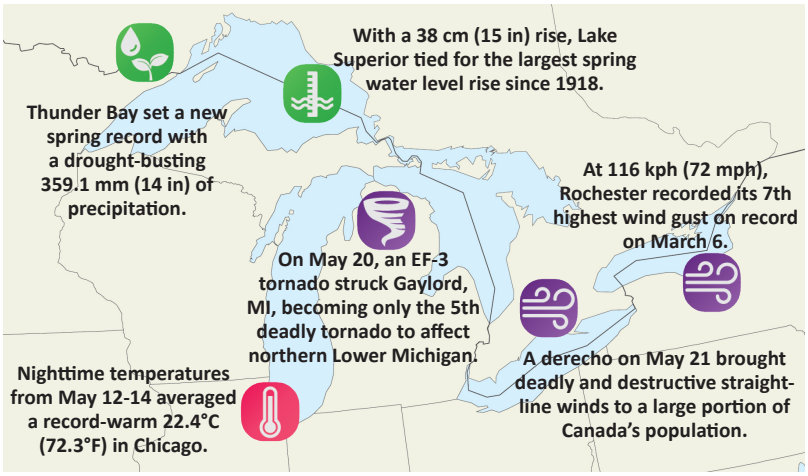
Quarterly Climate Impacts and Outlook

Great Lakes Region

June 2022

Great Lakes Significant Events – *March - May 2022*



A strong weather system brought warm temperatures, earlier than normal, to the eastern basin on March 6 along with strong winds. Ithaca had its 3rd earliest 21.1°C (70°F) day since 1893. Winds up to 116 kph (72 mph) affected the area, damaging buildings and downing trees.

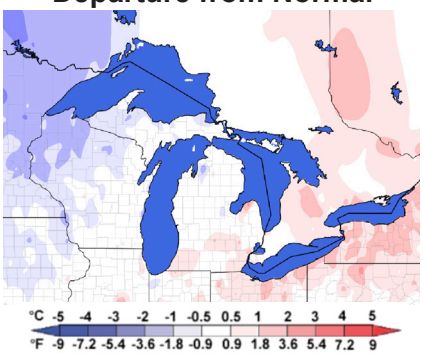
Record-setting spring precipitation in the northwest basin was widespread after two years of drought. Portions of the Lake Superior basin measured 2-3 times above normal precipitation in April. Thunder Bay received over 69 mm (2.7 in) in 12 hours on April 22-23, in just one of many heavy downpours to affect the region in April and May.

Extremely warm and humid air affected the central Great Lakes region May 9-14, with high temperatures over 11°C (20°F) above normal and low temperatures up to 8°C (15°F) above normal. Green Bay had the earliest occurrence of 34.4°C (94°F) since records began in 1886.

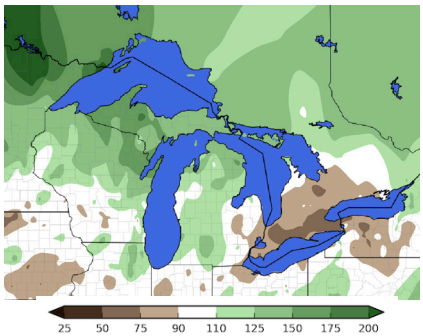
An intense, large-scale wind event (derecho) stretched from Sarnia, ON northeast to Quebec City on May 21 with widespread wind gusts over 120 kph (75 mph). A 132 kph (82 mph) gust was measured at Kitchener, ON. An EF2 tornado with 195 kph (121 mph) winds hit Uxbridge, ON.

Regional Climate Overview – *March - May 2022*

Spring Temperature Departure from Normal



Spring Precipitation Percent of Normal



Precipitation normals based on 1991-2020. Temperature normals based on 1991-2020 (U.S) and 1981-2010 (Canada).

Air Temperature and Precipitation

March ranged from 2°C (4°F) below normal in the Superior basin to 3°C (5°F) above normal in the Erie and Ontario basins. April ranged from 4°C (7°F) below normal in the Superior basin to 1°C (2°F) above normal in the Ontario basin. May ranged from near normal to 3°C (5°F) above normal. Spring ranged from 2°C (4°F) below normal in the Superior basin to 2°C (4°F) above normal in the Erie and Ontario basins.

During March and April, the Erie and Ontario basins were drier than average while the other basins were wetter, with the overall basin seeing 118% of average in March and 122% of average in April. During May, all basins were drier except Superior, with the overall basins seeing 96% of average. The overall basin saw 111% of average for spring, with Erie and Ontario being drier and the other basins being wetter.

