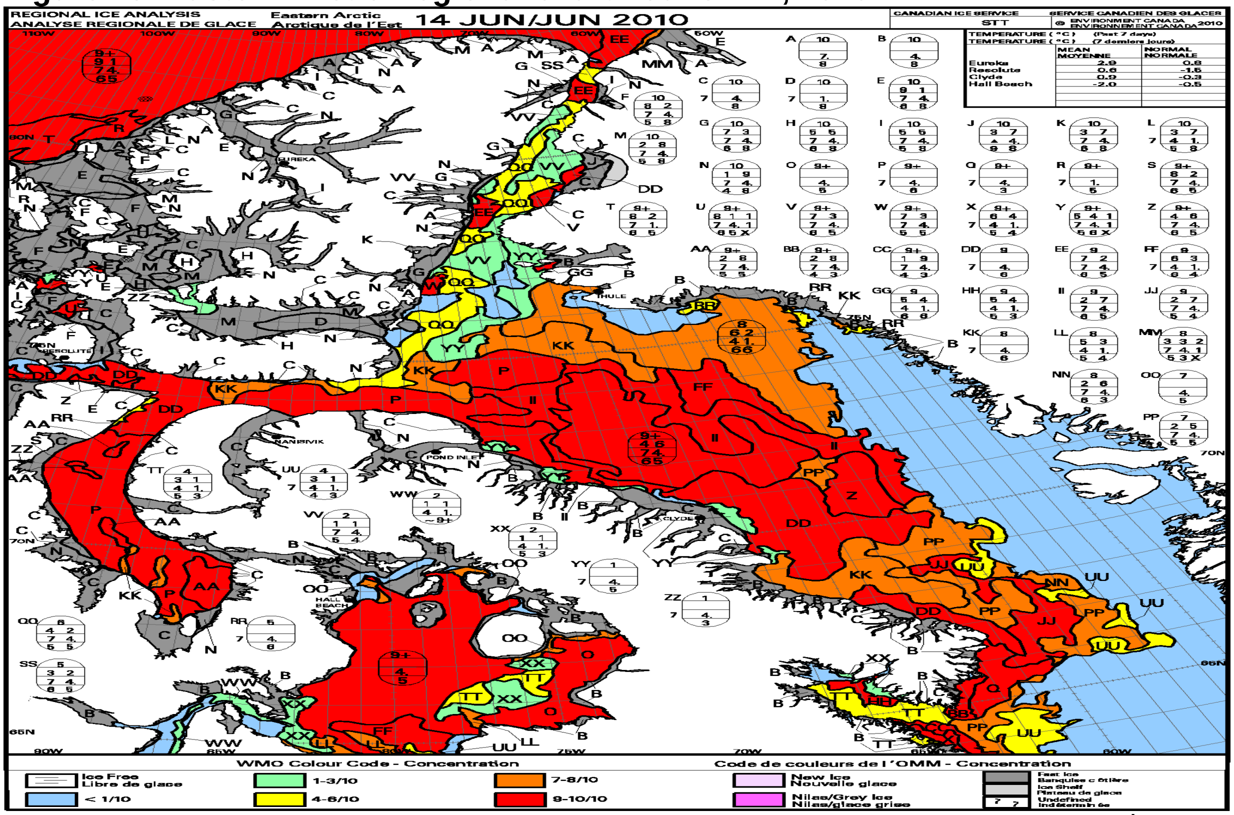


Figure 16: Departure from normal ice concentration for Eastern Arctic - June 14th, 2010

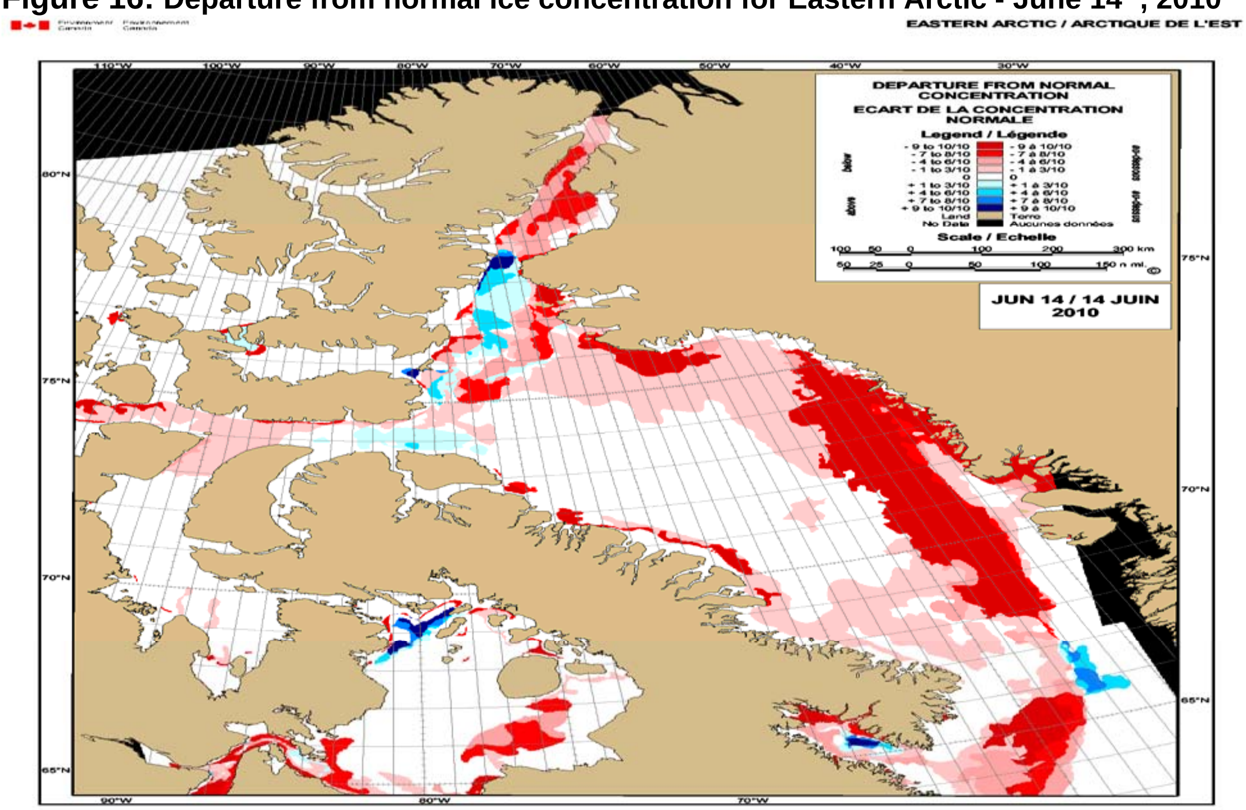


Figure 17: Eastern Arctic Regional chart - July 12th, 2010

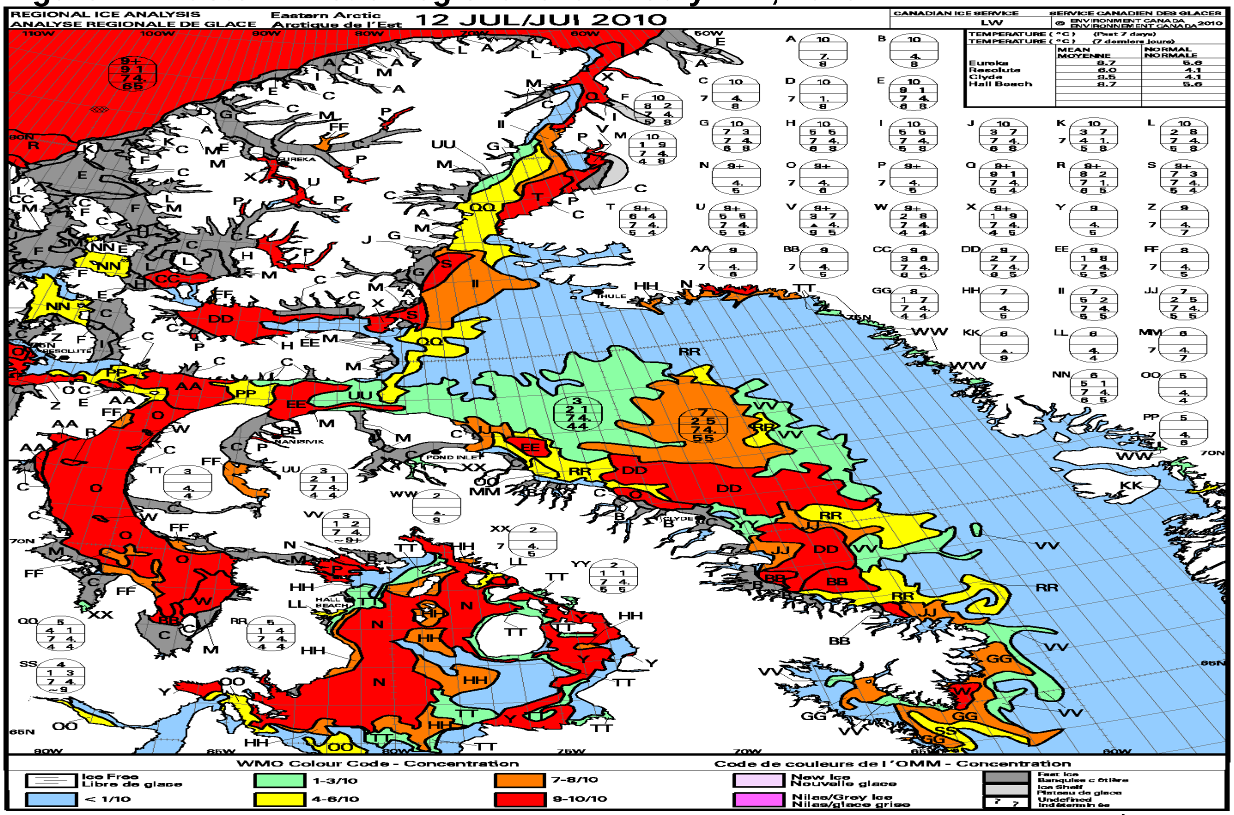


Figure 18: Departure from normal ice concentration for Eastern Arctic - July 12th, 2010

