Environment Canada Environnement Canada

Produced by Canadian Ice Service of
Environment Canada
4 December 2007

Seasonal Outlook
Gulf of St. Lawrence and
East Newfoundland Waters
Winter 2007-2008

Canada

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

Table of Contents

Table of Figures

Table of Tables

Appendix

Canadian Ice Service - Service Canadien des Glaces

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

GULF OF ST. LAWRENCE AND NEWFOUNDLAND WATERS

WINTER 2007-2008

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/mcts-sctm/ramn/docs/aa.ae/index.htm#part5

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

General Seasonal Outlook

The temperature profile since late spring to the end of October over the Atlantic Provinces ranged from near normal over the southern section of the Gulf to slightly above normal in the northeastern section as well as in the Estuary. Above normal temperatures were generally reported over the Newfoundland waters and along the Labrador coast. For the month of November, slightly above normal temperatures were generally reported over the entire region except for slightly below normal temperatures over the Estuary.

At the beginning of December, Lake Melville was covered almost entirely by grey ice. Some new ice has begun to form in the smaller bays along the Labrador coast, in the western section of the St Lawrence River and in shallow bays along the eastern New Brunswick coast. Otherwise open water or bergy water was prevalent over most of the forecast area.

The forecast for December for the Gulf of St Lawrence and Newfoundland is for below normal temperatures during the first half of December then near normal for the remainder of the month. Near normal temperatures are forecast for Labrador for most of December. Freeze-up over the St. Lawrence River and the south-western section of the Gulf of St Lawrence will occur near or slightly before their normal dates. Over North-eastern Gulf, Newfoundland waters and along the Labrador coast freeze up is expected to be delayed by a few days.

