**Great Lakes Significant Events - for December 2015 - February 2016**

**Winter**

Winter temperatures were much above normal for the Great Lakes basin. This resulted in below-normal snowfall for much of the basin as well as a delayed start and reduced extent of Great Lakes ice cover. El Niño conditions were the driver for the unseasonably warm Great Lakes weather this winter.

December was remarkably warm across the entire Great Lakes basin, with all U.S. states and the entire province of Ontario experiencing the warmest December on record. December snowfall was significantly below-normal across the basin and the first snow of the season fell late in some places. Buffalo, NY recorded its latest date for first measurable snowfall on December 18 (breaking the previous record of 1899). While still above-normal overall, January and February temperatures were more variable. For example, locations in Ontario experienced record-breaking warmth on February 3 and just ten days later, many of the same locations experienced record-breaking cold (a temperature swing was 40-46°C (72-83°F) in some locations).

Great Lakes ice cover reached its maximum extent of 34% on February 14, not long after a delayed start in late December due to warmer temperatures. Ice cover fluctuated along with the temperatures in January and February (see daily graph to right). The uncovered lakes also produced significant lake-effect snow (LES) this winter. In mid-January, multiple LES events produced 0.9-1.2 m (3-4 ft) of snow eastward of Lake Ontario and 0.3-0.6 m (1-2 ft) eastward of Lake Erie.

Significant atmospheric pressure differences produced very strong winds across the basin on February 19. Peak wind gusts reached 116 km/h (72 mph), causing significant damage around Chicago, IL and producing waves of 3-6 m (10-20 ft) on lakes Michigan-Huron and Ontario.

**Regional Climate Overview - for December 2015 - February 2016**

**Precipitation**

December was record warm for the Great Lakes basin, as temperatures were more than 5°C (9°F) above normal region-wide. January temperatures ranged from near normal to 4°C (7°F) warmer than normal. February temperatures ranged from near normal to 3°C (5°F) above normal. The winter season was 2°C (4°F) to 5°C (9°F) above normal.

**Great Lakes Water Levels**

After a winter of generally wet weather and mild temperatures, water levels on all the Great Lakes were well above average and higher than last year. Lake Ontario ended the quarter 30 cm (11.8 in) above average and 50 cm (19.7 in) higher than last year. Lake Erie ended the quarter 33 cm (13 in) well above average and 38 cm (15 in) higher than last year. Lake Michigan-Huron’s water level was 29 cm (11.4 in) above average and the highest end of February since 1998. Lake Superior ended the quarter 24 cm (9.4 in) above average and the highest for this time of year since 1997.

**Air Temperature**

Ice cover was below the long-term average on all basins this winter. The largest departures of 30% to 45% below normal ice cover were on Lake Erie. Colder temperatures in mid-January caused rapid growth, but a warm spell in late January and early-February caused quite a bit of melting before temperatures turned cold again. Ice cover peaked on February 14 at 34% but quickly began melting after warmer temperatures in late February.

**Great Lakes Ice Cover**

The maximum extent of Great Lakes ice cover was only 34% this winter, which is significantly lower than the last two winters (92.5% and 88.8%).

December 2015 is now the warmest December on record for the entire Great Lakes basin. Lake Ontario water levels rose 20 cm (7.9 in) in February, the second-largest rise for that month since 1916.
Regional Impacts - for December 2015 - February 2016

Recreation
Warmer winter temperatures had both negative and positive impacts on recreation around the Great Lakes. Minimal and/or unstable ice resulted in a poor ice fishing season, which hurt local fishing supply stores and caused dangerous conditions as trucks and snowmobiles fell through thin ice. Organizers of the U.S. Pond Hockey Championship postponed the January tournament by two weeks due to ice safety concerns. Ski resorts in Pennsylvania and New York opened late and had limited trails due to the lack of snowfall and warmer temperatures. On the other hand, the golfing and kayaking season were extended well into December, which was a positive for local businesses that provide these hobbies.

Public Health
The influenza (flu) season got off to a slow start and did not peak as high this year, partially due to the warmer temperatures since the virus tends to live longer in cold and dry conditions. In Canada, there have been 30 influenza deaths in the 2015/16 season, compared to 600 deaths in 2014/15 and 300 deaths in 2012/13 and 2013/14. The number of reported influenza cases is down in Chicago, IL and other areas of the U.S. as well.

Municipal Services
The below-normal snowfall resulted in decreased snow removal costs for many Great Lakes municipalities this winter (i.e. less salt, fuel, and manpower). Some municipalities have used the saved funds to purchase new equipment for upcoming winter seasons.

Transportation
Several winter weather events impacted transportation around the Great Lakes. A mid-February LES event in Lake County, OH caused a fatal multi-vehicle accident and shut down a major interstate for several hours. The high wind event on February 19 cancelled over 160 flights at Chicago O’Hare International Airport and also caused dangers to highway transportation (semi-truck rollovers) and commuter train disruptions in Chicago.

Shipping
With less ice cover on the Great Lakes this winter, the St. Lawrence Seaway is opening on its regular schedule of March 21, which is a welcome change for the shipping industry since the opening was delayed the last two years. Also, limited ice will allow ships to move more quickly than they would otherwise.

Regional Outlook - for April - June 2016

Temperature & Precipitation Outlook
Above-normal temperatures are expected to continue across the Great Lakes basin into April-June 2016, according to the seasonal outlooks from the Climate Prediction Center (CPC) and Environment and Climate Change Canada (ECCC). The driver for the above-normal temperature outlooks are the El Niño conditions in the tropical Pacific Ocean, which are beginning to weaken. CPC is forecasting below-normal precipitation for most of the U.S. Great Lakes basin, with greater chances near Lake Superior and Lake Michigan-Huron. Currently, there is no strong signal in the Canadian Great Lakes basin on whether April-June precipitation will be above-, near-, or below-normal.

Wildfire Potential
The 2016 Spring Fire Season may begin earlier than normal across portions of the Great Lakes basin. The National Interagency Fire Center and Natural Resources Canada is forecasting above-normal wildfire potential in the western Great Lakes in April 2016, particularly in areas around lakes Superior and Michigan-Huron. Increasing dryness in these areas is the main reason for the increased wildfire potential, as much of the eastern U.S. fire activity is based on shorter-term precipitation and temperature trends. Wildfire potential conditions are expected to return to normal in May and June.

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Great Lakes Region
Quarterly Climate Impacts and Outlook - March 2016 -
http://mrcc.isws.illinois.edu/pubs/pubsGreatLakes.jsp
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