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Seasonal Outlook

Gulf of St Lawrence and East Newfoundland Waters Winter 2011-2012

By



Canadian Ice Service
Le service canadien des glaces

Foreword

This outlook of the expected pattern, timing, and the extent of ice growth has been developed through an analysis of the oceanographic and meteorological parameters for the summer and the fall before the beginning of the ice season. These conditions are compared with earlier years then further analysed using the December wind and temperature forecasts plus the seasonal temperature outlook. Significant variations from these wind and temperature 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 the 30-day forecasts. These forecasts will also indicate the beginning of the spring break-up process.

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:

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

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General Seasonal Outlook

Above normal air temperatures were generally reported between the beginning of June and the end August over the forecast area but colder than normal temperatures were observed over Newfoundland and the eastern Gulf of St. Lawrence. Temperatures from September 1 to late November were above normal over all the forecast area. Water temperatures at the end of November were also above normal, except near normal along most of the Labrador coast.

At the end of November, new ice was forming along the Labrador coast and some new and grey ice was forming in Lake Melville. The western end of Lake Melville was consolidated with grey ice. These conditions were more than a week ahead of normal. For December to February air temperatures are forecast to be normal to above normal, except normal to below normal over a portion of the Labrador coast.

Freeze-up should be up to a week later than normal in the Gulf of St. Lawrence and in Newfoundland waters.

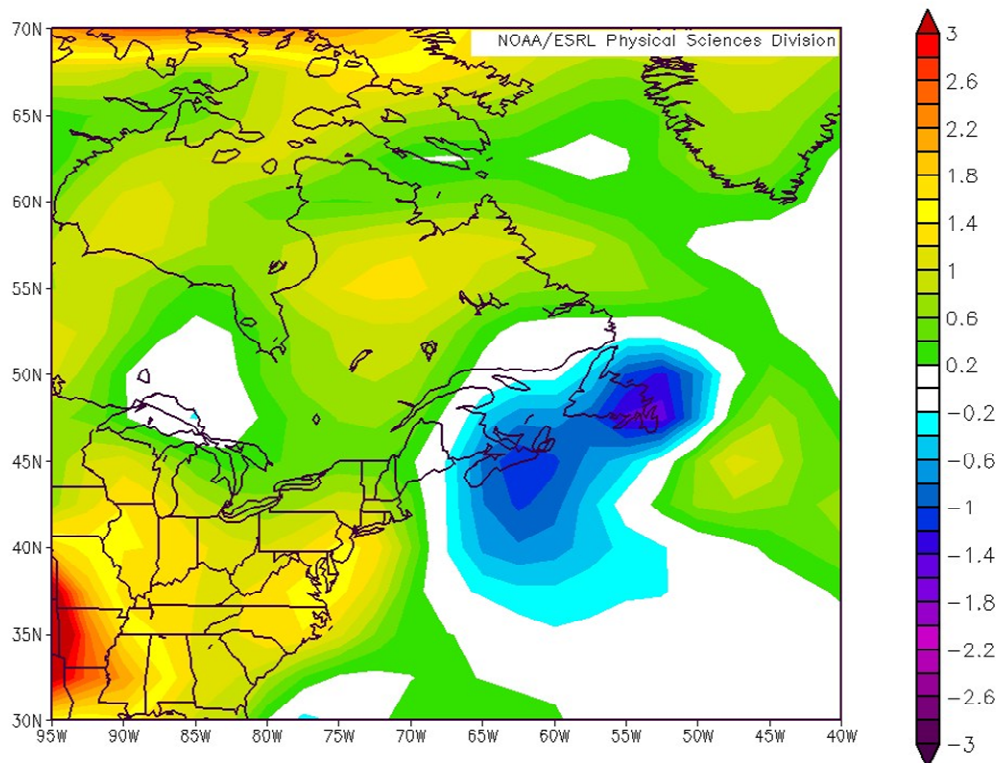


Figure 1: Air Temperature anomaly, June to August 2011 (NOAA)