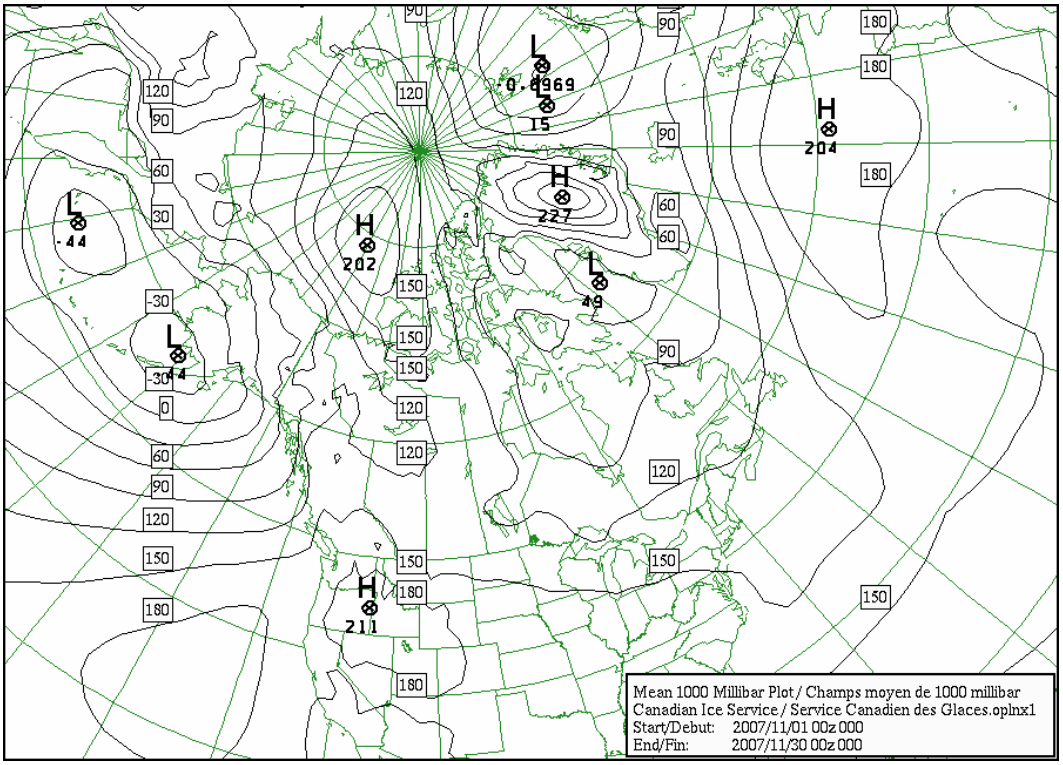

Figure 1: 1000 mb pressure pattern - November 2007

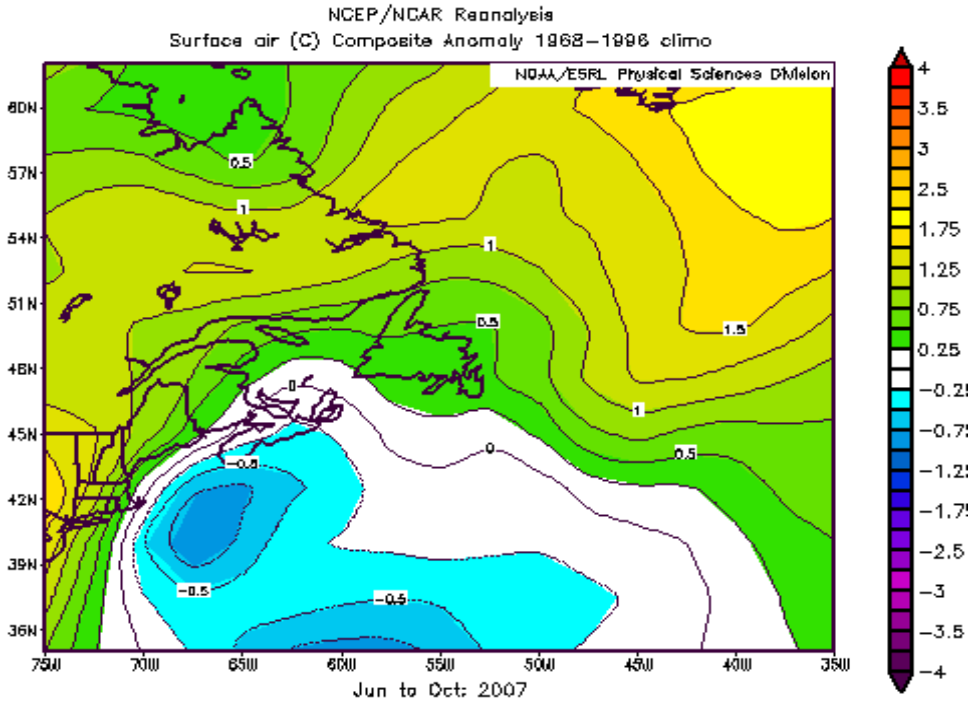

Figure 2: Departure from normal temperatures – June 1, 2007 to October 31, 2007

	Normal Temperatures	Observed	Departure
Quebec	-0.7	-0.4	0.3
Sept-Iles	-3.0	-3.6	-0.6
Gaspe	-0.7	-0.8	-0.1
Sydney	3.2	4.3	1.1
Stephenville	2.2	3.4	1.2
St Johns	2.5	4.3	1.8
Gander	0.8	2.7	1.9
Cartwright	-2.5	-1.5	1.0
Goose Bay	-4.6	-4.2	0.4
Nain	-5.2	-5.9	-0.7
Average	-0.8	-0.2	0.6

