

**International Lake Superior  
Board of Control  
Semi-Annual Progress Report to the  
International Joint Commission  
Covering the Period March 22, 2013 to September 19, 2013**

---



## Table of Contents

<b>Section</b>	<b>Page</b>
1. Highlights	1
2. Monitoring of Hydrologic Conditions	2
3. Regulation of the Outflow from Lake Superior	3
4. Governing Conditions during the Reporting Period	4
5. Inspections and Repairs at the Compensating Works	5
6. Repairs and Maintenance at the Hydropower Facilities	5
7. Flow Verification Measurements	6
8. Water Usage in the St. Marys River	6
9. Long Lac and Ogoki Diversions	7
10. Peaking and Ponding Operations at Hydropower Plants	8
11. Plan 2012 Implementation	9
12. Annual Meeting with the Public and Public Information	9
13. Board Membership and Meetings	10

### **Cover photos (credit: Michelle Hill, Soo Park Ranger):**

Flooded observation structure on Whitefish Island, August 2013

### **Figures**

Figure 1: Lake Superior and Lakes Michigan-Huron Monthly Levels

Figure 2: Lake Superior and Lakes Michigan-Huron Basin Monthly Precipitation

Figure 3: Lake Superior and Lakes Michigan-Huron Net Basin Supplies

Figure 4: Hourly U.S. Slip Levels & Lake Superior Outflows – March to August 2013

### **Tables**

Table 1: 2012-2013 Lake Superior Hydrologic Factors

Table 2: 2012-2013 Lakes Michigan-Huron Hydrologic Factors

Table 3: Monthly Distribution of Lake Superior Outflow (metric units)

Table 4: Monthly Distribution of Lake Superior Outflow (customary units)

# International Lake Superior Board of Control

## Canada

Jaymie Gadal, Member  
Rob Caldwell, Secretary

## United States

BG Margaret W. Burcham, Member  
John W. Kangas, Secretary

19 September 2013

International Joint Commission  
Ottawa, Ontario  
Washington, D.C.

Commissioners:

This semi-annual report covers the Board's activities from 21 March to 19 September 2013.

## **1. Highlights**

From March through August, the monthly mean water levels of Lake Superior ranged from 9 to 34 cm (4 to 13 in.) below average and ranged from 8 cm (3.1 in.) lower to 17 cm (6.7 in.) higher than in 2012. Lake Superior levels have been consistently below average since May of 2005, which is the longest sustained period of below-average monthly levels in the 1918-2012 record. Prior to inclusion of 2012 data (which lowered the long-term average values for some months), levels had been consistently below average since April of 1998.

The levels of Lakes Michigan-Huron have remained below average since January of 1999, also the longest period on record of consistently below average levels. In the past six months, monthly mean Lakes Michigan-Huron levels ranged from 47 to 67 cm (19 to 26 in.) below average. Lakes Michigan-Huron were 37 cm (15 in.) lower than last year's levels in March, but by August, were 11 cm (4 in.) higher than those of 2012.

The Lake Superior outflows were as specified by Regulation Plan 1977-A, except for a decrease in discharge in August following a unit outage at the Brookfield Renewable Energy Group (BREG) hydropower plant. Since March, monthly outflows have been between 74% and 118% of average. The monthly outflows from Lakes Michigan-Huron ranged from 86% to 91% of average. Water supplies to Lake Superior were below average in March and April, but have been above average since. Water supplies to Lakes Michigan-Huron were below average in March and July, but have otherwise been above average.

Ponding by the hydropower companies was restricted from the last weekend in March through May due to levels at U.S. Slip being below the threshold. Ponding was permitted on weekends and holidays in June through August, but with all plants running at capacity during August due to the unit outage at BREG, ponding operations were not conducted.

The Board hosted its annual public meeting and teleconference on the afternoon of

21 August online as a Webinar session. A total of about 77 members of the public, media, government officials, Board Members, staff, and associates participated. Stakeholders on lakes Superior and Michigan-Huron both voiced concerns about how the current regulation plan balances the levels of their respective lake, with citizens on Lake Superior concerned over recent gate openings and citizens on Lake Michigan-Huron concerned over the generally-consistent below-average releases over the past decade. Some participants remain concerned about potential impacts due to climate change and variability. There remains some apathy regarding the expected performance of proposed Regulation Plan 2012. Several people continued to express disappointment regarding an International Upper Great Lakes Study (IUGLS) recommendation that no structures be constructed in the St. Clair River (to restore upstream water levels).

The Great Lakes Fisheries Commission (GLFC) requested that the gate pattern at the Compensating Works be altered each year to improve sea lamprey trapping efficiency. Gates 9 and 10 were closed and Gates 15 and 16 opened partially from 3 June to 1 August. Board staff will propose to the GLFC that the shift to Gates 15 and 16 for several months each year become standard procedure.

Plan 1977-A prescribed six gates fully opened in August. This is the first time since July 2005 that the plan prescribed multiple gates. Four gates remained open in September.

Detailed monthly inspections of the Compensating Works were conducted during the reporting period, with no major issues identified.

## **2. Monitoring of Hydrologic Conditions**

The Board continuously monitors the water levels of lakes Superior and Michigan-Huron, and also the water levels and flows in the St. Marys River. The Regulation Representatives' monthly reports to the Board provide hydrologic assessments and recommendations for the regulation of outflows from Lake Superior. These reports indicate the amount of water available for hydropower purposes, after the requirements for domestic use, navigation, and the fishery (St. Marys Rapids) are met.

Tables 1 and 2 list the recent monthly water levels, net basin supplies, and outflows for lakes Superior and Michigan-Huron, respectively. Figure 1 compares the monthly water levels for this period to long-term averages and extremes. Figure 2 shows the monthly precipitation over the lakes Superior and Michigan-Huron basins. Figure 3 shows the monthly net basin supplies for the basins.

Precipitation over the Lake Superior basin was 126% of average from March through August 2013 and would be expected to be exceeded 4% of the time. According to U.S. National Weather Service officials, there was an "anomalously high snowpack in the [upper Great Lakes] basin" this spring, and the snowmelt period was delayed until the end of April to early May timeframe. Precipitation was above average in April, May, July, and August, and slightly below average in March and June. The net basin water supplies to Lake

Superior, which are the net amount of precipitation, evaporation, and runoff to the lake, were slightly below average in March and April, but have been above average since. On the whole, the March through August net basin supplies to Lake Superior would be expected to be exceeded 4% of the time.

Lake Superior's water levels slipped below chart datum (183.2 m or 601.1 ft.) starting on 23 September 2012, but reached chart datum again by 23 May. Levels remained above datum until the end of the reporting period and, on 19 September, were 27 cm (10.6 in.) above chart datum. Its monthly mean levels over the past six months ranged from 9 to 34 cm (4 to 13 in.) below average. On 19 September, its level was at elevation 183.47 m (601.94 ft.), which was 6 cm (2.4 in.) below average and 31 cm (12.2 in.) higher than last year. The levels of Lake Superior have been consistently below average since May of 2005, which is the longest sustained period of below-average monthly levels in the 1918-2012 period of record. Prior to inclusion of 2012 data (which lowered the long-term average values for some months), levels had been consistently below average since April of 1998.

Precipitation over the Lakes Michigan-Huron basin was 112% of average over the past six months according to provisional data and would be expected to be exceeded 16% of the time. Net basin water supplies to Lakes Michigan-Huron were below average in March and July, but were otherwise above average. On the whole, the March through August net basin supplies to Lakes Michigan-Huron would be expected to be exceeded about 16% of the time.

Monthly mean Lakes Michigan-Huron levels ranged from 47 to 67 cm (19 to 26 in.) below average. Water levels had been consistently below chart datum (176.00 m or 577.4 ft.) since 7 August 2012, but reached chart datum again by 29 May where they remained until the end of the reporting period. On 19 September, Lakes Michigan-Huron were at elevation 176.03 m (577.53 ft.), 46 cm (18.1 in.) below average, 18 cm (7.1 in.) higher than last year, and 3 cm (1.2 in.) above chart datum. The level of Lakes Michigan-Huron has been below average since January of 1999, also the longest sustained period of below-average monthly levels on record.

### **3. Regulation of the Outflow from Lake Superior**

The outflows of Lake Superior were as specified by Regulation Plan 1977-A during the reporting period, except in August when outflows were less than those specified by the regulation plan following a unit outage at the BREG hydropower plant. Lake Superior outflows were 92% of average over the last six months, with monthly flows ranging from 1,540 to 2,780 m<sup>3</sup>/s (54,400 to 98,200 cfs). Outflows were limited by Criterion (c) of the Orders during March, April, June, and July. Plan-prescribed outflows were limited to the normal minimum outflow of Plan 1977-A (1560 m<sup>3</sup>/s) during May. About 200 m<sup>3</sup>/s (7060 cfs) below the Plan-prescribed outflow was passed in August due to an unexpected BREG unit outage. Board staff notified the International Joint Commission (IJC) of this situation on 8 August via email and conference call and the Board requested a deviation

from Plan 1977-A by letter on that date. The IJC authorized this under-discharge deviation the same day so as not to exacerbate existing flooding of a portion of Whitefish Island adjacent to the St. Marys Rapids. The small amount of water temporarily stored on Lake Superior, equivalent to a total of 0.6 cm, was likely not sufficient to affect regulatory computations significantly. Plan 1977-A will self-adjust by releasing slightly more water over the coming months.

