

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

International Lake Superior Board of Control



Canada
Jaymie Gadai, Member
Rob Caldwell, Secretary

April 2, 2014

Dr. Charles A. Lawson
Secretary, U.S. Section
International Joint Commission
2000 L Street, N.W.
Suite 615
Washington, DC 20440

Ms. Camille Mageau
Secretary, Canadian Section
International Joint Commission
234 Laurier Avenue West
22nd Floor
Ottawa, ONT K1P 6K6

Dear Secretaries:

Enclosed are 2 advance copies of the Board's Semi-Annual Progress Report. The Board will be pleased to discuss the report with the Commission in Washington on April 30 and will present signed copies to the Commission's Secretaries at that time. This letter is being sent to both Sections of the Commission with the concurrence of the Canadian Secretary of the Board.

John W Kangas
Secretary, U.S. Section

Enclosures
As stated

DISTRIBUTION:
Board Members
Regulation Representatives
Mr. Caldwell

**International Lake Superior
Board of Control**

**Semi-Annual Progress Report to the
International Joint Commission**

Covering the period September 20, 2013 to March 25, 2014

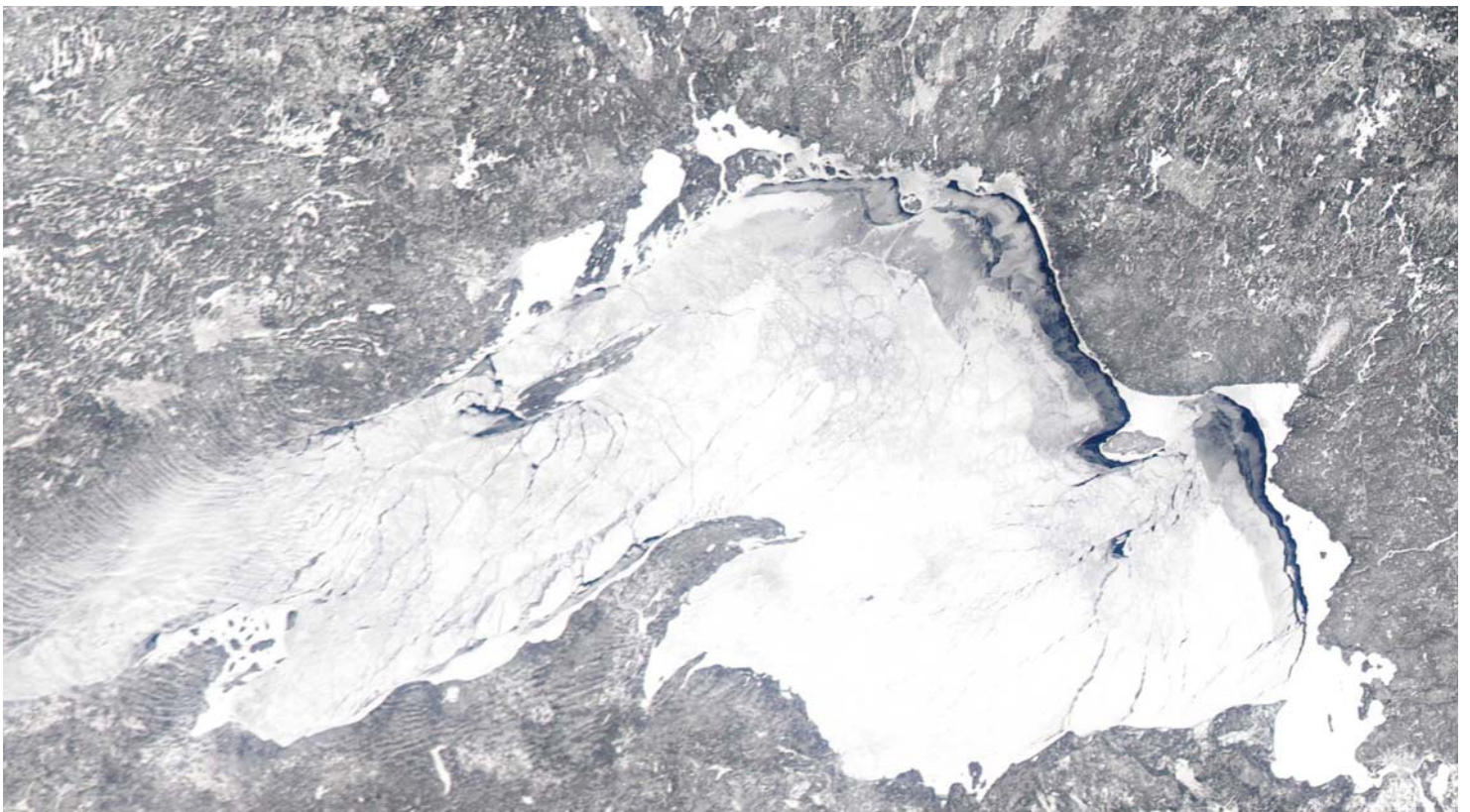


Table of Contents

1. Highlights	3
2. Monitoring of Hydrologic Conditions	4
3. Regulation of the Outflow from Lake Superior	5
4. Governing Conditions During the Reporting Period	5
5. Inspections and Repairs at the Compensating Works	5
6. Repairs and Maintenance at the Hydropower Facilities	6
a. U.S. Government Hydropower Plant	6
b. Brookfield Renewable Energy Group	6
c. Cloverland Electric Co-operative	6
7. Flow Verification Measurements	6
8. Water Usage in the St. Marys River	7
9. Long Lac and Ogoki Diversion	8
10. Peaking and Ponding Operations at Hydropower Plants	8
11. Gate Movement Limits Study	9
12. Plan 2012 Implementation	9
13. Annual Meeting with the Public and Public Information	9
14. Board Membership and Meetings	10

Figures

Figure 1: Lake Superior Monthly Levels

Figure 2: Lakes Michigan-Huron Monthly Levels

Figure 3: Lake Superior Monthly Precipitation

Figure 4: Lakes Michigan-Huron Monthly Precipitation

Figure 5: Lake Superior Net Basin Supplies

Figure 6: Lakes Michigan-Huron Net Basin Supplies

Figure 7a-f: Hourly U.S. Slip Levels & Lake Superior Outflows – September 2013 to February 2014

Tables

Table 1: 2013-2014 Lake Superior Hydrologic Factors

Table 2: 2013-2014 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)

Cover photo: Satellite image of Lake Superior on February 16, 2014, NOAA.

International Lake Superior Board of Control

Canada
Mr. Jaymie Gadal, Member
Mr. Rob Caldwell, Secretary

United States
BG Margaret Burcham, Member
Mr. John W. Kangas, Secretary

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

March 25, 2014

Commissioners:

This semi-annual report covers the Board's activities from September 20, 2013 to March 25, 2014.

1. Highlights

During the past six months (September 2013 to February 2014), the water levels of Lake Superior were below average. Lake Superior monthly mean water levels have been consistently near or below average since May of 1998, which is the longest sustained period of below-average monthly levels in the 1918-2013 period of record (IGLD 1985). The water levels were from 28 centimetres (cm) (11 inches (in)) above to 33 cm (13 in) above last year's levels during the reporting period.

The levels of Lake Michigan-Huron have been below average since January of 1999, the longest period on record of consistently below average levels. Over the past six months, monthly mean Lake Michigan-Huron levels have been 33 cm (13 in) to 46 cm (18 in) below average. Although below average, the levels are 18 cm (7 in) to 38 cm (15 in) above last year's levels.

Ice cover on Lake Superior peaked at the beginning of March at approximately 96% ice concentration, and the Great Lakes system as a whole peaked at 92% at the beginning of March. The basin experienced sustained, unusually cold temperatures this winter season. The last time basin-wide ice concentrations were over 90% was in 1994, and before that, 1979.

The Lake Superior outflows were as specified by Regulation Plan 1977-A throughout the reporting period, and between 103% and 123% of average. Monthly outflows from Lake Michigan-Huron ranged from 87% to 98% of average. Water supplies to Lake Superior were above average for all months of the reporting period except for the month of January. Water supplies for the majority of months for Lake Michigan-Huron were also above average; September and February were the exceptions.

Ponding by the hydropower entities was permitted on weekends and holidays for the entire reporting period, due to levels at U.S. Slip being above the threshold. However, with plants running at capacity in September and October, ponding was not feasible.

2. Monitoring of Hydrologic Conditions

The Board continuously monitors the water levels of lakes Superior and Michigan-Huron, and the water levels and flows in the St. Marys River. The Regulation Representatives' monthly reports to the Board provide hydrologic assessments and recommendations on 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) were met.

Tables 1 and 2 show the recent monthly water levels, net basin supplies, and outflows for lakes Superior and Michigan-Huron, respectively. *Figures 1 and 2* compares monthly water levels over a two year period to long-term averages and extremes. *Figures 3 and 4* show the monthly precipitation over the Lake Superior and Michigan-Huron basins. *Figures 5 and 6* depict the monthly net basin supplies for the basins.

Precipitation over the Lake Superior basin was 78% of average from September 2013 through February 2014 and would be expected to be exceeded 88% of the time. The net basin water supplies to Lake Superior, which are the net effect of precipitation, evaporation and runoff to the lake, were greater than normal over most of the reporting period. The September 2013 through February 2014 net basin supplies to Lake Superior would be expected to be exceeded 23% of the time.

Lake Superior's monthly mean water level has been above chart datum (183.20 m or 601.1 ft) since June 2013 and ended the reporting period approximately 4 cm (2 in) above. Lake Superior's monthly mean levels over the past six months ranged from 2 to 6 cm (1 to 2 in) below average, which is above last year's levels by 28 to 33 cm (or 11 to 12 in). As of March 25, 2014, Lake Superior was at an elevation of 183.22 m (601.13 ft), which is March's monthly average. This is 33 cm (13 in) higher than one year ago, and 2 cm (1 in) above chart datum.

