

LEVEL *news*



Great Lakes - St. Lawrence River Water Levels

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A Few More Words about Water Level Data

As mentioned in last month's edition of LEVEL*news*, the U.S. Army Corps of Engineers (the Corps) and Environment Canada calculate lake-wide average monthly mean water levels for each of the Great Lakes and Lake St. Clair under the auspices of the Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data (the Coordinating Committee).

A Little History

This month's edition provides some background into the origin of this data set, which was established over ten years ago in order to help meet public information and water management needs.

During the IJC's Water Levels Reference Study (completed in 1993) the water level information products that were available for the Great Lakes at that time were reviewed. This work included a review of the Monthly Water Level Bulletins published by the Corps and the Canadian Hydrographic Service in the United States and Canada, respectively.

The reviewers concluded that several small but important differences between the U.S. and Canadian bulletins could lead to confusion under certain circumstances.

These differences included the use of: 1) different

forecast methodologies; 2) water level data from a different "master gauge" on each lake in each country and; 3) different periods of record for the historical data (both between the two bulletins and in the case of the Canadian bulletin, between the lakes themselves). Differences 2 and 3 were further complicated by the impact that differential crustal movement in the Great Lakes region has on recorded water level data.

In their final report to the IJC, the Water Levels Reference Study Board recommended that the bulletins published in **(continued on next page)**

Great Lakes Water Level Information				
Lake	February 2006 Monthly Mean Level		Beginning of March 2006 Level	
	Compared to Monthly Average (1918-2005)	Compared to One Year Ago	Compared to Beginning-of-Month Average (1918-2005)	Compared to One Year Ago
Superior	10 cm below	9 cm below	12 cm below	12 cm below
Michigan-Huron	39 cm below	18 cm below	40 cm below	20 cm below
St. Clair	1 cm above	20 cm below	2 cm below	22 cm below
Erie	10 cm above	19 cm below	8 cm above	22 cm below
Ontario	27 cm above	1 cm above	25 cm above	2 cm below

each country be further coordinated so that the water level information and forecasts that they contain agree. The coordination of base data and the further standardization of the bulletins were carried out under the auspices of the Coordinating Committee in the early 1990s.

Several changes were made to the bulletins to address their differences. One of the most significant changes made was the switch from presenting water level information for a single gauging station in each country on each lake to the use of coordinated lake-wide average values. This change required the establishment of historical monthly mean water levels and related statistics based on a coordinated network of U.S. and Canadian gauges on each lake. In addition, the Coordinating Committee felt

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February Precipitation over the Great Lakes

As a percentage of the long-term February average:

Great Lakes Basin	117%	Lake Erie	121%
Lake Superior	89%	(including Lake St. Clair)	
Lakes Michigan-Huron	136%	Lake Ontario	93%

NOTE: These figures are preliminary

it was important to maintain a consistent period of record for all of the Great Lakes and Lake St. Clair. In other words, the longest common, complete period of record possible for all of the lakes would be used for the historical lake-wide average (or network) water levels.

The team working on this project reviewed the water level data available on each of the lakes. Combinations of gauge records were examined in order to establish a representative set of monthly mean water levels for each lake. The analysis took into account the water level data available on each lake as well as the effect of differential crustal movement on recorded water level data. As a result of this effort, a time series of historical lake-wide average monthly mean water levels are available for each lake from 1918 onward.

The lake-wide average monthly mean water levels and their statistics have been used in the bulletins and elsewhere since 1994. The

length of record grows each year as more data is added, and as indicated in the water level information table included here, the period of record for the lake-wide average water level data is now 1918 to 2005.

Other Water Level Data

The existence of the coordinated lake-wide average water levels does not mean that water level data recorded at individual gauges around the lakes (which may have records starting earlier than 1918) cannot be used for analysis or comparison purposes. In some cases, such as a wetland study, it may be more appropriate to use water levels recorded at gauges located near the wetlands instead of the lake-wide average values. In all cases, care must be taken to use and interpret water level information properly.

February Outflows from the Great Lakes

As a percentage of the long-term February average:

Lake Superior	101%	Lake Erie	124%
Lake Huron	94%	Lake Ontario	109%

NOTE: These figures are preliminary