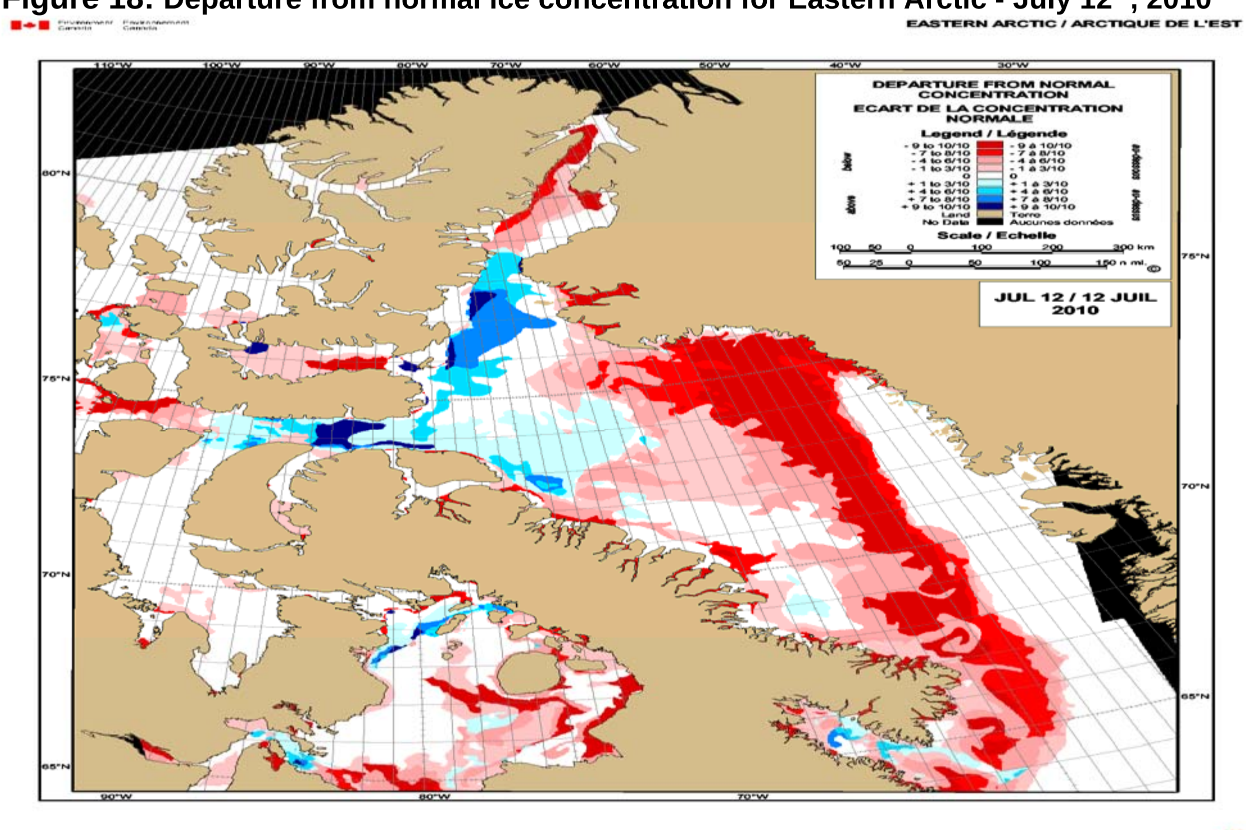


Figure 19: Eastern Arctic Regional chart - August 16th, 2010

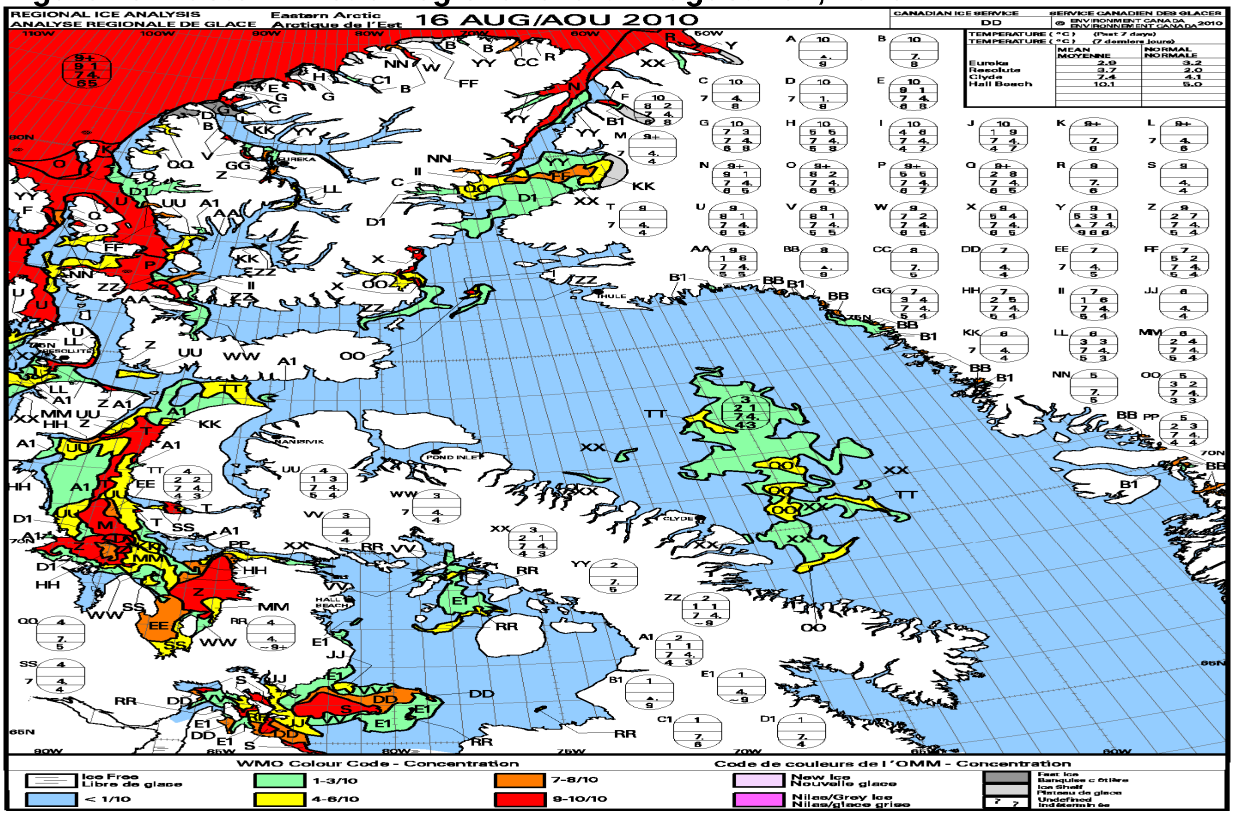


Figure 20: Departure from normal ice concentration for Eastern Arctic - August 16th, 2010

