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Environment Canada
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Seasonal Outlook
Gulf of St Lawrence and
East Newfoundland Waters
Winter 2009-2010

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ph./tél.: (877) 789-7733 fax: (613) 947-9160 ECWeather-meteo@ec.gc.ca URL: http://ice.ec.gc.ca

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GULF OF ST. LAWRENCE AND NEWFOUNDLAND WATERS

WINTER 2009-2010

Introduction

This outlook of the expected pattern, timing, and the extent of ice growth attempts to identify areas and periods where conditions should be more or less favourable than normal. It has been developed through an analysis of the oceanographic and meteorological parameters for the summer and the fall proceeding the ice season. These conditions are compared with earlier years, the December wind and temperature forecasts plus the seasonal temperature outlook. A prediction of the ice regime is then produced. **It should be noted that significant variations of these conditions will have an impact on the timing and extent of ice formation.**

Throughout the winter, this outlook will be updated by a twice monthly issue of 30-day forecasts. These forecasts will also indicate the beginning of the spring break-up process throughout the area. Daily radio broadcasts of ice charts and forecasts will be made to support ongoing operations in the various areas where ice affects marine activity. For more information regarding the broadcast schedule, please consult the following Canadian Coast Guard web site (Appendix B - General information from the Canadian Coast Guard).

http://www.ccg-gcc.gc.ca/eng/CCG/MCTS_Radio_Aids

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General Seasonal Outlook

Near to slightly above normal temperatures were generally reported between the beginning of June and the end of October over the forecast area. The first half of November was characterized by above normal temperatures in the Gulf area but near to below normal in Newfoundland and southern Labrador waters. In the second half of November above normal temperatures were generally reported over the entire forecast area. Water temperatures at the end of November were above normal in much of the Gulf of St Lawrence near normal along the southern Labrador coast but below normal in the Newfoundland waters.

At the beginning of December bergy water was the norm along the Labrador coast. At that time new and grey ice was beginning to form in the western end of Lake Melville. These conditions are a week behind normal.

For December near normal temperatures are generally forecast except below normal in the Newfoundland waters. Freeze up in the Gulf of St Lawrence and along the southern Labrador coast should be a few days to a week later than normal. In the Newfoundland waters a slightly earlier than normal freeze up is expected

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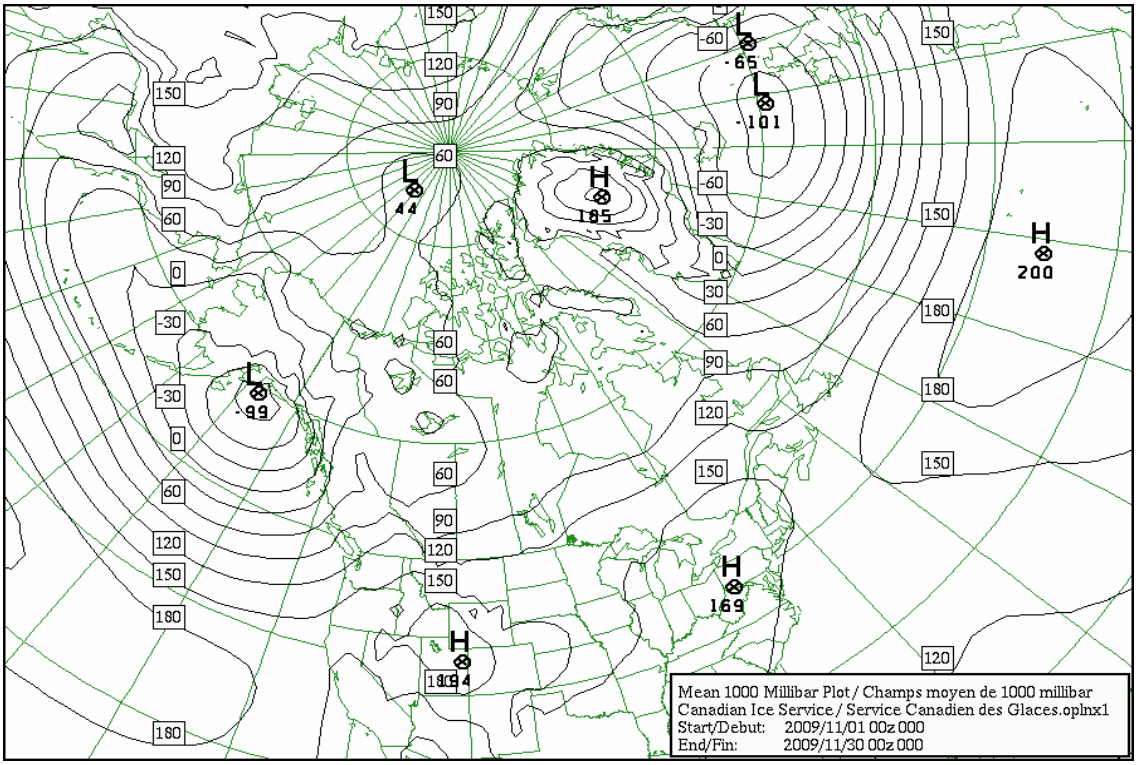