The gate settings at the Compensating Works supplying the main portion of the St. Marys Rapids were at an equivalent one-half gate open from March through July. The equivalent one-half gate open setting was initially maintained in the typical pattern with Gates 7, 8, 9, and 10 each set at 20 cm (8"). To facilitate sea lamprey control trapping, Gates 9 and 10 were closed and Gates 15 to 16 were each opened from 3 June to 1 August to the 20 cm equivalent opening. On 1 August, Gates 15 and 16 were closed, and Gates 6, 7, 8, 10, 11, and 13 were opened fully to achieve a six gate open setting as per the application of Regulation Plan 1977-A. Gates 9 and 12 were not used (use of U.S. Gates 9 to 11 is customary with a six-gate open setting) to preclude the potential for scour around the railway pier located immediately downstream from them. To achieve a four gate open setting in September, on 3 September, Gates 6 and 13 were closed. Gate 1, which supplies water to the Fishery Remedial Works, remained set at 15 m<sup>3</sup>/s (530 cfs).

It was reported to the Board that no obvious damage was indicated on Whitefish Island or elsewhere from the six-gate opening during August, apart from nuisance flooding of some of the recreational trails and observation structures. Though Batchewana First Nation had noted its displeasure at not being notified prior to the gate movements, the Commission stressed that the band should not have constructed recreational trails and observation decks in the floodplain (without at least notifying the IJC) and that the current chief had been reminded of the land-transfer agreement and flood demarcation mapping prepared during the 1990s. The Board has ensured that band staff were added to the flow change notice distribution list, and hope to arrange a tour of the island with band officials in 2014.

Several scheduled and a few unexpected flow reductions occurred at the three hydropower plants to facilitate maintenance and make repairs. Details are provided in Section 6. All flow reductions were easily offset by flow increases at other times within each month, with the exception of BREG's unit outage in August. When units are taken off-line, water levels immediately downstream of the plants (as indicated by the U.S. Slip gauge) fall, but quickly rise again as the idled units are brought back on-line. No problems related to water levels were reported as a result of these variations. No ships were reported delayed due to the flow variations.

#### **4. Governing Conditions during the Reporting Period**

The monthly mean levels of Lake Superior ranged between 182.90 and 183.44 m (600.1 and 601.8 ft.) during the reporting period, within the limits of 182.76 and 183.86 m (599.6 and 603.2 ft.) specified in the Commission's Orders of Approval.

During the reporting period, the daily mean water levels in the lower St. Marys River at the U.S. Slip gauge downstream of the U.S. Locks, varied between 175.86 and 176.74 m (577.0 and 579.9 ft). Therefore, the Criterion B of the Commission's 1979 Orders (which restricts outflow to no more than preproject values when the level at U.S. Slip is above 177.94 m (583.8 ft.)) was not a concern. Daily mean U.S. Slip levels fell below the ponding restriction threshold (see Section 10) of 176.09 m (577.72 ft.) for 53 days during March, April, and May but no impacts to navigation were reported.

## **5. Inspection and Repairs at the Compensating Works**

Ongoing routine maintenance and inspections of the Compensating Works occurred in the past six months. The structure is generally in good condition.

Routine monthly maintenance inspections continue to be conducted on the Canadian portion by BREG. Inspection observations include public safety features such as fencing and signs, the concrete and masonry structure, gates, and mechanisms, on-site safety equipment such as life jackets and air horns, as well as anything unusual. The August monthly inspection found the Compensating Works facilities to be in good condition. The annual fall inspection was completed on 3 September.

Monthly inspections and routine maintenance continue to be conducted on the U.S. portion by the U.S. Army Corps of Engineers (USACE) Soo Area Office. The 3 September monthly inspection found the Compensating Works facilities to be in good condition.

The periodic inspection/assessment schedule was recently revised to be more balanced for USACE Detroit District funding and manpower. The next periodic inspection of the U.S. portion of the Compensating Works is scheduled for 14-17 July 2014.

## **6. Repairs and Maintenance at the Hydropower Facilities**

### *a. U.S. Government Hydropower Plant*

Units at the plant were offline for a combined total of 1,144 hours during the reporting period. Outages were the result of maintenance, inspections, and ice boom repairs. A significant ice run in the power canal in April resulted after the failure of several ice booms. An outage at Unit 1 for miscellaneous repairs needed from melted brushes accounted for 805 of the 1,144 hours in June and July. A total plant shutdown occurred for about 11 hours on 11 September to repair the ice booms and allow the Corps dive team to replace the foot valve for the condenser pumps. No major maintenance is scheduled for the next six months. The plant is operating well and all water allocations were used.

### *b. Brookfield Renewable Energy Group*

Scheduled maintenance outages continued to be performed. Unit G3 was shut down from 15 April to 15 May for annual inspection and additional repairs. Unit G1 was forced off due to brush gear failure on 6 August. Annual inspection was also performed during the repair, which was completed on September 9. Unit G2 was shut down to replace brushes

on 12 to 13 August. Two 10-hour Unit G2 outages are scheduled for 1 and 2 October to facilitate boom and signage work and two 4-week annual inspection outages on Units G1 and G2 will be staggered next Spring. The annual under water cable inspection and maintenance for Lake Superior Power Ltd. will not be performed. Instead, a test will be performed on the cable itself (on a date yet to be determined). The power entity was able to pass the allotted flows each month, with the exception of August (see Section 3 for details).

*c. Cloverland Electric Coop*

Routine maintenance and inspections were performed at the plant which did not affect the plant's ability to pass their allocated flow. There are no planned outages for the next six months.

## **7. Flow Verification Measurements**

No flow verification measurements were performed during the reporting period.

Discharge measurements to verify the flows through the hydropower plants (last made in September 2010) will continue on a five-year cycle and are next scheduled for 2015.

The United States Geological Survey (USGS) continued to gather data for rating the acoustic Doppler velocity meter (ADVM) on the St. Marys River. When a satisfactory rating is established, data from this meter will be available as a second means of estimating the total flow in the river.

## **8. Water Usage in the St. Marys River**

Table 3 (Table 4 in cubic feet per second) lists the distribution of outflows from Lake Superior for January 2012 to August 2013. Water uses are divided into four categories: domestic, navigation, fishery, and hydropower. According to the 1979 Supplementary Order, after the first three water requirements are satisfied, the remaining outflow is shared equally between the U.S. and Canada for hydropower purposes. Any remainder, beyond the flow capacity of the hydropower plants, is discharged through the Compensating Works into the St. Marys Rapids.

As shown in the tables, water used for domestic and industrial purposes was 3 m<sup>3</sup>/s (106 cfs) over the past six months, or 0.1 to 0.2% of the total monthly outflow.

The monthly flow through the locks depends on traffic volume and varied from 3 to 14 m<sup>3</sup>/s (106 to 494 cfs) during the past six months. As a percentage of the total river flow, water allocated for navigation can vary seasonally from 0.1% (when the locks are closed for the winter) to 1.0% in the busiest part of the navigation season.

The U.S. locks opened on 25 March. The Canadian lock reopened on 15 May.

In accordance with the Commission's Orders to fulfill the fishery needs in the main rapids,

a minimum gate setting of one-half gate open is required at all times at the Compensating Works. A setting equivalent to one-half gate open for the main rapids is maintained by having four gates partially open to supply the same quantity of water. This spreads the flow more evenly across the main rapids, and is thought to reduce potential damage from ice floes impacting the gates. In addition, a flow of at least 15 m<sup>3</sup>/s (530 cfs) is normally also maintained in the Fishery Remedial Works through Gate 1. The flow in the St. Marys Rapids, including that through the Fishery Remedial Works, ranged from 81 to 893 m<sup>3</sup>/s (2,860 to 31,540 cfs) over the last six months, or approximately 4 to 32% of the total monthly outflow. A six-gate fully open pattern (to the main Rapids, plus Gate 1) was prescribed by Plan 1977-A during August, and a four-gate fully open pattern was prescribed in September. This is the first time multiple gates open were prescribed by the Plan since Summer 2005.

The hydropower plants passed an average of 1,712 m<sup>3</sup>/s (60,460 cfs) from March to August for electric power production, or 88.1% of the total river flow. The allocation for this period averaged 1,748 m<sup>3</sup>/s (61,730 cfs). The average monthly unintentional difference of -36 m<sup>3</sup>/s (-1,270 cfs) was due primarily to the -258 m<sup>3</sup>/s (-9,110 cfs) difference that occurred in August following the unexpected BREG unit outage. The August difference was offset somewhat by positive unintentional differences from March to July averaging +8.4 m<sup>3</sup>/s (+1,270 cfs). The BREG unit outage was also the primary source of the -200 m<sup>3</sup>/s (-7,060 cfs) total outflow deviation during August, which was approved by the IJC. Usages at each plant are shown in Tables 3 and 4.

Following audits of the water usage and measurement techniques at the various Canadian facilities and installations on the St. Marys River in Summer 2012, the Board had proposed similar audits of the U.S. side to take place in Summer 2013, but had to postpone these due to availability of staff. The Board now expects to complete the U.S. audits next Summer.

As a result of the Canadian audit, Board staff requested and received revised Essar Algoma Steel usage data extending back to 1980. The Board has also requested revised data for the Canadian Lock, but has yet to receive it. The delay is understood to be the result of resource issues at Parks Canada. The net effect of the Canadian revisions is expected to be less than 10 m<sup>3</sup>/s (350 cfs), and the Board expects to revise Lake Superior outflow records when all revised data is received and once the U.S. audits are completed.

## **9. Long Lac and Ogoki Diversions**

Ontario Power Generation (OPG) continued to provide the Board with information on the operations of the Long Lac and Ogoki Diversions. The Ogoki Diversion into Lake Nipigon (which flows into Lake Superior) averaged 116.2 m<sup>3</sup>/s (4,100 cfs) and the Long Lac Diversion averaged 48.3 m<sup>3</sup>/s (1,710 cfs) from March through August. Combined, these diversions were about 98 percent of average for the period 1944-2012.