Table 1: Departure from Normal Temperatures - November 2007

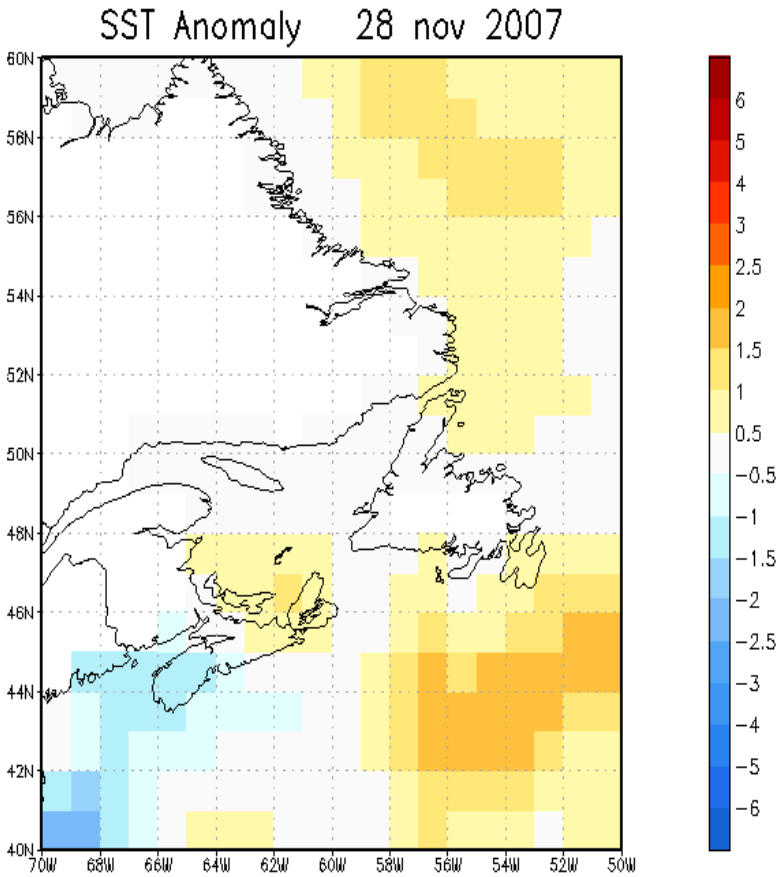

Figure 3: Water temperature anomalies - 28 November 2007 (NCEP)

