Environment Canada Environnement Canada

Annual Arctic Ice Atlas

Winter 2013

By

Canadian Ice Service
Le service canadien des glaces

Canada

Foreword

The 2013 Annual Arctic Ice Atlas is part of a continuing series, prepared each year by the Canadian Ice Service since 1990. This collection of atlases documents Canadian Arctic winter sea ice conditions to provide a comparison from year to year. In each atlas, ice formation during the freeze-up period is first described. This is then followed by graphical depictions of the winter ice conditions, primarily based on synthetic aperture radar (SAR) data.

The SAR data used in the compilation of the image mosaics in this year's atlas primarily came from the RADARSAT-2 satellite. The data were captured by the Prince Albert (Saskatchewan) and Gatineau (Quebec) receiving stations, between February 2nd and February 28th, 2013.

In this atlas the Arctic is divided up into five main regions and four larger-scale snapshot regions. All of the main regions (Metarea17, Metarea18, the Eastern Arctic, the Western Arctic, and Hudson Bay) include an analysis of the data as well as a SAR image mosaic. The ice analyses were created by Environment Canada's Canadian Ice Service (CIS) personnel, who used additional supporting information (including meteorological summaries, ice thickness reports and NOAA AVHRR imagery) in their preparation. An explanation of the nomenclature on the analysis charts can be found on the Sea Ice Symbols page. A more detailed explanation of the terminologies used is available in MANICE (Manual of Standard Procedures for Observing and Reporting Ice Conditions), prepared by Environment Canada's Meteorological Service.

For most regions, the SAR image mosaic represents a composite of orbits from several days. The period over which the data were acquired is noted on each page. Basic geographic annotation is provided on the mosaics as a reference. During the image production, the raw data were radiometrically adjusted and enhanced. The overlapping orbits were then digitally seamed together to give a balanced and finished picture. For the main regions, although the SAR data were captured at a resolution of 50 metres pixel^{-1}, the data were analyzed at approximately 100 metres pixel^{-1} and the published image mosaics were resampled to approximately 800 metres pixel^{-1}. For the snapshot regions, the SAR data were captured at a resolution of approximately 25 metres pixel^{-1}, analyzed at 25 metres pixel^{-1}, and the published images were resampled to approximately 200 metres pixel^{-1}.

 All data acquired for this atlas has been archived

by the Canadian Centre for Remote Sensing (CCRS). This atlas has been published with the permission of MDA.

The successful completion of this project was made possible with the able assistance of many people. The following contributions should be noted:

- Project Manager: Dan Fequet (CIS)
- RADARSAT SAR data acquisition: MDA, Céline Fabi and Kathy Clevers (CIS)
- Mosaic production: Emma Nussli (CIS-COOP)
- Image analysis: Trudy Wohlleben, Denis Dubé, Luc Desjardins and Jeanine Laing (CIS)
- Freeze-up and Winter summary: Trudy Wohlleben (CIS)

Freeze-up

Hudson Bay and Approaches

Air Temperatures

During the first part of the freeze-up period, from the beginning of October to the end of November, mean air temperatures averaged 1-2°C above the 1981-2010 normal over Hudson Bay and 2-3°C above normal in Foxe Basin, Hudson Strait and along the Labrador Coast. Average temperatures in December then rose to 3-6°C above normal over Hudson Bay, Foxe Basin and between Frobisher Bay and the north Labrador coast, with a local hotspot averaging greater than 6°C above normal in Hudson Strait. In January, mean air temperatures over Hudson Bay returned to near normal except in the west where they averaged 1-3°C below normal. Air temperatures elsewhere averaged 2°C above normal or more, except along the southern section of the Labrador coast where they were near normal. Locally, in January, average temperatures reached 4°C above normal in northeastern Foxe Basin and 5°C above normal southwest of Baffin Island.

Ice Conditions Summary

Initial ice formation and thicknesses along the shores of Foxe Basin, Southampton Island, western Hudson Bay and southern Baffin Island were near normal in October. However, by mid-late November the southward advance of the ice edge from Foxe Basin into Hudson Bay and Hudson Strait, and from Davis Strait around the south coast of Baffin Island, was showing a delay of about a week due to the above normal air temperatures. In December, areas of delayed ice advance continued to exist in southwestern Hudson Bay, in Hudson Strait, in Frobisher Bay, along the leading edge of the Davis Strait ice pack and along the Labrador coast. The progression of ice formation was most delayed along the Labrador coast, where by the end of December it was approximately 3 weeks behind normal. However, in southeastern Hudson Bay and in Ungava Bay, areas of greater than normal ice concentrations developed in early December and persisted throughout most of the month.

Freeze-up: October to December

Following the summer melt season, at the beginning of October, all parts of the region were free of sea ice. Freeze-up then began normally and by mid-October new ice had begun forming along northern coastal areas of Foxe Basin. However, due to the warmer than normal average air temperatures, the progress of ice thickening and southward advance then slowed to approximately a week behind normal. By early November, new and grey ice covered the northern third of Foxe Basin and extended southwards along its coasts. New and grey ice had also developed in Roes Welcome Sound, along the south coast of Southampton Island, along the west coasts of Hudson and James Bays, along portions of the

coasts of eastern Hudson Bay and western Ungava Bay, and at the heads of Frobisher Bay and Cumberland Sound. By mid-November, Foxe Basin was nearly 100% ice covered, 1 week later than normal, as was Cumberland Sound, 1 week earlier than normal.

By the beginning of December, Foxe Basin was filled with predominantly grey-white ice when normally thin first-year ice would have already prevailed in this area and the coastal fast ice in Foxe Basin was less extensive than normal. Measured ice thicknesses at Hall Beach were running 6-7cm below those estimated based on the air temperature history during freeze-up at this time. Coastal fast ice had also begun to develop along the coasts of southern Baffin Island, Southampton Island, Hudson Bay, western James Bay and western Ungava Bay. Measured ice thicknesses at Coral Harbour were running approximately 4 cm less than predicted. The pack ice from Davis Strait had rounded southern Baffin Island as per normal, and grey-white ice filled Cumberland Sound. New and grey-white ice filled Frobisher Bay. Grey-white ice was forming in the northern part of Hudson Bay while new and grey ice lined its western shore, the southern margin of the main pack, and the shores of James Bay, Hudson Strait and Ungava Bay. New ice was forming in the fiords of the Labrador coast and in Lake Melville. The pattern of ice advance was close to normal everywhere, although slightly less extensive than normal in southwestern Hudson Bay, in western Hudson Strait, in Frobisher Bay and along the eastward margin of the Davis Strait pack ice. On the other hand, ice extents were slightly more extensive than normal in east-central Hudson Bay. By mid-December, thin first-year ice finally prevailed in Foxe Basin, 1-2 weeks behind schedule, and was developing in the northern part of Hudson Bay, in the Davis Strait pack ice, and along the shores of Cumberland Sound. Ice concentrations were less than normal along the Labrador coast and greater than normal in eastern Hudson Strait and Ungava Bay, primarily because winds in December averaged from the east and served to compress the ice westwards from the Labrador Sea into Hudson Strait. Ice concentrations were also greater than normal in southeastern Hudson Bay. Fast ice formation within the coastal fiords of Labrador finally began in the third week of December.

Winter: January

By the first week of January, Foxe Basin and Hudson Bay were 100% ice covered as per normal, but the extent of the pack ice along the Labrador coast was much less than normal. A mix of thin and medium first-year ice prevailed in Foxe Basin as per normal, and medium first year ice was beginning to form in the north-central parts of Hudson Bay. However, the extent of the thin first-year ice in Hudson Bay, Hudson Strait and in Davis Strait was somewhat restricted and areas of grey-white ice continued to prevail in a band along the eastern shore of Hudson Bay, in the northern half of Hudson Strait and in Ungava Bay. Grey-white ice prevailed in James Bay as per normal, but the lead along the west coast of

Hudson Bay contained mainly grey ice instead of grey-white ice, as did central sections of Frobisher Bay. South of 58.5°N, a thin 60km-wide band of mainly new ice extended southward along the Labrador coast when normally a nearly 200km-wide band of grey and grey-white ice should have extended along the entire length of the coast at this time. By the end of January, ice coverage was near normal everywhere except in a narrow zone along the eastern margin of the Davis Strait / Labrador ice pack, where concentrations were less than normal. Ice thicknesses within the mobile pack ice were near normal for the most part, with medium first-year ice prevailing in Foxe Basin, in central and northern Hudson Bay, Hudson Strait, and in the Davis Strait pack ice rounding southern Baffin Island. However, ice thicknesses were noticeably less than normal in certain areas. Along the Labrador coast, grey-white instead of thin first-year ice still prevailed. Along the west coast of Hudson Bay, where normally mostly thin first-year ice would be expected, a zone of grey and grey-white ice prevailed because average winds were from the west in January and the shore lead had been reopened more often than usual. Anomalous areas of grey-white ice also still existed in western James Bay, around the Belcher Islands, and in Cumberland Sound where thin first-year ice should have prevailed. Grey and grey-white ice still existed along the north coast of Hudson Strait and in Frobisher Bay, instead of thin first-year ice, again as the result of persistent northwesterly winds in January. On the other hand, medium first-year ice was being reported in Ungava Bay and in the northern Labrador Sea, when normally these areas would have been predominantly covered in thin first-year ice, because ice had invaded these areas early in December. At the end of January, measured fast ice thicknesses at Coral Harbour (~90cm) and at Hall Beach (~96cm) were around 15cm less than predicted based on air temperature history, while at Iqaluit (~100cm) they were approximately 10cm greater than predicted.

Eastern Arctic

Air Temperatures

Mean air temperatures in the Eastern Arctic averaged 1-3°C above the 1981-2010 normal during the freeze-up period, except in Baffin Bay where they averaged close to 5°C above normal. Positive temperature anomalies in Baffin Bay were greatest in November, when they were greater than 8°C above normal in the northern part of the bay. In January, mean air temperatures over Baffin Bay and adjacent areas continued to be 3-6°C above normal.

Ice Conditions Summary

Freeze-up was delayed by 2-3 weeks in most areas of the Eastern Arctic. In contrast, the fast ice in Nares Strait formed extremely early - by the end of the first week of November (nearly 3 months earlier than normal). This event was

aided by a large fragment of the new 2012 Petermann Ice Island, which was grounded in southern Kane Basin. This grounded fragment helped block the southward flow of ice and resulted in the early formation a stable ice arch in southern Nares Strait. In January, although ice coverage and the southward extent of the ice pack in Baffin Bay / Davis Strait were near normal, the progression of ice thickening lagged by 1-2 weeks in many places, especially in areas along the southern and eastern margins of the Baffin Bay ice pack and in northern Baffin Bay where the thin ice associated with the North Open Water polynya extended much farther south and east than normal.

