International Lake Superior Board of Control

Semi-Annual Progress Report to the International Joint Commission

Covering the Period March 20, 2008 to September 15, 2008

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International Lake Superior Board of Control

Canada
David Fay, Member
Rob Caldwell, Secretary

United States
BG John W. Peabody, Member
John W. Kangas, Secretary

15 September 2008

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

Commissioners:

This semi-annual report covers the Board's activities from 20 March to 15 September 2008.

1. Highlights

During the past six months, the water levels of Lake Superior remained below average but were higher than last year. Lake Superior levels rose considerably in the last year but have been consistently below average since April of 1998, which is the longest sustained period of below-average monthly levels in the 1918-2007 record. The levels of Lakes Michigan-Huron have been below average since January of 1999, the second longest period on record of consistently below average levels. However, the level is now significantly above those of the past two years.

This period of sustained low water levels and outflows continues to have significant impacts on stakeholders in the upper Great Lakes region. The Board has been apprised of ongoing detrimental effects to navigation, hydropower, tourism, industrial, and shoreline interests, but it appears concerns have diminished somewhat as conditions have improved.

The Lake Superior outflows were as specified by Regulation Plan 1977-A. Since March, these monthly outflows have been between 81% and 103% of average. Meanwhile, the monthly outflows from Lakes Michigan-Huron ranged from 82% to 90% of average. Water supplies to lakes Superior and Michigan-Huron were above average except in March, May, and August.

Ponding by the hydropower entities was permitted on weekends and holidays during the reporting period with the exception of the last weekend in March, and during April. No new concerns related to peaking and ponding were reported to the Board during the period.

The Board, for the first time, incorporated a phone-in option in its annual public meeting, held this year on the evening of 12 June in Sault Ste. Marie, ON. About nine members of the public and media attended the Sault College meeting, while five people called in via the teleconference line available. Most participants were pleased with the new format and the rising lake levels, but remain concerned about potential impacts due to climate change and variability. Though people are aware that hydrologic factors have resulted in the low levels, many thought that other factors (such as regulatory practices, unreported diversions, consumptive use, erosion in the St. Clair River, etc.) were adding to the problem. Many also reiterated their impatience with having to wait for the International Upper Great Lakes Study Board to resolve whether erosion in the St. Clair River may be impacting levels. After the meeting, attendees had an opportunity to talk to the Board and Commission representatives.

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 110% of average from March through August 2008 and would be expected to be exceeded 21% 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 in March, May, and August, but were above average otherwise. On the whole, the March through August net basin supplies to Lake Superior would be expected to be exceeded 30% of the time.

Lake Superior's water levels have been consistently above chart datum (183.2 m or 601.1 ft.) since 17 April and are currently 18 cm (7 in.) above chart datum. Its levels over the past six months ranged from 11 to 27 cm (4 to 11 in.) below average. On 15 September, its level was at elevation 183.38 m (601.64 ft.), which was 16 cm (6 in.) below average and 37 cm (15 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 1918-2007 period of record.

Precipitation over the Lakes Michigan-Huron basin was 107% of average over the past six

months according to provisional data and would be expected to be exceeded 30% of the time. Net basin water supplies to Lakes Michigan-Huron were below average in March, May, and August, but were above average otherwise. On the whole, the March through August net basin supplies to Lakes Michigan-Huron were above average and would be expected to be exceeded about 34% of the time.

Monthly mean Lake Michigan-Huron levels ranged from 35 to 54 cm (14 to 21 in.) below long-term averages. Water levels rose above chart datum (176.00 m or 577.4 ft.) on 3 May and have remained above datum since. On 15 September, Lakes Michigan-Huron were at elevation 176.20 m (578.08 ft.), 31 cm (12 in.) below average, 26 cm (10 in.) higher than one year ago, and 20 cm (8 in.) above chart datum. The level of Lakes Michigan-Huron has been below average since January of 1999, the second 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 91% of average over the last six months, with monthly flows ranging from 1,590 to 2,440 m^3/s (56,200 to 86,200 cfs). Outflows were limited by Criterion (c) of the Orders in March, June, and July.