Precipitation over the Lake Michigan-Huron basin was 82% of average over the past six months and would be expected to be exceeded 76% of the time. Water supplies to Lake Michigan-Huron were above average for the majority of the reporting period, with September and February being the exceptions. The net basin supplies for this time period would be expected to be exceeded about 41% of the time.

Monthly mean Lake Michigan-Huron levels ranged from 33 to 46 cm (13 to 18 in) below long-term averages. Water levels ranged from 5 cm below to 4 cm above chart datum (-2 to 2 in) during the reporting period. The monthly mean levels in December and January were 36 cm (14 in) and 38 cm (15 in) higher, respectively, than the record lows for December 2012 and January 2013. On March 25, 2014, Lake Michigan-Huron was at an elevation of 175.94 m (577.24 ft), 35 cm (14 in) below March's monthly average, 31 cm (12 in) higher than one year ago, and 6 cm (2 in) below chart datum. The level of Lake Michigan-Huron has been below average since 1999, the longest sustained period of below-average monthly levels on record.

Modeled snow water equivalent data from the National Operational Hydrologic Remote Sensing Center (NOHRSC) indicates that as of March 25, 2014, snowpack was considerably more than last year around the same time across the northern portion of the Great Lakes basin.

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. Lake Superior outflows were 111% of average over the last six months, with monthly flows ranging from 1,970 to 2,790 m³/s (69,570 to 98,528 ft³/s). Outflows were limited by Criterion (c) of the Orders November 2013 through March 2014.

The gate settings at the Compensating Works supplying the main portion of the St. Marys Rapids were set to four gates open in September and October during the period of high flow. The gates were set to a one-half gate open equivalent from November through March. The equivalent one-half gate open setting was maintained using Gates 7 to 10 open 20 cm (8 in). Gates 7, 8, 10, and 11 were open in September and October. Gate 1, which supplies water to the Fishery Remedial Works, was maintained at the prescribed 15 m³/s during the reporting period.

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* of this report. All flow reductions were offset by flow increases at other times within each month. When units are taken off-line, water levels at 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 183.24 and 183.48 m (601.18 and 601.96 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 176.89 and 176.19 m (577.07 and 578.05 ft). Therefore, Criterion B of the Commission's 1979 Orders, which restricts outflow to no more than pre-project 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 stayed above the ponding restriction threshold (see *Section 10*) of 176.09 m (577.72 ft) for the reporting period. Ponding was permitted during the entire reporting period, but with plants running at capacity in September and October, there was no opportunity to perform ponding operations.

5. Inspections and Repairs at the Compensating Works

Monthly inspections and routine maintenance of the Compensating Works are conducted on the U.S. portion by the US Army Corps of Engineers' (USACE) Sault Ste. Marie Area Office. All gates, railings, and locks were reported to be in good working order over the reporting period. Monthly inspections will resume in April 2014 and continue through November 2014. Monthly inspections of the Compensating Works are not performed during the winter months.

The next U.S. periodic inspection of the Compensating Works is scheduled for the week of July 14th, 2014.

Routine monthly maintenance inspections continue to be conducted on the Canadian portion of the Compensating Works by Brookfield Renewable Energy Group (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 fall 2013 inspections found the Compensating Works facilities to be in good condition.

In the summer of 2013, a Five-Year Dam Safety assessment was completed by Hatch, a third party consultant, as part of the Brookfield Dam Safety Program; no major issues were noted. The assessment found the Compensating Works facilities to be in good condition. Identified action items will be addressed in Brookfield's 20-Year Capital and Major Maintenance program. Routine Dam Safety inspections and Compensating Gates maintenance inspections are planned for 2014.

6. Repairs and Maintenance at the Hydropower Facilities

a. U.S. Government Hydropower Plant

The outage total for September through January was 869 hours: 73 hours for Hydro Unit 1; 6 hours for Unit 2; 18 hours for Unit 3; 47 hours for Unit 3A; and 725 hours for Unit 10. Hydro Unit 10 was offline 706 hours for the entire month of October due to unplanned repairs, making up most of the total outage hours. The October allocation requirement was unattained due to the Unit 10 outage and the other plants running at capacity and unable to take on additional flow. In the coming months, the plant will be updating its SCADA operating system.

b. Brookfield Renewable Energy Group

Planned outages totaled 279 hours throughout the reporting period. Unscheduled outages totaled 93.5 hours, with 20 of those hours due to unit shutdowns in response to heavy rainfall that resulted in water entering the plant, and 72 hours due to a transmitter switching error. Both of these unexpected outages occurred in November, and Brookfield was unable to meet its flow allocation this month; no other outages affected Brookfield's ability to meet its discharge allotment during the reporting period. Upcoming scheduled maintenance will include a six-week outage on Unit 1 beginning the middle of April 2014 to perform annual inspections and rotor arm repairs.

c. Cloverland Electric Co-operative

Cloverland had no major outages that affected allocation or discharge. Canal repairs are expected to take place late this summer, which will reduce flows and impact the ability to use allocation.

7. Flow Verification Measurements

Discharge measurements were made at the Compensating Works in August 2012. The draft report has been finalized this reporting period.

The 2012 discharge measurements made below the rapids for gate settings of 1- and 2-gates open were consistent with the 1931 ratings and with other historical measurements. For 3-gates open the 2012 measurements made upstream of the structure were also near or slightly below the rating and similar to other reliable historical measurements. For 4- and 5-gates open, the measurements were higher than the rating, but also higher than most of the historical measurements. Low water levels in 2012 and the resulting shallow areas upstream of the Compensating Works may have affected the measurements.

For both ½ -gate and ½ -gate equivalent settings there is very little difference between the various methods of computing the flows. At these settings all historical measurements showed consistent results and all showed satisfactory results when compared to the computed flows. The methods presently used in operations to compute both forecasted and actual flows for a ½ -gate open setting seem to be appropriate.

It is recommended that periodic discharge measurements continue to be made at the Compensating Works, particularly at gate settings above 3-gates open.

8. Water Usage in the St. Marys River

Table 3 (Table 4 in English units) lists the distribution of outflows from Lake Superior for January 2013 to February 2014. 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 ranged from 2 to 3 m³/s (71 to 106 ft³/s) or 0.1 to 0.2% of the total monthly outflow.

The monthly flow through the locks depends on traffic volume and varied from 0 to 12 m³/s (0 to 424 ft³/s) over 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, up to 1.0% during the busiest part of the navigation season.

In accordance with the Commission's Orders to fulfill the fishery needs in the main rapids, a minimum gate setting of a ½ gate open is required at all times at the Compensating Works. A setting equivalent to ½ 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 gate. The flow in the St. Marys Rapids, including that through the Fishery Remedial Works, ranged from 85 to 657 m³/s (279 to 2,156 ft³/s) over the last six months, or approximately an average of 16% of the total monthly outflow. August through October 2013 was the first time since August 2008 that the plan called for more than a ½ gate open.

The hydropower plants passed an average of 2,060 m³/s (72,750 ft³/s) from September 2013 to February 2014 for electric power production, or 88% of the total river flow. The allocation for this period averaged 2,060 m³/s (72,910 ft³/s). Usages at each plant are shown in *Tables 3 and 4*.

9. Long Lac and Ogoki Diversion

Ontario Power Generation (OPG) provided the Board with information on the operations of the Long Lac and Ogoki Diversions. The Ogoki Diversions into Lake Nipigon (which flows into Lake Superior) averaged 97.2 m³/s (3,431 ft³/s) and the Long Lac Diversion averaged 42.8 m³/s (1,512 ft³/s) from September 2013 through February 2014. Combined, these diversions were about 101% of average for the period 1944-2013.

Slots cut into Waboose Dam provide a minimum flow northward into the Ogoki River of approximately 2 m³/s to meet fisheries requirements. However, continued wet conditions (which began in June 2013) resulted in additional water being spilled northward from September through the beginning of October, such that the average rate of flow was 170 m³/s (6,004 ft³/s) during these two months. As drier conditions returned, the flow was again reduced to the minimum “slot flow” by mid-October, and averaged 2 m³/s (70 ft³/s) from November 2014 through February 2014.

10. Peaking and Ponding Operations at Hydropower Plants

Peaking and ponding operations are the within-day and day-to-day flow variations that enable the hydropower plants to better align 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 (577.72 ft) as a result of ponding operations, then the power entities are required to pass 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.

During the reporting period, the power entities undertook peaking and ponding operations under the supervision of the Board. Above average outflows from Lake Superior combined with a recovery in Lake Michigan-Huron levels from the lows of the previous year resulted in levels at U.S. Slip remaining above the established threshold, such that ponding was permitted during the entire reporting period of September 2013 through February 2014. Due to the plants flowing at capacity during September and October 2013, however, the plants were unable to conduct ponding. 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, the U.S. Army Corps of Engineers 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 concerns related to peaking and ponding were reported to the Board during the period.

Figures 7a-7f compare the hourly Lake Superior outflow and the hourly levels at U.S. Slip on the lower St. Marys River. In general, U.S. Slip levels were higher than the same period last year.

11. Gate Movement Limits Study

The gate movement limit study, partially funded through the IJC's International Watersheds Initiative (IWI) intends to measure and analyze discharge, velocity, and water level data in the St. Mary's Rapids under various settings of Compensating Works gates. This will allow the Board to establish field-verified gate movement rates of change to prevent harm to fish caused by stranding or flushing. The work will take place this year with a final report expected to be completed in the fall of 2014. Previously, the Board reported that measurements were to be made in October 2013; however high flows and American scheduling issues delayed the measurements until spring of 2014.

