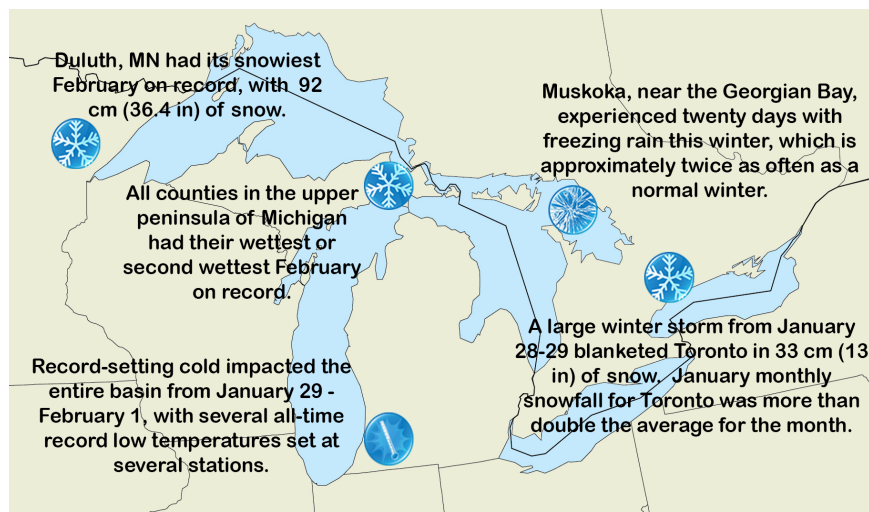


### Great Lakes Significant Events – for December 2018 - February 2019

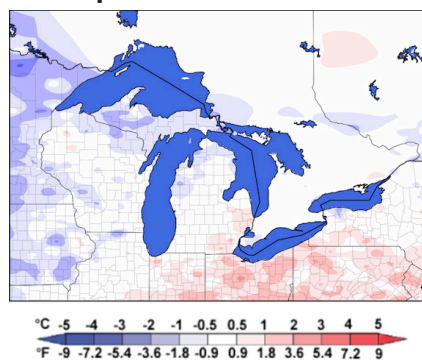


Extreme cold occurred from January 29 through February 1 as the polar vortex descended on the Great Lakes Basin. Several locations set all-time daily low maximum temperature records, including Midway Airport in Chicago at -23°C (-9°F), Cotton, MN at -32°C (-25°F), and Dearborn, MI at -19°C (-3°F). Coupled with strong winds, several locations in Minnesota reported temperatures below -45°C (-50°F). Temperatures quickly rose to much warmer than normal from February 2-4, with several locations on the western side of the basin warming by 21°C (70°F) or more. Milwaukee, WI warmed 22°C (71°F) between January 31 and February 4.

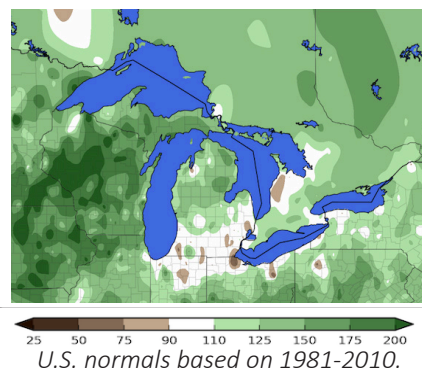
Following a fairly quiet and dry December, several large snow events were reported throughout the basin starting in mid-January. From January 24-26, 66 cm (26 in) of snow fell east of Lakes Erie and Ontario, with 44 cm (17.2 in) of snow recorded on January 25 in Buffalo, NY, which was the third greatest 1-day snowfall for January. For the month of February, Iron Mountain, MI recorded 111 cm (43.7 in) of snow, making this the snowiest February on record with more than four times the normal amount of snowfall.

### Regional Climate Overview – for December 2018 - February 2019

#### Winter 2019 Temperature Departure from Normal



#### Winter 2019 Precipitation Percent of Normal



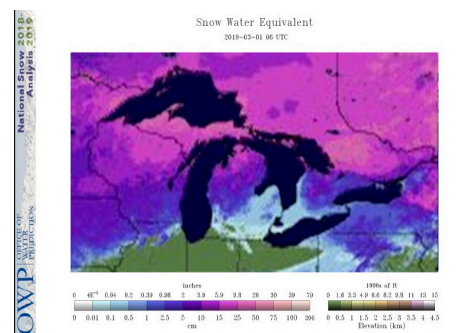
#### Temperature and Precipitation

December temperatures were up to 4°C (7°F) above normal. In January, temperatures were as much as 3°C (5°F) below normal. February temperatures ranged from 4°C (7°F) below normal in the Superior basin to 2°C (4°F) above normal in the Erie basin. Winter temperatures ranged from 2°C (4°F) below normal in the Superior basin to 2°C (4°F) above normal in the Erie basin.

December and January were drier than normal, with precipitation ranging from 64% to 101% of normal in December and from 61% to 85% of normal in January. February was wetter than normal, with precipitation ranging from 105% to 176% of normal. Winter precipitation ranged from 91% to 101% of normal.