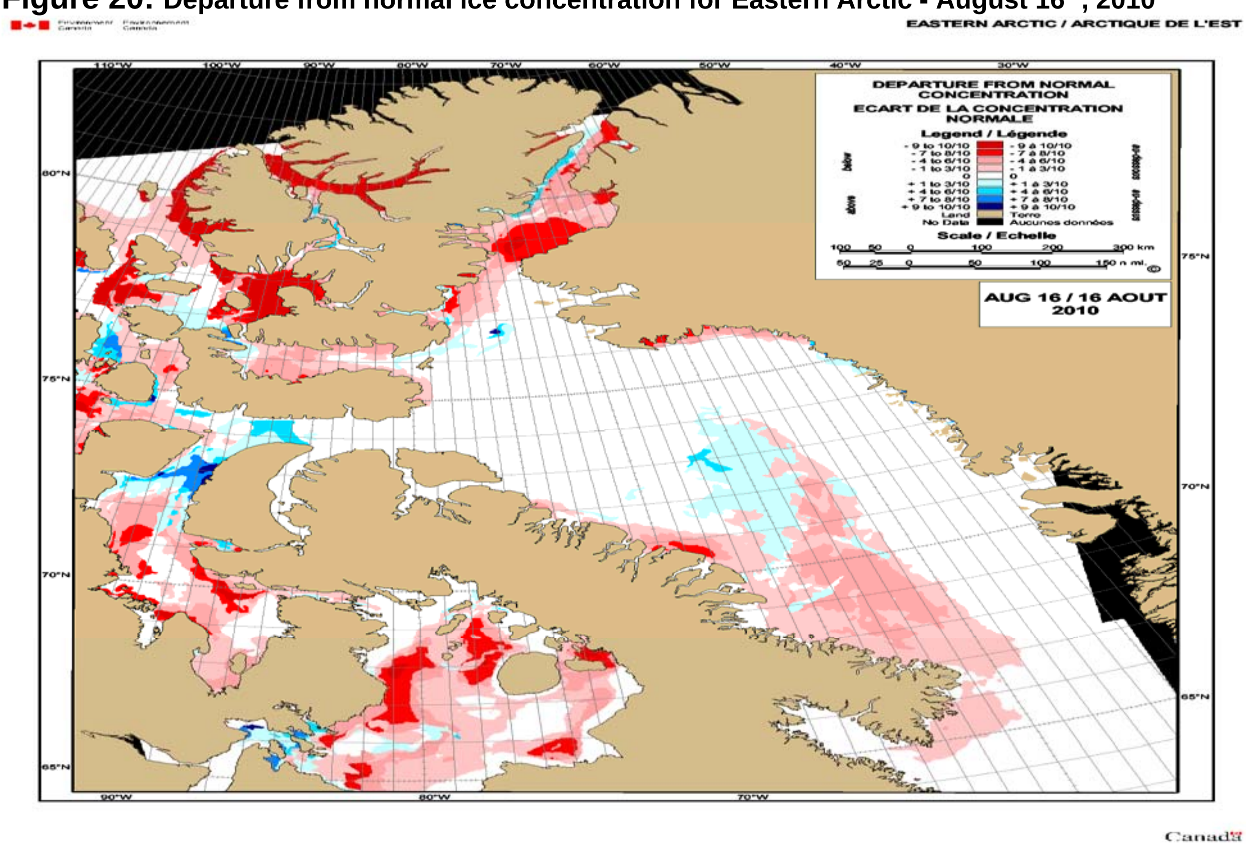


Figure 21: Eastern Arctic Regional chart - September 13th, 2010

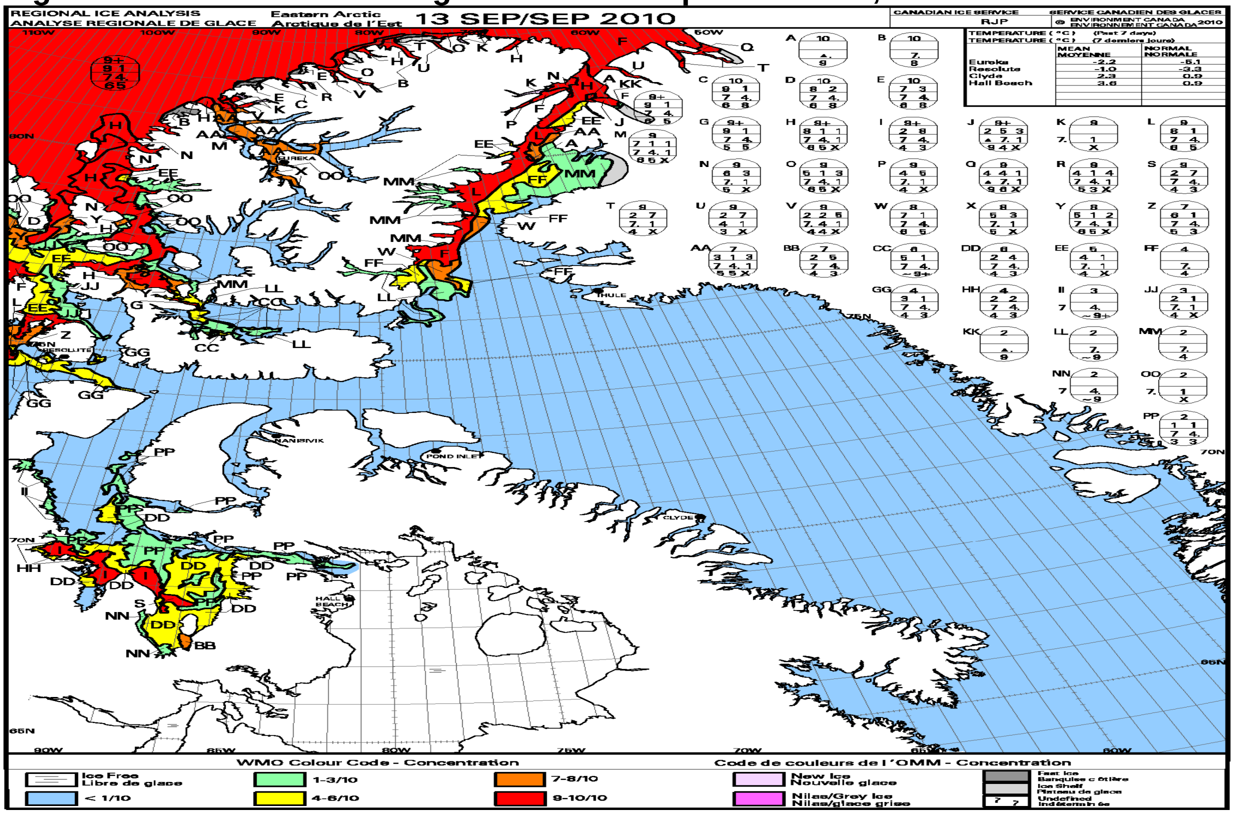
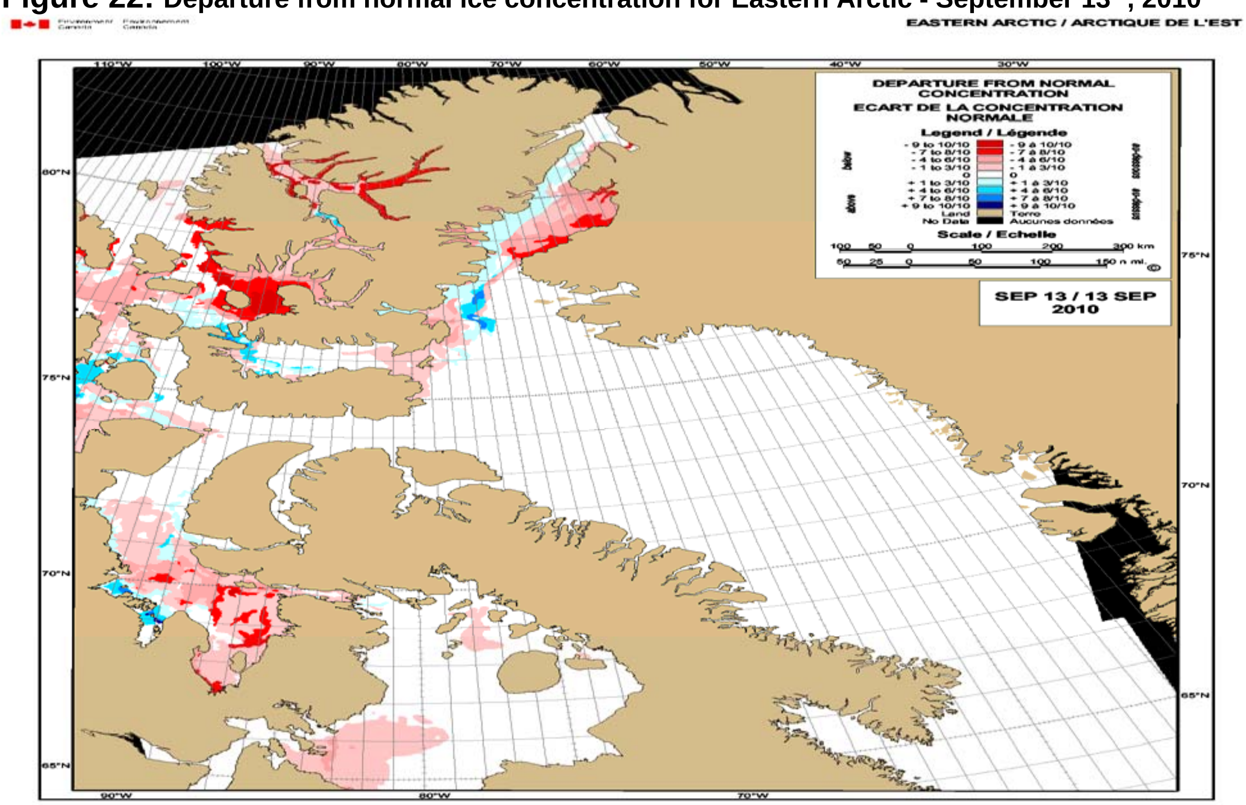


Figure 22: Departure from normal ice concentration for Eastern Arctic - September 13th, 2010



Western and Central Arctic

May 2010

Mean air temperatures during the month of May were above normal north of 72.5N but near to below normal south of this latitude. Winds over the entire region were predominantly from the north. The ice in M'Clure Strait and eastern Melville Sound / western Barrow Strait did not consolidate as per normal over the past winter. The ice in Amundsen Gulf also did not consolidate this year. As a result of the mobility of the ice in these regions, and its responsiveness to the wind, areas of less than normal ice concentrations, and even areas of open water between the pack ice and coastal fast ice, were evident in these waterways in May. Elsewhere, overall ice concentrations were normal, although the composition of the ice in many areas was not: greatly reduced concentrations of multi-year ice were evident in the southeastern Beaufort Sea and in western Parry Channel.

June 2010

Mean air temperatures during the month of June were above normal north and east of Larsen Sound and in the vicinity of Banks Island, but near to below normal elsewhere (see Table 3 and Figures 23 and 24). Strong northerly winds prevailed over the eastern Canada Basin and Beaufort Sea and east-northeasterly winds prevailed over the southern Beaufort Sea. As a result, most of the ice cleared out of Amundsen Gulf and M'Clure Strait by mid-June, and a very wide open water lead developed between the pack ice and the coastal fast ice along western Banks Island and the Tuktoyaktuk Peninsula. A large open water area also developed west of Point Barrow by mid-June as a result of the prevailing easterly winds. Accelerated ice melt in eastern Viscount Melville Sound and western Barrow Strait, as a result of the abnormal mobility of the ice in these areas, resulted in continued lower than normal concentrations in these waterways. Mid-June ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 25 and Figure 26, respectively.

July 2010

Mean air temperatures during the month of July were generally above normal everywhere except below normal over the Arctic Ocean pack ice and over the islands north of 77°N (see Table 3 and Figures 23 and 24). Strong southerly winds prevailed over the western Beaufort Sea and Canada Basin, while winds over the southern Beaufort Sea were generally light and variable. Strong east-southeasterly winds also affected Coronation Gulf and Queen Maud Gulf during this time. As a result of the light and variable winds, the large open water areas west of Point Barrow, in M'Clure Strait, in the southeastern Beaufort Sea and in Amundsen Gulf did not change very much in northward and westward extent in July. The latter two areas did expand in the southward and eastward directions, however, as a result of the fracturing and melting of fast ice areas along the Tuktoyaktuk Peninsula and in Coronation Gulf by mid-July. By the end of July, open water had developed along the nearly the entire length of the Alaskan Coast and along the Canadian mainland from Mackenzie Bay all the way to Rae Strait. The progress of open water development in these areas was approximately 1 to 2 weeks ahead of normal. The fast ice in Viscount Melville Sound also fractured by mid-July, so that the ice in the whole western half of Parry Channel became entirely mobile 3 weeks earlier than normal. Elsewhere in the Central Arctic, fast ice fracturing proceeded at a normal pace except in Byam Martin Channel and northwards where it proceeded at a rate that was 3-4 weeks ahead of normal. While concentrations of old ice in the Beaufort Sea ice pack continued to be less than normal throughout July, by the end of the month an area of greater than normal old ice concentration had developed north of Point Barrow which extended eastward towards Prudhoe Bay. Mid-July ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 27 and Figure 28, respectively.