Slots cut into Waboose Dam provide a minimum flow northward to the Ogoki River of approximately 2 m<sup>3</sup>/s (to meet fisheries requirements). This slot flow averaged 2.1 m<sup>3</sup>/s

(74 cfs) during March, April, and May. Due to wet conditions, starting near the beginning of June and continuing through the end of August, additional water was spilled northward, such that the average rate of flow was 238.8 m<sup>3</sup>/s (8,435 cfs) during this three-month period.

Continuous minimum flows of at least 2 m<sup>3</sup>/s (70 cfs) are maintained from the Saturday of Victoria Day weekend (in May) through Labour Day from the northern outlet of Long Lake (Kenogami Dam) for environmental enhancement. Wet conditions required additional water to be spilled northward through the Kenogami Dam, starting on July 29 and continuing through August 6. As a result, the July and August flows through the Kenogami Dam averaged 12.2 m<sup>3</sup>/s (431 cfs) and 15.6 m<sup>3</sup>/s (551 cfs), respectively.

## **10. Peaking and Ponding Operations at Hydropower Plants**

Peaking and ponding operations are the within-day and day-to-day flow variations, respectively, that enable the hydropower plants to better match their electricity production with demand. However, these variations cause the water levels in the St. Marys River downstream of the plants to fluctuate more than they otherwise would. The Commission has approved guidelines within which the Board may restrict peaking and ponding operations by the hydropower entities under certain conditions. Specifically, if the minimum level at the U.S. Slip gauge on the lower river is expected to be below the threshold level of 176.09 m (577.7 ft.) as a result of ponding operations, then the power entities are required to pass on-peak flows for at least an 8-hour period each weekend and holiday day to provide periods of relatively higher levels on the lower St. Marys River each day. The Board provides summaries of peaking and ponding in its semi-annual reports.

An IUGLS recommendation to formalize the current peaking and ponding guidelines in the integrated Orders of Approval of Regulation Plan 2012 was reviewed by the IJC. The IJC is expected to include a separate directive on peaking and ponding within a package that will accompany the Orders.

During the reporting period, the power entities undertook peaking and ponding operations under the supervision of the Board. Ponding by the hydropower companies was restricted from the last weekend in March through May due to levels at U.S. Slip being below the threshold. Ponding was permitted on weekends and holidays in June through August. No navigation problems related to peaking and ponding were called to the Board's attention.

To continue to provide timely information on expected flow variations to the users, the USACE distributes monthly notices during the shipping season (March through January) on expected Lake Superior outflows, and a schedule of flow variations at the hydropower plants. No related concerns were reported to the Board during the period.

Figures 4a-4f compare the hourly Lake Superior outflow and the hourly levels at U.S. Slip on the lower St. Marys River. U.S. Slip levels ranged from 38 cm (15 in.) below to 55 cm

(22 in.) above those during the same period in 2012.

## **11. Plan 2012 Implementation**

The Board's staff has been in contact with the IJC's Engineering Advisers regarding Lake Superior Regulation Plan 2012, approved by the Commission as a replacement for Plan 1977-A. The Regulation Representatives and their staff continue to coordinate efforts to make the Study Board's computer code for Plan 2012 operational. The Board sent the IJC a letter on 3 December 2012 to provide comments on the IUGLS report, as per their request dated 30 August 2012. The Board followed this up with a 3 July 2013 letter to seek clarification on a few outstanding technical issues. The IJC responded by letter dated 11 September 2013. One issue is the Compensating Works gate opening rate. A recently approved USACE study to be completed in October (partially funded under the IJC's International Watersheds Initiative (IWI)) may shed more light on appropriate gate opening ramping rates by testing the potential impacts of water level changes on fish species in the Rapids. The Board requested a deviation from Plan-prescribed outflows during October to facilitate these tests by letter dated 7 August 2013. The IJC approved a deviation on 19 September, but Board staff now believe it is possible to undertake these tests without a deviation.

Side-by-side comparisons of monthly regulation computations have also been initiated and coordinated (commencing July 2013) to prepare a simulation of Plan 2012 releases relative to actual ones. This comparison will soon be made available on the Board's Website.

When Plan 2012 is implemented, the Regulation Representatives will adopt a multi-decadal ensemble technique using 100+ years of water supply scenarios to replace the standard technique for water level and outflow forecasting that has been in place for decades. The ensemble forecast has been demonstrated to be more accurate than the old methodology, in that it more closely simulates the true variability in water levels and outflows.

The Regulation Representatives and IJC Engineering Advisers are working on draft directives on peaking and ponding and minor deviation authority to accompany the new Orders. The Commission will require that the Board demonstrate coordination and communication of all proposed deviations with stakeholder groups prior to invoking any deviations, but will leave it up to the Board's discretion to decide when to elevate any concerns to the IJC.

## **12. Annual Meeting with the Public and Public Information**

The Board hosted its annual public meeting and teleconference on the afternoon of 21 August using a new Webinar/teleconference format. About 77 people participated, including members of the public, media, government officials, IJC Commissioner Dereth Glance, Board Members, staff, and associates.

U.S. Alternate Member, COL Bob Peterson, presented information describing the IJC, the

Board, the control structures, the regulation plan, and the current and expected water levels. Commissioner Glance also spoke briefly regarding the approval and implementation of Plan 2012. The meeting was then opened for public comment, questions, and concerns, with COL Peterson chairing. The slide presentation shown during the Webinar was also made available online to callers beforehand, and callers were able to interact with the chairman and other participants during the event.

Stakeholders on lakes Superior and Michigan-Huron both voiced concerns about how the current regulation plan balances the levels of their respective lake, with citizens on Lake Superior concerned over recent gate openings and citizens on Lake Michigan-Huron concerned over the generally-consistent below-average releases over the past decade. Some participants remain concerned about potential impacts due to climate change and variability. There remains some apathy regarding the expected performance of proposed Regulation Plan 2012. Several people continued to express disappointment regarding an IUGLS recommendation that no structures be constructed in the St. Clair River (to restore upstream water levels).

The date of the next meeting with the public will be set at the spring business meeting. An open-house style meeting tied with the Soo Locks Engineer's Day in June was discussed. The Board may also hold a similar Webinar/teleconference again later in 2014 as well.

The Board continues to issue, at the beginning of each month, news releases informing the public about Lake Superior regulation and water level conditions. The Board provides monthly media releases and hydrologic update information to the Commission to maintain a Board Website. A new site format was launched during Summer 2013, and is available at: <http://ijc.org/en/ilsbc>. Content includes information on Board members and responsibilities as well as news releases, semi-annual reports, meeting minutes, Plan comparisons, regulation updates, and hydrologic data summaries. The Board will launch a Facebook page this Fall.

### **13. Board Membership and Meetings**

Mr. Jacob Bruxer replaced Mr. Rob Caldwell as Canadian Regulation Representative effective 26 August. Mr. Caldwell remains the Canadian Secretary.

The Board held a meeting on 19 September in Burlington, Ontario.

