
**International Lake Superior
Board of Control
Semi-Annual Progress Report to the
International Joint Commission
Covering the period August 31, 2011 to March 22, 2012**



March 22, 2012

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Cover photo: The ice encrusted CSL Assiniboine heads into the Poe Lock under clear skies, December 28, 2011. *Photo credit to Ms. Michelle Hill, Park Ranger at the USACE, Soo Area Office.*

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International Lake Superior Board of Control

Canada

David Fay, Member
Rob Caldwell, Secretary

United States

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

22 March 2012

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

Commissioners:

This semi-annual report covers the Board's activities from 31 August 2011 to 22 March 2012.

1. Highlights

During the past six months, the water levels of Lake Superior remained below average and have been 1 to 2 centimetres (cm) (0 to 1 inch (in)) higher than last year's levels, and they were 33 cm (13 in) below average last month. Lake Superior water levels have been consistently below average since April of 1998, which is the longest sustained period of below-average monthly levels in the 1918-2011 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 3 cm (1 in) below to 18 cm (7 in) above those of one year ago. Last month's monthly mean water level was 33 centimetres (13 in) below average.

The Lake Superior outflows were as specified by Regulation Plan 1977-A. Since September 2011, these monthly outflows have been between 69% and 82% of average. Meanwhile, the monthly outflows from Lakes Michigan-Huron ranged from 90% to 105% of average. Water supplies to Lake Superior were below average throughout the reporting period. In September 2011 and February 2012, water supplies to Lakes Michigan-Huron were also below average. From October 2011 through January 2012, however, supplies to Lakes Michigan-Huron were above average.

Ponding by the hydropower entities was permitted on weekends and holidays during the reporting period.

A USEPA-funded study to assess improvements to sea lamprey trapping efficiencies was completed just before this reporting period at the end of August 2011. Preliminary results were presented to the Board at its 22 March 2012 meeting. The Board was informed that a second year of tests is being proposed that focuses on the Brookfield Renewable Power (BRP) plant. The Board urged the Great Lakes Fishery Commission representative at the meeting to provide documentation on its detailed study plans and coordination with other agencies as soon as possible.

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 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 75% of average from September 2011 through February 2012 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 below average from September 2011 through February 2012. On the whole, the September 2011 through February 2012 net basin supplies to Lake Superior would be expected to be exceeded 88% of the time.

Lake Superior's water levels have been consistently below chart datum (183.2 m or 601.1 ft) since 26 October 2011 and are currently 25 cm (10 in) below chart datum. Its levels over the past six months ranged from 30 to 33 cm (12 to 13 in) below average. On 22 March 2012, its level was at an elevation of 182.95 m (600.23 ft), which was 28 cm (11 in) below average and 4 cm (2 in) higher than last year. The levels of Lake Superior have been consistently below average since April of 1998, which is the longest sustained period of below-average monthly levels in the 1918-2011 period of record.

Snow survey flights to determine the snow water equivalent on the entire Lake Superior basin were flown the first week of March. The results indicate that there is less water available from snowmelt across the Superior and Michigan-Huron basins as compared to last year. Shortly after the snow survey flight, record warm temperatures caused rapid snowmelt across the Great Lakes basin.

Precipitation over the Lakes Michigan-Huron basin was 104% of average over the past six months according to provisional data and would be expected to be exceeded 43% of the time. Net basin water supplies to Lakes Michigan-Huron were below average in September 2011 and February 2012, but were otherwise above average from October 2011 through January 2012. On the whole, the September 2011 through February 2012 net basin supplies to Lakes Michigan-Huron would be expected to be exceeded about 42% of the time.

Monthly mean Lake Michigan-Huron levels ranged from 29 to 38 cm (11 to 15 in) below long-term averages. Water levels were below chart datum (176.00 m or 577.4 ft) from 31 January 2012 through 16 March 2012. On 22 March 2012, Lakes Michigan-Huron were at elevation 176.01 m (577.46 ft), 29 cm (11 in) below average, 17 cm (7 in) higher than one year ago, and 1 cm (0 in) above 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 75% of average over the last six months, with monthly flows ranging from 1,560 to 1,650 m³/s (55,100 to 58,300 cfs). Outflows were limited by Criterion (c) of the Orders in March 2012.

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 13 to 16 open 20 cm (8 in) each from 5 July 2011 to 8 September 2011 in order to facilitate sea lamprey trapping efforts. The typical gate setting of Gates 7 to 10 open 20 cm (8 in) was in place after 8 September 2011. 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. All flow reductions were easily 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 182.94 and 183.23 m (600.2 and 601.15 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 176.00 and 176.46 m (577.4 and 578.9 ft). Therefore, the requirement for maintaining the level below 177.94 m (583.8 ft.) was satisfied. Daily mean U.S. Slip levels fell below the ponding restriction threshold (see Section 10) of 176.09 m (577.72 ft) for four days during the reporting period. Ponding has been permitted over the last six months.

5. Inspection and Repairs at the Compensating Works

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

Routine monthly maintenance inspections continue to be carried out on the Canadian portion of the Compensating Works by BRP. In addition, the annual fall inspection was carried out in November 2011. 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. Conditions were found to be generally good.

Monthly inspections and routine maintenance continued to be conducted on the U.S. portion by the USACE Soo Area Office. The last monthly inspection conducted on 30 November 2011 found the Compensating Works facilities to be in good condition. Monthly inspections will resume in March 2012 and continue through November 2013. Monthly inspections of the Compensating Works are not performed during the winter months.