Many locations, especially in the western half of the basin, had above average snowfall for the month of February. By the end of winter (March 1), a majority of the basin was still covered by snow, as shown by snow-water equivalent values.

#### Snow and Ice Cover



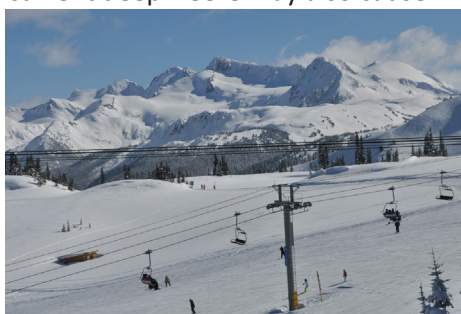
During December 2018 and January 2019, the Great Lakes had less ice compared with the long-term average. Ice concentration started to increase during the latter part of January owing to the polar vortex bringing cold air temperatures into the Great Lakes region. By the end of February, the Great Lakes were about 71% ice covered. Lakes Superior and Huron were in the top ten years for historical max ice cover, with Lake Superior recording the 10th highest max ice cover and Lake Huron the 8th highest max ice cover (since 1973).

## Regional Impacts – for December 2018 - February 2019

**Extreme snowfall** throughout the basin has resulted in positive and negative impacts. In Greater Sudbury, ON roof collapses are a growing concern due to the excessive weight on roofs from snow. With the [collapse of one roof](#) on February 17 that fortunately resulted in no injuries, residents were being urged to [clear their roofs](#) of the heavy weight of snow before more storms occurred. The fear of a potential collapse also led to the [partial evacuation](#) of Blind River hospital on February 23 as another winter storm was moving in. Abundant snow has, however, also increased winter recreation as the skiing and snowmobiling seasons have been extended

**Ice shoves** formed in late February along the shores of [Lake Huron](#) in Michigan and Lake Erie in New York and Ontario. The ice was pushed onshore as a result of [high winds](#) up to 128 km/h (80 mph) that also caused [power outages](#), roof damage, and school closures. The wind also pushed ice from the [Niagara River](#) over a retaining wall in Fort Erie, ON. A [voluntary evacuation](#) for residents of Hamburg, NY was put in place due to the shifting and encroaching ice on homes.

**Flooding concerns** have increased heading into the spring. There is an above-normal [chance of flooding](#) for the Great Lakes region, especially in the western half of the basin. Due to snowpack and saturated and frozen soils, there is an enhanced susceptibility to flooding in the spring. Throughout most of the basin, [soil saturation](#) remains above 90%. The current deep freeze may also cause more runoff and flooding to occur if precipitation is unable to permeate the ground.



A good skiing season with lots of snowfall.



Ice shove in Michigan (credit: C. Koval)..



Street flooding (credit: Sam Lashley).

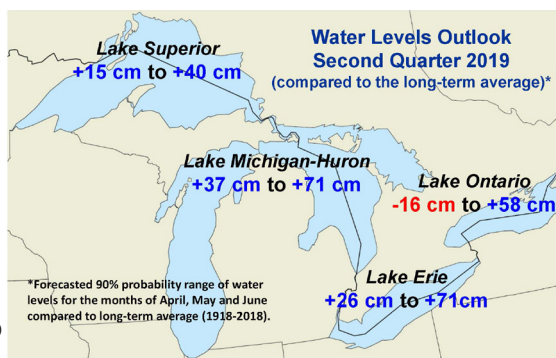
## Regional Outlook – for April - June 2019

### Temperature and Precipitation

According to [American](#) and [Canadian](#) forecasters, the temperature outlook shows equal chances of above, near and below normal for the western lakes and an enhanced chance for above-normal temperatures for the central and eastern lakes. There is an equal chance for above-, near- and below-normal precipitation for most of the basin in the spring, except for the far southern portion where there is an enhanced chance for above-normal precipitation.

### Great Lakes Water Levels

All of the Great Lakes began March above-average for this time of year and at or above the levels seen at this time in 2018. Above-average water supplies over the quarter resulted in Lake Superior declining less than average and Lake Michigan-Huron staying near the same level when on average it declines. Lake Erie rose by its average amount and Lake Ontario rose more than average. Based on average water supplies, all of the Great Lakes are expected to rise into or throughout the second quarter of 2019. All of the lakes, except Lake Ontario, are expected to stay well above average, even if very dry conditions occur in the next quarter. Lakes Superior and Erie could reach record high values if very wet conditions occur, however, they are more likely to remain below record values.



### Current Water Levels

Lake	Begin of Mar 2019 Compared to:		Change since Dec. 1st	
	Average	2018	2018/19	Average
Sup.	+33 cm	Same	-14 cm	-20 cm
Mich.-Huron	+56 cm	+6 cm	0 cm	-8 cm
Erie	+62 cm	+4 cm	+3 cm	+3 cm
Ont.	+37 cm	+4 cm	+33 cm	+10 cm

### Partners

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