Environment Canada Environnement Canada

Seasonal Summary

Canadian Arctic Waters
Summer 2011

By

Canadian Ice Service
Le service canadien des glaces

Canada

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Executive Summary

After a slow ice melt at the beginning of the season, mean air temperatures climbed rapidly to above normal values during the summer season. The ice over Hudson Bay and Foxe Basin melted very quickly during June and July. This same breakup pattern was also observed over the rest of the Arctic from July to September. Due to the extensive ice melt that occurred this summer, a new record was set for the lowest ice coverage ever observed over Canadian Arctic Waters since 1968.

Hudson and Foxe

May 2011

A very late freeze-up in the middle of the winter season and much thinner ice than normal at the beginning of May resulted in the ice melting rapidly along the Labrador Coast during the second half of May. Mean air temperatures were near normal values over most locations except below normal over Hudson Strait, northern Hudson Bay and Foxe Basin (see Table 1). Northwesterly winds developed along the Labrador Coast, from Davis Strait to northern Hudson Bay and in Foxe Basin, while easterly winds prevailed over southern Hudson Bay. As a result, this helped to clear northern Hudson Strait and the northwestern shore of Hudson Bay, while it maintained an area of open drift ice along the Labrador Coast. Due to thinner than normal ice, ice concentrations were lower than normal along the eastern edge of the pack ice in Davis Strait, east of Hudson Strait and in Ungava Bay. Up to 2 tenths of old ice was observed in the pack ice over the eastern entrance to Hudson Strait and in Davis Strait. Large areas of open water developed along portions of the eastern shore of Hudson Bay and west of Belcher Islands. The rest of the area including Foxe Basin was covered with first-year ice. Mid-May ice conditions, as well as the departure from median ice concentrations, are shown in Figure 2 and Figure 3, respectively.

June 2011

Mean air temperatures were near normal over most locations except above normal values east of Belcher Islands and along the southwestern shore of Hudson Bay (see Table 1). A south to southeasterly flow developed over most locations except for light and variable winds over northern Hudson Bay. The ice melted rapidly along the Labrador Coast up to Cape Chidley during the first week of June. So by mid-June, most of the ice melted completely except for a few areas of ice left in some bays and inlets which lasted until the last week of June. This represented the first time ever since 1968 that the ice along the Labrador Coast melted completely at the end of June. Elsewhere, mild air temperatures and thinner than normal ice resulted in the ice to melt at a faster than normal pace. As a result, large areas of bergy or open water formed over Frobisher Bay, western Cumberland Sound, northwestern Hudson Strait, southern Ungava Bay and northwestern Hudson Bay during the first two weeks of June. The ice melt accelerated during the second half of June. By the end of June, narrow areas of ice remained along the western shore of Ungava Bay, in coastal areas over western Hudson Strait and northwestern James Bay. A large area of first-year ice remained over the central and northeastern sections of Hudson Bay. Over Foxe

Basin, open drift ice was present over the southeastern section, while an area of open water prevailed along the northern shore of Southampton Island. The rest of Foxe Basin was covered with first-year ice. Mid-June ice conditions, as well as the departure from median ice concentrations, are shown in Figure 4 and Figure 5, respectively.

July 2011

Mean air temperatures were above normal over most locations except near normal over James Bay (see Table 1). The prevailing winds were from the east to southeast along the Labrador Coast, Davis Strait and eastern Foxe Basin, while northwest winds dominated over the rest of the region. The rapid ice melt which occurred in June continued to affect all other regions during the month of July except for Foxe Basin. This produced a new set of records for early breakup over Davis Strait and Hudson Strait. In early July, the ice melted completely over Ungava Bay. The ice melted rapidly over Davis Strait, Hudson Strait and in James Bay during the first half of July. By mid-July, all ice cleared from Hudson Strait and James Bay, while the pack ice in Davis Strait retreated northward to north of Cumberland Sound. The southern ice edge continued its northward progression to reach Home Bay during the last week of July. At the end of July, all areas were clear of ice except for Hudson Bay and Foxe Basin. Ice concentrations decreased rapidly over the central and northeastern sections of Hudson Bay. As a result, some isolated areas of ice were present off the southwestern shore of Hudson Bay towards the end of July. However, the ice over Foxe Basin melted at a slower pace than Hudson Bay. A major portion of the pack ice over Foxe Basin drifted westward due to the easterly winds. Some of the ice in shallow waters remained along the eastern shore and from Prince Charles Island to south of Steensby Inlet. Large areas of open water formed over the southeastern section and the northwestern shore of Foxe Basin after mid-July. The ice coverage for the end of July did not set a new minimum record but was very close to the record established in 2006 (see Figure 1). Mid-July ice conditions, as well as the departure from median ice concentrations, are shown in Figure 6 and Figure 7, respectively.

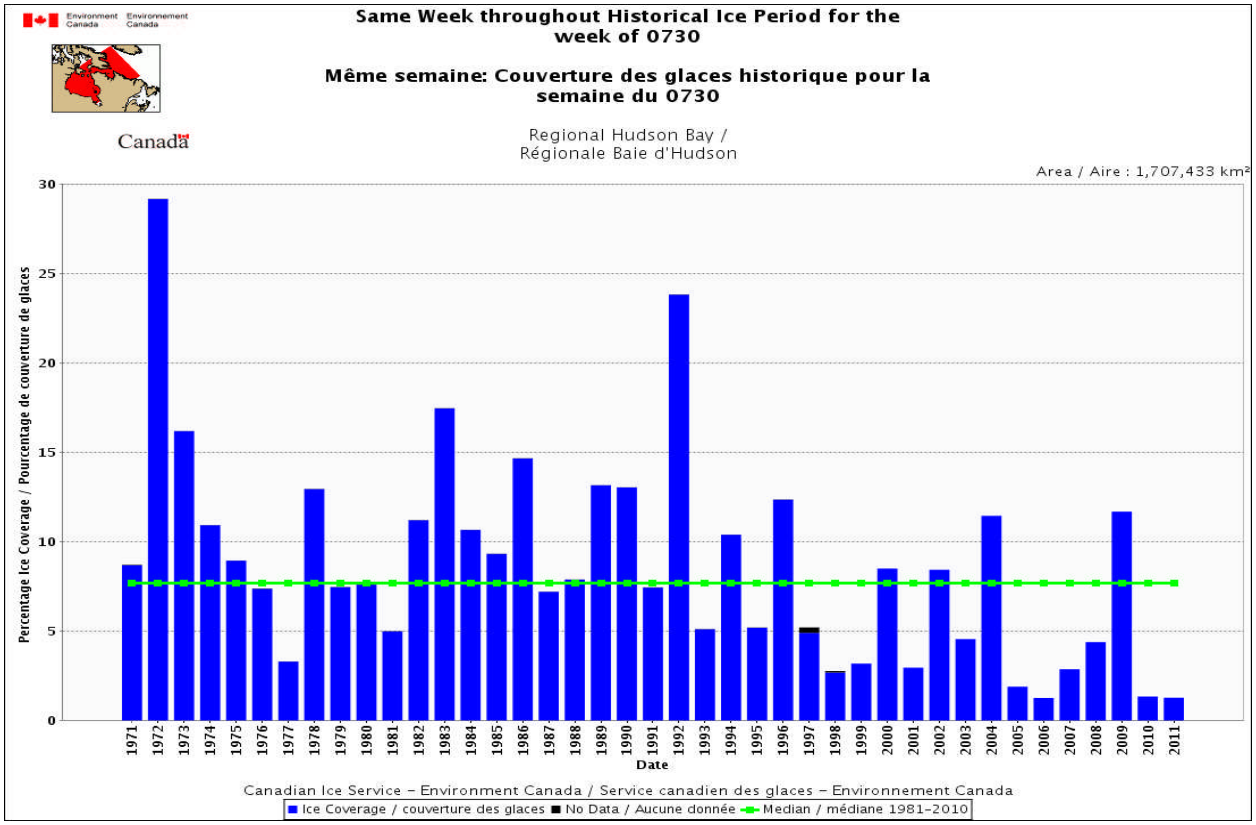

Figure 1: Historical Ice Coverage for Hudson Bay on July 30, 2011.

August 2011

Mean air temperatures were above normal over most locations except near normal over northern Hudson Bay and southern Davis Strait (see Table 1). An east to southeasterly flow dominated over most areas except for light and variable winds over southern Hudson Bay. In early August, all of the remaining ice melted completely over Hudson Bay. The rest of the area was free of ice except for Foxe Basin. Over Foxe Basin, ice concentrations continued to decrease rapidly during August, while the ice is being pushed westward due to the prevailing easterly winds. By mid-August, open drift ice was present over the southeastern and northern sections, while the ice was compacted along the western shore of Foxe Basin and the northern shore of Southampton Island. Some of that ice drifted westward to reach Repulse Bay. By the end of August, a few areas of open drift ice were present from northwest of Prince Charles Island to south of Steensby Inlet. Meanwhile, the rest of the pack ice was located along the northern shore of Southampton Island, in Repulse Bay and over northern Roes Welcome Sound. Some of the ice drifted southward towards the southeastern shore of Southampton Island for a short period of time. An open water route from Foxe Channel to Hall Beach formed during the last week of August which was near normal. Mid-August ice conditions, as well as the

departure from median ice concentrations, are shown in Figure 8 and Figure 9, respectively.

September 2011

Mean air temperatures were above normal over most locations except near normal over Davis Strait and northern Hudson Bay (see Table 1). The ice melted rapidly over Foxe Basin except for the compacted ice over the extreme southwestern section of Foxe Basin. The remaining ice over northern Foxe Basin melted completely during the second week of September. Meanwhile the ice which was present along the northern shore of Southampton Island and in northern Roes Welcome Sound persisted until the end of September. Bergy or open water dominated over the rest of the region. Mid-September ice conditions, as well as the departure from median ice concentrations, are shown in Figure 10 and Figure 11, respectively.

Table 1: 2011 Temperatures and departures from normal (ºC) for Hudson Bay

	May		June		July		August		September	
Stations	Temp	Depart	Temp	Depart	Temp	Depart	Temp	Depart	Temp	Depart
Nain	1.6	0.6	5.7	-0.4	11.8	1.7	11.5	0.9	9.2	2.5
Iqaluit	-5.0	-0.6	3.9	0.4	9.2	1.7	6.9	0.1	3.1	0.9
Kuujjuaq	-1.0	-1.2	7.3	0.3	12.9	1.6	13.7	3.2	7.0	1.4
Cape Dorset	-6.1	-1.1	3.0	0.7	9.5	2.4	6.0	0.2	2.0	0.6
Churchill	-2.2	-1.5	7.7	1.1	14.2	2.4	13.0	1.5	10.3	4.6
Moosonee	5.6	-0.1	11.8	-0.6	16.3	0.6	16.4	1.5	11.7	1.2
Kuujjuarapik	1.5	0.3	8.6	1.7	13.1	2.5	13.7	2.4	9.7	2.4
Hall Beach	-10.2	-1.1	0.5	-0.1	8.1	2.3	5.8	1.3	0.9	1.4

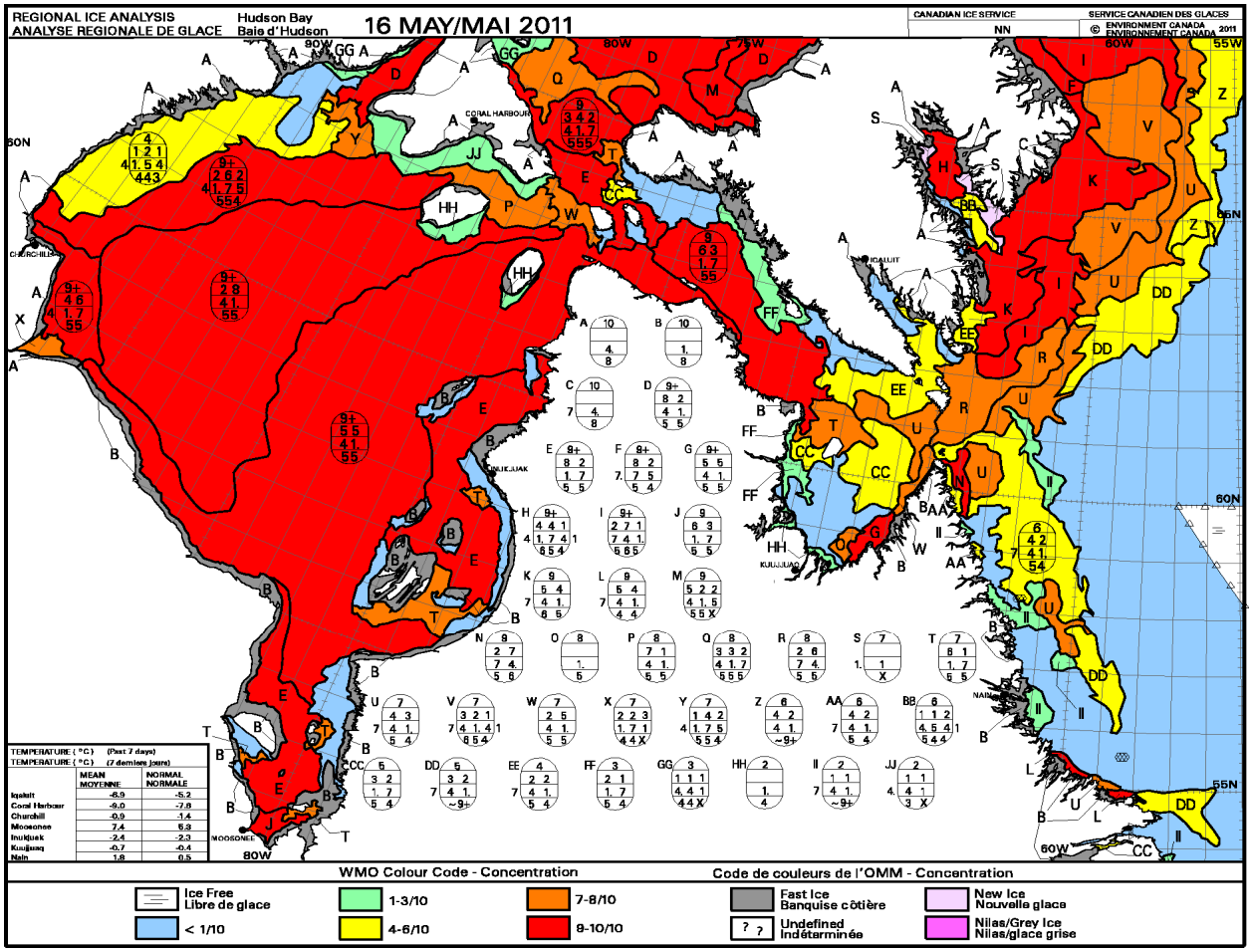

Figure 2: Hudson Bay Regional chart on May 16, 2011.

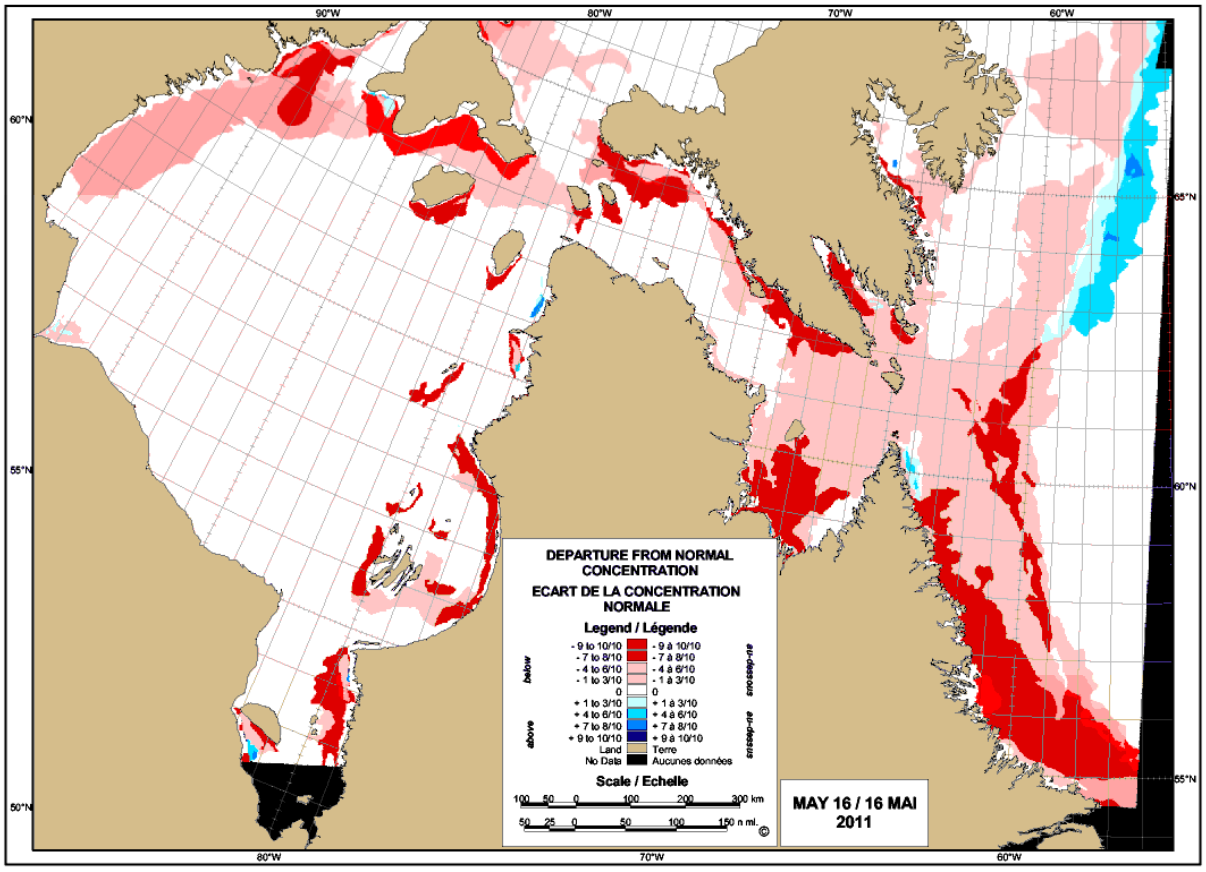

Figure 3: Departure from normal ice concentration for Hudson Bay on May 16, 2011.