Respectfully submitted,

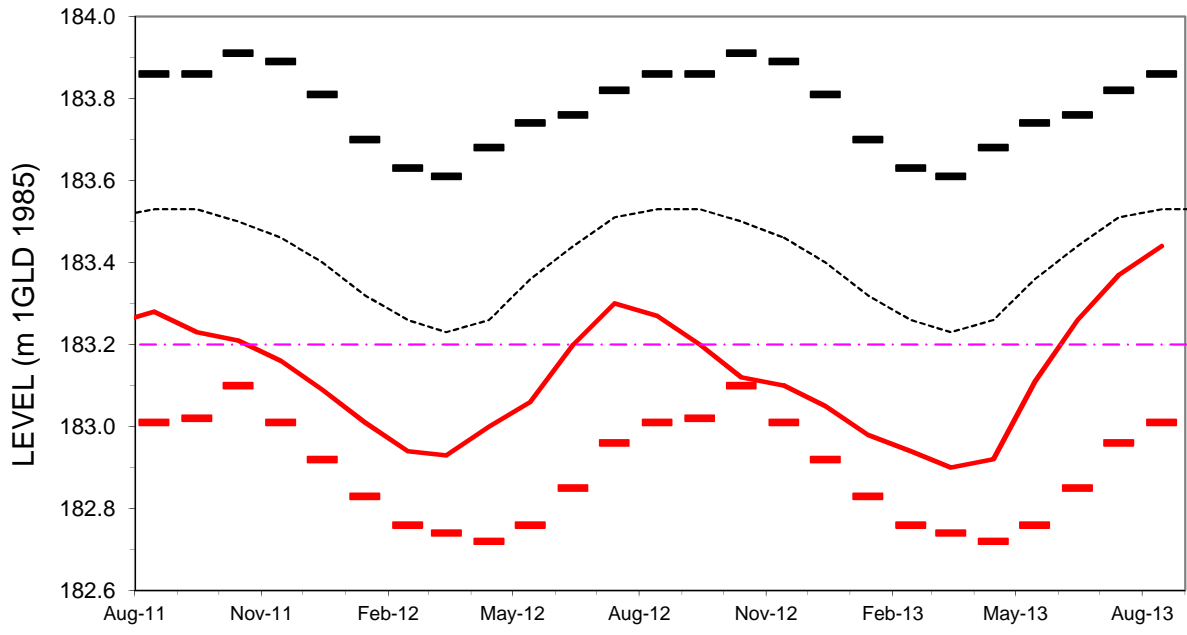
---

Jaymie Gadai  
Member for Canada

---

BG Margaret W. Burcham  
Member for United States

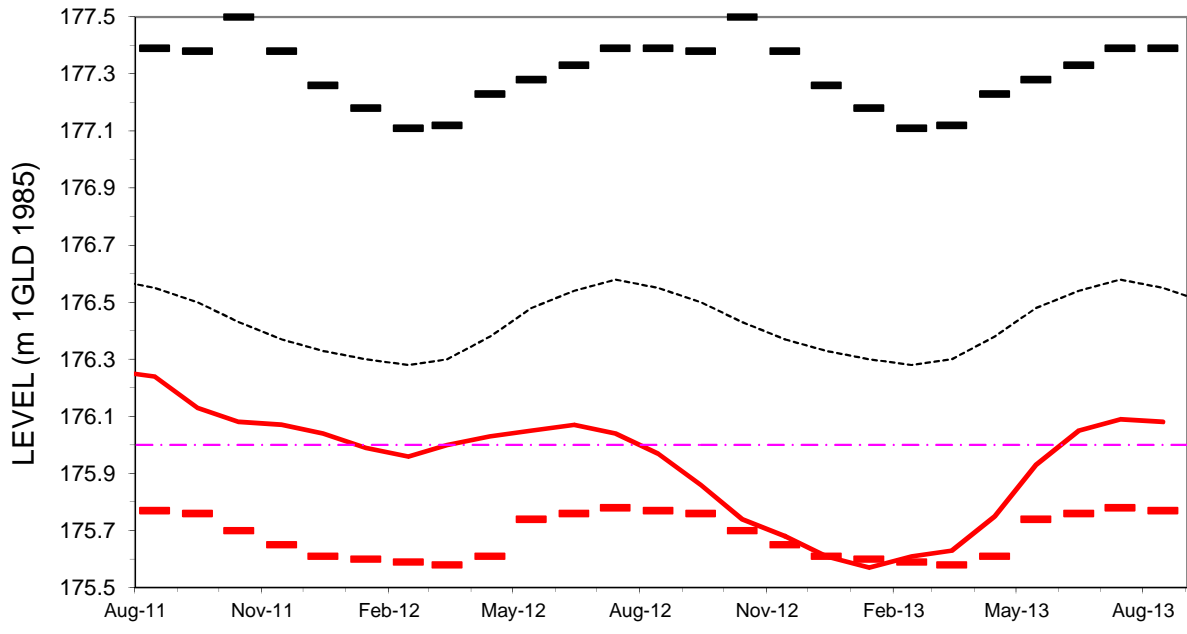
### LAKE SUPERIOR MONTHLY WATER LEVELS



Based on a mean of 5 gauges. Average, maximum, and minimum for period 1918-2012.



### LAKES MICHIGAN-HURON MONTHLY WATER LEVELS



Based on a mean of 6 gauges. Average, maximum, and minimum for period 1918-2012.

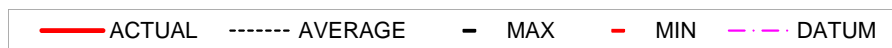
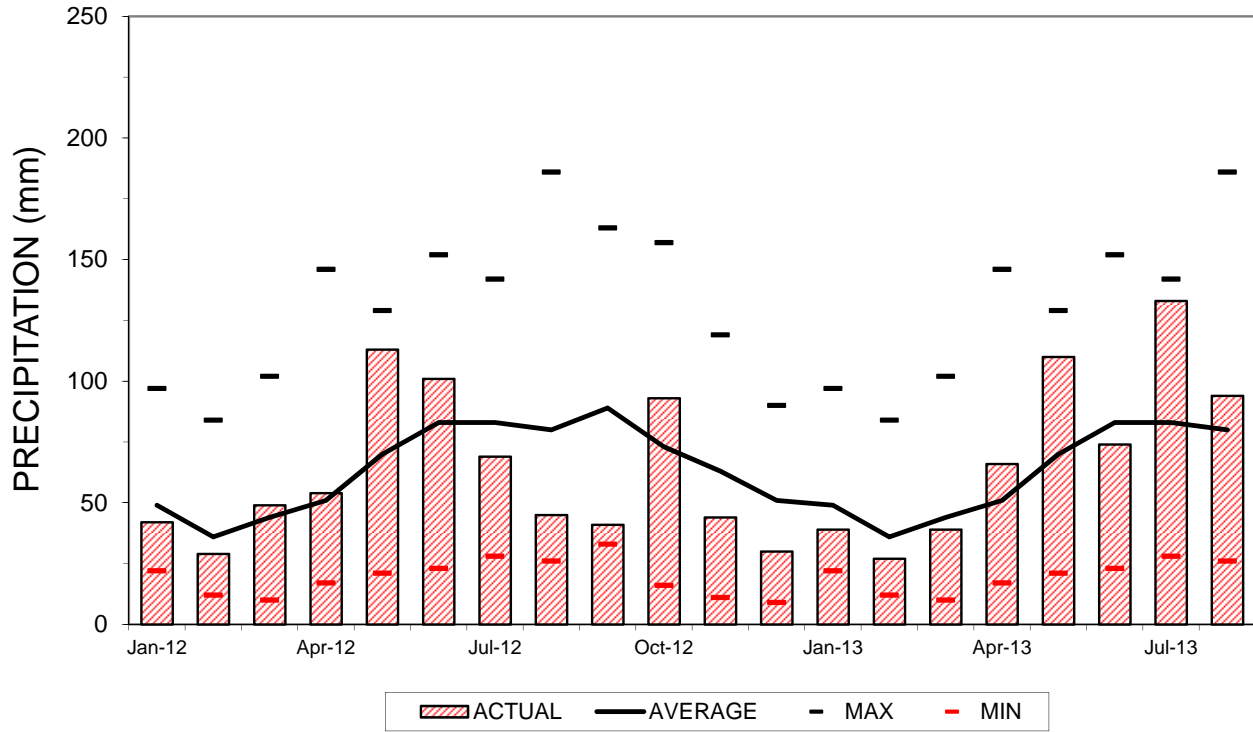
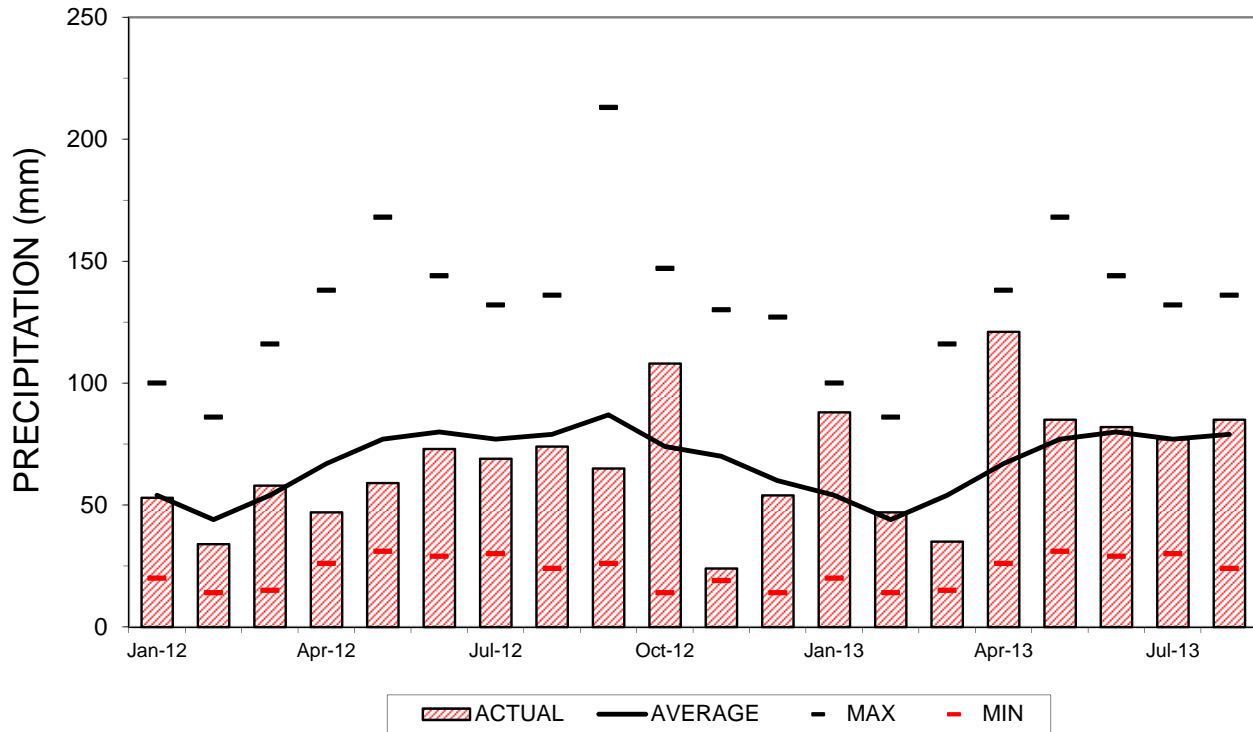