Figure 1: 1000 mbs pressure pattern – November 2009

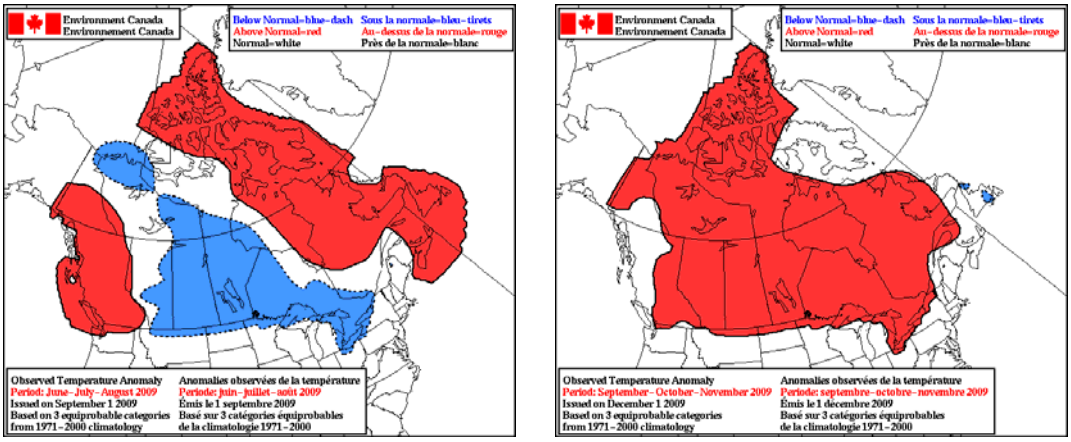

Figure 2: Temperature anomaly, June to August and September to November

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Table 1: Departure from normal temperatures – November 2009

	Normal Temperatures	Observed	Departure
Quebec	-0.7	2.9	3.6
Sept-Iles	-3.0	0.8	3.8
Gaspe	-0.7	2.3	3.0
Sydney	3.2	5.1	1.9
Stephenville	2.2	4.0	1.8
St John's	2.5	4.4	1.9
Gander	0.8	2.3	1.5
Cartwright	-2.5	-1.0	1.5
Goose Bay	-4.6	-1.7	2.9
Nain	-5.2	-2.6	2.6
Average	-0.8	1.7	2.5

