

**Seasonal Outlook
Great Lakes
Winter 2013-2014**



Issued by the North American Ice Service

4 December 2013

Lake Superior

Winter temperature and ice forecasts.

Average air temperatures will be near normal during the winter. Below normal ice coverage is expected.

Thunder Bay.

Outlook for December... At the end of the month, a narrow band of open drift to close pack new and thin lake ice along the shores. Very close pack new and thin lake ice west of Pie Island.

Outlook for January...In the second week, close to very close pack thin and medium lake ice. At the end of January, consolidated medium lake ice except for a small area of mobile ice northeast of Pie Island.

Outlook for February...Consolidated ice will become thick lake ice in the first week.

Nipigon and Black Bays.

Outlook for December... In the second week, the northern portion of Black Bay will consolidate with thin lake ice. Close to very close pack new and thin lake ice will cover the western third of Nipigon Bay. Around mid-month, most of Black Bay will be consolidated with thin lake ice. Nipigon Bay will be covered with new and thin lake ice and the north-western portion of the bay will be consolidated. In the last week, fast ice will thicken to medium lake ice in both bays.

Outlook for January...by mid-month, consolidated with thick lake ice.

Outlook for February...Consolidated with thick lake ice.

From Grand Marais Minnesota to the entrance to Nipigon Bay.

Outlook for December...Open water.

Outlook for January...After mid-month strips and patches of new lake ice with some medium lake ice.

Outlook for February...After mid-month, becoming open drift to close pack medium with some thick lake ice north of Isle Royale. Otherwise, very open to open drift thin and medium lake ice within 15 nautical miles of the shore.

From Grand Marais to Duluth.

Outlook for December...Open water.

Outlook for January...Generally open water. Very close pack thin with some medium lake ice within 15 nautical miles of Duluth in the last week.

Outlook for February...Occasionally open drift to close pack new and thin lake ice. Close pack medium with some thick lake ice within 20 nautical miles of Duluth.

Southern Lake Superior west of Keweenaw Peninsula.

Outlook for December...Chequamegon Bay will be consolidated with thin lake ice in the last week. A narrow band of new and thin lake ice will develop near the shore from near Chequamegon Bay and westward near the end of the month.

Outlook for January...Fast ice in Chequamegon Bay will thicken to medium lake ice in the first week. In the second week, narrow band of new and thin lake ice from the Keweenaw Peninsula to Duluth. Some medium lake ice near the Apostle Islands. In the last week, new and thin lake ice with some medium lake ice up to 15 nautical miles

offshore from the Keweenaw Peninsula to Duluth and consolidated medium lake ice around the Apostle Islands.

Outlook for February...Fast ice around the Apostle Islands and in Chequamegon Bay becoming thick lake ice in the first week. After mid-month, the ice will extend up to 30 nautical miles offshore. Some thick lake ice near the shores.

Southern Lake Superior east of the Keweenaw Peninsula.

Outlook for December...Ice free to open water.

Outlook for January... Narrow band of new and thin lake ice along the shore in the last week.

Outlook for February... Narrow band of new and thin with some medium lake ice along the shore. Strips and patches of thin and medium lake ice up to about 30 nautical miles eastward of the Keweenaw Peninsula. After mid-month, open drift to close pack thin and medium lake ice will extend 20 to 30 miles offshore. Consolidated thick lake ice along portions of the shore.

Whitefish Bay.

Outlook for December...Patches of new and thin lake ice along the shore after mid-month.

Outlook for January...Consolidated medium lake in shallower coastal areas in the second week. After mid-month, strips and patches of new and thin lake ice in most of the bay.

Outlook for February...In the first week, very close pack medium lake ice except for consolidated thick lake ice in shallower coastal waters. In the third week, consolidated thick lake ice will cover the eastern and southern portions of the bay. Very close pack medium and thick lake ice elsewhere.

From Whitefish Bay northwards to Michipicoten Bay.

Outlook for December...Open water.

Outlook for January... Mostly open water.

Outlook for February...Near mid-month, thin with some medium lake ice up to 15 nautical miles offshore. At the end of the month, ice up to 30 nautical miles offshore.

From Michipicoten Bay to the entrance to Nipigon Bay.

Outlook for December...Ice free to open water.