Figure 1

### LAKE SUPERIOR MONTHLY PRECIPITATION



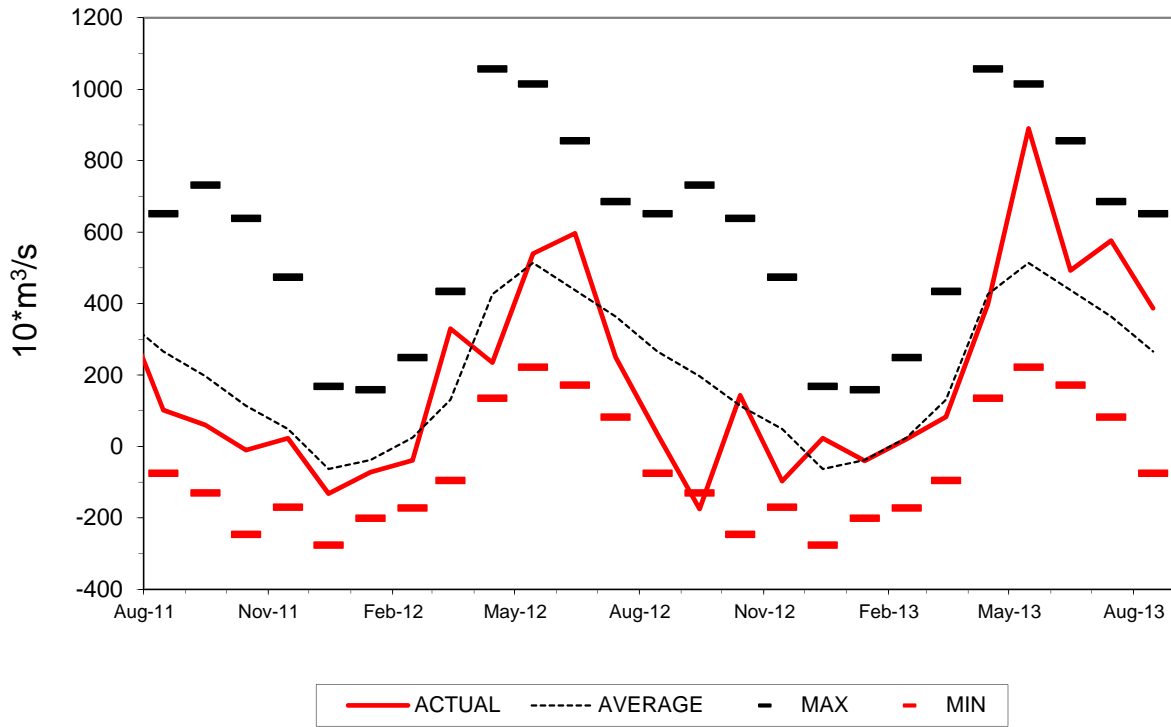
### LAKES MICHIGAN-HURON MONTHLY PRECIPITATION



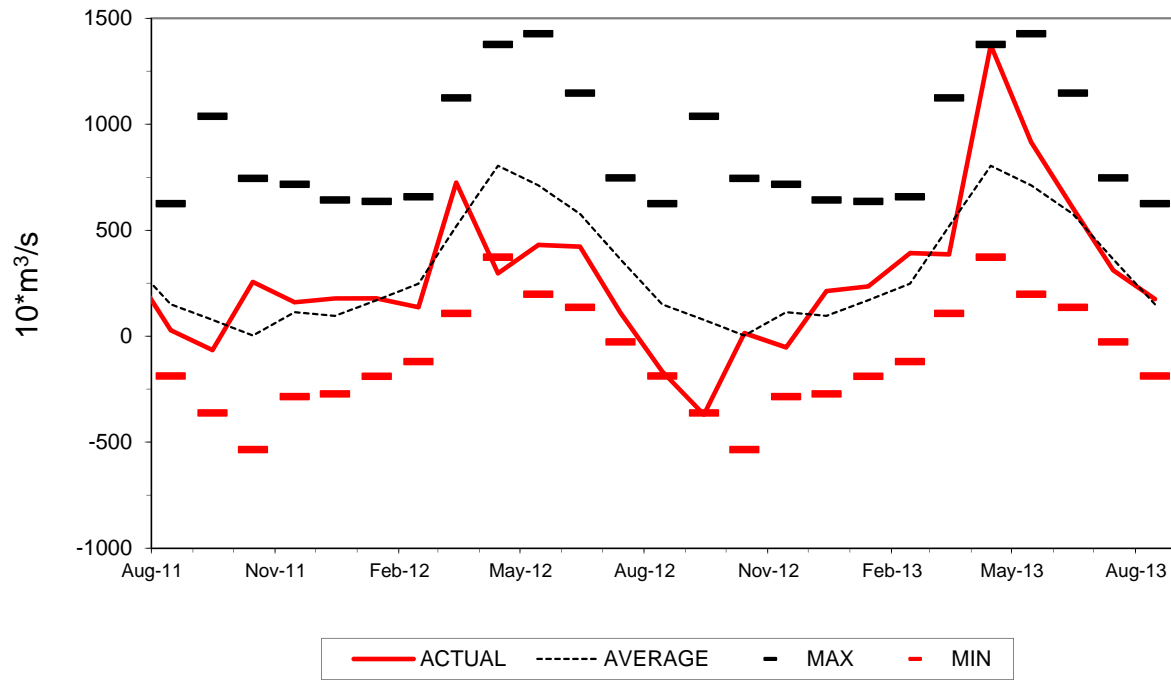
Average, maximum and minimum values based on period of record 1900-2012

Figure 2

### LAKE SUPERIOR MONTHLY NET BASIN SUPPLIES



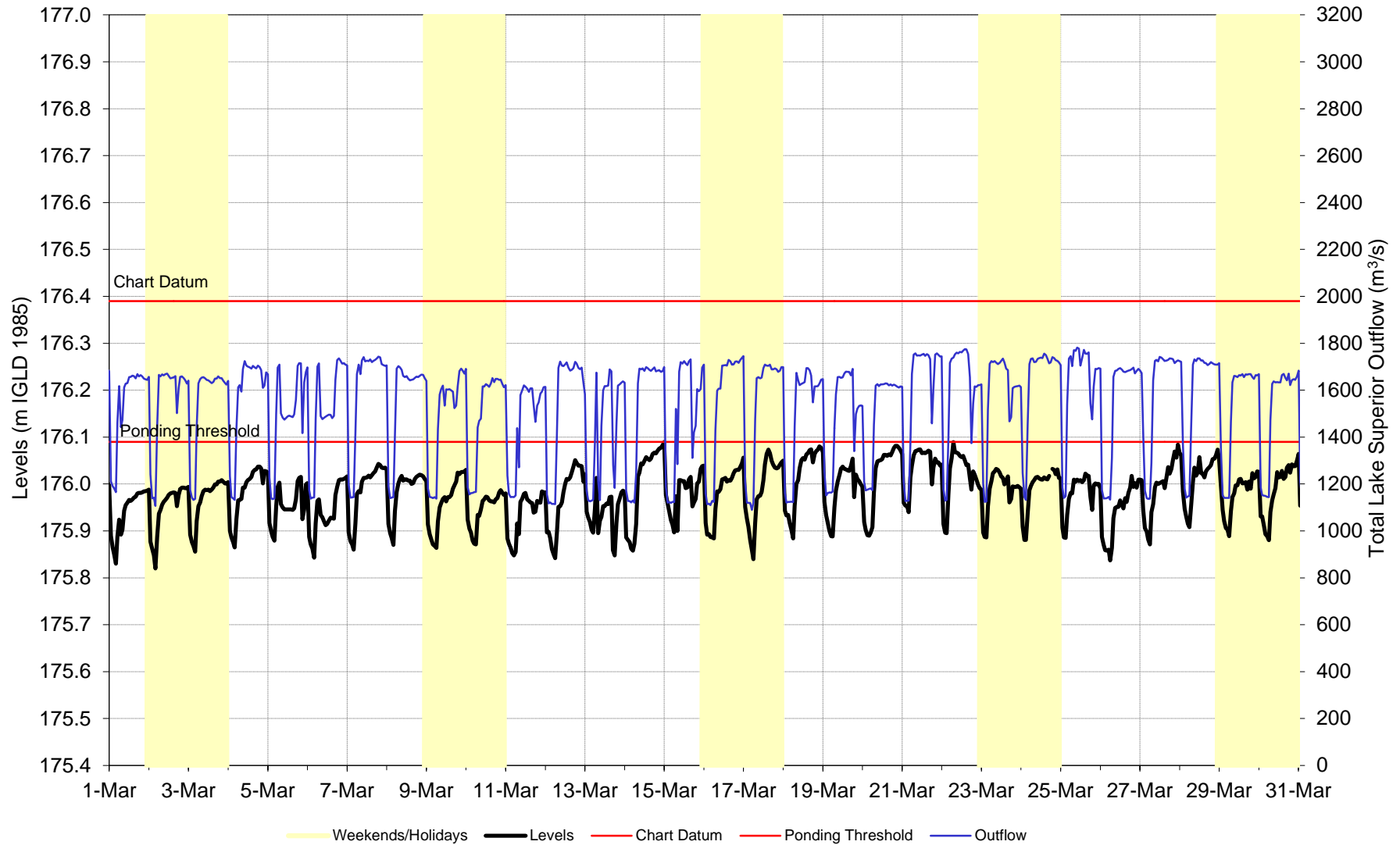
### LAKES MICHIGAN-HURON MONTHLY NET BASIN SUPPLIES



