
**International Lake Superior
Board of Control**

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

Covering the period September 21, 2012 to March 20, 2013



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Cover photo: Dewatered MacArthur lock at the Soo Locks, Sault Ste. Marie, Michigan, January 2013.

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 20, 2013

Commissioners:

This semi-annual report covers the Board's activities from September 21, 2012 to March 20, 2013.

1. Highlights

During the past six months (September 2012 to February 2013), the water levels of Lake Superior remained below average and have been 2 centimetres (cm) (1 inch (in)) above to 8 cm (3 in) below last year's levels. This past month, Lake Superior's level was 31 cm (12 in) below average. Lake Superior water 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 period of record.

The levels of Lakes 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 Lakes Michigan-Huron levels have been 27 cm (11 in) to 43 cm (17 in) below those of one year ago. In December and January of the reporting period, Lakes Michigan-Huron water levels set new monthly mean record lows. February's monthly mean water level was 67 cm (26 in) below average.

The Lake Superior outflows were as specified by Regulation Plan 1977-A. Since September 2012, these monthly outflows have been between 68% and 82% of average. Monthly outflows from Lakes Michigan-Huron ranged from 85% to 94% of average. Water supplies to Lake Superior were the lowest on record for the month of September, and supplies were again below average in November 2012 as well as February 2013. For the remaining three months of the reporting period, Lake Superior water supplies were above average. Water supplies in September 2012 also set a record low on Lakes Michigan-Huron. Water supplies were below average again in November 2012, but were above average for the remainder of the reporting period.

Ponding by the hydropower entities was permitted on weekends and holidays in September 2012 and February 2013. For the rest of the reporting period, ponding was restricted due to levels at U.S. Slip being below the threshold.

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. *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 75% of average from September 2012 through February 2013 and would be expected to be exceeded 94% 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 the lowest on record since 1900 during the month of September. Supplies were also below average in November 2012 and February 2013. For the rest of the reporting period, supplies were above average. The September 2012 through February 2013 net basin supplies to Lake Superior would be expected to be exceeded 81% of the time, due mostly to September's record low net basin supplies.

Lake Superior's water levels have been below chart datum (183.2 m or 601.1 ft) since September 2012 and are currently 28 cm (11 in) below chart datum. Lake Superior's levels over the past six months ranged from 31 to 37 cm (12 to 15 in) below average. Lake Superior water levels have been 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 the completion of 2012, it had been reported that Lake Superior levels had been consistently below average since April of 1998. However, this sustained period of low levels has had the effect of lowering Lake Superior's monthly averages, such that monthly mean levels experienced in some months in late 2004 and early 2005 are now equal to or above the 1918-2012 monthly averages. On March 20, 2013, the lake's level was at an elevation of 182.92 m (600.13 ft), which was 31 cm (12 in) below March's average and 1 cm (0.4 in) lower than last year.

Modelled snow water equivalent data from the National Operational Hydrologic Remote Sensing Center (NOHRSC) indicated that on March 12, 2013, snowpack was generally less than last year around the same time across the Lake Superior basin. NOHRSC continues to improve its snow model and now includes Canadian data sources such as Ontario Power Generation, the Ontario Ministry of Natural Resources and Brookfield Renewable Energy Group. Their model will now become a preferred source for snow water equivalent data. As budgets allow, airborne gamma surveys may still be used to help verify model results.

Precipitation over the Lakes Michigan-Huron basin was 97% of average over the past six months according to provisional data and would be expected to be exceeded 61% of the time. Water

supplies to Lakes Michigan-Huron were the lowest on record for the month of September. Supplies were again below average in November, but above average for the remainder of the reporting period. On the whole, the September 2012 through February 2013 net basin supplies to Lakes Michigan-Huron would be expected to be exceeded about 35% of the time.

Monthly mean Lake Michigan-Huron levels ranged from 64 to 73 cm (25 to 29 in) below long-term averages. Water levels were below chart datum for the entire reporting period. The monthly mean levels for December 2012 and January 2013 were the lowest on record since 1918. The February level was 2 cm (0.8 in) above the record low. The levels of Lakes Michigan-Huron have been below average since January of 1999, the longest period on record (1918-2012) of consistently below average levels. On March 20, 2013, Lakes Michigan-Huron were at elevation 175.66 m (576.31 ft), 64 cm (25 in) below March's monthly average, 35 cm (14 in) lower than one year ago, and 34 cm (13 in) below chart datum. The level of Lakes Michigan-Huron has been below average since January of 1999, 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. Lake Superior outflows were 77% of average over the last six months, with monthly flows ranging from 1,530 to 1,850 m³/s (54,000 to 65,300 ft³/s). Outflows were limited by Criterion (c) of the Orders in February 2013.

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 September through February. The equivalent one-half gate open setting was maintained using Gates 7 to 10 open 20 cm (8 in). 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 182.96 and 183.20 m (600.26 and 601.05 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 175.60 and 176.28 m (576.12 and 578.35 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 fell below the ponding restriction threshold (see Section 10) of 176.09 m (577.72 ft) for most of the reporting period. Ponding was allowed during September 2012 when the daily mean at U.S. Slip was above the threshold and in February 2013 when navigation was not a concern due to the locks being closed. For the remainder of the reporting period, ponding was restricted.

5. Inspection and Repairs at the Compensating Works

Monthly inspections and routine maintenance continue to be conducted on the U.S. portion by the US Army Corps of Engineers' (USACE) Sault Ste. Marie Office. The last monthly inspection conducted on September 21, 2012 found the Compensating Works facilities to be in good condition. Monthly inspections will resume in March 2013 and continue through November 2013. Monthly inspections of the Compensating Works are not performed during the winter months. Future inspections will be scheduled using USACE's Facilities and Equipment Maintenance (FEM) system. In the early fall, four public safety signs were installed on the deck handrails on the Canadian side of the Compensating Works. Two signs face upstream and state "Danger, Fast Water, Keep Away", while the two signs facing downstream say "Danger, Dam Outflow, Keep Away". Monthly maintenance inspections of the facility continue to be carried out. In addition, the annual fall inspection of the structure, which includes inspection of public safety features, the concrete and masonry structure, gates and mechanisms, was completed October 1, 2012 with no unusual conditions noted.

A periodic inspection of the MacArthur Lock was conducted from January 22-25, 2013 while the lock was dewatered for winter work. Overall, the lock is in good condition with no major deficiencies which could lead to dam failure.

Annual inspection of the Soo Locks complex will be conducted later in the year. The periodic inspection/assessment schedule has been revised to be more balanced for USACE Detroit District funding and manpower. As a result, the periodic inspection of the Compensating Works has been scheduled for July 14-17, 2014.

6. Repairs and Maintenance at the Hydropower Facilities

a. U.S. Government Hydropower Plant

The three hydro units have been online since November 23, 2012. Outage totals since September are: 56 hours for Hydro Unit 1; 4.5 hours for Unit 2; 1.7 hours for Unit 3; 430 hours for Unit 3A, 10.5 hours for Unit 10. Hydro Unit 3A was offline 426 hours due to inspection and

cavitation repairs in September 2012. Scheduled 2013 outages are for Unit 2 and Unit 10 for cleaning and testing.

b. Brookfield Renewable Energy Generation

Outages on Brookfield Renewable Energy Generation's three Clergue plant units occurred during the reporting period due to testing, maintenance and repairs, for a total of 647 hours. On September 26, 2012 all three units were shut down for approximately 8 hours to assist with the no flow requirement to perform maintenance work on the public safety caissons on the headpond. On September 30 to October 4, 2012, unit G1 tripped offline for approximately 100 hours due to wicket gate issues. A temporary repair was made at that time but a permanent repair date has yet to be determined. During the period from October 29, 2012 to November 8, 2012, Unit G3 was shut down for approximately 253 hours to complete its three-year maintenance inspection. Unit G2 was shut down for approximately 83 hours during November 26 to 29, 2012 for its annual inspection. From February 4 to 7, 2013, Units G1, G2 and G3 were shut down for approximately 37, 27 and 85 hours, respectively, for maintenance on Bus 1 and Bus 2 at the Clergue transmission station. During the period from March 5 to 7, 2013, Unit G2 was shut down for approximately 30 hours (daily outages) to support bulb nose ladder installation work. A series of minor, unscheduled outages also occurred. The power entity was able to pass the allotted flows each month.

c. Cloverland Electric Co-operative

There were no changes to the Cloverland Electric Co-operative hydro operations since the last reporting period.

