

**Produced by Canadian Ice Service of  
Environment Canada  
03 December 2003**

**Seasonal Outlook  
Gulf of St. Lawrence and  
East Newfoundland Waters  
Winter 2003-2004**



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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 2003-2004

#### 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\\_arnm/Atlantic/part 5 e.htm](http://www.ccg-gcc.gc.ca/mcts-sctm/ramn_arnm/Atlantic/part_5_e.htm)



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Figure 1: 1000 mb pressure pattern - November 2003

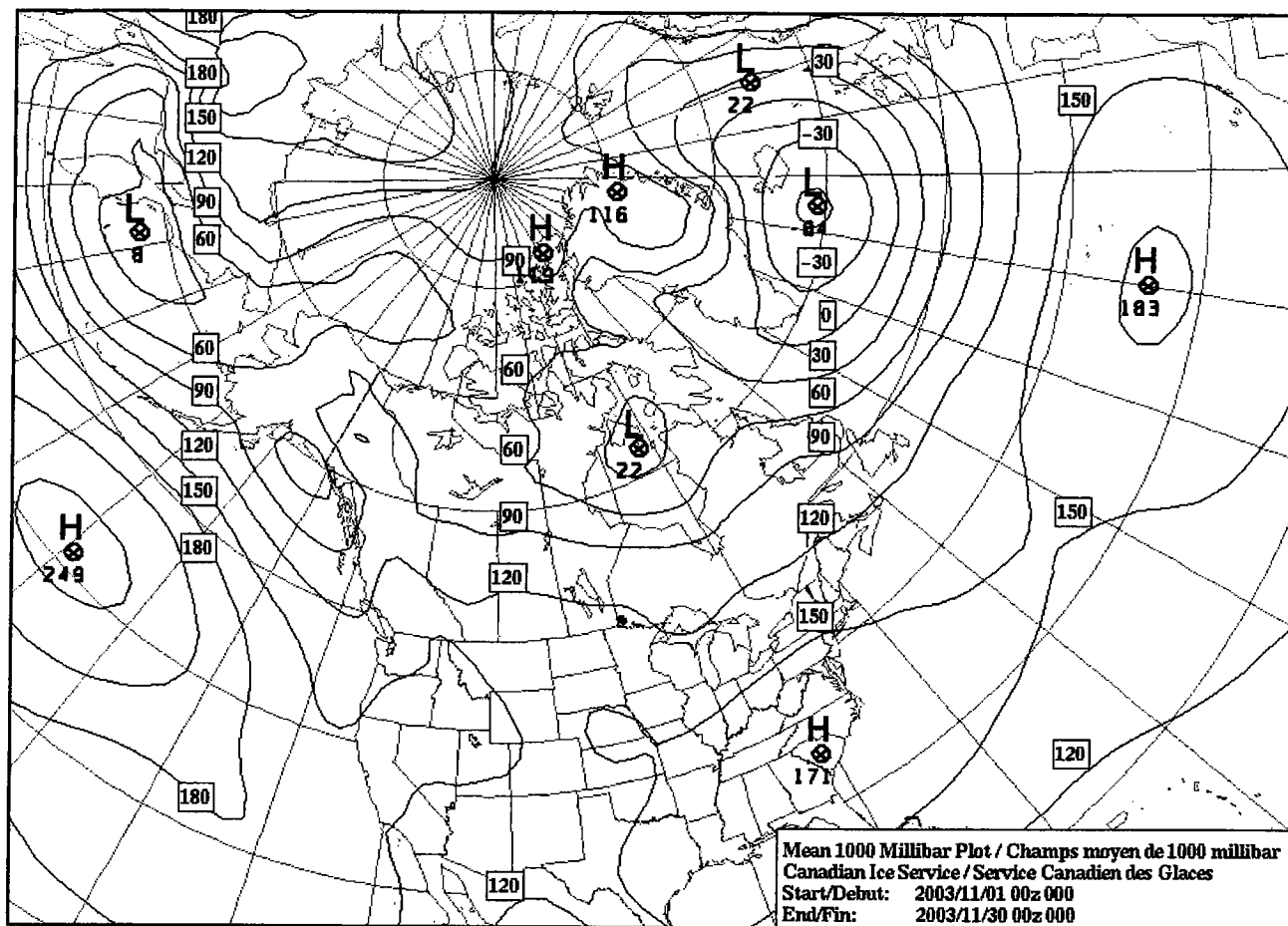


Table 1: Departure from Normal Temperatures - November 2003

Nain	Cartwright	Gander	St John's	Sydney	Gaspe	Sept-Iles	Quebec
2.8	1.9	1.2	1.1	1.1	1.5	1.0	1.2