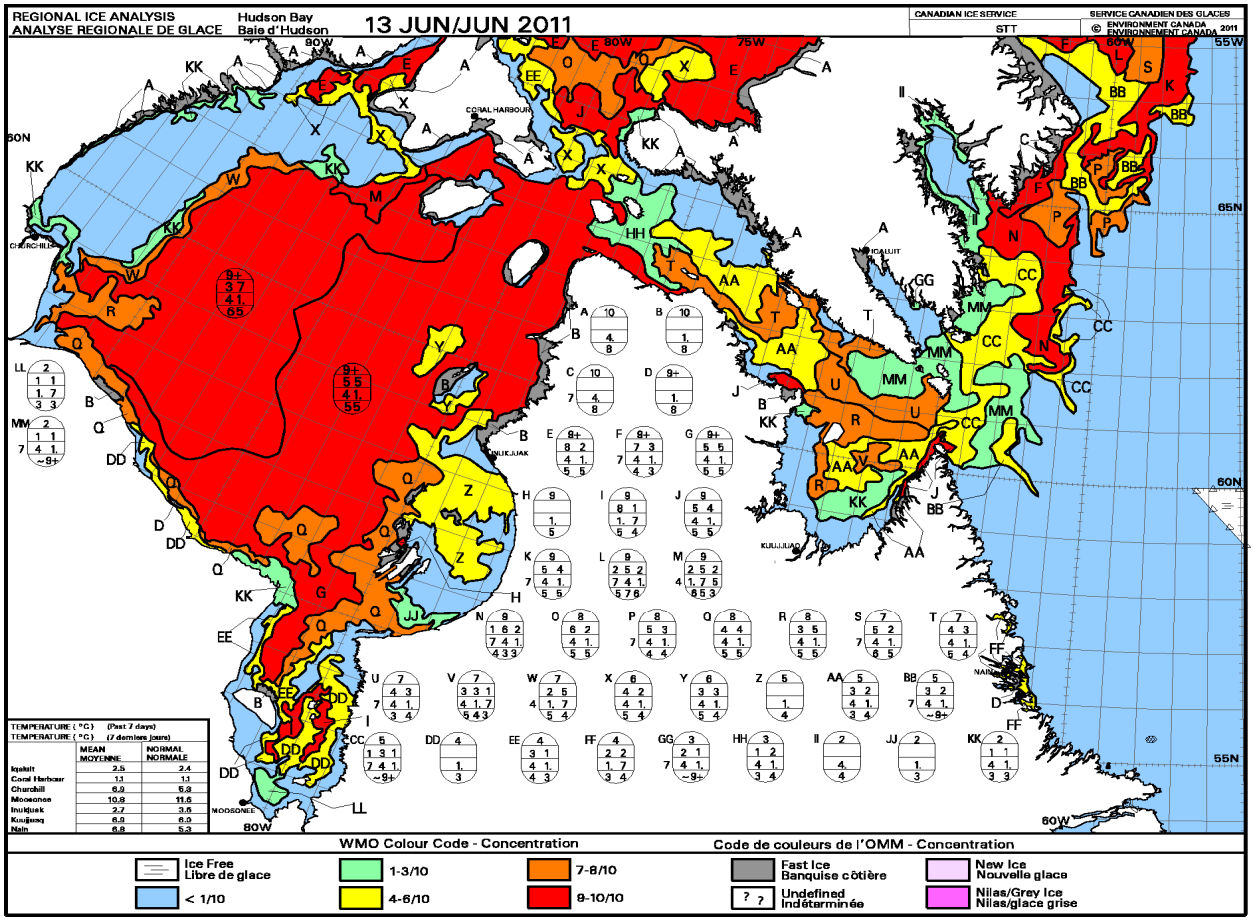

Figure 4: Hudson Bay Regional chart on June 13, 2011.

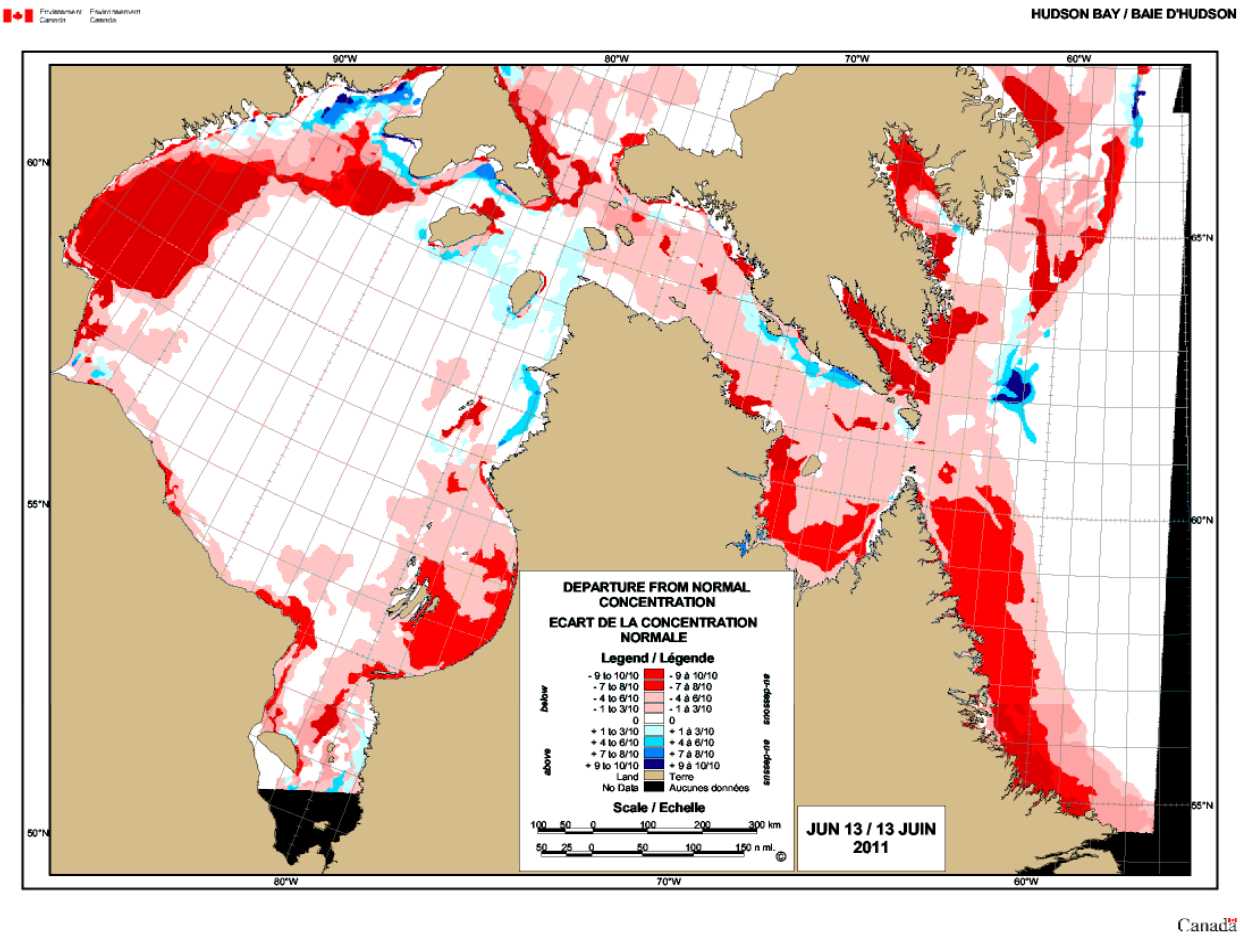

Figure 5: Departure from normal ice concentration for Hudson Bay on June 13, 2011.

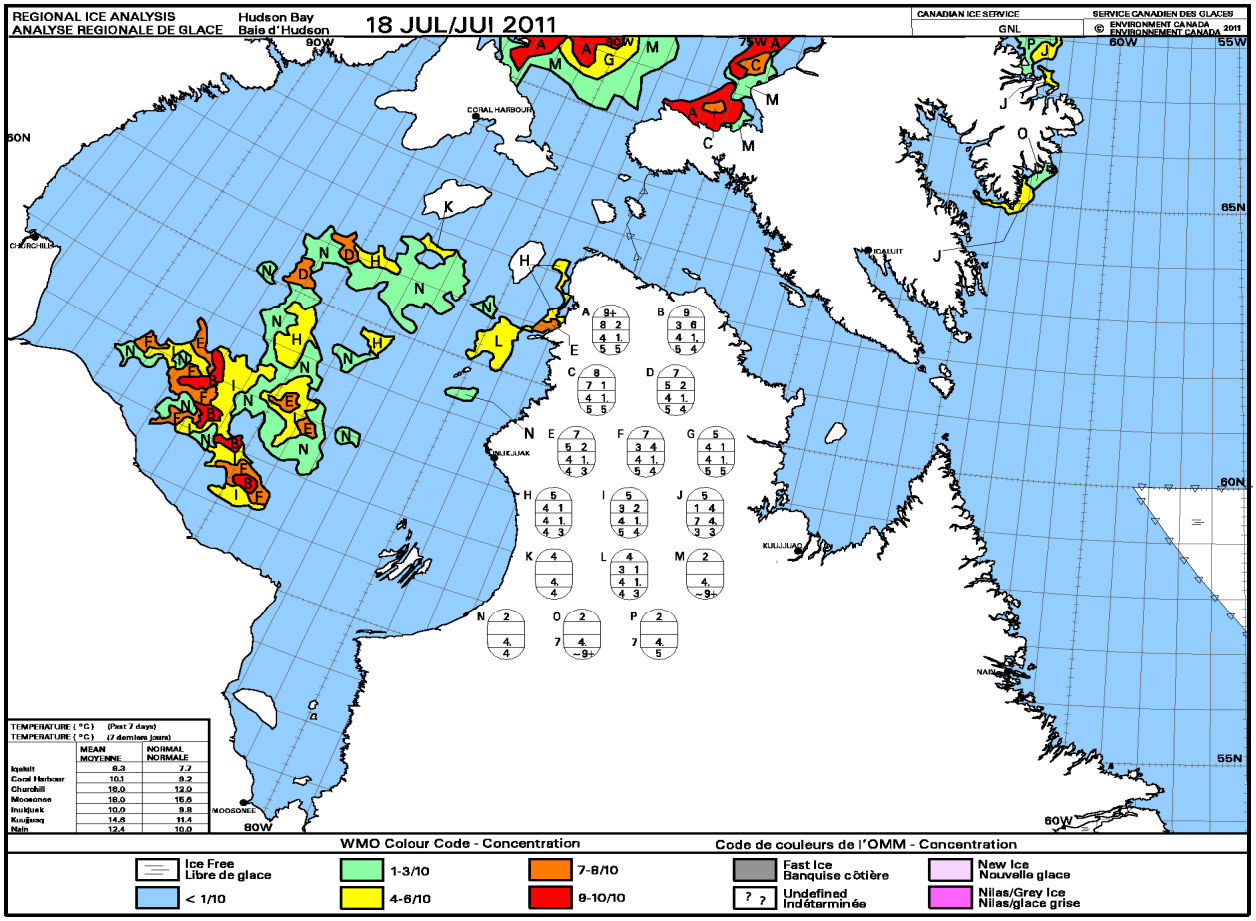

Figure 6: Hudson Bay Regional chart on July 18, 2011.

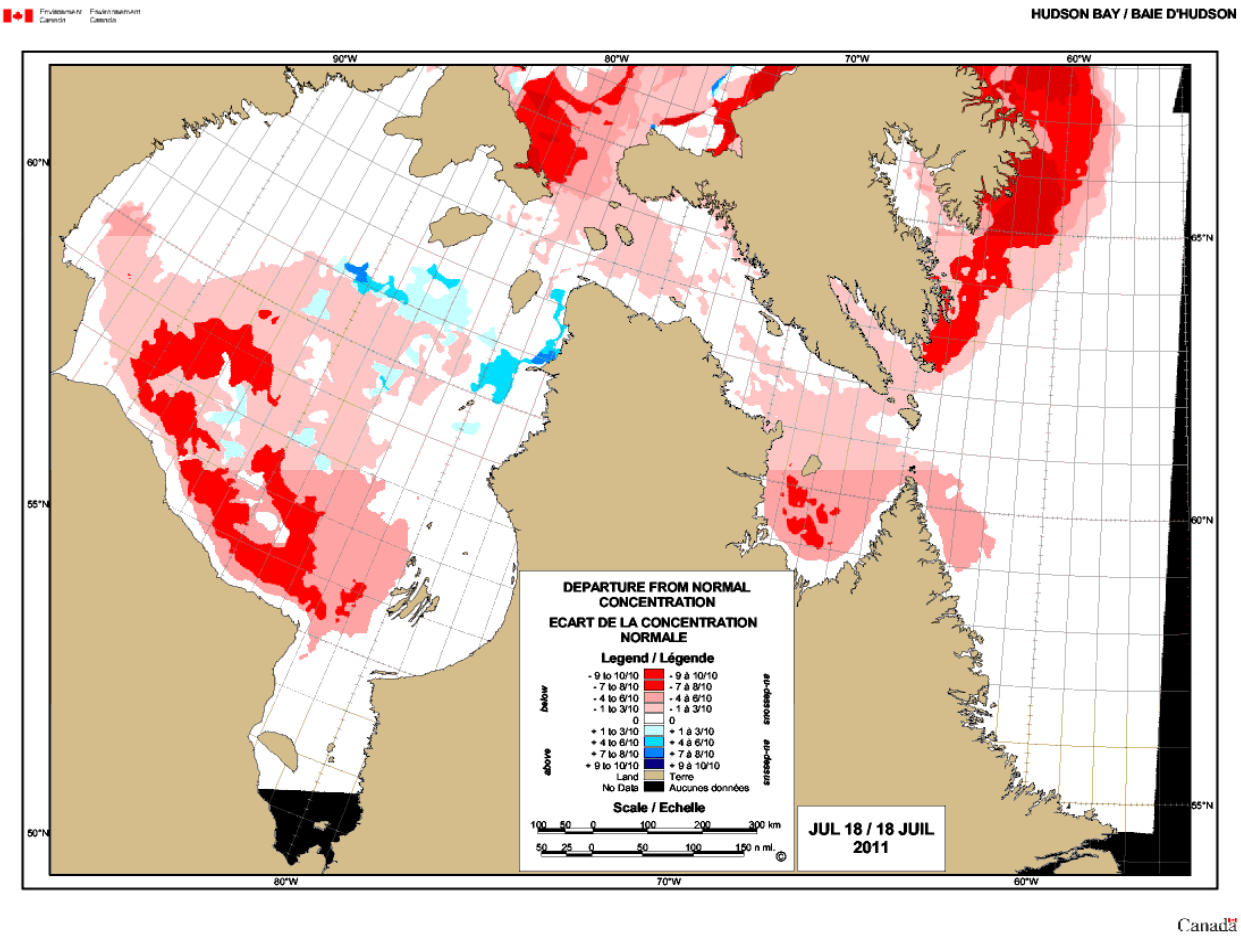

Figure 7: Departure from normal ice concentration for Hudson Bay on July 18, 2011.

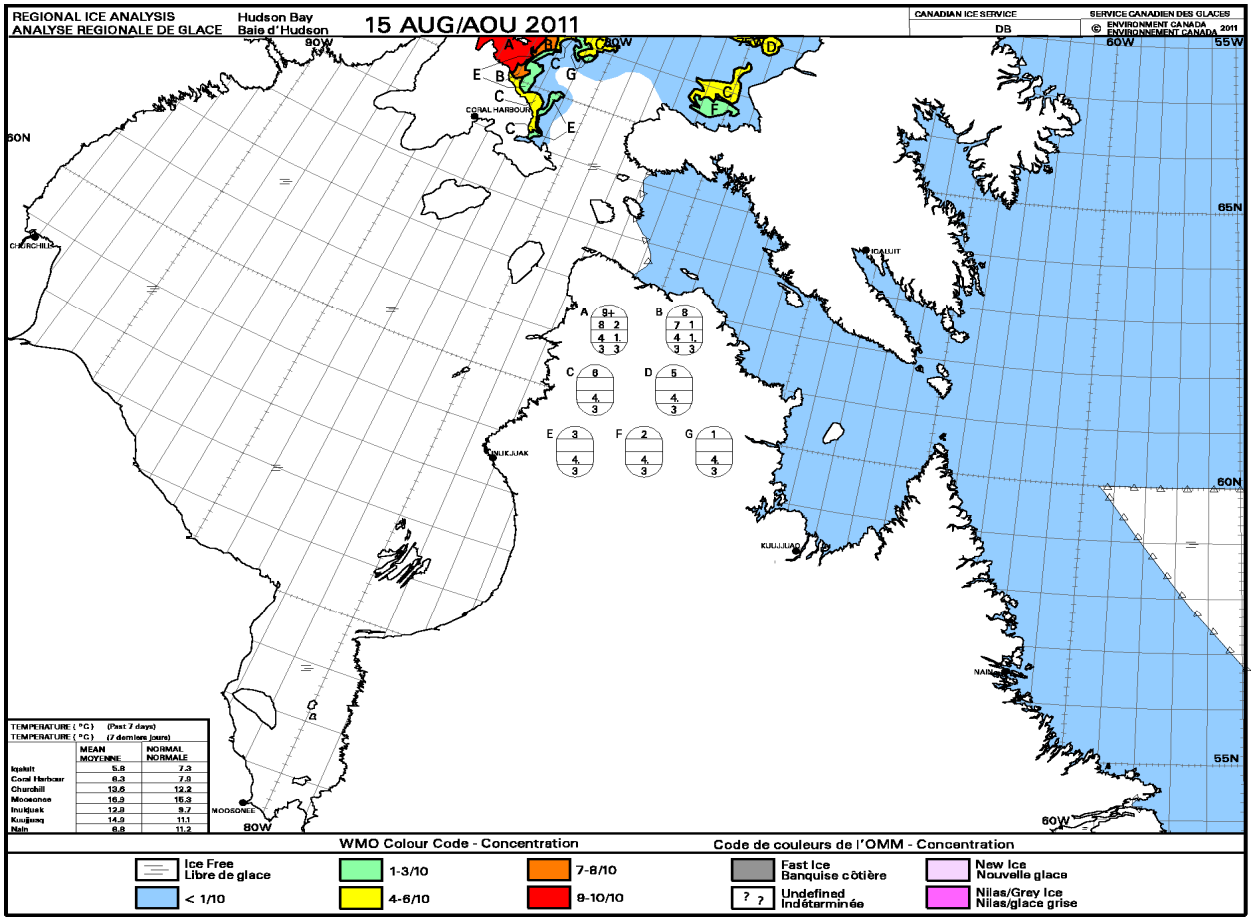

Figure 8: Hudson Bay Regional chart on August 15, 2011.