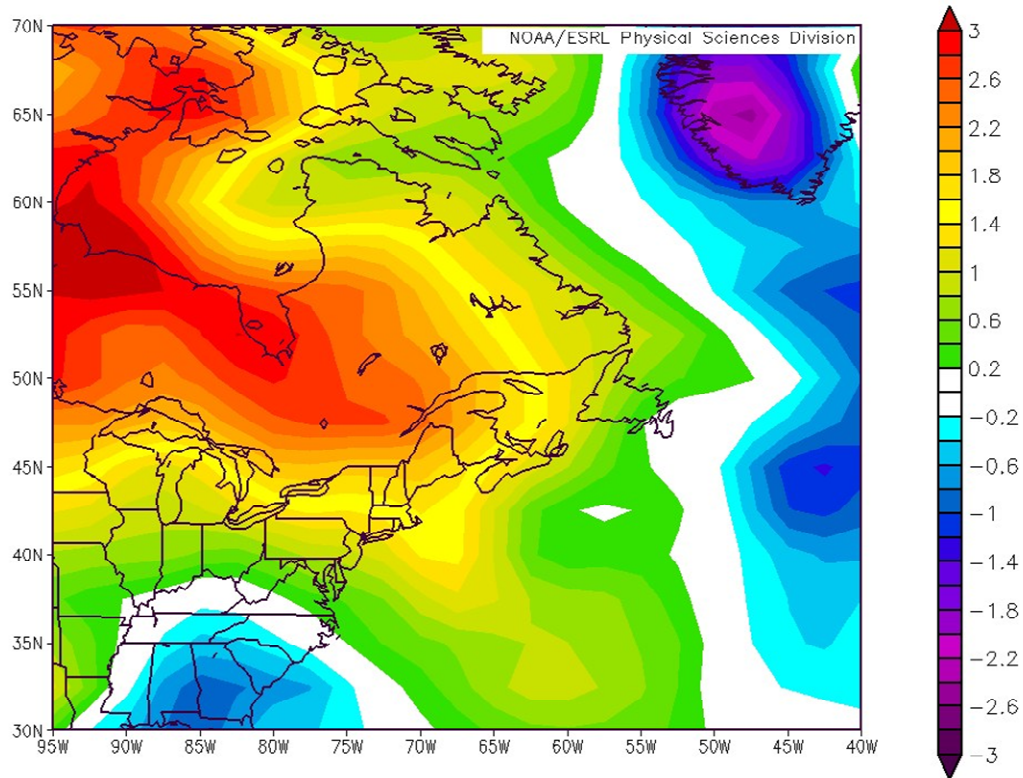


Figure 2: Air temperature anomaly, September 1st to November 26th (NOAA)

Table 1: Departure from normal air temperatures – November 1st to November 28th 2011

	Normal Temperatures	Observed	Departure
Quebec	-0.4	3.1	3.5
Sept-Iles	-2.8	-1.3	1.5
Gaspé	-0.4	2.1	2.5
Sydney	3.4	4.7	1.3
Stephenville	2.3	3.8	1.5
St John's	2.6	3.3	0.7
Gander	1.0	1.8	0.8
Cartwright	-2.3	-1.3	1.0
Goose Bay	-4.3	-2.3	2.0
Nain	-4.9	-3.4	1.5
Average	-0.6	1.1	1.6