7. Flow Verification Measurements

The flow verification measurements performed August 21-24, 2012 at the Compensating Works continue to be reviewed. Gate settings ranging from ½ to 5 gates open were measured. These measurements are being used as part of an effort to evaluate the equations used to determine the flow through the Compensating Works for various gates-open settings. Discharge measurements to verify the flows through the power 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.

No hydropower flow verification measurements were performed this reporting period. Measurements continue on a five-year cycle and are expected to be next completed in 2015.

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 February 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 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 2 to 14 m³/s (71 to 494 ft³/s). 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% during the busiest part of the navigation season.

The locks are scheduled to re-open on March 25.

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 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 83 to 88 m³/s (2,930 to 3,100 ft³/s) over the last six months, or approximately 5% of the total monthly outflow.

The hydropower plants passed an average of 1,500 m³/s (53,000 ft³/s) from September 2012 to February 2013 for electric power production, or 94% of the total river flow. The allocation for this period averaged 1,520 m³/s (53,800 ft³/s). Usages at each plant are shown in *Tables 3 and 4*.

9. Long Lac and Ogoki Diversion

Ontario Power Generation (OPG) continued to provide 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 76.7 m³/s (2,710 ft³/s) and the Long Lac Diversion averaged 20.6 m³/s (730 ft³/s) from September 2012 through February 2013. Combined, these diversions were about 70% of average for the period 1944-2011.

Slots cut into Waboose Dam provide a minimum flow northward into the Ogoki River of approximately 2 m³/s to meet fisheries requirements. "Slot flow" (averaging 2 m³/s (70 ft³/s)) was passed during September 2012 through February 2013.

Continuous flows of at least 2 m³/s (70 ft³/s) are maintained from the Saturday of Victoria Day weekend (in May) through Labour Day from the north outlet of Long Lake (Kenogami Dam) for environmental enhancement. An average of 0.8 m³/s (30 ft³/s) was spilled from September 2012 through February 2013.

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 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.

It was recommended in the International Upper Great Lakes Study that the integrated Orders of Approval of Superior Regulation Plan 2012 formalize the current guidelines governing peaking and ponding operations. This recommendation is being reviewed by the Commission. These guidelines would continue to be subject to periodic review.

During the reporting period, the power entities undertook peaking and ponding operations under the supervision of the Board. Ponding was permitted in September 2012 and February 2013 and restricted for the remainder of the reporting period due to water levels at the U.S. Slip gauge falling below the threshold level. 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 Corps 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 4a-4f 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 lower than during the same period last year.

11. Plan 2012 Implementation

The Board's staff has been in contact with the Commission's Engineering Advisors regarding the new regulation plan proposed by the recently completed International Upper Great Lakes Study. In order to be prepared should the Commission adopt the new regulation plan, the Regulation

Representatives and their staff have begun the process of making the Study Board's computer code operational. This is expected to be completed by late spring or early summer. The Board will be writing a letter to the Commission to obtain clarification on some technical issues.

12. Annual Meeting with the Public and Public Information

The Board proposes to discuss the format of its next public meeting with the Commission prior to setting a meeting date. The Board discussed several alternatives to reaching out to the public in a cost-effective manner. The exact date, venue and format of the next meeting with the public will be set by the Board following discussions with the Commission.

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 web site. Content includes information on Board members and responsibilities as well as news releases, semi-annual reports, meeting minutes and hydrologic data summaries. In addition, in support of the Board and the Commission, the Detroit District Corps of Engineers posts pertinent regulation information on its own District website.

13. Board Membership and Meetings

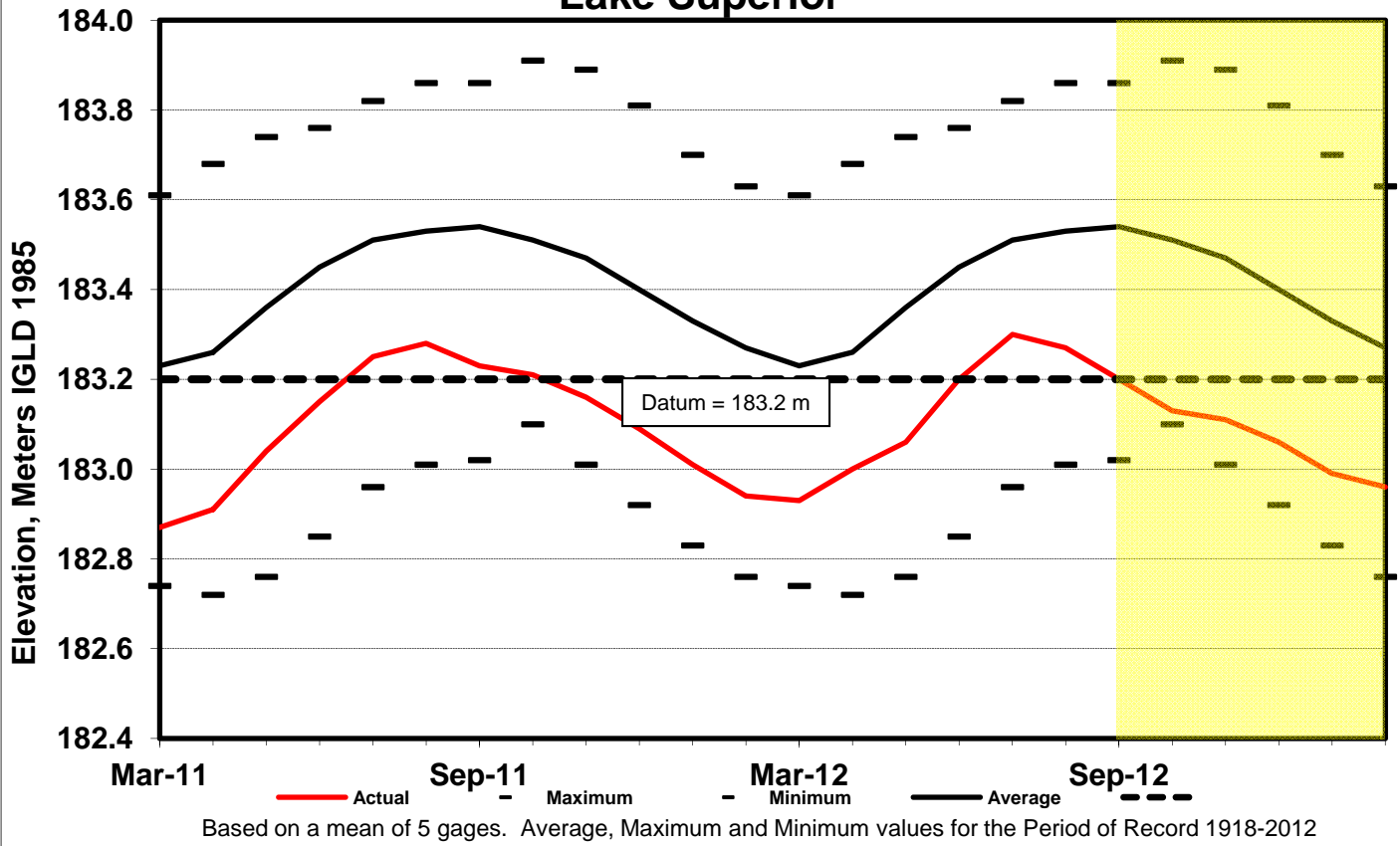
The Board held a meeting on March 20, 2013 in Chicago, Illinois, with both Members in attendance.