Outlook for January...Ice free to open water.

Outlook for February...Open water.

Elsewhere in Lake Superior.

Outlook for December...Ice free to open water.

Outlook for January...Ice free to open water.

Outlook for February...Open water. After mid-month, some medium lake ice will occasionally drift into the middle portion of the lake west of the Keweenaw Peninsula.

Lake Michigan.

Winter temperature and ice forecasts.

Near normal temperatures are expected from December to February. Near normal ice conditions are forecast.

Green Bay.

Outlook for December...In the second week, close pack new and thin lake ice in the southern third of the bay. Consolidated thin lake ice in the Bays de Noc. In the last week, consolidated thin lake ice along the shore in the southern third of Green Bay.

Outlook for January...By the end of the first week, consolidated medium lake ice in the Bays de Noc and some medium lake ice in the southern third of Green Bay. The rest of Green Bay will be covered with thin lake ice except for a large area of open water in the northern portion of the bay. By mid-month, most of Green Bay will be covered with thin and medium lake ice. Near the end of the month, two thirds of Green Bay will become consolidated with medium lake ice, with very close pack medium lake ice in the rest of the bay.

Outlook for February...In the first week, fast ice in Green Bay and the Bays de Noc becoming thick lake ice. Close pack medium and thick lake ice will be present in upper third of Green Bay.

Northeastern Lake Michigan.

Outlook for December...After mid-month, narrow band of new and thin lake ice along portions of the northern shore.

Outlook for January...In the first week, very close pack thin lake ice to up to 20 nautical miles off the north shore of the lake north of Beaver Island, and strips and patches of new and thin lake ice will spread from the north shore of the lake to Beaver Island and into the Straits of Mackinac. By mid-month, a 20 nautical miles wide band of close to very close pack thin with some medium lake ice will be present along the northeast shore of the lake and into the Straits of Mackinac. At the end of the month very close pack thin and medium lake ice from the northeast shore to Beaver Island and a narrow band of new and thin lake ice will spread westward to the entrance to Green Bay. At that time, consolidated medium lake ice will form within 15 nautical miles of the northeast shore and into the Straits of Mackinac. Thin and medium lake ice will drift into Little Traverse Bay.

Outlook for February...In the first week of the month the fast ice will thicken to the thick lake ice stage. A portion of Little Traverse Bay will consolidate with medium lake ice. By mid-month consolidated thick lake ice will extend to Beaver Island. After mid-month, some medium and thick lake ice in Grand Traverse Bay.

Elsewhere in Lake Michigan.

Outlook for December...Ice free to open water.

Outlook for January...From about mid-month and onward, a 5 to 15 nautical miles wide band of new and thin lake ice along the western, southern and southeastern shores of the lake.

Outlook for February...Some of the ice along the southern and southeastern shore of the lake will thicken to the medium lake ice stage in the first half of the month. Ice destruction will occur in the second half of February. Only a few isolated patches of ice

are expected to be present along the southern and southeastern shores at the end of the month.

Lake Huron and Georgian Bay.

Winter temperature and ice forecasts.

Near to above normal temperatures are expected over Lake Huron from December to February. Near to below normal ice conditions are forecast.

North Channel.

Outlook for December... After mid-month, very close pack new and thin lake ice in the shallower coastal areas.

Outlook for January...In the first week, very close pack new and thin with some medium lake ice in a narrow band along the north shore and in the eastern end of the channel. Consolidated medium lake ice in shallower coastal areas. The channel will be completely ice covered at the end of the third week. At that time, the eastern and western ends of the channel will be consolidated with medium lake ice.

Outlook for February...Becoming completely consolidated with thick lake ice at the end of the first week.

St Mary's River.

Outlook for December...New and thin lake ice in the shallower portions of the river. Around mid-month, consolidated thin lake ice in the shallower portions and close pack thin lake ice will cover the greater part of the rest of the river.

Outlook for January...Most of the river consolidated with medium lake ice at the end of the first week. It will become completely consolidated with medium lake ice in the third week.

Outlook for February...Consolidated thick lake ice.

South of Manitoulin Island westward to North-western Lake Huron.

Outlook for December...Open water.

Outlook for January...A narrow band of new and thin lake ice along the shore in the third week.

Outlook for February...A narrow band of new and thin lake ice at times along the shore.