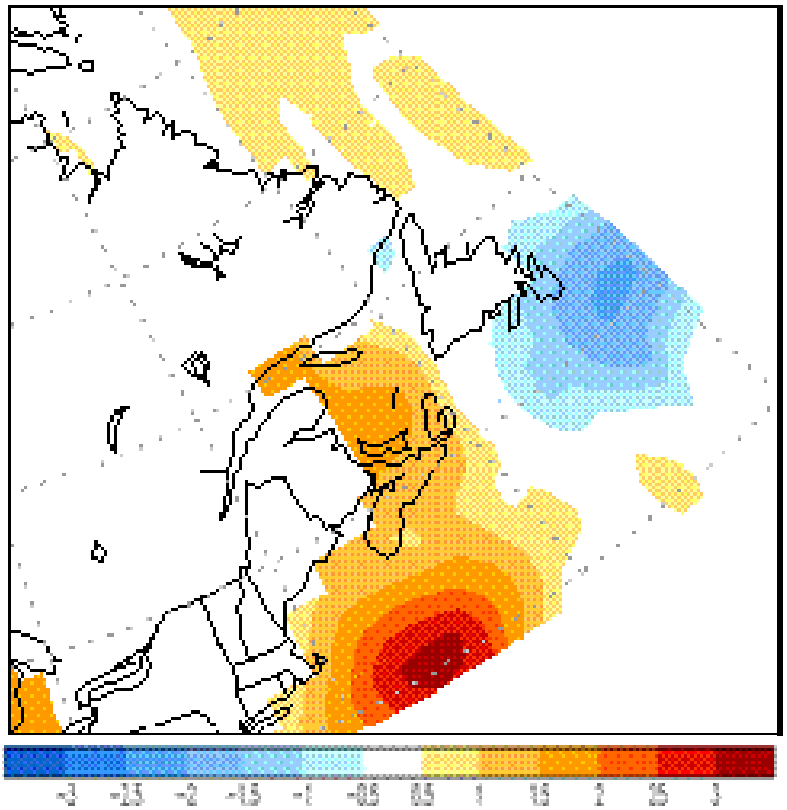

Figure 3: Water temperature anomalies – 25 November 2009

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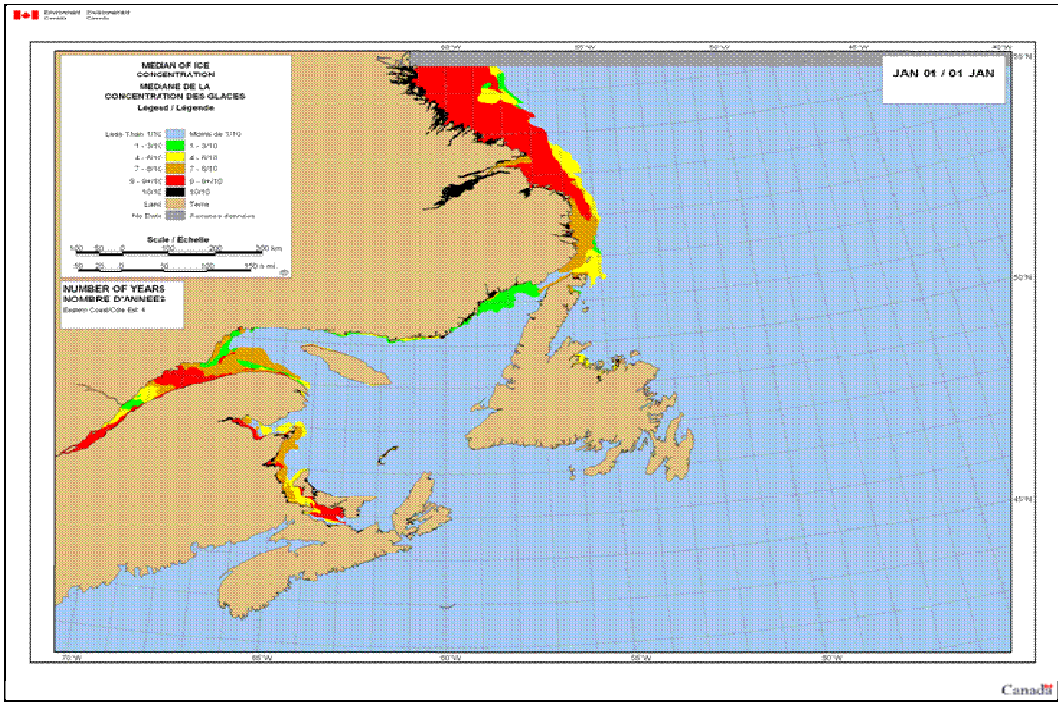