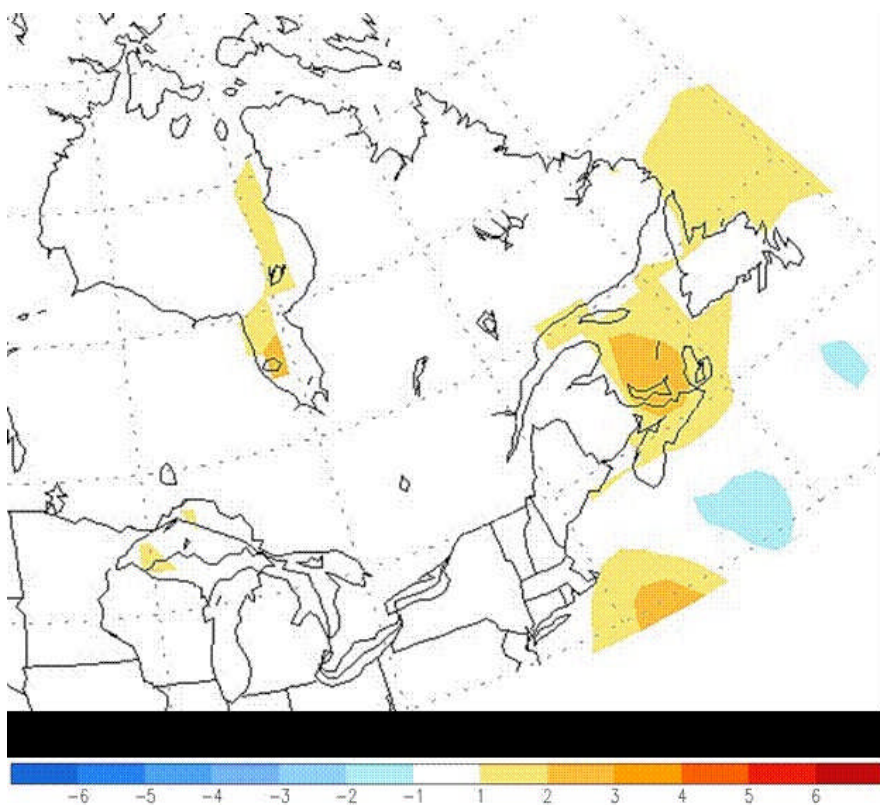
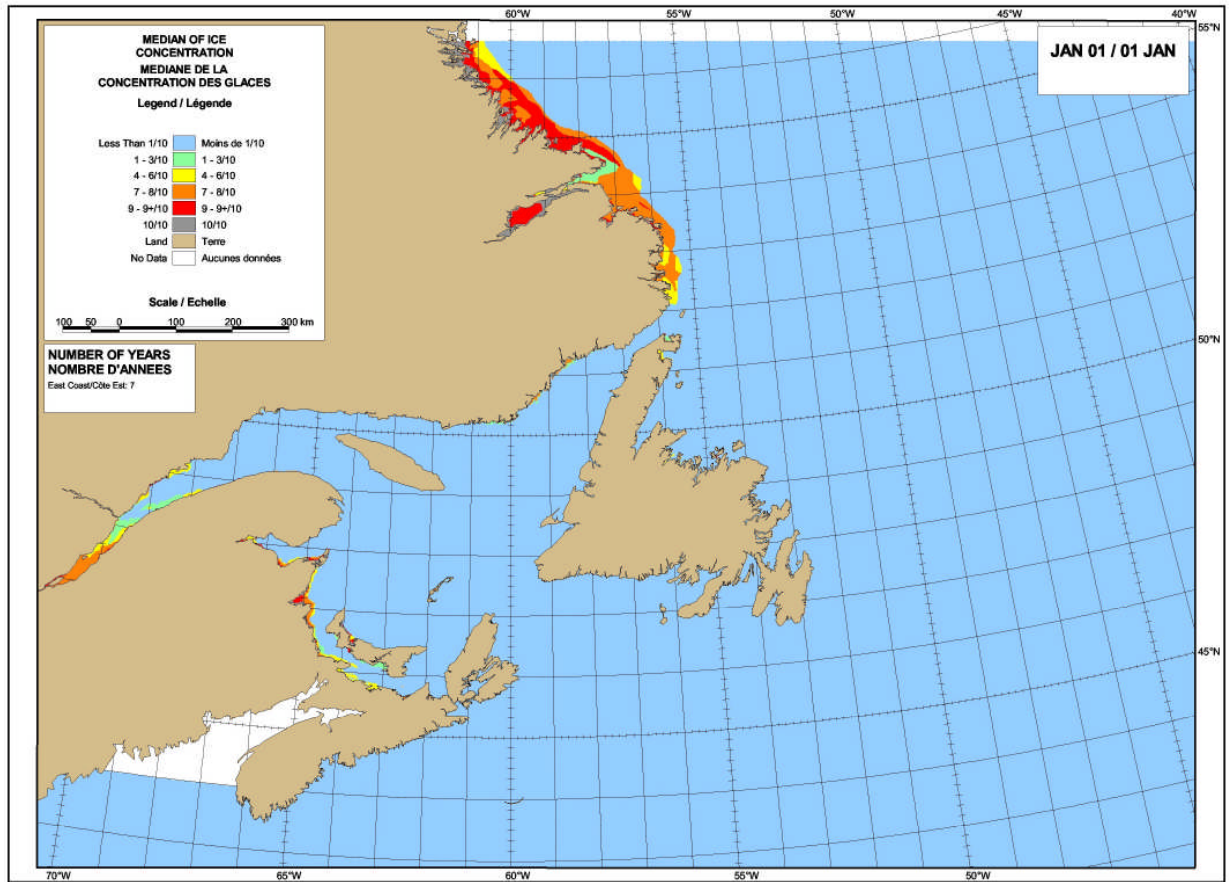
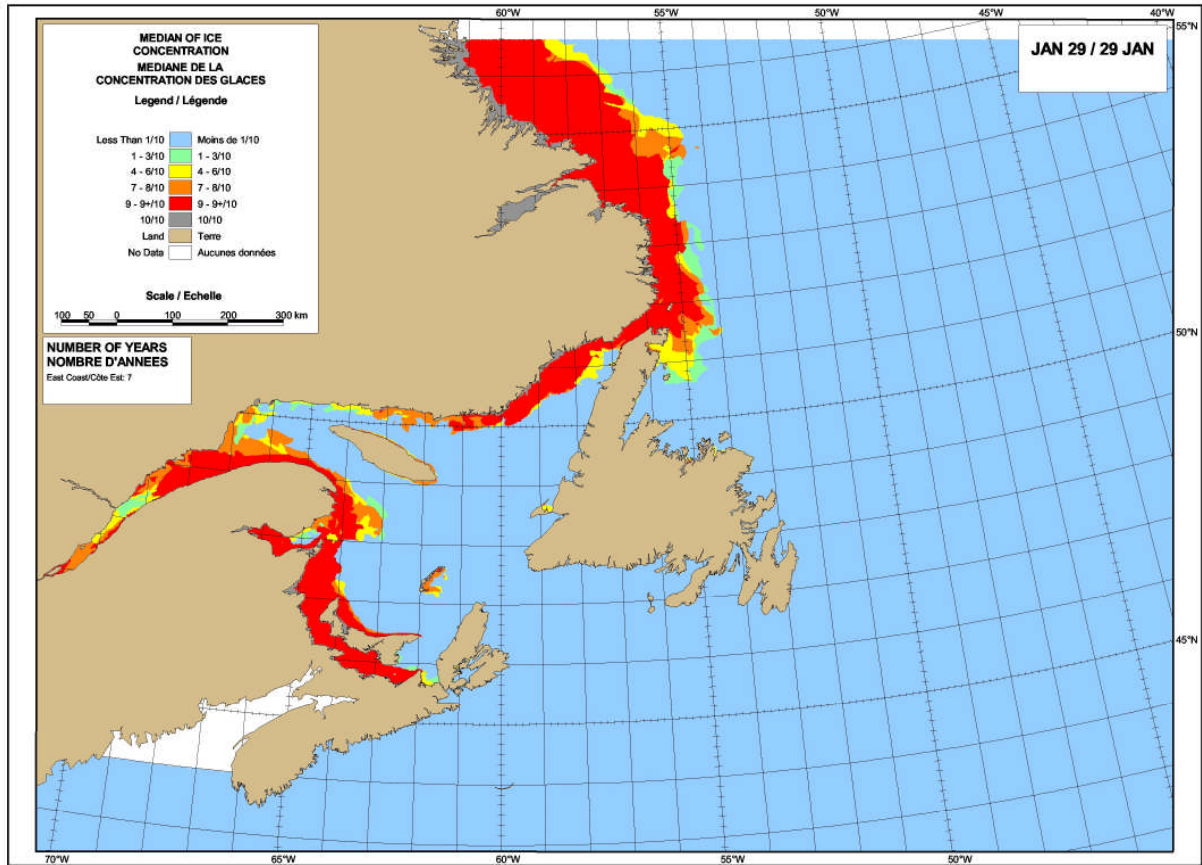