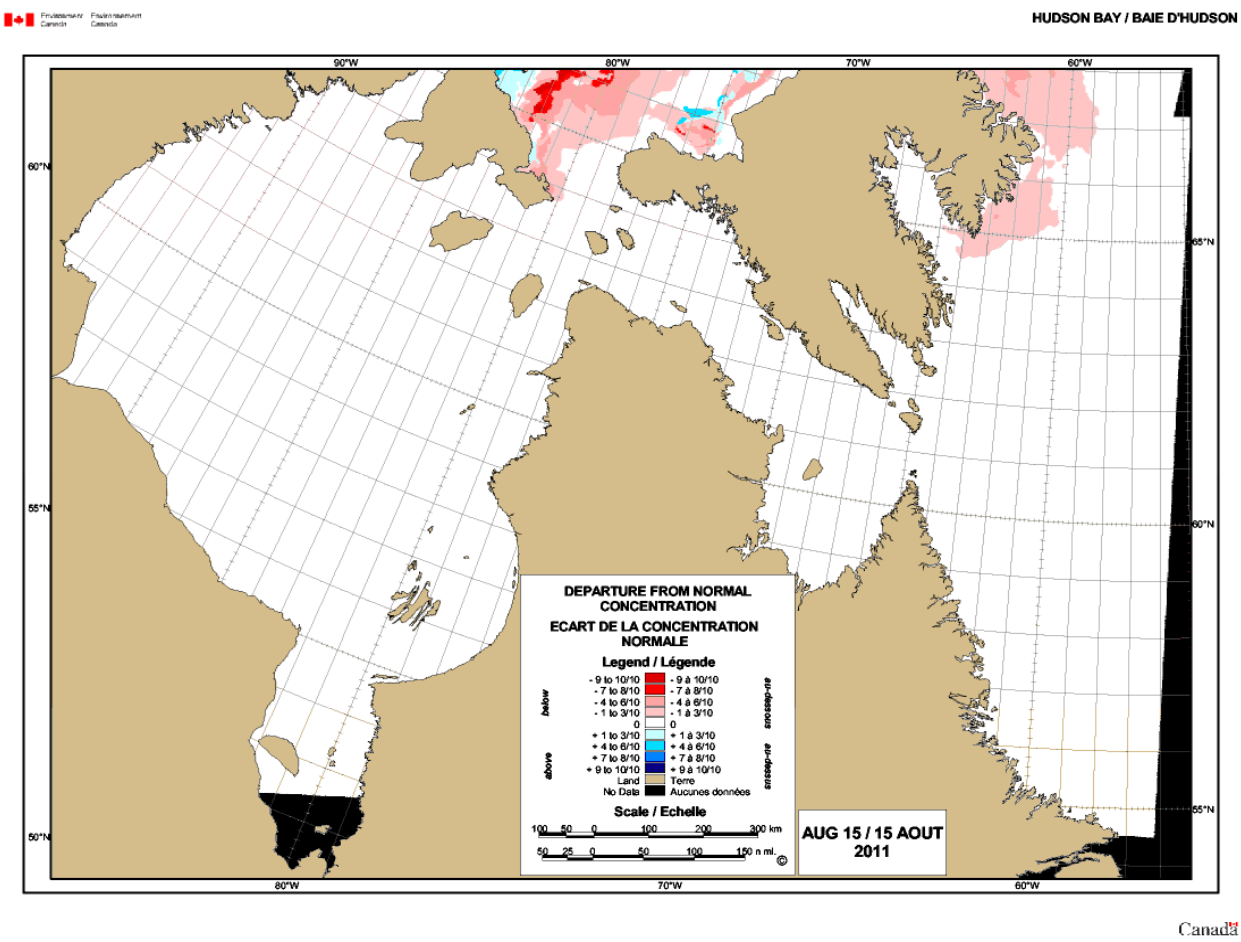

Figure 9: Departure from normal ice concentration for Hudson Bay on August 15, 2011.

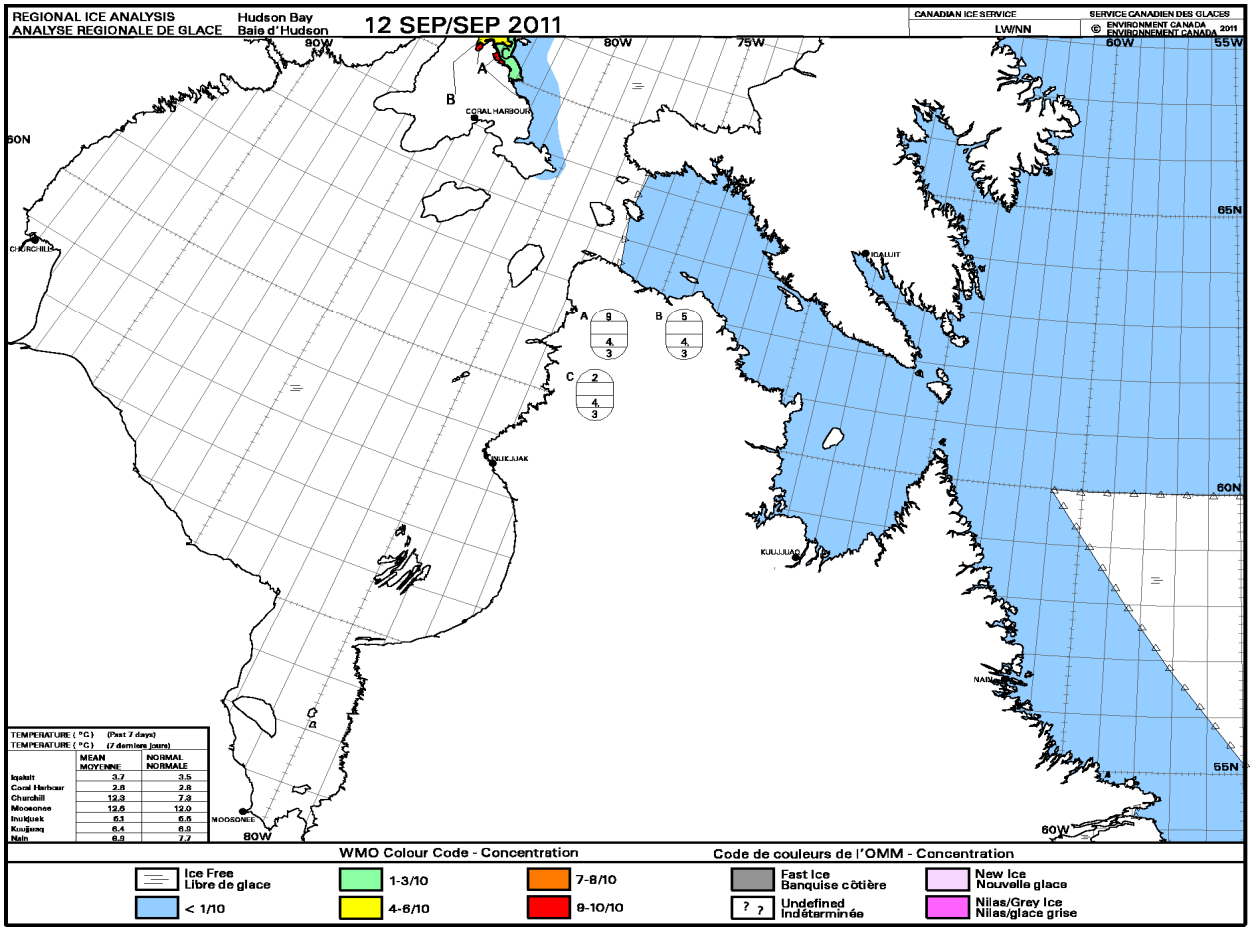

Figure 10: Hudson Bay Regional chart on September 12, 2011.

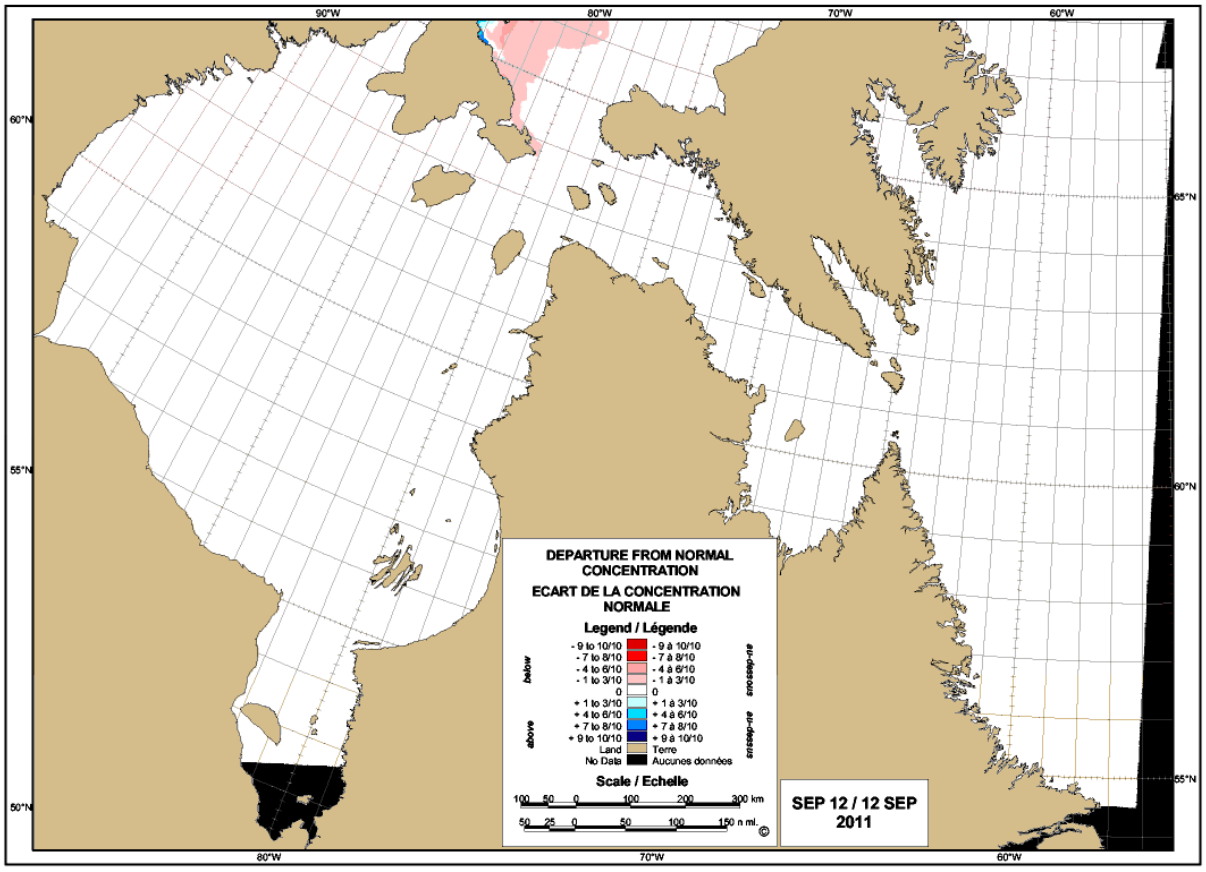

Figure 11: Departure from normal ice concentration for Hudson Bay on September 12, 2011.

Eastern and High Arctic

May 2011

Mean air temperatures were near normal over most locations except above normal over the High Arctic and the northern section of Baffin Bay (see Table 2). A light to moderate northerly flow developed over the High Arctic, while light and variable winds dominated over the rest of the Eastern Arctic. With delayed freeze-up during the winter season and thinner than normal ice, the ice started to decay along the eastern edge of the pack ice in Baffin Bay. Nares Strait did consolidate during the winter season which was the first time since 2008. After mid-May, large areas of bergy water developed early in the season over eastern Barrow Strait, western Lancaster Sound and in the extreme northwestern section of Baffin Bay. The rest of the Eastern Arctic was covered with first-year ice, while the ice north and west of Resolute was consolidated. Just before Nares Strait consolidated during the winter season, areas of up to 2 tenths of old ice drifted over the western section of Baffin Bay as far south as Cape Dyer. Very narrow bands of old ice were also observed in Prince Regent Inlet and along the southern shore of Lancaster Sound. Greater than normal ice concentrations of old ice were present over Pelly Bay, northern Jones Sound, southern Norwegian Bay and Eureka Sound. Mid-May ice conditions, as well as the departure from median ice concentrations, are shown in Figure 13 and Figure 14, respectively.

June 2011

Mean air temperatures were above normal over the whole area (see Table 2). Most of the rapid ice melt occurred over southern and northwestern Baffin Bay, in Lancaster Sound and off the consolidated ice along the eastern shore of Baffin Island. The bergy water lead along the Greenland Coast slowly expanded to lie south of 74°30'N at the end of the month. The ice loosened up very quickly over southern and western Baffin Bay during the second half of June. Consequently, an open drift or less route to Home Bay developed during the last week of June which set a new record as the earliest date since 1968. At the end of the month, an area of first-year ice with up to 2 tenths of old ice was still present over the rest of Baffin Bay and from Prince Regent Inlet to northern Committee Bay. Large areas of bergy water dominated south of the ice bridge in Kane Basin, in eastern Jones Sound and from Lancaster Sound to eastern Barrow Strait. Over these areas, broken fast ice coming out of bays and inlets were present along the shores. The ice bridge over Kane Basin started to fracture over the central section but the rest of the ice remained solid for the whole month. The rest of the Eastern Arctic remained consolidated but some of

the ice started to break up over Queens Channel and southwestern Barrow Strait. Mid-June ice conditions, as well as the departure from median ice concentrations, are shown in Figure 15 and Figure 16, respectively.

July 2011

Mean air temperatures were well above normal over the whole Eastern Arctic (see Table 2). As a result, the ice decayed at a faster pace than normal over most regions. Even the presence of old ice in the pack ice didn't slow down the ice melt during the month. Most of the breakup events over the Eastern and High Arctic occurred during the first two weeks of July. Some of the fracture events near Resolute and over the High Arctic set new records for this month as being the earliest dates since 1968. The consolidated ice in Kane Basin fractured in early July. A persistent east to southeasterly flow pushed the ice that came from Kane Basin towards the eastern shore of Ellesmere Island. This prevented the ice from drifting south of Jones Sound during the month. During the first half of July, the ice melted rapidly over Baffin Bay and in Parry Channel. As a result, a bergy water route developed across northern Baffin Bay, over the eastern portion of Parry Channel and southern Eureka Sound during the second week of July. First-year ice with up to 2 tenths of old ice was still present over northern Admiralty Inlet, from western Jones Sound to eastern Norwegian Bay and from Prince Regent Inlet to north of Pelly Bay. Open drift ice prevailed over the rest of Eureka Sound and in Pelly Bay. The ice decay continued to accelerate during the second half of July so much so that much lower than normal ice concentrations were observed over the whole area. Only small areas of first-year ice with some old ice were present over the north central section of Baffin Bay and along the shipping route to Eureka. Most shipping routes leading to Nanisivik, Resolute and Thule were free of ice at the end of the month. Due to the easterly winds experienced during the month, the ice was compacted over the western section of the Gulf of Boothia and southwestern Barrow Strait. The ice melted completely over Pelly Bay at the end of the month. Mid-July ice conditions, as well as the departure from median ice concentrations, are shown in Figure 17 and Figure 18, respectively.

August 2011

Mean air temperatures continued to remain well above normal over the whole Eastern Arctic (see Table 2). Rapid ice melt which started in the previous month continued into this month. As a result, ice conditions continued to clear rapidly into areas where the ice is usually present at this time of year. During the first half of August, the ice melted completely along the eastern shore of Baffin Island, in Jones Sound, southwestern Barrow Strait and the northern section of Gulf of Boothia. Meanwhile, a small area of open drift ice was present over the north central section of Baffin Bay between 74°N and 75°N where it lasted until the end of August. The ice which was drifting out of Kane Basin melted along the

shore of Ellesmere Island and remained north of Jones Sound. Only isolated areas of very open drift old ice persisted in Norwegian Bay and Eureka Sound. A persistent easterly flow over the southwestern section of the Gulf of Boothia maintained the ice compacted along the western shore just north of Pelly Bay. Much lower than normal ice concentrations were observed over Committee Bay and north of Cornwallis Island. After mid-August, the ice started to melt completely in areas where it doesn't normally clear. For the first time ever, all the shipping routes into the Eastern Arctic were clear of ice which was never been seen since 1968. The only exception was north of Pelly Bay where an area of compacted first-year ice with some old ice was still present. For a short period of time, a narrow route of bergy water did develop into Pelly Bay towards the end of the month. Very open drift old ice was still present from north of Jones Sound to Nares Strait. This year, the ice cleared out of Eureka Sound during the last week of August. The ice coverage for the end of August set a new record for the Eastern Arctic as the lowest minimum ice coverage ever recorded since 1968. Mid-August ice conditions, as well as the departure from median ice concentrations, are shown in Figure 19 and Figure 20, respectively.

September 2011

Mean air temperatures were again above normal over the whole Eastern Arctic but daily temperatures started to decrease from last month (see Table 2). The ice continued to melt during the first two weeks of September. During that time, ice concentrations north of Pelly Bay continued to decrease rapidly but some of the ice started to drift into northern Pelly Bay. For the rest of the month, most of the ice melted completely over southern regions except for a narrow band of ice which remained along the northern shore of Simpson Peninsula. Much lower than normal ice concentrations prevailed over most of the Eastern Arctic during the month. Very open drift old ice was still present along Ellesmere Island north of Jones Sound and in western Norwegian Bay. After mid-September, an increasing amount of old ice was starting to drift into Nares Strait and in western Norwegian Bay, as northwesterly winds developed over the area. Bergy water was still dominating over the rest of the Eastern Arctic. This turns out to be a record year for the lowest minimum ice coverage observed over the Eastern Arctic for early September since 1968 (see Figure 12). New and grey ice started to form over the High Arctic near mid-September and for the rest of the Central Arctic at the end of September. Mid-September ice conditions, as well as the departure from median ice concentrations, are shown in Figure 21 and Figure 22, respectively.

