

**Produced by Canadian Ice Service of
Environment Canada
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**Seasonal Outlook
Gulf of St. Lawrence and
East Newfoundland Waters
Winter 2004-2005**



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GULF OF ST. LAWRENCE AND NEWFOUNDLAND WATERS

WINTER 2004-2005

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/docs/ramn_arbm/Atl/dls/part5_e.pdf



General Seasonal Outlook

During the period from the beginning of June to the end of October, air temperatures over the south-western part of the Gulf of St Lawrence was near normal whereas the central Labrador coast averaged about 1.9°C above normal.

The mean 1000 mb pressure chart for November 2004 is shown in Figure 1. The chart indicates a high pressure centre located over the Carolinas with a ridge extending westward. A low pressure centre located over southern Davis Strait combined with the high in the Carolinas generated a westerly to northwesterly circulation over the Gulf of St Lawrence while a more westerly pattern reigned over Newfoundland and Labrador. Temperatures were generally near normal over the entire area for the month of November except along the Labrador Coast where temperatures were above normal. Departure from normal temperatures over the area ranged from minus 0.2°C at Baie Comeau to plus 1.9°C in Nain.

Figure 2 shows sea surface temperature anomalies for eastern Canadian waters on November 24th. This chart shows near normal water temperatures over of the southern portion of the Gulf of St-Lawrence as well as the Northeast Arm. The exception is the Estuary where temperatures were 1.5°C to 2.0°C above normal. Water temperatures along the East Coast of Newfoundland were near normal while the temperatures were about 0.5°C to 1°C above normal along the Labrador Coast.

At the end of November, generally open water conditions prevailed in Lake Melville except for a small patch of new and grey ice in the western end of the lake.

The forecast for December is for near to above normal air temperatures for the Gulf of St. Lawrence and the Labrador coast. Freeze-up over the St. Lawrence River will occur slightly earlier than normal while the Gulf of St Lawrence, Newfoundland and Labrador will occur later than normal.



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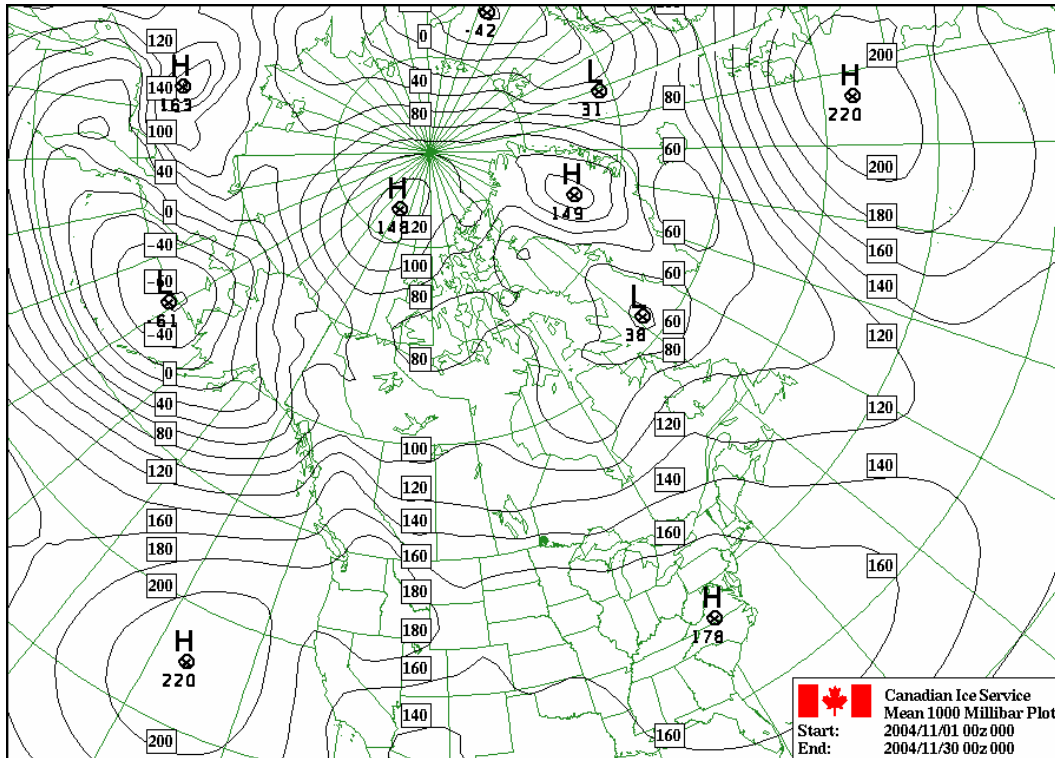