12. Plan 2012 Implementation

The Board has developed the operational tools required for Plan 2012 and is ready to implement the new plan, pending final approval of the IJC and receipt of finalized Orders of Approval. The Regulation Representatives and the IJC Engineering Advisors have completed draft directives on peaking and ponding for the new plan and are awaiting their approval. At its March 25, 2014 meeting, the Board discussed the draft terms of reference and work plan presented to the IJC by the Adaptive Management Task Team at the end of January. The Board considered the tasks that would both assist it in assessing the impact of its operations and which could be implemented under existing authorities and agency support. The three Great Lakes Boards will prepare a letter for the Commission prior to the Spring Appearances with its recommendations on establishing the Adaptive Management Committee.

13. Annual Meeting with the Public and Public Information

The previous fall meeting was the first the Board has conducted by teleconference/webinar, and the overall impression was that this format was successful in terms of public participation and in reducing costs to the Board's supporting agencies. The Board would like to continue public meetings in this format to garner more public participation. The next public meeting date is tentatively set for June 17th, 2014. The Board will have a presence this year at the Soo Locks in Sault Ste. Marie, MI, as part of the U.S. Army Corps of Engineer's Engineer Day festivities on June 27th, 2014.

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 data updates and information to the Commission and has begun to take a more proactive role in maintaining the Board's web site. A new Board website was launched in September 2013, and is updated monthly. Content includes information on Board members and responsibilities as well as news releases, semi-annual reports, meeting minutes and hydrologic data summaries. The Board also recently launched an official Facebook page, in which regulation activities and water level information is posted for public viewing.

14. Board Membership and Meetings

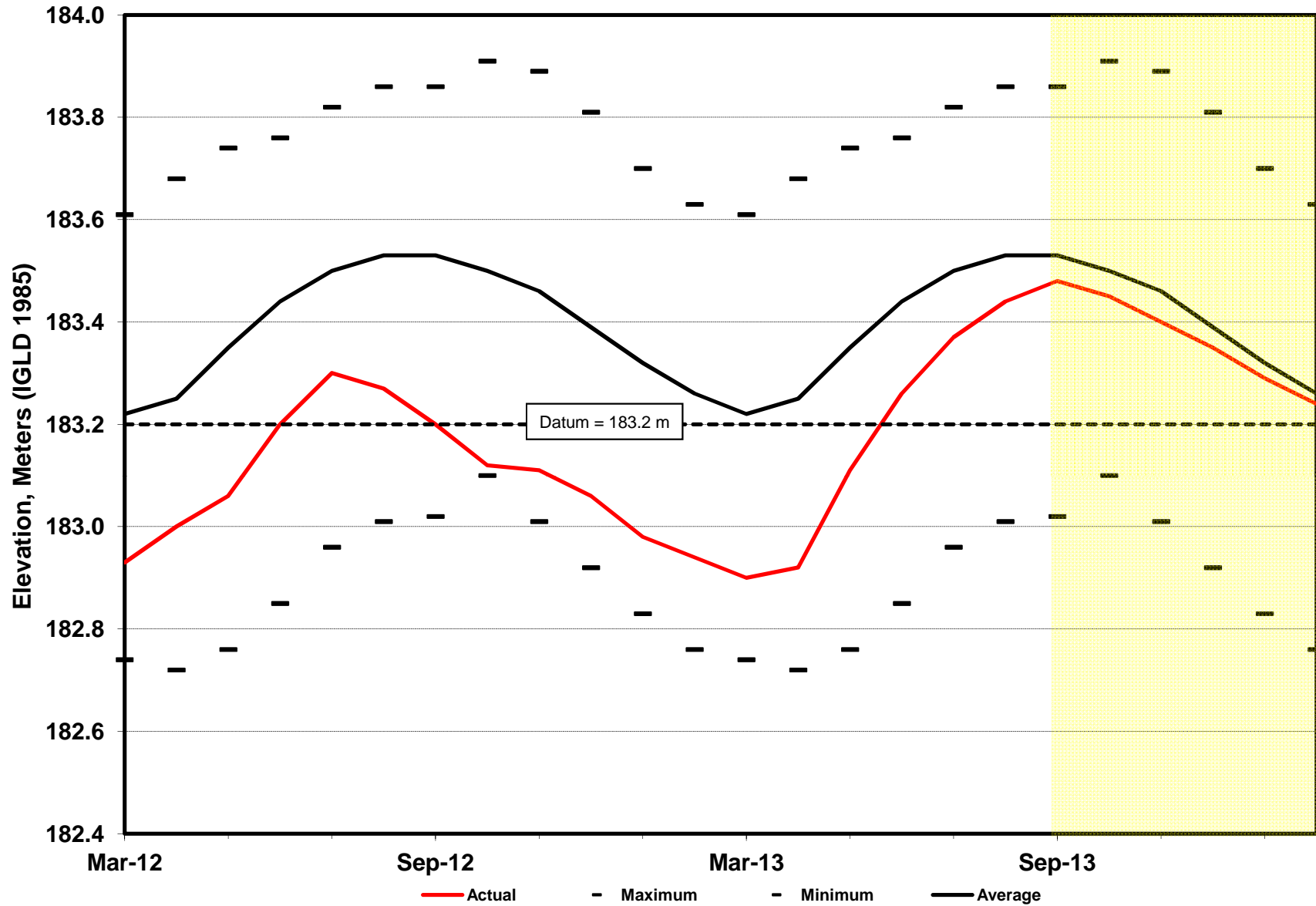
The Board held a meeting on March 25, 2014 in Detroit, Michigan with the Canadian Member and the Alternate U.S. Member in attendance.

Respectfully submitted,

Mr. Jaymie Gadal
Member for Canada

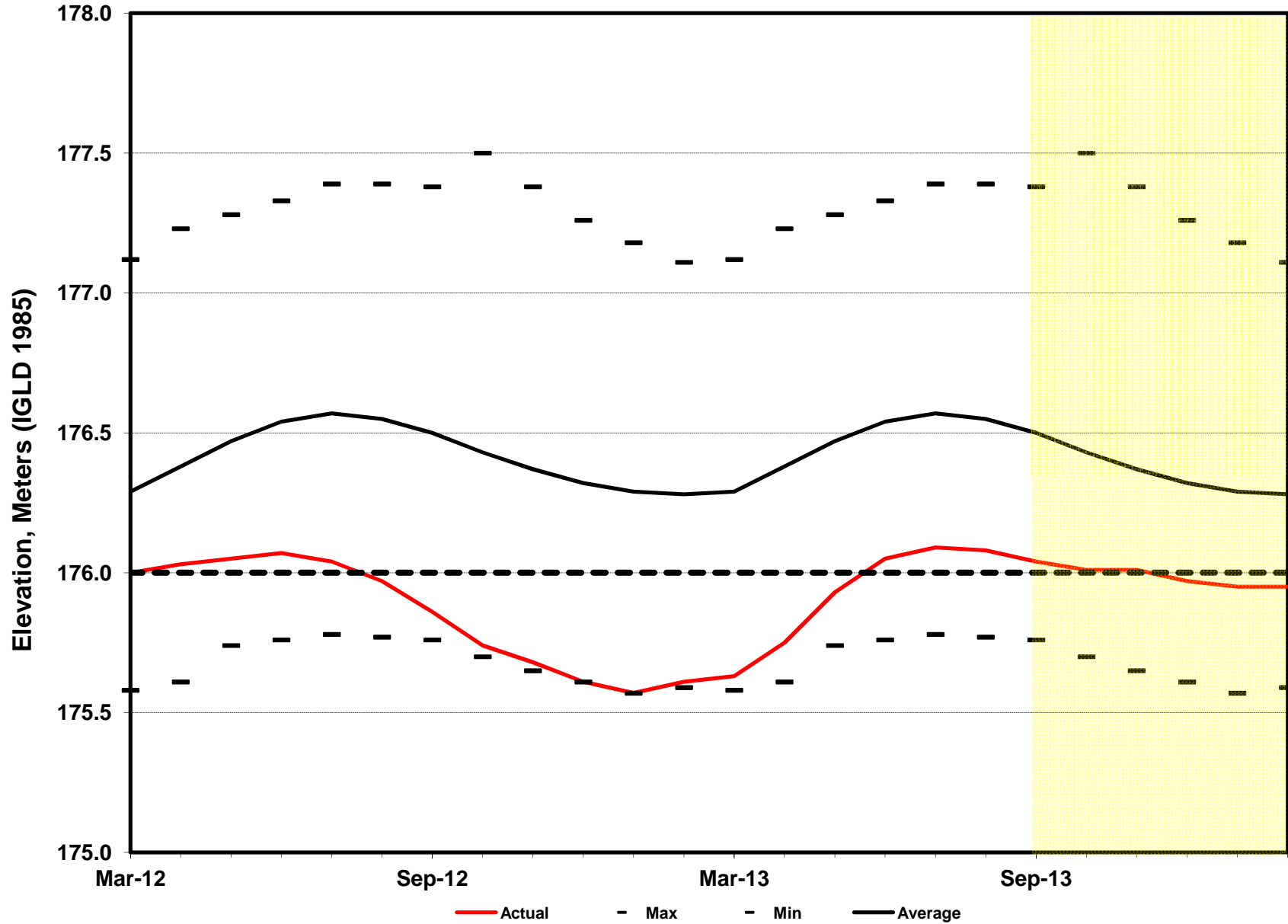
COL Robert Peterson
Alternate Member for United States

