Quarterly Climate Impacts and Outlook

Great Lakes Region

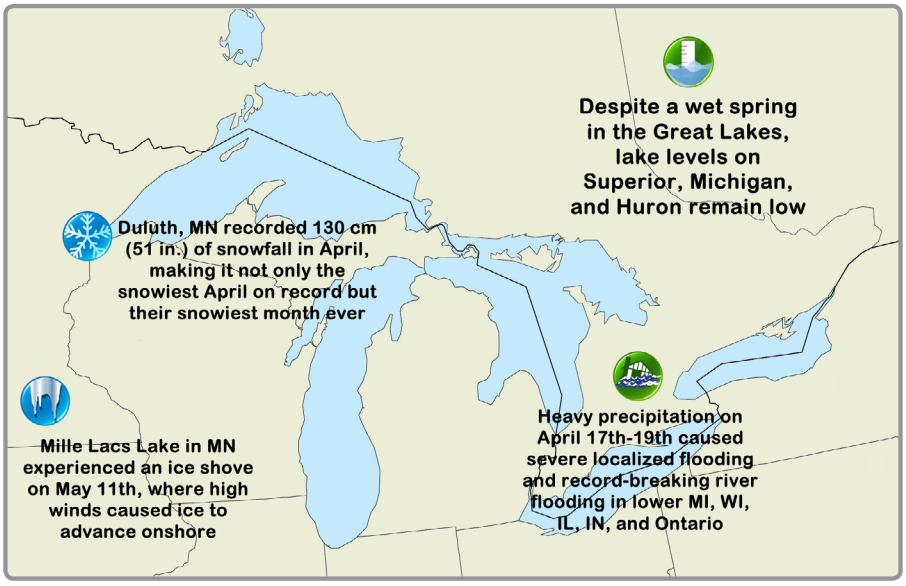
June 2013 (*Experimental*)

Great Lakes Significant Events - *for March - May 2013*

The 2013 spring season was wet and cool across the Great Lakes region. However, despite above average spring precipitation and subsequent water level rise, water levels on lakes Superior, Michigan, and Huron remain below average. Water levels on lakes Erie and Ontario remain at or near their long-term average.

Cooler spring temperatures caused ice-out on lakes to occur several weeks later than normal in Minnesota and other portions of the region, coming just one year after ice-outs that were among the earliest on record in 2012.

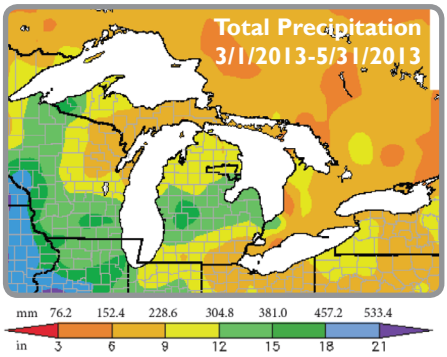
A noteworthy ice shove event occurred this spring on Mille Lacs Lake in Minnesota on May 11th, where strong winds pushed partially melted ice onshore from the lake surface. Ice piled 1.5 to 9 m high (5 to 30 ft), which caused extensive damage to several homes along the shoreline.



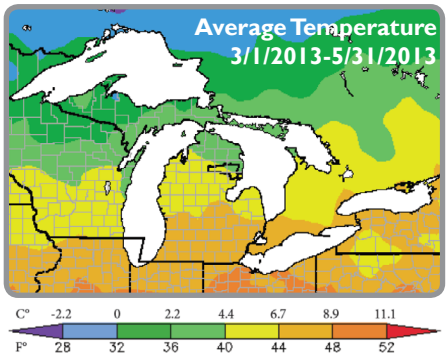
Due to a strong storm system that brought heavy precipitation through the region on April 17th-19th, severe localized flooding and record-breaking river flooding occurred across portions of Wisconsin, Illinois, lower Michigan, northern Indiana, and the Muskoka region of Ontario (central Ontario). Storm event severity ranged from a 1 in 25 year event to 1 in 100 year event in some locations.

Regional Climate Overview - *for March - May 2013*

Precipitation and Temperature



The Great Lakes U.S. basin received 267.5 mm (10.53 in.) of precipitation, 124% of normal, making it the 9th wettest spring on record. Twenty of the 25 climate divisions were wetter than normal with 11 ranking spring 2013 among their top 10 wettest. In fact, with 169% of normal precipitation, central lower Michigan reported its wettest spring on record. The Canadian side of the Great Lakes received above normal precipitation as well. The north side averaged 250-300 mm (9.8-11.8 in.), which is 115-150% of normal.



With an average temperature of 5.2°C (41.4°F), it was 1.3°C (2.4°F) below normal on the southern side of the Great Lakes basin. Of the 25 climate divisions that make up the southern side, 22 were cooler than normal with four ranking this spring among their top 10 coolest. On the northern side of the basin, temperatures varied with Southern Ontario averaging 5-10°C (41-50°F) and areas north of Lake Superior averaging -2-0°C (28.4-32°F).

U.S. normals based on 1981-2010 and Canadian normals based on 1971-2000.

Great Lakes Water Levels

Grand Traverse Bay, MI (1/11/13)
Photo: Michigan Sea Grant

Despite above average precipitation this spring, water levels remain below average on lakes Superior, Michigan, and Huron. Even though Lake Michigan-Huron water levels rose by 24 cm (9.5 in.) in April and another 13 cm (5 in.) in May, Lake Michigan-Huron remains the lowest of the lakes relative to its long-term average around 50 cm (20 in.) below at the end of May. Lake Superior had the second largest May rise on record of 24 cm (9.5 in.), but at the end of May, still remained about 18 cm (7 in.) below its long-term average.