Figure 1: 1000 mb pressure pattern - November 2004

	Normal Temperatures	Observed	Departure
Quebec	-0.5	-0.3	0.2
Sept-Iles	-2.9	-2.8	0.1
Gaspe	-0.5	-0.6	-0.1
Sydney	3.3	3.3	0.0
Stephenville	2.3	2.7	0.4
St Johns	2.6	3.3	0.7
Gander	0.9	1.8	0.9
Cartwright	-2.4	-1.2	1.2
Goose Bay	-4.5	-4.8	-0.3
Nain	-5.1	-3.2	1.9
Average	-0.7	-0.2	0.5

Table 1: Departure from Normal Temperatures - November 2004



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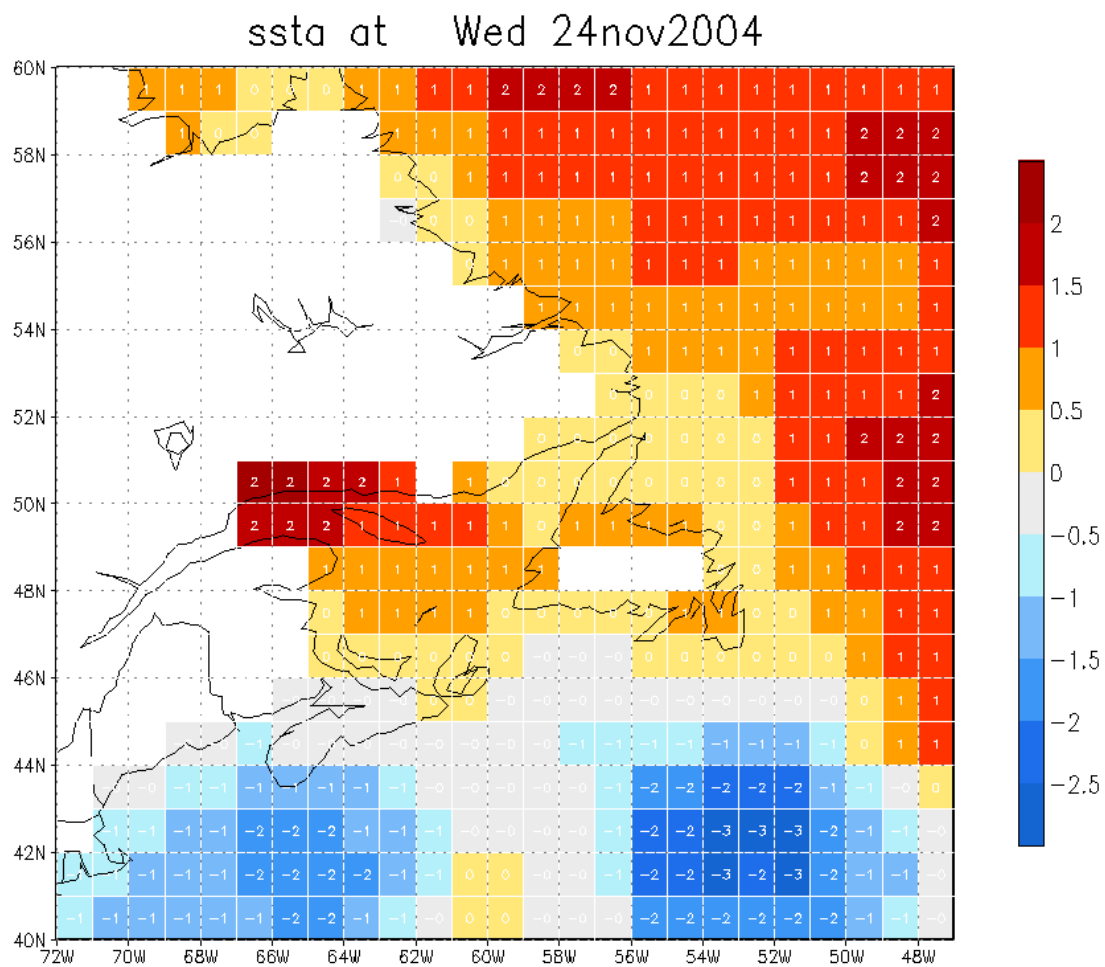
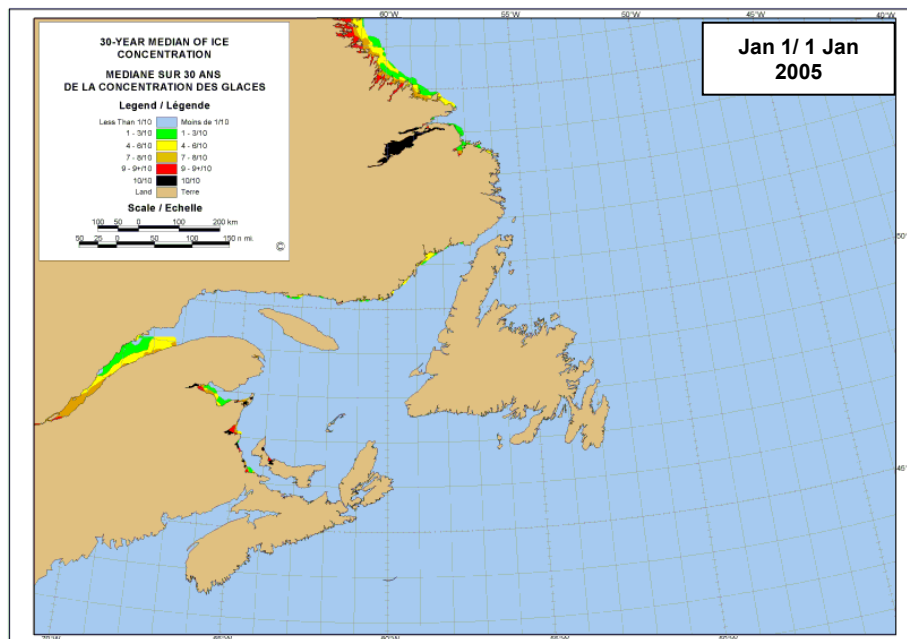