Freeze-up: October to December

At the end of the 2012 melt season, ice concentrations in the Eastern Arctic were below normal almost everywhere, mainly due to lower than normal concentrations of multi-year ice north of 75°N and in the Gulf of Boothia / Committee Bay area. The only exceptions were in Kennedy Channel and in northern Kane Basin, and in Fury and Hecla Strait, where total ice concentrations were above normal. By mid-September, new and grey ice began forming north of 78°N as per normal, among the multi-year ice areas in Nares Strait and in the northwestern Queen Elizabeth Islands. At this time, new ice filled Nansen Sound, Greely Fiord and Eureka Sound. However no new ice formation was evident south of 78°N, when normally it would also have started forming in Jones Sound, Wellington Channel, Barrow Strait, Prince Regent Inlet and in the Gulf of Boothia / Committee Bay.

By the beginning of October, when new and grey ice would normally be expected as far south as 68°N west of Baffin Bay and down to 75°N in northwestern Baffin Bay, there was still no evidence of new ice formation in any of these areas, except among the loosely concentrated multi-year ice floes in the southeastern Gulf of Boothia / northeastern Committee Bay and in Fury and Hecla Strait. By mid-October, new and grey ice finally began to fill these areas, 2-3 weeks late, except in Lancaster Sound, Jones Sound and northern Baffin Bay where bergy water still prevailed. North of 77°N, grey-white ice had finally started to develop, although normally thin-first year ice would already have prevailed in these areas. The ice in Greely Fiord and the northern part of Eureka Sound was fast as per normal, but the ice in Nansen Sound was still mobile.

By the beginning of November, fast ice had formed in Nansen Sound but the ice among the rest of the Queen Elizabeth Islands south of Eureka Sound still remained mobile. The ice north of 76°N had for the most part thickened to the thin first-year ice stage, and grey-white ice filled Jones Sound, Barrow Strait, Lancaster Sound and the eastern half of the Gulf of Boothia. Elsewhere, new and grey ice covered Committee Bay, Pelly Bay and the western half of the Gulf of Boothia. New and grey ice was at last also forming in northwestern Baffin Bay and in the northern part of Foxe Basin and southward along its coasts. Hints of

new ice formation could also be seen at the head of Cumberland Sound. By mid-November, the ice among most of the eastern Queen Elizabeth Islands had become fast, 2-3 weeks later than normal. Fast ice had also formed in southern Kane Basin (3 months early), where a large fragment of the 2012 Petermann Ice Island had become grounded. The ice in Admiralty Inlet, Pond Inlet and Pelly Bay all became fast around this time (each a week later than normal). Ice had thickened to the thin-first year stage in most of Jones Sound, eastern Parry Channel and in the Gulf of Boothia / Committee Bay. New and young ice formation was progressing rapidly southwards in Foxe Basin and in Cumberland Sound, while the pack ice extent in Baffin Bay now reached eastward to 60°W and southward to 67°N, approximately what would have been expected 2 weeks earlier around the beginning of November, based on climatology.

By the end of November / early December, ice extents and concentrations were near normal in all areas of the eastern Arctic except along the eastern margins of the Baffin Bay / Davis Strait pack ice where they were still below normal. Fast ice filled the entire length of Nares Strait. Fast ice was slowly developing in the fiords of eastern Baffin Island, Cumberland Sound and Jones Sound, and in the coastal areas of Foxe Basin, although it was much less extensive than normal in all these areas. Medium first-year ice prevailed as per normal north of 76°N and thin first-year ice prevailed in much of northwestern Baffin Bay, the Gulf of Boothia and in Committee Bay. However, ice thicknesses were thinner than normal in Foxe Basin and in central Baffin Bay, being still primarily in the grey-white stage as opposed to the thin first-year ice stage. Grey-white ice prevailed normally along the eastern margin of the Baffin Bay / Davis Strait pack ice and in Cumberland Sound. Measured fast ice thicknesses in Hall Beach were approximately 6cm less than predicted in December.

Winter: January

By the end of December, fast ice had formed in central Jones Sound and extended through Penny Strait, Queens Channel and Wellington Channel. By the beginning of January, fast ice had also formed in western Barrow Strait. The zone of fast ice along the east coast of Baffin Island had widened and now encompassed several grounded fragments of the 2010 and 2012 Petermann Ice Islands as well as the Ryder Ice Island from northern Greenland. The leading ice island fragments still within the mobile pack ice were rounding Cape Dyer. At the beginning of January, ice concentrations were near normal everywhere, except right along the southeastern edge of the Baffin Bay pack, where a narrow zone of below normal concentrations could still be found. Thick first-year ice was beginning to form in Nares Strait and north of 76°N in the Queen Elizabeth Islands, as per normal. Medium first-year ice prevailed elsewhere among the islands west of Baffin Bay, except in eastern Foxe Basin where thin first-year ice still dominated, again as per normal. In Baffin Bay, however, most of the pack ice was still in the thin first-year ice stage and the extent of the medium first year ice

was limited to a single tongue that extended eastward from Lancaster Sound into the northwestern part of the Bay. Additionally, grey-white and grey ice could still be found along the entire eastern margin of the Baffin Bay pack. Measured ice thicknesses at Eureka and Hall Beach were very close to calculated thicknesses based on the air temperature histories at those sites, but measured ice thicknesses at Resolute Bay were running approximately 5cm below estimated while those at Alert were running approximately 10 cm below estimated. By the end of January, medium first-year ice filled most of Baffin Bay as per normal while thin first-year ice prevailed along its northeastern margins. However, no areas of thick first-year ice yet existed in the northwestern sections of the bay, while south of 71°N an abnormal zone of grey to grey-white ice still existed along the eastern margin of the pack. The North Open Water polynya immediately south of Nares Strait was abnormally extensive in the second half of January, with broad areas of bergy water and new and grey ice where normally grey-white ice would have prevailed. West of Baffin Bay, although thick first-year ice prevailed in the fast ice areas north of Parry Channel, in western Barrow Strait, in Pond Inlet, Admiralty Inlet, and along the coasts of the Gulf of Boothia from Pelly Bay and northwards, no extensive areas of thick first-year ice had yet developed within the mobile pack. Additionally, the ice in Foxe Basin still remained a mixture of thin and medium first-year ice, when normally medium first-year ice would prevail everywhere. Anomalous areas of grey and grey-white ice could be found in Barrow Strait, northern Cumberland Sound and southwest Foxe Basin, as a result of periods of northwesterly winds. While measured ice thicknesses at Eureka and Resolute Bay were close to predicted, those at Hall Beach were now running approximately 15cm below estimated while those at Alert were running approximately 7-15cm below estimated, depending on the exact site.

Western Arctic

Air Temperatures

Mean air temperatures during freeze-up in the western Arctic averaged well above the 1981-2010 normal: 1-3°C above normal over the Canadian Arctic Archipelago (CAA) and along the mainland coast, and 3-6°C above normal and more over the Beaufort Sea. Positive temperature anomalies were greatest from October to November, 2012. However, this pattern then began to change in December and by January, 2013, a large area of below normal temperatures had developed over the western CAA south of 78°N and in the southwestern Beaufort Sea where temperatures now averaged close to 5°C below normal. By the last week of January mean air temperatures were well below normal across the entire region, ranging from 1-2°C below normal near Point Barrow and in Queen Maud Gulf to 3-5°C below normal over the central CAA to more than 5°C below normal in the southwestern Beaufort Sea and Amundsen Gulf. This pattern continued into February.

Ice Conditions Summary

Ice formation was delayed by 3-4 weeks in the Beaufort Sea and among the islands of the CAA, as a result of the warm temperatures during freeze-up. By January; however, due to the normal and colder than normal temperatures that developed during December, first-year ice thicknesses were near normal everywhere.

Freeze-up: October to December

By the end of the 2012 melt season, the 44-year record for least end-of-summer average ice cover in the Western Arctic had been broken. Ice free conditions existed along nearly the entire the southern route of the Northwest Passage, from Franklin Strait to the Yukon-Alaska border, and an area of ice free water also existed in the central and southwestern Beaufort Sea. Adjacent to these areas, open water prevailed in much of M'Clintock Channel, Viscount Melville Sound, Peel Sound, Barrow Strait and along the Alaskan Coast. The multi-year ice pack in the Beaufort Sea, the southern margin of which would normally lie along 71.5°N and which would normally extend westward along this latitude towards Point Barrow, was constrained in 2012 to areas north of 74°N and east of 145°W. Within the CAA north of Parry Channel, multi-year ice concentrations were below normal everywhere at the end of the 2012 melt season, except near normal in the Prince Gustaf Adolf Sea where the Arctic pack ice was intruding southwards. Within Parry Channel and in M'Clintock Channel, multi-year ice concentrations at this time were also well below the normally extensive 9+/10 coverage, instead consisting of local patches of ice with less than 5/10 concentration (except for a narrow band along the south coast of Melville Island where concentrations were greater than normal). As a result, both the north and south routes of the Northwest Passage were navigable in 2012. The south route was navigable from end-August to mid-October, while the north route was navigable from early September to early October.

In mid-September, New and grey ice began forming locally among the Queen Elizabeth Islands north of 75°N as per normal. At the same time, new and grey ice had also begun to develop among the ice floes in the Beaufort Sea pack ice. By mid-October, however, delays in the progression of ice development in the Western Arctic were very apparent. A large zone of anomalously ice free waters still persisted in the southern Beaufort Sea between the coast and the pack ice, and within Amundsen Gulf. A mix of new, grey and grey-white ice had only just finally developed over most parts of western Parry Channel and along the southern and western margins of the Beaufort Sea multi-year ice pack. Areas of new ice were only just beginning to develop in northern M'Clintock Channel, western Victoria Strait, Prince of Wales Strait, Peel Sound, along the south shores of Queen Maud Gulf and Rae Strait, and along the mainland coast between Point Barrow and Tuktoyaktuk.

By the beginning of November, although areas of fast ice had developed along sections of the coasts of Alaska, Yukon and the Northwest Territories and in sheltered bays and narrow passages within the CAA, the bulk of the ice north of Parry Channel was still anomalously mobile. Large areas of open water interspersed with areas of new ice continued to prevail south of 72.5°N from Coronation Gulf westward to Point Barrow. Thin first-year ice prevailed as per normal within the Queen Elizabeth Islands (where not covered in multi-year ice), in western Viscount Melville Sound, M'Clure Strait, and around the Beaufort Sea multi-year ice pack north of 74°N and east of 145°W. However, grey-white instead of thin first-year ice still prevailed in eastern Viscount Melville Sound and Barrow Strait southwards into northern Queen Maud Gulf, and around the Beaufort Sea pack ice down to 73°N.