Figure 1: Monthly Mean Levels Lake Superior



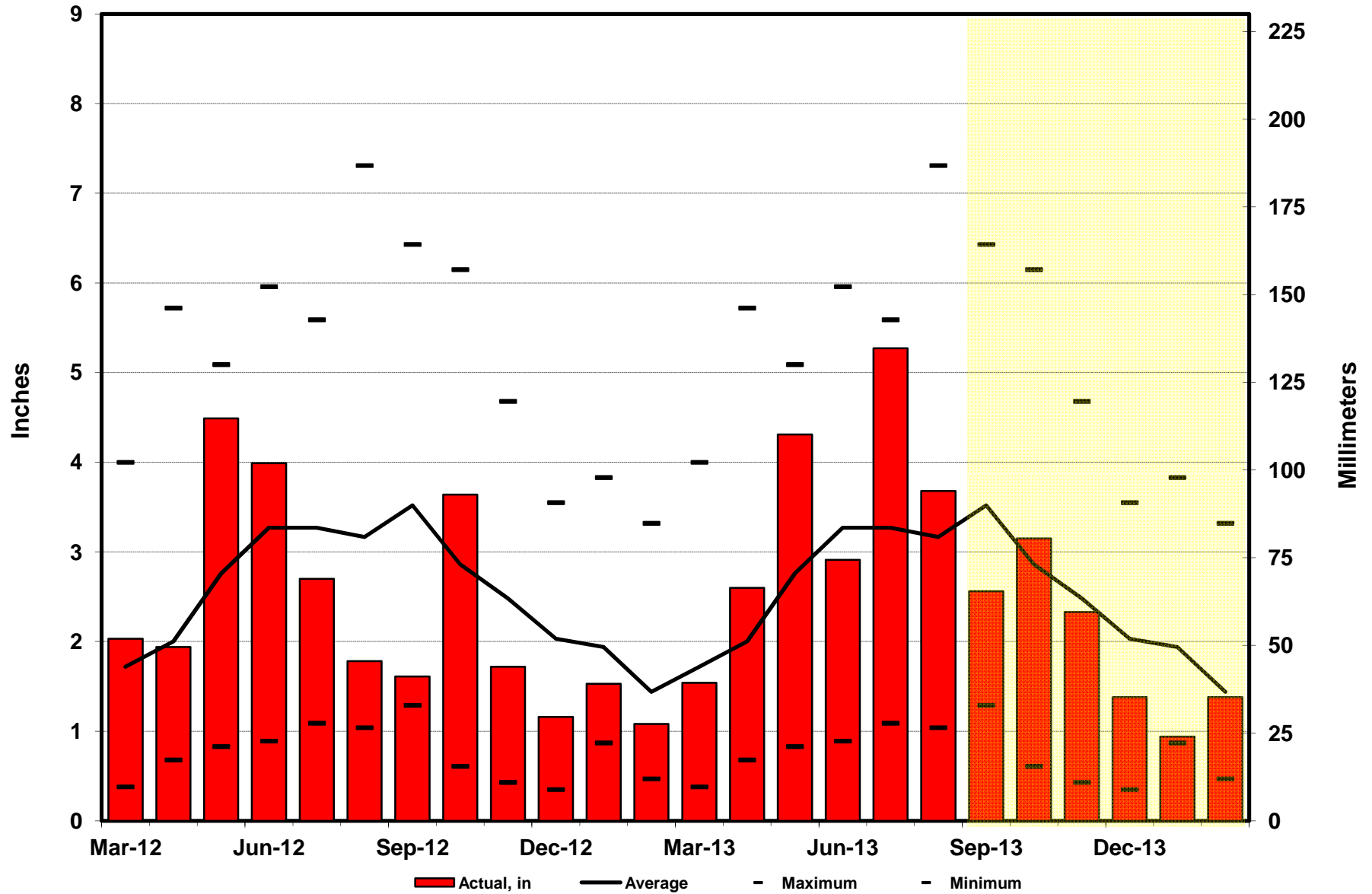
Based on a mean of 5 gages. Average, Maximum and Minimum values for the Period of Record 1918-2013

**Figure 2: Monthly Mean Levels
Lakes Michigan Huron**



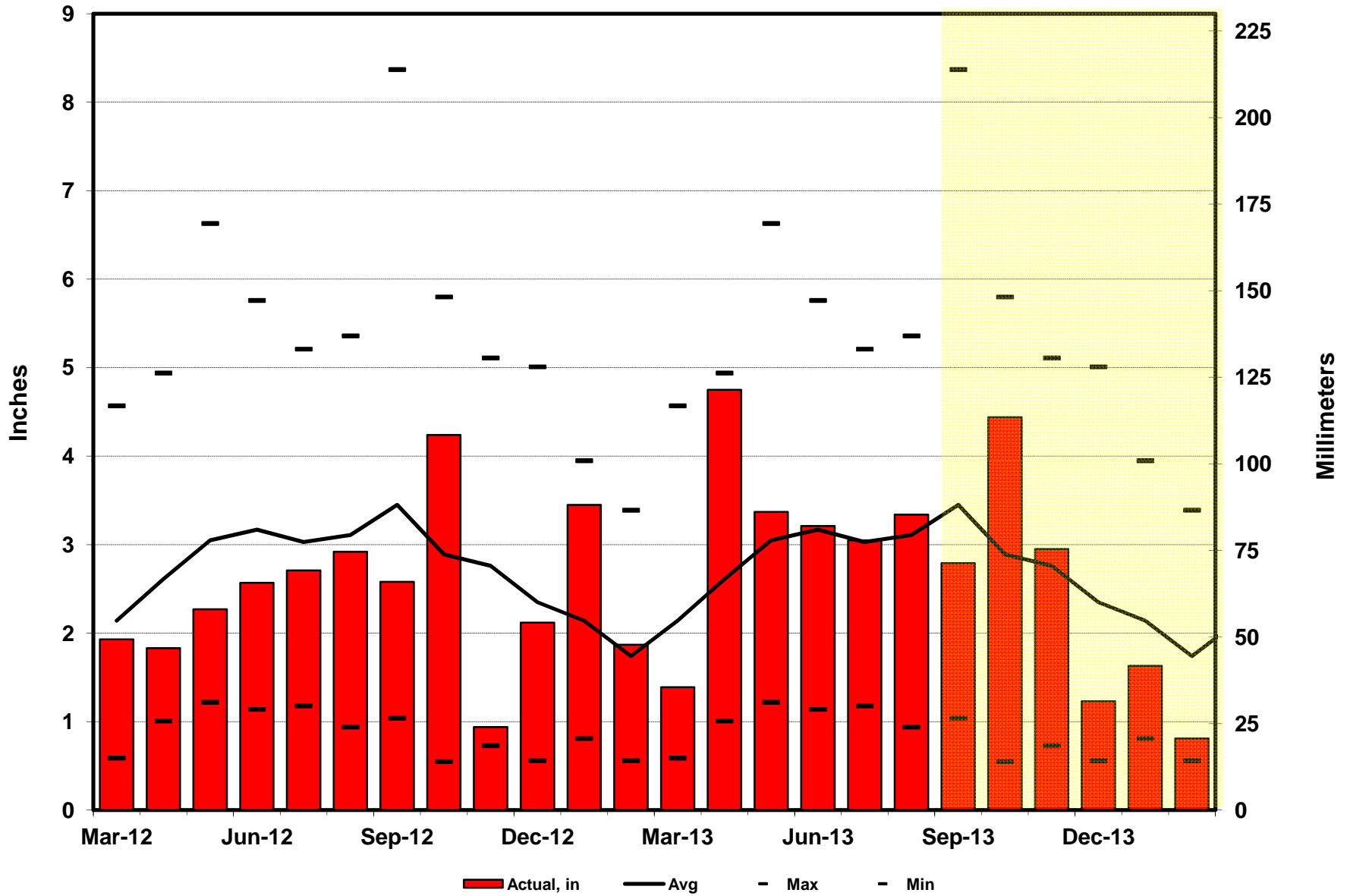
Based on a mean of 6 gages. Average, Maximum and Minimum values for the Period of Record 1918-2013