The next periodic inspection of the U.S. portion of the Compensating Works is scheduled for 2015. From 16-25 July 2012, a periodic assessment (more detailed than a periodic inspection) will be conducted for the entire Soo complex, but will focus on the Main/Unit 10 and connecting dikes section.

6. Repairs and Maintenance at the Hydropower Facilities

a. U.S. Government Hydropower Plant

Work continued on the timber crib dam repairs from September 2011 through November 2011 of the reporting period. The crib dam repairs accounted for about 100 hours worth of outages for Units 1, 2, 3, and 3A from September 2011 through November 2011. Starting on 6 September 2011, Unit 1 was offline for 320 hours (13 days) to change the turbine draft seal.

Including the above outages, several more scheduled and unscheduled outages have occurred since September 2011 resulting in about 53 hours of downtime for scheduled and unscheduled maintenance and to correct electrical faults. Since 14 December 2011, all units

have been online with no interruptions. Flow allocations were met during the reporting period. Cloverland Electric Co-operative (CEC) used all of the allocation that the government plant was unable to use. The total outages (including outages needed for crib dam repairs) are significantly less than the outages reported in the Fall 2011 report.

b. Brookfield Renewable Power

Scheduled maintenance outages continue to be performed. 2012 annual inspections are scheduled on Unit #1 from 30 April to 4 May, Unit #3 from 24-30 September, and Unit #2 from 1-11 October. Outages are planned in the first half of 2012 for each unit to implement ladder access modifications to unit bulb nose access points. Work at Unit #3 was initiated between March 5 and 8 and completed on March 21. BRP expects to be able to pass monthly water allocations.

On 25 September 2011, Unit 3 tripped and was out for a couple of hours due to a mechanical issue. The 2011 annual inspection on Unit 3 was completed from 3-21 October. Planned outage work on Transmission Busses 1 and 2 resulted in various temporary outages affecting all three units from 5-8 December. On 23 January 2012, all three units experienced a short generation rejection from the 115kV transmission grid due to a transmission line issue. These outages did not affect BRP's ability to pass monthly water allocations.

The annual 8-hour underwater cable inspection and maintenance for Lake Superior Power Ltd has not been scheduled yet.

c. Cloverland Electric Co-operative

During the reporting period, all flow allocations were used by CEC. Routine maintenance at the plant was conducted during the reporting period, but it did not impact operations or flow schedules. No maintenance is scheduled for 2012 that would require a shutdown or restricted flows.

7. Flow Verification Measurements

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.

Flow measurements were made at model sections in the lower St. Marys River in October 2011. These measurements were for use in the calibration of hydraulic models and are not related to the power plant flow verification program.

Flow measurements at the Compensating Works are tentatively scheduled for the first week of August 2012.

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 2011 to February 2012. 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 10 to 11 m³/s (353 to 388 cfs) or 0.6 to 0.7% of the total monthly outflow.

The monthly flow through the locks depends on traffic volume and varied from 2 to 12 m³/s (71 to 424 cfs). 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 Poe lock on the U.S. side stayed open three days past the traditional closing date of the navigation season, at the request of the shipping industry, allowing the movement of over 400,000 tons of additional cargo. The locks are scheduled to re-open on 25 March.

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 85 m³/s (2,930 to 3,000 cfs) over the last six months, or approximately 5% of the total monthly outflow.

The hydropower plants passed an average of 1,472 m³/s (52,000 cfs) from September 2011 to January 2012 for electric power production, or 93% of the total river flow. The allocation for this period averaged 1,471 m³/s (51,900 cfs). Usages at each plant are shown in Tables 3 and 4.

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 Diversions into Lake Nipigon (which flows into Lake Superior) averaged 22.6 m³/s (800 cfs) and the Long Lac Diversion averaged 55.2 m³/s (1,950 cfs) from September 2011 through February 2012. Combined, these diversions were about 56 percent 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 1.9 m³/s (70 cfs)) was passed during September 2011 through February 2012.

Continuous flows of at least 2 m³/s (70 cfs) 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 cfs) was spilled from September 2011 through February 2012.

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 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 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.

The Commission’s guidelines were to be examined on a five-year basis by the Board, beginning in 2010. At the Spring Appearance on 21 April, the Commission agreed that the Board could defer the report until after related findings of the International Upper Great Lakes Study are released.

During the reporting period, the power entities undertook peaking and ponding operations under the supervision of the Board. Ponding was permitted for the entire reporting period. 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 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 slightly higher than during the same period last year.

11. Sea Lamprey Control Tests

A set of sea lamprey control tests was completed in August 2011, just before the reporting period. This consisted of trapping tests below the Compensating Works as well as downstream of the CEC and BRP hydropower plants.

As discussed in Section 3, 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 2011 through February 2012. The equivalent one-half gate open setting was maintained using Gates 13 to 16 open 20 cm (8 in) each from 5 July to 8 September 2011 in order to facilitate sea lamprey trapping efforts. The typical gate setting of Gates 7 to 10 open 20 cm (8 in) was in place after 8 September 2011.