Water level statistics based on the 1918-2012 period of record.

Contacts: Molly Woloszyn (mollyw@illinois.edu)
Samantha Borisoff (samantha.borisoff@cornell.edu)

Regional Impacts - *for March - May 2013*

Agriculture

Wet and cool conditions in April and early May delayed the start of the planting season for farmers in the region. The cool spring also led to some delays in development of tree fruit in Michigan. More favorable conditions in May allowed planting to rapidly progress and warmer temperatures also helped tree fruit develop to normal growth stages for this time of year.

Left: Corn showing steady growth in northern Indiana in early June 2013; Photo courtesy of Justin Leighty (In the Field)

A late May frost in Ontario resulted in damage to 4.5% of corn acres, 4% of soybean acres, 2% of tobacco, and 8% of tomato according to Agri-corp (www.agricorp.com). It is difficult to say how much the frost could cost, but it has been a rough spring so far in Ontario for vegetation.

Transportation

The low water levels continue to have an impact on transportation across the Great Lakes, specifically the shipping industry. Large vessels are having to reduce their cargo loads because of the low water levels, therefore reducing potential revenue. In Ontario, the start of the Chi-Cheemaun ferry season, which is the main source of transportation between Bruce Peninsula and Manitoulin Island, was delayed by two weeks from its typical May 3rd start as low water on Lake Huron caused docking problems for the ferry.

Above: The Chi-Cheemaun ferry

Recreation and Tourism

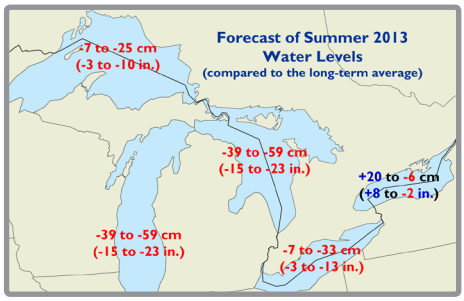
Record late ice-outs on lakes across the upper Great Lakes has had an impact on fishing season openers, reducing the revenue typically generated this time of year from recreation and tourism. The Lake Superior fishing season opener had record low attendance this year because of lingering ice, extremely cold water temperatures, and high winds, all of which also became safety hazards.

Left: Lake Bemidji (MN) on May 8th; Photo courtesy of Tom Robertson/ MN Public Radio

Regional Outlook - *for Summer 2013*

Lake Level Outlook

Outlook from the US Army Corps of Engineers and Environment Canada (Summer 2013)



Great Lakes water levels, with the exception of Lake Ontario, are expected to remain below average throughout summer 2013 (JJA), with the level of Lake Michigan-Huron expected to remain 39 to 59 cm (15 to 23 in.) below its long-term average. Anticipated impacts of prolonged low water levels include undercutting of shore protection, increased dredging, and navigational hazards.

Harmful Algal Blooms Outlook

Increased precipitation, as what was experienced this April, could lead to more persistent and widespread harmful algal blooms in Lake Erie this summer. Recently, a potential algal bloom in Lake Superior was also discovered. The presence of algal blooms in the Great Lakes could have an immediate impact on tourism and local economies as algae is aesthetically unappealing to recreationists and there are foul odors associated with algal blooms and mats in the nearshore.

Temperature & Precipitation Outlook

In Ontario, outlooks from Environment Canada (EC) indicate that above normal temperatures are anticipated in portions of central Ontario, with near normal elsewhere. EC forecasts above normal precipitation throughout Ontario this summer. In the U.S., the Climate Prediction Center (CPC) outlooks indicate no appreciable chances for above or below normal temperatures or precipitation throughout the summer.

Great Lakes Region Partners

Environment Canada
www.ec.gc.ca
Agriculture and Agri-Food Canada
www.agr.gc.ca
Midwestern Regional Climate Center
www.mrcc.isws.illinois.edu
Northeast Regional Climate Center
www.nrcc.cornell.edu
Great Lakes Region State Climatologists
www.stateclimate.org
National Oceanic and Atmospheric Administration
www.noaa.gov
- **National Climatic Data Center**
  www.ncdc.noaa.gov
- **National Ocean Service**
  www.oceanservice.noaa.gov
- **National Operational Hydrologic Remote Sensing Center**
  www.nohrsc.nws.gov
- **Great Lakes Environmental Research Laboratory**
  www.glerl.noaa.gov
- **NOAA Great Lakes Sea Grant Network**
  www.seagrant.noaa.gov
- **North Central River Forecast Center**
  www.crh.noaa.gov/ncrfc
- **NOAA's Great Lakes Regional Collaboration Teams**
  www.regions.noaa.gov
- **Climate Prediction Center**
  www.cpc.noaa.gov

Great Lakes Integrated Sciences & Assessments Center
www.glisa.umich.edu
US Army Corps of Engineers
www.usace.army.mil
National Integrated Drought Information System
www.drought.gov
Great Lakes Water Level Dashboard
www.glerl.noaa.gov/data/now/wlevels/dbd/

Contacts: Molly Woloszyn (mollyw@illinois.edu)
Samantha Borisoff (samantha.borisoff@cornell.edu)