Figure 3: Monthly Precipitation Lake Superior



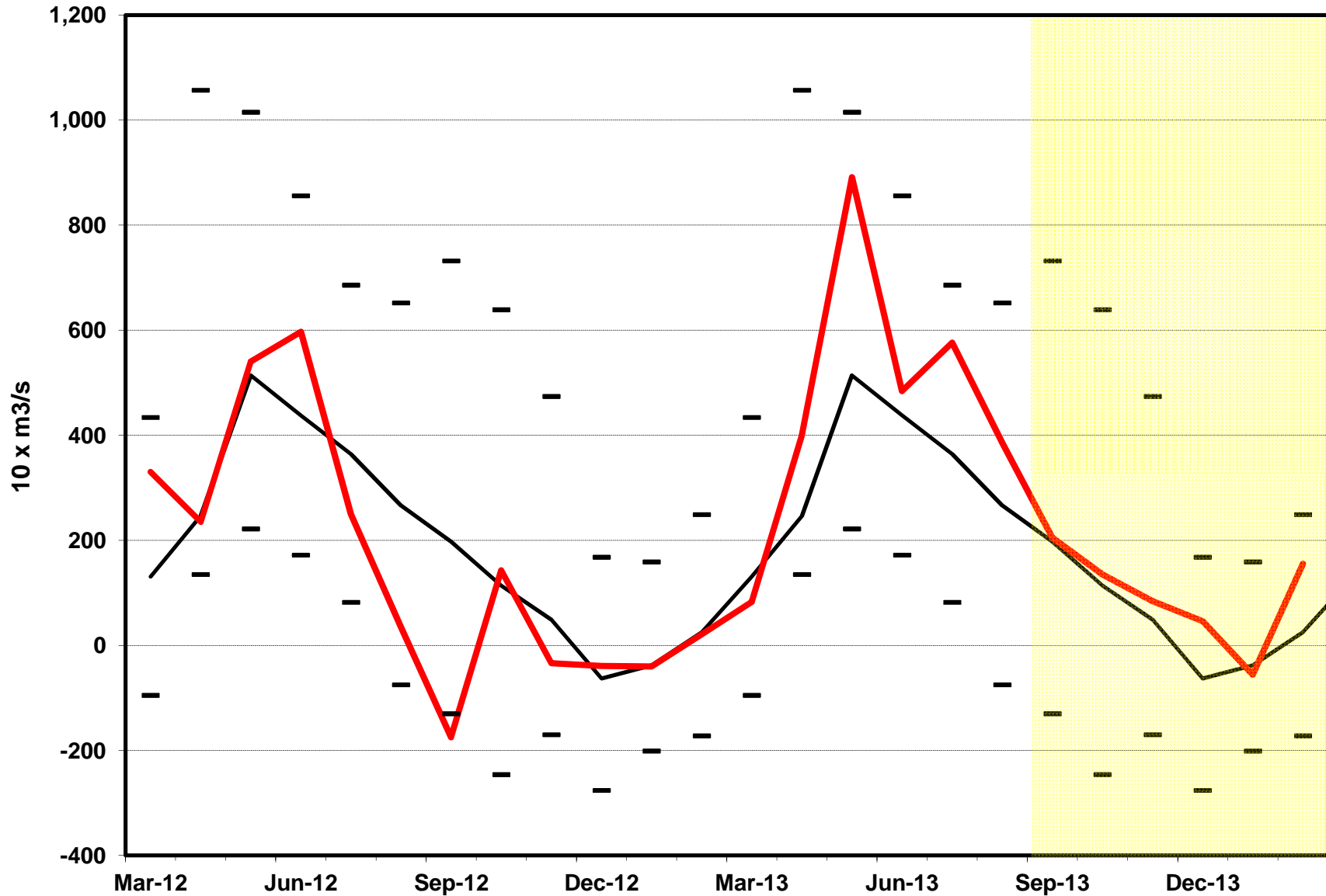
Maximum, Minimum and Average Precipitation Values based on Period of Record 1900 - 2010

**Figure 4: Monthly Precipitation
Lake Michigan-Huron**



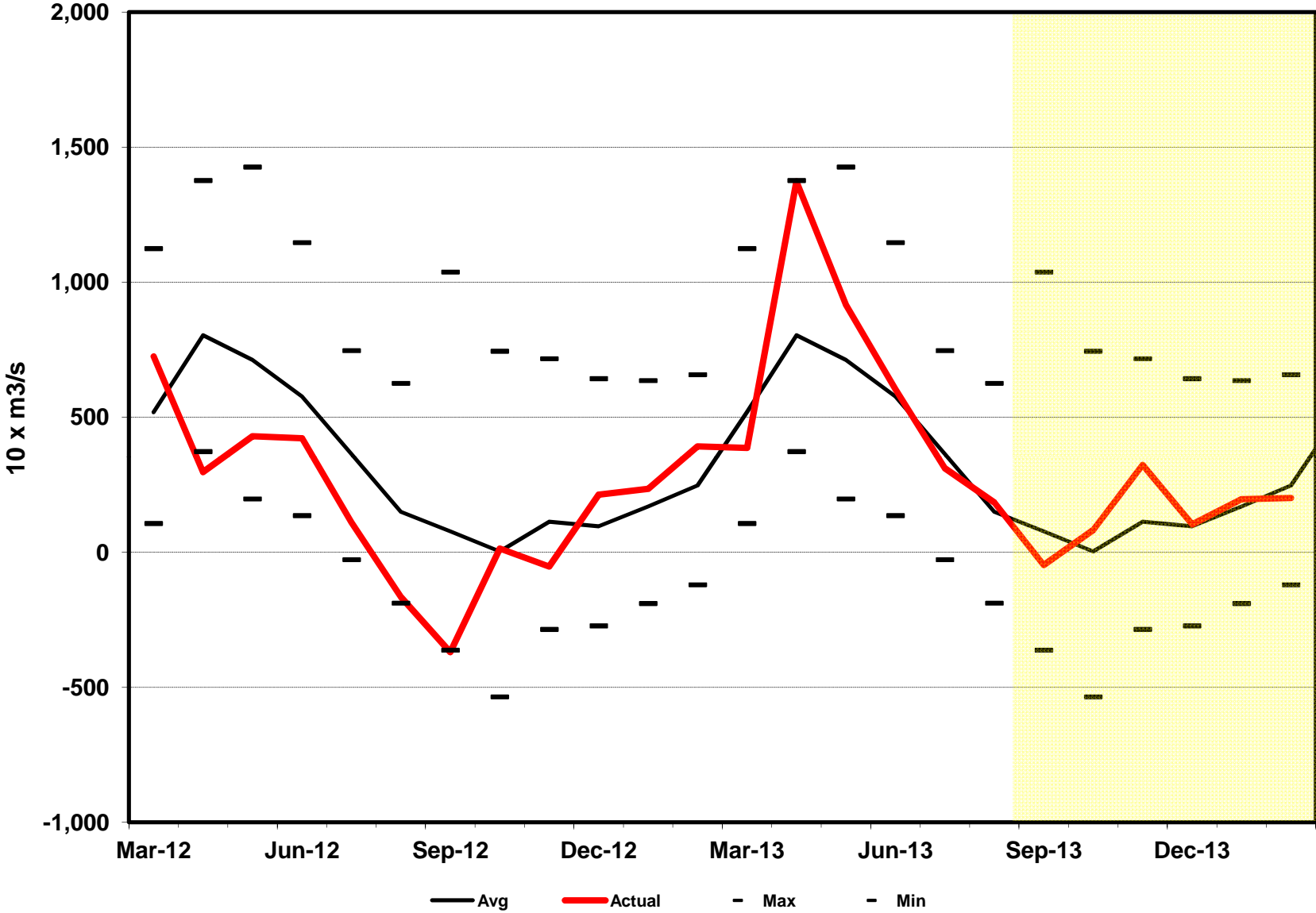
Maximum, Minimum and Average Precipitation Values based on Period of Record 1900 - 2010

**Figure 5: Monthly Net Basin Supplies
Lake Superior**



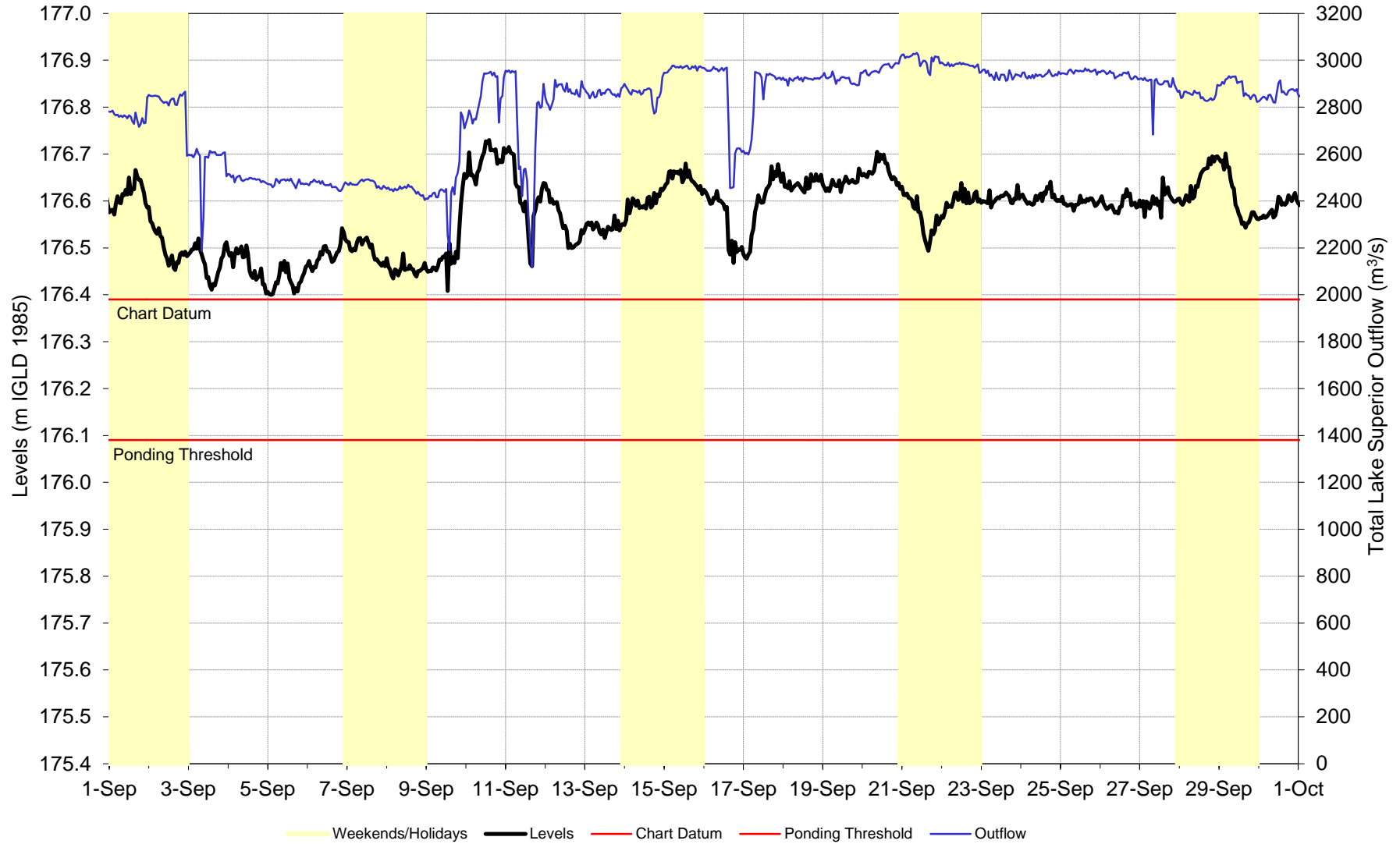
— Average — Actual - Maximum - Minimum
 Average, Maximum and Minimum Based on Coordinated Period of Record 1900-2008