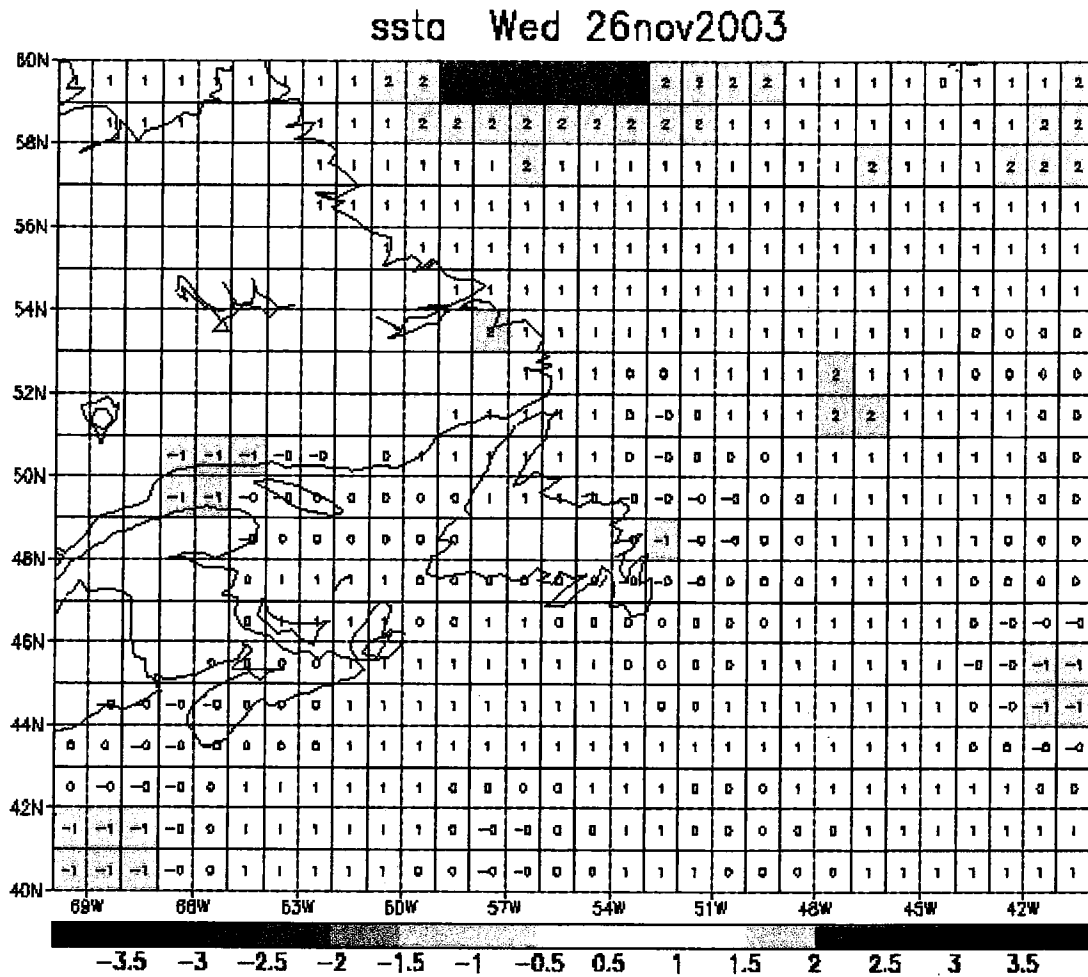
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Figure 2: Temperature anomalies - 26 November 2003 (NCEP)



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### General Seasonal Outlook

During the period from the beginning of June to the end of October, air temperatures over the Gulf of St Lawrence and the Estuary were about 1°C above normal whereas Newfoundland and the Labrador coast averaged about 2.5°C above normal.

The mean 1000 mb pressure chart for November 2003 is shown in Figure 1. The chart indicates a high pressure centre located over the Carolinas with a weak ridge extending northward into Quebec. A low pressure centre located over northern Hudson Bay combined with the high in the Carolinas generated a westerly circulation over the Great Lakes into the Gulf area. A second low pressure centre located just south of Iceland with a trough extending southwestward towards Labrador generated a northwesterly circulation along the Labrador coast and Newfoundland. Temperatures were generally above normal over the entire area for the month of November. Mean November temperatures over the Gulf of St. Lawrence ranged from plus 4.3°C at Sydney to minus 2.0°C at Sept Iles. Along the Labrador and Newfoundland coasts, mean temperatures ranged from plus 3.6°C at St. John's to minus 2.4°C at Nain.

