



2019

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

Prepared for The Saint-Lawrence Seaway Management Corporation

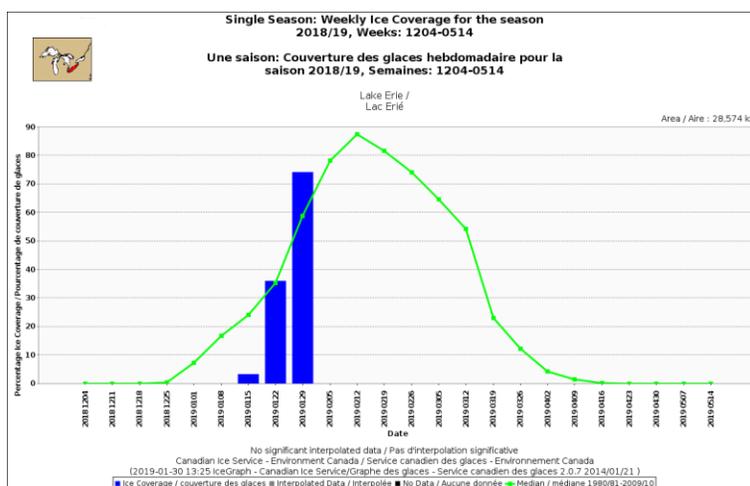
31 January 2019

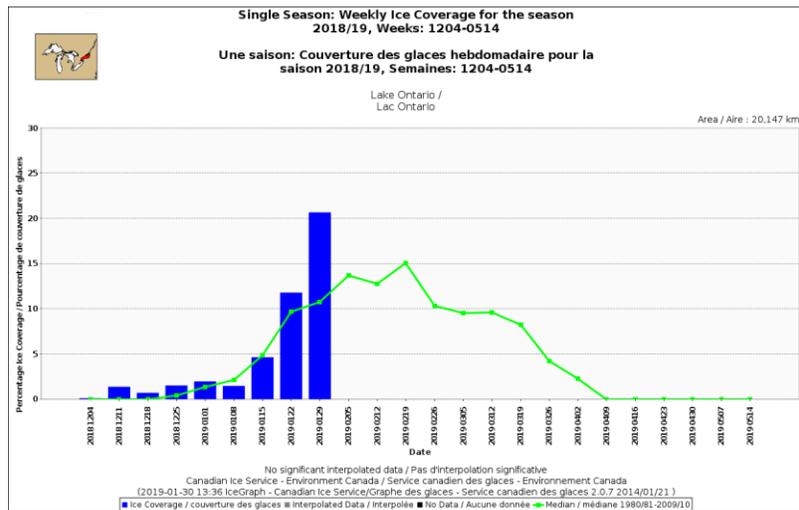
CURRENT CONDITIONS

1. Average temperatures over Lake Erie, Lake Ontario, and the Seaway have been generally near normal values. For the second year in a row, temperatures have fluctuated greatly since the mid-November period through the end of 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:

	November	December		January		16 Nov. – 29 Jan
	16-30	01-15	16-31	01-15	16-31	
Montreal	-2.6°C	-0.8°C	+2.6°C	+2.0°C	-2.0°C	-0.1°C
Kingston	-2.0°C	+0.4°C	+2.9°C	+1.6°C	-2.6°C	+0.1°C
Windsor	-2.5°C	-0.1°C	+4.4°C	+4.0°C	-2.7°C	+0.7°C

Abnormally cold temperatures in mid-November saw some ice forming in isolated bays and inlets earlier than the normal start of the “ice season” for the Great Lakes Basin (December 1). These abnormally cold temperatures fluctuated a lot and were not persistent as it was the case in 2017-2018 when there was well below normal temperatures from Mid-December through mid-January. Temperatures this year remained above normal from early December through to mid-January, promoting a much-delayed formation of ice on Lake Erie, as can be seen in the yearly ice graph below. In Lake Ontario, ice developed early however was confined to isolated bays and in the Bay of Quinte.





First ice was seen in the Bay of Quinte in early December however, the ice in the bay underwent multiple freeze/thaw cycles before becoming more established in January 2019. Near normal amounts of ice were seen in lake Ontario for December. Little ice was seen on Lake Erie through the month of December with ice forming well behind the normal expected date of ice formation.