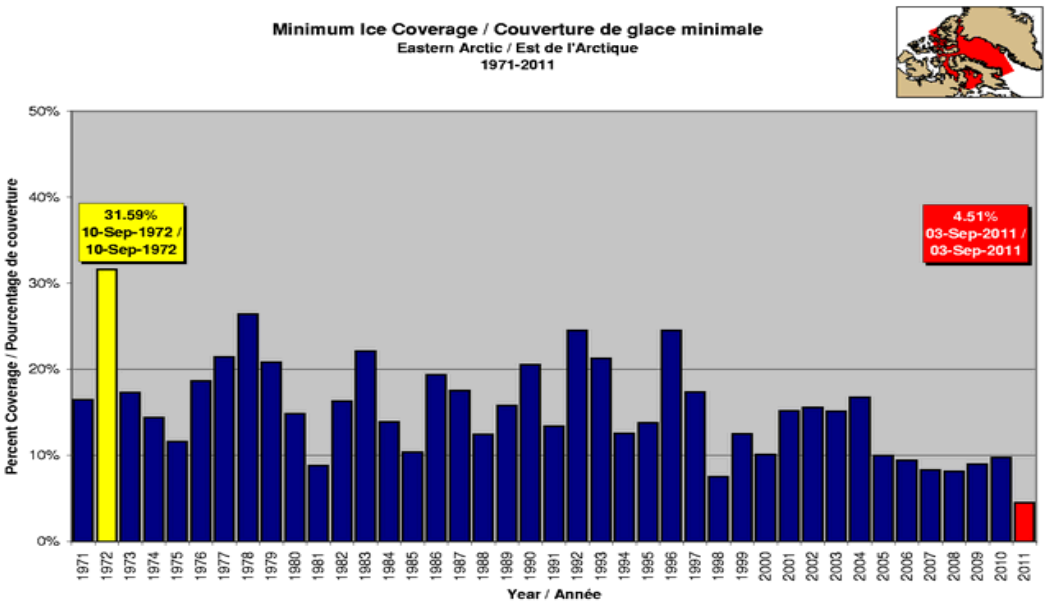

Figure 12: Minimum Ice Coverage for the Eastern Arctic on September 3, 2011.

Table 2: 2011 Temperatures and departures from normal (ºC) for the Eastern Arctic

	May		June		July		August		September	
Stations	Temp	Depart	Temp	Depart	Temp	Depart	Temp	Depart	Temp	Depart
Eureka	-8.5	2.5	5.5	3.8	9.8	4.3	6.5	4.1	-6.3	1.6
Resolute	-9.3	1.5	2.8	3.2	8.9	4.9	5.3	3.9	-2.9	2.1
Pond Inlet	-9.0	0.2	4.3	2.7	8.1	2.3	7.6	3.6	-0.5	1.3
Clyde	-8.6	-0.4	2.0	1.5	5.2	1.0	5.2	1.4	1.2	1.5
Kugaaruk	-7.8	0.0	4.2	1.3	11.9	3.2	10.2	3.8	2.2	2.1

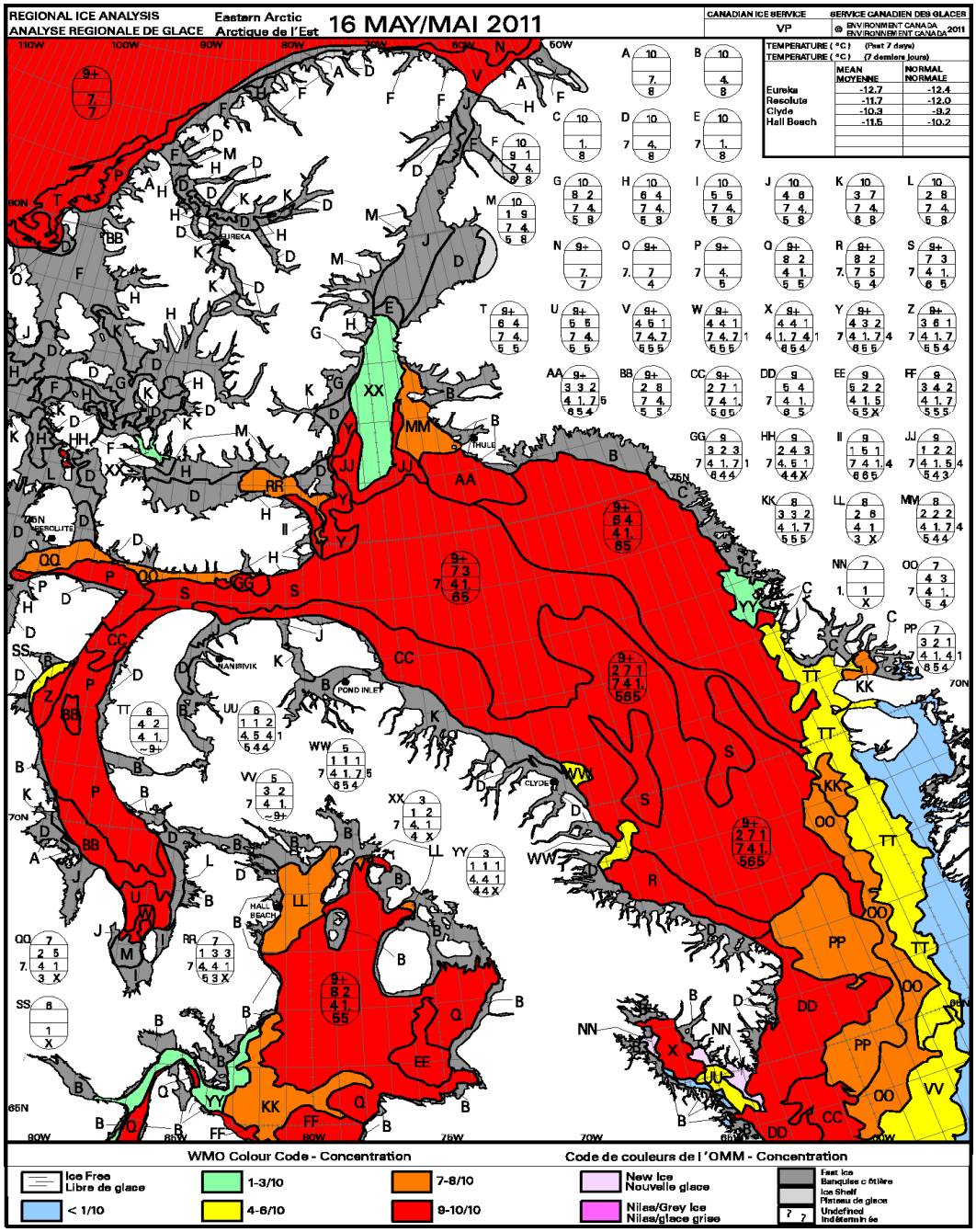

Figure 13: Eastern Arctic Regional chart on May 16, 2011.

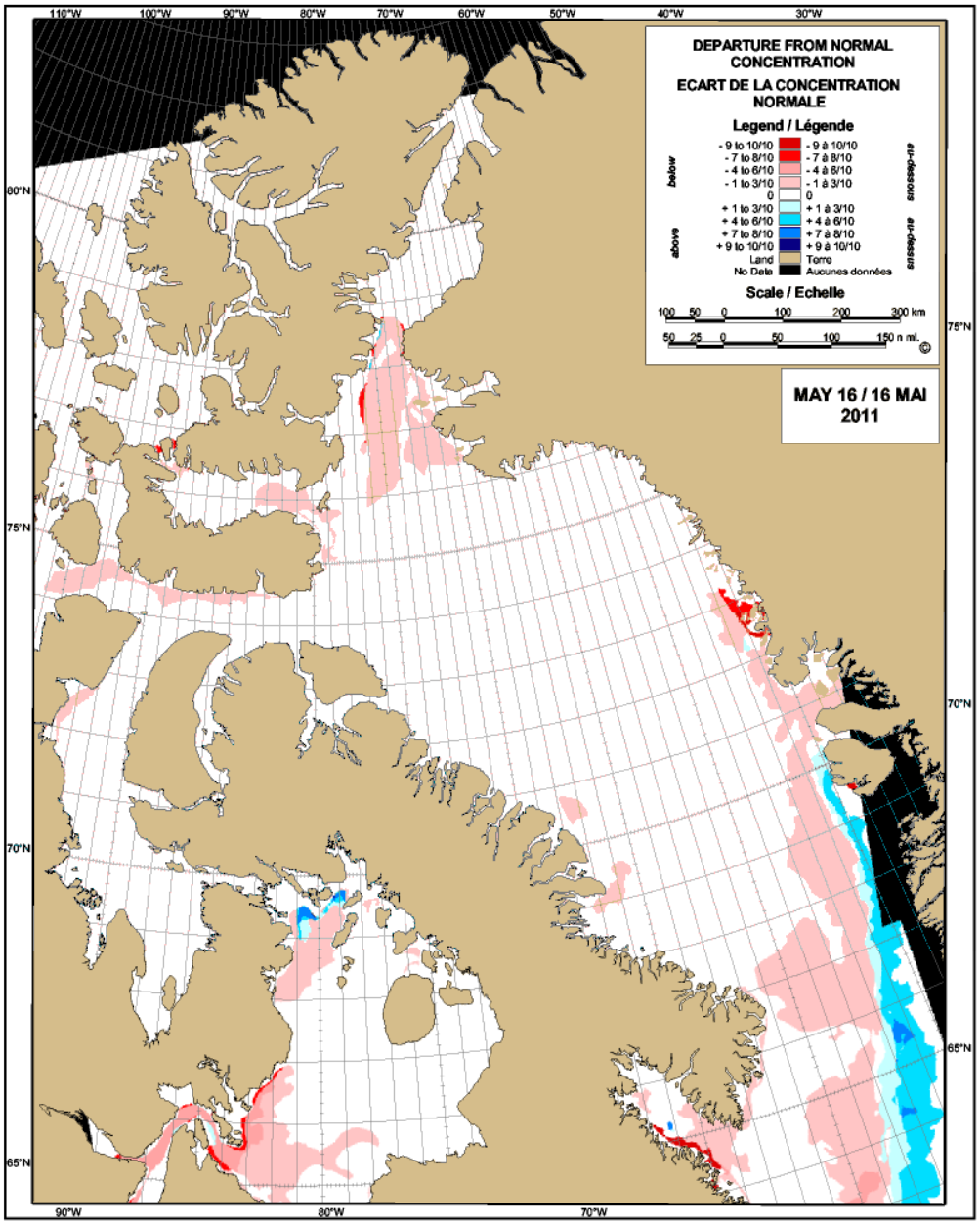

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Figure 14: Departure from normal ice concentration for the Eastern Arctic on May 16, 2011.

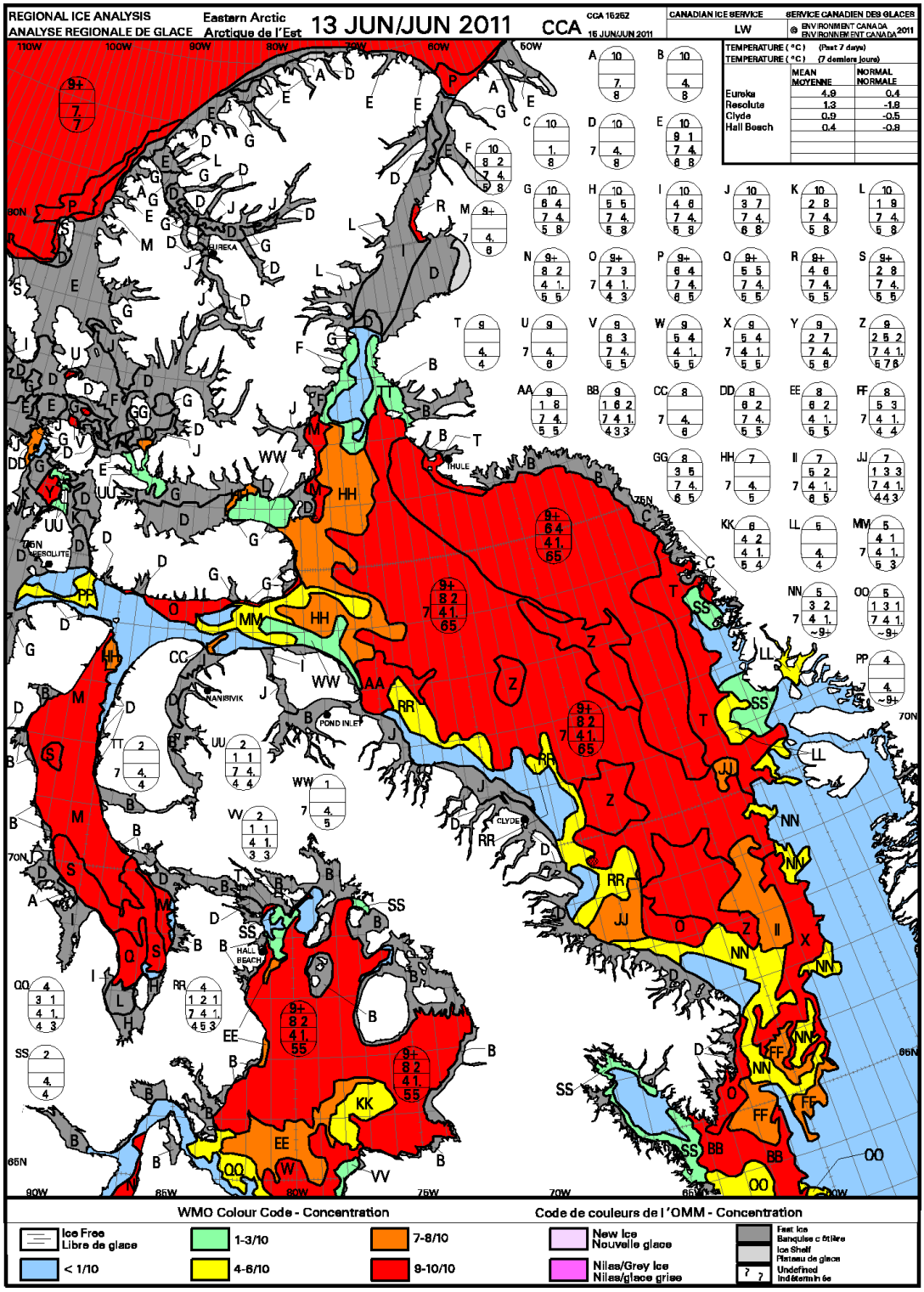

Figure 15: Eastern Arctic Regional chart on June 13, 2011.

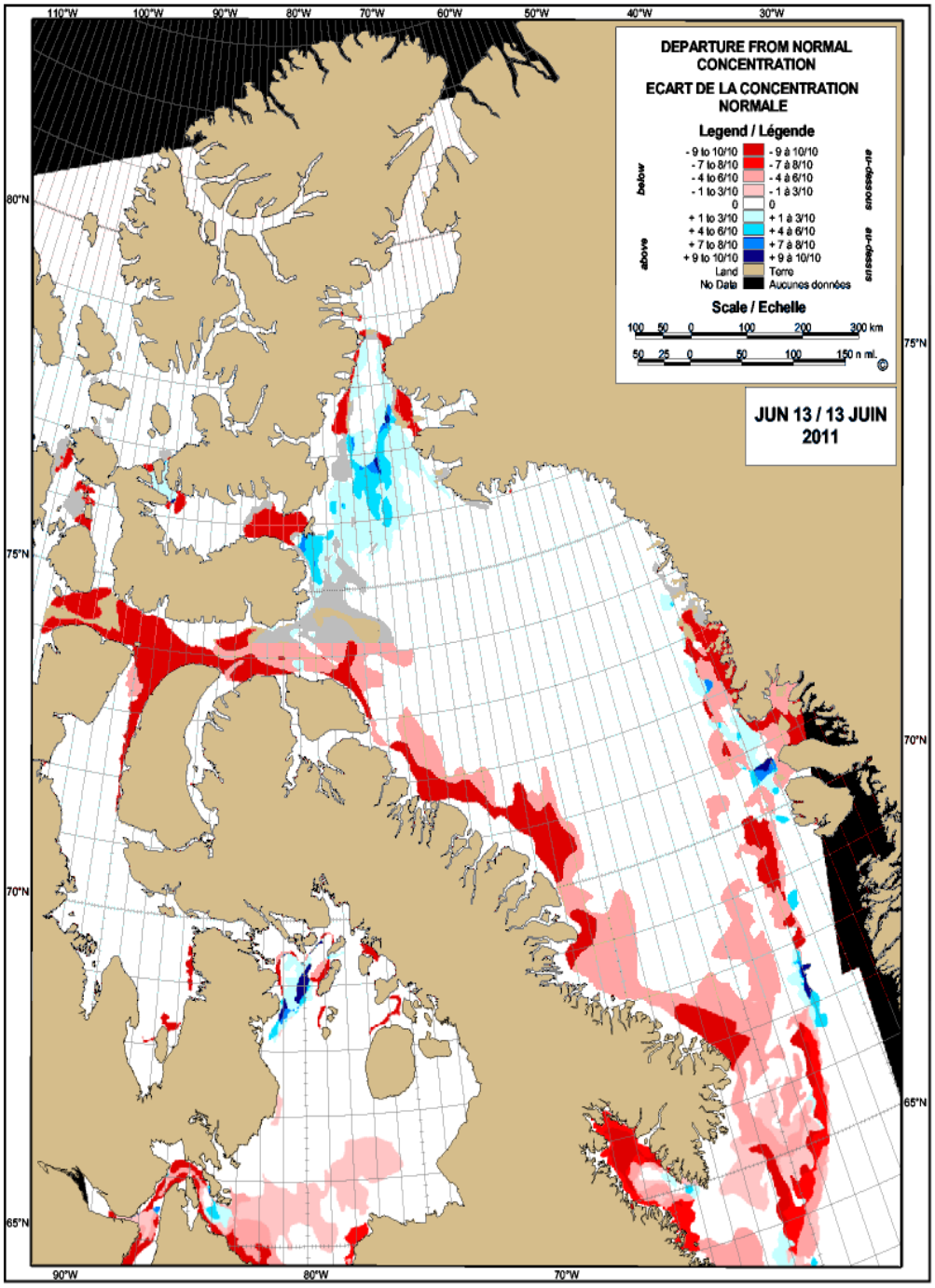

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Figure 16: Departure from normal ice concentration for the Eastern Arctic on June 13, 2011.