Figure 3: Water temperature anomalies on 23 November 2012 (NOAA)



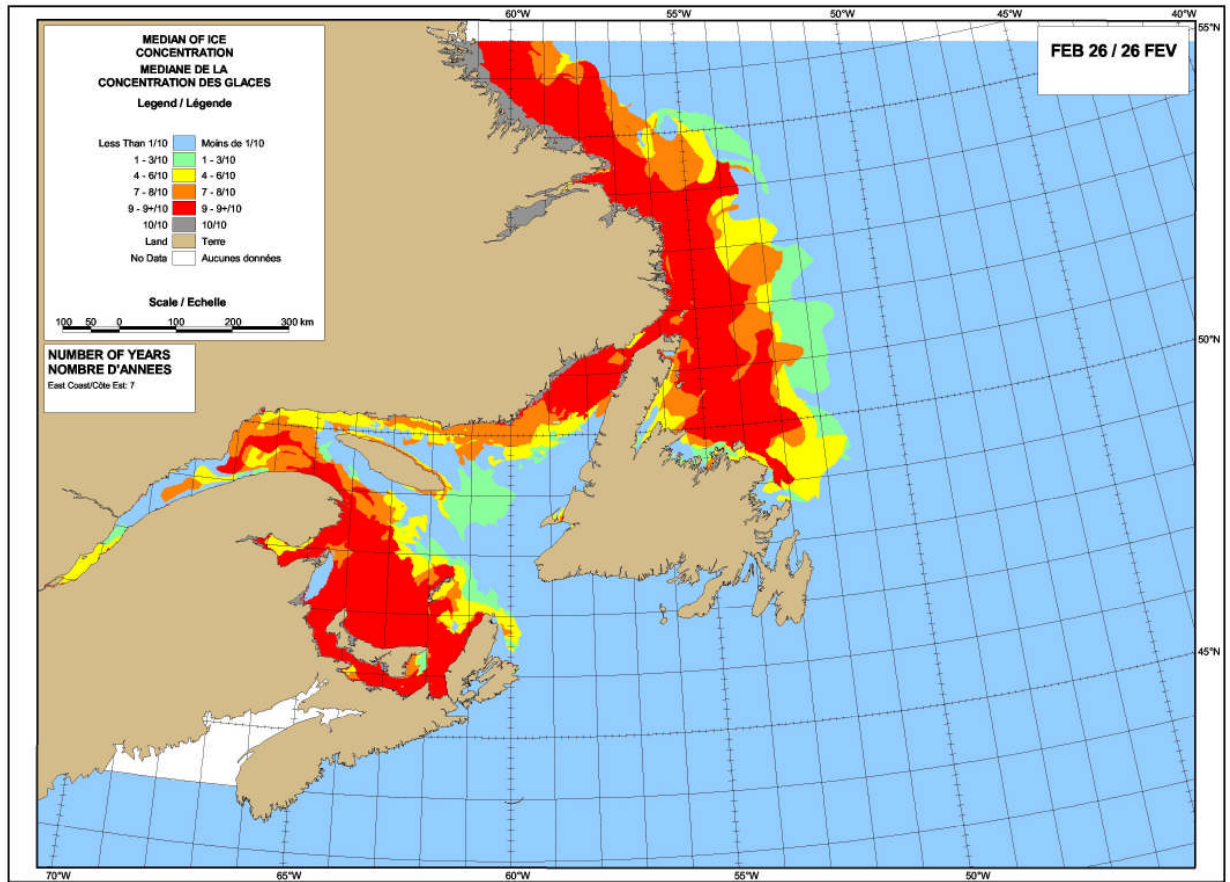
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 Statistiques basées sur les années: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.