Figure 2 shows sea surface temperature departures from normal for eastern Canadian waters on the 26<sup>th</sup> of November. This chart showed near to 1°C above normal water temperatures over most of Gulf of St-Lawrence except in the Estuary where temperatures were 0.5°C to 1.0°C below normal. Water temperatures were near normal along the East Coast of Newfoundland and 1.0°C to 1.5°C above normal along the Northern Peninsula and the Labrador Coast.

At the end of November, generally open water conditions prevailed in Goose Bay, Terrington Basin and Lake Melville.

The forecast for the first half of December is for near to below normal air temperatures for the Gulf of St. Lawrence and the Labrador coast while the second half of December will have near to slightly above normal temperatures over the area. Newfoundland will be near to slightly below normal for the first half of December with near to above normal temperatures for the second half. Freeze-up over the St. Lawrence River, Gulf of St Lawrence will occur slightly later than normal while Newfoundland waters and Labrador coast freeze-up will occur later than normal.



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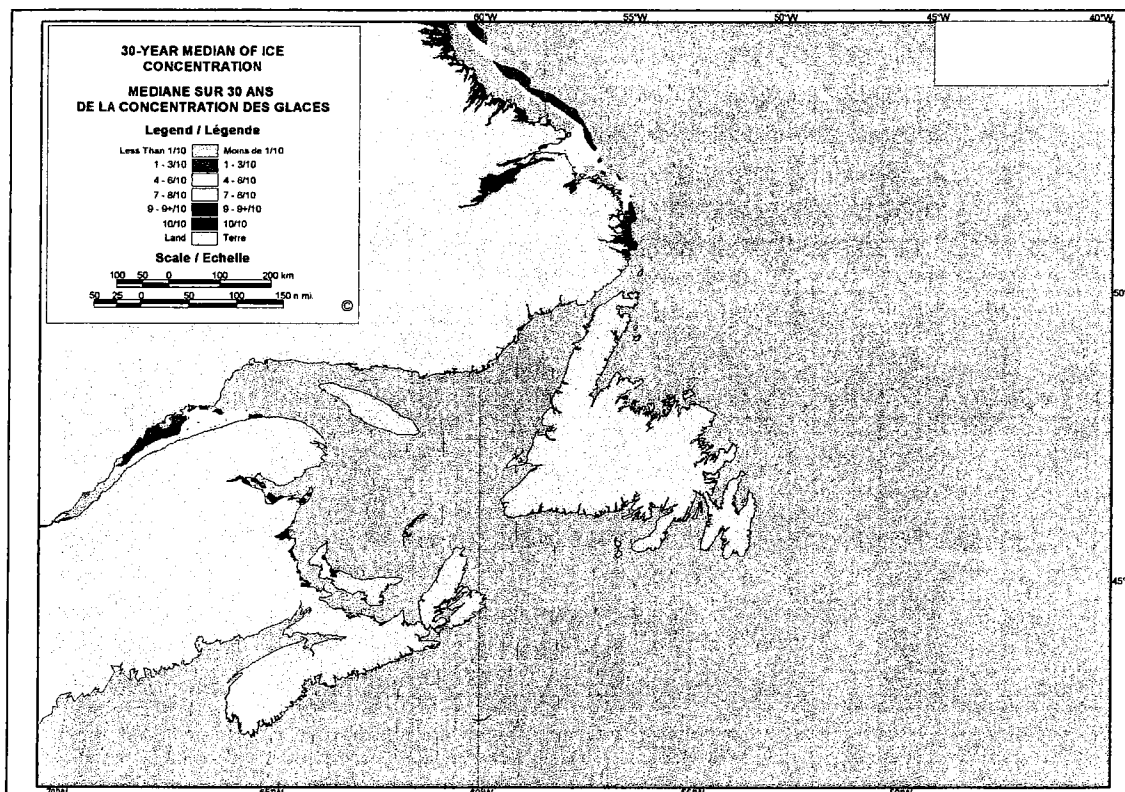


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Figure 3: Expected ice conditions - 01 January 2004