August 2010

Mean air temperatures during the month of August were generally above normal everywhere except near normal over the Arctic Ocean pack ice and over the islands north of 77°N (see Table 3 and Figures 23 and 24). Prevailing winds were generally north-northeasterly over the entire region. By mid-August, because of the early clearing of M'Clure Strait and the early fracturing of the fast ice in Viscount Melville Sound, large and abnormal areas of open water developed in most of western Parry Channel. The only thing that prevented western Parry Channel from becoming entirely ice free by the end of August were trickles of multi-year ice entering the channel from McDougall Sound, Byam Martin Channel, and from the Arctic Ocean pack ice at the mouth of M'Clure Strait. To the north of Parry Channel, because of the early fracture of the fast ice and its resultant mobility and responsiveness to the wind, large abnormal areas of open water could be found along the southwest coasts of most of the high Arctic islands. By late August the only fast ice that could be found in the Central Arctic were remnant fringes along the north coasts of Borden and Prince Patrick Islands. To the south of Parry Channel, ice melt and retreat continued at an accelerated rate. The open water route to Taloyoak was fully formed by the first week of the month (2 weeks earlier than normal) and areas of open water had developed in northeastern M'Clintock Channel and in Peel Sound by mid-month. By the end of the month, most of the ice in and around Larsen Sound had disappeared. Only a steady influx of ice floes into the southwestern part of Larsen Sound, Victoria Strait and northern Queen Maud Gulf, from the area of multi-year ice in the southwestern half of M'Clintock Channel, prevented problem-free navigation via those waterways. In the Western Arctic, accelerated deterioration of the Beaufort Sea ice pack continued, especially south of 75°N and west of 135°W. Only a narrow tongue of very close pack ice, east of 135°W, intruded southward to nearly 71°N. To the west of this tongue, open drift ice conditions prevailed where very close pack ice is normally expected. To the south and southwest of this tongue, the pack ice was more than twice as far from the coast as normal for this time of the year, especially north of Point Barrow where it only reached 74.5°N. Contrary to the trend in the rest of the Western Arctic in August, an abnormal band of open drift to close pack ice lingered just off the coast between Harrison and Prudhoe Bays throughout the month of August. Mid-August ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 29 and Figure 30, respectively.

September 2010

Mean air temperatures during the month of September were above normal everywhere except for a small area in the eastern Canada Basin near 80°N where temperatures were near to below normal (see Table 3 and Figures 23 and 24). By mid-September in the Western Arctic, ice concentrations in the Arctic Ocean pack ice were far less than normal, although they did not break the record set in 1998 for this area, coming in third lowest after 2008. The abnormal band of ice off the Alaskan coast between Harrison and Prudhoe Bays lingered right to the end of September, and remnant areas of very open drift ice from this patch could still be found in the area when new ice began forming along the coast in the first week of October (1 week earlier than normal). In the Central Arctic, by mid-September, mostly open water continued to prevail in western Parry Channel, setting a new record for lowest ice coverage in this area, beating the old 1998 record by a significant margin. South of Parry Channel, an area of primarily multi-year ice remained in southern M'Clintock Channel and tongues of multi-year ice extended north and south of this. As a result of ice drifting from M'Clintock Channel into southwestern Larsen Sound, Victoria Strait and northern Queen Maud Gulf, ice concentrations in these areas were somewhat greater than normal by the end of the melt season. Mid-September ice conditions, as well as the departure from 1971-2000 median ice concentrations, are shown in Figure 31 and Figure 32, respectively.

Table 3: 2010 Temperatures and departures from normal (ºC) for Western Arctic

	June		July		August		September	
Stations	Temp.	Depart.	Temp.	Depart.	Temp.	Depart.	Temp.	Depart.
Gjoa Haven	1.7	0.2	8.8	1.3	7.7	2.1	2.4	2.7
Cambridge Bay	2.9	0.7	10.1	2.0	8.6	2.4	1.8	2.4
Kugluktuk	6.6	1.7	10.7	0.3	10.5	1.9	3.9	1.3
Tuktoyaktuk	6.6	0.4	12.9	1.9	11.7	2.6	4.1	1.4
Point Barrow	1.0	-0.7	5.7	1.0	6.1	2.4	3.4	3.8

Figure 23: Air Temperatures for Tuktoyaktuk from June 1st to September 30th, 2010

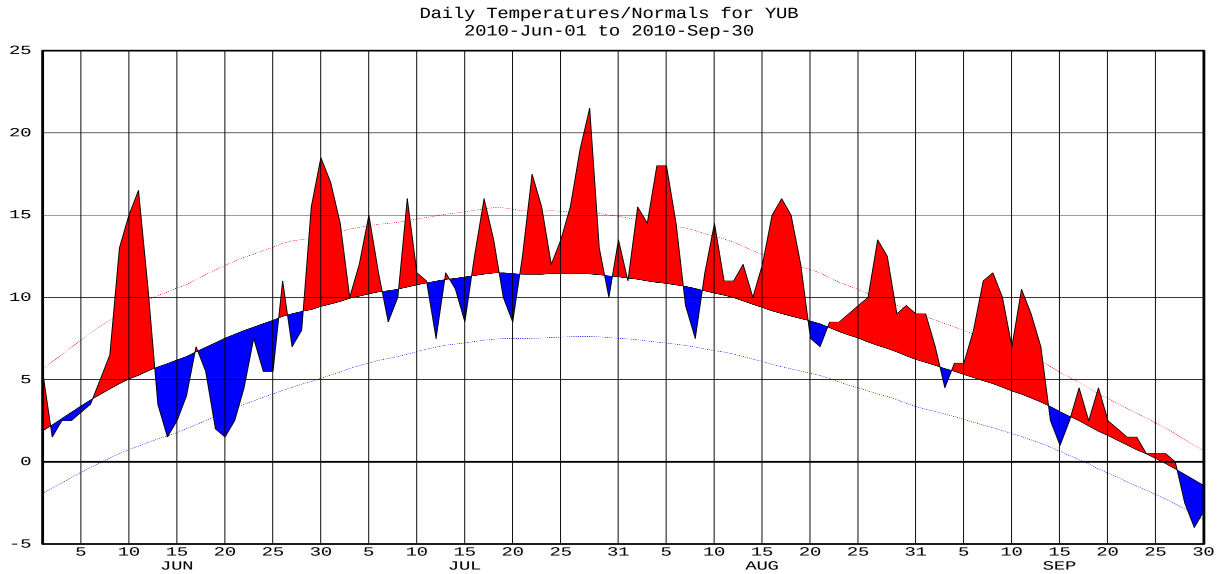


Figure 24: Air Temperatures for Cambridge Bay from June 1st to September 30th, 2010

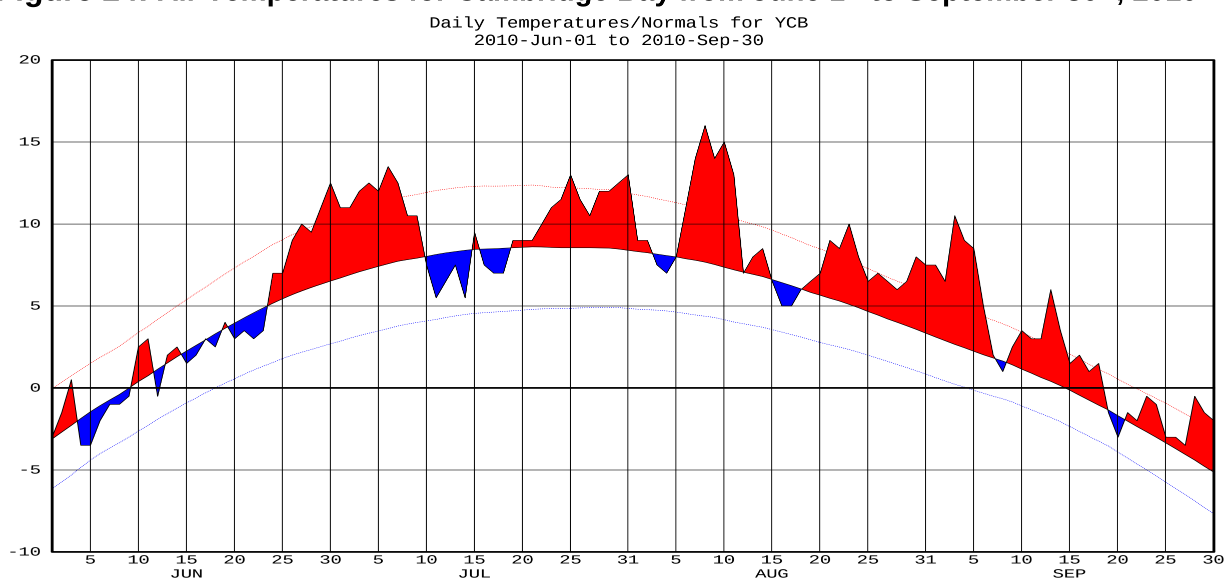


Figure 25: Western Arctic Regional chart - June 14th, 2010

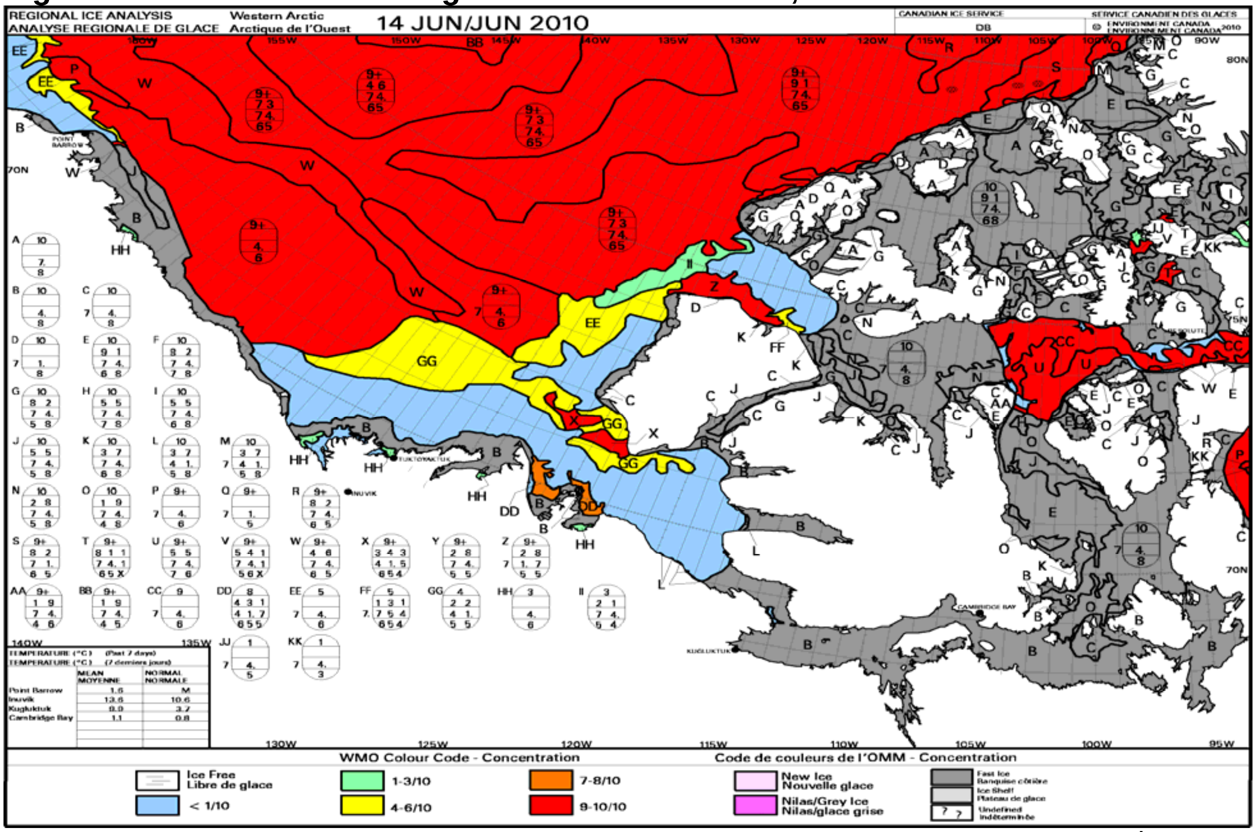


Figure 26: Departure from normal ice concentration for Western Arctic - June 14th, 2010