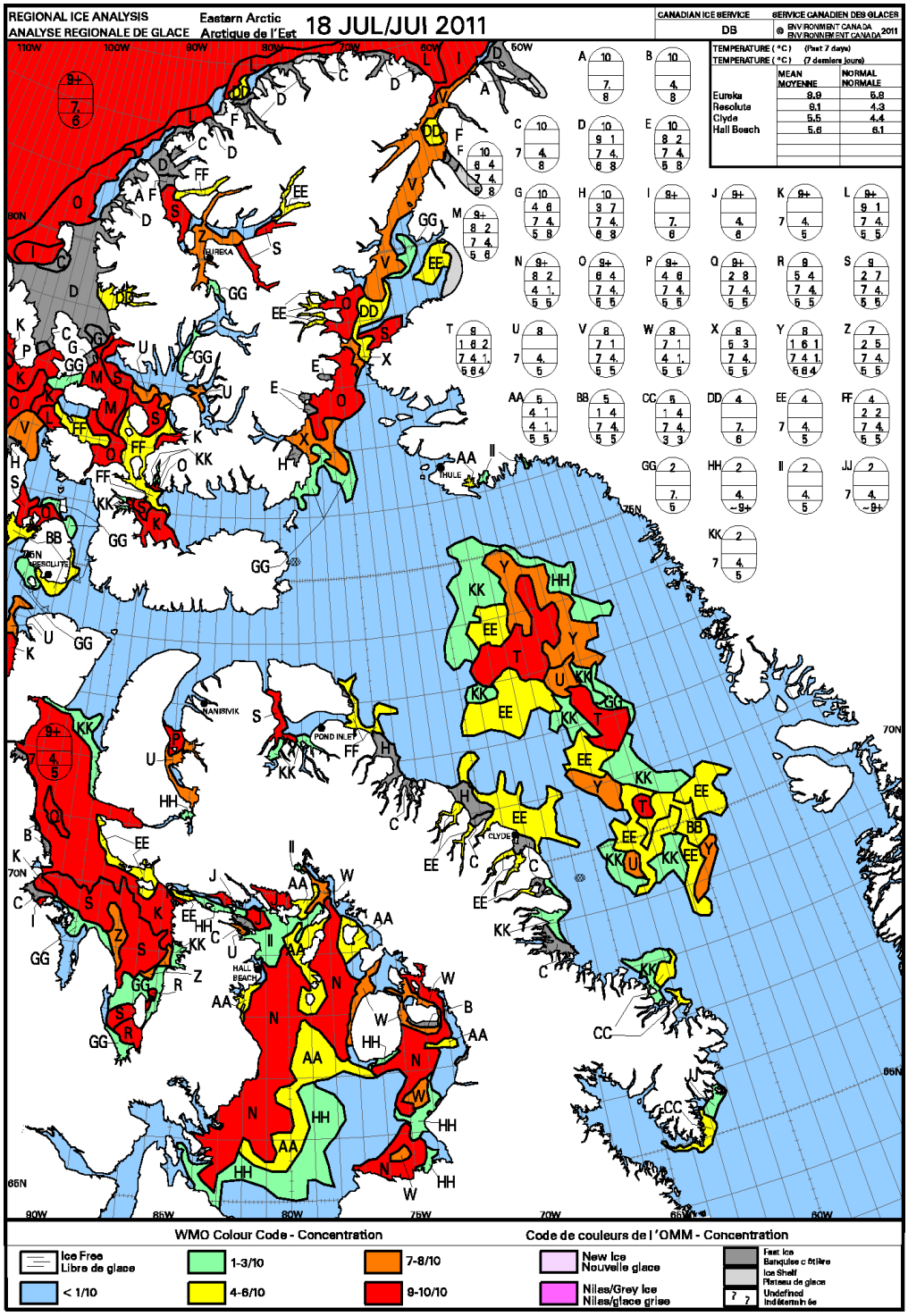

Figure 17: Eastern Arctic Regional chart on July 18, 2011.

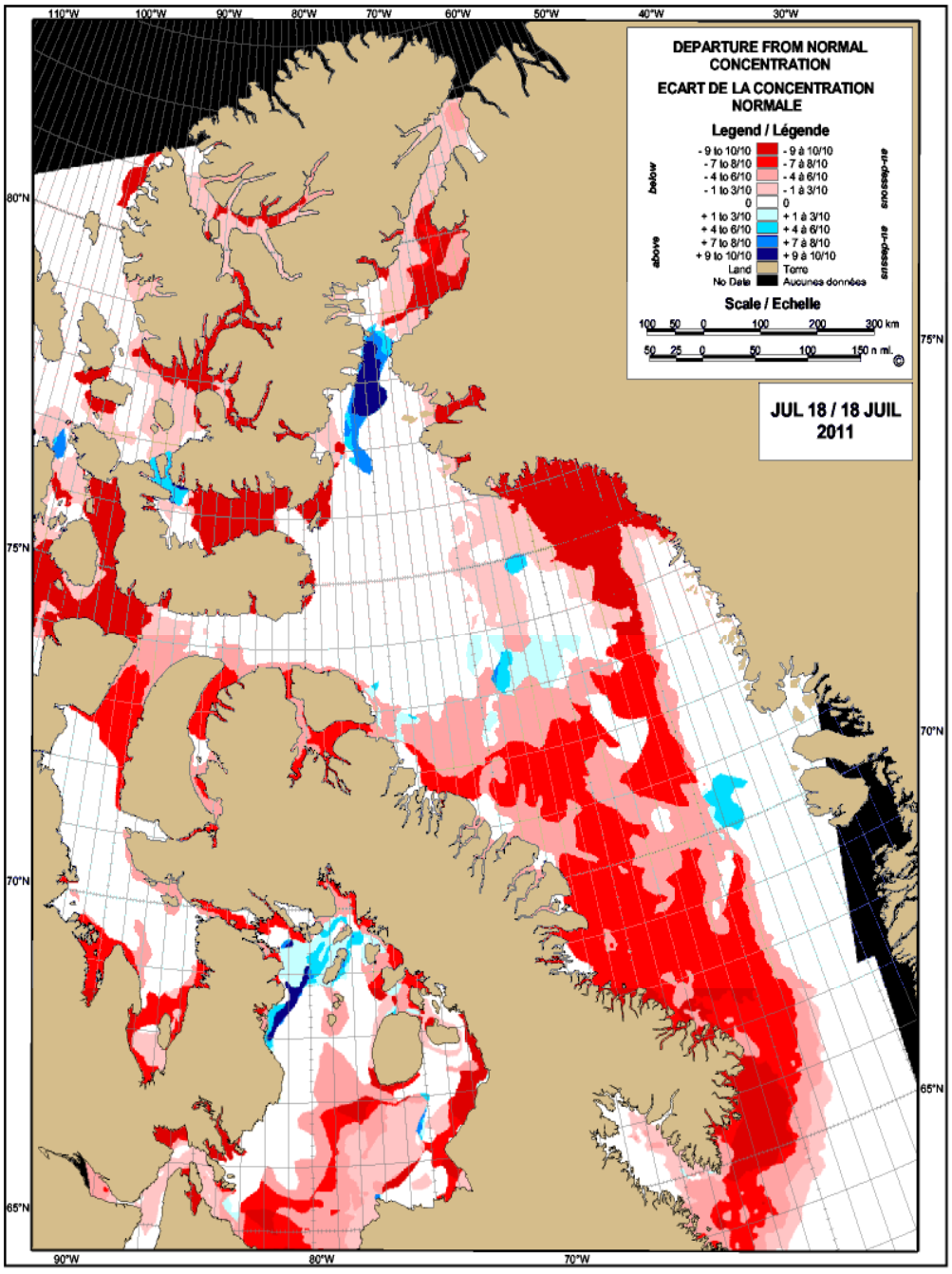

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Figure 18: Departure from normal ice concentration for the Eastern Arctic on July 18, 2011.

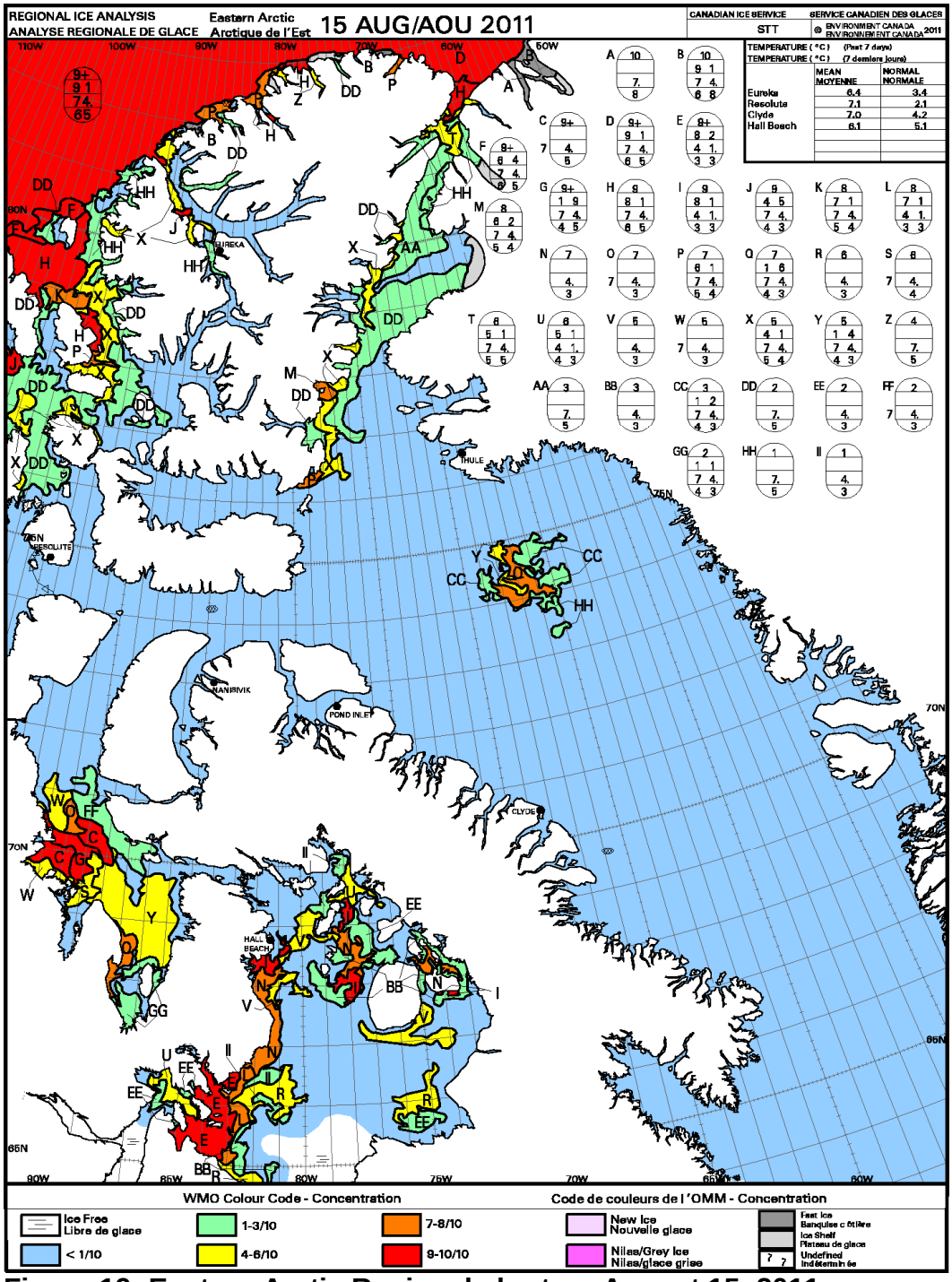

Figure 19: Eastern Arctic Regional chart on August 15, 2011.

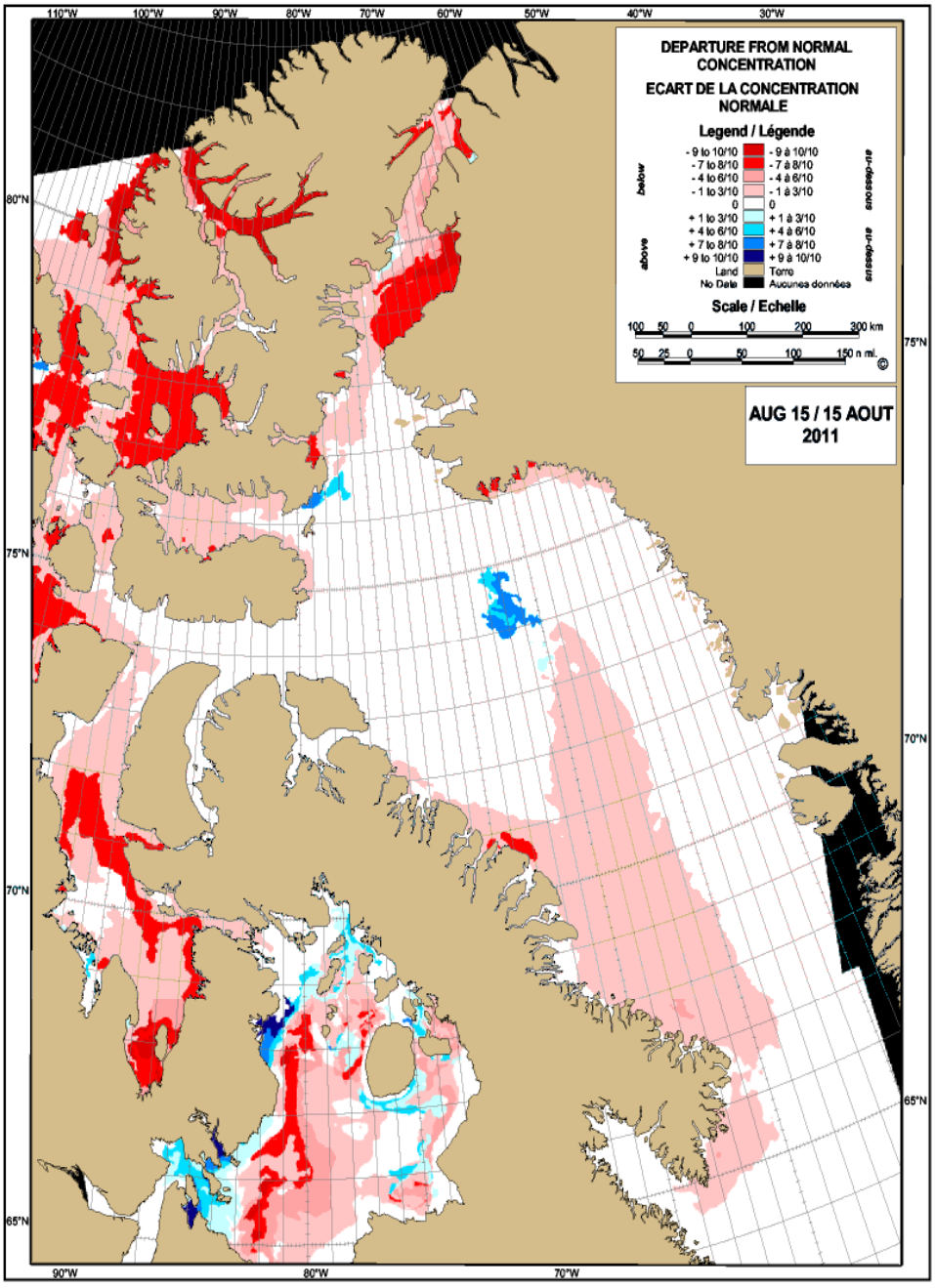

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Figure 20: Departure from normal ice concentration for the Eastern Arctic on August 15, 2011.

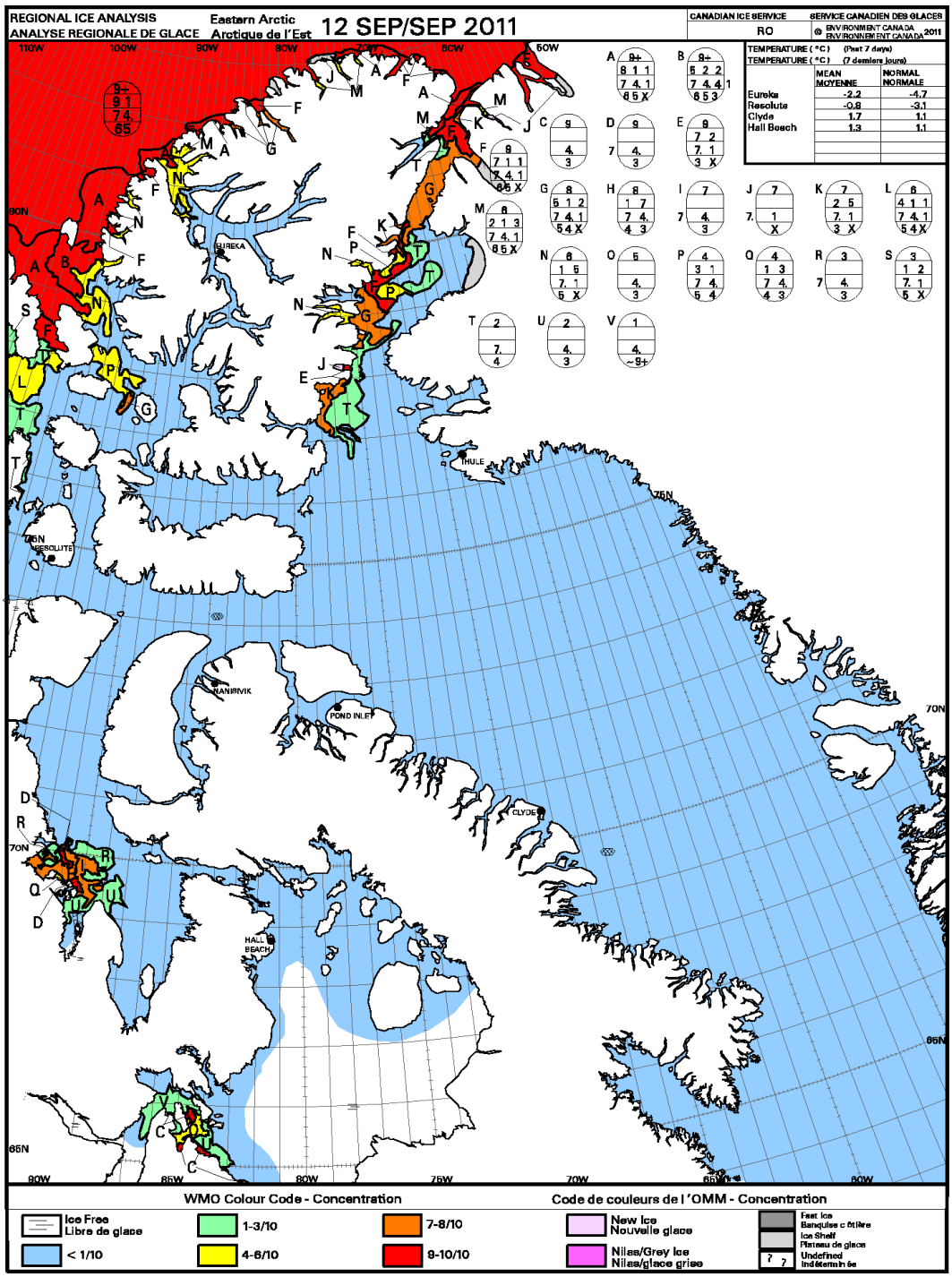

Figure 21: Eastern Arctic Regional chart on September 12, 2011.