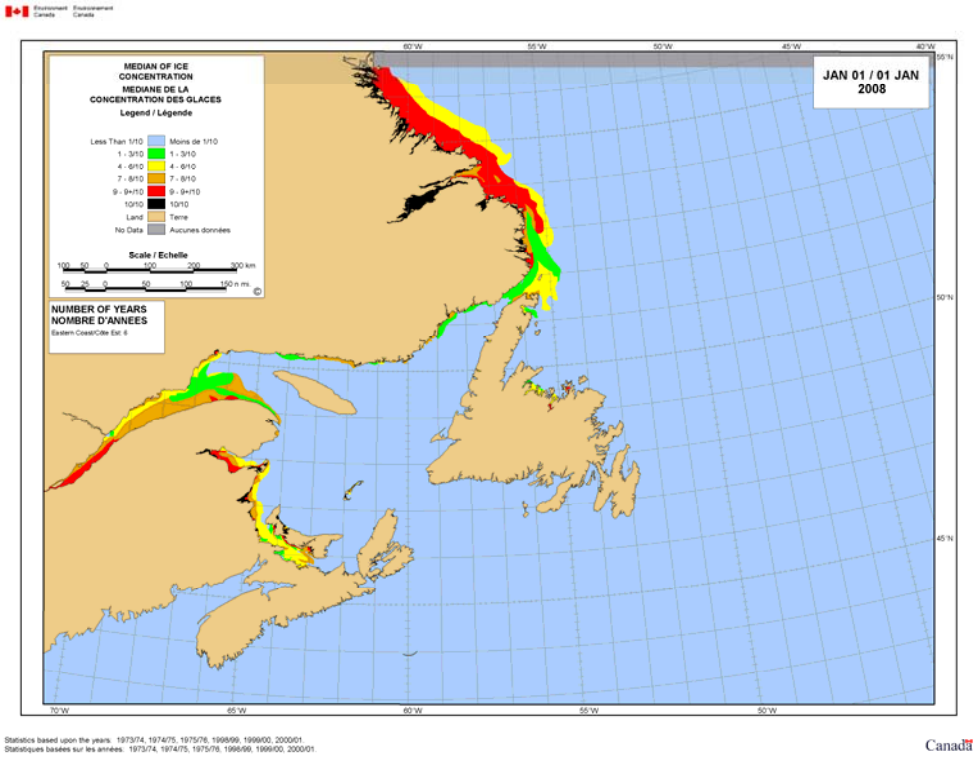

Figure 4: Expected ice conditions – 1 January 2008

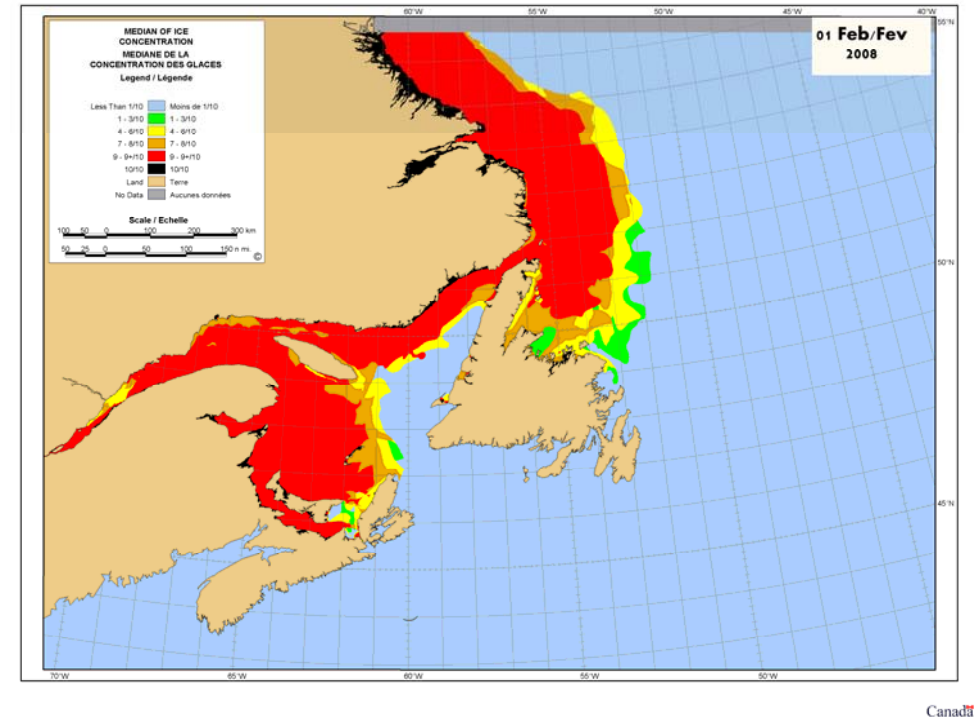

Figure 5: Expected ice conditions – 1 February 2008

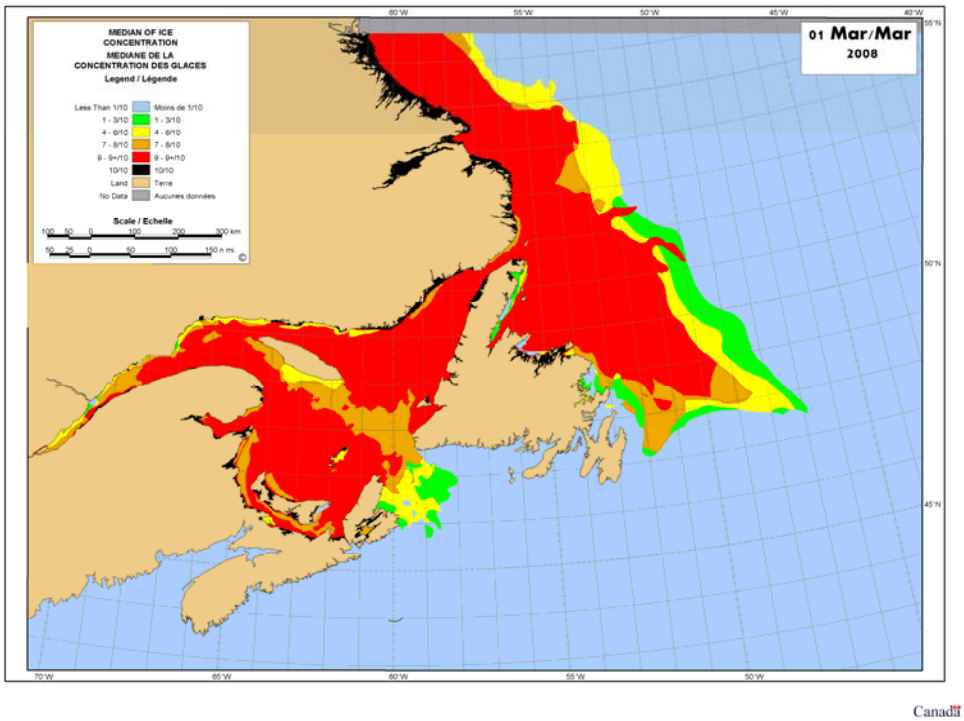

Figure 6: Expected ice Conditions – 1 March 2008

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

Gulf of St. Lawrence

Near the end of November water temperatures were around 1.0ºC above normal in the southwestern section of the Gulf of St Lawrence and near normal in the rest of the Gulf, in the Estuary and in the Northeast Arm (see figure 3). During the first half of December, temperatures will be below normal but will increase to near normal for the balance of the month.

At the beginning of December some new ice has begun to form over the western section of the St Lawrence River and in shallow bays along the New Brunswick coast. However some of this ice will get destroyed in strong wind events. New ice will spread over the entire western section of the River by mid-December and gradually spread eastward to cover most of the St Lawrence River near Christmas Day. Ice will further spread along the northern shore of the Gaspe Peninsula during the last week of the year to reach Gaspe by year's end. New ice will start to develop along the New Brunswick coast, in Chaleur Bay and in Northumberland Strait near Christmas Day. By the end of December a 10 to 15 mile wide band of new with some grey ice would have developed along the New Brunswick coast. At that time new and grey ice will predominate in the St Lawrence River, in southern Estuary, in western Gaspe Passage as well as in most of Northumberland Strait while a narrow band of new ice prevails along much of the northern shore of the gulf and in the Strait of Belle Isle. The forecast ice extent for January 1st is illustrated in Figure 4.

The seasonal Temperature outlook for January and February indicates that temperatures will be slightly above normal for the Gulf of St Lawrence. Significant fluctuations in temperature are likely as a series of low pressure systems tracks over the Gulf area. Ice thicknesses and extent will be somewhat less than normal.

Ice development will accelerate in January despite slightly above normal air temperatures. During the first half of the month new and grey ice will spread over the northern section of the Estuary and in Gaspe Passage while greywhite ice gradually develops in southern Chaleur Bay, in the St Lawrence River and further east along the southern shore of the Estuary. During that time ice along the eastern coast