The gate settings at the Compensating Works supplying the main portion of the St. Marys Rapids were at an equivalent one-half gate open from March through July, and one full gate equivalent open in August. The equivalent one-half gate open setting was maintained with Gates 7, 8, 9, and 10 each set at 20 cm (8”). To facilitate the Canadian gate refurbishment program, these four gates were closed and Gates 13 to 16 were each opened on 10 June to the 20 cm equivalent opening. On 6 August, Gates 13 and 16 were closed and Gate 15 was fully opened. Gate 14 remained open 20 cm to account for the delay in resetting the gates due to a miscommunication. This resulted in an equivalent flow of one gate open for the month of August. The Board received a letter, dated 15 July 2008, from a U.S. Fish and Wildlife Service fish biologist that expressed concern about the gate setting being increased at the beginning of August. The biologist was concerned that sea lamprey traps would be less effective with higher discharges in the rapids. A subsequent telephone conversation with the U.S. Secretary of the Board revealed that the sea lamprey traps would be removed during the last week of July, thereby resolving the issue. The Board sent a follow-up letter to the Fish and Wildlife Service. On 2 September, Gate 15 was closed partially and Gates 12 to 15 were each set at 20 cm to yield a half gate equivalent opening.

Gate 1, which supplies water to the Fishery Remedial Works, remained set at 15 m^3/s (530 cfs) throughout the 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 182.97 and 183.42 m (600.3 and 601.8 ft.) during the reporting period, within the limits of 182.76 and 183.86 m (599.6 and 603.2 ft.) specified in the Commission's Orders of Approval.

During the reporting period, the daily mean water levels in the lower St. Marys River at the U.S. Slip gauge downstream of the U.S. Locks, varied between 176.04 and 176.66 m (577.6 and 579.6 ft). Therefore, the requirement for maintaining the level below 177.94 m (583.8 ft.) was satisfied. The daily mean U.S. Slip level was below chart datum (176.39 m or 578.71 ft.) for 75 days during the first half of the reporting period.

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. Monthly inspections and routine maintenance were conducted on the U.S. portion during the past six months.

On the Canadian side of the structure, Brookfield Renewable Power's major multi-year repainting and refurbishment program recommenced on 19 June, with completion of this year's two-gate phase expected by 31 October. Dewatering structures were installed at Gates 4 and 7. Blast cleaning and painting are being carried out. Other activities, such as concrete repairs, have been scheduled to accommodate the painting operations, and include steel armouring of the upstream noses of Piers 6 to 8.

6. Repairs and Maintenance at the Hydropower Facilities

a. U.S. Government Hydropower Plant

As reported previously, the runner for Unit 10 was damaged by cavitation. Temporary repairs permitted the unit to be run continuously while permanent repair plans were formulated. The USACE Hydraulic Design Center plans to manufacture replacement sections for the turbine blades. Contract technical documents are expected to be completed by the end of FY08. Work is scheduled for summer FY09 pending availability of funds. The potential for a plant freeze-up with the unit off-line precludes doing the work during the winter.

Several scheduled and unscheduled outages have occurred since March. On 4 March, Unit 10 was down for about 4 hours to replace a servo motor. Units 1 and 3 were taken off-line to investigate mechanical problems for about 80 hours from 21 to 24 April. Unit 3A was

down on 19 June to tighten a packing gland and again on 3 and 5 July for about an hour each day due to a speed sensor failure. All units were taken off line for about 6 hours between 8 and 10 July due to outages at the Magazine Street substation. Units 1, 2, 3 & 10 were also taken off-line for about 6 hours for equipment maintenance by ESELCO on 16 July. On 4 July the T-1 line from Barkley, KY was down for 16 hours. The plant was operated locally during this period. The monthly Lake Superior outflows were met by transferring the unused water allocations to ESELCO.

b. Brookfield Renewable Power

A series of scheduled maintenance outages were undertaken at the Brookfield Renewable Power plant. Unit C3 was shut down from 7 to 12 April, Unit C2 was shut down from 23 to 30 May, and Unit C1 was shut down from 2 to 6 June for annual inspections. Unit C3 was also shut down on 30 April and 1 May due to transformer damage, on 22 and 23 May for transformer welding repairs, on 8 and 9 August to repair a rupture in the piping for the bearing lube oil, and on 12 September due to failure of a bearing lube pump. Unit C2 was also shut down on 5 to 7 May due to oil pump problems. The power entity was able to pass the allotted flows each month. Shutdowns during daylight hours are expected on 4 October to facilitate the annual underwater cable inspection and maintenance for Lake Superior Power Ltd. as well as a diving inspection of Parks Canada's effluent pipe in the Clergue tail race. A safety boom installed on 19 November 2007 in the Clergue tail race failed and will also be repaired at this time.

c. Edison Sault Electric Company

The seals on the power canal head gates are being replaced. The work started on 30 July and was finished on 30 August. In September, work resumed on patching the gate piers and miscellaneous canal work. The additional work is expected to take four to six weeks, and is being done at night during off-peak flow hours. Total flow allocation for the month will not be affected.