By mid-November, the entire Western Arctic region was finally 100% ice-covered, 2-3 weeks later than normal. The ice among most of the western Queen Elizabeth Islands north of Parry Channel had finally become fast, also 2-3 weeks later than normal, except for the ice in the Prince Gustaf Adolf Sea to Byam Martin Channel corridor which remained anomalously mobile. The ice in this corridor did not become fast until the last week of November, 4 weeks later than normal.

By the beginning of December, the ice in Rae Strait, Queen Maud Gulf and Coronation Gulf had become fast as per normal, however the ice in Peel Sound still remained mobile. Medium first year ice prevailed within the Queen Elizabeth Islands and around the margins of the Beaufort Sea multi-year ice pack southwards to around 73.5°N, but Parry Channel still contained primarily thin first year ice. Thin first year ice also prevailed almost everywhere else except in Coronation Gulf, Amundsen Gulf and along the coast to Point Barrow where a mix of thin first-year and grey-white ice could still be found.

Winter: January

By the beginning of January, ice coverage and ice thicknesses were normal everywhere, with thick first-year ice prevailing in the CAA north of Parry Channel, and medium first-year ice prevailing elsewhere. Measured ice thicknesses and those calculated based on the air temperature history at Cambridge Bay were in close agreement, in the medium first-year ice stage. Fast ice had developed in western Viscount Melville Sound and in M'Clintock Channel as per normal, but the ice in M'Clure Strait and eastern Viscount Melville Sound was still mobile. However, these remaining areas then consolidated by mid-January. By the end of January, ice coverage and ice thicknesses were normal everywhere, with thick first-year ice prevailing among the islands and also among the multi-year ice floes in the Beaufort Sea pack ice north of 75°N. Measured and calculated ice thicknesses at Cambridge Bay continued to be in agreement and had reached the thick first-year ice stage. Medium first-year ice prevailed in Amundsen Gulf

and in the Beaufort Sea south of 75°N. Measured ice thicknesses in February then went on to surpass estimated thicknesses based on freezing degree days. Additionally, because the average wind direction in January was from the north, a tongue of the Beaufort Sea multi-year ice pack was pushed southwards along the west coast of Banks Island, and greater than normal old ice concentrations were then observed in that area, south of 74°N, in the second half of January.

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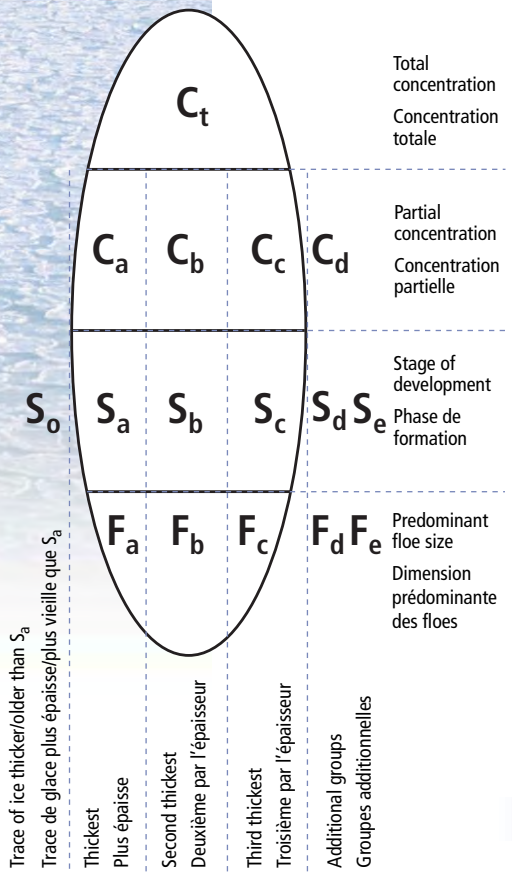
FACT SHEET / FICHE D'INFORMATION

SEA ICE SYMBOLS
SYMBOLES DE LA GLACE DE MER

2009

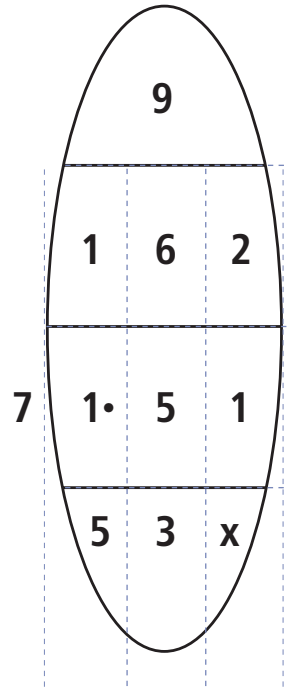


Total concentration
Concentration totale

Partial concentration
Concentration partielle

Stage of development
Phase de formation

Predominant floe size
Dimension prédominante des floes



Total concentration: the ice coverage of an area determined by its concentration and expressed in tenths (in this example, 9/10).
Concentration totale : l'étendue de la couverture de glace, exprimée en dixièmes de la superficie du secteur (dans cet exemple, 9/10).

Partial concentration: the break-down of the total ice coverage expressed in tenths and graded by thickness. The thickest starting from the left and in this example, 1/10 is the thickest.
Concentration partielle : les concentrations respectives, exprimées en dixièmes, des glaces de différente épaisseur, par ordre décroissant. La plus épaisse commence à la gauche du diagramme, c'est-à-dire, 1/10 est le plus épais.

Stage of development: the type of ice in each of the grades, determined by its age, that is 1/10 is medium first-year ice (1•), 6/10 is grey-white ice (5) and 2/10 is new ice (1). Trace of old ice is represented on the lefthand side (outside the egg) by the number 7.
Stade de développement : le type de glace de chacune des catégories déterminé par son âge, c'est-à-dire, 1/10 est de la glace moyenne de première année (1•), 6/10 est de la glace blanchâtre (5), et 2/10 est de la nouvelle glace (1). Une trace de vielle glace est représentée à gauche (à l'extérieur de l'oeuf) par le chiffre 7.

Floe size: the form of the ice determined by its floe size for each section. In this example, big floes (5) for medium first-year ice (1•); small floes (3) for grey-white ice (5); and undetermined, unknown or no form floes (x) for new ice (1).
Taille des floes : la forme de la glace, déterminée par la taille des floes dominants de chaque section. Dans cette exemple, grands floes (5) pour la glace moyenne de première année (1•); petits floes (3) pour glace blanchâtre (5)et floes indéterminée, inconnue ou sans forme (x) pour la nouvelle glace (1).

Note: When an ice type has a dot (•) every other value to the left of it is also considered to have a dot.

Remarque: Lorsqu'un nombre est suivi d'un point (•), toute autre valeur apparaissant à sa gauche est également pointée.

SEA ICE SYMBOLS/SYMBOLES DE LA GLACE DE MER

Stage of Development/Stade de développement ($S_oS_aS_bS_cS_dS_e$)

Description/Élément	Thickness/Épaisseur	Code
New ice/Nouvelle glace	<10 cm	1
Nilas; ice rind/Nilas glace, vitrée	<10 cm	2
Young ice/Jeune glace	10-30 cm	3
Grey ice/Glace grise	10-15 cm	4
Grey-white ice/Glace blanchâtre	15-30 cm	5
First-year ice/Glace de première année	30 cm	6
Thin first-year ice/Glace mince de première année	30-70 cm	7
Medium first-year/ Glace moyenne de première année	70-120 cm	1•
Thick first-year ice/Glace épaisse de première année	>120 cm	4•
Old ice/Vieille glace		7•
Second-year/Glace de deuxième année		8•
Multi-year/Glace de plusieurs années		9•
Ice of land origin/Glace d'origine terrestre		▲•
Undetermined, unknown or no form/ Indéterminée, inconnue ou sans forme		X

Floe Size/Grandeur des floes ($F_aF_bF_c$)

Description/Élément	Width/Extension	Code
Pancake ice/Glace en crêpes		0
Small ice cake, brash ice/Petit glaçons, sarrasins	<2 m	1
Ice cake/Glaçons	2-20 m	2
Small floe/Petits floes	20-100 m	3
Medium floe/Floes moyens	100-500 m	4
Big floe/Grands floes	500-2000 m	5
Vast floe/Floes immenses	2-10 km	6
Giant floe/Floes géants	>10 km	7
Fast ice/Banquise côtière		8
Icebergs		9
Undetermined, unknown or no form/ Indéterminée, inconnue ou sans forme		X
Strips (concentration = C)/ Glace en cordons (concentration = C)		ᔕ C

Canadian Ice Service/Service canadien des glaces (CIS/SCG)

Client Services/Service à la clientèle
373 promenade Sussex Drive, E-3
Ottawa, Ontario
K1A 0H3

Tel./Tél.: 1-800-767-2885 (Canada) and/et 613-996-1550
Fax: 613-947-9160
Email/Courriel: cis-scg.client@ec.gc.ca
Web site/Site web: http://ice-glaces.ec.gc.ca

Canada

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SEA ICE SYMBOLS
SYMBOLES DE LA GLACE DE MER

WMO Concentration Colour Code – Sea Ice
Code de couleurs de l'OMM – Concentration – Glace de mer

- Ice Free / Libre de glace
- < 1/10
- 1-3/10
- 4-6/10
- 7-8/10
- 9-10/10
- Fast Ice / Banquise côtière
- ??? Undefined / Non-définie

Optional/Facultatif

- 7/10 New Ice / Nouvelle glace
- 9+-10/10 Nilas, Grey Ice / Glace grise**

Colour is based on total ice concentration.

La couleur utilisée est établie en fonction de la concentration totale de la glace.

** The optional colour indicating 9/10+-10/10 of nilas or grey ice indicates level ice, mainly on leads; it is not used for ice broken into brash or ice cakes or for concentrations less than 9/10+.

La couleur optionnelle désignant 9/10+-10/10 de nilas ou de glace grise indique de la glace uniforme se retrouvant surtout dans les chenaux; elle n'est pas utilisée pour désigner des sarrasins, des glaçons ou des concentrations de glace inférieures à 9/10+.