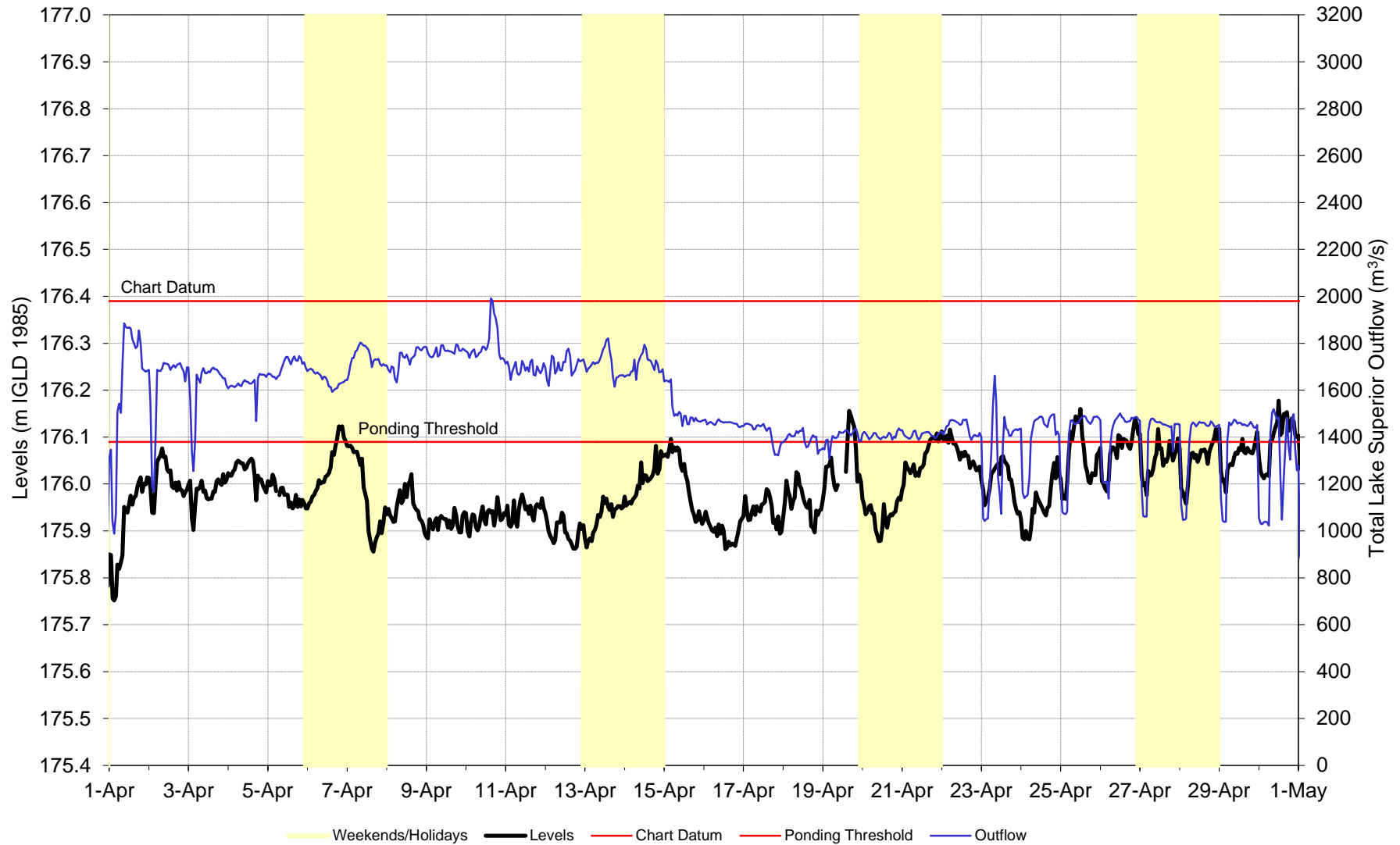
Average, maximum and minimum values based on coordinated period of record 1900-2008.

Figure 3

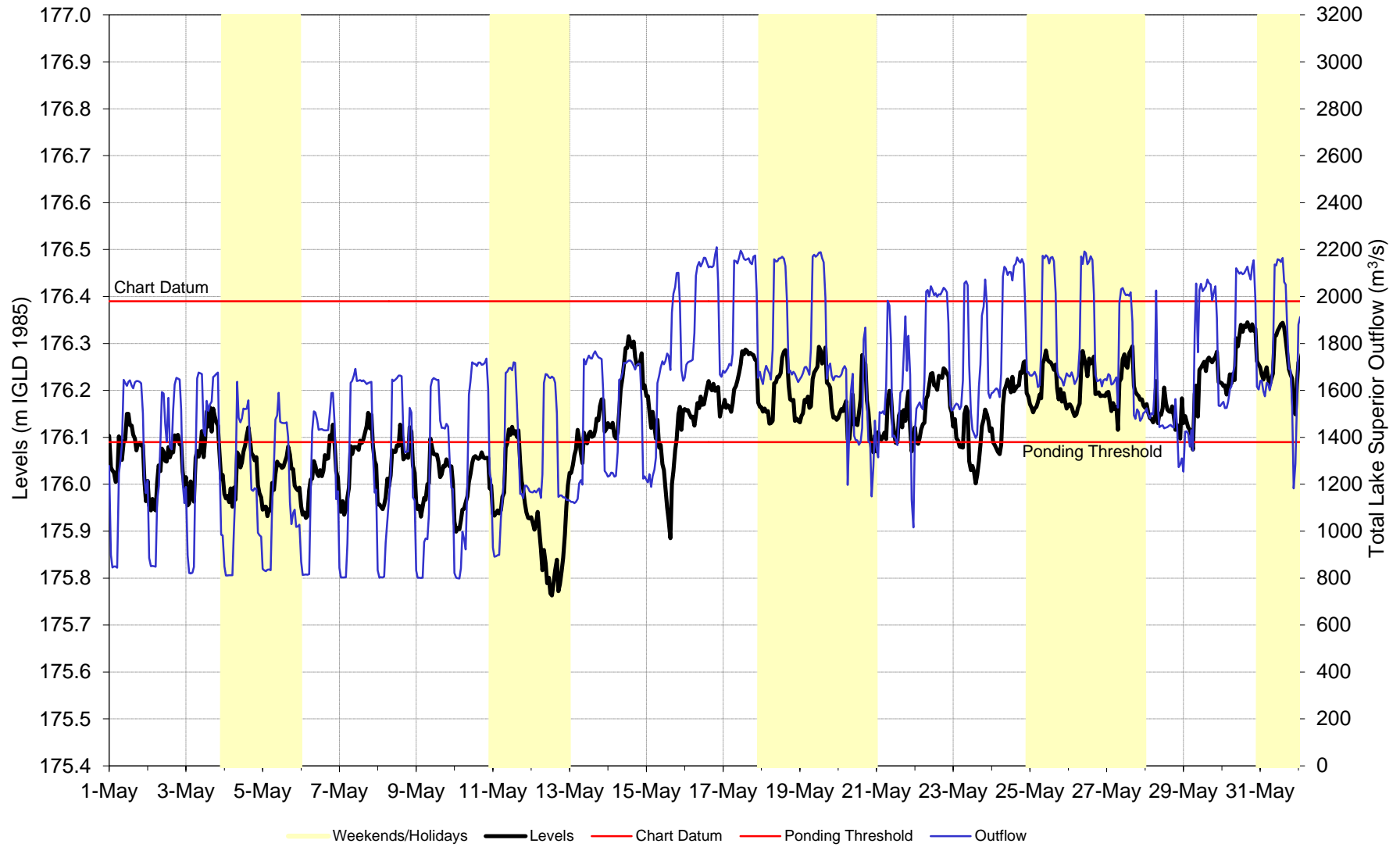
Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4a - March 2013



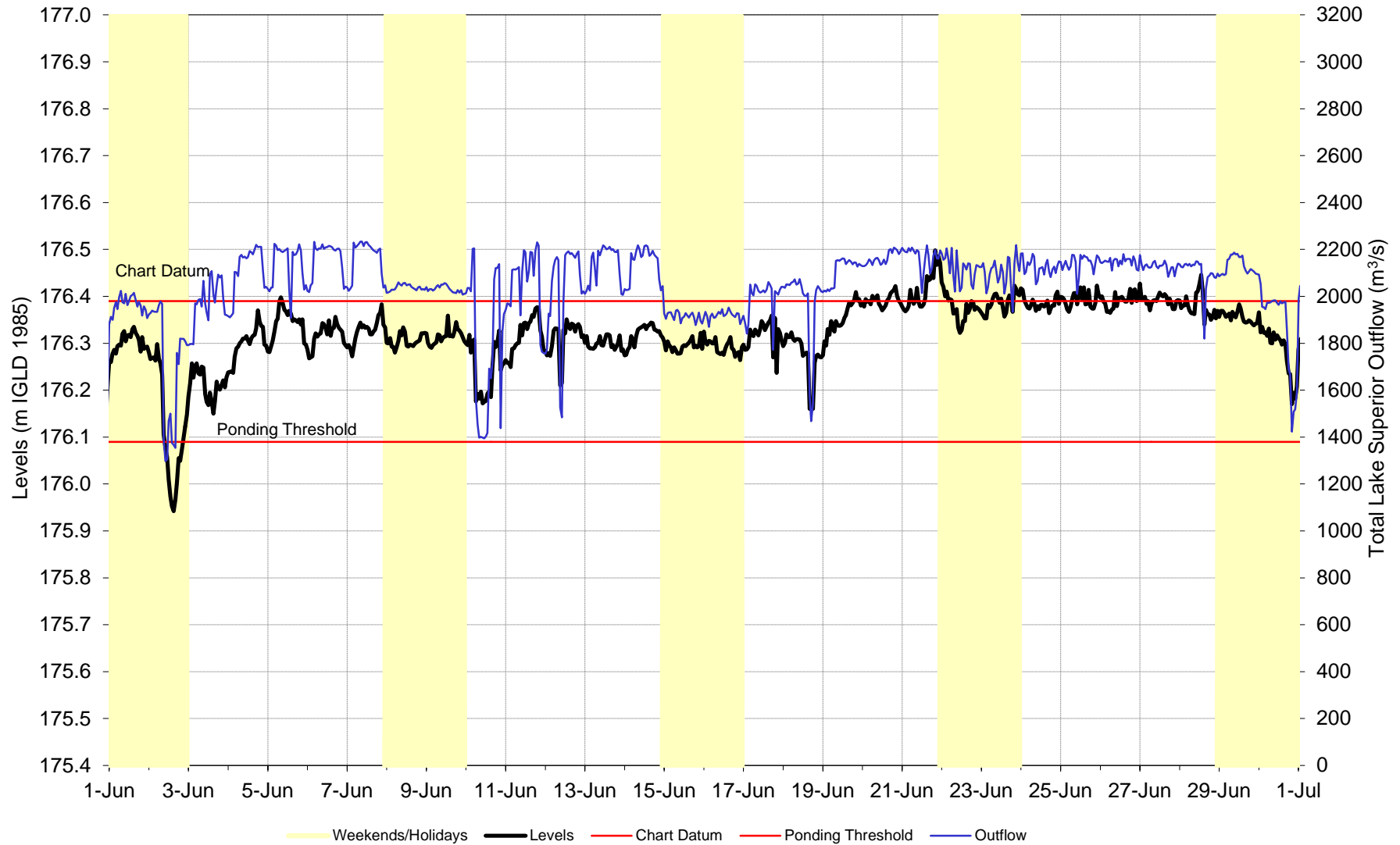
Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4b - April 2013