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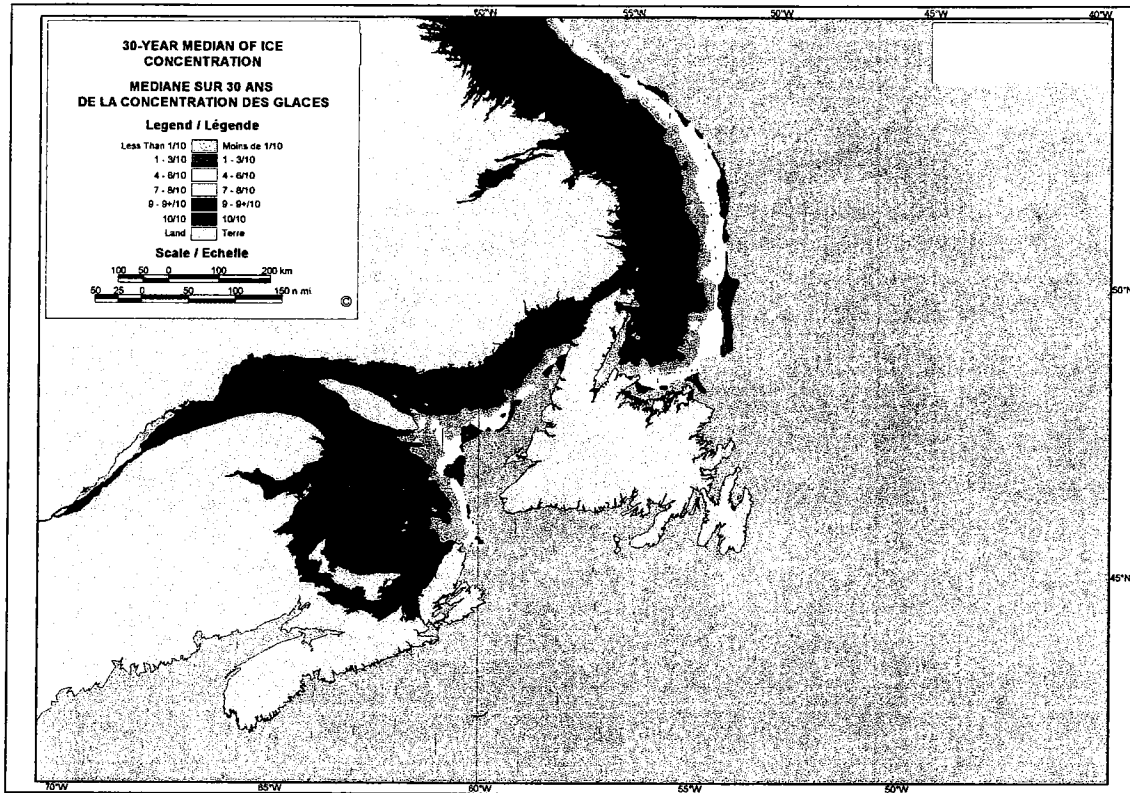
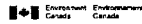
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Figure 4: Expected ice Conditions - 29 January 2004