Concentration of Ice
Concentrations de glace

<1/10	Open water/ Eau libre
1–3/10	Very open drift/ Banquise très lâche
4–6/10	Open drift/ Banquise lâche
7–8/10	Close pack/Drift Banquise serrée
9/10	Very close pack/ Banquise très serrée
9+/10	Very close pack/ Banquise très serrée
10/10	Compact/Consolidated ice Banquise compact/consolidée

WMO Stage of Development Colour Code – Sea Ice
Code de couleurs de l'OMM – Stade de développement – Glace de mer

- Ice Free / Libre de glace
- Open Water / Eau libre
- New Ice / Nouvelle glace — *< 10 cm*
- Grey Ice / Glace grise — *10-15 cm*
- Grey-White Ice / Glace blanchâtre — *15-30 cm*
- First-Year Ice / Glace de première année — *>= 30 cm*
- Thin First-Year Ice / Glace mince de première année — *30-70 cm*
- Medium First-Year Ice / Glace moyenne de première année — *70-120 cm*
- Thick First-Year Ice / Glace épaisse de première année — *120 cm >*
- Old Ice / Vieille glace
- Second-Year Ice / Glace de deuxième année
- Multi-Year Ice / Glace de plusieurs années
- Fast Ice / Banquise côtière
- ??? Undefined Ice / Glace non-définie
- Icebergs

Colour is based on stage of development of predominant ice.

La couleur utilisée est établie en fonction du stade de développement de la glace prédominante.

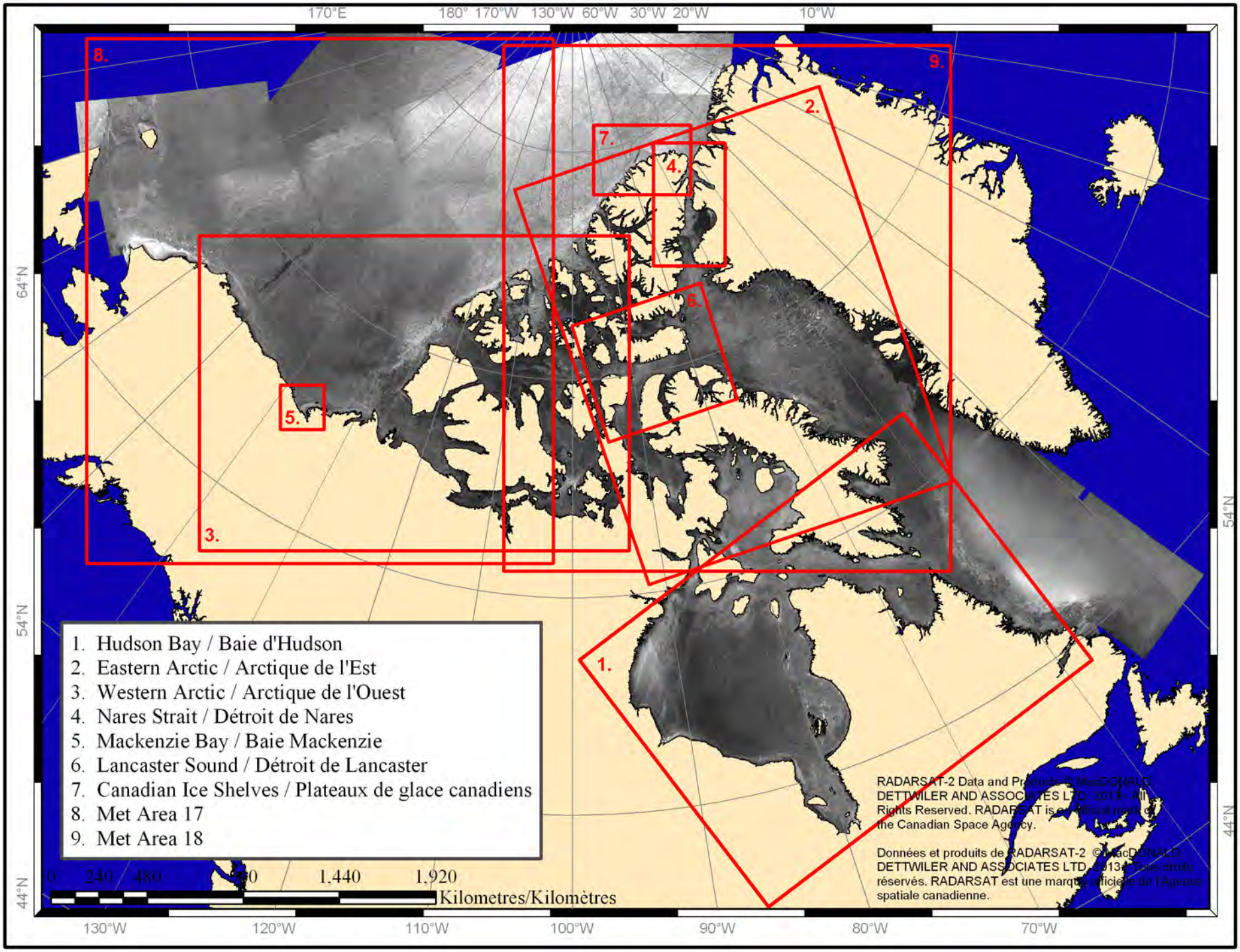
Canadian Ice Service/Service canadien des glaces (CIS/SCG)

Client Services/Service à la clientèle
373 promenade Sussex Drive, E-3
Ottawa, Ontario
K1A 0H3

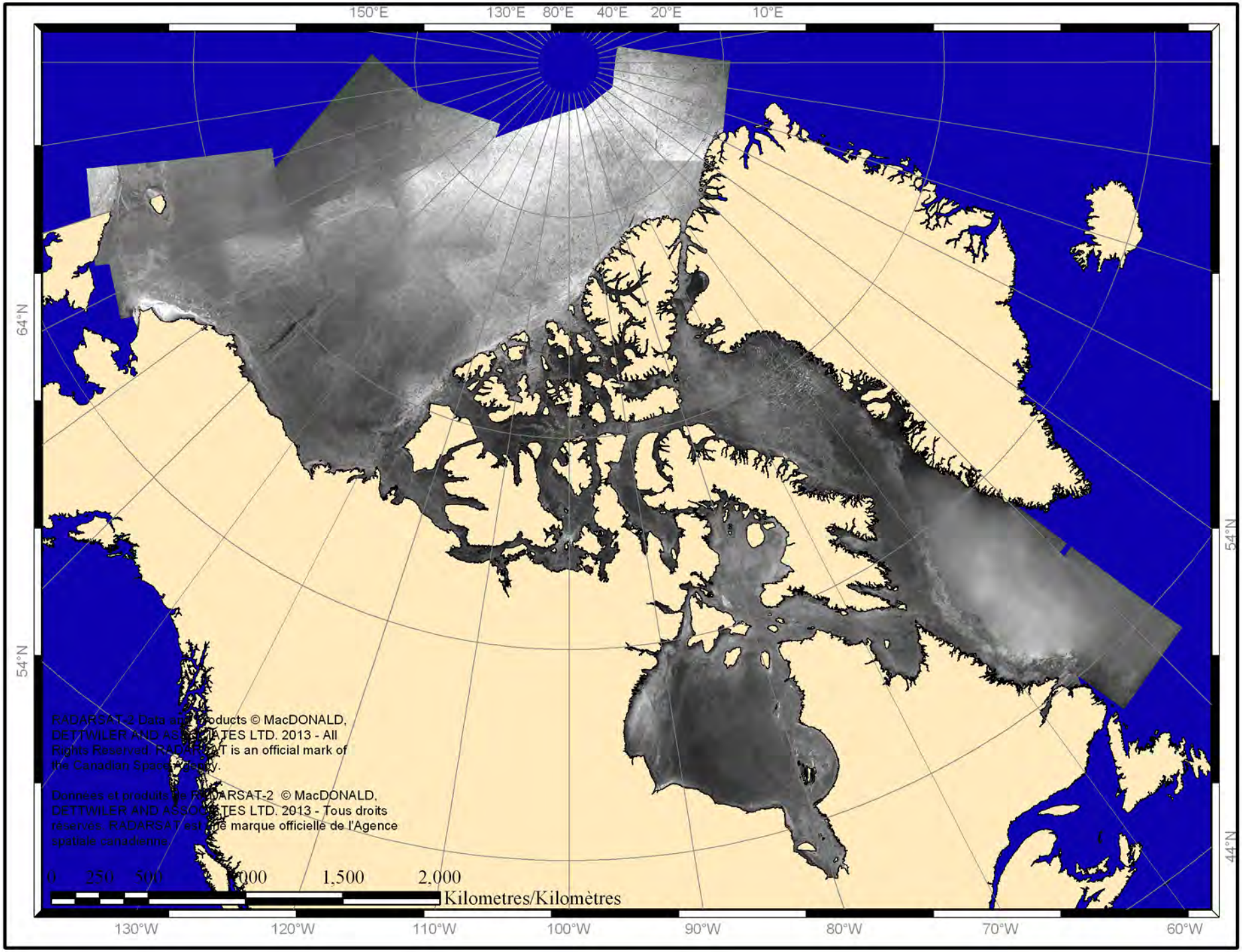
Tel./Tél.: 1-800-767-2885 (Canada) and/et 613-996-1550
Fax: 613-947-9160
Email/Courriel: cis-scg.client@ec.gc.ca
Web site/Site web: http://ice-glaces.ec.gc.ca