Preliminary results of the experiments below the hydropower plants were presented by a representative from the Great Lakes Fishery Commission (GLFC) to the Board at its 22 March 2012 meeting. The relationship between increased flow and increased daily catch success was not as strong as expected. The Board asked for an analysis that showed the difference between daylight and night catches, instead of a lumped daily catch. There appeared to be little difference in catch success at the CEC plant, perhaps because the flow is distributed over a large area. A 3-dimensional model of lamprey behavior near the BRP plant is still under development. The Board was informed that a second year of tests is being proposed that focuses on the BRP plant and that increased nighttime flows would be requested. No further tests are planned at the CEC plant. Moving the Compensating Works gate open setting closer to the southern (U.S.) end is again expected to be requested. The Board urged the GLFC representative at the meeting to provide documentation on its detailed study plans and coordination with other agencies as soon as possible. Board staff is preparing an analysis of what flow increases might be accommodated within the plan-prescribed outflows.

12. Annual Meeting with the Public and Public Information

The Board proposes to hold its 2012 annual meeting with the public tentatively scheduled for the week of 20 August in Sault Ste Marie, ON. The meeting will include a call-in option for interested parties.

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 maintains additional technical information on its own Board Web site.

13. Board Membership and Meetings

On 19 September 2011, MG John W. Peabody resigned from the Board, effective upon his turning over command of the Great Lakes and Ohio River Division and departure for a new assignment in the Corps of Engineers' Mississippi Valley Division. On 3 October 2011 the Commission appointed BG Margaret W. Burcham as the U.S. Chair of the Board, replacing MG Peabody.

The Board held a meeting on 22 March 2012 in Watertown, New York, with the Canadian Member and the U.S. Alternate Member in attendance.

Respectfully submitted,

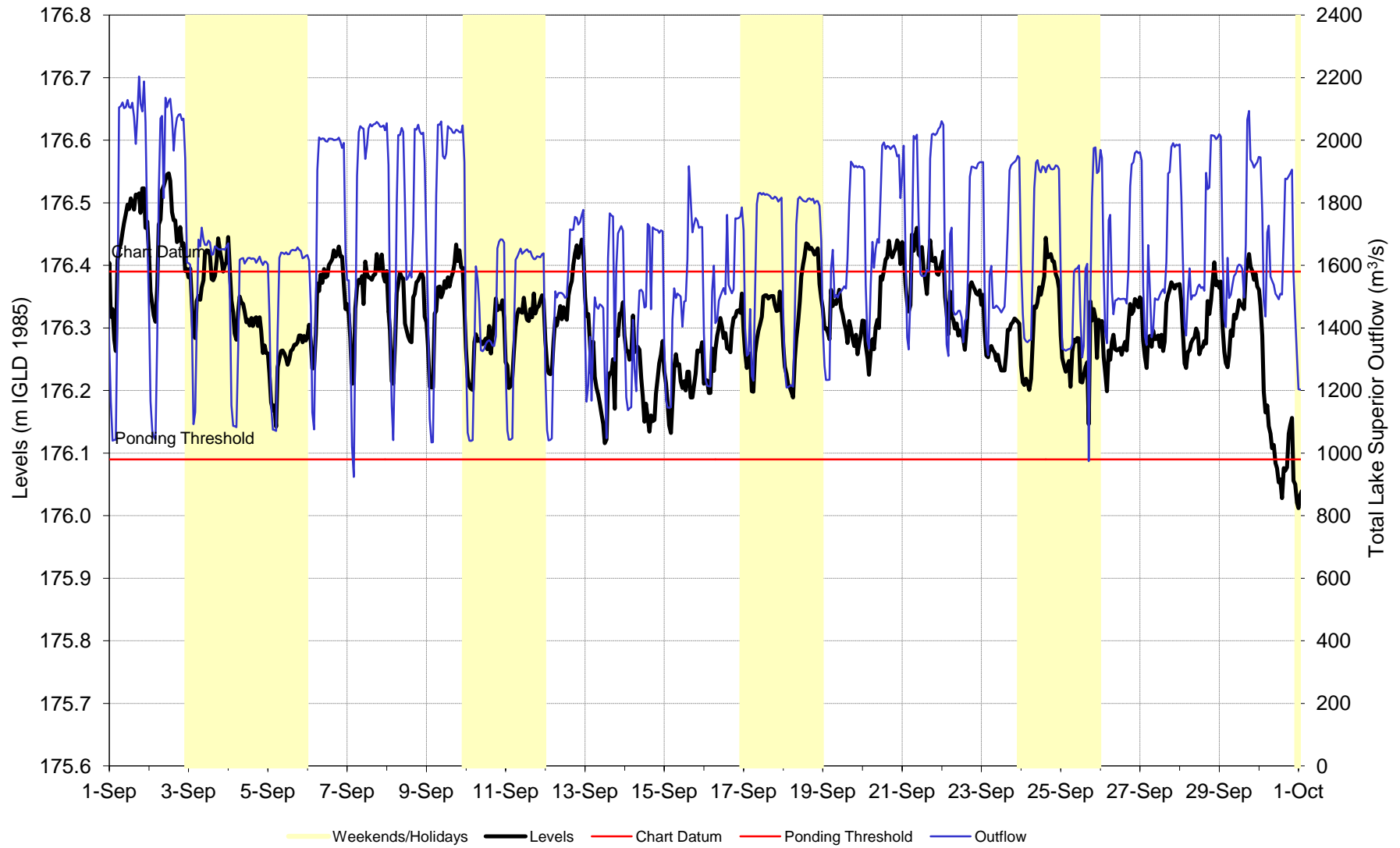
Original Signed by:

David Fay
Member for Canada

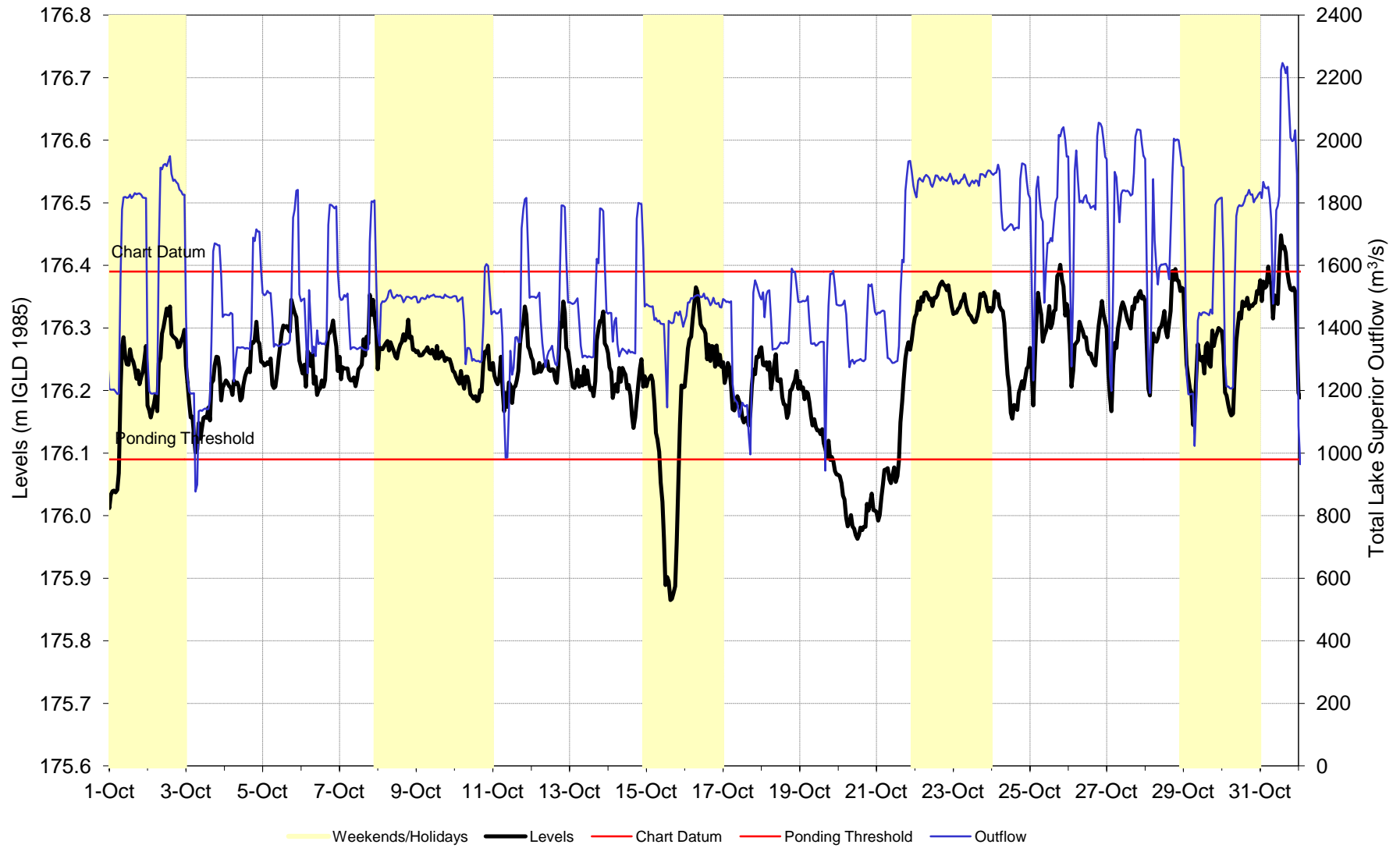
Original Signed by:

BG Margaret Burcham
Member for United States

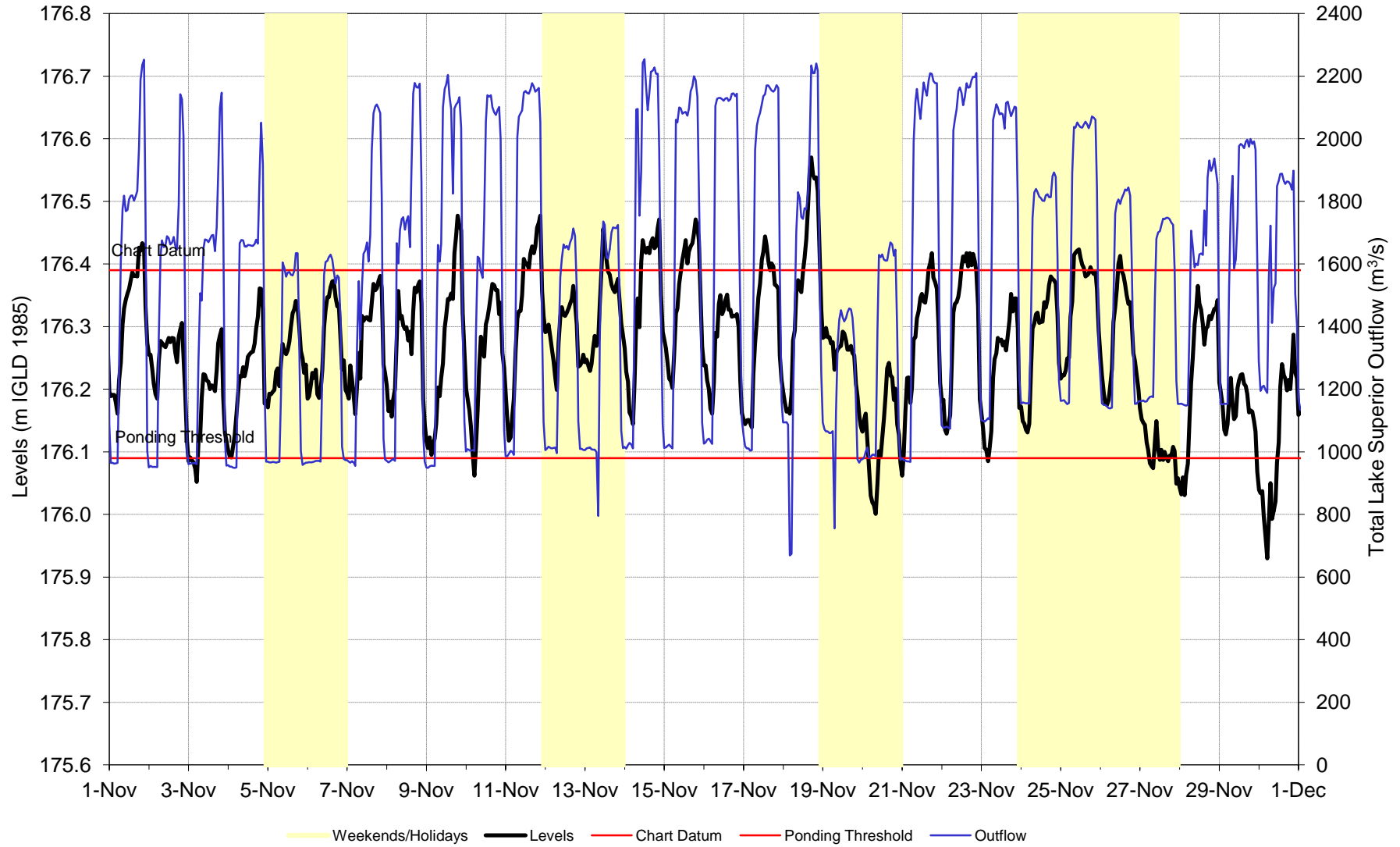
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4a - September 2011



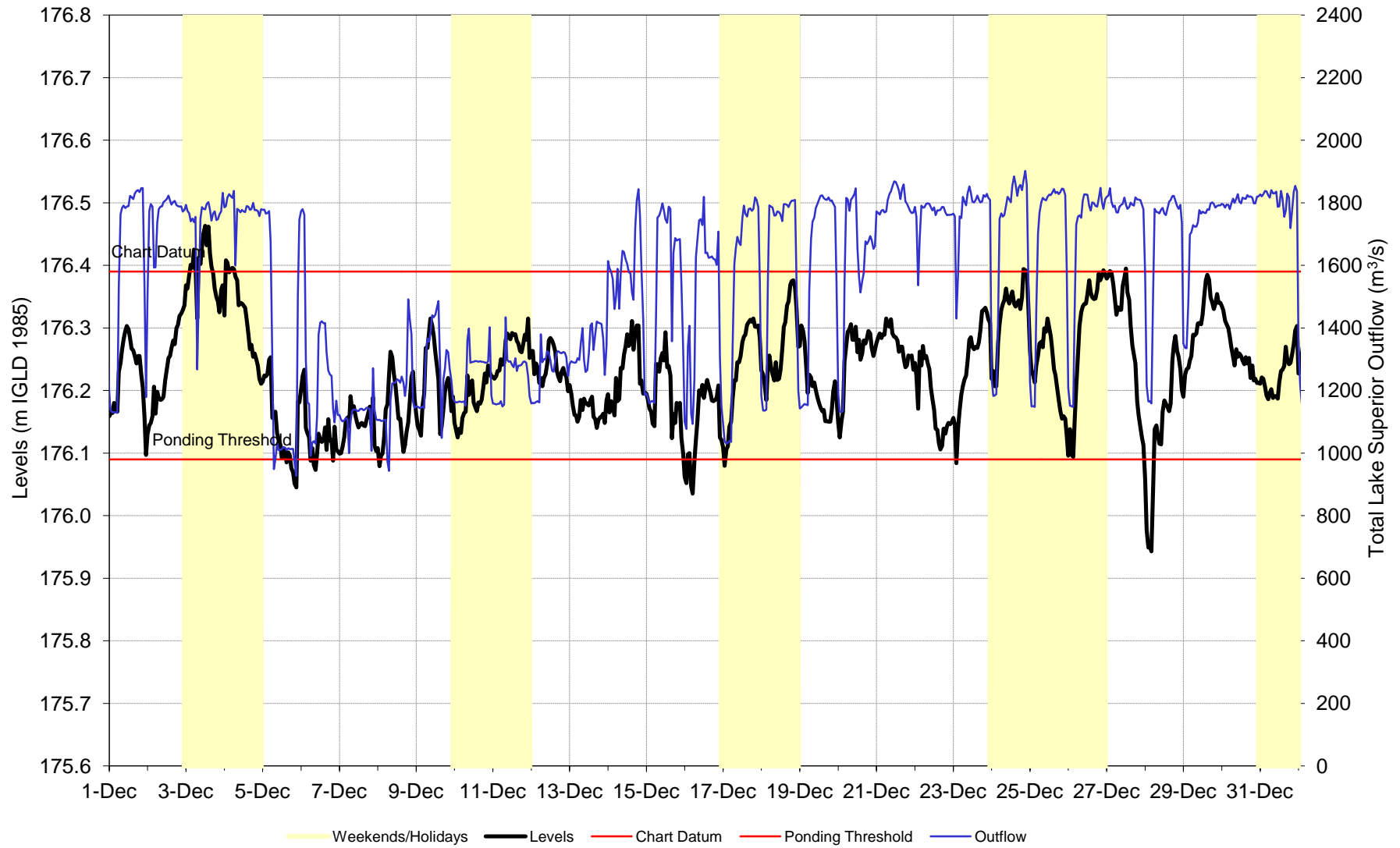
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4b - October 2011



