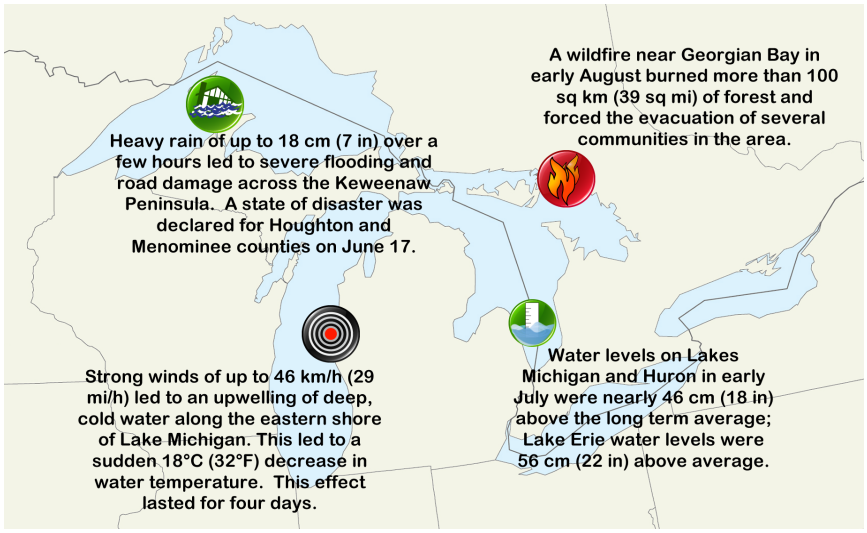
Quarterly Climate Impacts and Outlook

Great Lakes Region

September 2018

Great Lakes Significant Events – *for June - August 2018*



The Great Lakes region experienced extreme heat and rainfall events in the summer of 2018. In late June and early July, several days of high temperatures and humidity made it feel like 38°C (100°F) with some areas reaching as high as 43°C (110°F). This prompted the issuance of Excessive Heat Warnings in the eastern portion of the basin. The lack of relief from the excessive heat led to two heat-related deaths in New York.

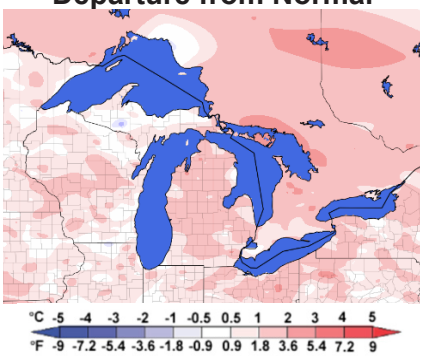
Several heavy rain events in July and August in the eastern half of the basin caused flooding that resulted in road damage, overflown streams, and several water rescues. On August 7, more than 64 mm (2.5 in) of rain fell in only two hours in the Toronto, ON area which led to flooded roads, power outages, and subway closures. Several downtown locations saw water pouring through ceilings and hallways, and two people had to be rescued from an elevator when rising waters trapped them.

The summer concluded with a severe weather outbreak in areas of the basin. The event on August 28 resulted in 19 confirmed tornadoes across southeastern Wisconsin and an additional four confirmed tornadoes in northern Michigan. One tornado in Wisconsin was confirmed as an EF2, while all others were rated as EF0 or EF1.

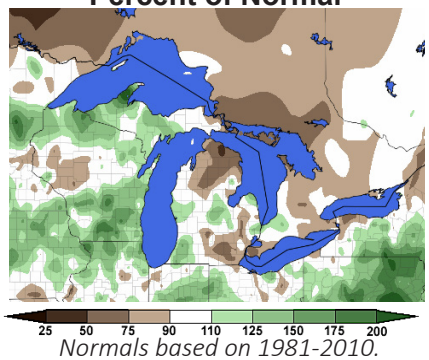
Regional Climate Overview – *for June - August 2018*

Precipitation and Temperature

Summer 2018 Temperature Departure from Normal



Summer 2018 Precipitation Percent of Normal



Normals based on 1981-2010.

June temperatures ranged from 2°C (4°F) below normal to 2°C (4°F) above normal. Both July and August had temperatures that were near normal to 3°C (5°F) above normal. Many Canadian locations as well as Erie, PA and Buffalo, NY experienced a top 10 warmest August on record. Summer overall was similar to the last two months with temperatures that were near normal to 3°C (5°F) above normal.

June precipitation ranged from half of normal in the Huron basin to near normal in the Superior and Erie basins. July precipitation ranged from 66% of normal in the Huron basin to 93% of normal in the Ontario basin. In August, all basins with the exception of Superior were 112% to 146% of normal. Superior reached only 88% of normal. For the summer, the U.S. portion of the basin had above normal precipitation while the Canadian side was below normal.