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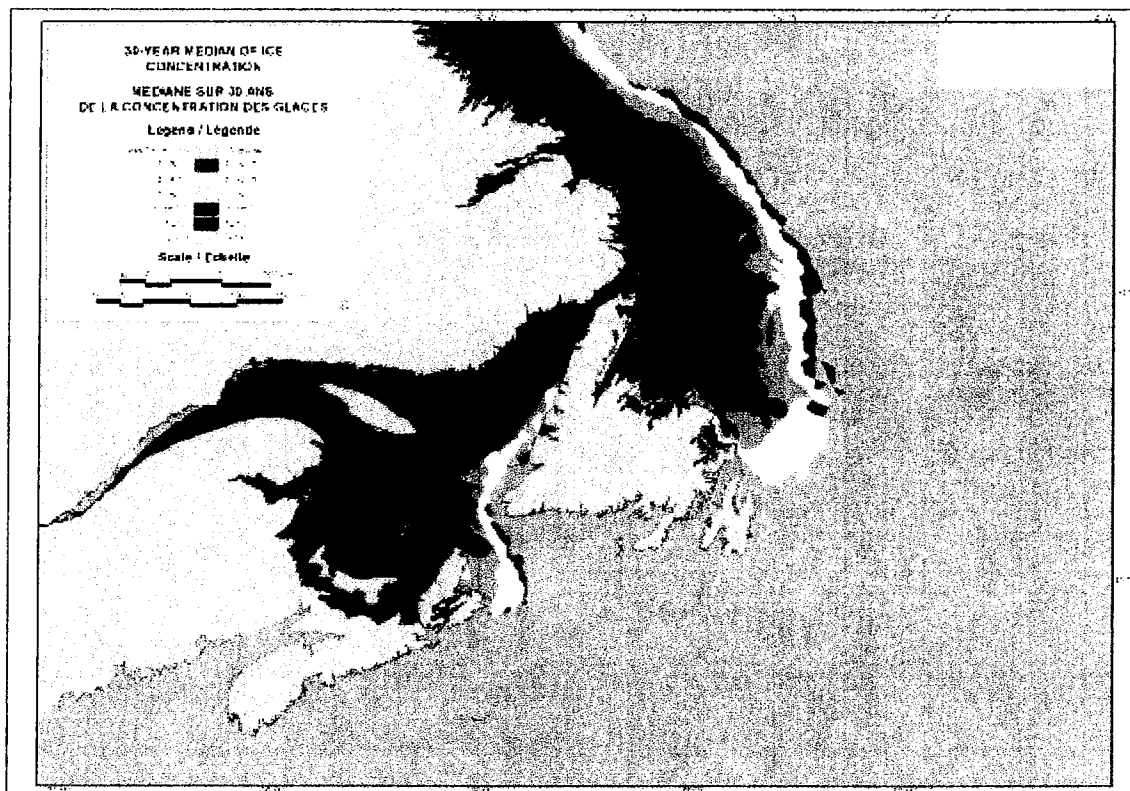


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Figure 5: Expected ice Conditions - 26 February 2004

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### **Gulf of St. Lawrence**

Water temperatures ranged from normal to slightly below normal over the Western Gulf and the Estuary and 0.5°C to 1.5°C above normal over the Northeast Arm near Belle Isle Strait and the southern Gulf. Air temperatures will average below normal over the Estuary and the Gulf of St. Lawrence during the first half December and become near to slightly above normal temperatures for the last half of December.

At the beginning of December, no new ice has begun to form over the St Lawrence River. Ice will begin to form around the Quebec City area during the second week of December.

By the end of December, the ice will reach just west of Pointe des Monts. New ice will begin to form over Northumberland Strait, Chaleur Bay and along the New Brunswick coast by the end of the year. By the first week of January, grey and new ice will cover Chaleur Bay and the Northumberland Strait. Ice will also be delayed somewhat in the Belle Isle Strait to the first week of January. At the beginning of January, the forecast ice extent will be less than normal especially in the Northeast Arm area. The expected ice cover for 01 January is illustrated in Figure 3.

The seasonal temperature outlook for January and February indicates that temperatures will be near to below normal over most of the Gulf of St Lawrence. The exception will be in the Belle Isle area as well as the western coast of Newfoundland where near to slightly above normal temperatures are forecast. Significant fluctuations in temperature will likely occur over the Gulf as storms track eastward over the area. With generally near to below normal temperatures over the Gulf, ice extent will be near normal. Ice thicknesses will be near to slightly thicker than normal especially over the western portion of the Gulf. By the end of the first week in January, the ice should reach the Gaspé Passage. At the same time, new ice will begin to form along the North Shore of the Gulf.

New ice will spread southeastward from Gaspé Passage during the first week of January. At that time Northumberland Strait and Chaleur Bay will be covered by grey with some greywhite ice. Ice will then spread eastward from the New Brunswick coast to reach the eastern end of Anticosti Island and Îles de la Madeleine early in the third week of January. At that time the Northeast Arm, the Strait of Belle Isle as well as the Estuary will be predominately covered with grey and greywhite ice. The ice pack will continue its southeastward progression and will reach the northern tip of Cape Breton by the last week of the month. At the end of January the ice will be near Cape North with some ice moving into Northwestern Cabot Strait as indicated on Figure 4. At that time grey and greywhite ice will be predominant in the Gulf. There will also be some area of thin first year ice along the south



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side of the Estuary, in southern Chaleur Bay, in eastern Northumberland Strait as well as the Northeast Arm.