Figure 4: Expected ice conditions – 1 January 2010

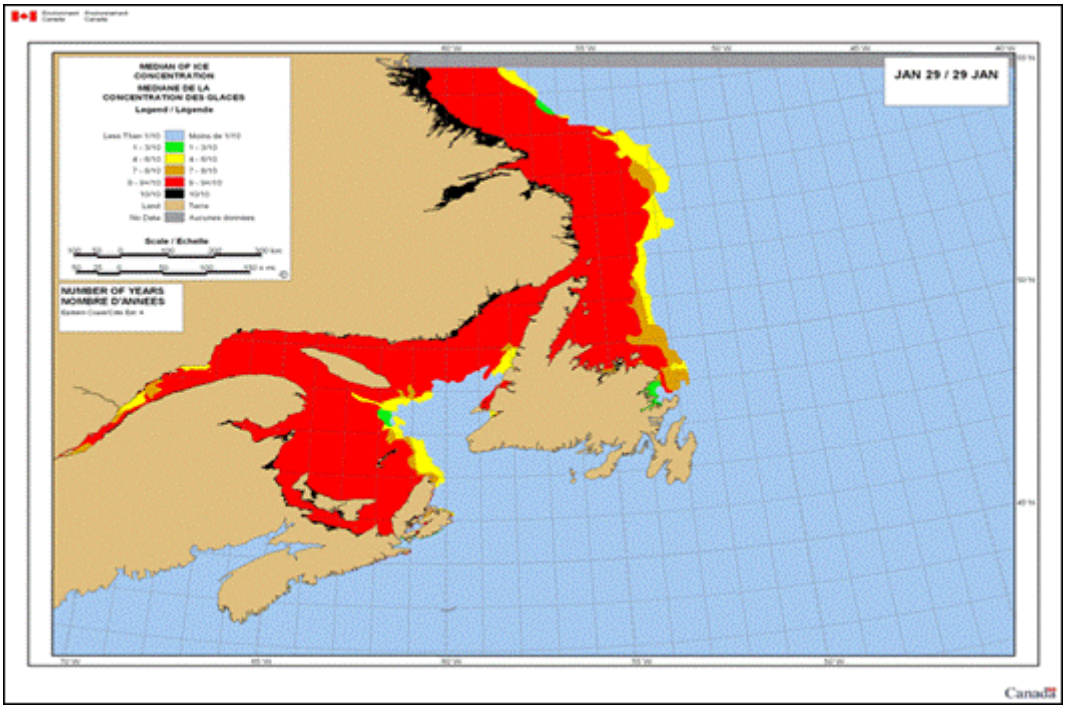

Figure 5: Expected ice conditions – 29 January 2010

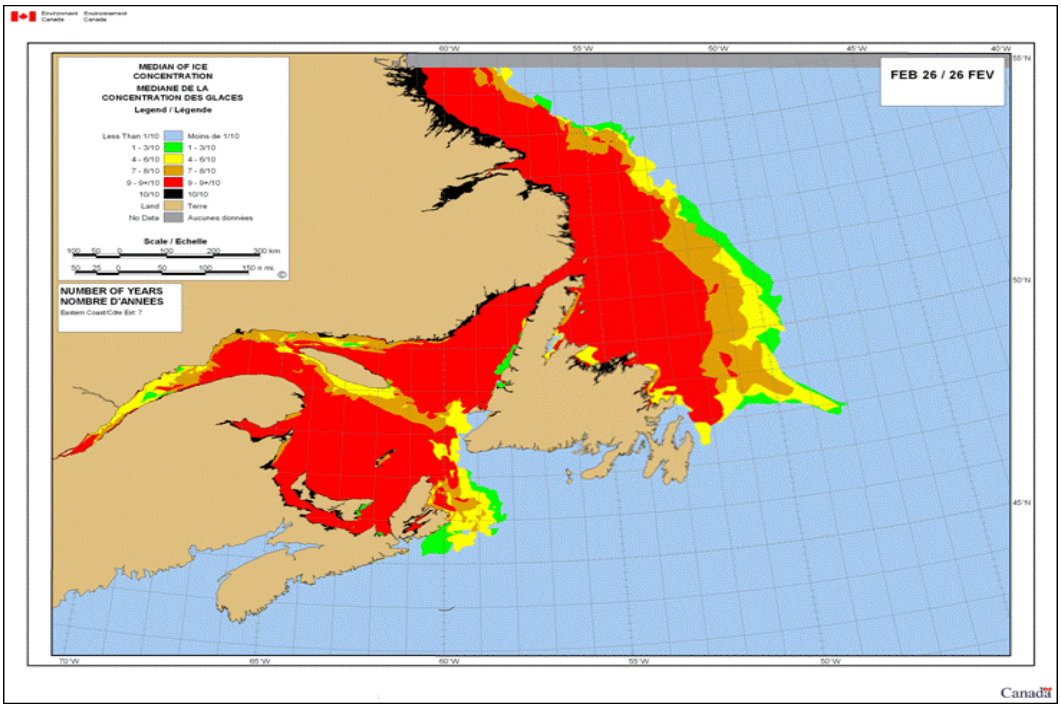

Figure 6: Expected ice conditions – 26 February 2010

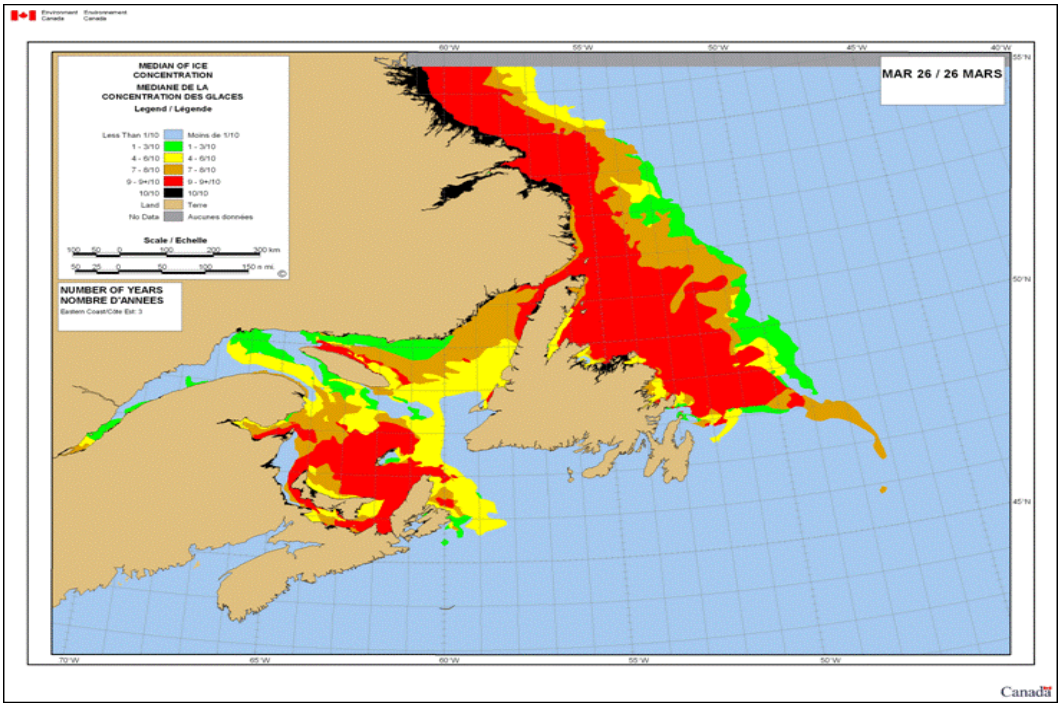

Figure 7: Expected ice conditions – 26 March 2010

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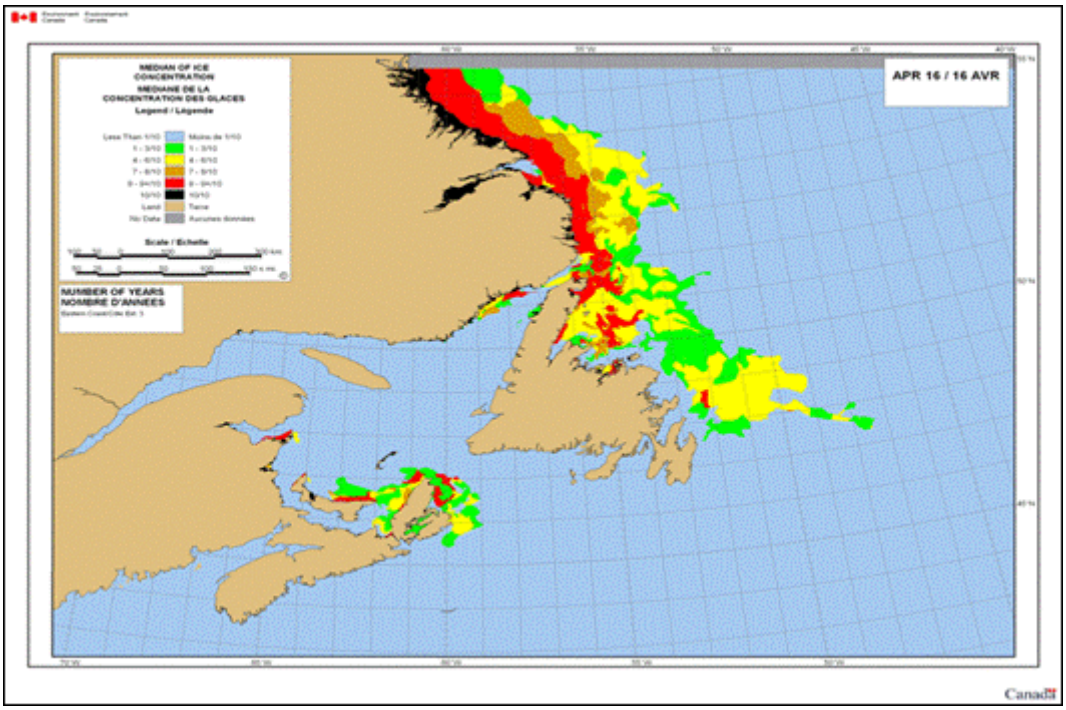

Figure 8: Expected ice conditions – 16 April 2010

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Gulf of St-Lawrence

Near the end of November water temperatures in the Gulf of St Lawrence were above normal except near normal in the northeastern section (Figure 3). Near normal air temperatures are forecast for the first half of December but temperatures will cool to slightly below normal in the second half.

New ice will start to develop in the vicinity of l'île d'Orleans during the second week of December and will gradually spread eastward to reach Pointe-des-Monts just after Christmas Day. Ice will further spread to cover the coastal areas of the Estuary by New Year's Day. New and grey ice will develop in shallow bays along the New Brunswick coast and in the western end of Chaleur Bay in the