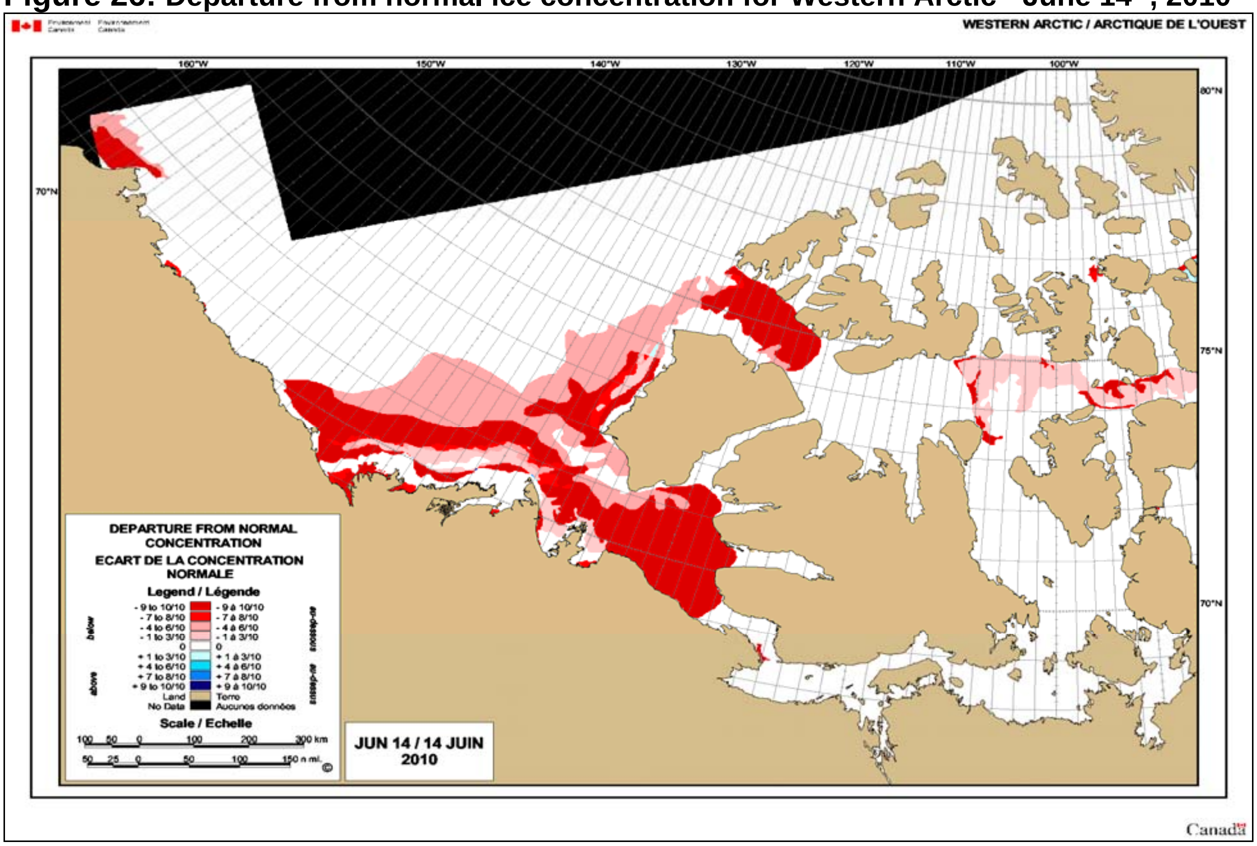


Figure 27: Western Arctic Regional chart - July 12th, 2010

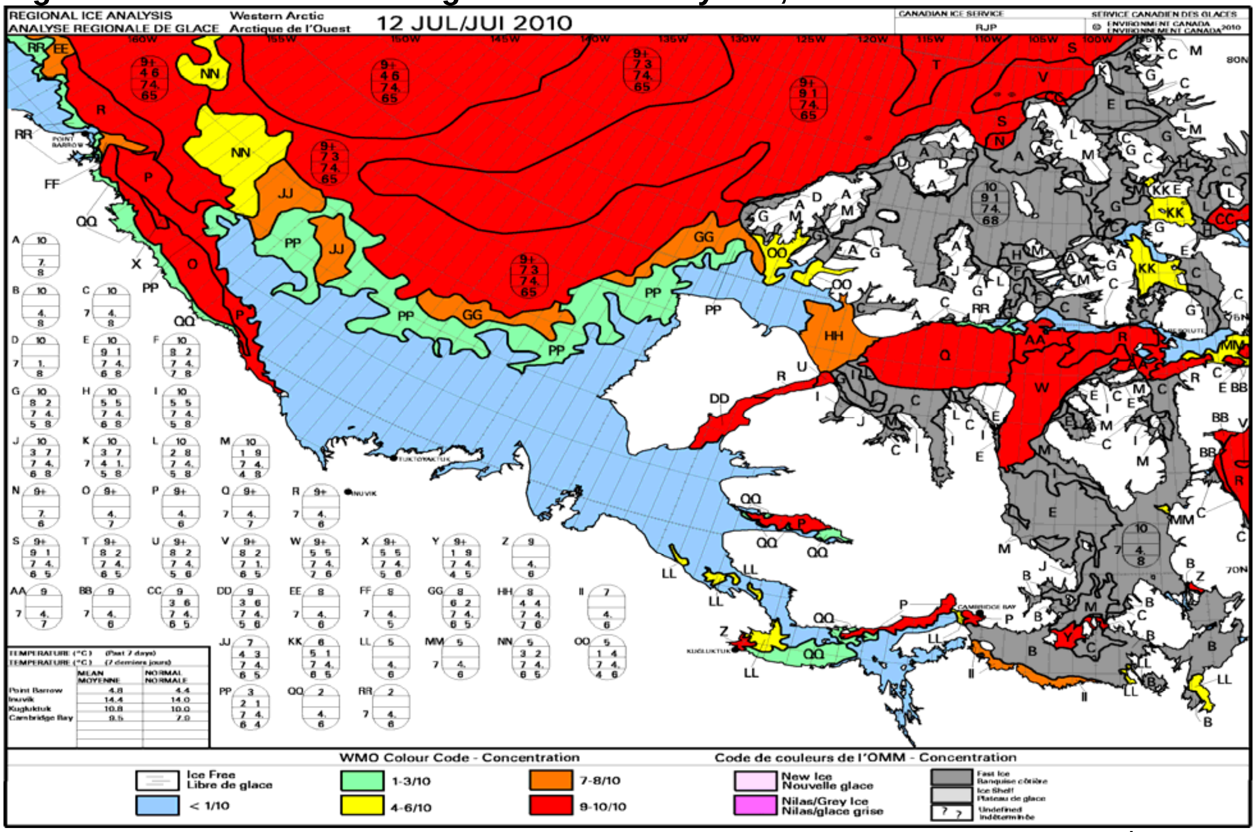


Figure 28: Departure from normal ice concentration for Western Arctic - July 12th, 2010