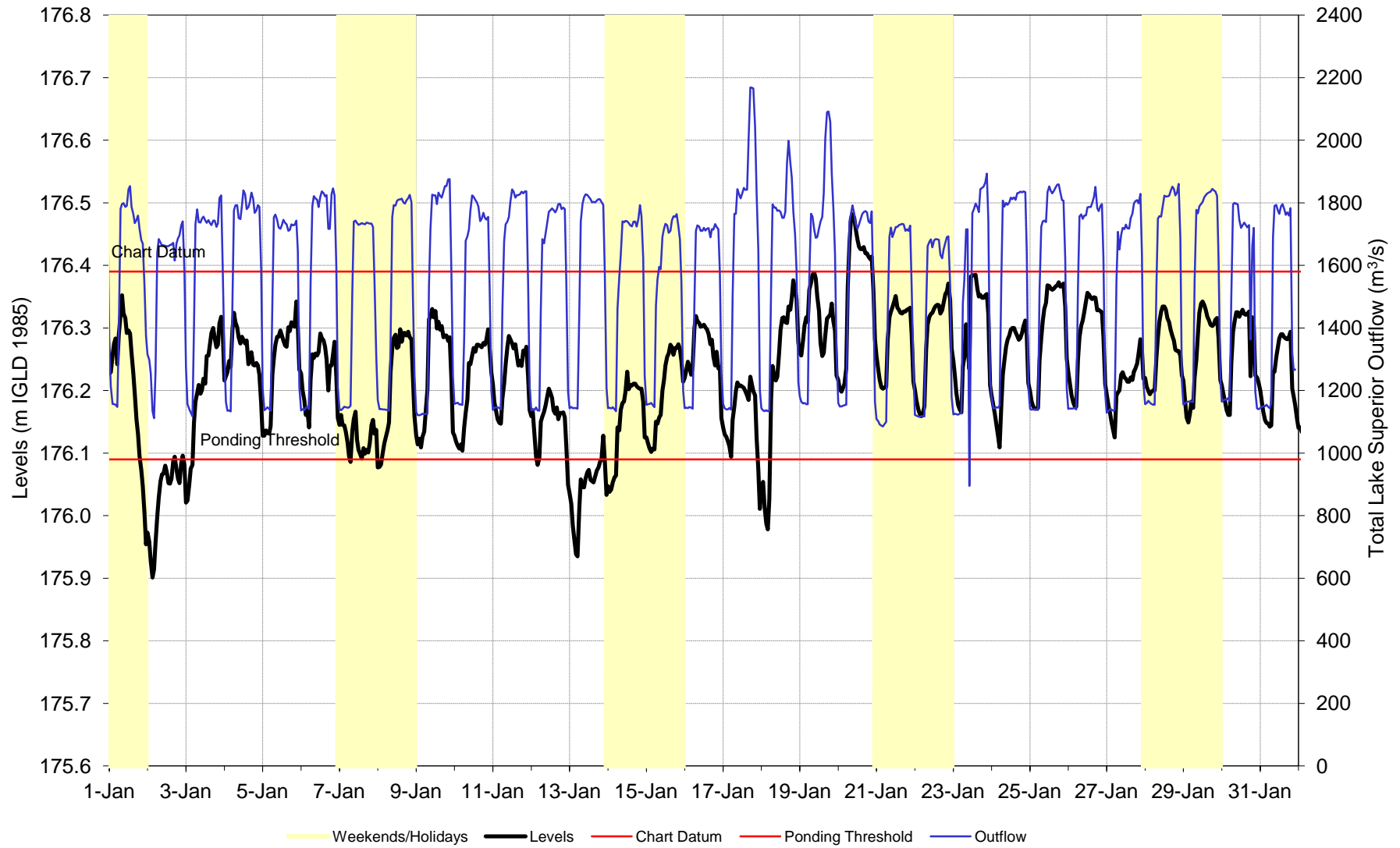
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4c - November 2011