Respectfully submitted,

Mr. Jaymie Gadai
Member for Canada

BG Margaret Burcham
Member for United States

Monthly Mean Levels Lake Superior



Monthly Mean Levels Lakes Michigan Huron

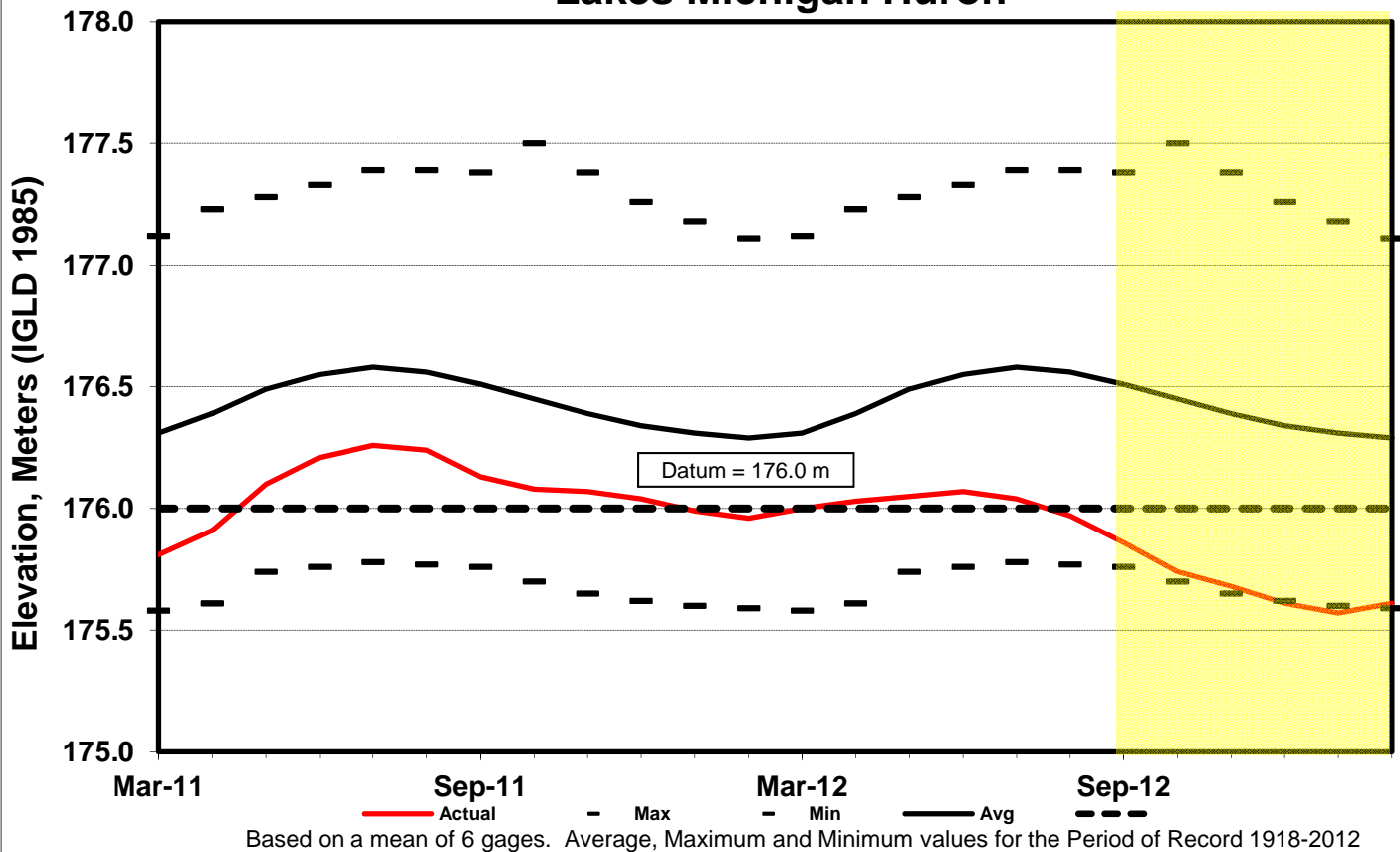
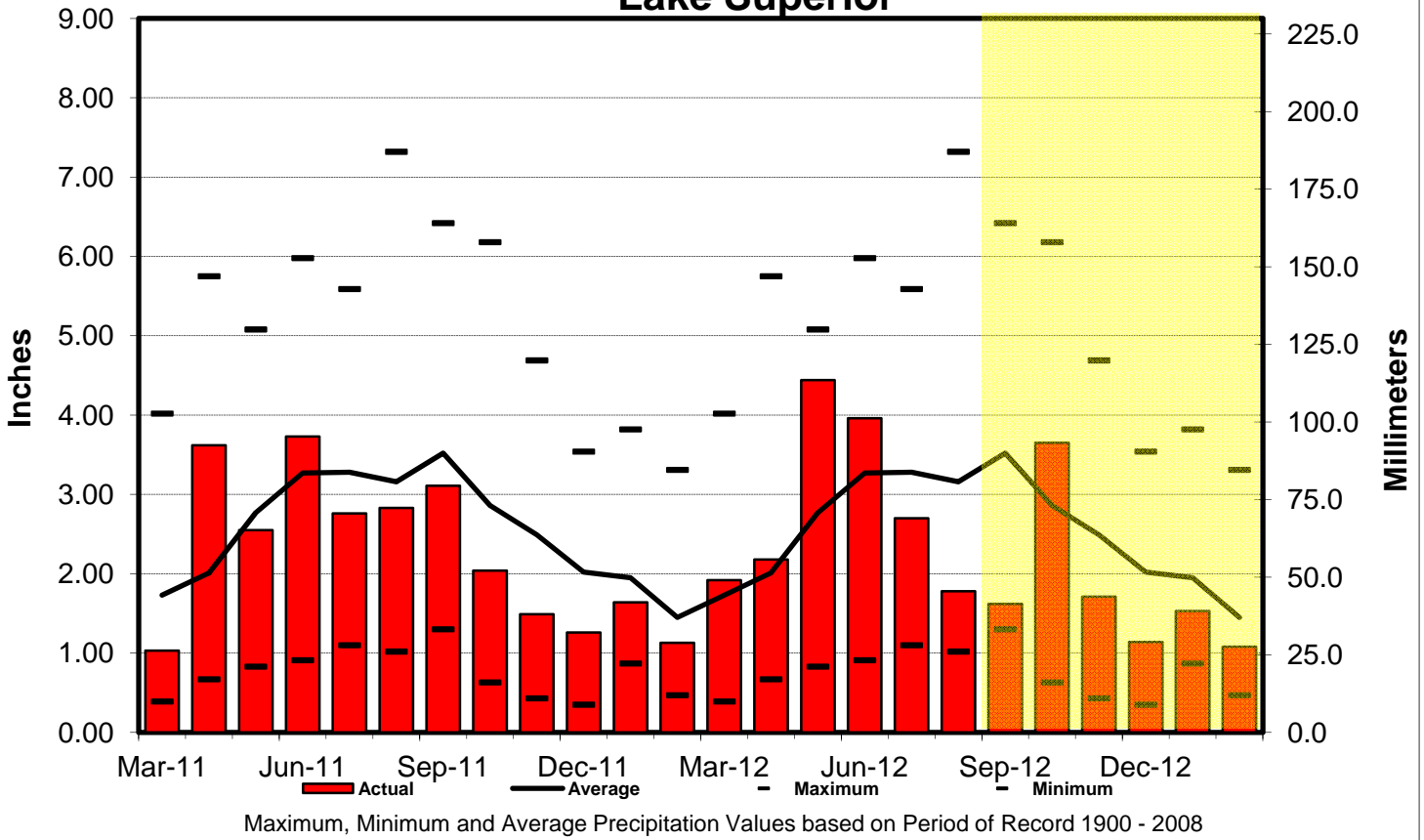