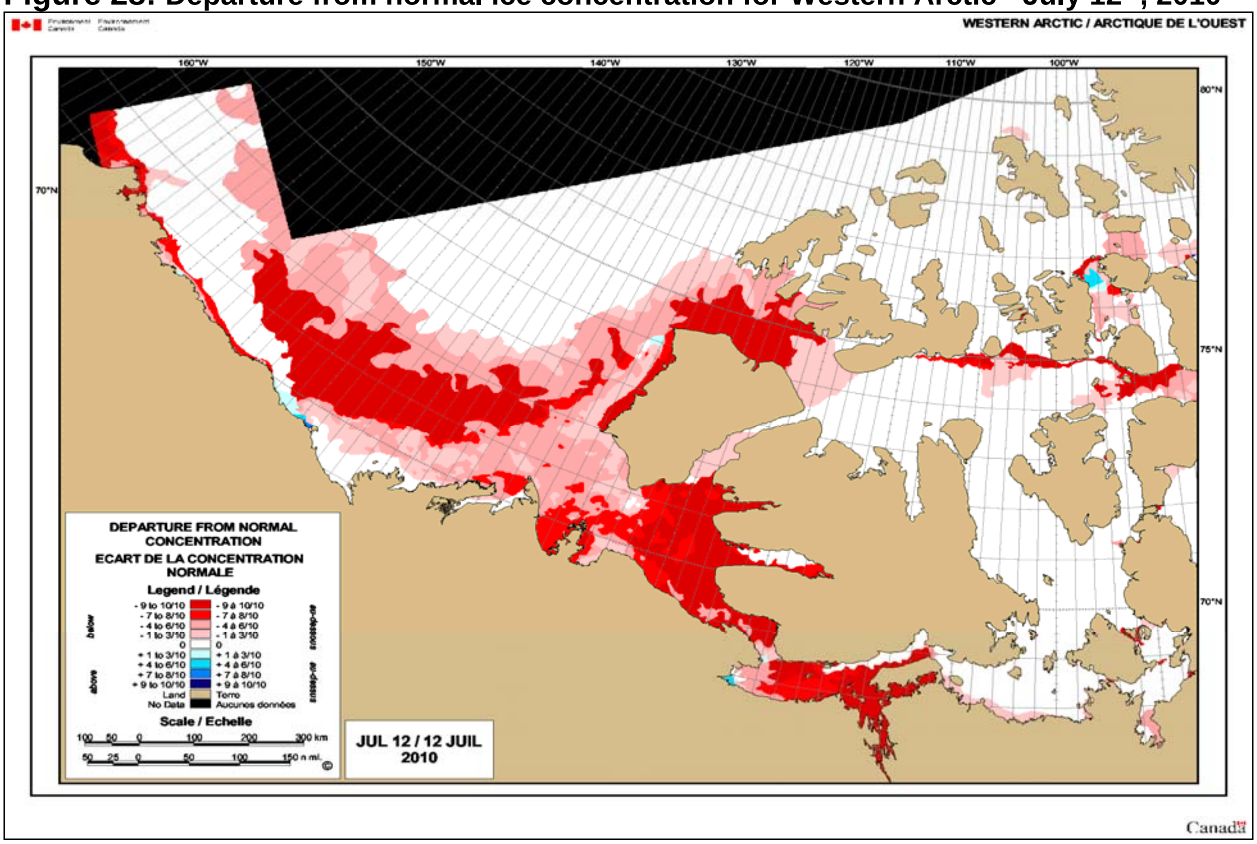


Figure 29: Western Arctic Regional chart - August 16th, 2010

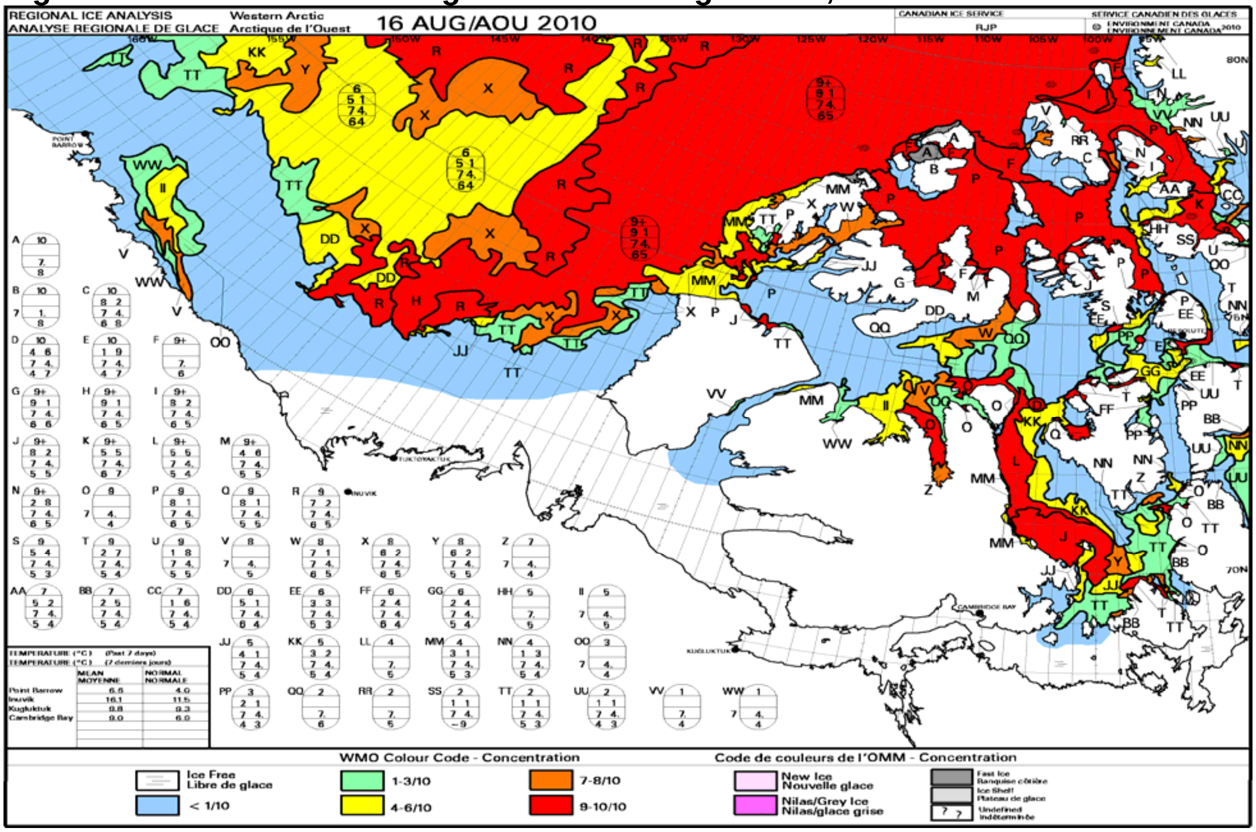


Figure 30: Departure from normal ice concentration for Western Arctic - August 16th, 2010

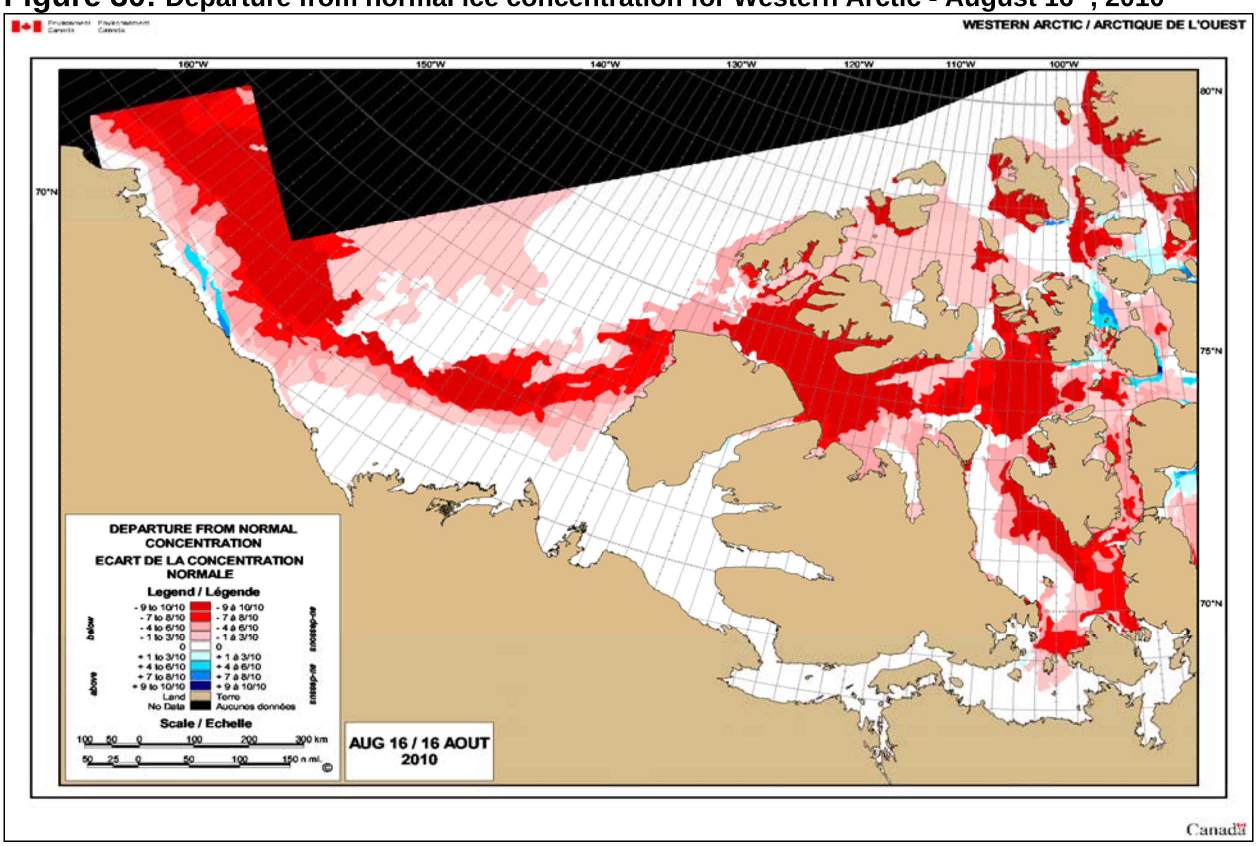


Figure 31: Western Arctic Regional chart - September 13th, 2010

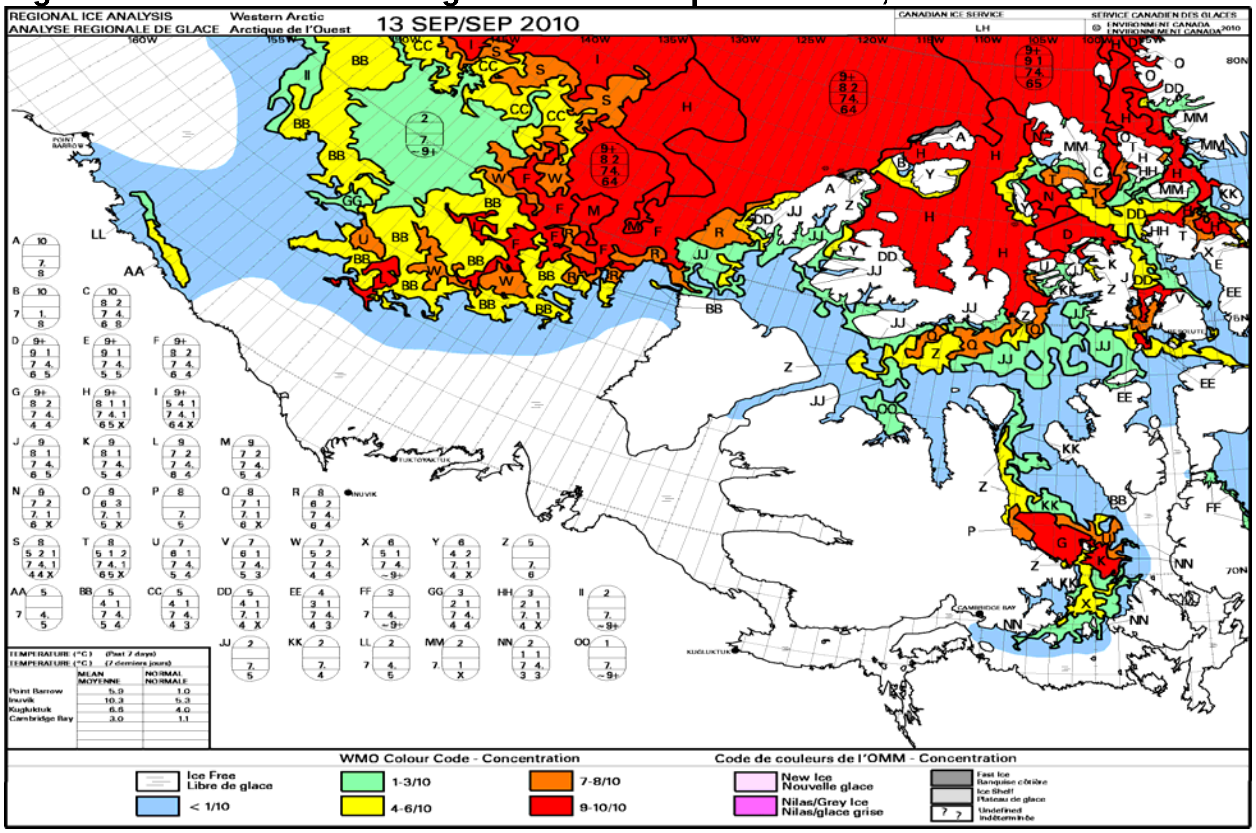


Figure 32: Departure from normal ice concentration for Western Arctic - September 13th, 2010