third week of December. In the following week ice will continue to develop and at the end of 2009 Chaleur Bay and Northumberland Strait will report open drift to close pack areas mainly grey ice. In addition a 8 to 15 mile wide band of new and grey ice will be present along the New Brunswick coast during the last week of December. A narrow band of new and grey ice is expected to develop along the north shore of Quebec up to the Strait of Belle Isle just before the end of 2009. The forecast ice extent for January 01st is illustrated in Figure 4.

The forecast for the rest of the winter for the Gulf of St Lawrence is for near normal temperatures except below in, and south of, Cabot Strait. However large fluctuations in temperatures can be expected as low pressure systems track over the Gulf area. Ice thicknesses and extents, at the peak of the ice season should be close to their normal values except for possibly more ice than normal southeast of Cape Breton.

A moderate to rapid ice development is expected in the first half of January. Grey ice will spread in the rest of the Estuary in the first two weeks of January. In addition a narrow band of greywhite will develop along the southern shore of the Estuary in the second week of the month. New and grey ice will develop in the western section of the Gaspe Passage in the first week of 2010 and spread eastward to cover most of the passage a week later. The band of new and grey ice along the north shore of Quebec will extend to about 15 to 20 miles offshore at mid-January. Grey ice will rapidly spread in the rest of Chaleur Bay and Northumberland Strait early in the New Year. Greywhite ice will develop in the above areas just before mid-January. The ice along the New Brunswick coast will gradually expand seaward to about 70 miles offshore in the first 2 weeks of the year. At mid-January grey and greywhite ice will prevail in the St Lawrence River and the Strait of Belle Isle. Ice will continue to develop during the second half of January. The ice pack will expand to reach les Îles de la Madeleine during the third week of the month and the

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longitude of Cape North a week later. In the northeast Arm the ice will progress southward along the Newfoundland coast to reach Daniel's Harbour at the end of January. At that time new and grey ice would have developed in Bay of Islands. The forecast ice extent for the end of January is shown in Figure 5.