Figure 1

Monthly Precipitation Lake Superior



Monthly Precipitation Lake Michigan-Huron

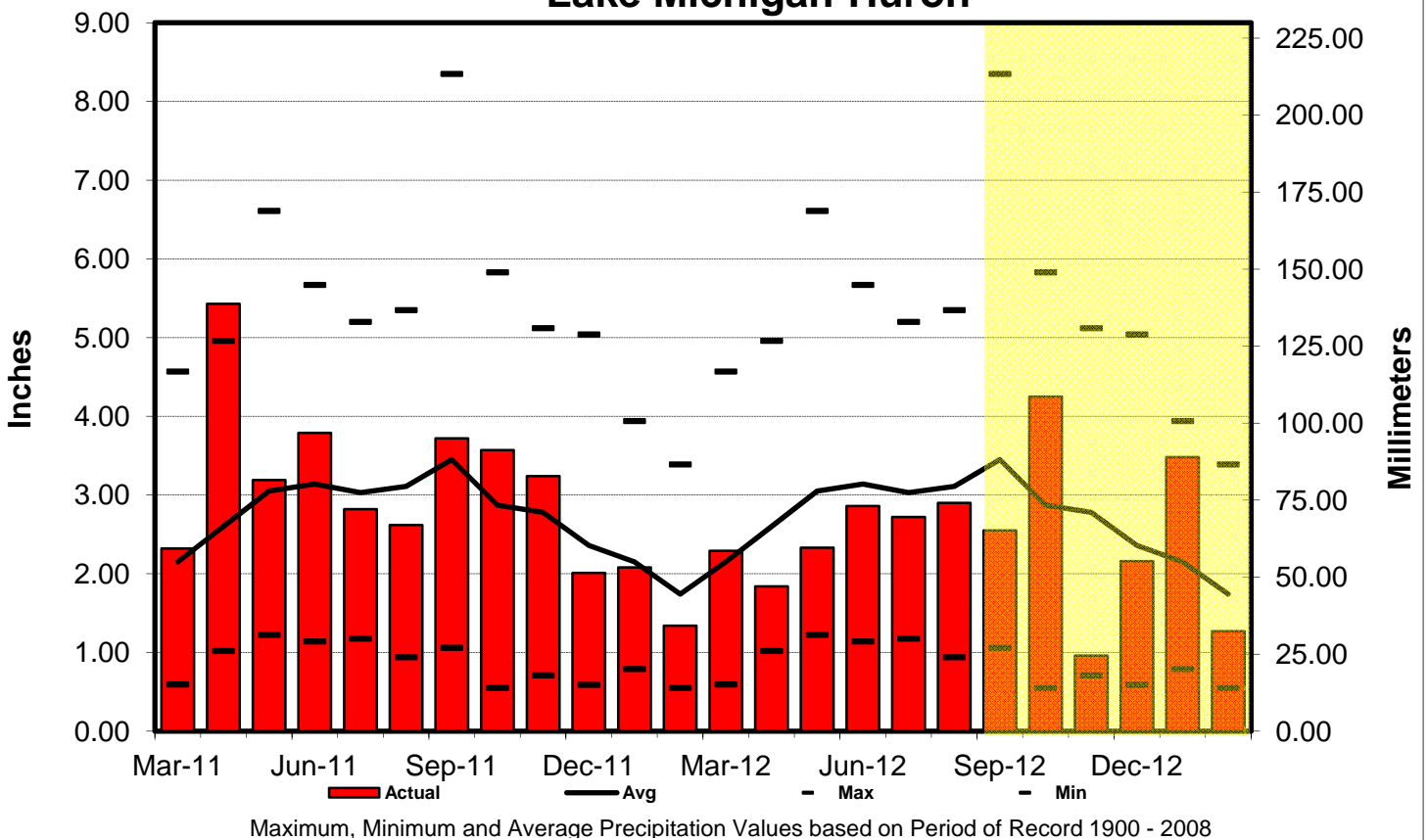
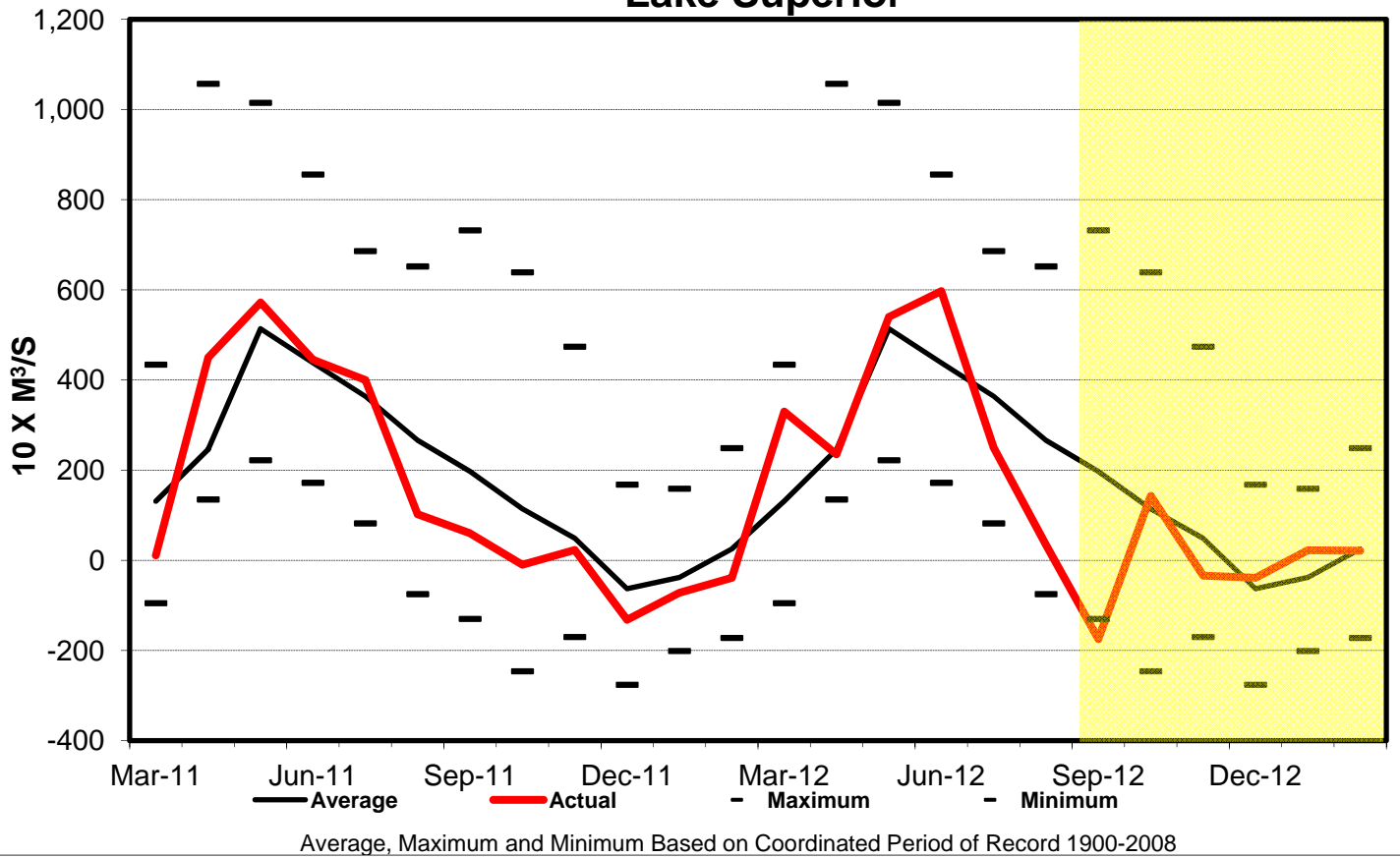