Figure 2: Water temperature anomalies - 24 November 2004 (NCEP)



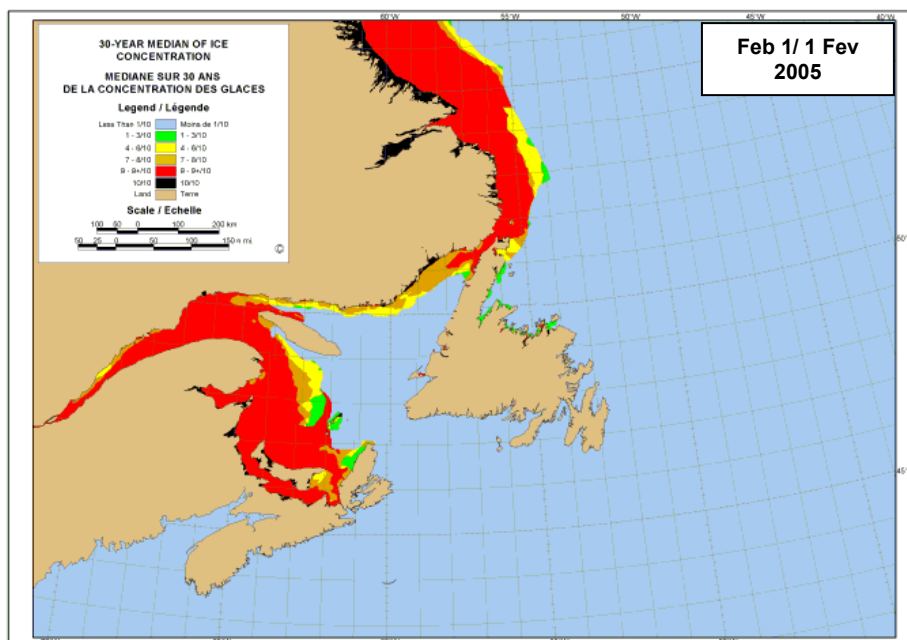
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Figure 3: Expected ice conditions – 1 January 2005