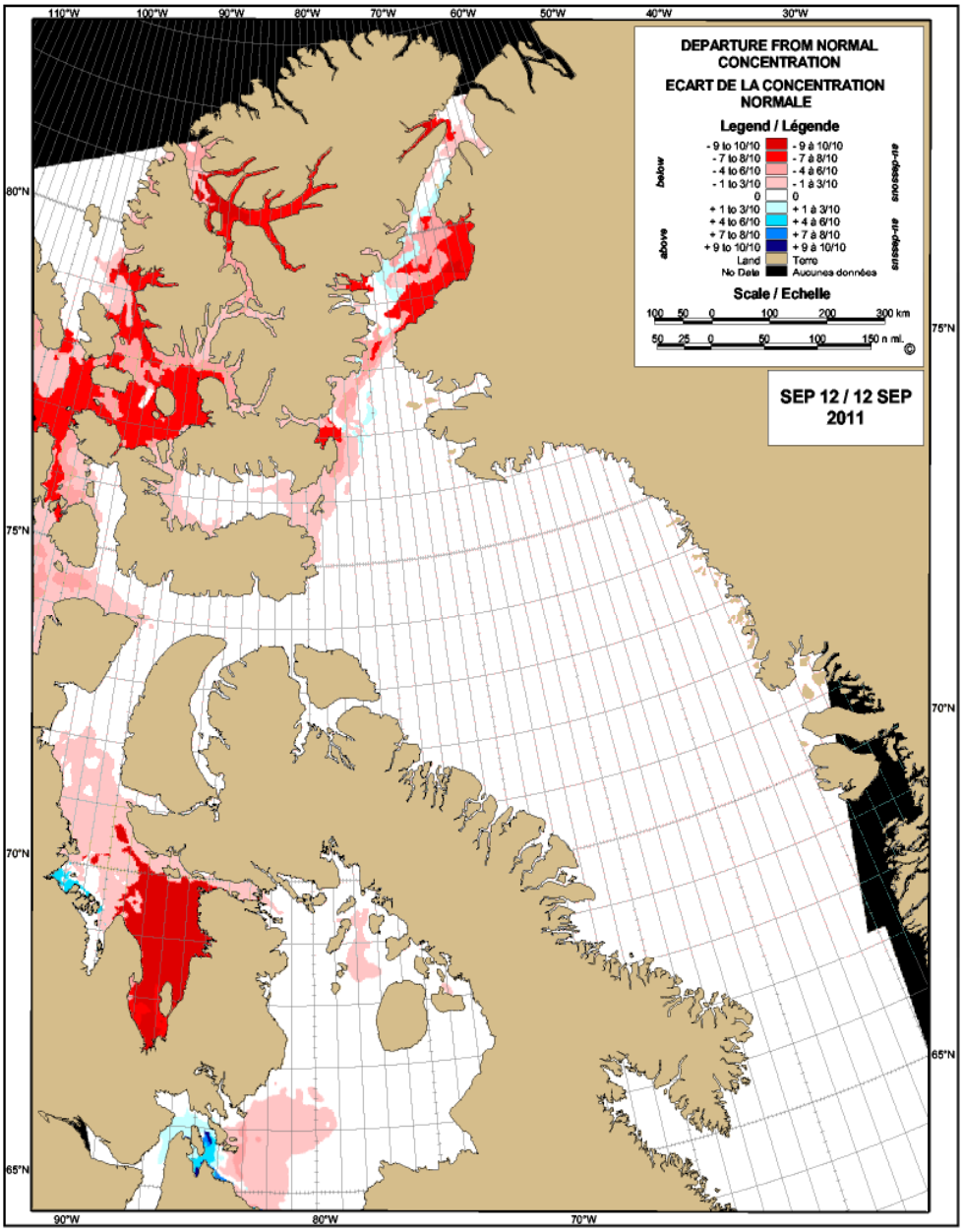

Figure 22: Departure from normal ice concentration for the Eastern Arctic on September 12, 2011.

Western and Central Arctic

May 2011

Mean air temperatures were above normal values over most locations except near normal over the area from Queen Maud Gulf to Peel Sound (see Table 3). A light to moderate northerly flow prevailed over the Central Arctic, while a light to moderate southeasterly flow developed over the rest of the Western Arctic. At the end of the winter season, consolidated first-year ice was present over the Central Arctic including the Amundsen Gulf area. However concentrations of old ice were much lower than normal over these same areas. A large area of consolidated first-year ice was present along the coast over the southern Beaufort Sea and the Alaskan Coast. During the first two weeks of May, the ice started to fracture over the western section of Amundsen Gulf and drifted westward into the Beaufort Sea. Between the mainland coast and south of 71°30'N, an area of first-year ice with up to 2 tenths of old ice dominated over the region. After mid-May, wide areas of open water started to form over the southeastern Beaufort Sea, west of Banks Island and southwestern Amundsen Gulf. North of 71°30'N, an area of old and first-year ice persisted east of 141°W over the northern Beaufort Sea and the Arctic Ocean, while first-year ice with much lower than normal old ice concentrations dominated west of 141°W. M'Clure Strait was showing signs that the consolidated ice over the western section was fracturing at the end of May. Mid-May ice conditions, as well as the departure from median ice concentrations, are shown in Figure 24 and Figure 25, respectively.

June 2011

Mean air temperatures were near normal values for most locations except above normal near Mould Bay (see Table 3). However, below normal temperatures were observed over Coronation Gulf during the same time period. A light easterly flow developed over the Central Arctic, while a light to moderate southeasterly flow persisted over the rest of the Western Arctic. During the first half of June, little change was observed in the ice conditions except for areas of open water over the southeastern Beaufort Sea and open drift ice over western Amundsen Gulf. West of Point Barrow, a lead of open water developed along the coast off the consolidated first-year ice. For the rest of the month, areas of open water widened over the Beaufort Sea and west of Point Barrow, while the ice fractured over eastern Amundsen Gulf. The ice melted completely during the last week of June over Mackenzie Bay and Kugmallit Bay. With southeasterly winds developing west of Amundsen Gulf, this helped to clear the ice off the Alaskan Coast as far west as Barter Island. A few areas of open drift first-year ice were

still present north of Tuktoyaktuk Peninsula and in western M'Clure Strait from the fracture of the consolidated ice. North of 71°30'N, an area of old and first-year ice persisted east of 141°W over the northern Beaufort Sea and the Arctic Ocean, while first-year ice with much lower than normal old ice concentrations dominated west of 141°W. The ice remained consolidated over the Central Arctic with less than normal old ice concentrations. Mid-June ice conditions, as well as the departure from median ice concentrations, are shown in Figure 26 and Figure 27, respectively.

July 2011

Mean air temperatures were above normal values over the whole Western Arctic (see Table 3). At the beginning of July, the ice decay started to accelerate over the area. A light to moderate east to southeasterly flow persisted over the Western Arctic. The ice started to fracture along the southern and northern routes of the Northwest Passage during the first two weeks of July. The consolidated ice north of Tuktoyaktuk Peninsula completely fractured during the first week of July. The persistent southeasterly flow over the Beaufort Sea helped to push the ice westward to a narrow area of first-year ice north of Point Barrow at mid-July. Meanwhile, areas of open water continued to widen rapidly over the southern Beaufort, west of Banks Island and west of Point Barrow. However, isolated areas of open drift first-year ice were still present along the coastal areas from Tuktoyaktuk Peninsula to Barter Island and in Amundsen Gulf. The ice melted completely over southwestern Coronation Gulf and in Bathurst Inlet. The ice remained consolidated over most of M'Clintock Channel and the Queen Elizabeth Islands. In the second half of the month, the ice melted rapidly over most locations across the Western Arctic. Consolidated old ice still persisted over Hazen Strait and Prince Gustaf Adolf Sea. At the end of July, an open water route developed along parts of the Northwest Passage from Amundsen Gulf to Coronation Gulf. An area of open water was present within 90 miles of the shore over the southern Beaufort Sea and along the Alaskan Coast, but isolated patches of first-year ice still remained near Herschel Island and north of Harrison Bay. Most of western M'Clure Strait was clear of ice. First-year ice was still present along the shipping routes from northern Queen Maud Gulf to Peel Sound, in M'Clintock Channel and from Viscount Melville Sound to eastern M'Clure Strait. Large areas of old ice persisted in central Viscount Melville Sound northwest of Stefansson Island and in southwestern M'Clintock Channel. Ice concentrations decreased rapidly over southern Queen Maud Gulf and Rasmussen Basin after mid-month, as very open drift first-year ice dominated over these areas. During the month, an area of old and first-year ice persisted north of 72°N and east of 143°W to 30 miles west of Banks Island, while first-year ice with up to 2 tenths of old ice prevailed west of 143°W. Concentrations of old ice were less than normal over much of the Western Arctic for the month of July.

Mid-July ice conditions, as well as the departure from median ice concentrations, are shown in Figure 28 and Figure 29, respectively.

August 2011

Mean air temperatures remained above normal values over the whole Western Arctic (see Table 3). Just like the Eastern Arctic, rapid ice decay was observed over all areas during the month. During the first week of August, the ice melted completely over northern Queen Maud Gulf and in Rasmussen Basin creating an open water route from central Amundsen Gulf to Taloyoak. Patches of first-year ice persisted near Herschel Island and north of Harrison Bay during the first half of the month. As well, the rapid ice decay and persistent east to southeasterly winds over the Central Arctic helped to melt the ice along the rest of the Northwest Passage from Victoria Strait to Peel Sound and in eastern M'Clintock Channel. However ice concentrations only started to decrease over Viscount Melville Sound during the second week of August, while some of the ice continued to drift westward into eastern M'Clure Strait. So, by mid-August, most shipping routes through the southern route of the Northwest Passage and the Beaufort Sea were clear of ice. Light to moderate east to southeasterly winds which developed over the Central Arctic for the rest of the month helped to compact the ice over western M'Clintock Channel. Meanwhile, as the pack ice continued to drift westward, clearing was occurring over the southern and eastern sections of Viscount Melville Sound. Some of the ice from Viscount Melville Sound drifted across northern M'Clure Strait. Ice free conditions were observed along the shipping route over the Beaufort Sea south of 72°N, the southern section of the Northwest Passage, within 60 miles west of Banks Island and in southern M'Clure Strait. Open drift old and first-year ice dominated over the Beaufort Sea between 72°N and 75°N. At the end of the month, an area of old ice prevailed over the Arctic Ocean north of 75°N and east of 138°W, while first-year ice with up to 2 tenths of old ice persisted west of 138°W. Concentration of old ice was still much less than normal over most of the Western Arctic for the month of August, but was greater than normal over northern Viscount Melville Sound and southwestern M'Clintock Channel. The ice coverage for the end of August set a new record for the Western Arctic as the lowest minimum ice coverage ever recorded since 1968. Mid-August ice conditions, as well as the departure from median ice concentrations, are shown in Figure 30 and Figure 31, respectively.

September 2011

Mean air temperatures remained above normal values over the whole Western Arctic (see Table 3). The remaining ice continued to melt over Parry Channel northward during the first two weeks of September and until the end of

September further south. Ice free conditions persisted over the southern Beaufort Sea, along the Alaskan Coast, the southern route of the Northwest Passage, in southern Parry Channel and eastern Viscount Melville Sound during the month. An east to southeasterly flow dominated over the whole Western Arctic except for a short period of northwesterly winds at mid-month which pushed the remaining ice southward over the Central Arctic. During the first two weeks of September, very open drift old ice persisted over Parry Channel west of Byam Martin Channel, north of Stefansson Island and northwestern M'Clintock Channel, while the ice remained compacted along the shore over southwestern M'Clintock Channel. Over the northern Beaufort Sea between 72°N and 74°N, open drift old and first-year ice dominated over the area, while little change in the ice conditions was observed further north. During the last two weeks of September, most of the remaining old ice melted completely over Viscount Melville Sound and in northern M'Clintock Channel. However an area of compacted old ice persisted over southwestern M'Clintock Channel with some of the ice drifting southward into northwestern Victoria Strait. As well, concentration of old ice over Byam Martin Channel started to increase during the second half of the month. The ice coverage for early September set a new record for the Western Arctic as the lowest minimum ice coverage ever recorded since 1968 (see Figure 12). At the end of September, new with some grey ice was forming over the High Arctic and Parry Channel west of Stefansson Island. At that time, grey ice was forming between old ice floes over the Arctic Ocean. Mid-September ice conditions, as well as the departure from median ice concentrations, are shown in Figure 32 and Figure 33, respectively.

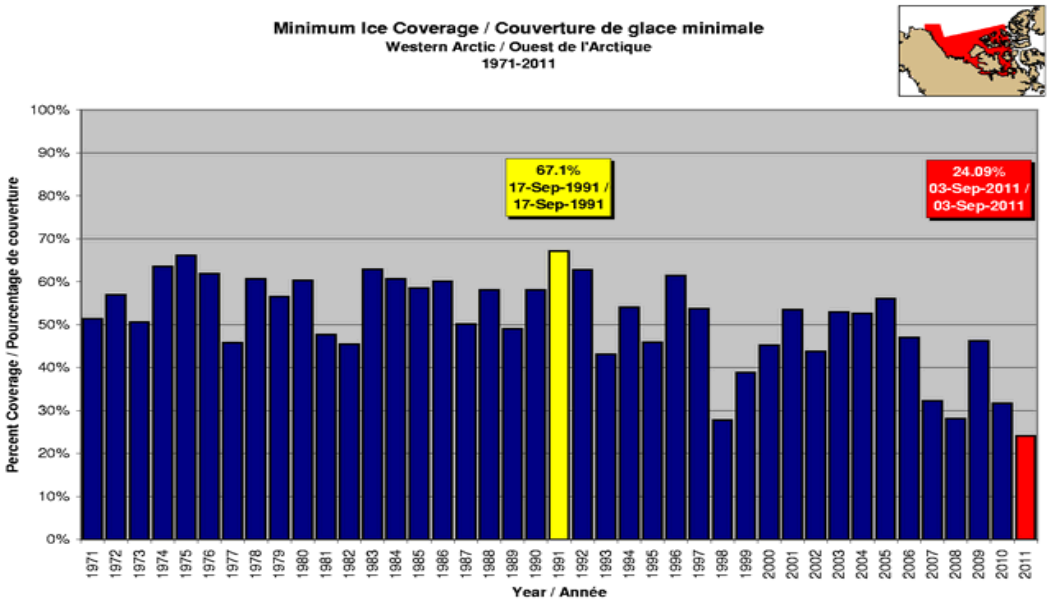

Figure 23: Minimum Ice Coverage for the Western Arctic on September 3, 2011.