Figure 2

Monthly Net Basin Supplies Lake Superior



Monthly Net Basin Supplies Lakes Michigan-Huron

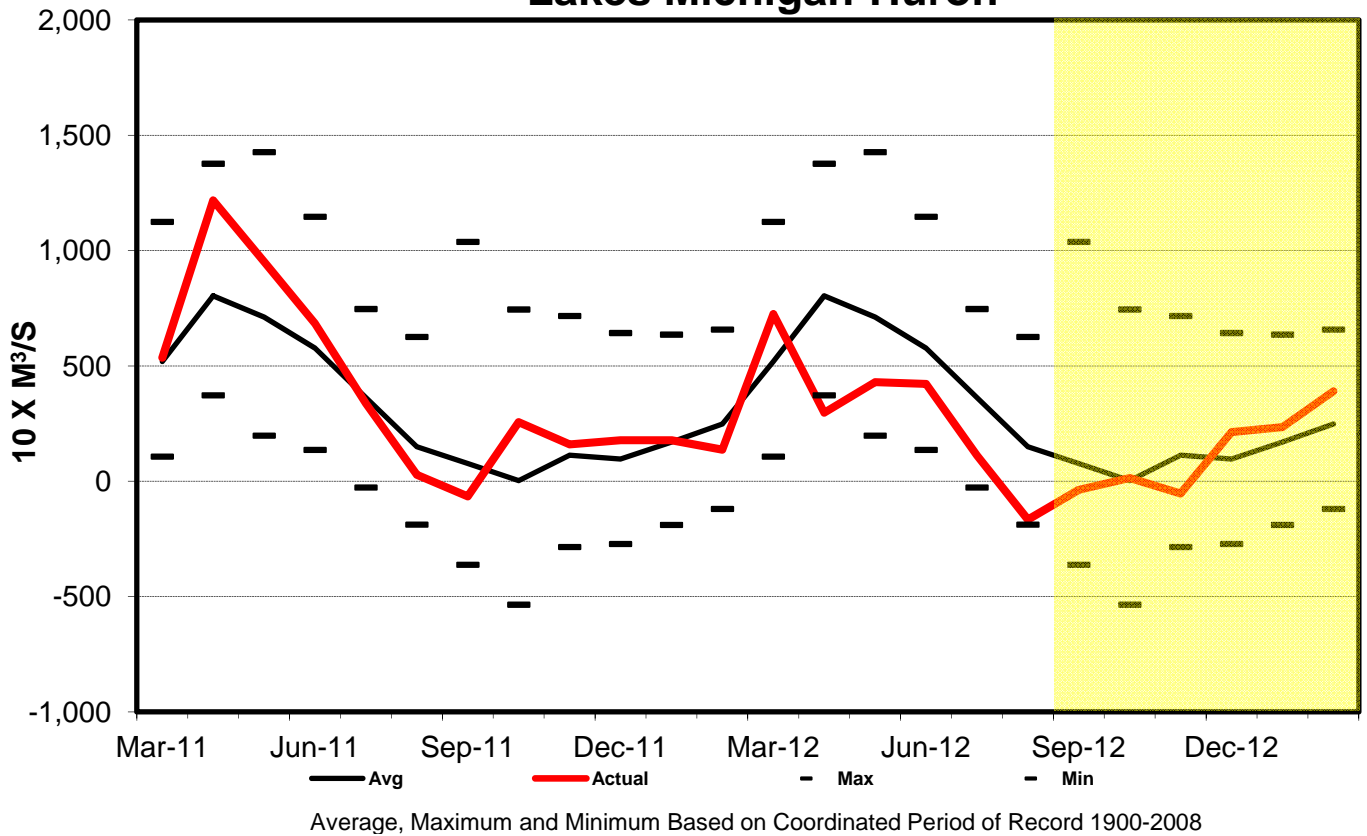
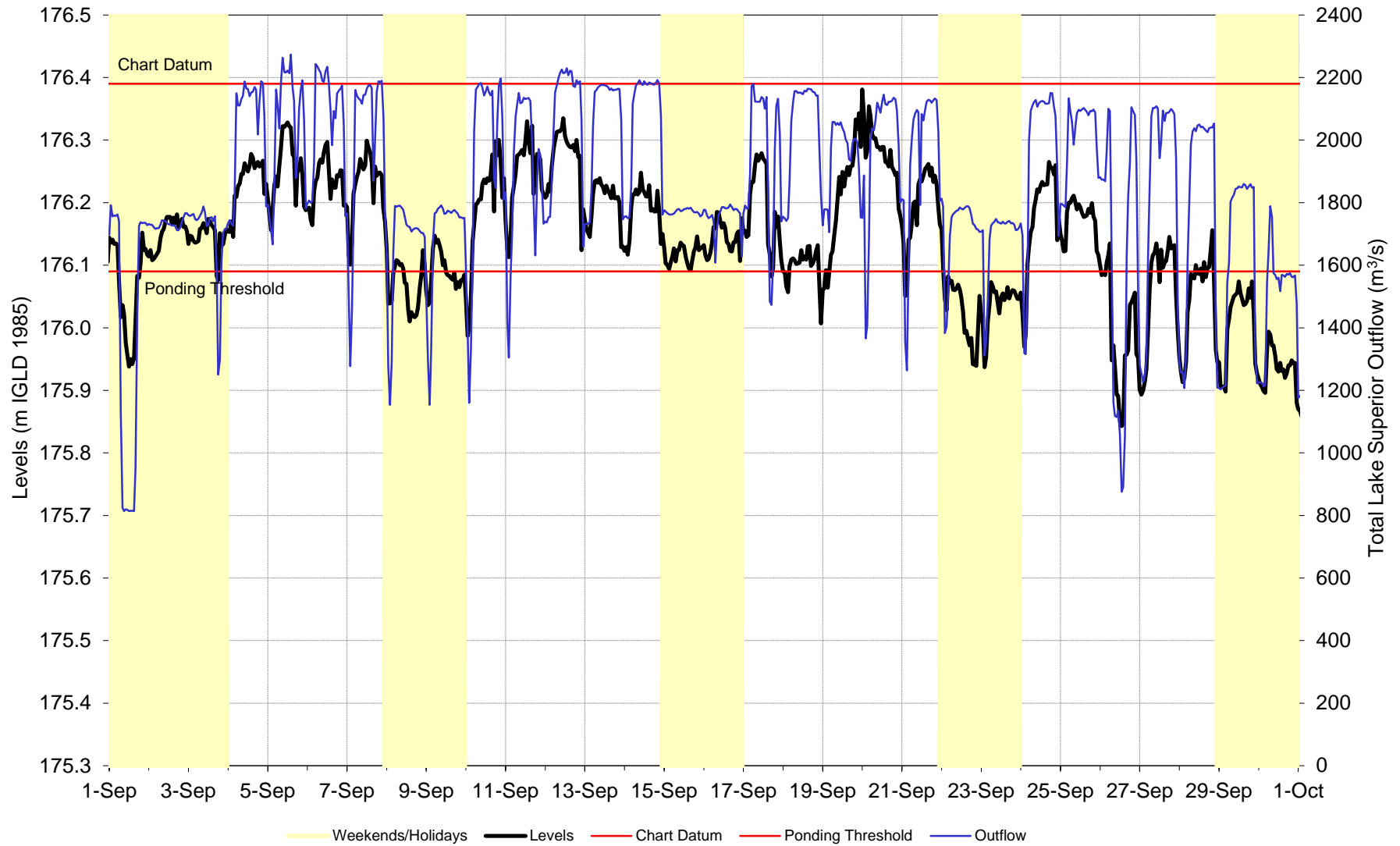
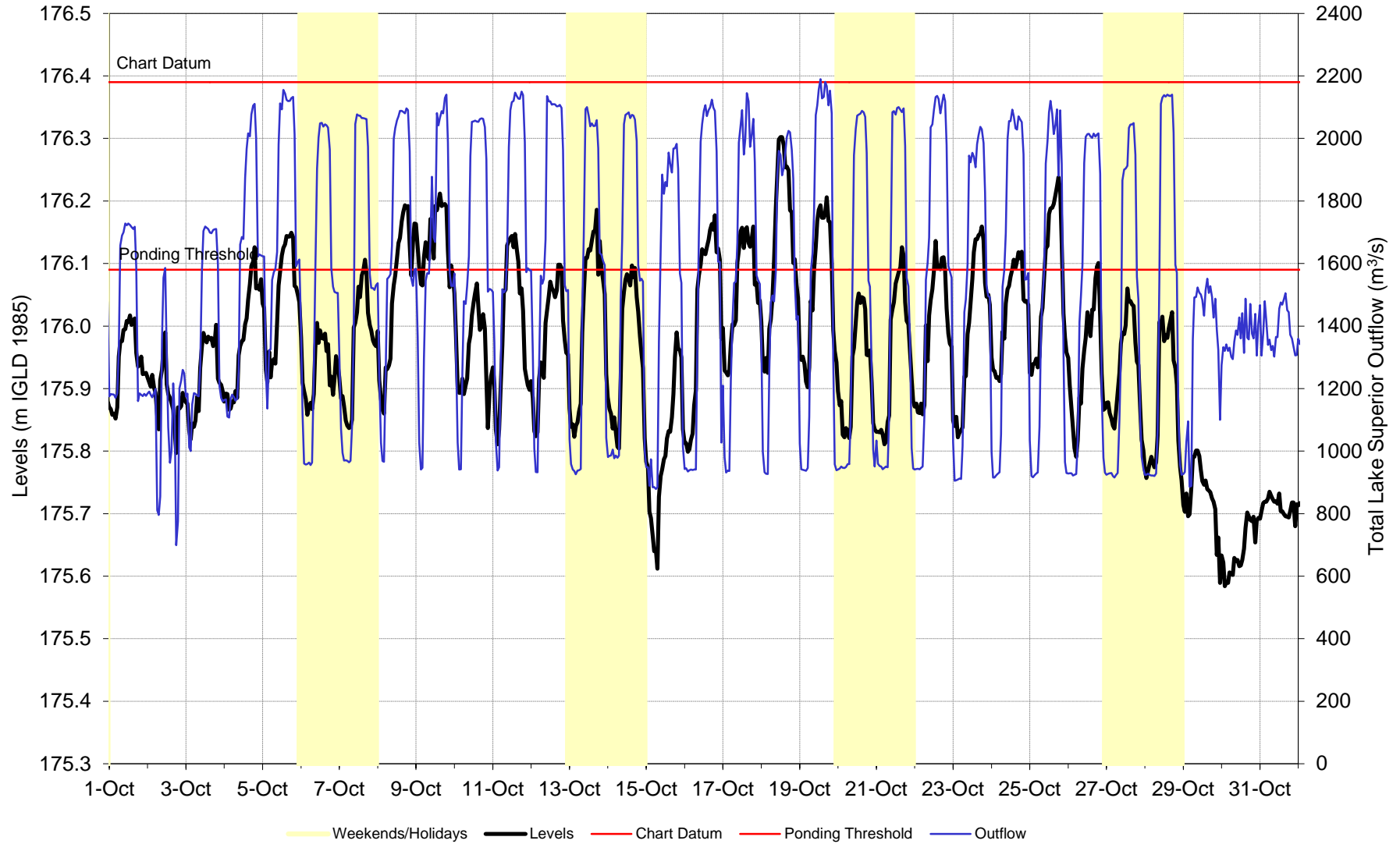