**Figure 6: Monthly Net Basin Supplies
Lakes Michigan-Huron**

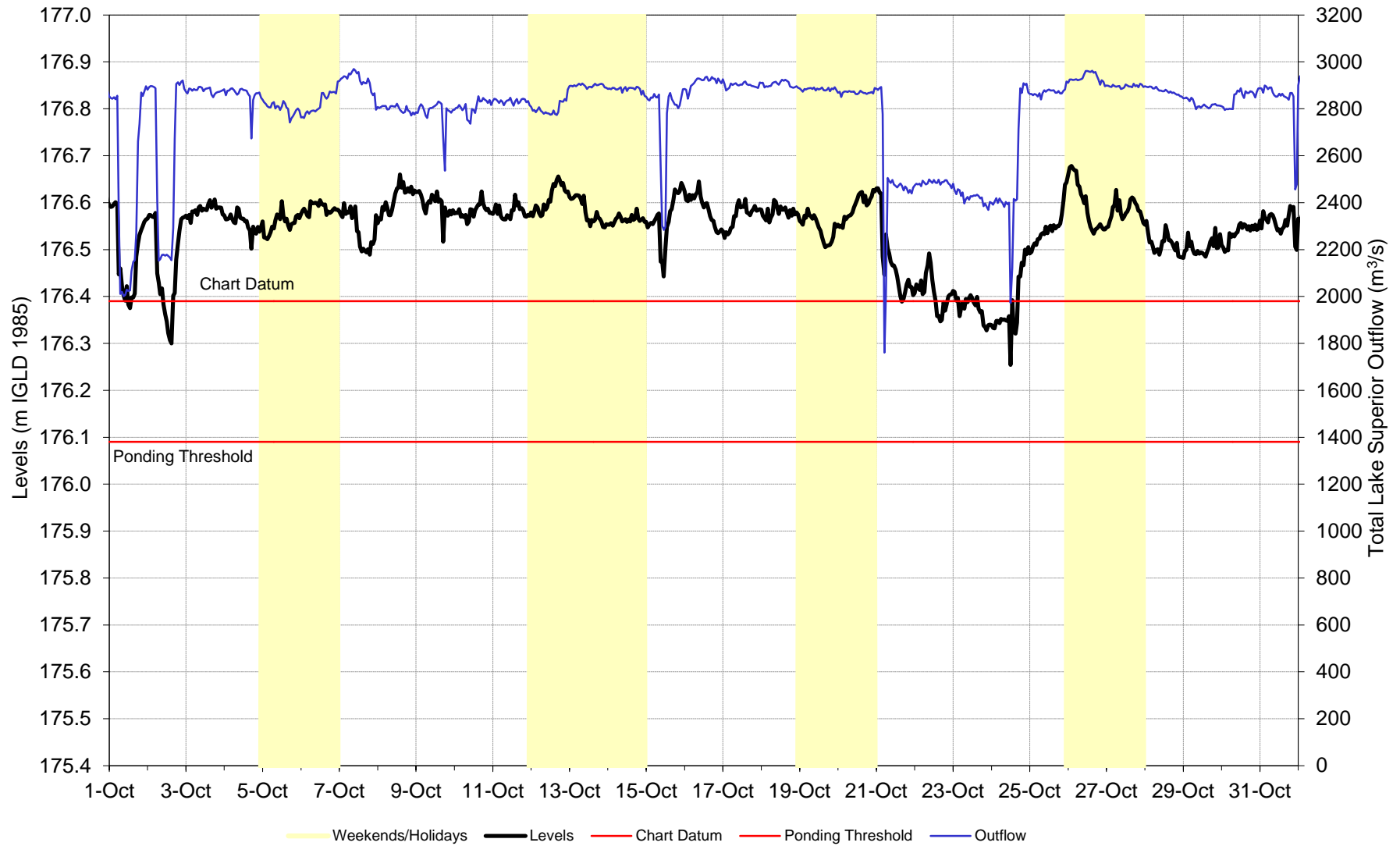


Average, Maximum and Minimum Based on Coordinated Period of Record 1900-2008

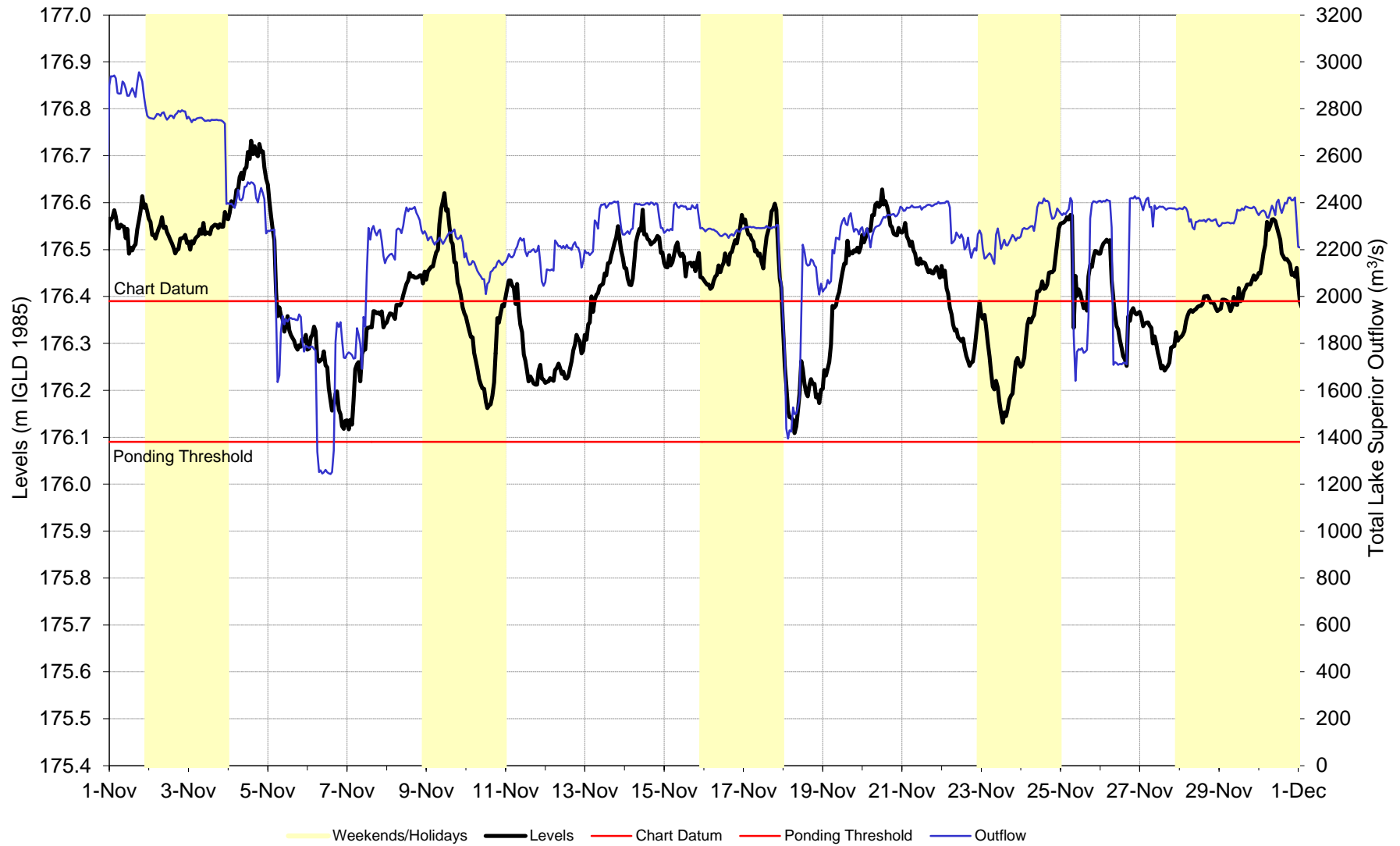
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 7a - September 2013