Canada

CANADIAN ARCTIC MOSAIC / MOSAÏQUE DE L'ARCTIQUE CANADIEN



CANADIAN ARCTIC MOSAIC / MOSAÏQUE DE L'ARCTIQUE CANADIEN

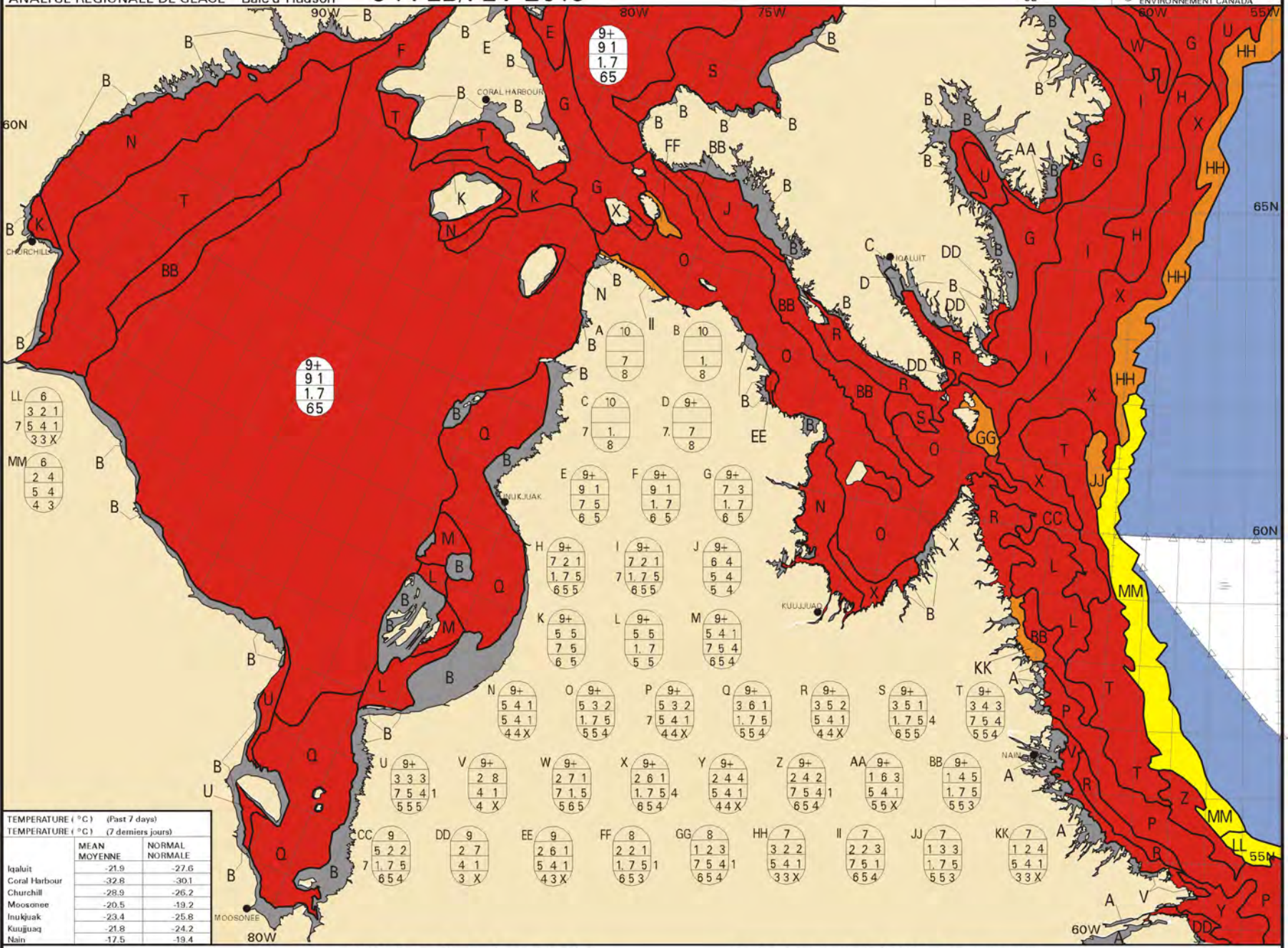


REGIONAL ICE ANALYSIS
ANALYSE REGIONALE DE GLACE

Hudson Bay
Baie d'Hudson

04 FEB/FEV 2013

CANADIAN ICE SERVICE
SERVICE CANADIEN DES GLACES
JL



TEMPERATURE (°C) (Past 7 days) / TEMPERATURE (°C) (7 derniers jours)	MEAN MOYENNE	NORMAL NORMALE
Iqaluit	-21.9	-27.6
Coral Harbour	-32.8	-30.1
Churchill	-28.9	-26.2
Moosonee	-20.5	-19.2
Inukjuak	-23.4	-25.8
Kuujjuaq	-21.8	-24.2
Nain	-17.5	-19.4

WMO Colour Code - Concentration

Code de couleurs de l'OMM - Concentration

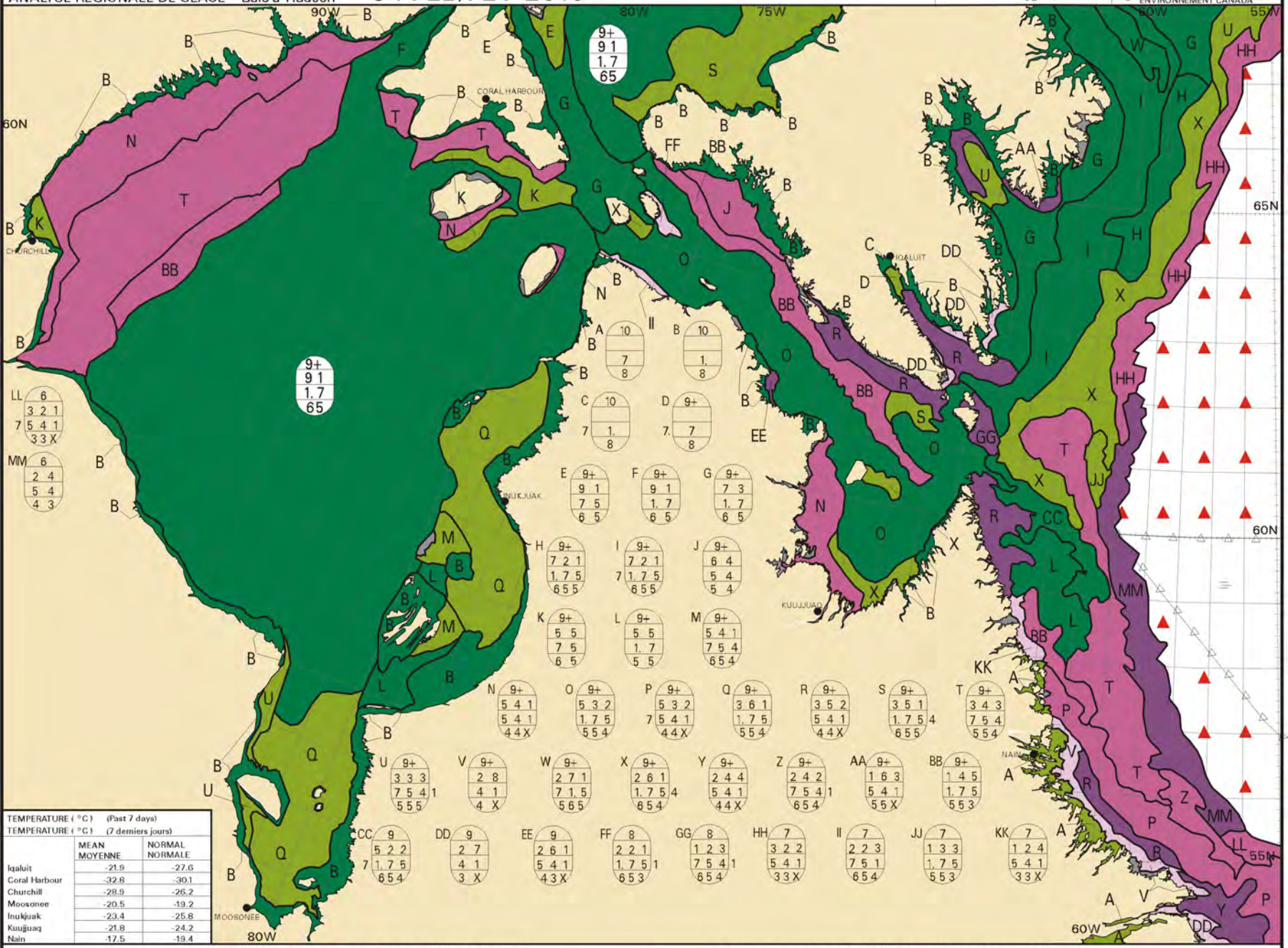
- Ice Free / Libre de glace
- < 1/10
- 1-3/10
- 4-6/10
- 7-8/10
- 9-10/10
- Fast Ice / Banquise côtière
- ? ? Undefined / Indéterminée
- New Ice / Nouvelle glace
- Nilas/Grey Ice / Nilas/glace grise

REGIONAL ICE ANALYSIS
ANALYSE REGIONALE DE GLACE

Hudson Bay
Baie d'Hudson

04 FEB/FEV 2013

CANADIAN ICE SERVICE
SERVICE CANADIEN DES GLACES
JL



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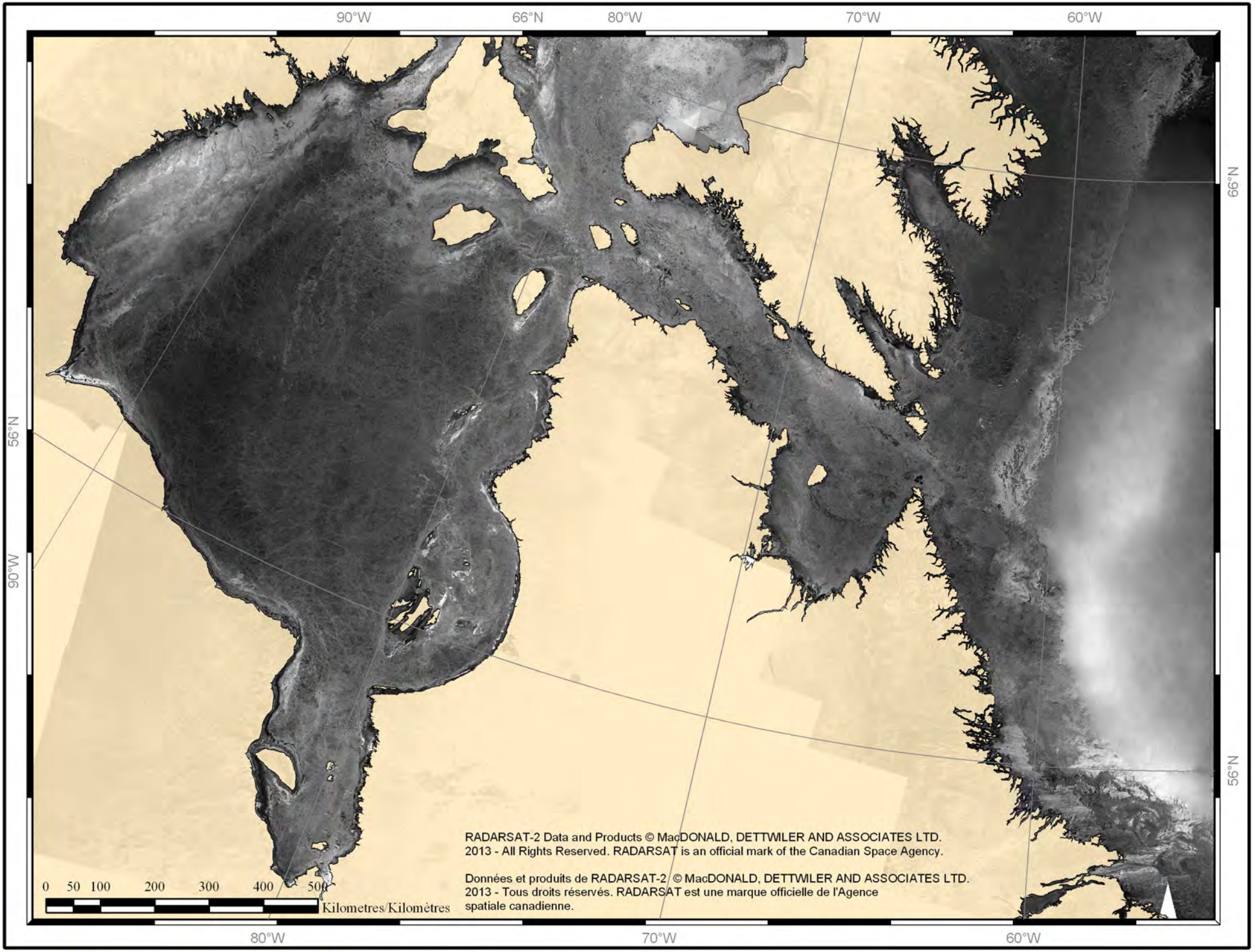
Inukjuak	-23.4	-25.8
Kuujjuaq	-21.8	-24.2
Nain	-17.5	-19.4