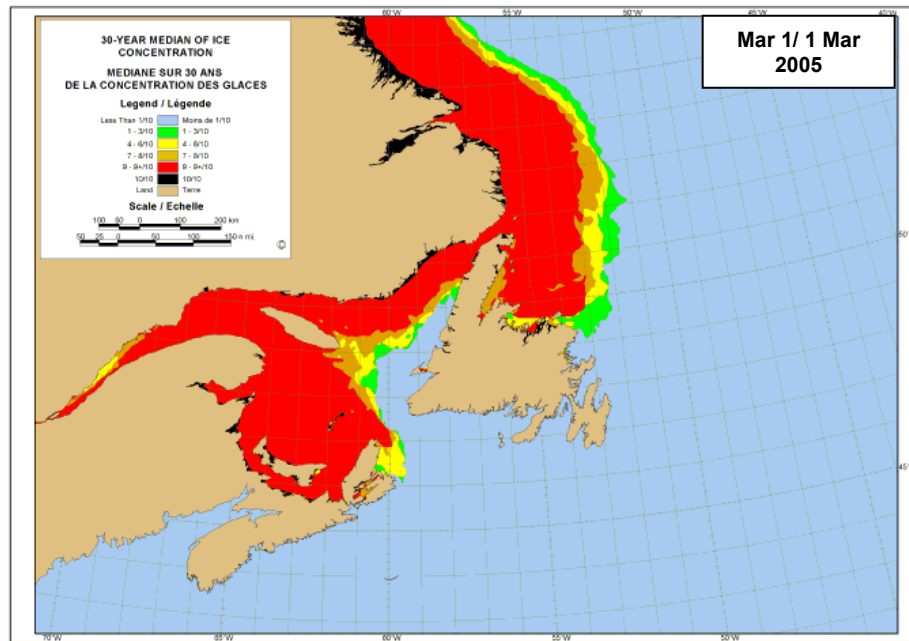
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Figure 4: Expected ice conditions – 1 February 2005



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Figure 5: Expected ice Conditions – 1 March 2005



Gulf of St. Lawrence

Water temperatures ranged from 2.0°C above normal over the north-western Gulf of St Lawrence and the Estuary to near normal over the southern Gulf in the Northumberland Strait as well as the Northeast Arm. Air temperatures will average above normal over most of the Gulf except for the Estuary and the St Lawrence River where near to below normal temperatures will prevail for the month of December.

At the beginning of December, no new ice has begun to form over the St Lawrence River. New ice will begin to form around the Quebec City area during the second week of December and continue to expand eastward down the river. By the end of December, the ice will reach just west of Pointe des Monts. New ice will begin to form in Chaleur Bay and along the New Brunswick and Prince Edward Island coast on the Northumberland. At the same time, the North Shore of Quebec will also see some patches of new ice in the bays. The rest of the Gulf will remain open water to ice free. The forecast ice extent for January 1st is illustrated in Figure 3.

The seasonal temperature outlook for January and February indicates that temperatures will be above normal over most of the Gulf of St Lawrence. The exception will be in the St Lawrence River and Estuary where temperatures will be near to below normal. Significant fluctuations in temperature will likely occur over the Gulf as storms track eastward over the area. With generally near to above normal temperatures over the Gulf, ice extent will be slightly less than normal. Ice thicknesses will generally be slightly less than normal over most of the Gulf except slightly thicker than normal over the Estuary and the St Lawrence River. The ice will continue to form and drift eastward from the river into the Estuary during the first half of January. The ice will be confined to the southern portion of the Estuary along the Gaspé Peninsula with mostly open water in the central portion of the Estuary. By the end of the first week in January, the ice should reach the southern part of the Gaspé Passage. During the same time, grey and new ice will cover Chaleur Bay and the Northumberland Strait. By the middle of January, most of the Estuary as well as the Gaspé Passage will be frozen over with new and grey ice with a narrow band of greywhite ice hugging the Gaspé Peninsula. The ice edge will extend offshore by about 5 to 10 miles from the northern shore of Prince Edward Island. The new and grey ice along the North Shore will continue to spread slowly southward to about 7 to 15 miles from the shore. At the same time, new ice will begin to form in the Belle Isle Strait. By the fourth week of January, ice will then spread eastward from the New Brunswick and Prince Edward Island coast to reach the Magdelaine Islands. At that time the Strait of Belle Isle as well as the Estuary will be predominately covered with grey and new ice. By the end of January the ice will be near Cape North on Cape Breton Island with some ice moving into Northwestern Cabot Strait. At that time greywhite with some thin first year ice will be present in Northumberland Strait and along the northern shore of Prince Edward Island. There will also be some areas of thin first year ice along the south side of the Estuary and southern Chaleur Bay. The remainder of the Gulf will be open water to ice free. The forecast ice extent for February 1st is illustrated in Figure 4.