of New Brunswick will expand seaward and the eastern limit will lie about 30 miles west of les Îles-de-la-Madeleine. The band of ice along the northern shore will expand to about 30 miles offshore during the first 2 weeks of the year. At mid-January greywhite ice will predominate in Northumberland Strait as well as in the Strait of Belle Isle. The main ice pack in the central Gulf will continue its eastward expansion and reach les Îles-de-la-Madeleine during the third week in January and Cape North a few days later. At the end of the month the main ice pack in the Gulf, which will be composed of mainly greywhite and grey ice, will lie just west of a line extending from Cape North to the southeastern tip of Anticosti Island to the Newfoundland coast about 25 miles north of Daniel's Harbour. However grey ice is expected to develop in bays along the Newfoundland coast south of the limit during the second half of January. At month's end greywhite ice will predominate in the Northeast Arm while thin first

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

year ice would have just started to develop in Belle Isle Strait. The forecast ice extent for February 1st is illustrated in Figure 5.

Slightly above normal temperatures will continue to prevail for most of February and the ice coverage will continue to expand and ice thicknesses to increase. Grey and greywhite ice will gradually spread into Cabot Strait during the second week of February with some first year ice developing there just after mid-month. Ice in Northumberland Strait will thicken to reach the first year ice stage by mid-February. The ice in the Northeast Arm will continue to edge southward along the western Newfoundland Coast. The main ice pack in the Gulf will expand towards Newfoundland and reach the approaches to Bay of Islands by month's end. At that time the western half of Cabot Strait will be covered by greywhite and first year ice. At the end of February greywhite and first year ice will be the predominant ice types in the Gulf except for thinner ice along the northern shore. Episodes of strong onshore winds will, at times, result in strong ice pressure in coastal areas and within the ice pack.

The ice extent will reach its maximum near the beginning of March. With near to above forecast temperatures in March and the fact that the ice thicknesses will be somewhat less than normal, clearing of the River and the Estuary should occur shortly after mid-March which is close to a week earlier than normal. The forecast ice extent for March 1st is illustrated in Figure 6.