WMO Colour Code - Stage of Development

- Ice Free / Libre de glace
- Open Water / Eau Libre
- Icebergs
- New / Nouvelle
- Grey / Grise
- Grey-white / Blanch âtre
- First-year / Première ann ée

Code de couleurs de l'OMM - Stade de formation

- Thin First-year / Mince de premi ère ann ée
- Medium First-year / Moyenne de premi ère ann ée
- Thick First-year / Epaisse de premi ère ann ée
- Old ice / Vieille glace
- Second-year / Deuxième ann ée
- Multi-year / Plusieurs ann ées
- Undefined Fast Ice / Indéfini Banquise c ôtière
- Undefined / Indéterminée



Hudson Bay / Baie d'Hudson

02/01/2013 - 02/10/2013

REGIONAL ICE ANALYSIS
ANALYSE REGIONALE DE GLACE

Eastern Arctic
Arctique de l'Est

04 FEB/FEV 2013

CANADIAN ICE SERVICE
SERVICE CANADIEN DES GLACES
LD
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TEMPERATURE (°C) (Past 7 days) / TEMPERATURE (°C) (7 derniers jours)	MEAN MOYENNE	NORMAL NORMALE
Eureka	-42.7	-38.1
Resolute	-35.4	-32.9
Clyde	-24.9	-29.2
Hall Beach	-33.0	-32.7

110W 100W 90W 80W 70W 60W 50W

80N 75N 70N 65N

EUREKA RESOLUTE THULE NANISIVIK POND INLET CLYDE HALL BEACH

WMO Colour Code - Concentration

Code de couleurs de l'OMM - Concentration

- Ice Free / Libre de glace
- < 1/10
- 1-3/10
- 4-6/10
- 7-8/10
- 9-10/10
- New Ice / Nouvelle glace
- Nilas/Grey Ice / Nilas/glace grise
- Fast Ice / Banquise c ôtière
- Ice Shelf / Plateau de glace
- ? ? Undefined / Indéterminée

REGIONAL ICE ANALYSIS
ANALYSE REGIONALE DE GLACE

Eastern Arctic
Arctique de l'Est

04 FEB/FEV 2013

CANADIAN ICE SERVICE
SERVICE CANADIEN DES GLACES
LD
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TEMPERATURE (°C) (Past 7 days) / TEMPERATURE (°C) (7 derniers jours)	MEAN MOYENNE	NORMAL NORMALE
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Hall Beach	-33.0	-32.7

110W 100W 90W 80W 70W 60W 50W

80N 75N 70N 65N

EUREKA RESOLUTE NANISIVIK POND INLET CLYDE HALL BEACH

WMO Colour Code - Stage of Development

Code de couleurs de l'OMM - Stade de formation

- Ice Free / Libre de glace
- Open Water / Eau Libre
- Icebergs
- New / Nouvelle
- Grey / Grise
- Grey-white / Blanc âtre
- First-year / Première ann ée
- Thin First-year / Mince de premi ère ann ée
- Medium First-year / Moyenne de premi ère ann ée
- Thick First-year / Epaisse de premi ère ann ée
- Old ice / Vieille glace
- Second-year / Deuxième ann ée
- Multi-year / Plusieurs ann ées
- Undefined Fast Ice / Ind éfini Banquise c ôtière
- Ice Shelf / Plateau de glace
- Undefined / Ind éterminée

02/02/2013 - 02/10/2013

Eastern Arctic / Arctique de l'Est

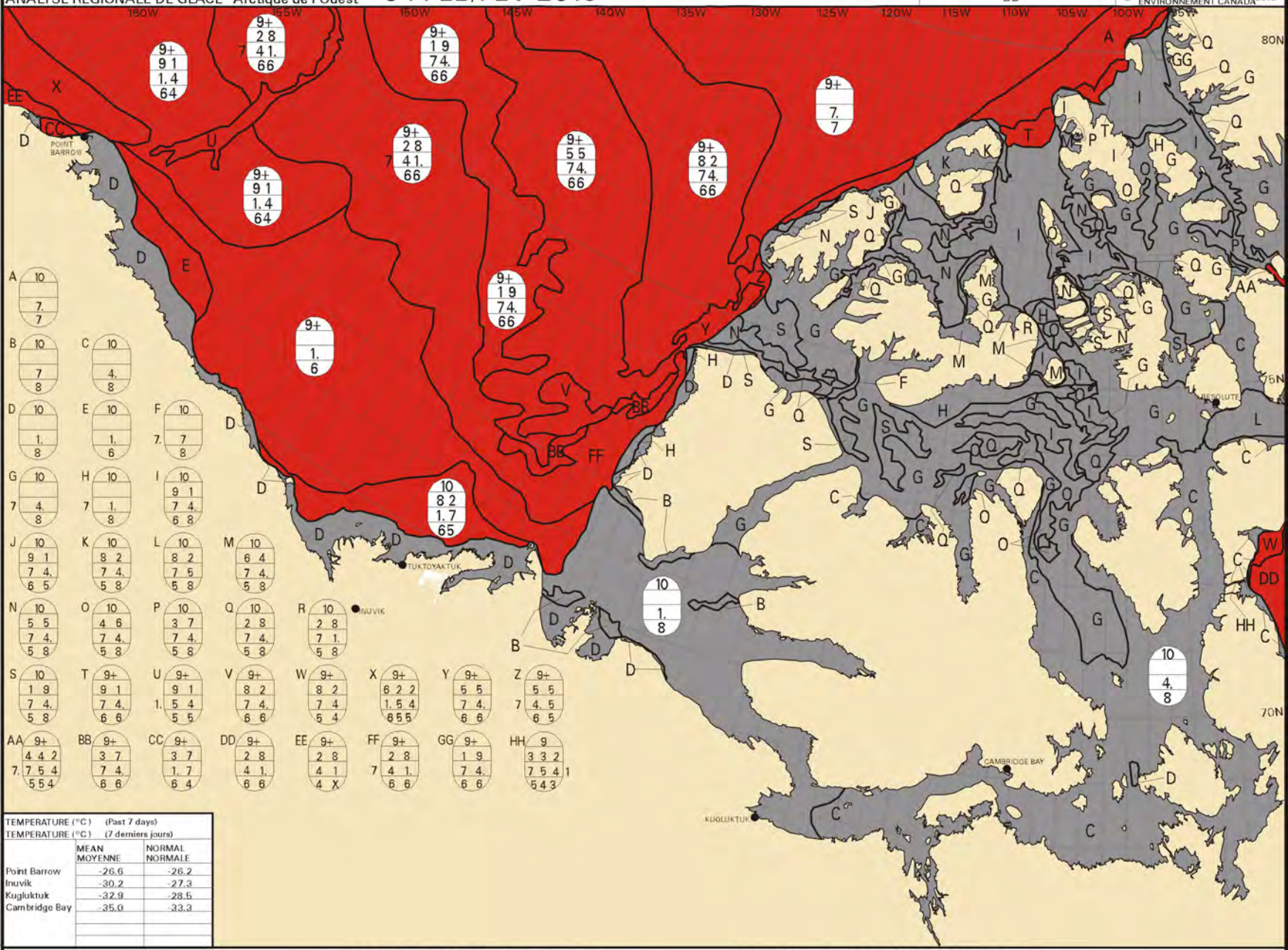
REGIONAL ICE ANALYSIS
ANALYSE REGIONALE DE GLACE

Western Arctic
Arctique de l'Ouest

04 FEB/FEV 2013

CANADIAN ICE SERVICE
SERVICE CANADIEN DES GLACES

DD



TEMPERATURE (°C) (Past 7 days) TEMPERATURE (°C) (7 derniers jours)	MEAN MOYENNE	NORMAL NORMALE
Point Barrow	-26.6	-26.2
Inuvik	-30.2	-27.3
Kugluktuk	-32.9	-28.5
Cambridge Bay	-35.0	-33.3

WMO Colour Code - Concentration

Code de couleurs de l'OMM - Concentration

- Ice Free / Libre de glace
- < 1/10
- 1-3/10
- 4-6/10
- 7-8/10
- 9-10/10
- New Ice / Nouvelle glace
- Nilas/Grey Ice / Nilas/glace grise
- Fast Ice / Banquise côtière
- Ice Shelf / Plateau de glace
- ? ? Undefined / Indéterminée