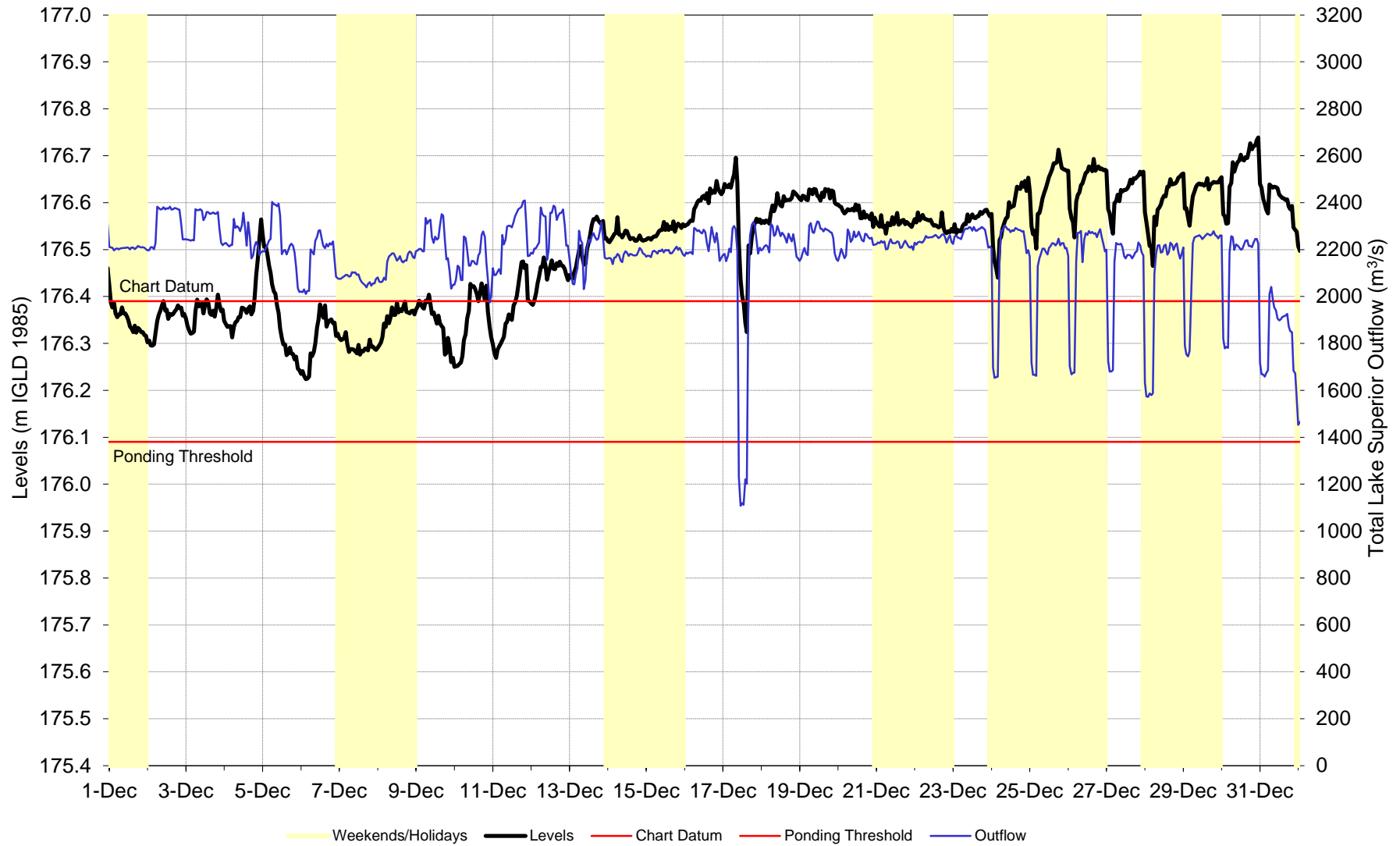
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 7b - October 2013



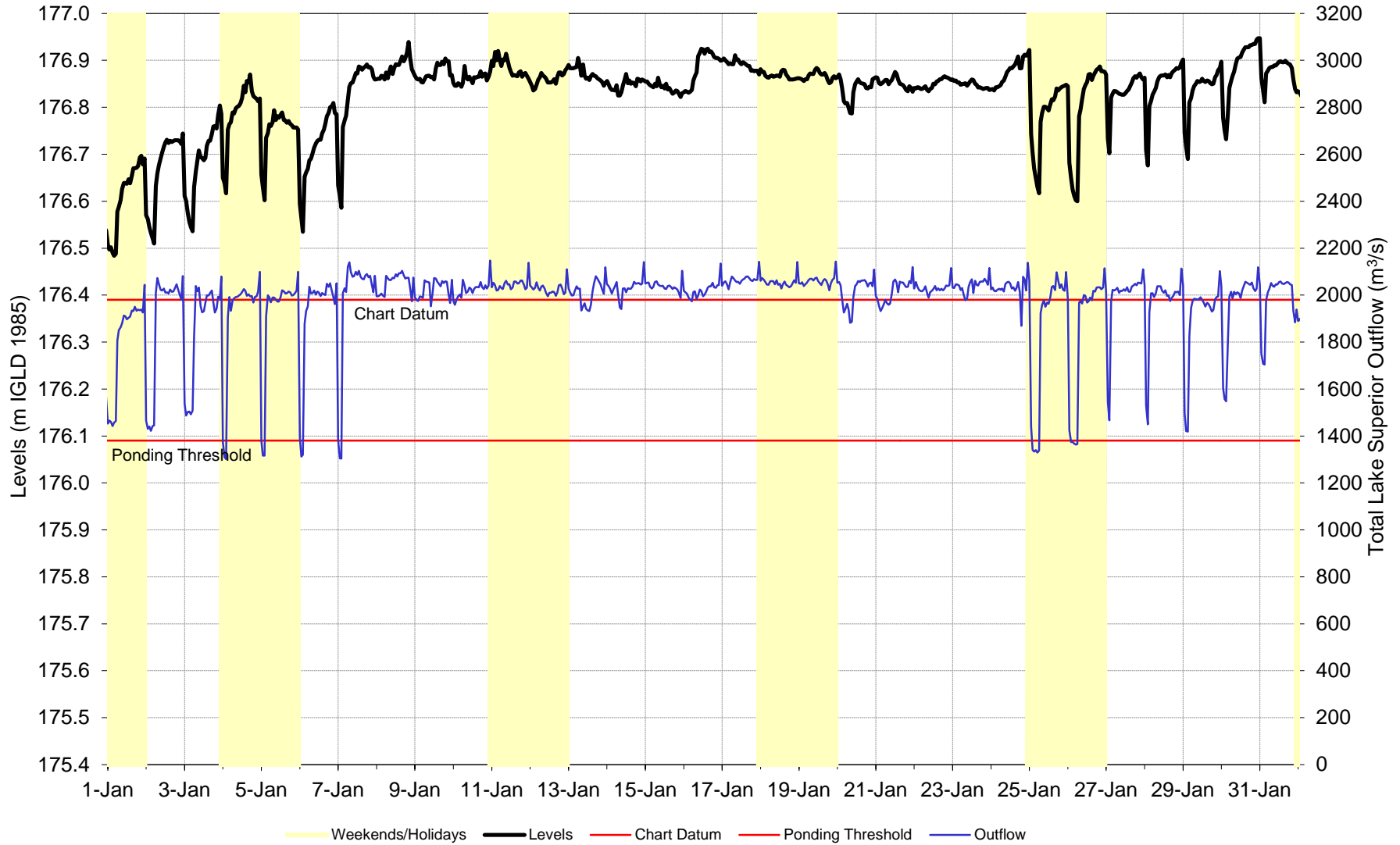
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 7c - November 2013