Figure 4: Expected ice conditions on 1 January 2012



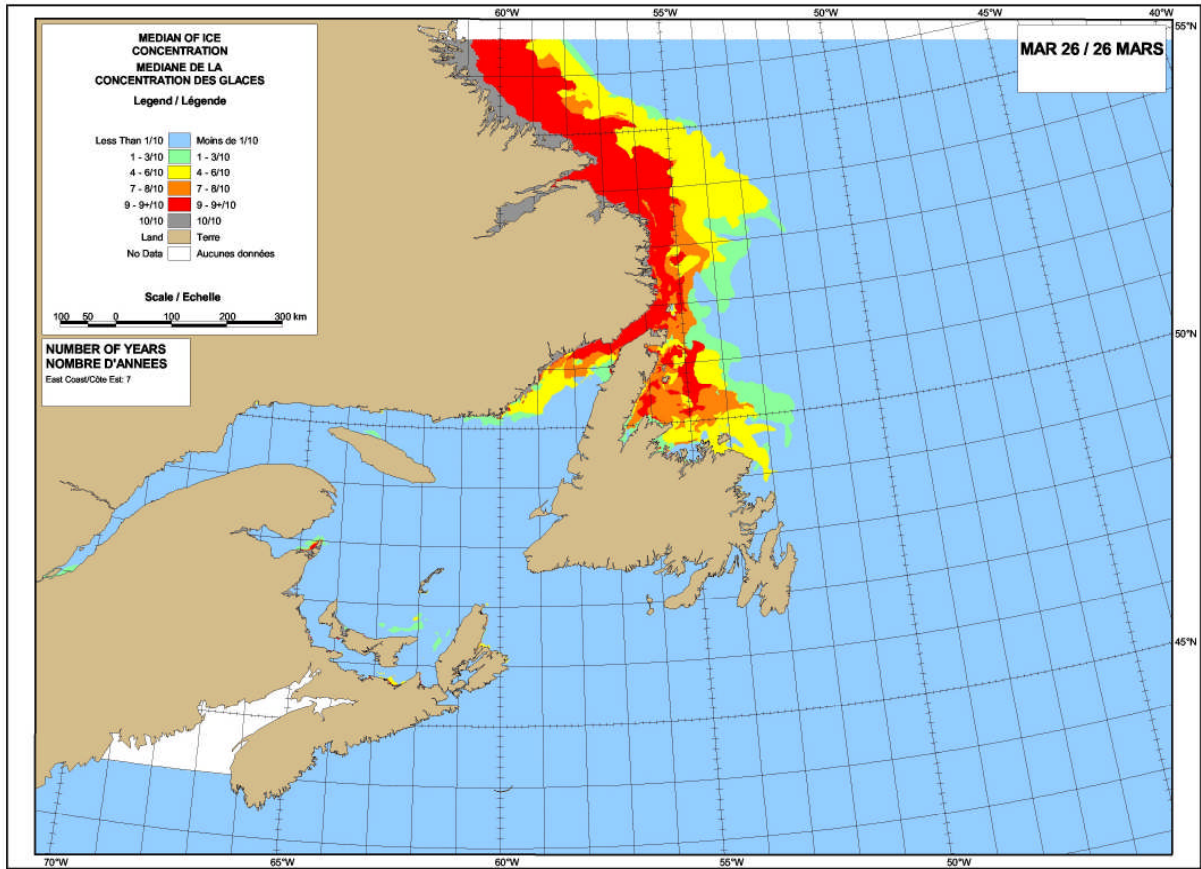
Statistics based upon the years: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.
 Statistiques basées sur les années: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.