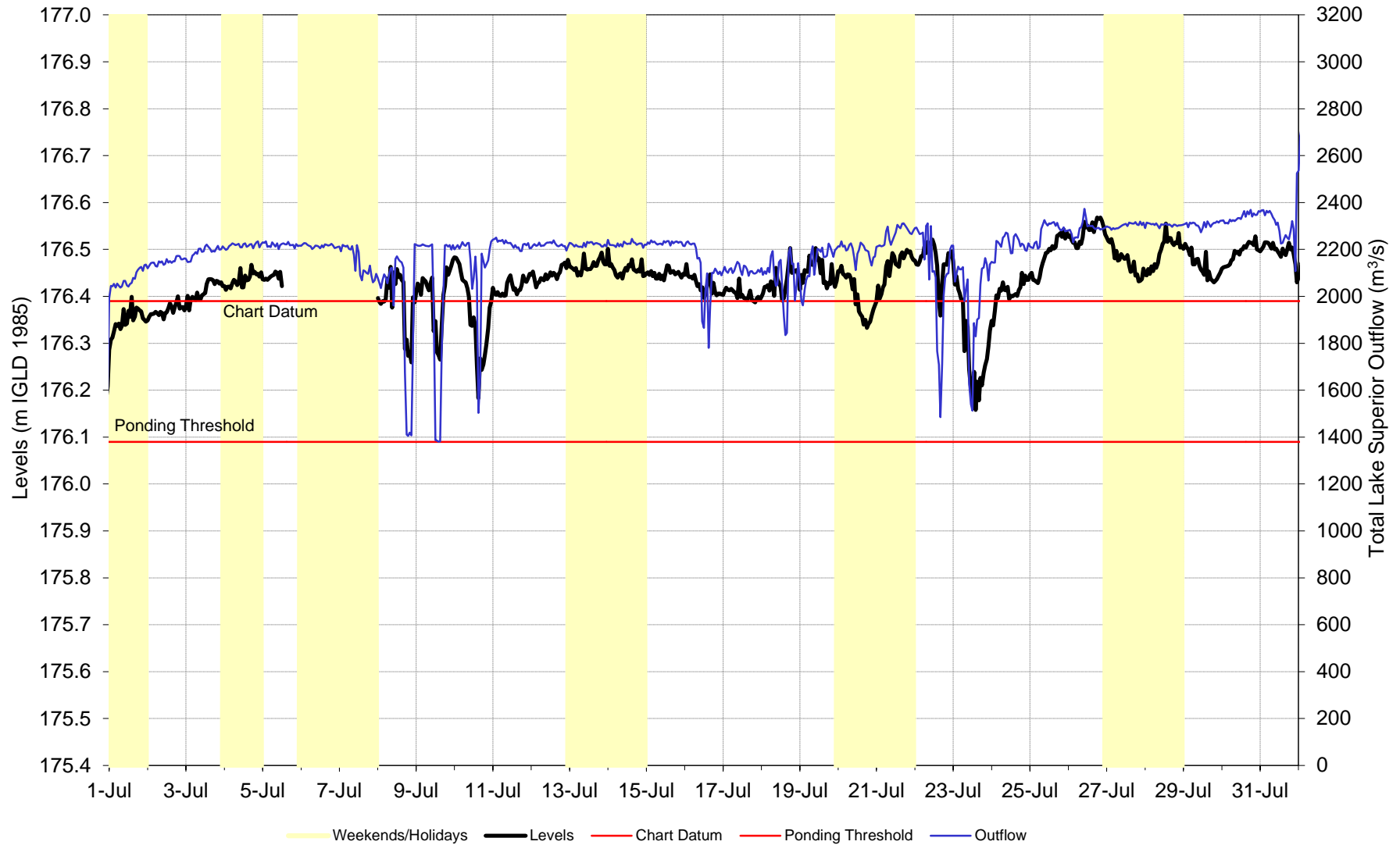
Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4c - May 2013



Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4d - June 2013



Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4e - July 2013



Hourly U.S. Slip Levels & Lake Superior Outflows  
Figure 4f - August 2013

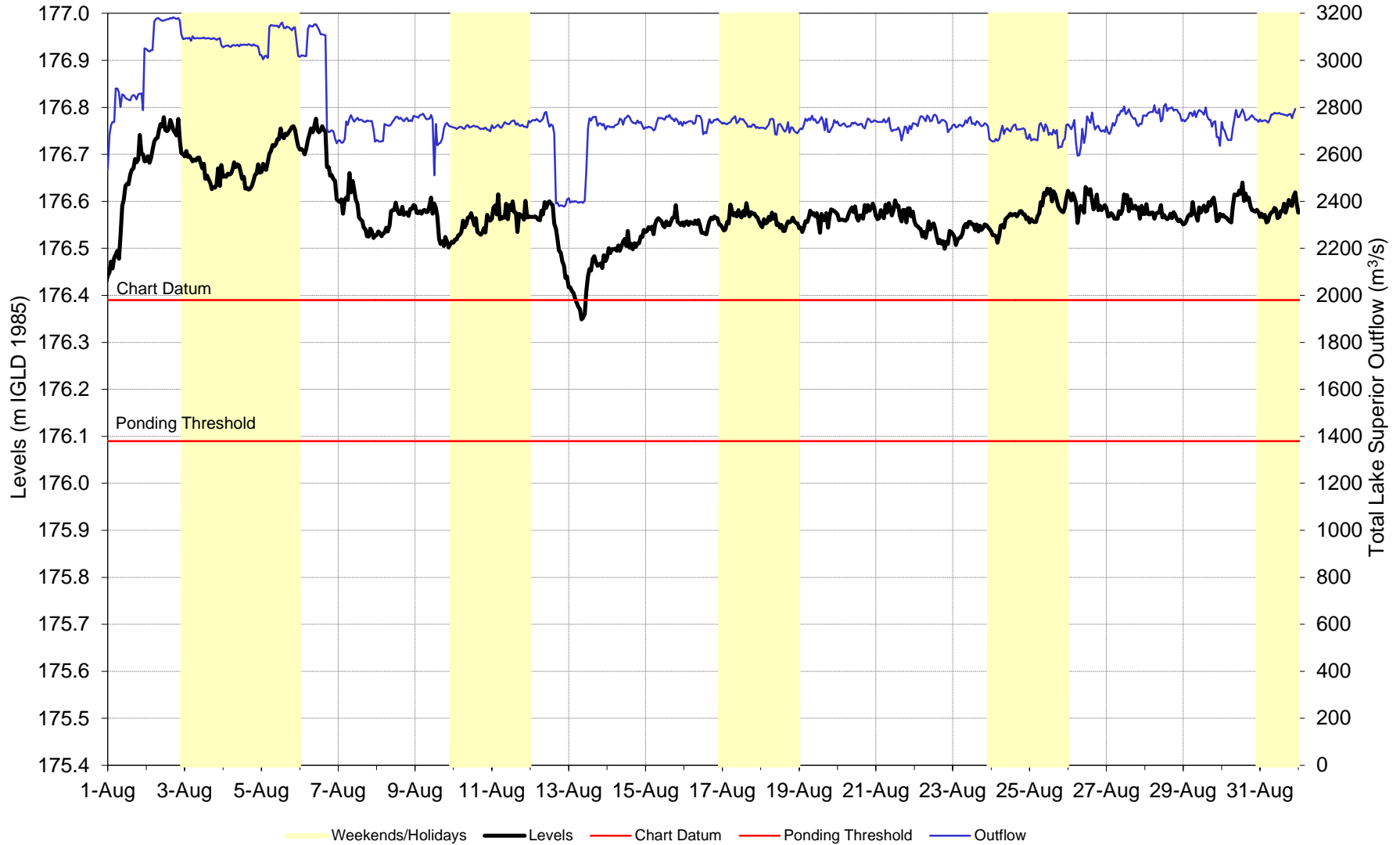


TABLE 1. 2012-2013 Lake Superior Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedence Probability <sup>3</sup> (%)	Monthly Mean Recorded		Percent of Average <sup>4</sup>
	metres	feet	metres	feet	m3/s	tcfs		m3/s	tcfs	
Mar-12	182.93	600.16	-0.30	-0.98	3300	117	6	1500	53	80
Apr-12	183.00	600.39	-0.26	-0.85	2350	83	92	1570	55	81
May-12	183.06	600.59	-0.30	-0.98	5400	191	42	1560	55	74
Jun-12	183.20	601.05	-0.24	-0.79	5970	211	15	1660	59	76
Jul-12	183.30	601.38	-0.20	-0.66	2500	88	83	2090	74	92
Aug-12	183.27	601.28	-0.26	-0.85	340	12	97	2160	76	92
Sep-12	183.20	601.05	-0.33	-1.08	-1750	-62	>99 <sup>5</sup>	1850	65	79
Oct-12	183.12	600.79	-0.38	-1.25	1430	50	39	1530	54	68
Nov-12	183.10	600.72	-0.36	-1.18	-970	-34	89	1620	57	73
Dec-12	183.05	600.56	-0.35	-1.15	230	8	15	1570	55	77
Jan-13	182.98	600.33	-0.34	-1.12	-400	-14	50	1570	55	81
Feb-13	182.94	600.20	-0.32	-1.05	210	7	50	1560	55	82
Mar-13	182.90	600.07	-0.33	-1.08	830	29	64	1540	54	82
Apr-13	182.92	600.13	-0.34	-1.12	3990	141	55	1540	54	80
May-13	183.11	600.75	-0.25	-0.82	8900	314	1	1570	55	74
Jun-13	183.26	601.25	-0.18	-0.59	4930	174	34	2050	72	94
Jul-13	183.37	601.61	-0.13	-0.43	5760	203	5	2190	77	96
Aug-13*	183.44	601.84	-0.09	-0.30	3870	137	17	2780	98	118