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The ice pack will continue to drift south-eastward in the gulf during the first half of February. The ice edge will reach the eastern tip of Anticosti Island by the end of the first week of February. Ice will drift into the western third of Cabot Strait around mid-February. Meanwhile, the ice in the Belle Isle Strait will continue to edge southward along the western Newfoundland Coast and will be located about 25 miles north of Daniel's Harbour by mid-month. South of the ice edge, some of the smaller bays and inlets along the western Newfoundland Coast will have some new and grey ice forming. At the same time, the ice along the North Shore will continue to expand southward and fill the Northeast Arm. By mid-February, the ice edge will be close to the northern shore of Anticosti Island from the North Shore of Quebec and about 10 to 15 miles east of the Magdelaine Islands. Most of the ice in the gulf will be grey and new ice with mostly greywhite and thin first year ice located in the south-western part of the Gulf, southern Chaleur Bay and along the north shore of the Gaspé Peninsula. Some of the thicker ice will drift south from Cape North and could edge into the Sydney area. The rest of the Gulf from the eastern side of Chabot Strait into the south-eastern part of the Gulf will be open water. By the end of February, the western two thirds of the Chabot Strait will be cover with ice. Ice will continue to move down the west coast of Newfoundland and reach Daniel's Harbour by that time. 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 except for some new and grey ice in the sheltered bays and inlets. 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 while the rest of the Gulf will have less than normal ice extent and thickness. The forecast ice extent for March 1st is illustrated in Figure 5. The ice will reach its maximum extent near mid-March.

With generally above normal temperatures over the winter season over most of the Gulf except the St Lawrence River and Estuary, clearing of the St. Lawrence River and Estuary and western Cabot Strait will occur slightly earlier than its normal date.



East Newfoundland Waters

Water temperatures, over the east Newfoundland waters, ranged from normal to 1.0°C above normal while they were near normal along the Labrador coast to 1.5°C above normal off-shore.

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 2 weeks later than normal. Air temperatures will be above normal for Newfoundland and Labrador for the month of December. New and grey ice will begin to form along the northern Labrador coast during the third week of December and will spread southward to reach Hamilton Inlet by the end of the month. South of the ice edge, some new ice will form in the smaller bays and inlets. 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. 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 3.

The seasonal temperature forecast indicates near to above normal temperatures over the entire area 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, combined 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 Isle Strait by the middle of January. During the second week of January, some new and grey ice will begin to form in the Bay of Exploits area as well as the eastern shore of the Northern Peninsula with the ice in the Bay of Exploits becoming consolidated 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 January, the southern edge of the main ice pack will be just south of Hare Bay and extend 40 to 120 miles east of the Labrador coast. Some 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. The ice type from Belle Isle Strait southward will be grey and new while ice between Belle Isle Strait to Cartwright will be mostly greywhite and thin first year ice. North of Cartwright, mostly thin first year ice will prevail. The expected ice cover for February 1st is illustrated in Figure 4.

In February, the ice edge will continue its southward progression and be located north of Notre Dame Bay by mid-February. The southern ice edge will be in Notre Dame Bay by the end of the month with some of the ice edging close or south of Cape Freels. Figure 5 shows the expected ice conditions on March 1st. At that time, greywhite and thin first year ice will be the dominant ice in the pack south of Belle Isle Strait. North of Belle Isle Strait, thin first year with some medium first year ice will prevail. The eastern ice edge will be located about 150 miles east of the Northern Peninsula and 120 to 180 miles east of the Labrador coast at the end of February.



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During the month of March the southern ice edge could edge further south to about Cape Bonavista however the significant ice will be located from Notre Dame Bay northward. The ice edge will begin to retreat during the latter part of March.

Concentrations of old ice in northwestern Baffin Bay where 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/docs/ramn_arNm/Atl/dls/part5_e.pdf

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.



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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-scq.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.