Figure 3

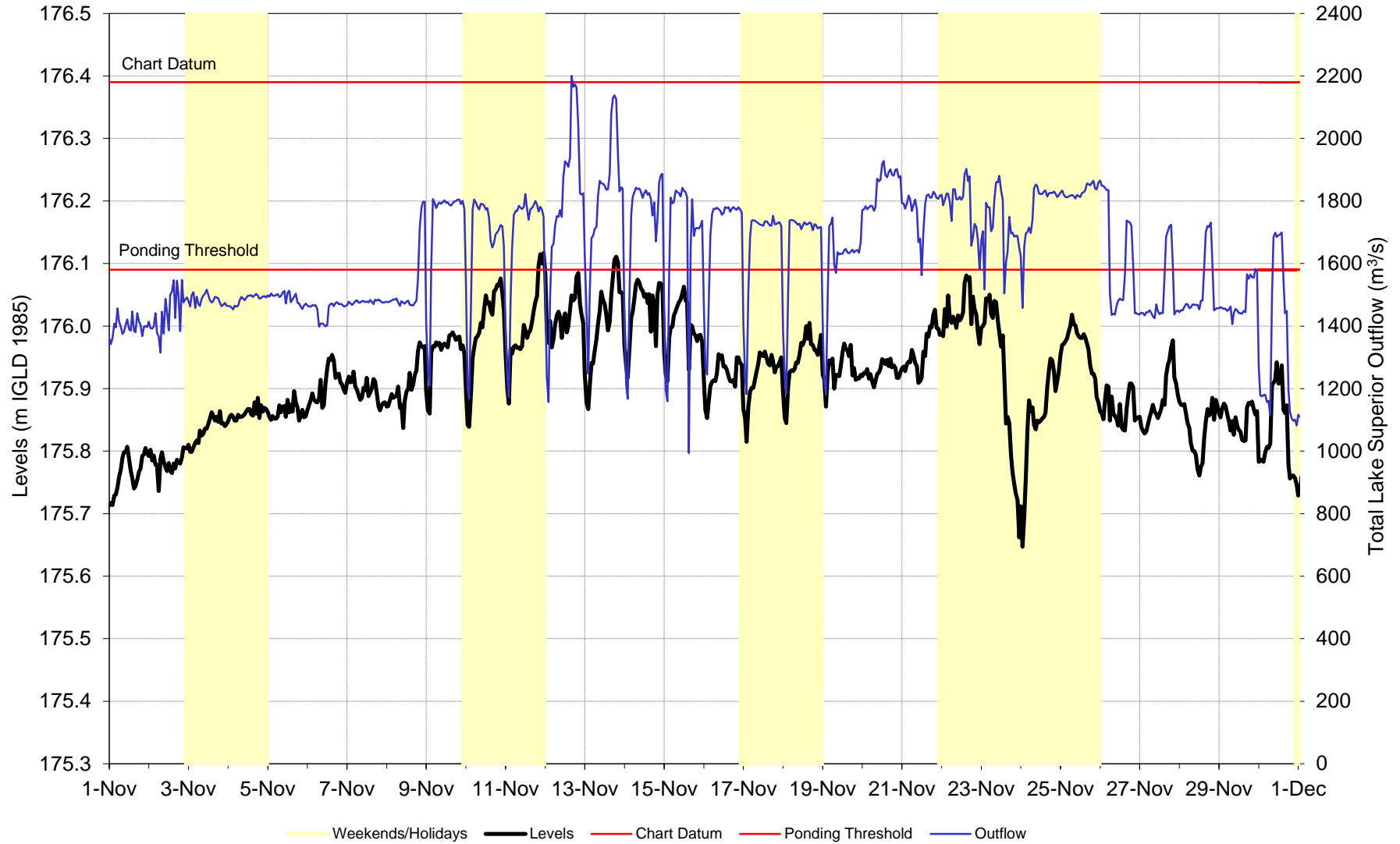
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4a - September 2012