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4d - December 2011



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4e - January 2012



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4f - February 2012

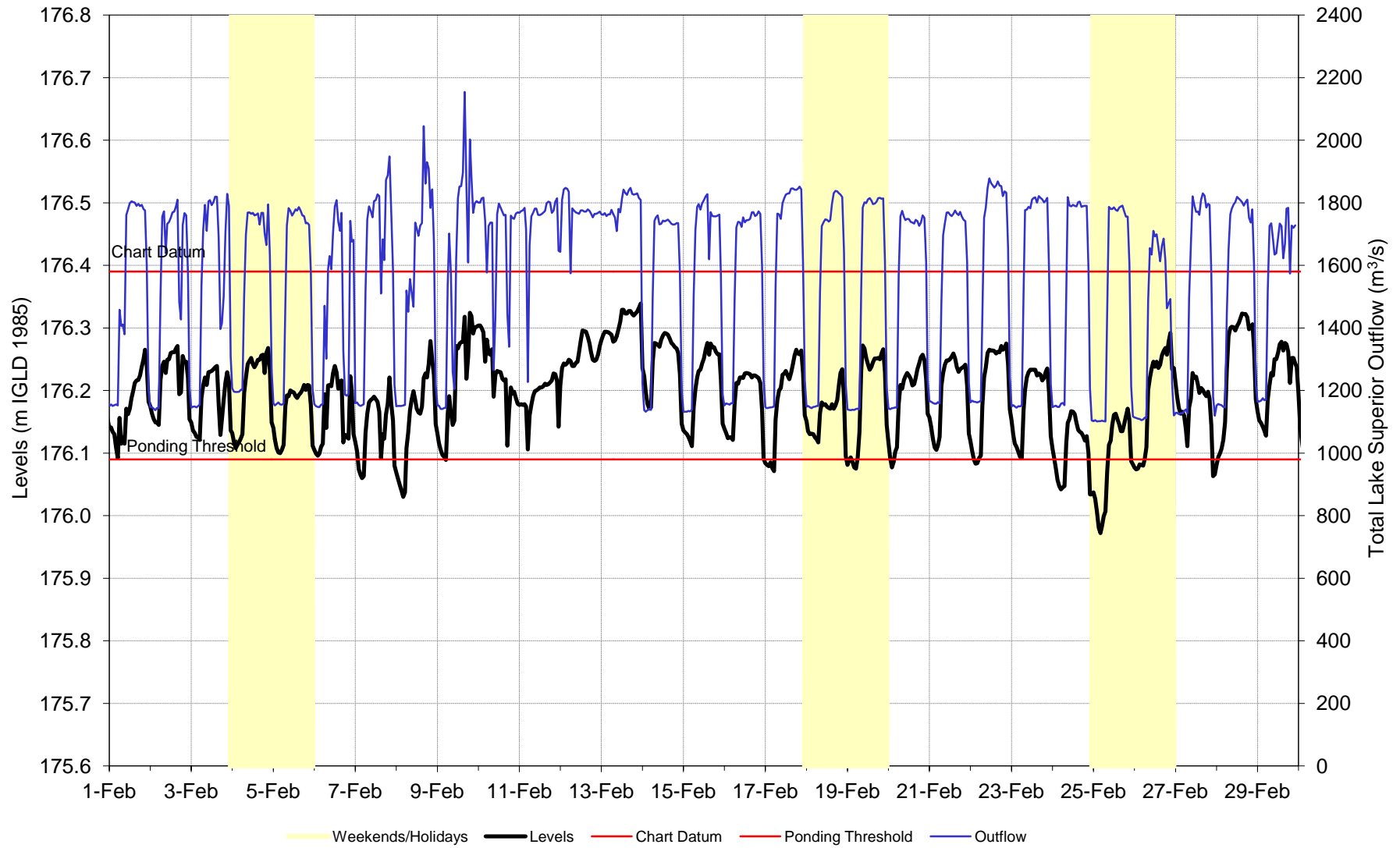


TABLE 1. 2011 - 2012 Lake Superior Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded ¹		Difference From Average ²		Monthly Mean Recorded		Exceedance Probability ³	Monthly Mean Recorded		Percent of Average ⁴
	Meters	Feet	Meters	Feet	m3/s	tcfs	(%)	m3/s	tcfs	
2011										
JAN	183.00	600.39	-0.33	-1.08	-150	-5	36	1,560	55	80
FEB	182.93	600.16	-0.34	-1.12	-780	-28	91	1,540	54	81
MAR	182.87	599.97	-0.36	-1.18	110	4	85	1,470	52	79
APR	182.91	600.10	-0.35	-1.15	4,500	159	40	1,470	52	76
MAY	183.04	600.52	-0.32	-1.05	5,720	202	35	1,550	55	73
JUN	183.15	600.89	-0.29	-0.95	4,450	157	46	1,630	58	74
JUL	183.25	601.21	-0.26	-0.85	4,000	141	36	1,720	61	75
AUG	183.28	601.31	-0.25	-0.82	1,020	36	90	1,740	61	74
SEP	183.23	601.15	-0.30	-0.98	600	21	83	1,650	58	71
OCT	183.21	601.08	-0.30	-0.98	-100	-4	82	1,560	55	69
NOV	183.16	600.92	-0.30	-0.98	230	8	56	1,560	55	70
DEC	183.09	600.69	-0.31	-1.02	-1,320	-47	79	1,560	55	76
2012										
JAN	183.01	600.43	-0.32	-1.05	-720	-25	68	1,560	55	80
FEB*	182.94	600.20	-0.33	-1.08	-400	-14	79	1,560	55	82

Notes: m3/s = cubic meters per second

tcfs = 1,000 cubic feet per second

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

² Average levels are for the period 1918-2011, based on a mean of five gauges. Differences computed as meters and then converted to feet.

³ Exceedance probabilities are based on 1900 - 2008.

⁴ Average flows are for the period 1900 - 2008.

