LEVEL news

Great Lakes - St. Lawrence River Water Levels

Volume 18, Number 11 **November 12, 2010**

Annual Seasonal Declines Underway on All Lakes

Water levels fell on each of the Great Lakes and Lake St. Clair during October 2010 as the lakes experience their annual seasonal declines. Levels on lakes Superior, Michigan-Huron and St. Clair fell more than their average declines for October, while lakes Erie and Ontario had smaller-than-average declines, compared to their 1918-2009 period of record averages.

The level of Lake Superior fell by 8 cm, 5 cm more than its long-term average decline for October. Similarly, the levels of lakes Michigan-Huron and St. Clair fell by 13 and 16 cm respectively, 6 cm more than their long-term average declines for the month.

The level of Lake Erie fell by 7 cm, 2 cm less than its long-term average decline for October. The level of Lake Ontario fell by 8 cm in October. On average, levels on this lake have fallen by 12 cm in October over the 1918-2009 period.

Except for Lake Ontario, the levels of each of the lakes began November 2010 below their respective 1918-2009 average beginning-of-November level and lower than they were at the same time last year. Lake Ontario began November 2010 at its average level, the same level as it was at the beginning of November 2009.

Water Level Forecast

Water levels on each of the Great Lakes and Lake St. Clair are expected to fall during November as they continue their annual seasonal declines. For a complete range of probable water levels over the next six months on each of the Great Lakes and Lake St. Clair, please refer to the October 2010 edition of the Canadian Hydrograph Service's monthly water Level Bulletin found at: **http://www.waterlevels.gc.ca/C&A/tidal_e.html**.

Winds Effects

Autumn and early winter often bring storms packing high winds to the Great Lakes

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Great Lakes Water Level Information

Lake	October 2010 Monthly Mean Level		Beginning-of-November 2010 Level	
	Compared to Monthly Average (1918-2009)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2009)	Compared to One Year Ago
Superior	32 cm below	17 cm below	34 cm below	21 cm below
Michigan-Huron	38 cm below	22 cm below	40 cm below	31 cm below
St. Clair	14 cm below	14 cm below	14 cm below	14 cm below
Erie	9 cm below	16 cm below	10 cm below	16 cm below
Ontario	same	1 cm above	same	same

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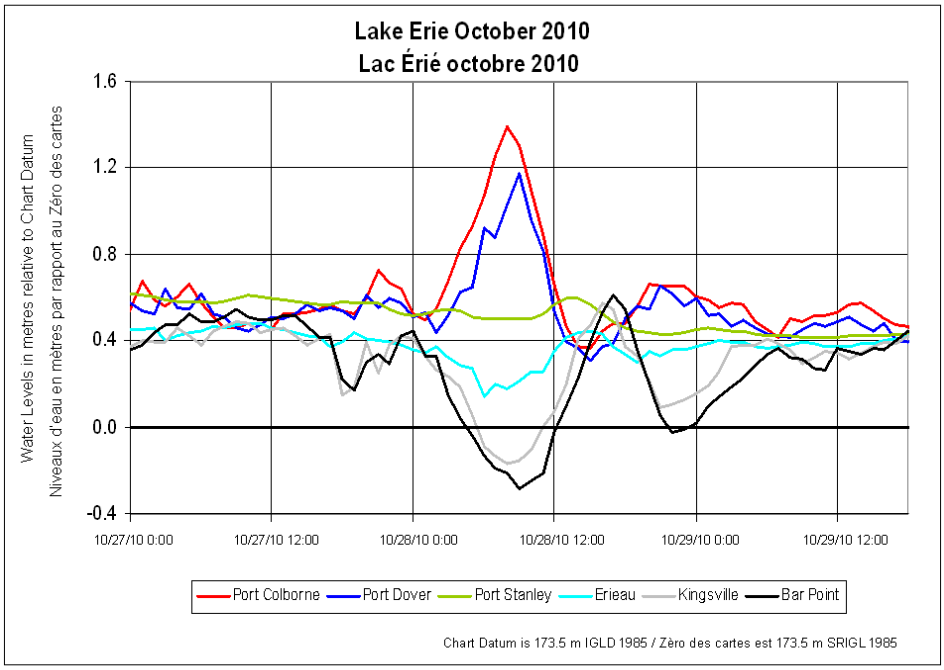
region. When strong, sustained winds prevail in one direction over a lake, water levels can rise (set-up) or fall (set-down) significantly in a short period of time.

These fluctuations, lasting from less than an hour to several days, create temporary imbalances in the water level at various locations. Storm surges are largest at the ends of an elongated basin, particularly when the long axis of the basin is aligned with the wind. In deep lakes such as Lake Ontario, the surge of water level rarely exceeds 0.5 m, but in shallow Lake Erie, water-level differences of more than 5 m have been observed from one end of the lake to the other.

The following plot of hourly water levels relative to Chart Datum (the reference level for depths on navigation charts) from October 27 to 30, 2010 shows how the water level changed at six gauging stations on the north shore of Lake Erie due to high winds. The Port Colborne and Port Dover gauges are located in the lake's eastern basin, Port Stanley and Erieau are in the central basin, Kingsville is in the western basin and the Bar Point gauge is located at the mouth of the Detroit River at the western end of the lake. As can be seen from the plot, at around 8:00 a.m. on October 28 the difference in water levels between Port Colborne and Bar Point, located at the eastern and western ends of Erie, respectively, was about 1.6 m.



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Editor, Chuck Southam

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October Precipitation over the Great Lakes *

Great Lakes Basin	**77%**	**Lake Erie**	**90%**
Lake Superior	**87%**	**Including Lake St. Clair)**	
Lakes Michigan-Huron	**67%**	**Lake Ontario**	**75%**

October Outflows from the Great Lakes *

Lake Superior	**69%**	**Lake Erie**	**93%**
Lake Huron	**94%**	**Lake Ontario**	**101%**

*** As a percentage of the long-term October average.**
NOTE: These figures are preliminary