North-western Lake Huron near the Straits of Mackinac.

Outlook for December...At mid-month, new and thin lake ice in the shallower areas of the north shore.

Outlook for January...By the end of the first week consolidated thin lake ice along the north shore. Strips and patches of new and thin lake ice will drift into the Straits of Mackinac. By mid-month, very close pack thin with some medium lake ice from Bois Blanc Island westward into the Straits of Mackinac. In the last week, consolidated medium lake ice along the north shore and south and west of Bois Blanc Island into the Straits of Mackinac.

Outlook for February...Consolidated thick lake ice along the north shore and south and west of Bois Blanc Island into the Straits of Mackinac. Strips and patches of thin with some medium lake ice to the north and to the east of Bois Blanc Island.

From north-western Lake Huron to Saginaw Bay.

Outlook for December...Isolated patches of new lake ice along the shore after mid-month.

Outlook for January...After mid-January a 10 to 15 nautical miles wide area of new and thin lake ice along the shore.

Outlook for February...An area of new and thin with some medium lake ice within 10 to 20 nautical miles of the shore.

Saginaw Bay.

Outlook for December...Close pack new and thin lake ice in the second week. Narrow areas of consolidated medium lake ice along the shore at the end of the month. At that time, the rest of the bay will be covered with thin lake ice.

Outlook for January...Ice will thicken to the thin and medium lake ice stage by mid-January. The bay will be consolidated with medium lake ice at the end of the month.

Outlook for February...Consolidated with thick lake ice.

The southern and eastern shore of Lake Huron.

Outlook for December...Open water.

Outlook for January...Narrow areas of new and thin lake ice along the shore. At the end of the month a 10 to 20 nautical mile wide area of thin with some medium lake ice along the eastern and southern shores. Consolidated medium lake ice along the Bruce Peninsula.

Outlook for February...In the second week the southern end of the lake will be covered with thin and medium lake ice. Thick lake ice mostly in narrow bands along portions of the shore from about mid-February onward.

Georgian Bay.

Outlook for December...Narrow areas of new and thin lake ice along portions of the shore in the second week. Shallower coastal areas of the eastern shore will become consolidated with thin lake ice in the last week.

Outlook for January...Consolidated medium lake ice along the northeast shore in the first week. In the third week, a 15 nautical mile wide band of new and thin lake ice along the northern and eastern shores.

Outlook for February...The fast ice will thicken to the thick lake ice stage in the first week. Also in the first week, thin and medium lake ice will extend up to 30 nautical miles from the north shore. From about mid-February onward, thin and medium lake ice will cover the northern portion of the bay including the entrance. Otherwise, thin and medium lake ice will extend up to 20 nautical miles from the eastern shore. An area of open water will generally be present in south-western portion of Georgian Bay.

Elsewhere in Lake Huron.

Outlook for December...Ice free.

Outlook for January...Ice free to open water.

Outlook for February...A few transient patches of thin and medium lake ice mostly in the southern half of the lake.

Lake Erie and Lake St. Clair

Winter temperature and ice forecasts.

Near to above normal temperatures are expected from December to February. Near normal ice conditions are forecast.

Lake St Clair and the Western Basin.

Outlook for December...New and thin lake ice in the eastern portion of Lake St. Clair and near the shores of the Western Basin in the second week. New and thin lake ice will cover the northern and eastern portions of Lake St Clair and most of the Western Basin at the end of the month.

Outlook for January...In the second week, consolidated thin lake ice in Sandusky Bay. In the third week, close to very close pack thin and medium lake ice in Lake St Clair and the Western Basin. At the end of the month, the northern and eastern portions of Lake St. Clair consolidated with thin lake ice.

Outlook for February...Very close pack medium lake ice in the Western Basin with some thick lake ice forming after mid-month. From mid-February onward most of Lake St. Clair consolidated with thick lake ice and consolidated medium to thick lake ice in a narrow band along the western and southern shores of the Western Basin.

The rest of Lake Erie.

Outlook for December...New and thin lake ice in Long Point Bay.

Outlook for January...Around mid-month, 10 nautical miles wide bands of new and thin lake ice along portions of the shore and consolidated medium lake ice in Long Point Bay. At the end of the month, very close pack new and thin with some medium lake ice the western portion. 10 to 20 nautical miles wide bands of new and thin lake ice elsewhere along the shores except very close pack medium lake ice near Buffalo.