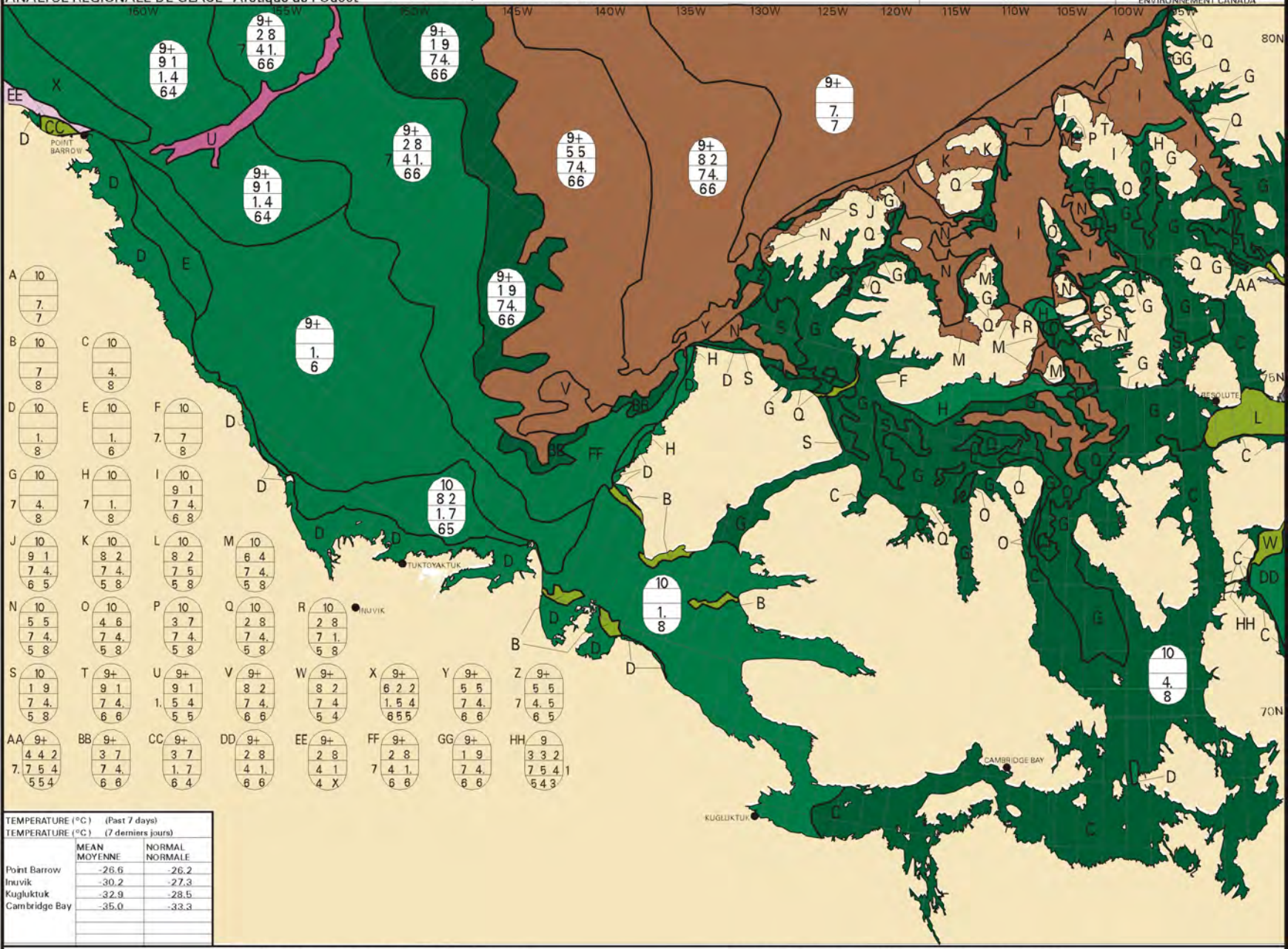
REGIONAL ICE ANALYSIS
ANALYSE REGIONALE DE GLACE

Western Arctic
Arctique de l'Ouest

04 FEB/FEV 2013

CANADIAN ICE SERVICE
SERVICE CANADIEN DES GLACES

DD



TEMPERATURE (°C) (Past 7 days)
TEMPERATURE (°C) (7 derniers jours)

	MEAN MOYENNE	NORMAL NORMALE
Point Barrow	-26.6	-26.2
Inuvik	-30.2	-27.3
Kugluktuk	-32.9	-28.5
Cambridge Bay	-35.0	-33.3