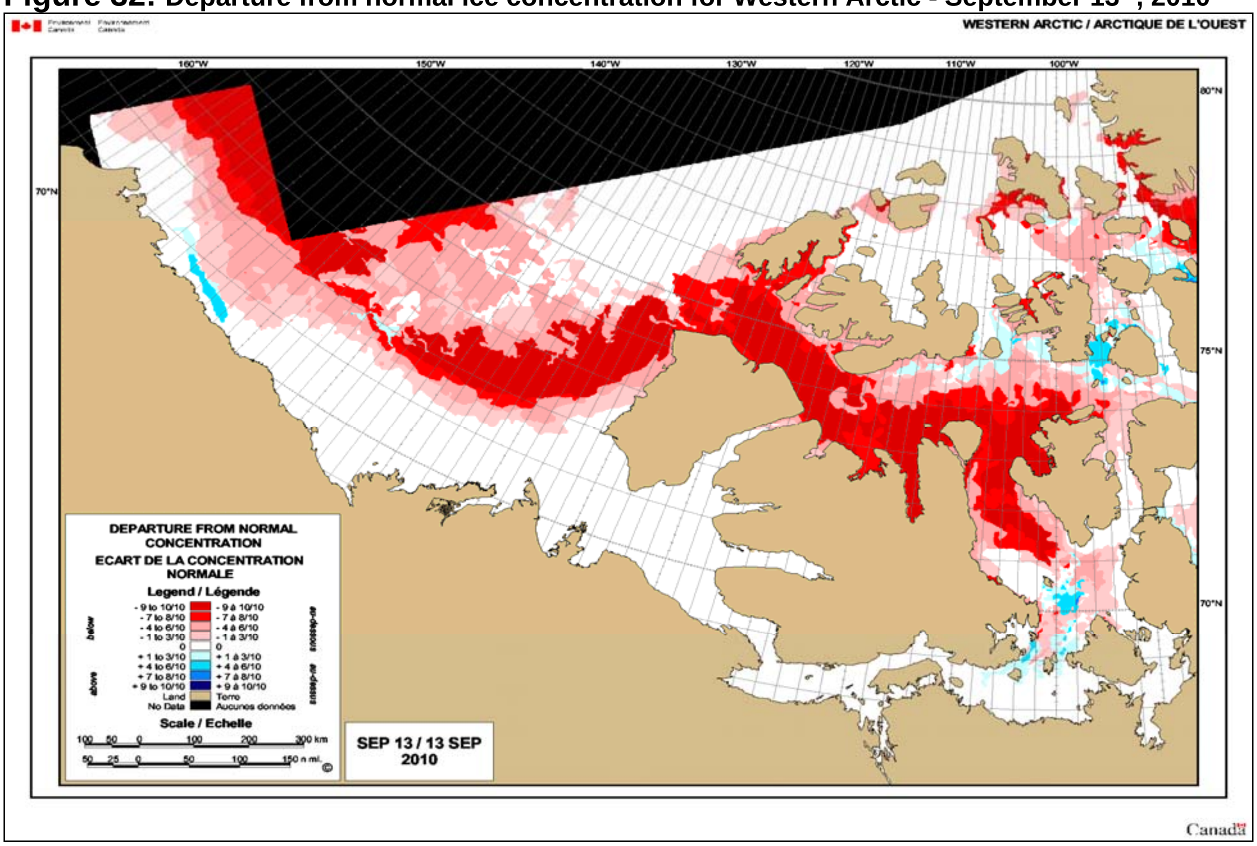
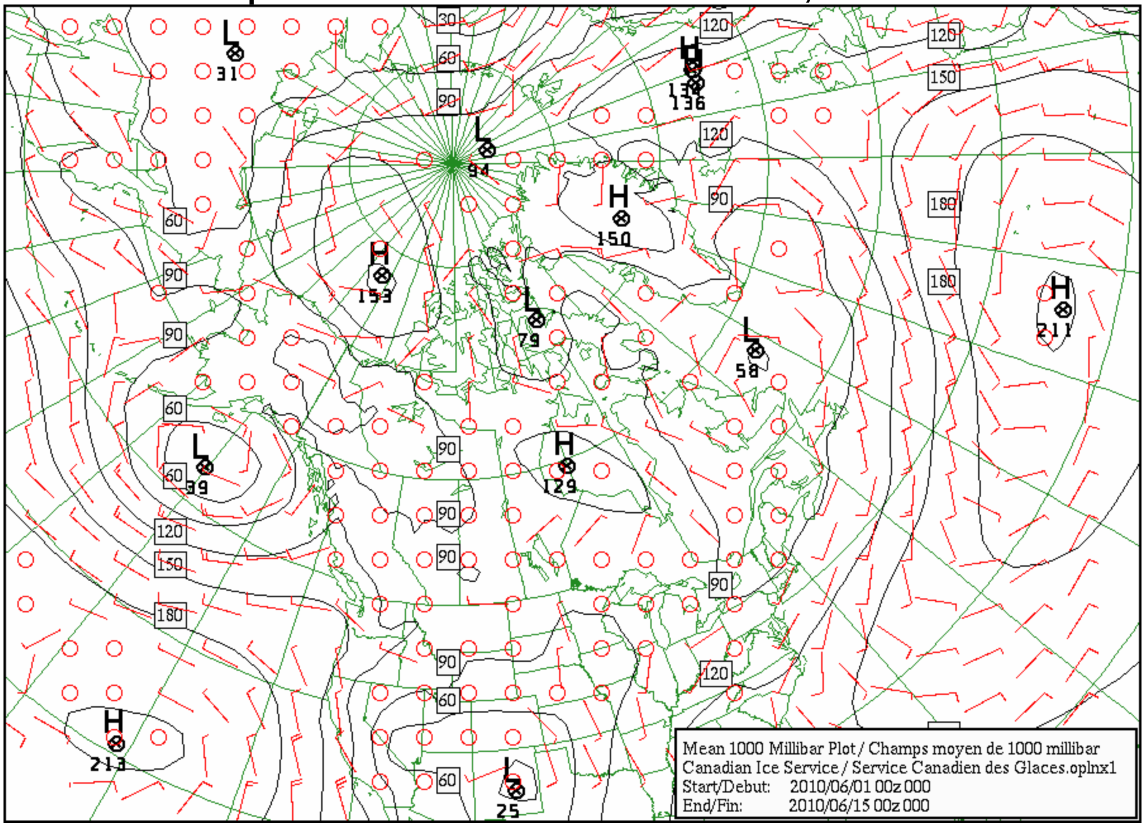