Figure 5: Expected ice conditions on 29 January 2012



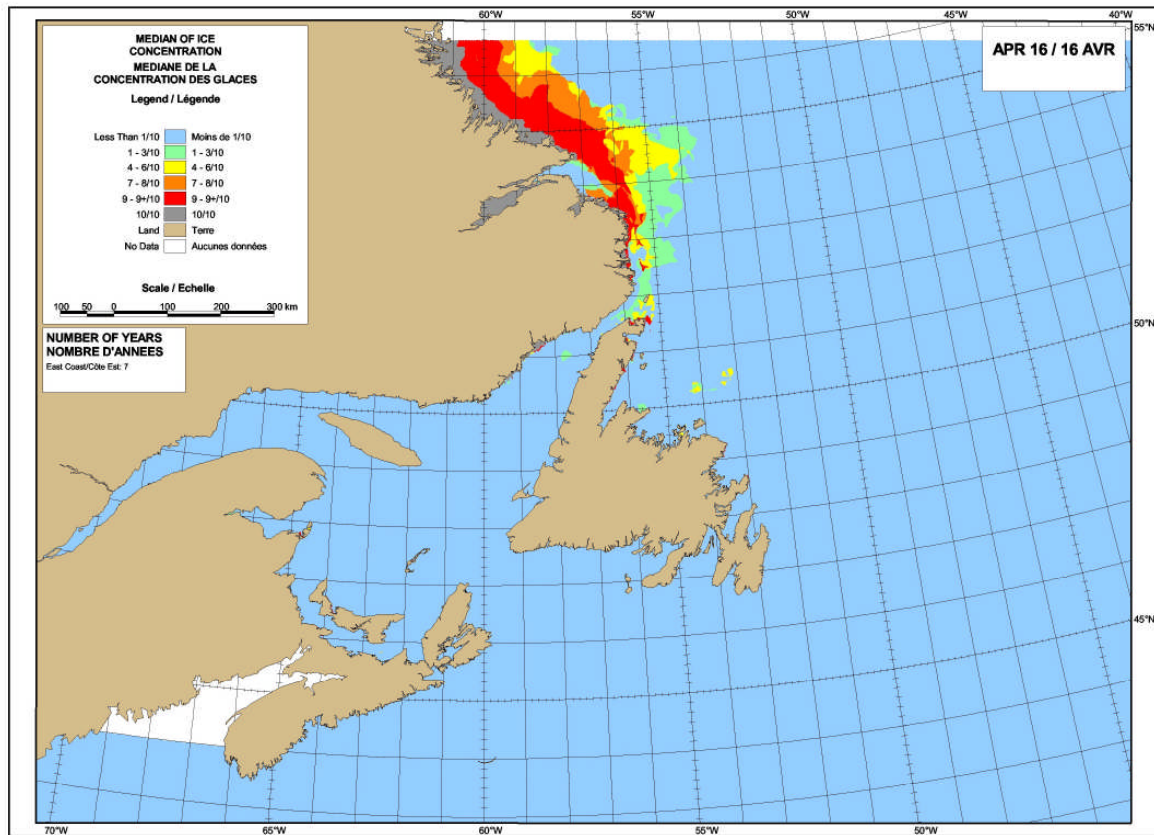
Statistics based upon the years: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.
 Statistiques basées sur les années: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.

Figure 6: Expected ice conditions on 26 February 2012



Statistics based upon the years: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.
 Statistiques basées sur les années: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.

Figure 7: Expected ice conditions on 26 March 2012



Statistics based upon the years: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.
 Statistiques basées sur les années: 1997/98, 1999/00, 2000/01, 2005/06, 2006/07, 2009/10, 2010/11.

Figure 8: Expected ice conditions on 16 April 2012

Gulf of St-Lawrence

The water temperature in the Gulf of St. Lawrence was above normal at the end of November (Figure 3) and the air temperature is forecast to be above normal for the month of December.

New ice will start developing within the St. Lawrence River in the vicinity of l'Île d'Orléans in the third week of December and will slowly spread eastward in the estuary. At that time, new ice will also develop in the western end of Chaleur Bay and in other shallow bays along the New Brunswick and Prince Edward Island coasts as well as along the Quebec north shore east of Havre-Saint Pierre.

By the end of 2011, new and grey ice will cover most of the St. Lawrence River west of the Saguenay River and new ice will be present downstream near the south shore to Matane and near the north shore to Baie-Comeau. At that time, some consolidated grey-white ice will be present along the shores in Miramichi Bay and from Miscou to Caraquet. The western end of Chaleur Bay and the rest of its south shore, the rest of Miramichi Bay and other shallow bays along the New-Brunswick coast, in Northumberland Strait and along the north shore of Prince Edward Island will be covered with new and grey ice. Also near the end of the year, some new ice will appear near Îles de la Madeleine and in the shallower bays along the west coast of Newfoundland, north of Bay of Islands.