* Provisional

TABLE 2. 2011 - 2012 Lake 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		Percent of Average ⁴
	Meters	Feet	Meters	Feet	m3/s	tcfs	(%)	m3/s	tcfs	
2011										
JAN	175.81	576.80	-0.49	-1.61	750	26	70	4,010	142	88
FEB	175.78	576.71	-0.51	-1.67	1,460	52	75	3,800	134	86
MAR	175.81	576.80	-0.49	-1.61	5,360	189	45	4,060	143	84
APR	175.91	577.13	-0.48	-1.57	12,180	430	5	4,630	164	90
MAY	176.10	577.76	-0.38	-1.25	9,520	336	13	4,730	167	88
JUN	176.21	578.12	-0.34	-1.12	6,840	242	27	4,810	170	88
JUL	176.26	578.28	-0.32	-1.05	3,370	119	55	5,000	177	91
AUG	176.24	578.22	-0.32	-1.05	280	10	76	5,060	179	92
SEP	176.13	577.85	-0.38	-1.25	-660	-23	76	4,920	174	90
OCT	176.08	577.69	-0.36	-1.18	2,560	90	10	4,920	174	91
NOV	176.07	577.66	-0.31	-1.02	1,600	57	38	4,860	172	91
DEC	176.04	577.56	-0.29	-0.95	1,780	63	32	4,590	162	88
2012										
JAN	175.99	577.40	-0.31	-1.02	1,780	63	45	4,590	162	96
FEB*	175.96	577.30	-0.33	-1.08	1,400	49	77	4,660	165	105

Notes: m³/s = cubic meters per second

tcfs = 1,000 cubic feet per second

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

² Average levels are for the period 1918-2011, based on a mean of six gauges. Differences computed as meters and then converted to feet.

³ Exceedance probabilities are based on 1900 - 2008.

⁴ Average flows are for the period 1900 - 2008.

* Provisional

TABLE 3
MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOWS (Cubic Meters / Second)

Year and Month	POWER CANALS					NAVIGATION CANALS			DOMESTIC USAGE				Fishery	Total Lake
	U.S. Gov't Hydro	Edison Sault Electric	US Total	Brookfield Power	Total Power Canals	United States	Canada	Total Navigation Canals	Sault Ste. Marie US + CAN	Algoma Steel	St. Marys Paper	Total Domestic Usage	St. Marys Rapids	Superior Outflow (cms)
2011														
JAN	405	362	767	697	1,464	5.2	0.0	5	0.30	9.8	0.3	10	82	1,561
FEB	407	318	725	717	1,442	1.4	0.0	1	0.40	9.6	0.3	10	82	1,535
MAR	408	282	690	687	1,377	3.1	0.0	3	0.40	9.8	0	10	81	1,471
APR	406	281	687	684	1,371	8.6	0.0	9	0.40	9.9	0	10	81	1,471
MAY	327	393	720	728	1,448	10.4	0.5	11	0.40	10.3	0	11	83	1,553
JUN	295	467	762	760	1,522	11.4	1.1	12	0.30	10.9	0	11	84	1,629
JUL	285	520	805	806	1,611	12.3	2.0	14	0.30	10.5	0	11	85	1,721
AUG	373	439	812	820	1,632	12.1	1.8	14	0.30	10.9	0	11	85	1,742
SEP	346	393	739	799	1,538	10.7	1.0	12	0.30	10.4	0	11	85	1,646
OCT	403	323	726	727	1,453	9.5	0.3	10	0.30	10.1	0	10	85	1,558
NOV	390	338	728	732	1,460	9.4	0.0	9	0.30	9.8	0	10	84	1,563
DEC	403	330	733	721	1,454	8.7	0.0	9	0.30	10.3	0	11	84	1,558
2012														
JAN	404	330	734	731	1,465	4.8	0	5	0.30	10.2	0	10	83	1,563
FEB	405	327	732	732	1,464	2.0	0	2	0.30	10.2	0	10	83	1,559

NOTE: (1) POWER CANALS COLUMNS INCLUDE FLOWS THROUGH POWER PLANTS AND SPILLWAYS

**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	Edison Sault Electric	US Total	Brookfield Power	Total Power Canals	United States	Canada	Total Navigation Canals	Sault Ste. Marie US + CAN	Algoma Steel	St. Marys Paper	Total Domestic Usage	St. Marys Rapids	Superior Outflow (cfs)
2011														
JAN	14,300	12,800	27,100	24,600	51,700	184	0	184	11	346	11	368	2,900	55,200
FEB	14,400	11,200	25,600	25,300	50,900	49	0	49	14	339	11	364	2,900	54,200
MAR	14,400	10,000	24,400	24,300	48,700	109	0	109	14	346	0	360	2,860	52,000
APR	14,300	9,900	24,200	24,200	48,400	304	0	304	14	350	0	364	2,860	51,900
MAY	11,500	13,900	25,400	25,700	51,100	367	18	385	14	364	0	378	2,930	54,800
JUN	10,400	16,500	26,900	26,800	53,700	403	39	442	11	385	0	396	2,970	57,500
JUL	10,100	18,400	28,500	28,500	57,000	434	71	505	11	371	0	382	3,000	60,900
AUG	13,200	15,500	28,700	29,000	57,700	427	64	491	11	385	0	396	3,000	61,600
SEP	12,200	13,900	26,100	28,200	54,300	378	35	413	11	367	0	378	3,000	58,100
OCT	14,200	11,400	25,600	25,700	51,300	335	11	346	11	357	0	368	3,000	55,000
NOV	13,800	11,900	25,700	25,900	51,600	332	0	332	11	346	0	357	2,970	55,300
DEC	14,200	11,700	25,900	25,500	51,400	307	0	307	11	364	0	375	2,970	55,100
2012														
JAN	14,300	11,700	26,000	25,800	51,800	170	0	170	11	360	0	371	2,930	55,300
FEB	14,300	11,500	25,800	25,900	51,700	71	0	71	11	360	0	371	2,930	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.