Notes: m3/s = cubic metres per second      tcfs = 1000 cubic feet per second

<sup>1</sup> Water Levels are a mean of five gauges on Lake Superior, IGLD 1985

<sup>2</sup> Average levels are for period 1918-2012, based on a mean of five gauges. Differences computed as metres and then converted to feet.

<sup>3</sup> Exceedence probabilities are based on the period 1900-2008.

<sup>4</sup> Average flows are for the period 1900-2008.

<sup>5</sup> New record low supply

\* Provisional estimates

TABLE 2. 2012-2013 Lakes Michigan-Huron Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedence Probability <sup>3</sup> (%)	Monthly Mean Recorded		Percent of Average <sup>4</sup>
	metres	feet	metres	feet	m3/s	tcfs		m3/s	tcfs	
Mar-12	176.00	577.43	-0.30	-0.98	7250	256	19	4640	164	95
Apr-12	176.03	577.53	-0.35	-1.15	2970	105	>99 <sup>5</sup>	4900	173	95
May-12	176.05	577.59	-0.43	-1.41	4300	152	91	4880	172	91
Jun-12	176.07	577.66	-0.47	-1.54	4220	149	78	4900	173	90
Jul-12	176.04	577.56	-0.53	-1.74	1110	39	96	4900	173	89
Aug-12	175.97	577.33	-0.58	-1.90	-1660	-59	98	4880	172	88
Sep-12	175.86	576.97	-0.64	-2.10	-3700	-131	99 <sup>5</sup>	4760	168	87
Oct-12	175.74	576.57	-0.69	-2.26	140	5	45	4710	166	87
Nov-12	175.68	576.38	-0.69	-2.26	-530	-19	79	4570	161	85
Dec-12	175.61	576.15	-0.72	-2.36	2130	75	26	4500	159	87
Jan-13	175.57	576.02	-0.73	-2.40	2350	83	32	4280	151	94
Feb-13	176.61	579.43	0.33	1.08	3920	138	16	4050	143	91
Mar-13	175.63	576.21	-0.67	-2.20	3860	136	70	4420	156	91
Apr-13	175.75	576.61	-0.63	-2.07	13730	485	1	4460	158	87
May-13	175.93	577.20	-0.55	-1.80	9160	323	17	4830	171	90
Jun-13	176.05	577.59	-0.49	-1.61	6050	214	41	4880	172	90
Jul-13	176.09	577.72	-0.48	-1.57	3110	110	62	4760	168	86
Aug-13*	176.08	577.69	-0.47	-1.54	1750	62	43	4890	173	89

Notes: m3/s = cubic metres per second      tcfs = 1000 cubic feet per second

<sup>1</sup> Water Levels are a mean of six gauges on Lakes Michigan-Huron, IGLD 1985

<sup>2</sup> Average levels are for period 1918-2012, based on a mean of six gauges. Differences computed as metres and then converted to feet.

<sup>3</sup> Exceedence probabilities are based on the period 1900-2008.

<sup>4</sup> Average flows are for the period 1900-2008.

<sup>5</sup> New record low supply

\* Provisional estimates

TABLE 3

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOW

YEAR AND MONTH	POWER CANALS				NAVIGATION CANALS				DOMESTIC USAGE			FISHERY	TOTAL LAKE SUPERIOR OUTFLOW m <sup>3</sup> /s	
	US GOVT HYDRO	CEC	US TOTAL	BREG	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S.STE MARIE US+CAN	ESSAR ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	
2012														
JAN	404	330	734	731	1465	4.8	0.0	5	0.3	10.2	0.0	10	83	1563
FEB	412	331	743	732	1475	2.1	0.0	2	0.3	10.0	0.0	10	82	1569
MAR	412	291	703	701	1404	4.2	0.0	4	0.3	9.6	0.0	10	82	1500
APR	411	325	736	728	1464	9.1	0.0	9	0.3	10.1	0.0	10	83	1566
MAY	396	336	732	728	1460	10.8	0.4	11	0.3	9.9	0.0	10	83	1564
JUN	398	337	735	813	1548	11.5	1.1	13	0.3	10.2	0.0	10	85	1656
JUL	412	580	992	987	1979	11.9	2.1	14	0.3	10.6	0.0	11	85	2089
AUG	412	604	1016	1010	2026	11.6	1.9	14	0.3	2.6	0.0	3	114	2157
SEP	388	494	882	866	1748	11.2	1.0	12	0.3	2.6	0.0	3	88	1851
OCT	408	329	737	698	1435	9.3	0.4	10	0.3	2.6	0.0	3	84	1532
NOV	406	359	765	760	1525	9.4	0.0	9	0.3	2.4	0.0	3	84	1621
DEC	417	325	742	732	1474	9.7	0.0	10	0.3	2.6	0.0	3	83	1570
2013														
JAN	411	329	740	736	1476	4.0	0.0	4	0.3	2.6	0.0	3	83	1566
FEB	405	334	739	736	1475	1.4	0.0	1	0.3	2.6	0.0	3	82	1561
MAR	411	322	733	720	1453	3.0	0.0	3	0.3	2.5	0.0	3	82	1541
APR	405	322	727	718	1445	9.1	0.0	9	0.3	2.6	0.0	3	81	1538
MAY	413	352	765	707	1472	10.4	0.4	11	0.3	2.6	0.0	3	84	1570
JUN	342	620	962	987	1949	11.5	1.1	13	0.3	2.5	0.0	3	85	2050
JUL	353	681	1034	1049	2083	12.0	1.8	14	0.3	2.7	0.0	3	86	2186
AUG	408	718	1126	744	1870	11.5	1.9	13	0.3	2.7	0.0	3	893	2779

NOTE: POWER CANALS COLUMNS INCLUDE FLOWS THROUGH POWER PLANTS AND SPILLWAYS

TABLE 4

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOW

YEAR AND MONTH	POWER CANALS				NAVIGATION CANALS			DOMESTIC USAGE			FISHERY	TOTAL LAKE SUPERIOR OUTFLOW CFS		
	US GOVT HYDRO	CEC	US TOTAL	BREG	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S. STE MARIE US+CAN	ESSAR ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	
2012														
JAN	14300	11700	26000	25800	51800	170	0	170	11	360	0	371	2930	55300
FEB	14500	11700	26200	25900	52100	74	0	74	11	353	0	364	2900	55400
MAR	14500	10300	24800	24800	49600	148	0	148	11	339	0	350	2900	53000
APR	14500	11500	26000	25700	51700	321	0	321	11	357	0	368	2930	55300
MAY	14000	11900	25900	25700	51600	381	14	395	11	350	0	361	2930	55300
JUN	14100	11900	26000	28700	54700	406	39	445	11	360	0	371	3000	58500
JUL	14500	20500	35000	34900	69900	420	74	494	11	374	0	385	3000	73800
AUG	14500	21300	35800	35700	71500	410	67	477	11	92	0	103	4030	76100
SEP	13700	17400	31100	30600	61700	396	35	431	11	92	0	103	3110	65300
OCT	14400	11600	26000	24600	50600	328	14	342	11	92	0	103	2970	54000
NOV	14300	12700	27000	26800	53800	332	0	332	11	85	0	96	2970	57200
DEC	14700	11500	26200	25900	52100	343	0	343	11	92	0	103	2930	55500
2013														
JAN	14500	11600	26100	26000	52100	141	0	141	11	92	0	103	2930	55300
FEB	14300	11800	26100	26000	52100	49	0	49	11	92	0	103	2900	55200
MAR	14500	11400	25900	25400	51300	106	0	106	11	88	0	99	2900	54400
APR	14300	11400	25700	25400	51100	321	0	321	11	92	0	103	2860	54400
MAY	14600	12400	27000	25000	52000	367	14	381	11	92	0	103	2970	55500
JUN	12100	21900	34000	34900	68900	406	39	445	11	88	0	99	3000	72400
JUL	12500	24000	36500	37000	73500	424	64	488	11	95	0	106	3040	77100
AUG	14400	25400	39800	26300	66100	406	67	473	11	95	0	106	31500	98200

NOTE: POWER CANALS COLUMNS INCLUDE FLOWS THROUGH POWER PLANTS AND SPILLWAYS

NOTE: Flows for individual users were originally coordinated in m3/s, and are converted here to U.S. customary units (cfs) and rounded to 3 significant figures. Total flow for each category and total Lake Superior flow in this table are computed from the individual flows in cfs.