The ice will round Cape North and drift into western Cabot Strait reaching the approaches to Sydney within a week into February and Scatarie Island a few days later. The ice will continue its southward progression along the Newfoundland coast reaching the approaches to Bay of Islands towards mid-February. At that time a narrow open water lead will generally exist along the southwest coast of Newfoundland up to the entrance to Bay of Islands. Greywhite ice will generally predominate inside the main pack except for first year ice in the Strait of Belle Isle, in Northumberland Strait, along the northwest coast of Cape Breton and in sections of the St Lawrence River. In the Second half of February the ice will continue to drift from Cabot Strait to south southeast of Cape Breton. East north-easterly winds will occasionally push the ice in the approaches to and in Chedabucto Bay. At the end of February the ice will extent to about 60 miles south southeast of Scatarie Island. The open water route along the southwest coast of Newfoundland will cease to exist in the last week of February as greywhite and first year ice drift into the area. At the end of February first year ice will generally predominate inside the main pack except for thinner ice in the northern section of the Estuary and along the north shore of Quebec. The forecast ice extent for the end of February is shown in Figure 6.

The ice area south southeast of Cape Breton will persist during the first half of March but will start to retreat during the third week of the month. Signs of breakup will become evident during the second week of March in the St Lawrence River and in the north-western section of the Gulf. Assuming near normal temperatures in the second half of March and in April, breakup will proceed as per normal except a week later than normal in Cabot Strait area. Forecast ice conditions for the end of March and mid-April are shown in figure 7 and figure 8 respectively.

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East Newfoundland Waters

Near the end of November water temperatures over the east Newfoundland waters were 1.0˚C to 2.5˚C below normal (Figure 3). Along the Labrador coast water temperatures were in general near normal. Near to slightly below normal air temperatures are forecast for the month of December.

New and grey ice will continue to spread and will entirely cover Lake Melville in the second week of December. Greywhite ice will be the predominant ice type in Lake Melville at mid-month. New and grey ice will progress southward along the Labrador coast and reach Groswater Bay just after mid-December. At that time new and grey ice would have developed near Cartwright. The ice will continue to progress southward along the Labrador coast and will reach the entrance to the Strait of Belle Isle by the end of 2009. New and grey ice will then prevail along the Labrador coast except mainly greywhite ice north of Cartwright. Lake Melville will become consolidated with greywhite ice during the third week of December and with first year ice before the end of the year. Consolidated new and grey ice will develop in Bay of Exploits towards the end of December. The forecast ice extent for January 01st is illustrated in Figure 4.

The seasonal temperature forecast indicates below normal temperatures over the Newfoundland waters and near normal along the southern Labrador coast in January and February. However, temperatures will fluctuate between above and below normal values as storms track over the area. At the peak of the ice season the ice extent and thicknesses should both be somewhat above the long term average. The ice will progress southward along the Northern Peninsula and reach the Baie Verte Peninsula by mid-January. At that time the pack will extend about to 70 miles east of the Northern Peninsula and 100 miles east of the southern Labrador coast. First year and greywhite ice will predominate inside the pack except mainly grey ice south of St Anthony. Also, of note, is the formation of new and grey ice along the southern shore in Notre Dame Bay and eastward to south of Fogo island during the first and second week of January. The pack will expand further and reach Fogo Island in the third week of January and Cape Freels a week later. Loose areas of grey ice will drift into Notre Dame during the third week of January. Fast ice will develop along the coast in southern Notre Dame Bay and eastward to south of New World Island in the second half of January. At the end of January first year ice will predominate along the Labrador coast and grey and greywhite ice in the Newfoundland waters. At that time the pack will extend to about 120 miles east of the Northern Peninsula and the southern Labrador coast. The forecast ice extent for the end of January is shown in Figure 5.