Figure 33: 1000 mb pattern for June 1-15 and June 16-30, 2010



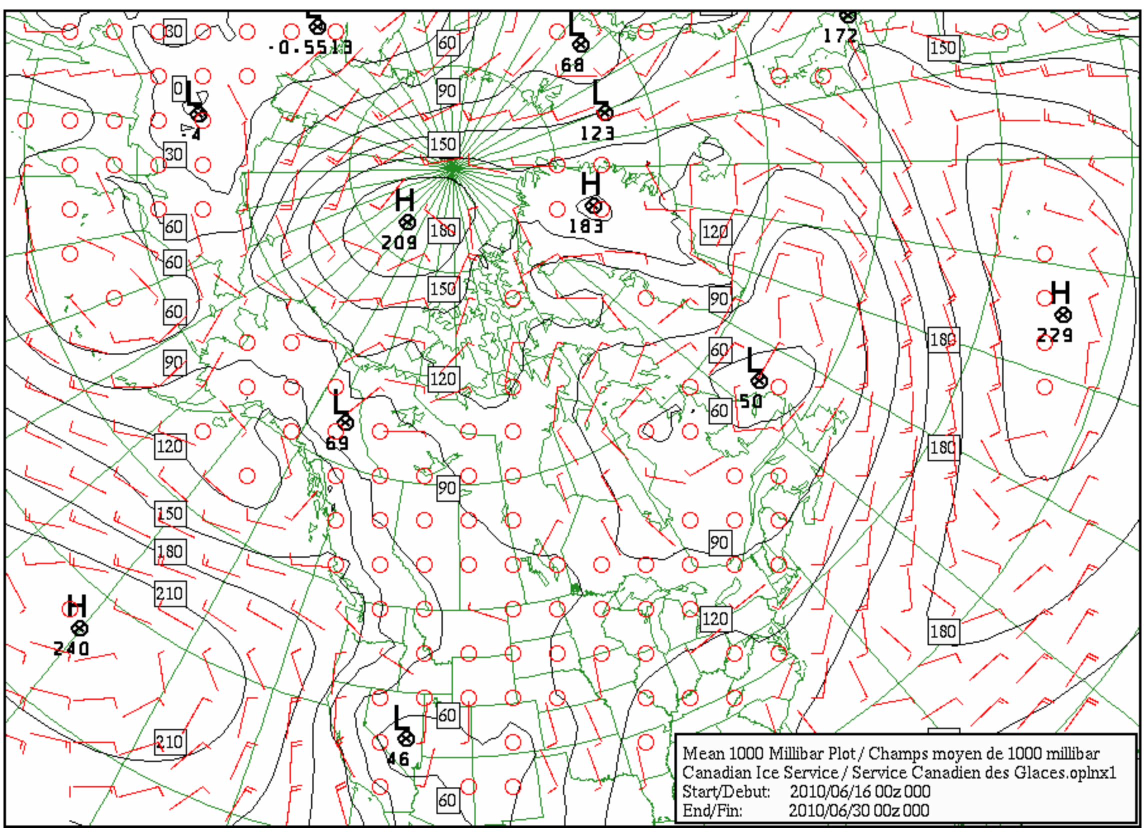
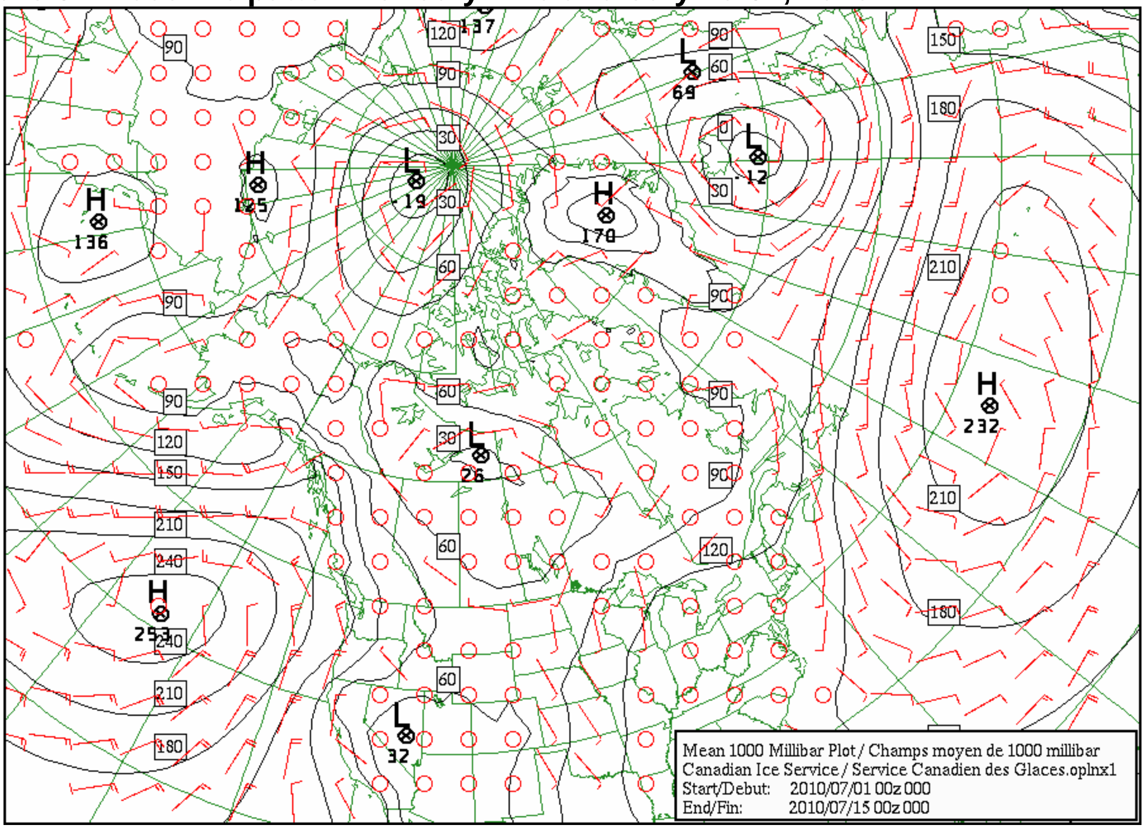


Figure 34: 1000 mb pattern for July 1-15 and July 16-31, 2010



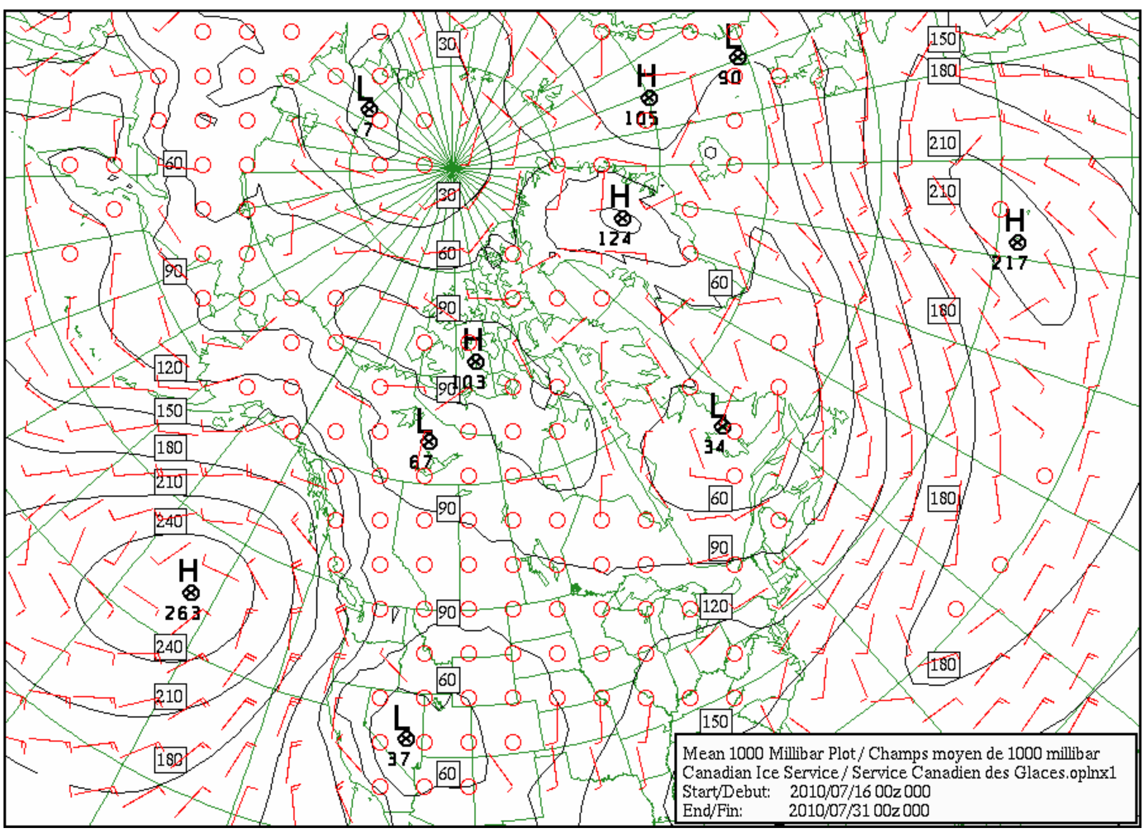


Figure 35: 1000 mb pattern for August 1-15 and August 16-31, 2010

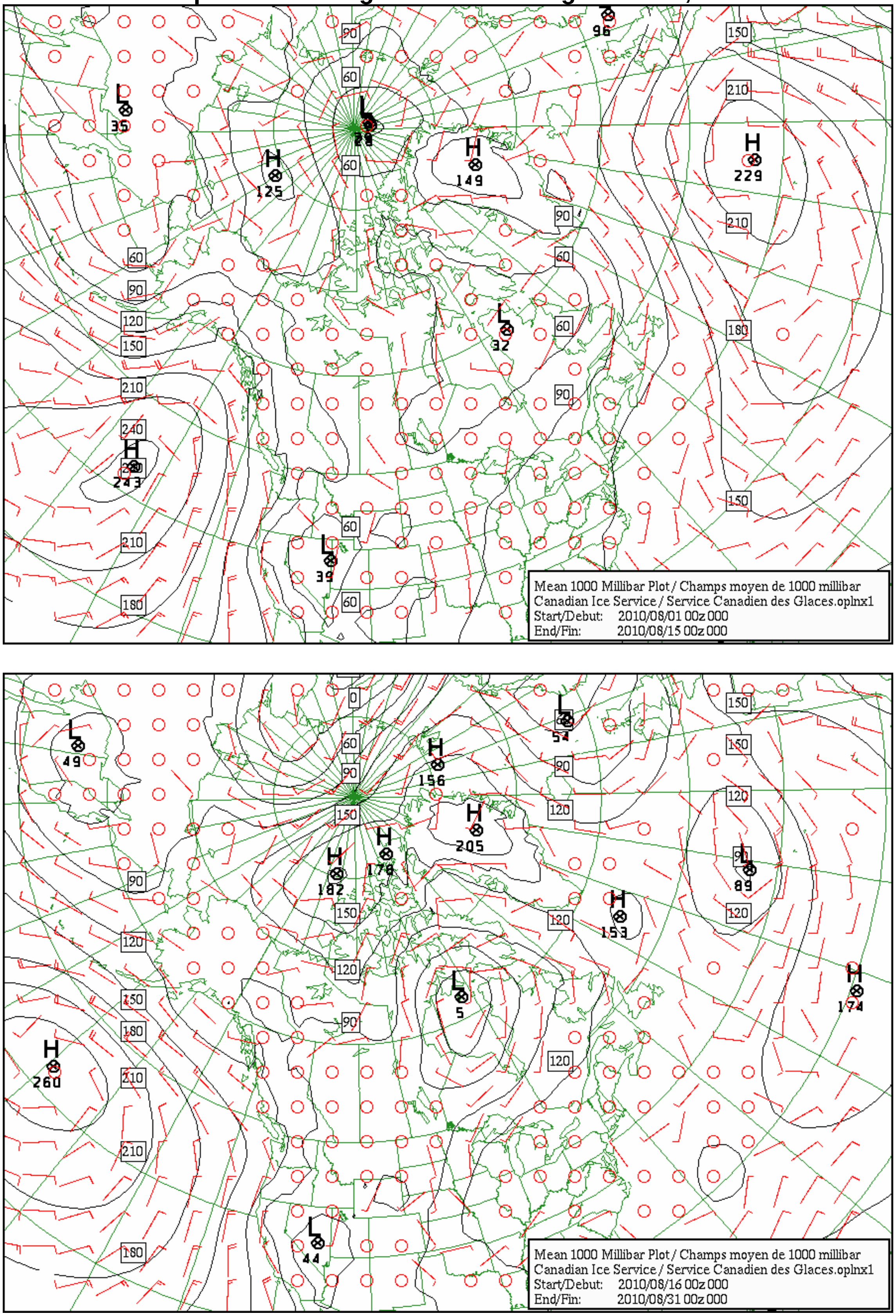


Figure 36: 1000 mb pattern for September 1-15 and September 16-30, 2010