Outlook for February...Close to very close pack thin and medium lake ice in the first week. In the third week, consolidated thick lake ice near Buffalo.

Lake Ontario.

Winter temperature and ice forecasts.

Near to above normal temperatures are expected from December to February. Near to below normal ice conditions are forecast.

Northeastern Lake Ontario.

Outlook for December...Isolated areas of new and thin lake ice in shallow coastal waters in the last week.

Outlook for January...Near the end of the first week, very open drift new lake ice in the river from near Kingston and eastward. In the third week, new and thin lake ice along the lake shore from southwest of Trenton to Stoney Point. At the end of the month, consolidated medium lake ice in shallower waters in the river and along the north-eastern shores of the lake. Very close pack medium lake ice elsewhere in the river. Very close pack medium lake ice in a narrow band along the shore from Stoney Point to Prince Edward Point with strips or patches of new and thin lake ice within 20 nautical miles of the shore.

Outlook for February...In the first week, consolidated medium lake ice in the river and close to very close pack thin and medium lake ice within 20 nautical miles of the shore

Seasonal Outlook – Great Lakes – Winter 2012-2013

from Stoney points to Prince Edward Point. New and thin lake ice in a narrow band along the shore from Prince Edward Point to southwest of Trenton. Consolidated ice thickening to the thick lake ice stage near mid-month. Ice destruction will start occurring after mid-February and pieces of broken fast ice will be found in the pack.

Bay of Quinte.

Outlook for December...Consolidated thin lake ice in the last week.

Outlook for January...Fast ice thickening to medium lake ice in the third week.

Outlook for February...Consolidated ice becoming thick lake ice around mid-month.

Elsewhere in Lake Ontario.

Outlook for December...Ice free to open water.

Outlook for January... Ice free to open water.

Outlook for February... Isolated areas of new lake ice along the shores.