Table 3: 2011 Temperatures and departures from normal (ºC) for the Western Arctic

	May		June		July		August		September	
Stations	Temp	Depart	Temp	Depart	Temp	Depart	Temp	Depart	Temp	Depart
Mould Bay	-9.2	1.7	1.3	1.3	8.6	4.7	5.0	4.2	-2.5	3.9
Gjoa Haven	-9.9	-0.8	1.8	0.3	10.5	3.0	9.1	3.5	1.5	1.8
Cambridge Bay	-9.3	-0.2	1.1	-1.1	10.9	2.8	9.8	3.6	1.7	2.3
Kugluktuk	-3.1	1.9	3.7	-1.2	12.5	2.1	11.4	2.8	5.1	2.5
Tuktoyaktuk	-1.3	2.9	6.2	0.0	13.0	2.0	10.6	1.5	4.5	1.8
Point Barrow	-5.1	1.5	1.8	0.1	5.8	1.1	5.7	2.0	2.9	3.3

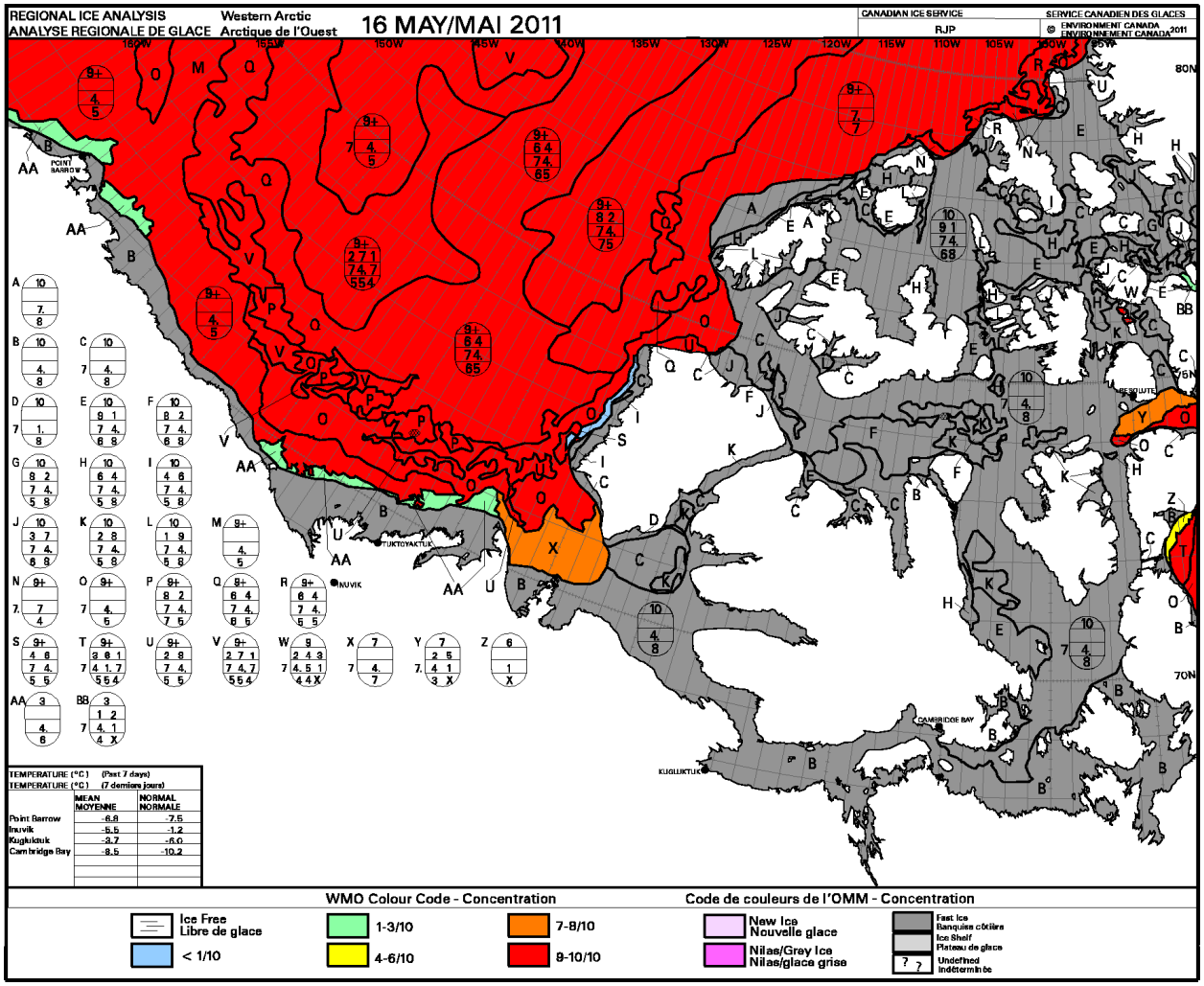

Figure 24: Western Arctic Regional chart on May 16, 2011.

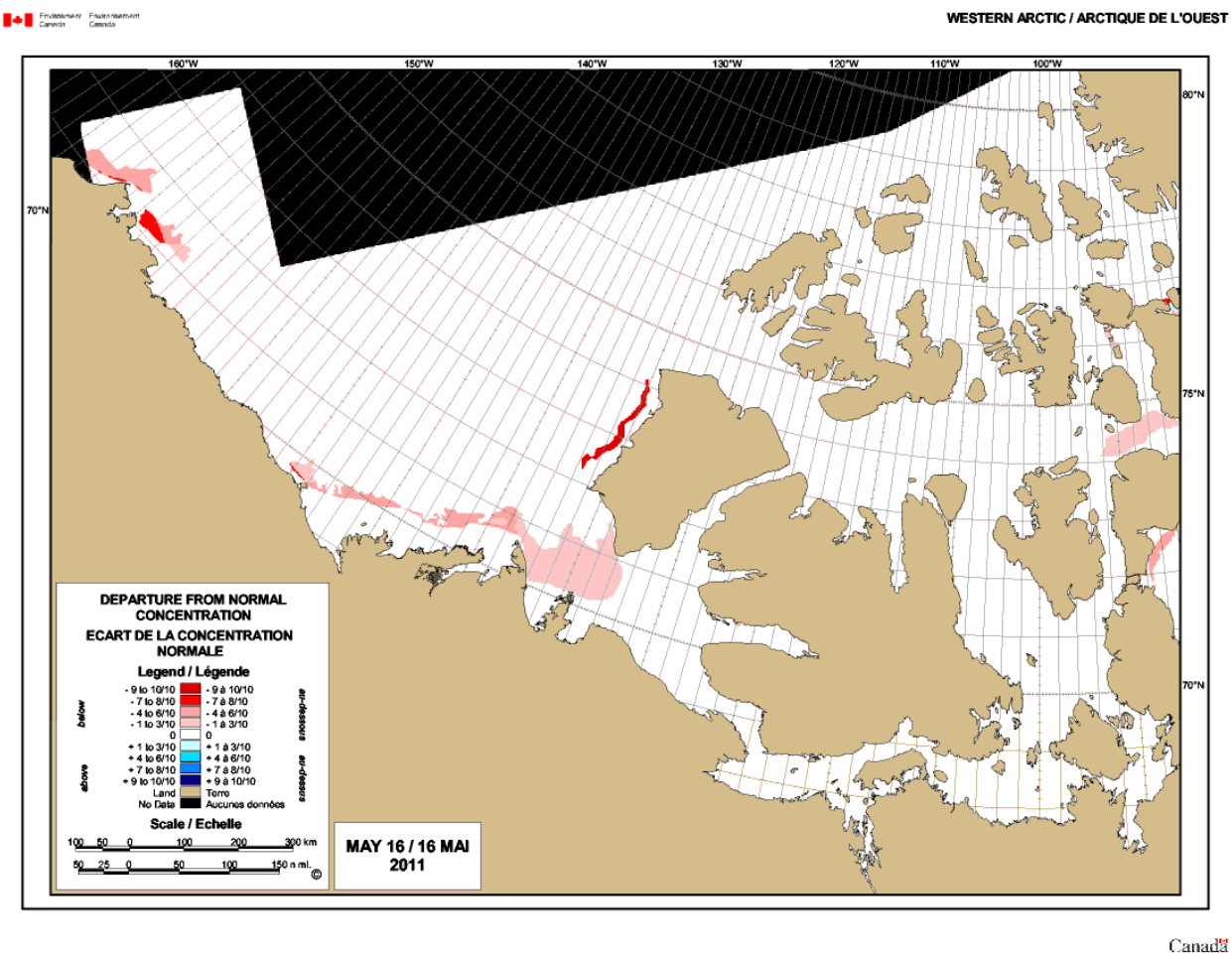

Figure 25: Departure from normal ice concentration for the Western Arctic on May 16, 2011.

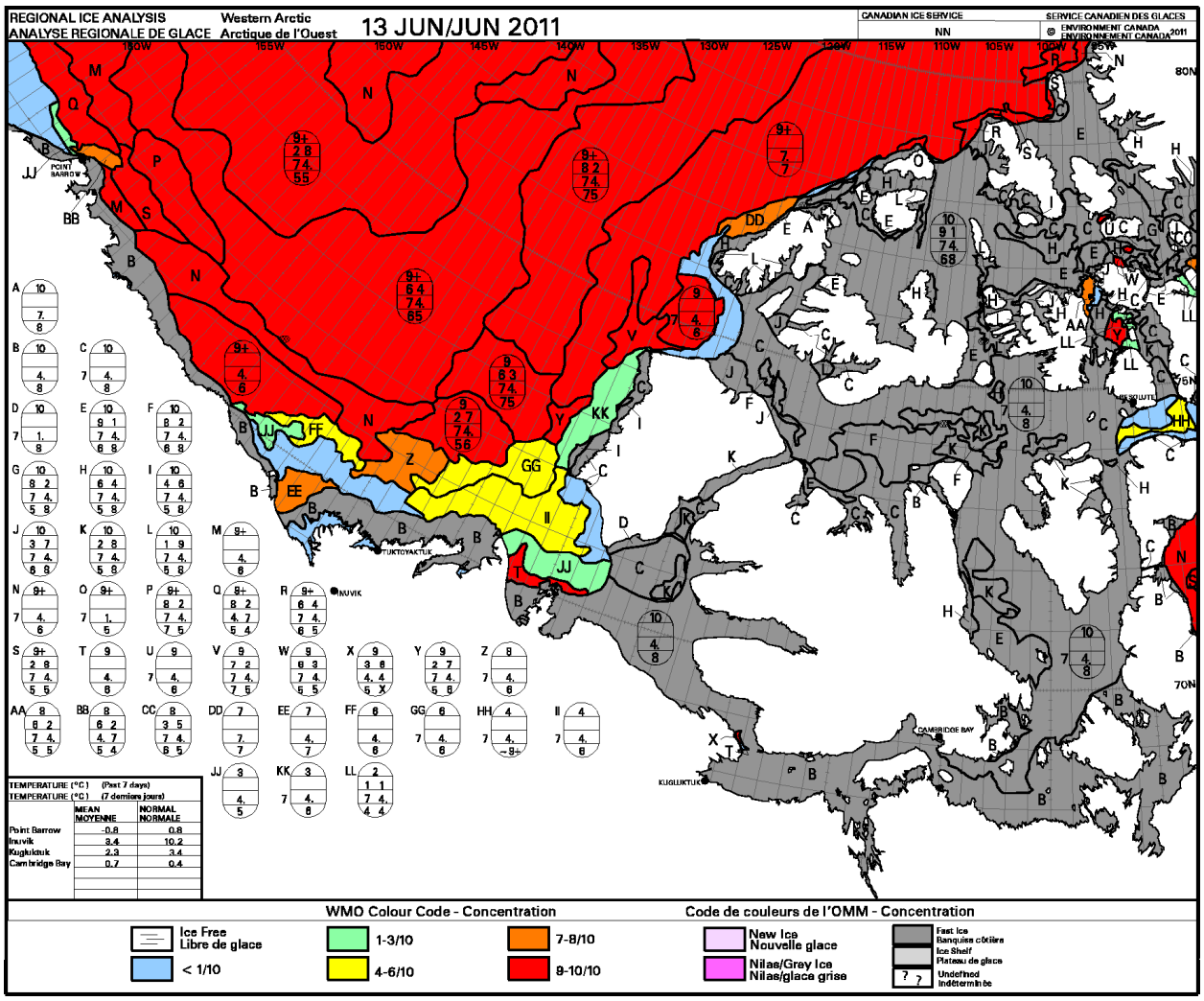

Figure 26: Western Arctic Regional chart on June 13, 2011.

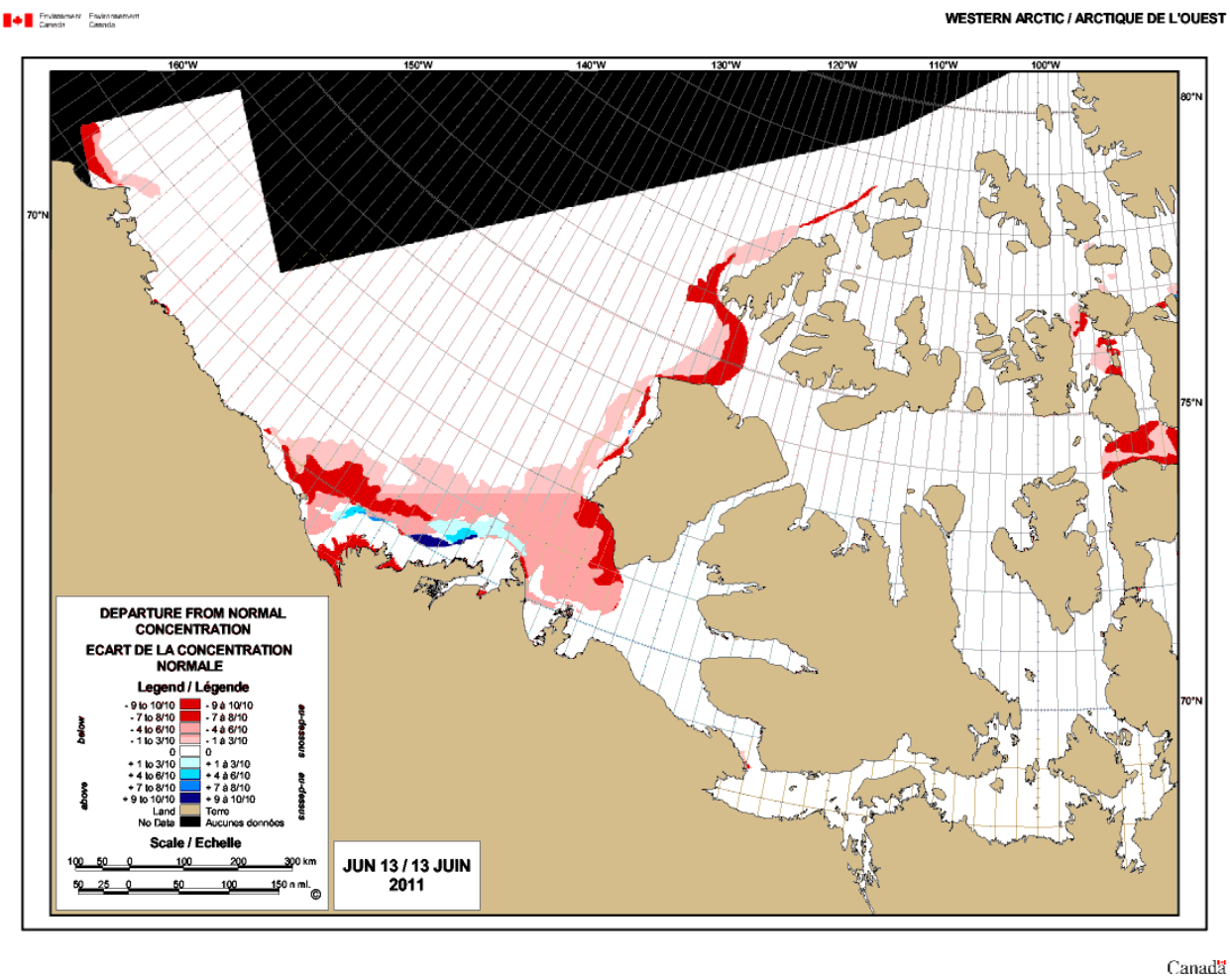

Figure 27: Departure from normal ice concentration for the Western Arctic on June 13, 2011.

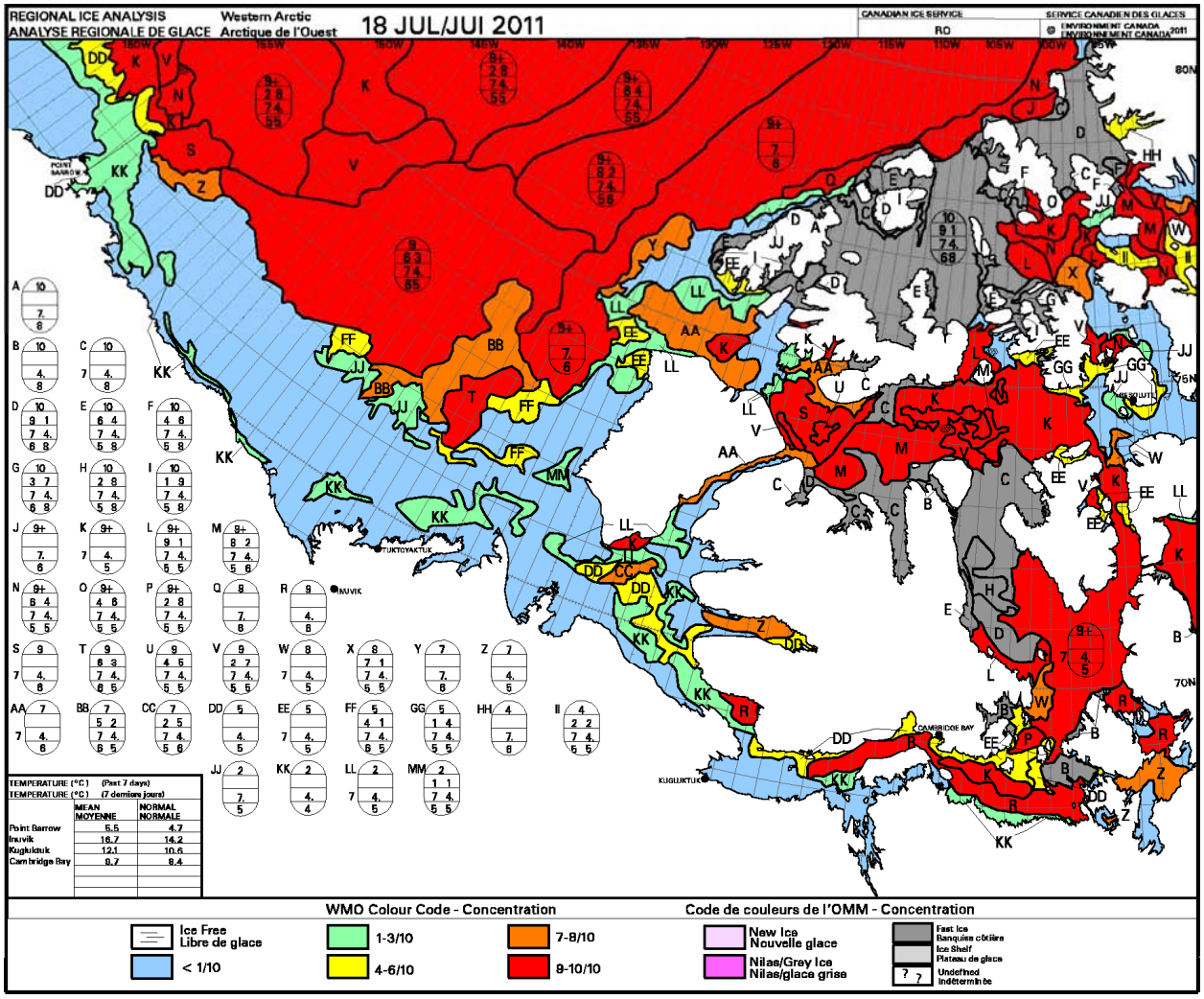

Figure 28: Western Arctic Regional chart on July 18, 2011.