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

East Newfoundland Waters

At the end of November, water temperatures over the east Newfoundland waters ranged from 0.5 to 1.0ºC above normal. As for Labrador coast area, water temperatures were near normal in the near shore area and increased to 0.5 to 1.0ºC above farther offshore (see figure 3).

At the end of November, new and grey ice was covering almost entirely Lake Melville. Some patchy new ice has begun to form in the smaller bays along the northern portion of the Labrador coast. Elsewhere mainly open or bergy water prevailed. The ice edge was located near Resolution Island which is a week to 10 days later than normal. Air temperatures, in December, will be near normal for Newfoundland Waters. Along the Labrador coast air temperatures will be slightly below normal for the first half of the month but near to above normal over the second half. Ice in Lake Melville will reach the greywhite stage early in December and the first year ice stage during the third week of the month. At that time Lake Melville will become consolidated. New and grey ice will continue to form along the northern Labrador coast and will spread southward to reach Nain shortly after mid-December. By the end of December, the ice edge will be near the entrance to Belle Isle Strait. South of the ice edge, some new ice will form in the smaller bays and inlets. No significant ice will begin to form along the Newfoundland coast before the New Year. The expected ice cover for January 1st is illustrated in figure 4.

The seasonal temperature forecast indicates near normal temperatures over most of the Newfoundland Waters area during January and February. Slightly below normal temperatures are forecast along the Labrador coast for the same period. However, temperatures will fluctuate between above and below normal values over Newfoundland as storms track eastward over the area. This, combine with a slightly later than normal freeze-up, will result in the ice extent and thickness to be slightly less than normal at the end of January. Ice will develop near St Anthony during the first week of January and spread southward along the Northern Peninsula during the second week. New ice will develop in White Bay and along the shore in southern Notre Dame Bay during the second week of January. Bay of Exploits will be ice covered by mid-January. In the second half of January the ice along the southern Labrador coast and the Northern Peninsula will gradually expand seaward and the eastern limit of the ice pack will lie 90 to 120 miles offshore at month's end. At that time the southern ice edge will lie just north of Notre Dame Bay. At the end of January grey ice will be the predominant ice type south of St Anthony while Greywhite ice will be the predominant type along the southern Labrador coast. Further north first year ice will prevail inside the ice pack. The expected ice extent for February 1st is illustrated in Figure 5.

In February the ice edge will continue its southward progression. Notre Dame Bay will be completely ice covered during the first week in February. The southern ice edge will reach the latitude of Cape Bonavista by mid-February. At that time the eastern ice edge will lie about 150 miles east of St Anthony and 90 miles east of Cape Freels. A slow southward progression of the ice edge is expected during the second half of February. However patchy

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

new and grey ice areas could occasionally developed in bays south of the ice edge. At the end of February greywhite ice will be the predominant ice type south of Cape Freels while first year ice prevails further north. The expected ice extent for March 1st is illustrated in Figure 6.

Little southward progression of the southern ice edge is expected during the first three weeks of March. A slow retreat of the ice edge is expected during the last week of the month. Periods of strong onshore winds could occasionally result in moderate to strong ice pressure developing along the Newfoundland coast north of Cape Bonavista. Patches of greywhite and first year ice could at times drift in Trinity Bay and Conception Bay. The southern ice edge is expected to retreat at a near normal pace in the spring.

Concentrations of old ice in northwestern Baffin Bay were slightly less than normal and small amounts of this old ice will be dispersed in the southern pack during the spring season. Note that ice concentration, ice type, and ice pressure in coastal areas will vary according to winds associated with storm systems passing over Newfoundland waters.

Client service - Service à la clientèle 373 Sussex Drive, E-3, Ottawa, Ontario K1A 0H3 Canada
ph./tél.: (800) 767-2885 / (613) 996-1550 fax: (613) 947-9160 cis-scg.client@ec.gc.ca URL: http://ice.ec.gc.ca

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/mcts-sctm/ramn/docs/index_e.htm

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.

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 (613) 996-1550, facsimile (613) 947-9160 or e-mail at:

cis-scg.client@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.