The forecast for the rest of the winter in the Gulf of St. Lawrence is for above normal temperatures. 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 season will be below normal.

Ice development is expected to be more than one week late compared to normal in the Gulf in the first half of January.

In mid-January, new and grey ice will cover the estuary west of Pointe-des-Monts and some new and grey ice will also round the Gaspé Peninsula and reach Gaspé. Some new ice will develop along Anticosti Island. At that time, some mobile grey-white ice will be found in Chaleur Bay, in Miramichi Bay and in the shallow bays along the New Brunswick and Prince Edward Island coasts. New and grey ice with some grey-white ice will cover Northumberland Strait west of Pictou Island and will extend 10 to 15 nautical miles off the New Brunswick coast. Also by mid-January, new ice will extend up to 10 nautical miles east of Îles de la Madeleine. A narrow band of new and grey ice will be present along most of the Quebec north shore from about Havre-Saint-Pierre and eastward with some consolidated grey-white ice in shallower bays. Some new and grey ice with some

grey-white ice will be present near Sept-Îles. Shallower bays along the west coast of Newfoundland, north of Bay of Islands, will consolidate with grey ice.

After mid-January, grey-white ice will develop along the Gaspé Peninsula and new and grey ice will extend to 30 nautical miles southeast of Gaspé. Consolidated grey-white ice will be present in the western end of Chaleur Bay and from Miscou to Caraquet and will cover most of Miramichi Bay, as well as the shallower bays of the New-Brunswick, Prince Edward Island and Îles de la Madeleine coasts. Around that time, a narrow band of new and grey ice will develop north of Prince Edward Island and some new and grey ice will form in St. Georges Bay, Nova Scotia, and westward towards Northumberland Strait. Mobile grey-white ice with some first-year ice will appear in the eastern portion of the strait south of Prince Edward Island. Also after mid-month, consolidated grey-white ice will become more extensive along the Quebec north shore and the ice near Sept-Îles will consolidate. The band of ice from Havre-Saint-Pierre and eastward will extend to 10 to 25 nautical miles offshore. Consolidated grey and grey-white ice will appear near Corner Brook and Stephenville.

At the end of January, grey-white with some first-year ice will be found along portions of the southern shore of the estuary. At that time, fast ice near Sept-Îles, in the western end of Chaleur Bay, from Caraquet to Miscou, in Miramichi Bay and other shallower areas of the coasts of New Brunswick, Prince Edward Island, Îles-de-la-Madeleine and west coast of Newfoundland, including near Corner Brook and Stephenville, will thicken to the first-year ice stage. Also near the end of January, a 10 to 20 nautical mile wide band of mostly new and grey ice will be present from Sept-Îles to Havre-Saint-Pierre. East of Havre-Saint-Pierre, new and grey ice will extend to 20 to 30 nautical miles off the coast and some grey-white ice will be found in the pack ice in the Northeast Arm. The pack ice will reach the west coast of Newfoundland from Pointe Riche and northward.

Grey and grey-white ice will drift into Gaspé Passage in the first week of February and will extend to 60 to 80 nautical miles off the coast of New Brunswick. At that time, grey and grey-white ice will reach the west coast of Cape Breton Island. More first-year ice will be found in Northumberland Strait and some first-year ice will move into St. Georges Bay, Nova Scotia. First-year will be present in the Northeast Arm. Also in the first week of February, some new and grey ice will develop in the shallower areas of Bay of Islands and new and grey ice will be present northeast of Cape St. George, Newfoundland. At that time, some new and grey ice will start forming along the coast of Cape Breton Island, from west of Scatarie Island to Cape North.

After mid-February, ice will extend rapidly eastward in the Gulf and the pack ice will reach Îles de la Madeleine. First-year ice will prevail along the west coast of Prince Edward Island, in Northumberland Strait south of the island and along the west coast of Cape Breton Island. At that time, some grey-white and first-year ice

will round Cape North. Consolidated first-year ice will be found in the shallower areas of Bay of Islands.

Signs of break-up will appear in the estuary and in the Gulf of St. Lawrence in late February or early March. Break-up will occur faster than usual. Forecast ice conditions for the end of the month of March and the second week of April are shown in Figure 7 and Figure 8 respectively.

East Newfoundland Waters

Water temperatures at the end of November were above normal, except near normal along most of the Labrador coast (Figure 3). For December, the air temperature is forecast to be near normal along the southern Labrador coast and normal to above normal east of Newfoundland.