The ice pack will continue to drift southeastward and will cover the western third of Cabot Strait around mid-February. By the end of February, the western two thirds of the strait will be cover with ice. Ice will continue to move down the west coast of Newfoundland and reach Daniel's Harbour by mid-February. At that time open water conditions will persist in the eastern third of Cabot Strait and along the west coast of Newfoundland south of Daniel's Harbour. At mid-February greywhite with some thin first year ice will predominate over most areas including the shipping route through the Gulf of St. Lawrence and in the Estuary and persist until the end of the month. The Northeast Arm, Northumberland Strait, the northwest shores of Cape Breton Island and the Newfoundland coast north of Cape St. George will be predominantly covered with thin first year ice. During the month of February near normal ice conditions can be expected in the northern St. Lawrence River and along the east New Brunswick Coast. The forecast ice extent, at the end of February, is illustrated on Figure 5. The ice will reach its maximum extent near mid March with slightly thicker than normal ice thickness especially in the northwestern portion of the Gulf. However the extent will be slightly less than normal.

With generally slightly below normal temperatures over the winter season, clearing of the St. Lawrence River and Estuary and western Cabot Strait will occur slightly later than its normal date.



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### **East Newfoundland Waters**

Water temperatures, over the east Newfoundland waters, range from normal to 1.0°C above normal while they were 0.5°C to 1.5°C above normal along the Northern Peninsula and the Labrador coast.

At the end of November, no appreciable amount of ice was observed in Goose Bay and Lake Melville except for some ice drifting out of the Churchill River. Elsewhere mainly open or bergy water prevailed. The ice edge was well north of Cape Chidley which is up to 3 weeks later than normal. Air temperatures will be below normal for the Newfoundland and Labrador area during the first week of December and near to slightly above normal temperatures for the rest of the month over Newfoundland and the southern Labrador Coast. The northern portion of the Labrador Coast will have near to slightly below normal during the same period. New and grey ice will begin to form along the northern Labrador coast during the second week of December and will spread southward to reach Hamilton Inlet by the end of the third week of December. At the same time new and grey ice will begin to form in Lake Melville during the first week of December and become consolidated around the end of the month. By the New Year, ice will be near Battle Harbour. No significant ice will begin to form along the Newfoundland coast before the New Year. The 01 January expected ice cover is illustrated in Figure 3.

The seasonal temperature forecast indicates near to slightly below normal temperatures along the Labrador Coast and near to slightly above normal values over the east Newfoundland waters during January and February. However, temperatures will fluctuate between well above and well below normal values over Newfoundland as storms track eastward over the area. This, combine with a later than normal freeze-up, will result in the ice extent and thickness to be slightly less than normal at the end of January. The southern ice edge will move southward to lie near Belle Island by the third week of January then near Fogo Island by the end of January, as indicated in Figure 4. New and grey ice will begin to form during the second week of January in the Bay of Exploits area with the ice becoming consolidated about a week later. New and some grey ice will begin to form along the coast of Notre Dame Bay eastward to south of Fogo Island around the third week of the month. By the end of the month, the main ice pack will be just north of Notre Dame Bay and extend to 130 miles east of the Labrador coast and consist of mostly thin first year ice north of Cartwright. South of Cartwright greywhite and thin first year ice will predominate while greywhite and grey ice will prevail south of the Strait of Belle Isle. New and grey ice will lie along the east side of the Northern Peninsula and along the shipping route from Fogo Island to Notre Dame Bay.

In February, the ice edge will continue its southward progression reaching Cape Bonavista during the second week of February. The southern ice edge will reach Cape St Francis late in February but the main pack will remain mainly offshore. Figure 5 shows the



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expected ice conditions at the end of February. At that time greywhite and thin first year ice will predominate in the pack south of Cape Freels. North of Cape Freels thin first year with some medium first year ice will prevail. During the month of March the southern ice edge will position itself near the same latitude as Cape St. Francis but will start to retreat northward during the last week of the month. The eastern ice edge typically extends eastward off St. John's to about 50W with occasional intrusions to 47W. Such intrusions are likely to occur this season however at slightly higher latitude near Cape St. Francis. This winter, the ice will reach its maximum extent during the third week of March.

Concentrations of old ice in northwestern Baffin Bay were near 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. The southern ice edge is expected to retreat at a near normal pace in the spring.



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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/mcts-sctm/ramn\\_arNm/Atlantic/part\\_5\\_e.htm](http://www.ccg-gcc.gc.ca/mcts-sctm/ramn_arNm/Atlantic/part_5_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 the ice edge.
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 the ice edge.



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3. Iceberg Bulletin (FICN11): 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](mailto: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.