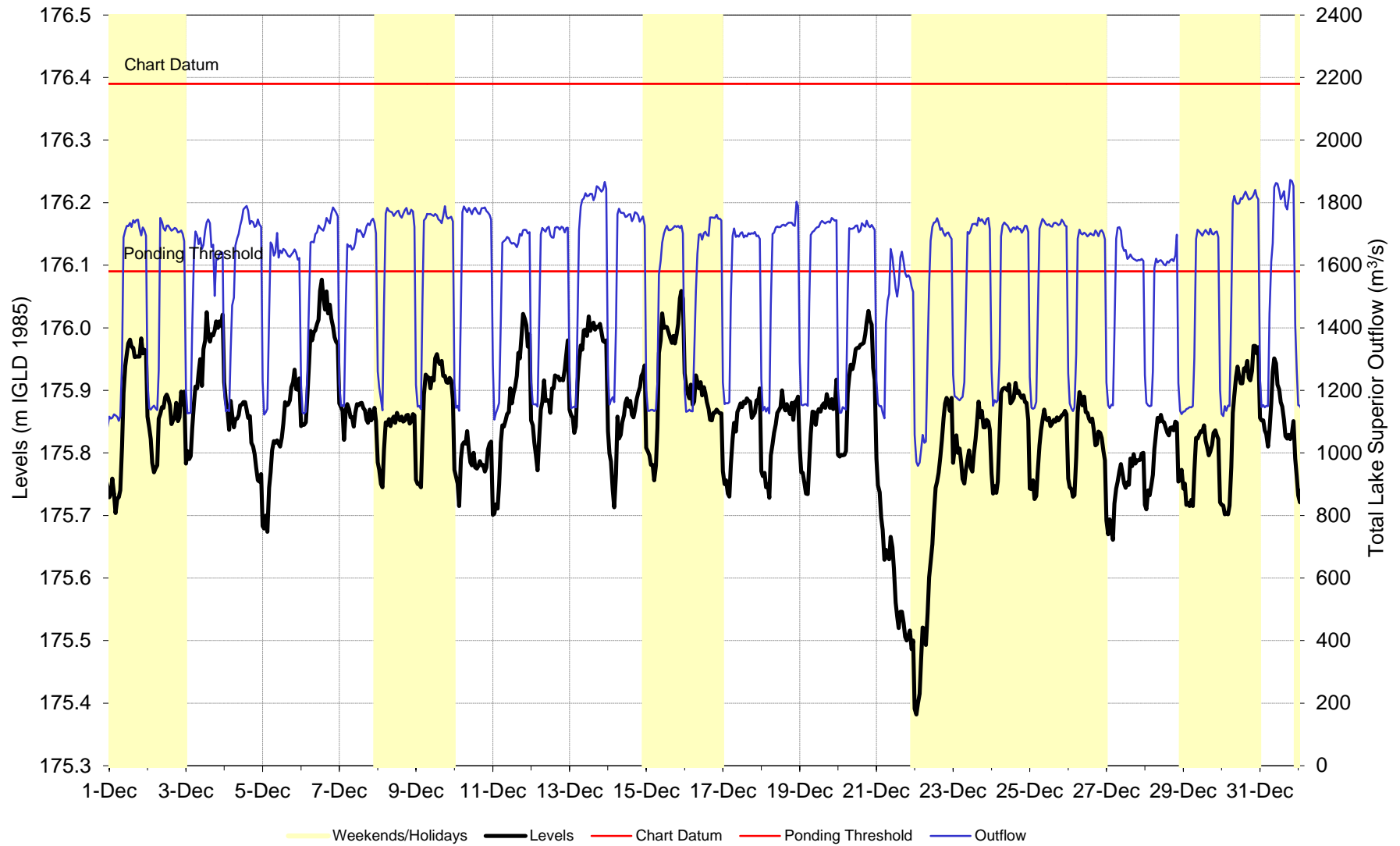
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4b - October 2012



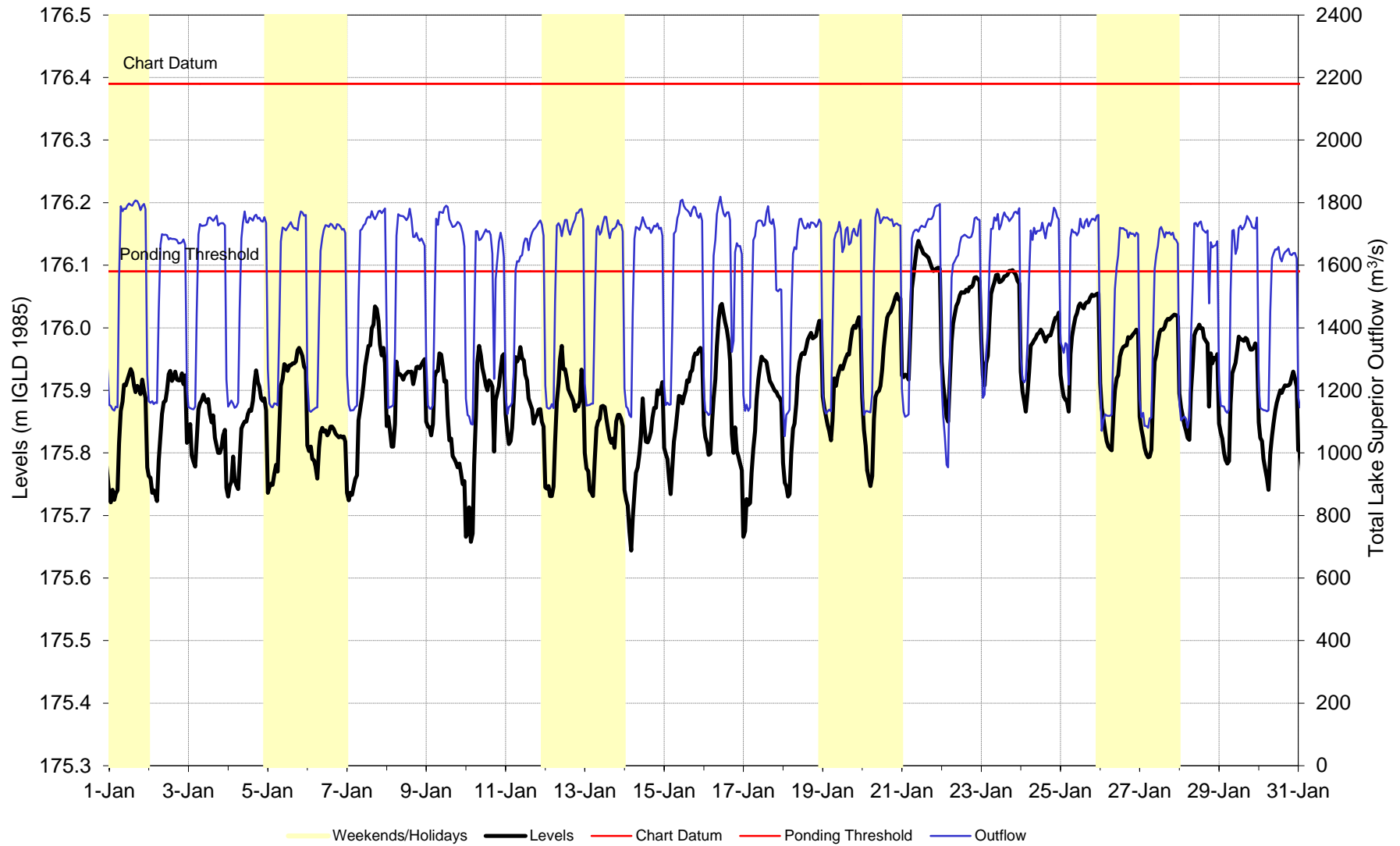
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4c - November 2012