Ice will continue to develop in Lake Melville and grey and grey-white ice will cover most of the lake near mid-December. New and grey ice will continue to be present along the Labrador coast from around Cartwright and northward.

At the end of the year, new and grey ice will be present along the Labrador coast northwest of Belle-Isle and will extent 10 to 20 nautical miles off the southern coast of Labrador. Shallower areas along the coast of Labrador will be consolidated with grey-white ice. At that time, Lake Melville will be covered with grey-white with some first-year ice; consolidated grey-white and first-year ice will be found in the shallower areas around the lake. Some new and grey ice will form near St. Anthony. Also at the end of 2011, new ice will develop in the shallower areas of Notre Dame Bay.

Consolidated grey and grey-white ice will develop south of Fogo Island by mid-January; at that time, new ice will be present near Botwood. Also by mid-month, grey ice will extend 40 nautical miles off the Labrador coast and will reach the Northern Peninsula. At that time, Lake Melville will be consolidated with grey-white and first-year ice. Consolidated first-year ice will be found from Cartwright and northward along the Labrador coast.

After mid-month, consolidated first-year ice will prevail in the shallower areas of the south coast of Labrador and the Strait of Belle-Isle will become covered with new and grey ice. The southern portion of Bay of Exploits will be covered with grey-white ice. Some new and grey ice will be found elsewhere in the shallower areas along the shore from Notre Dame Bay and northward.

Near the end of January, grey and grey-white ice will reach the Grey Islands, east of the Northern Peninsula, and grey-white ice will be present in the Strait of Belle Isle; mostly in its southern half. At that time, the southern portion of Bay of Exploits will become consolidated with first-year and grey-white ice. Also near the end of January, some first-year ice will be found in the pack ice off the south coast of Labrador. First-year ice will prevail in the pack ice north of Groswater Bay.

In the first week of February, the pack ice edge will reach the Baie Verte Peninsula and grey and grey-white ice with some first-year ice will extend to 80 nautical miles east of the Northern Peninsula and up to 100 nautical miles east of the south coast of Labrador. At that time, first-year ice will prevail in the southern

portion of the Strait of Belle Isle. Also in the first week of February, some new ice will form in the shallower areas of Bonavista Bay.

In the second week of the February, patches of new ice with some grey and grey-white ice will be found along the shores in Notre Dame Bay. Some grey and grey-white ice will reach Cape Freels. From that point on, bouts of north-easterly winds may bring ice into Notre Dame Bay. The pack ice edge will extend to about 130 nautical miles east of the southern coast of Labrador and about 130 nautical miles east of the Northern Peninsula.

Consolidated first-year ice in the southern portion of Bay of Exploits and south of Fogo Island will thicken to the first-year ice stage after mid-February. At that time, some grey and grey-white ice will reach northern Bonavista Bay and consolidated grey-white ice will be present in the shallower coastal areas of northern Bonavista Bay.

The main pack ice will reach Fogo Island and Cape Bonavista near the end of February. Patches of grey-white with some first-year ice will be present in Notre Dame Bay. At that time, first-year ice will prevail in the pack ice off the north-east coast. Bouts of north-easterly winds could bring ice into Bonavista and Notre Dame Bays.

A trace of old ice will be present in the pack ice off the southern coast of Labrador from early March until ice melt. Little southward progress will be made by the pack ice edge in the first two weeks of March. Ice intrusions in Bonavista and Notre Dame Bay will remain possible. As well strong onshore flow could occasionally produce strong ice pressure along the northeast coast of Newfoundland. Break up along the southern Labrador coast and in the Newfoundland waters should proceed at a faster than normal pace. Forecast ice conditions for the end of March and mid-April are shown in Figure 7 and Figure 8 respectively.

Appendix

Appendix A - Stages of Development of Lake Ice and Egg Code

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

<http://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=D5F7EA14-1&offset=1&toc=show>

or on the National Ice Center web site:

http://www.natice.noaa.gov/products/egg_code.html

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 could be found at the link below:

<http://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=D5F7EA14-1&offset=2&toc=show>

Appendix D - Ice Services for Canadian East Coast Waters

In Canada, ice services are provided to shipping and fishing operators by a co-operative effort of Environment Canada and the Department of Fisheries and Oceans. Department of Fisheries and Oceans, through the Canadian Coast Guard, provides icebreaker services and operates a seasonal Ice Operations Office in Quebec City and Halifax. Canadian Ice Service of the Meteorological Service of Canada (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 Forecast (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 forecast briefly describes general ice conditions within each marine forecast area.
2. East Newfoundland Waters Ice Forecast (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 forecast briefly describes general ice conditions within each marine forecast area.
3. Iceberg Bulletin (FICN10): a description of the general distribution of icebergs in Newfoundland waters and along the Labrador Coast.

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

Daily ice 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:

Weather.Info.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.