By mid-January well below normal cold temperatures established themselves over the southern Great Lakes and southern Quebec region. There was rapid development of ice in Lakes Erie and Ontario in the last 2 weeks of January due to these cold temperatures. The Western Basin of Lake Erie saw complete ice cover form over the span of 5 days in mid-January. At the end of January, a large amount of the western half of the lake remained partially covered with new and thin lake ice. Lake Ontario saw significant coastal development of new and thin lake ice during this same timeframe.

Although the ice coverage extent is near normal by the end of the month, the overall thickness of the observed ice is below normal. The seaway itself saw similar increase in ice condition severity towards mid-late January when ice thickened and became fast across much of the coastal areas of the Seaway. Thickness for much of the fast ice remains in the thin to medium lake ice thickness. Mobile ice, as has been reported by reconnaissance, is showing ice thicknesses generally at medium lake ice or thinner.

2. The table below indicates the monthly average temperatures at some locations along the Seaway and in western Lake Erie. (January covers 1-29).

	Average temperatures	
	December 2018	January 2019
Montreal	-5.2°C	-10.2°C
Kingston	-1.9°C	-8.0°C
Windsor	+0.9°C	-3.7°C

3. 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 29, 2019.

	Accumulated FDDs (2018-19)	Normal accumulated FDD	% of normal accumulated FDD
Montreal	531	537	99%
Kingston	329	372	88%
Windsor	131	214	61%

4. Ice conditions in the St Lawrence Seaway are described based on Radarsat-2 images from January 29-30, 2019 and MODIS images January 28, 2019. From Kingston through to Cornwall conditions are mainly land fast thin lake ice with some medium lake ice likely present closer to Cornwall. In the Cornwall area there is a closed drift new and thin lake ice region with coastal fast ice still present. From Cornwall to the Beauharnois canal conditions are mainly fast with thin lake ice with some medium lake ice likely present. In the Montreal region, from Beauharnois Canal to the St.Lambert lock, conditions are close pack new ice with medium fast ice along parts of the shore.
5. Average surface air temperatures will be below normal for the first few days of February then above normal for the rest of the first week of February. After the initial fluctuations of temperature in the first week temperatures are forecast to remain near normal for the rest of February. For March and April temperatures are forecast to remain near normal through the southern Great Lakes and the Seaway. Due to the late onset of ice this year, the reduced thickness of ice, and the near normal temperatures forecast within the lower Great Lakes Basin, it is expected that the breakup of existing ice will proceed earlier than the climate normal.

GENERAL OUTLOOK

The rapid ice growth seen in the latter half of January is expected to slow in early February due to warm temperatures forecast. A return to more seasonal temperatures in the second week of February will likely recommence the ice growth across the southern Great Lakes. Ice extent in Lake Erie will likely fluctuate between high coverage and lower coverage through the first few weeks of February with ice growth and destruction due to warmer temperatures and a return of colder air in the second week. The near full lake ice coverage at the end of January is not expected to remain in place until the end of February when the start of the melt season is expected on Lake Erie.

Lake Ontario to Cornwall – In northeastern Lake Ontario closed drift ice conditions are forecast through late February before becoming open drift in early March then very open drift by mid-March. In the seaway land fast thin lake ice is forecast to thicken to medium lake ice before the end of February. Forecast is for breakup of the fast ice in mid-March. Predominantly open water conditions are expected before the end of March.

Cornwall to Montreal – Very close pack ice and land fast thin and medium lake ice is forecast until mid-March when breakup is forecast to occur. Predominantly open water conditions are forecast by the end of March.

Lake Erie – Ice coverage extent is forecast to increase over the first few days of February before decreasing in the first 10 days. With a return to more normal temperatures, slight growth of the ice is forecast through the end of February. Mid-February very close pack medium lake ice conditions are expected in the extreme eastern section and in the western Basin with close pack thin and medium lake ice through the centre of the lake. By the end of February, conditions are forecast to begin improving with open drift thin and medium lake ice in the centre of the lake and close to very close pack ice in the eastern and western sections. Conditions are expected to improve rapidly in early March with open water areas expected in the Western Basin and central areas of the lake by mid-March. The last remnants of ice in eastern Lake Erie are expected to melt by the end of March. Breakup and melt of ice is forecast to be near one to two weeks earlier than the normal dates.

Contact:

Canadian Ice Service

Email: ec.ecweather-meteo.ec@canada.ca