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4d - December 2012



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



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

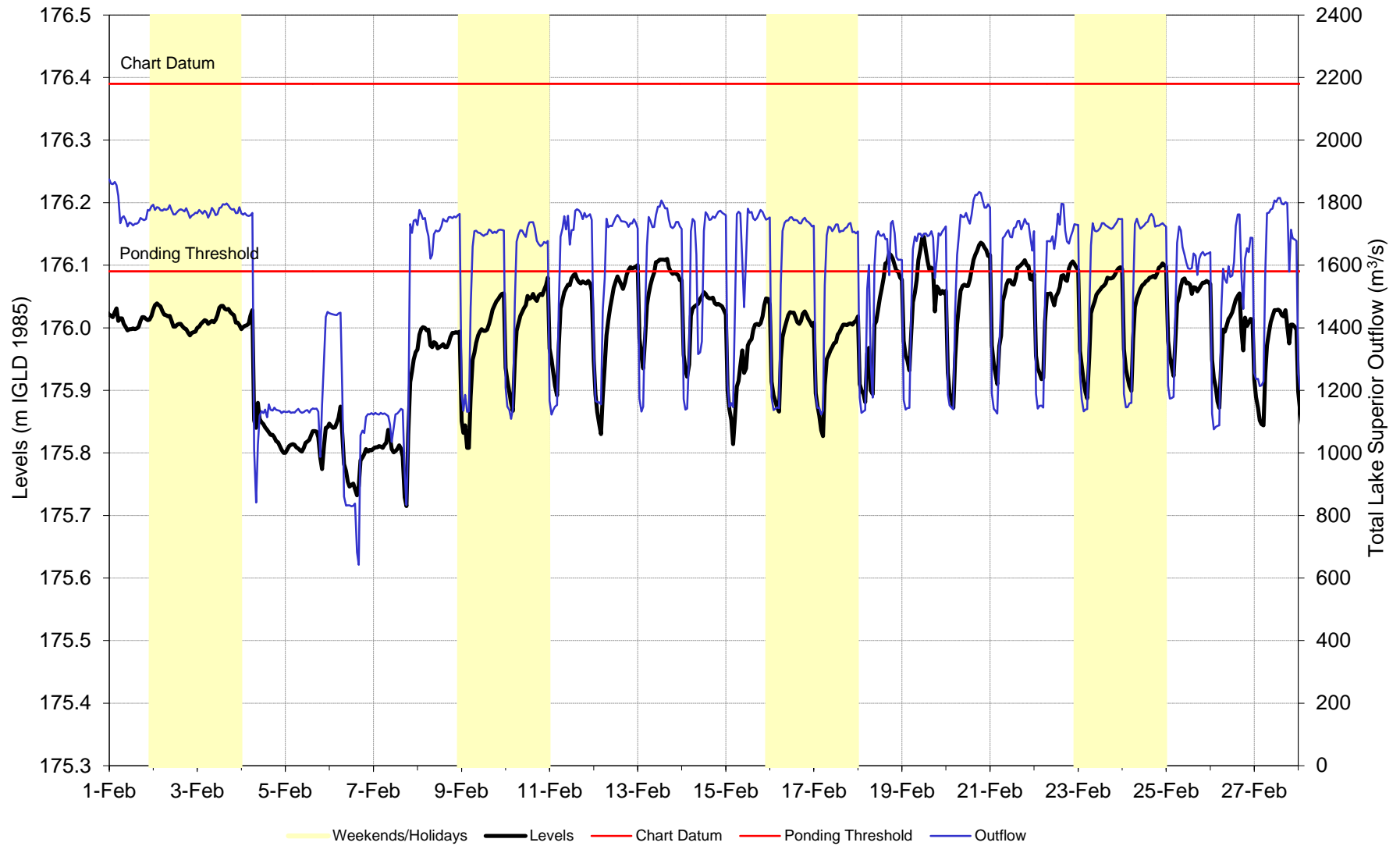


TABLE 1. 2012 - 2013 Lake Superior Hydrologic Factors

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	
2012										
JAN	183.01	600.43	-0.31	-1.02	-720	-25	68	1,560	55	80
FEB	182.94	600.20	-0.32	-1.05	-390	-14	79	1,570	55	83
MAR	182.93	600.16	-0.30	-0.98	3,300	117	6	1,500	53	80
APR	183.00	600.39	-0.26	-0.85	2,350	83	92	1,570	55	81
MAY	183.06	600.59	-0.30	-0.98	5,400	191	42	1,560	55	74
JUN	183.20	601.05	-0.24	-0.79	5,970	211	15	1,660	58	75
JUL	183.30	601.38	-0.20	-0.66	2,500	88	83	2,090	73	92
AUG	183.27	601.28	-0.26	-0.85	340	12	98	2,160	76	92
SEP	183.20	601.05	-0.33	-1.08	-1,750	-62	99	1,850	65	79
OCT	183.12	600.79	-0.38	-1.25	1,430	50	39	1,530	54	68
NOV	183.11	600.75	-0.35	-1.15	-340	-12	75	1,620	57	73
DEC	183.06	600.59	-0.34	-1.12	-390	-14	39	1,570	55	77
2013										
JAN	182.99	600.36	-0.33	-1.08	220	8	19	1,570	55	81
FEB	182.96	600.26	-0.30	-1.02	210	7	50	1,560	55	82

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 1918-2012, 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. 2012 - 2013 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	
2012										
JAN	175.99	577.40	-0.31	-1.02	1,780	63	45	4,590	162	101
FEB	175.96	577.30	-0.32	-1.05	1,370	48	78	4,640	164	105
MAR	176.00	577.43	-0.30	-0.98	7,250	256	19	4,640	164	95
APR	176.03	577.53	-0.35	-1.15	2,970	105	99	4,900	173	95
MAY	176.05	577.59	-0.43	-1.41	4,300	152	92	4,880	172	91
JUN	176.07	577.66	-0.47	-1.54	4,220	149	79	4,900	173	90
JUL	176.04	577.56	-0.53	-1.74	1,110	39	97	4,900	173	89
AUG	175.97	577.33	-0.58	-1.90	-1,660	-59	98	4,880	172	88
SEP	175.86	576.97	-0.64	-2.10	-3,700	-131	99	4,760	168	87
OCT	175.74	576.57	-0.69	-2.26	140	5	45	4,710	166	87
NOV	175.68	576.38	-0.69	-2.26	-530	-19	79	4,570	161	85
DEC	175.61	576.15	-0.72	-2.36	2,130	75	26	4,500	159	87
2013										
JAN	175.57	576.02	-0.73	-2.40	2,350	83	32	4,280	151	94
FEB	175.61	576.15	-0.67	-2.20	3,900	138	16	4,030	142	91

- 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 1918-2012, 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
2012														
JAN	404	330	734	731	1,465	4.8	0	5	0.3	10.2	0	10	83	1,563
FEB	412	331	743	732	1,475	2.1	0	2	0.3	10.0	0	10	82	1,569
MAR	412	291	703	701	1,404	4.2	0	4	0.3	9.6	0	10	82	1,500
APR	411	325	736	728	1,464	9.1	0	9	0.3	10.1	0	10	83	1,566
MAY	396	336	732	728	1,460	10.8	0.4	11	0.3	9.9	0	10	83	1,564
JUN	398	337	735	813	1,548	11.5	1.1	13	0.3	10.2	0	10	85	1,656
JUL	412	580	992	987	1,979	11.9	2.1	14	0.3	10.6	0	11	85	2,089
AUG	412	604	1,016	1,010	2,026	11.6	1.9	14	0.3	2.6	0	3	114	2,157
SEP	388	494	882	866	1,748	11.2	1.0	12	0.3	2.6	0	3	88	1,851
OCT	408	329	737	698	1,435	9.3	0.4	10	0.3	2.6	0	3	84	1,532
NOV	406	359	765	760	1,525	9.4	0	9	0.3	2.4	0	3	84	1,621
DEC	417	325	742	732	1,474	9.7	0	10	0.3	2.6	0	3	83	1,570
2013														
JAN	411	329	740	736	1,476	4.0	0	4	0.3	2.6	0	3	83	1,566
FEB	405	334	739	736	1,475	1.4	0	1	0.3	2.6	0	3	82	1,561

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

(2) Algoma Steel discharges prior to August 2012 have not yet been coordinated to reflect results of audit conducted summer of 2012

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

Year and Month	POWER CANALS					NAVIGATION CANALS			DOMESTIC USAGE				FISHERY	TOTAL LAKE
	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	14,300	11,700	25,900	25,800	51,700	170	0	177	11	360	0	353	2,900	55,200
FEB	14,500	11,700	26,200	25,900	52,100	74	0	71	11	353	0	364	2,900	55,400
MAR	14,500	10,300	24,800	24,800	49,600	148	0	141	11	339	0	350	2,900	53,000
APR	14,500	11,500	26,000	25,700	51,700	321	0	318	11	357	0	367	2,900	55,300
MAY	14,000	11,900	25,900	25,700	51,600	381	14	388	11	350	0	360	2,900	55,200
JUN	14,100	11,900	26,000	28,700	54,700	406	39	459	11	360	0	353	3,000	58,500
JUL	14,500	20,500	35,000	34,900	69,900	420	74	494	11	374	0	385	3,000	73,800
AUG	14,500	21,300	35,900	35,700	71,500	410	67	494	11	92	0	102	4,000	76,200
SEP	13,700	17,400	31,100	30,600	61,700	396	35	424	11	92	0	102	3,100	65,400
OCT	14,400	11,600	26,000	24,600	50,700	328	14	353	11	92	0	102	3,000	54,100
NOV	14,300	12,700	27,000	26,800	53,900	332	0	318	11	85	0	95	3,000	57,200
DEC	14,700	11,500	26,200	25,900	52,100	343	0	353	11	92	0	102	2,900	55,400
2013														
JAN	14,500	11,600	26,100	26,000	52,100	141	0	141	11	92	0	102	2,900	55,300
FEB	14,300	11,800	26,100	26,000	52,100	49	0	35	11	92	0	102	2,900	55,100

- 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.
(4) Algoma Steel discharges prior to August 2012 have not yet been coordinated to reflect results of audit conducted summer of 2012