Lake	End of May 2022 Level Compared to:		Change in Level from beg. of Mar. to end of May:	
	Average for May	May 2021	2022 Change in Level	Average Change in Level
Sup.	+12 cm	+2 cm	+38 cm	+17 cm
Mich.-Huron	+27 cm	-14 cm	+27 cm	+23 cm
Erie	+32 cm	-1 cm	+18 cm	+31 cm
Ont.	+8 cm	+45 cm	+21 cm	+43 cm

Current Water Levels

End of May water levels were above-average on all lakes, and Lakes Superior and Ontario were above last May's levels. Lake Superior had wet spring conditions that led to a large rise in water level. The lake measured a 38 centimeter increase from the beginning of March to the end of May, which tied for the largest rise on record (1918-2021) during that time frame. Lake Michigan-Huron had a slightly above-average spring rise, while water levels on Lakes Erie and Ontario had a below-average spring rise.

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Regional Impacts – *March - May 2022*

Ontario Derecho: The May 21 derecho that struck a highly populated region in Ontario (and southern Quebec) resulted in 11 fatalities, the most severe storm deaths since 1985. Record-setting power outages left one million customers in the dark for days, with rural areas still lacking power weeks after the storm. Widespread damage to homes, businesses, and other infrastructure is projected to be one of Canada's costliest storm events on record.

Rapid Temperature Switch: Spring started off cool and slow in the central and western basin, with the first 20°C (68°F) day occurring later than usual. The slow spring start was generally favorable for tree fruit, as cool April conditions slowed development, reducing the risk of freeze damage. However, extensive cold injury in northeast Ohio vineyards resulted from a late April cold snap preceded by March warmth. Conditions warmed rapidly in May, bringing strong tree fruit blooms and allowing rapid row crop planting. The heat resulted in 3 fatalities in Chicago.

Drought Improvement: Ample and persistent spring precipitation alleviated drought conditions that long-plagued the western basin, from northern Lake Superior to southern Lake Michigan. The Arrowhead of Minnesota had record spring precipitation. Water levels on Lake Superior increased significantly over the spring, with May seeing the 3rd highest net basin supply on record. In addition to increasing lake levels, wildfire risk was reduced, which may support improved air quality basin-wide.

Downed trees in Ontario, May 21 wind storm (credit: Arnold Ashton)

Apple blossoms (credit: PPD/Pixnio)

Gooseberry Falls in northeast Minnesota. (credit: Wikimedia)

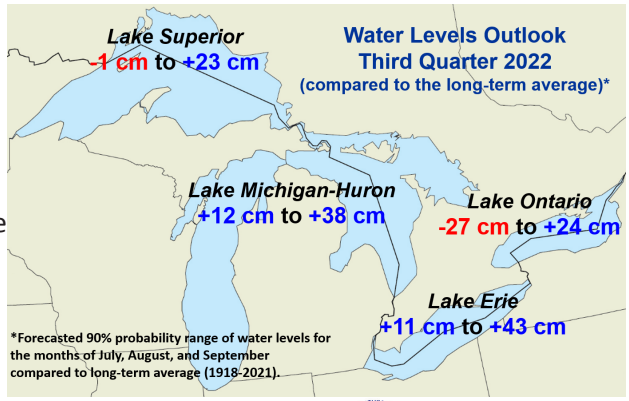
Regional Outlook – *for July - September 2022*

Temperature and Precipitation

The outlook from American and Canadian forecasters shows an enhanced chance for above-normal temperatures. The precipitation outlook shows equal chances for above-, below- and near-normal precipitation for most of the Great Lakes region, except for enhanced chances for below-normal precipitation in the far western area of the basin.

Great Lakes Water Levels

The June forecast indicates that third quarter (July, August, and September) water levels will peak and begin their seasonal decline on Lakes Superior and Michigan-Huron, while Lakes Erie and Ontario will likely be in a period of seasonal decline throughout the entire period. Water levels typically reach their seasonal peak during late spring and summer, followed by seasonal declines into the fall and early winter. After the wet spring, Lake Superior's water levels are likely to remain above average over the forecast horizon. Lakes Michigan-Huron and Erie are also forecast to remain above average, while Lake Ontario will likely transition towards average levels by July before going below average for the rest of the forecast period.



Harmful Algal Blooms (HAB)

The HAB season typically peaks in the late summer. The Seasonal Lake Erie HAB Forecast will be issued on June 30. The location of the bloom is monitored and forecast through the summer, with nearly daily updates, since conditions can change quickly.

Partners

- *Midwestern Regional Climate Center*
- *Environment and Climate Change Canada*
- *Agriculture and Agri-Food Canada*
- *Northeast Regional Climate Center*
- *Great Lakes Region State Climatologists*
- *NOAA*
  - *NCEI*
  - *GLERL*
  - *CoastWatch Great Lakes Node*
  - *Great Lakes and IL-IN Sea Grant Networks*
  - *North Central River Forecast Center*
  - *Ohio River Forecast Center*
  - *Climate Prediction Center*
  - *Office for Coastal Management*
- *GLISA*
- *US Army Corps of Engineers, Detroit District*
- *NIDIS*
- *USDA Midwest Climate Hub*

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