North American Ice Service

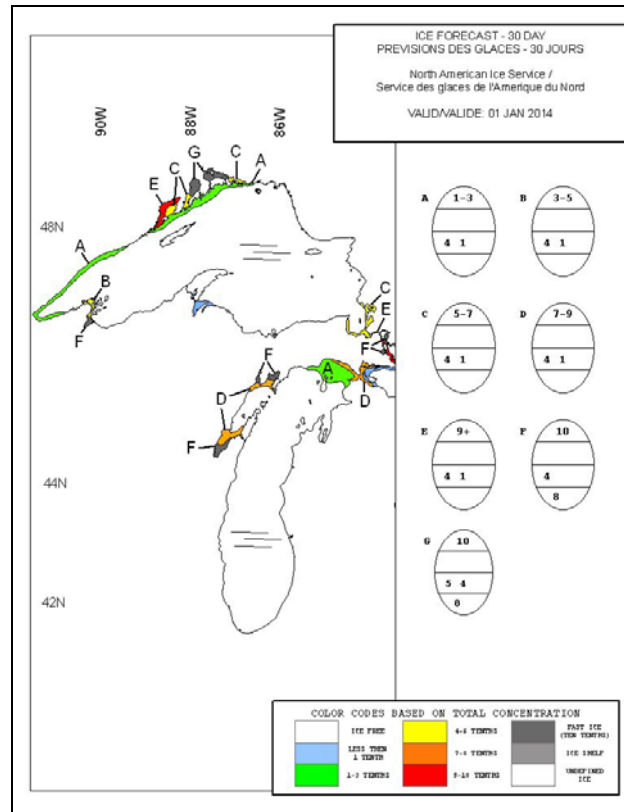


Figure 1: Expected ice conditions - western Great Lakes - 1 January 2014

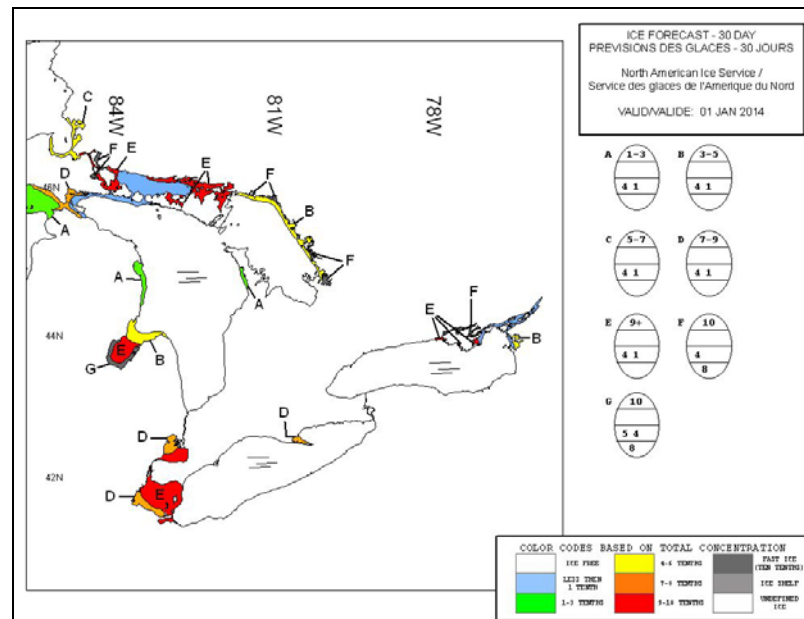


Figure 2: Expected ice conditions - eastern Great Lakes - 1 January 2014

North American Ice Service

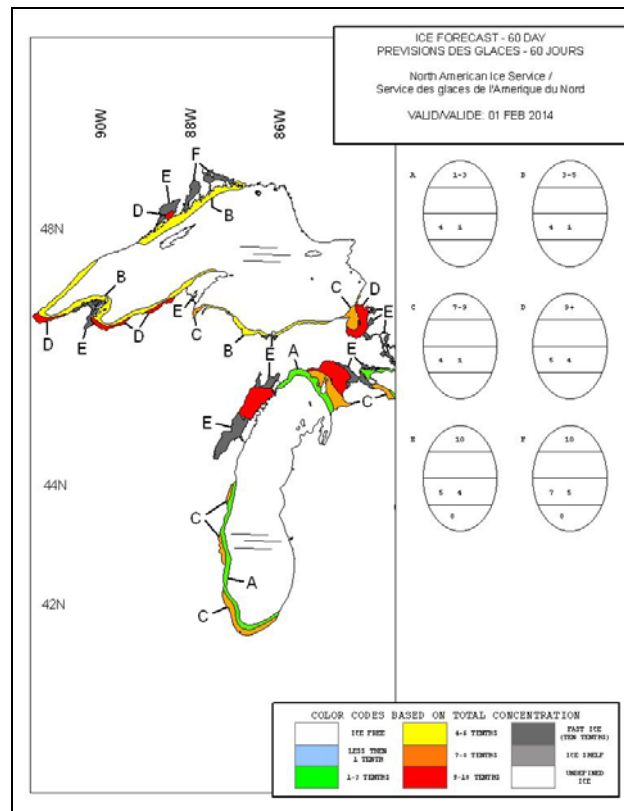


Figure 3: Expected ice conditions - western Great Lakes - 1 February 2014

