



OUTLOOK FOR BREAK-UP OF ICE ON THE ST. LAWRENCE SEAWAY & LAKE ERIE

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Prepared for:

The Saint-Lawrence Seaway Management Corporation



CURRENT CONDITIONS

Average temperatures over Lake Erie, Lake Ontario, and the Seaway have been well above normal values consistently since December. There have been no time periods with significantly below normal temperatures.

Temperatures have been especially higher than normal in December and January. The table below indicates the departure from normal temperatures at specific locations, on a bi-weekly basis, for the period from mid-November to the end of January:

Departure from normal temperatures

	November	December		January		16 Nov – 31 Jan
	16-30	01-15	16-31	01-15	16-31	
Montreal	+0.3 °C	+3.6°C	+5.7°C	+6.5°C	+5.9°C	+4.4°C
Kingston	0.0°C	+2.5°C	+4.3°C	+4.8°C	+5.7°C	+3.2°C
Windsor	-0.8°C	+1.6°C	+0.5°C	+5.6°C	+5.3°C	+2.6°C

Table 1: Departure from normal temperatures

The first ice seen in the southern Lakes was in the Bay of Quinte on 14th December. A few protected bays in eastern Lake Ontario saw some coastal ice form. A short cold snap saw some ice formation in Lake St. Claire and the western basin of Lake Erie on 24th December. This ice was predominately new and thin ice. The ice in the western basin thickened to a mix of thin and medium lake ice by January 1st. Warm temperatures and winds then destroyed most of the ice in the two lakes. By the time January ended the ice in the two southern lakes looked like it had when the season started with ice only in the northeast corner of Lake Ontario and mainly in the Bay of Quinte and other sheltered bays. The fast ice in the Bay of Quinte rotted and diminished after mid-January as well.