WMO Colour Code - Stage of Development

Ice Free
Libre de glace

Open Water
Eau Libre

Icebergs

New
Nouvelle

Grey
Grise

Grey-white
Blanchâtre

First-year
Première année

Code de couleurs de l'OMM - Stade de formation

Thin First-year
Mince de première année

Medium First-year
Moyenne de première année

Thick First-year
Epaisse de première année

Old ice
Vieille glace

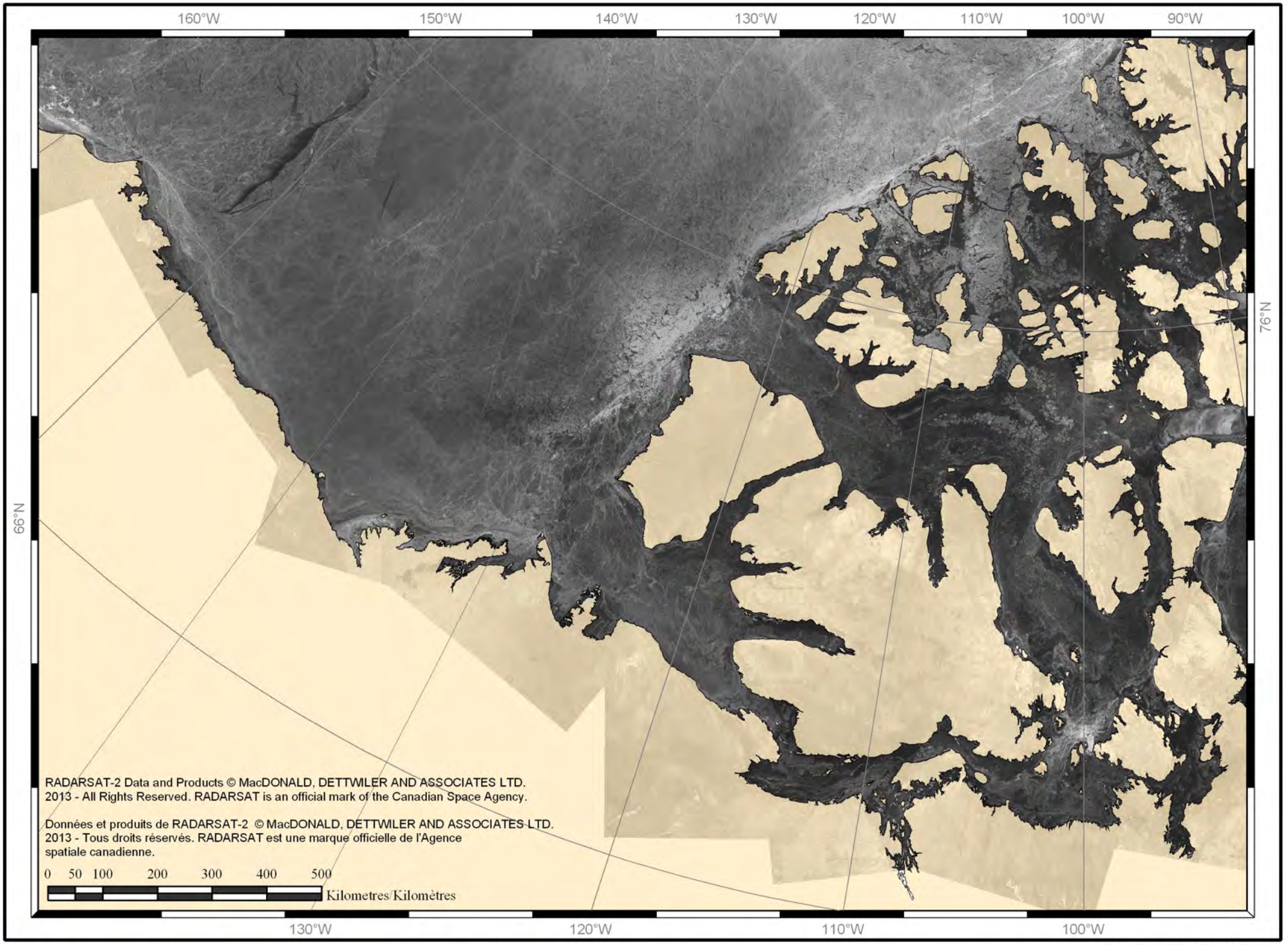
Second-year
Deuxième année

Multi-year
Plusieurs années

Undefined Fast Ice
Indéfini Banquise côtière

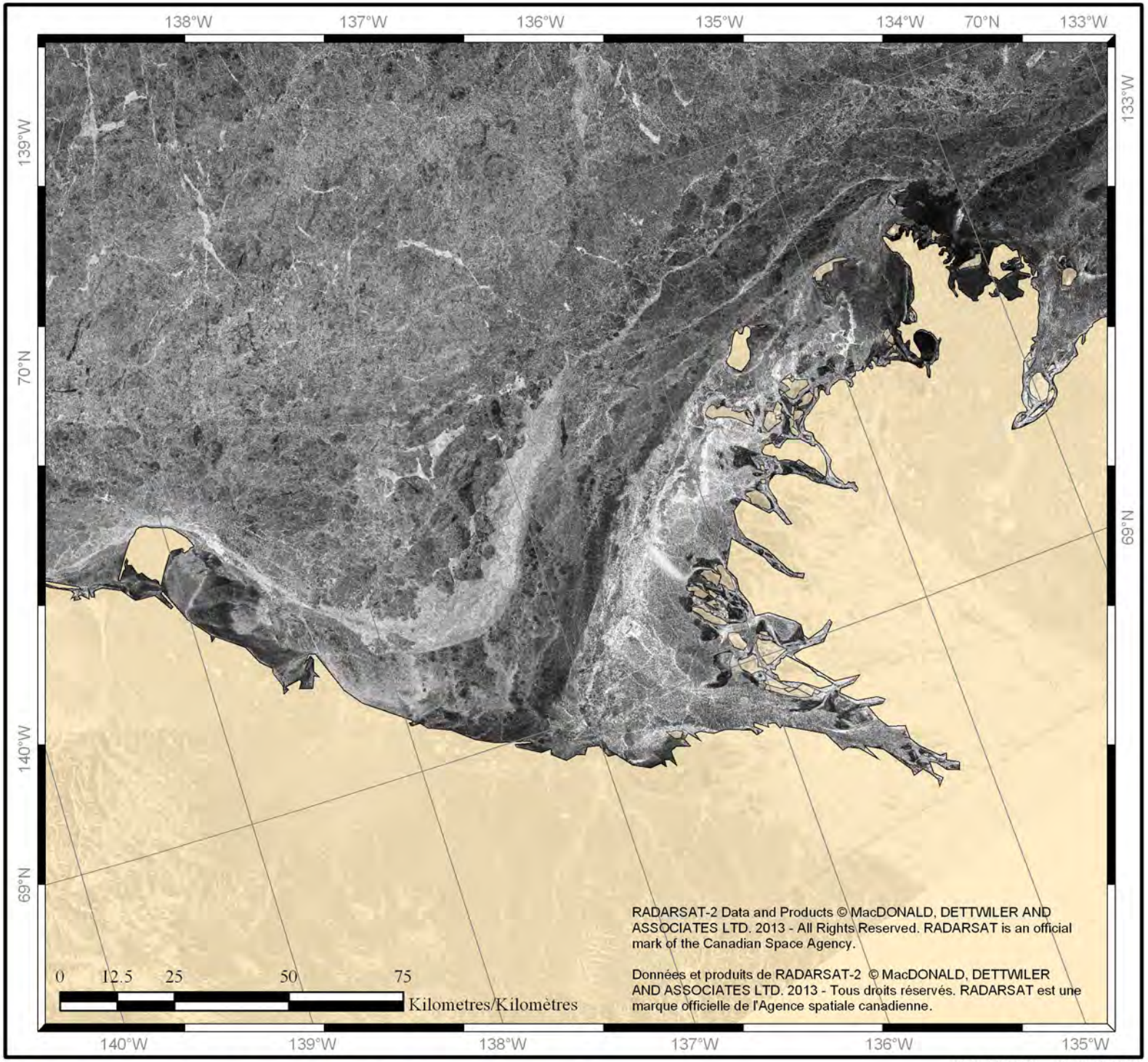
Ice Shelf
Plateau de glace

Undefined
Indéterminée



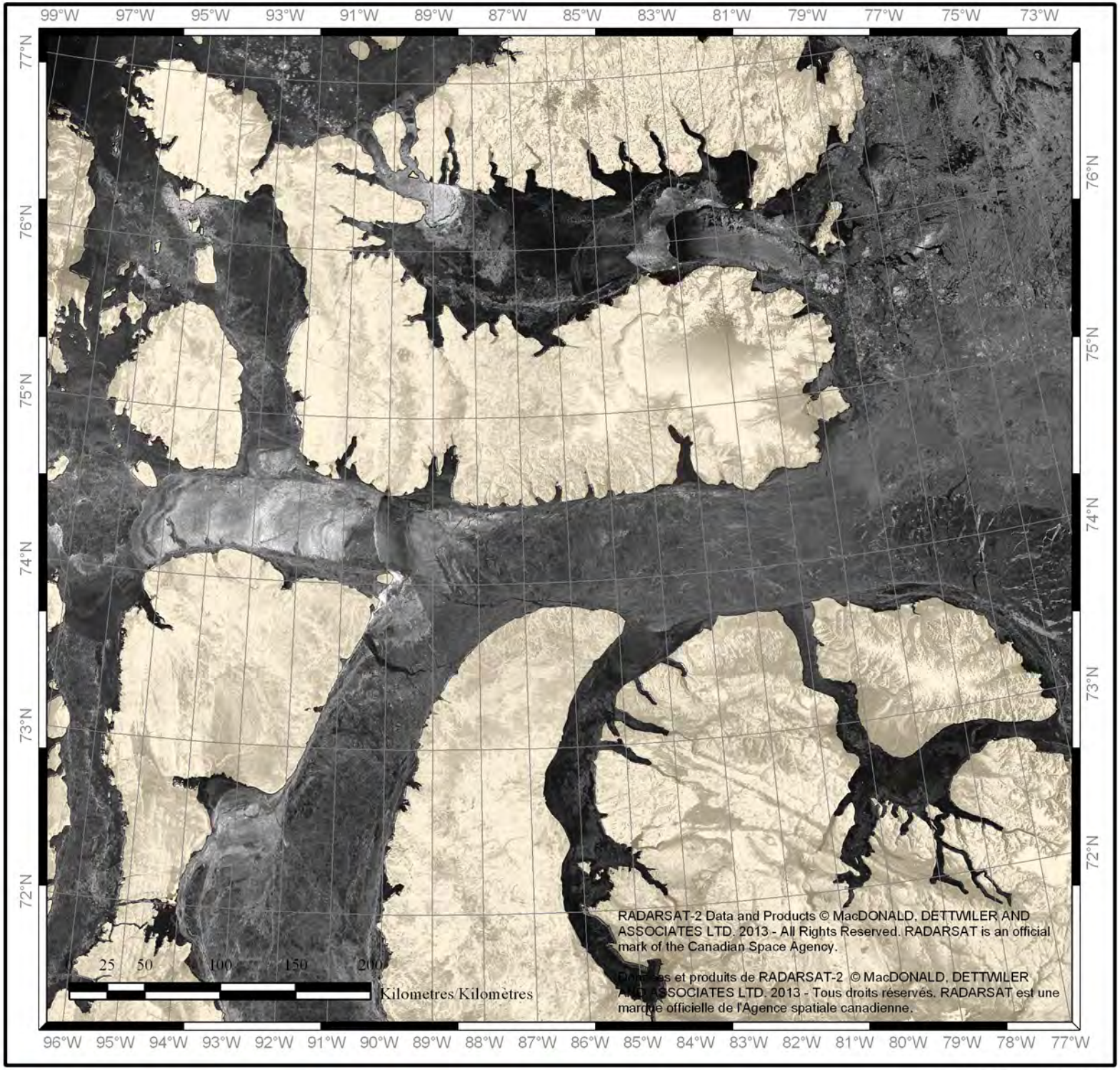
Western Arctic / Arctique de l'Ouest

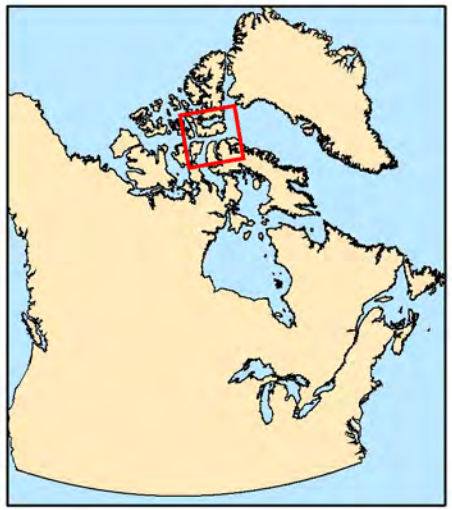
02/02/2013 - 02/10/2013



02/04/2013 - 02/07/2013

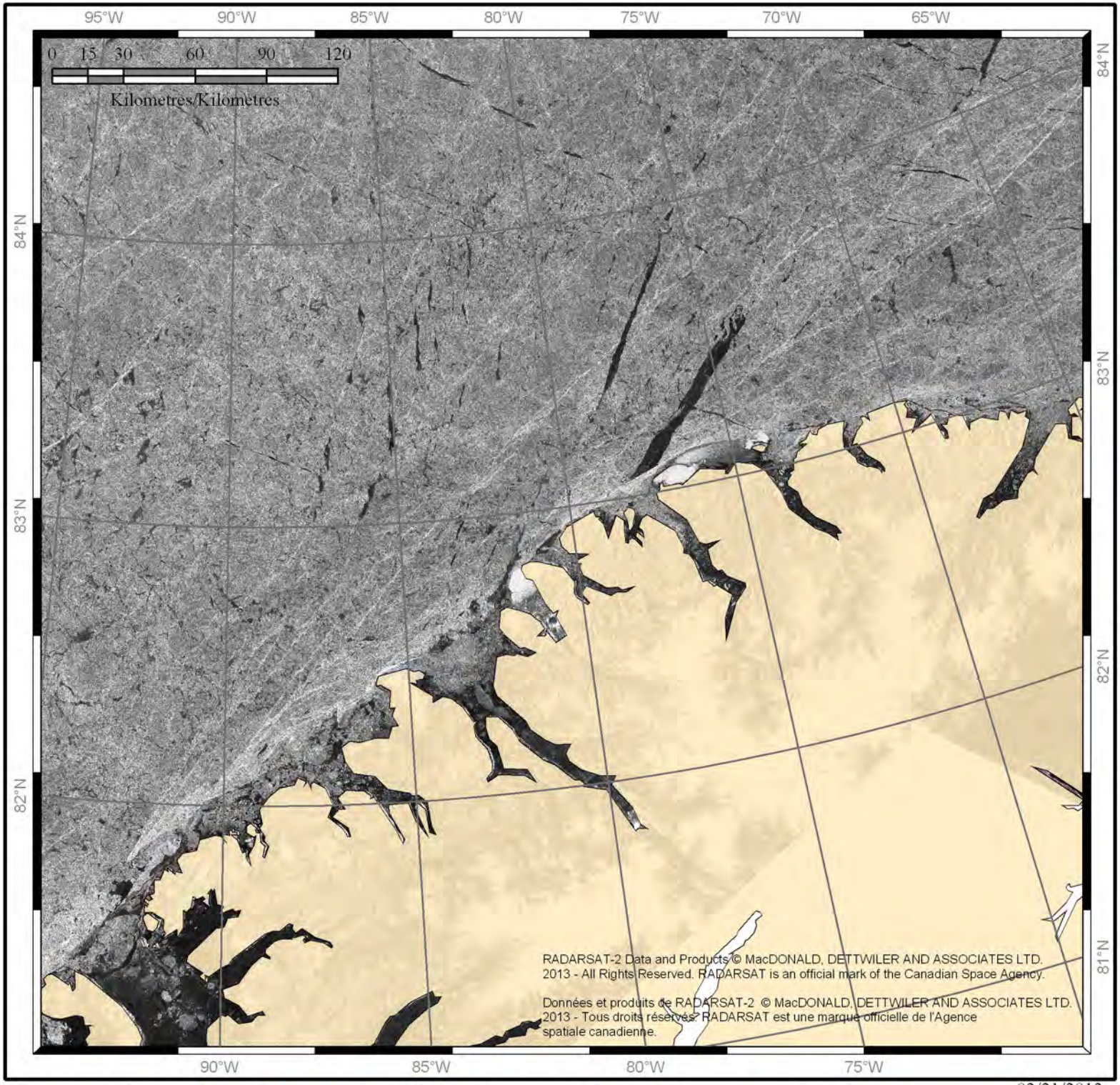
Mackenzie Bay / Baie Mackenzie





Lancaster Sound / Détroit de Lancaster

02/02/2013 - 02/10/2013



Canadian Ice Shelves / Plateaux de glace canadiens

02/21/2013 - 02/28/2013

02/02/2013 - 02/10/2013

Nares Strait / Détroit de Nares

Contact Us

Environment Canada
Canadian Ice Services
373 Sussex Drive, E-3
Ottawa, Ontario Canada, K1A 0H3
Attention: Client Services

Telephone: 613 996-1550 or 1-800-767-2885
Fax: 613 947-9160
E-mail: cis-scg.client@ec.gc.ca
Web site: http://ice-glaces.ec.gc.ca

Contactez-nous

Environnement Canada
Service canadien des glaces
373, promenade Sussex, E-3
Ottawa (Ontario) Canada, K1A 0H3
À l'attention du: Service à la clientèle

Téléphone: 613 996-1550 ou 1-800-767-2885
Télécourriel: 613 947-9160
Courriel: cis-scg.client@ec.gc.ca
Site web: http://glaces-ice.ec.gc.ca

Table of Contents / Table des matières