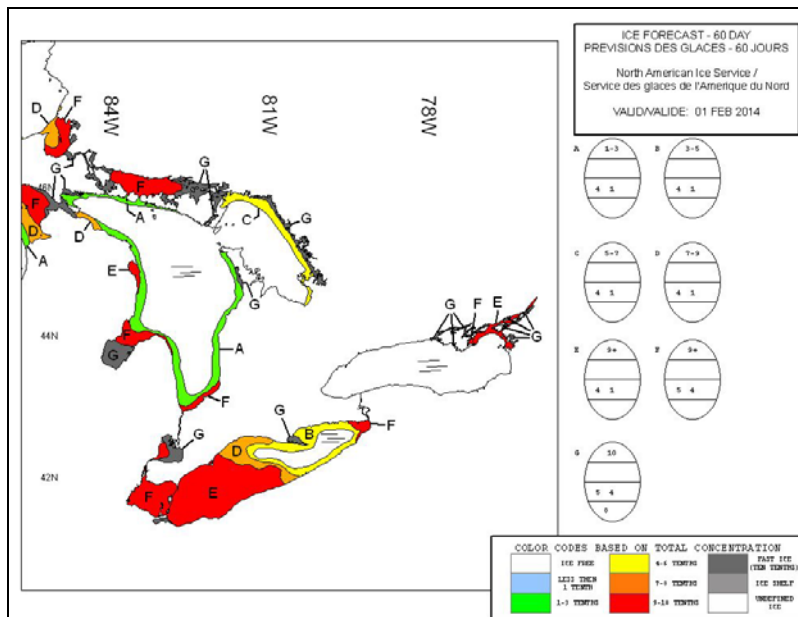


Figure 4: Expected ice conditions - eastern Great Lakes - 1 February 2014

North American Ice Service

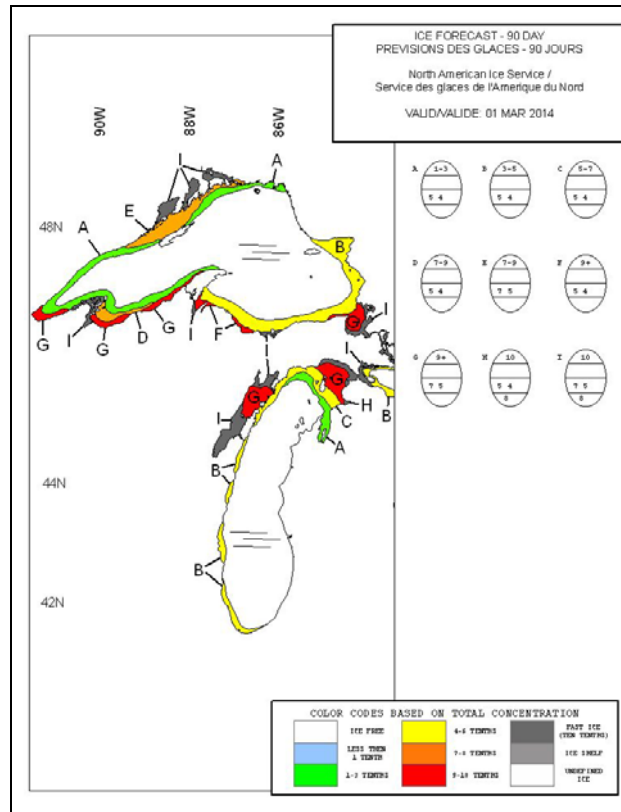


Figure 5: Expected ice conditions - western Great Lakes - 1 March 2014

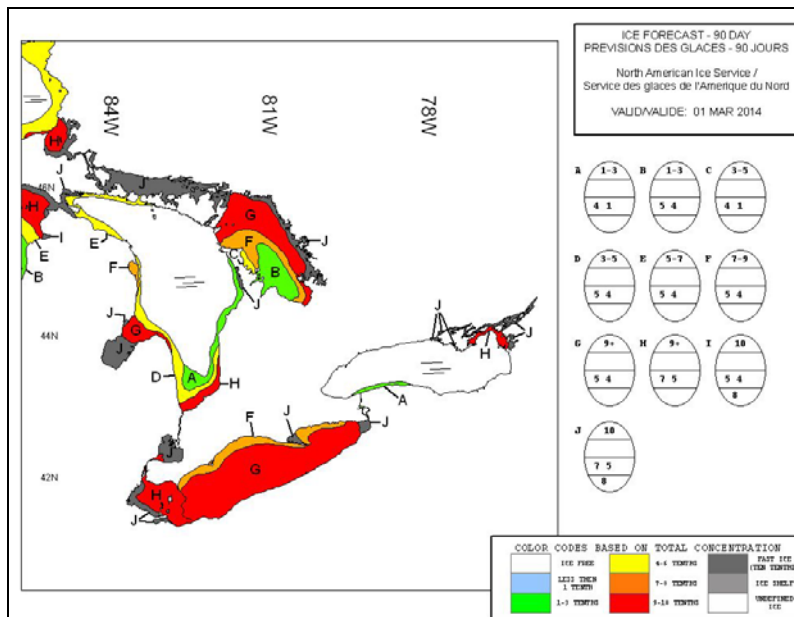


Figure 6: Expected ice conditions - eastern Great Lakes - 1 March 2014

Seasonal Outlook - Great Lakes - Winter 2012-2013