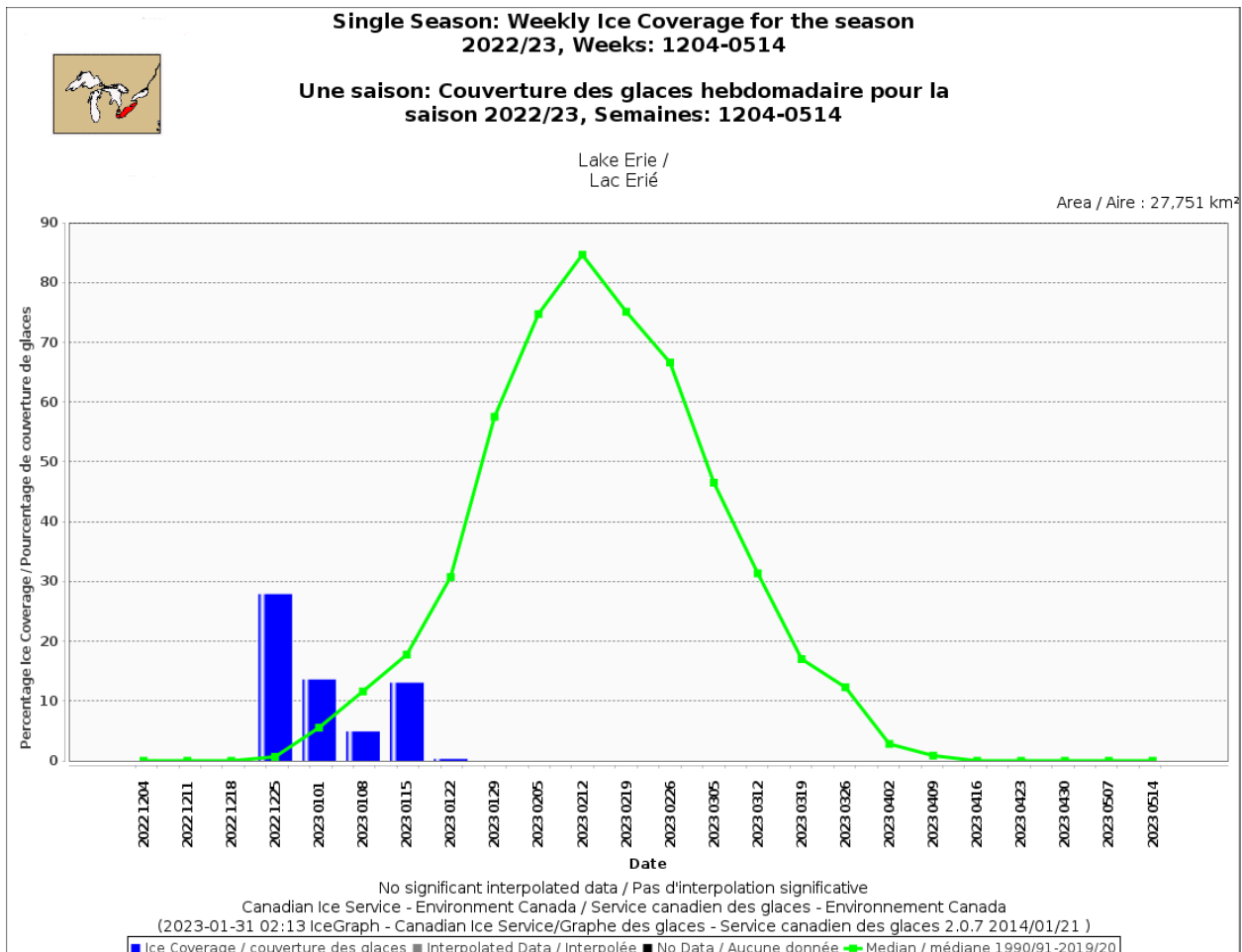


Chart 1: Season ice coverage Lake Erie

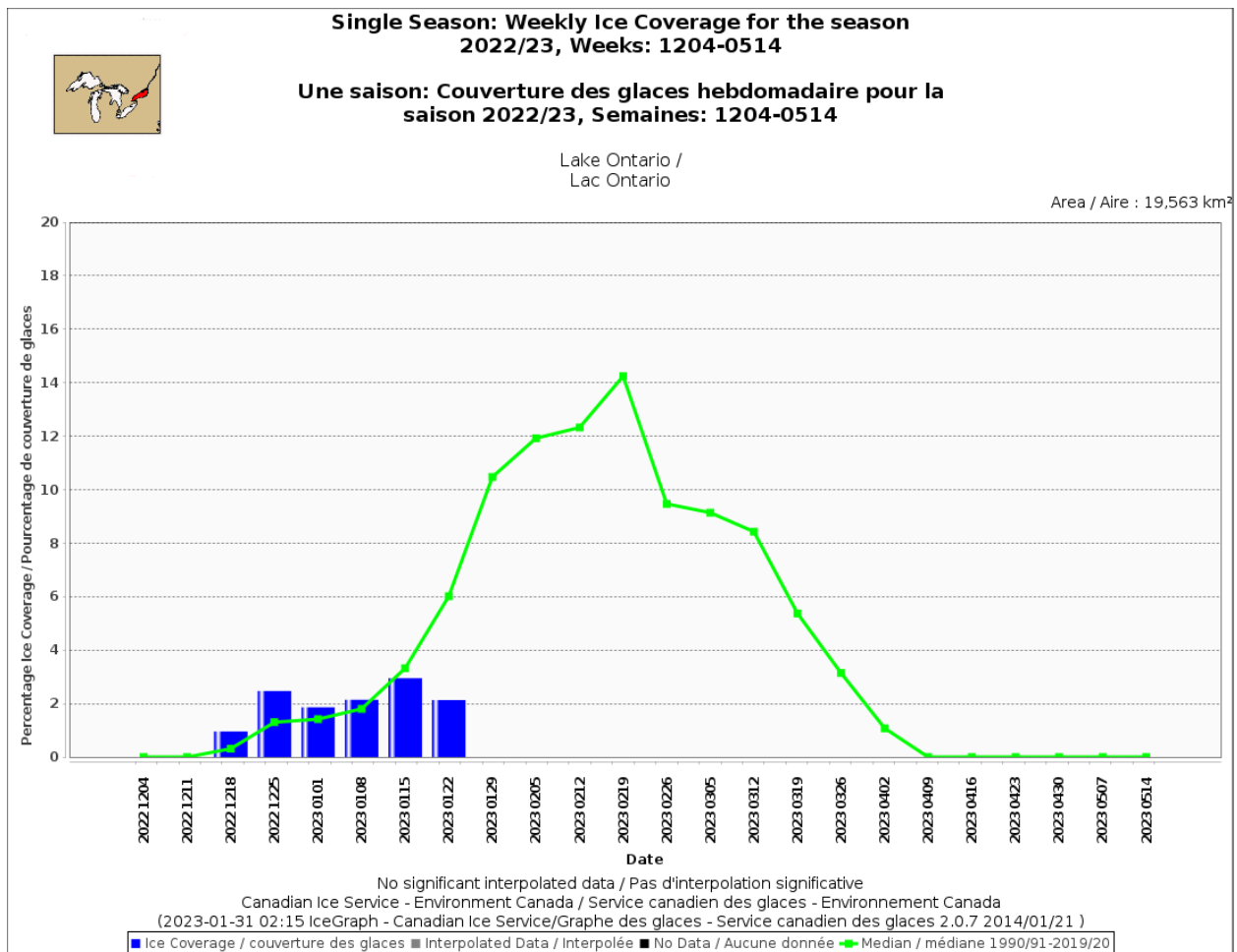


Chart 2: Season ice coverage Lake Ontario

No significant ice formed through the month of January in Lake Erie as temperatures remained above normal and a series of storms maintained strong winds across the region. The Seasonal ice coverage Chart 1 for Lake Erie shows the extent of how little ice has been present on the lake this year.

Ice in the seaway formed in early December with some new and thin ice. Much like the ice in eastern Lake Ontario ice completely melted out for the first two weeks of January before some patches of new and thin ice developed by the end of January. The second half of the month of January saw some small areas between Kingston to Montreal have slight ice formation, mainly when calm cold conditions occurred in the region.

The table below indicates the monthly average temperatures at three locations along the Seaway and in western Lake Erie. (January covers 1-30).

	Average temperatures	
	December 2022	January 2023
Montreal	-1.5°C	-3.9°C
Kingston	-0.5°C	-2.3°C
Windsor	+0.1°C	+1.1°C

The table below indicates the accumulated freezing degree days (FDD), the normal accumulated FDD and the percentage (%) of accumulated FDDs at various locations as of January 30, 2023.

	Accumulated FDDs (2022-23)	Normal accumulated FDD	% of normal accumulated FDD
Montreal	194	547	36%
Kingston	122	380	32%
Windsor	19	219	9%

Ice conditions in the St Lawrence Seaway are described based on RCM images from January 29-30, 2023. From Kingston through to Cornwall there are a few patches new ice present but conditions are mainly ice free. There are some patches of new ice with concentrations of 2 tenths as well and small areas of coastal fast ice. From Cornwall to the Beauharnois Canal, conditions continue to be mainly ice free. From the western entrance of the Beauharnois Canal east to Montreal there are patches of 4-6 tenths of thin ice.