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The ice will continue its southward progression along the east Newfoundland coast and reach the approaches to Conception Bay towards mid-February. South of Bonavista Bay open drift to close pack areas of grey and greywhite ice will prevail inside the pack. Further north inside the pack first year ice will generally predominate. The exception will be generally thinner ice in Notre Dame Bay and along the Northern Peninsula. The ice between Fogo Island and New World Island will consolidate during the second week of February. The pack will reach the approaches to St John's during the third week of February and will continue to progress along the Newfoundland coast in the last week of the month. Onshore winds could occasionally bring the ice to the east coast of Newfoundland coast and into Trinity and Conception bays. At the end of February first year ice will predominate in the main pack with the exception of greywhite ice along the east coast of Newfoundland and along the Northern Peninsula. At that time the pack will extend to about 130 miles off the east coast of Newfoundland and 160 miles off St Anthony. The forecast ice extent for the end of February is shown in Figure 6.

Little change is expected in the position of the southern ice edge in the first two weeks in March. Ice intrusions in the bays along the east coast of Newfoundland will remain possible. As well strong onshore flow could occasionally develop strong ice pressure along the northeast coast of Newfoundland. In late March and early April ice could possibly round the Grand Banks and move southward in the tongue of cold water as far south as 45N.

Break up along the southern Labrador coast and in the Newfoundland waters should be delayed by about one to two weeks. Forecast ice conditions for the end of March and mid-April are shown in figure 7 and figure 8 respectively

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Appendix

Appendix A - Stages of Development of Sea Ice.

For more information on this section, please refer to the following web link on the Canadian Ice Service web site:

http://ice-glaces.ec.gc.ca/App/WsvPageDsp.cfm?ID=11170&LnId=29&Lang=eng

Appendix B - General information from the Canadian Coast Guard.

General information regarding transmission times for bulletins and charts from various radio broadcast stations:

http://www.ccg-gcc.gc.ca/eng/CCG/MCTS_Radio_Aids

Appendix C - WMO (World Meteorological Organization) Colour Code

Information regarding the ice chart colour code using the WMO standard.

http://ice-glaces.ec.gc.ca/App/WsvPageDsp.cfm?ID=11500&LnId=19&Lang=eng

Appendix D - Ice Services for Canadian East Coast Waters

In Canada, ice services are provided to shipping, fishing and offshore operators by a co-operative effort of Environment Canada and Department of Fisheries and Oceans. Department of Fisheries and Oceans, through the Canadian Coast Guard, provides icebreaker services and operates seasonal Ice Operations Offices at Dartmouth, St. John's and Quebec City. Canadian Ice Service of the Atmospheric Environment Service (division of Environment Canada) is responsible for gathering and generating ice information services and forecasts.

The following forecasts are issued:

1. Gulf of St. Lawrence Ice Hazard Bulletin (FICN17): A tactical ice bulletin with an ice edge delimiter and, if required, a warning of hazardous ice conditions for the next 36 hours. This Ice Hazard Bulletin briefly describes general ice conditions within each marine forecast area.

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2. East Newfoundland Waters Ice Hazard Bulletin (FICN18): A tactical ice bulletin with an ice edge delimiter and, if required, a warning of current hazardous ice conditions for the next 36

hours. This Ice Hazard Bulletin briefly describes general ice conditions within each marine forecast area.

3. Iceberg Bulletin (FICN10): a narrative providing information on the distribution of icebergs in East Newfoundland waters and along the Labrador Coast. During the navigation season emphasis is placed on the Strait of Belle Isle and approaches.

Ice bulletins on ice conditions in the St. Lawrence River below Montreal are prepared twice daily (SRCN01 and SRCN03) by the ice office in Quebec City.

Daily ice analysis charts and a weekly "Regional Ice Chart" covering a larger area are issued by Canadian Ice Service. In addition to the distribution outlined in Appendix B, ice forecasts and bulletins and the Seasonal Outlook are available from the Canadian Ice Service website (http://ice-glaces.ec.gc.ca). The seasonal outlook is issued once yearly then updated twice monthly by 30-day forecasts.

For further information concerning these services please contact Canadian Ice Service by phone (877) 789-7733, facsimile (613) 947-9160 or e-mail at:

ECWeather-meteo@ec.gc.ca

Canadian Coast Guard Ice Operation Offices provide ship routing advice and arrange for icebreaker support when available and necessary. In order to obtain maximum benefit from Ice Operation Offices, it is essential that Masters report to 'ECAREG CANADA' office before entering ice covered waters.