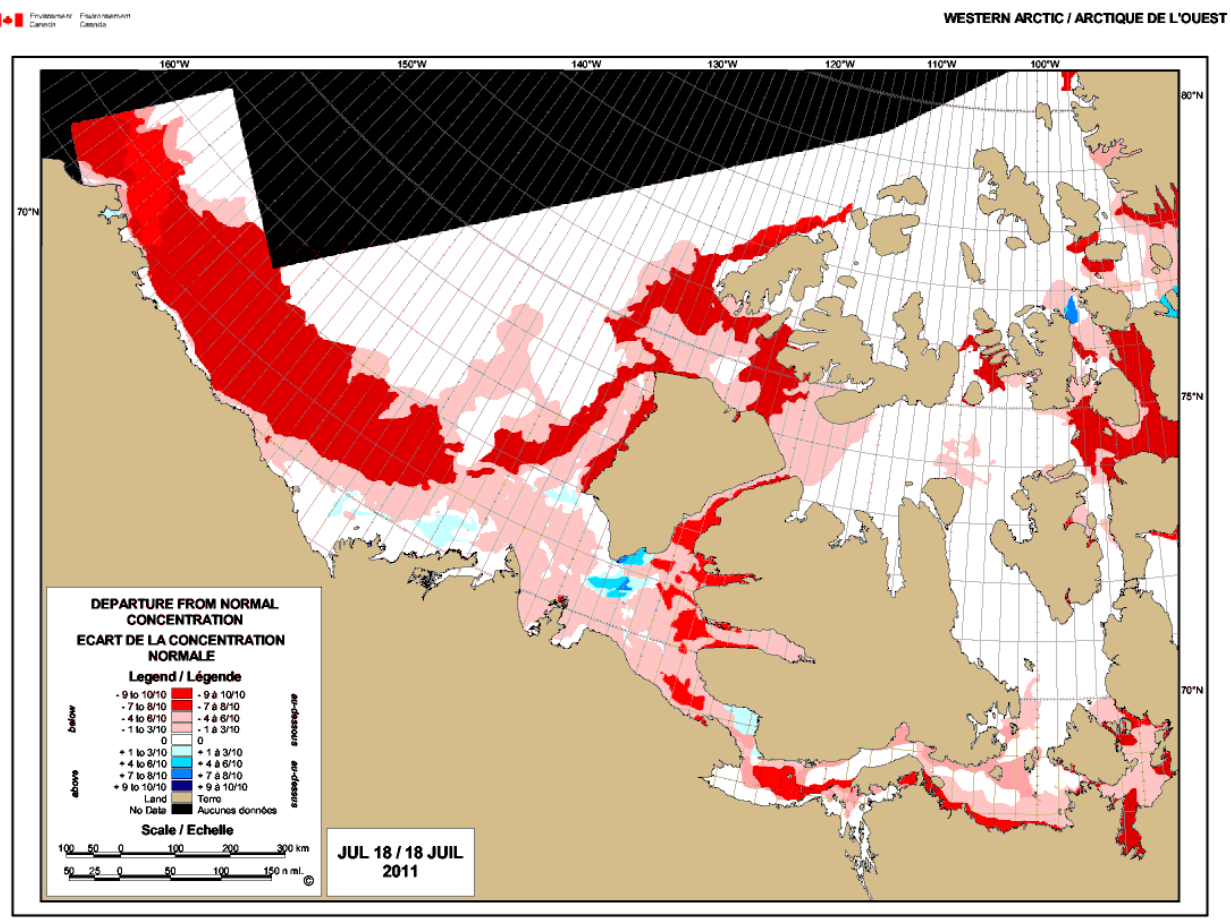

Figure 29: Departure from normal ice concentration for the Western Arctic on July 18, 2011.

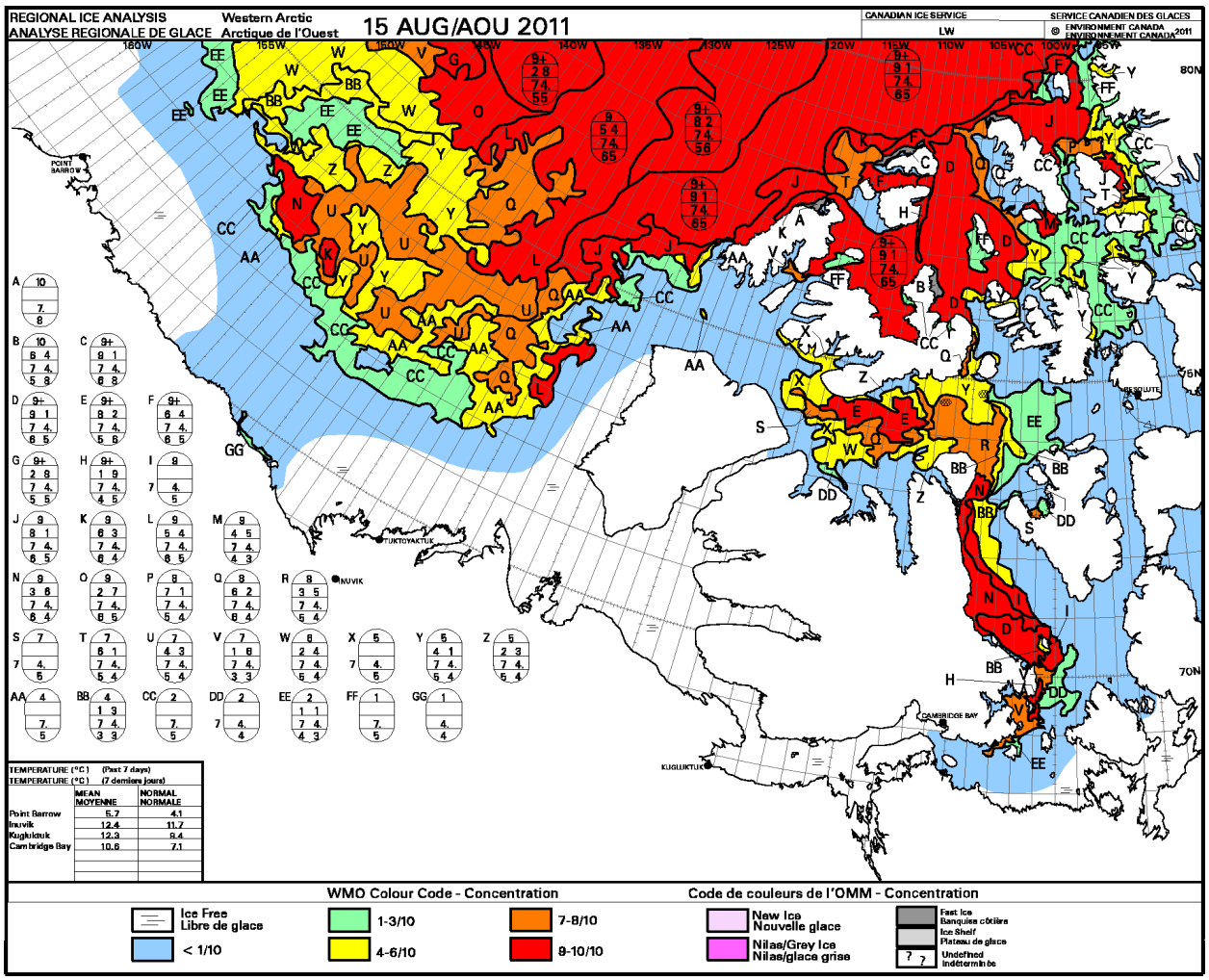

Figure 30: Western Arctic Regional chart on August 15, 2011.

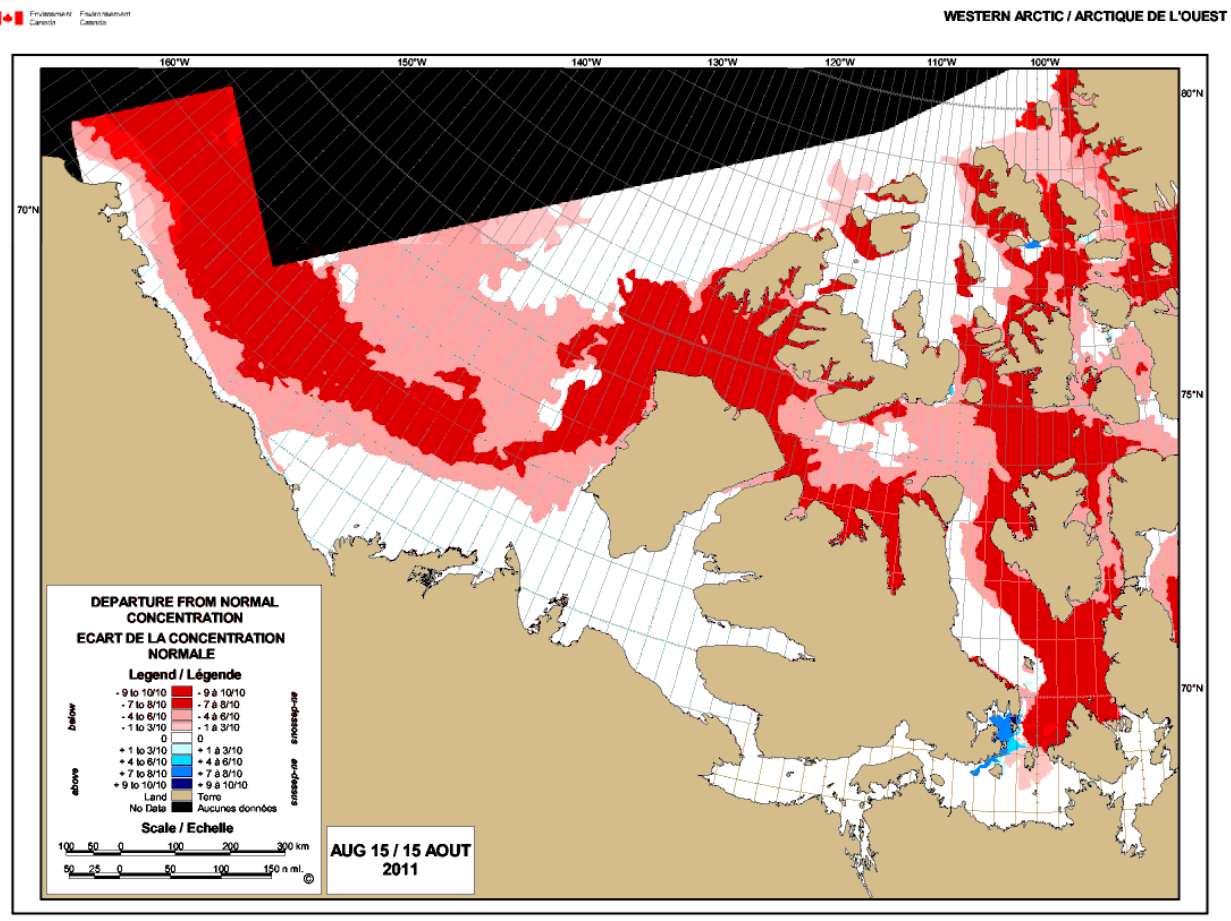

Figure 31: Departure from normal ice concentration for the Western Arctic on August 15, 2011.

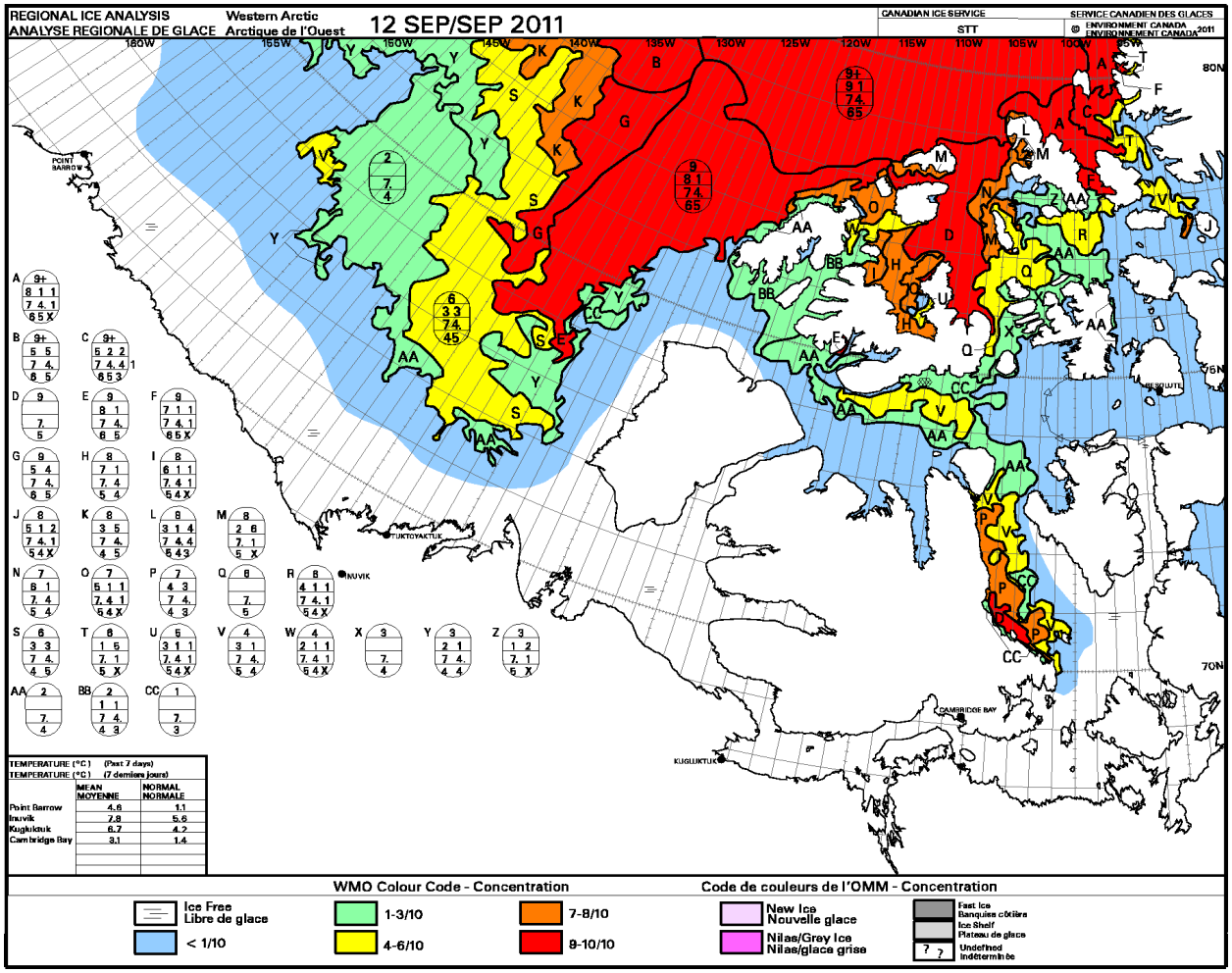

Figure 32: Western Arctic Regional chart on September 12, 2011.

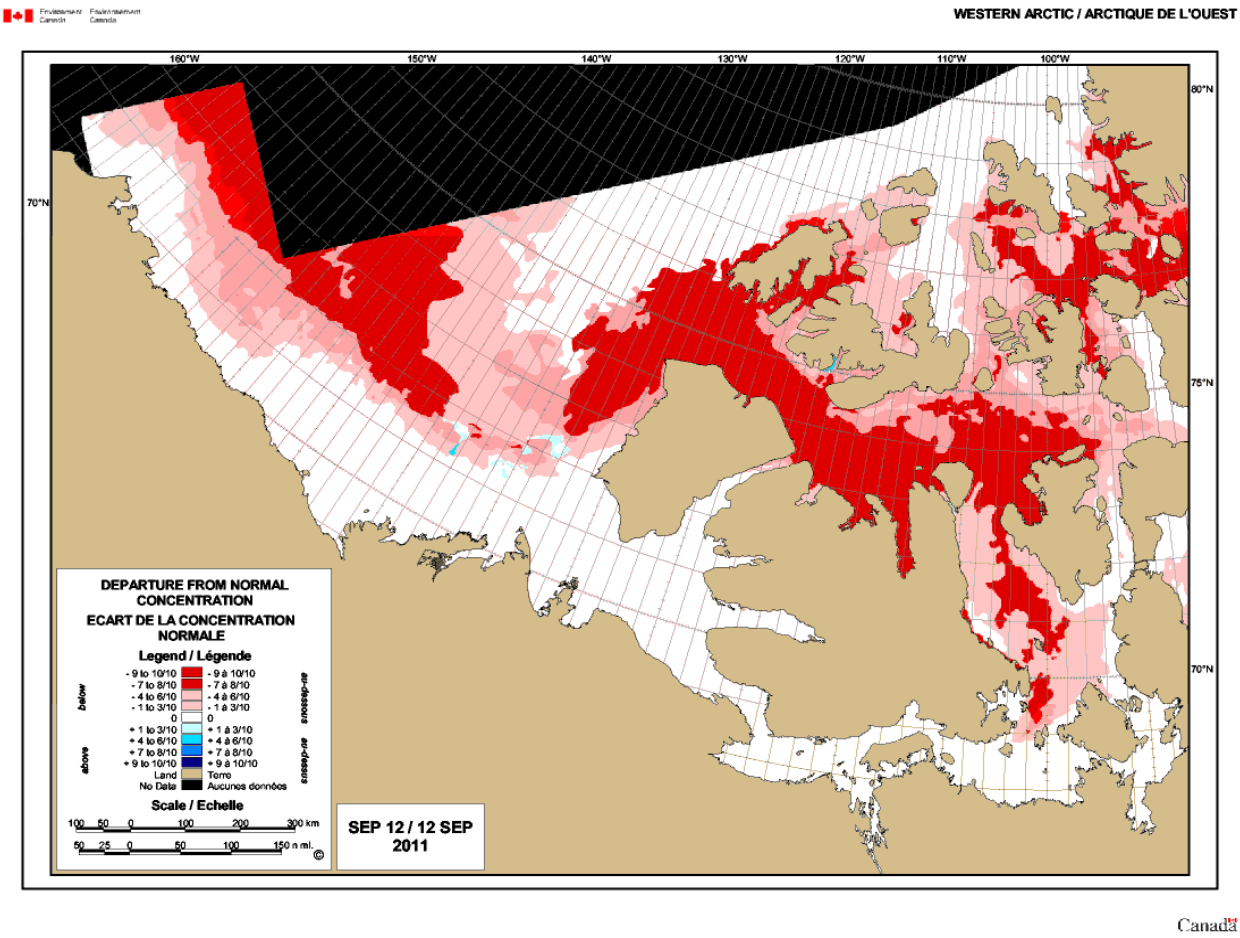

Figure 33: Departure from normal ice concentration for the Western Arctic on September 12, 2011.