Average surface air temperatures will be significantly below normal from the February 5th and lasting about a week to ten days. This is expected to be followed by a return to normal temperatures for the period for the remainder of February. March is expected to see a return to above normal temperatures. There is little ice present in the Seaway at forecast time. The forecast however is for significant cold temperatures for the first half of February that is expected to produce the bulk of the ice for this winter.

GENERAL OUTLOOK

Lake Ontario to Cornwall – Currently there are a few areas of fasted thin lake ice in sheltered bays in the northeast part of the lake. The Bay of Quinte is mainly fasted thin lake ice. The remainder of the lake is open water. Ice is expected to quickly form after cold air invades after February 4th with the fasted ice thickening to medium lake ice. New and thin lake ice will also form in the north east section of the lake and into the St Lawrence. However, with a return to normal temperatures for the second half of February and a forecast warm March the ice should be mainly melted by the last week in March.

Cornwall to Montreal – The current predominantly ice free conditions are expected to see new and thin ice formation with very cold temperatures in the first half of February. Medium ice will develop along the shores as well. Normal temperatures forecast in the second half of February will see slower but continued ice growth. March is expected to see a return to above normal temperatures with the ice expected to start to melt.

Lake Erie – Ice cover will likely rise abruptly the first half of February. Though not as cold as eastern Lake Ontario and northeastwards Lake Erie is very shallow and should see its ice season kick off at this time with ice coverage increasing to cover most of the lake by mid-February. With above normal temperatures forecast in March and normal temperatures for the second half of February expect ice conditions in Lake Erie to not start melting until March.

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