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 7d - December 2013



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 7e - January 2014



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 7f - February 2014

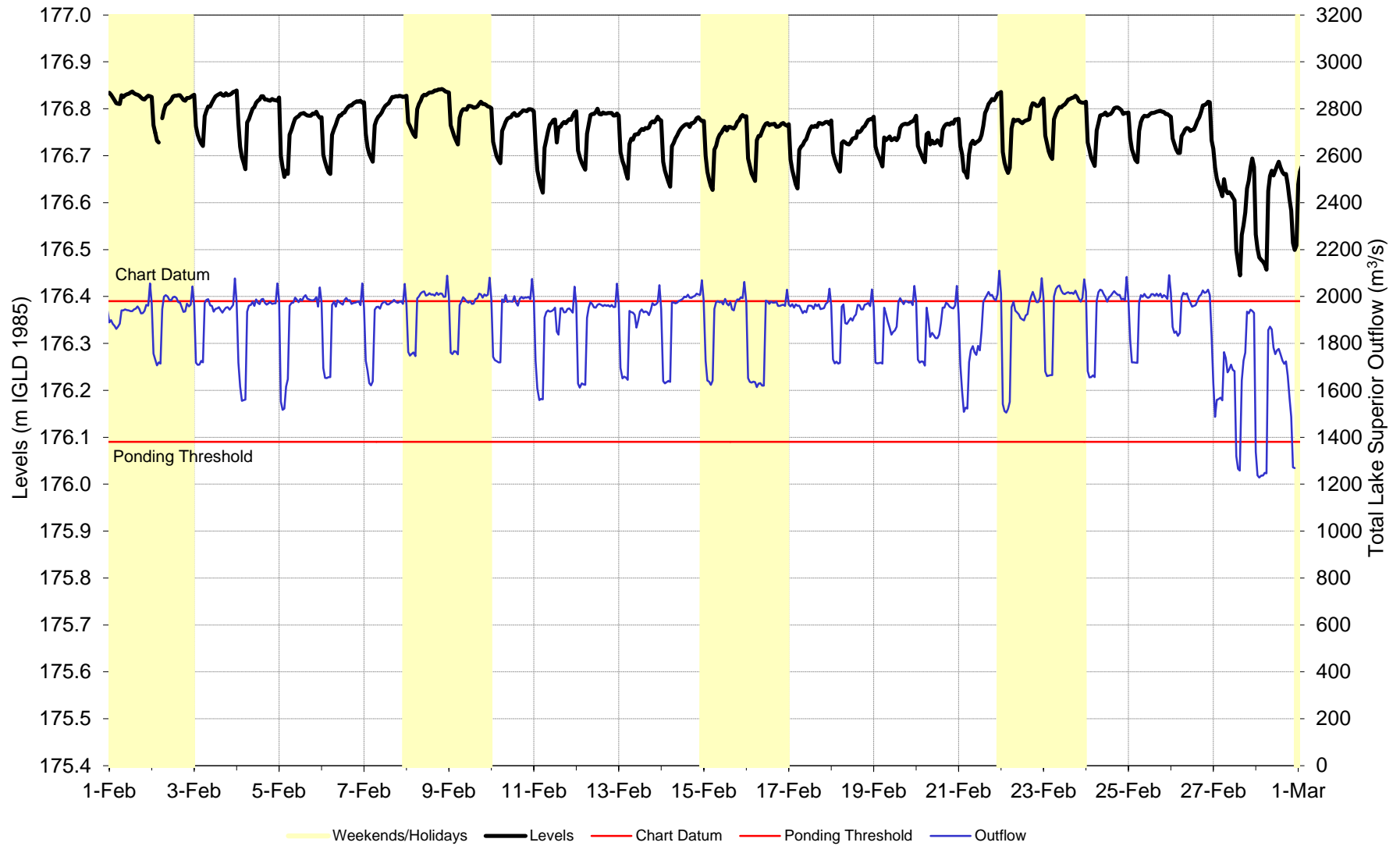


TABLE 1. 2013 - 2014 Lake Superior Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded ¹		Difference From Average ²		Monthly Mean Recorded		Exceedance Probability ³	Monthly Mean Recorded ⁴		Percent of Average ⁵
	Meters	Feet	Meters	Feet	m ³ /s	tcfs	(%)	m ³ /s	tcfs	
2013										
JAN	182.98	600.33	-0.34	-1.12	-400	-14	50	1,570	55	81
FEB	182.94	600.20	-0.32	-1.05	210	7	50	1,560	55	82
MAR	182.90	600.07	-0.32	-1.05	830	29	64	1,540	54	82
APR	182.92	600.13	-0.33	-1.08	3,990	141	55	1,540	54	80
MAY	183.11	600.75	-0.24	-0.79	8,910	315	1	1,570	55	74
JUN	183.26	601.25	-0.18	-0.59	4,840	171	36	2,050	72	94
JUL	183.37	601.61	-0.13	-0.43	5,760	203	5	2,190	77	96
AUG	183.44	601.84	-0.09	-0.30	3,850	136	17	2,690	95	114
SEP	183.48	601.97	-0.05	-0.16	2,050	72	45	2,790	99	120
OCT	183.45	601.87	-0.05	-0.16	1,350	48	41	2,790	99	123
NOV	183.40	601.71	-0.06	-0.20	840	30	36	2,280	81	103
DEC	183.35	601.54	-0.04	-0.13	460	16	10	2,180	77	106
2014										
JAN	183.29	601.35	-0.03	-0.10	-530	-19	58	2,070	73	107
FEB	183.24	601.18	-0.02	-0.07	1,560	55	6	1,970	70	104

Notes: m³/s = cubic meters per second tcfs = 1,000 cubic per second

¹ Water Levels are a mean of five gauges on Lake Superior, IGLD 1985

² Average levels are for the period 1918-2013, based on a mean of five gauges.

³ Exceedance probabilities are based on 1900 - 2008.

⁴ Outflows are rounded to the nearest 10 m³/s.

⁵ Average flows are for the period 1900 - 2008.

TABLE 2. 2013 - 2014 Lakes Michigan-Huron Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded ¹		Difference From Average ²		Monthly Mean Recorded		Exceedance Probability ³	Monthly Mean Recorded ⁴		Percent of Average ⁵
	Meters	Feet	Meters	Feet	m ³ /s	tcfs	(%)	m ³ /s	tcfs	
2013										
JAN	175.57	576.02	-0.72	-2.36	2,350	83	32	4,280	151	94
FEB	175.61	576.15	-0.67	-2.20	3,920	138	16	4,050	143	91
MAR	175.63	576.21	-0.66	-2.17	3,860	136	70	4,420	156	91
APR	175.75	576.61	-0.63	-2.07	13,730	485	1	4,460	158	87
MAY	175.93	577.20	-0.54	-1.77	9,160	323	17	4,830	171	90
JUN	176.05	577.59	-0.49	-1.61	6,050	214	41	4,880	172	90
JUL	176.09	577.72	-0.48	-1.57	3,110	110	62	4,760	168	86
AUG	176.08	577.69	-0.47	-1.54	1,840	65	41	4,890	173	89
SEP	176.04	577.56	-0.46	-1.51	-470	-17	73	4,910	173	90
OCT	176.01	577.46	-0.42	-1.38	830	29	31	4,870	172	90
NOV	176.01	577.46	-0.36	-1.18	3,230	114	15	4,970	176	93
DEC	175.97	577.33	-0.35	-1.15	1,030	36	46	4,910	173	95
2014										
JAN	175.95	577.26	-0.34	-1.12	1,960	69	41	3,940	139	87
FEB	175.96	577.30	-0.32	-1.05	2,040	72	61	4,370	154	98

- Notes: m³/s = cubic meters per second tcfs= 1,000 cubic per second
- ¹ Water Levels are a mean of five gauges on Lake Superior, IGLD 1985
- ² Average levels are for the period 1918-2013, based on a mean of five gauges.
- ³ Exceedance probabilities are based on 1900 - 2008.
- ⁴ Outflows are rounded to the nearest 10 m³/s.
- ⁵ Average flows are for the period 1900 - 2008.

TABLE 3
MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOWS (cubic meters/second)

	POWER CANALS					NAVIGATION CANALS			DOMESTIC USAGE				FISHERY	TOTAL LAKE
Year and Month	U.S. Gov't Hydro	Cloverland	U.S. Total	Brookfield	Total Power	United States	Canada	Total Navigation	Sault Ste. Marie U.S. + CAN	Algoma Steel	St. Marys Paper	Total Domestic Usage	St. Marys Rapids	Superior Outflow
2013														
JAN	411	329	740	736	1,476	4.0	0.0	4	0.3	2.6	0	3	83	1,566
FEB	405	334	739	736	1,475	1.4	0.0	1	0.3	2.6	0	3	82	1,561
MAR	411	322	733	720	1,453	3.0	0.0	3	0.3	2.5	0	3	82	1,541
APR	405	322	727	718	1,445	9.1	0.0	9	0.3	2.6	0	3	81	1,538
MAY	413	352	765	707	1,472	10.4	0.4	11	0.3	2.6	0	3	84	1,570
JUN	342	620	962	987	1,949	11.5	1.1	13	0.3	2.5	0	3	85	2,050
JUL	353	681	1,034	1,049	2,083	12.0	1.8	14	0.3	2.7	0	3	86	2,186
AUG	408	718	1,126	744	1,870	11.5	1.9	13	0.3	2.7	0	3	808	2,694
SEP	400	739	1,139	982	2,121	10.9	0.8	12	0.3	2.8	0	3	657	2,793
OCT	354	734	1,088	1,063	2,151	9.2	0.3	10	0.3	2.6	0	3	622	2,786
NOV	401	694	1,095	1,023	2,118	9.1	0.0	9	0.3	2.3	0	3	145	2,275
DEC	397	646	1,043	1,042	2,085	7.0	0.0	7	0.3	2.1	0	2	86	2,180
2014														
JAN	393	585	978	998	1,976	2.4	0	2	0.3	2.6	0	3	85	2,066
FEB	393	541	934	950	1,884	0	0	0	0.3	2.7	0	3	85	1,972

NOTE: (1) Power canals columns include flows through power plants and spillways

TABLE 4
MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOWS (cubic feet/second)

	POWER CANALS					NAVIGATION CANALS			DOMESTIC USAGE				FISHERY	TOTAL LAKE
Year and Month	U.S. Gov't Hydro	Cloverland	U.S. Total	Brookfield	Total Power	United States	Canada	Total Navigation	Sault Ste. Marie U.S. + CAN	Algoma Steel	St. Marys Paper	Total Domestic Usage	St. Marys Rapids	Superior Outflow
2012														
JAN	14,500	11,600	26,100	26,000	52,100	141	0	141	11	92	0	106	2,900	55,300
FEB	14,300	11,800	26,100	26,000	52,100	49	0	35	11	92	0	106	2,900	55,100
MAR	14,500	11,400	25,900	25,400	51,300	106	0	106	11	88	0	106	2,900	54,400
APR	14,300	11,400	25,700	25,400	51,000	321	0	318	11	92	0	106	2,900	54,300
MAY	14,600	12,400	27,000	25,000	52,000	368	14	388	11	92	0	106	3,000	55,400
JUN	12,100	21,900	34,000	34,900	68,800	406	39	459	11	88	0	106	3,000	72,400
JUL	12,500	24,000	36,500	37,000	73,600	424	64	494	11	95	0	106	3,000	77,200
AUG	14,400	25,400	39,800	26,300	66,000	406	67	459	11	95	0	106	28,500	95,100
SEP	14,100	26,100	40,200	34,700	74,900	385	28	424	11	99	0	106	23,200	98,600
OCT	12,500	25,900	38,400	37,500	76,000	325	11	353	11	92	0	106	22,000	98,400
NOV	14,200	24,500	38,700	36,100	74,800	321	0	318	11	81	0	106	5,100	80,300
DEC	14,000	22,800	36,800	36,800	73,600	247	0	247	11	74	0	71	3,000	77,000
2013														
JAN	13,900	20,700	34,500	35,200	69,800	85	0	71	11	92	0	106	3,000	73,000
FEB	13,900	19,100	33,000	33,500	66,500	0	0	0	11	95	0	106	3,000	69,600

NOTE: (1) Power canals columns include flows through power plants and spillways
(2) 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.
(3) Total flow for each category and total Lake Superior flow in this table are computed from the individual flows in cfs.