Great Lakes Water Levels

Lake	End of Aug. 2018 Compared to:		Change since June 1st	
	Average	2017	2018	Average
Sup.	+12 cm +4.7 in	-13 cm -5.1 in	+12 cm +4.7 in	+13 cm +5.1 in
Mich.-Huron	+43 cm +16.9 in	0 cm 0 in	-1 cm -0.4 in	+2 cm +0.8 in
Erie	+45 cm +17.7 in	-2 cm -0.8 in	-23 cm -9.1 in	-11 cm -4.3 in
Ont.	+1 cm +0.4 in	-40 cm -15.7 in	-43 cm -16.9 in	-24 cm -9.4 in

All of the Great Lakes ended August above average levels for this time of year, but all were also at or below their levels seen at the same time in 2017, generally due to drier supply conditions and above average outflows this quarter compared to the same time last year. The level changes on Lake Superior and Michigan-Huron over the quarter were near average. The decrease in levels on Lake Erie and Ontario were above average.

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Environment and Climate Change Canada / Environnement et Changement climatique Canada

Regional Impacts – *for June - August 2018*

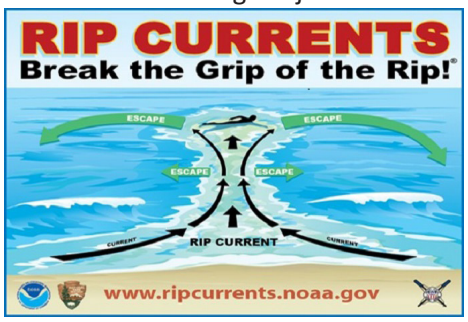
Agriculture around the Great Lakes experienced quick development during the early summer months as a result of above-normal temperatures. However, dry conditions began to develop and intensify through mid-to-late summer, primarily in eastern portions of the basin, resulting in increased stress on crops and livestock. Recent rainfall improved conditions, but some long-term precipitation deficits and concerns with livestock feed supplies remain around Lakes Huron and Erie. Some areas, like the Niagara region, were so dry that some crops never emerged in the first place.

Health and safety of many inhabitants of the Great Lakes basin were threatened by events such as forest fires, heat waves, harmful algal blooms, and flooding. Forest fires in central Ontario created an air quality hazard for residents of nearby communities. Abnormally high temperatures and humidity in early July led to heat-related health risks for many in the eastern portion of the basin. Excessive rainfall risked the safety of many across the basin, forcing several communities to evacuate while other rural areas, such as some in the upper peninsula of Michigan, were isolated due to widespread road closures.

Recreation over the summer has resulted in many deaths. Through Labor Day weekend, 72 deaths, including several drownings primarily in Lake Michigan and Lake Erie, occurred as a result of strong currents and rapidly changing wind conditions. Since 2010, 99% of the 643 people who have drowned in the Great Lakes were not wearing life jackets.

Corn suffering from drought conditions

Washed out road from flooding



Escape method for rip currents

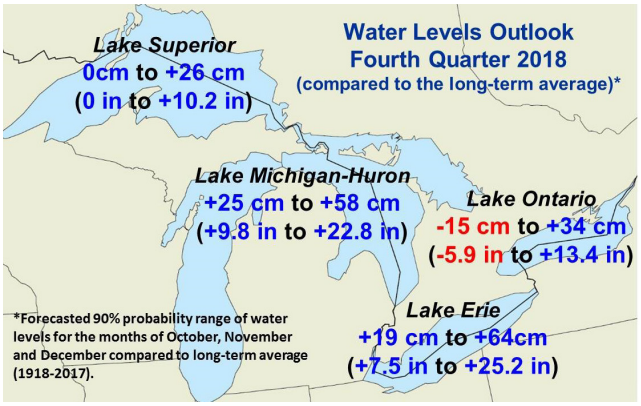
Regional Outlook – *for October - December 2018*

Temperature and Precipitation

Both American and Canadian forecasters predict above-normal temperatures for most of the Great Lakes basin in the October through December timeframe. At the same time, precipitation has been predicted to have an equal chance of being above, near, or below normal for the entire basin.

Forecasters have placed an El Niño watch into effect due to an increased likelihood (50-55%) of El Niño conditions developing over the next several months. A typical El Niño pattern results in a more northerly positioned jet stream. This can typically be associated with drier and warmer conditions, particularly during the winter months. Although colder and wetter conditions can occur, they are often less frequent and shorter in length during El Niño phases.

Great Lakes Water Levels



All of the Great Lake levels are expected to be in their seasonal fall declines over the fourth quarter, assuming average water supply conditions. Lakes Superior, Michigan-Huron and Erie levels are likely to stay above average, even if very dry conditions are encountered.

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
  - Great Lakes Sea Grant Network
  - North Central River Forecast Center
  - Ohio River Forecast Center
  - CPC
  - Office for Coastal Management
- GLISA
- US Army Corps of Engineers, Detroit District
- NIDIS
- USDA Midwest Climate Hub

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