Currently, Unit 70 is down for a major overhaul. Unit 30 is down due to a broken shaft and will remain off-line over the winter. ESELCO's ability to use its monthly flow allocations has not been affected.

7. Flow Verification Measurements

Other than measurements performed at the U.S. Government Hydropower Plant, no other flow verification measurements were performed during the reporting period. Previous results for other sites were provided in past reports.

a. U.S. Government Hydropower Plant

On 12 December 2007, Hatch Acres Corporation and SCIPAR began their review of flow

data and programming of the System Control and Data Acquisition (SCADA) system to resolve the differences between flow measurements and the SCADA output. It was recommended that for more accurate flow readings at or near capacity, the SCADA should calculate flow based on turbine wicket gate openings and head rather than power and head. A draft report was submitted by Hatch Acres on 1 September 2008.

Hatch Acres has reviewed the past flow measurement data and developed a relationship between wicket gate openings, head, and flow for each of the five generating units. The new relationship parameters have been installed in the SCADA system. USACE Detroit District and Environment Canada field crews were on site from 18 to 21 August to make verification flow measurements in the power canal. Analysis of the data is expected to be complete by early October. The 9% adjustment to the flows to compensate for under-reporting in the plant's calculation system continues.

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 2007 to August 2008. 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 12 m^3/s (353 to 424 cfs), or 0.4 to 0.7% of the total monthly outflow.

The monthly flow through the U.S. and Canadian locks depends on traffic volume and varied from 4 to 16 m^3/s (141 to 565 cfs). As a percentage of the total river flow, water allocated for navigation varies seasonally from 0.2% (when the locks are closed for the winter) to 0.8% in the busiest part of the navigation season.

The U.S. locks opened, as scheduled, on 25 March. The Canadian lock opened, as scheduled, on 15 May, and is expected to close for the season in mid October.

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. In addition, a flow of at least 15 m^3/s (530 cfs) is maintained in the Fishery Remedial Works (through Gate 1). The flow in the St. Marys Rapids, including that through the Fishery Remedial Works, ranged from 82 to 167 m^3/s (2,900 to 5,900 cfs) over the last six months, or approximately 5 to 7% of the total monthly outflow.

The hydropower plants passed an average of 1,823 m^3/s (64,400 cfs) from March to August for electric power production, or 93.8% of the total river flow. The allocation for this period averaged 1,824 m^3/s (64,400 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 71.8 m^3/s (2,540 cfs) and the Long Lac Diversion averaged 57.7 m^3/s (2,040 cfs) from March through August. Combined, these diversions were about 76 percent of average for the period 1944-2007.

Since 1999, a continuous flow of at least 2 m^3/s (70 cfs) is maintained during the summer (mid-May through about Labour Day) from the north outlet of Long Lake. This agreement between OPG and the local First Nations provides water for environmental enhancement of the Kenogami River, and reduces the amount diverted to Lake Superior. Additional average discharges of 66.6 m^3/s were spilled northward from Long Lake from May through July due to unusually heavy snowmelt and rainfall in the immediate area. High water supplies also resulted in water being spilled northward into the Ogoki River, further reducing the amount diverted to Lake Superior. The diversion, Lake Nipigon, and the reservoir were at their capacities and this action needed to be taken to prevent local flooding. An average flow of 264.3 m^3/s (9,330 cfs) was spilled into the Ogoki River from June through August. Additionally, slots cut into Waboose Dam provide a minimum flow northward into the Ogoki River of approximately 2 m^3/s to meet fisheries requirements.

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 are to be examined on a five year basis by the Board, starting with the last year of the International Upper Great Lakes Study or 2010, whichever comes first.

During the reporting period, the power entities undertook peaking and ponding operations under the supervision of the Board. From March through April, the weekend minimum

levels at the U.S. Slip site were expected to be below the threshold level. As a result, the hydropower companies were required to restrict ponding operations on weekends and holidays from the opening of the Soo Locks on 25 March through April. Starting in May, levels rose significantly and ponding was permitted for the rest of the reporting period.

To provide timely information on expected flow variations to the users, the Corps distributes monthly notices during the shipping season (March-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, outflows and U.S. Slip levels were significantly higher than during the same period last year.

11. Annual Meeting with the Public and Public Information

The Board hosted its annual public meeting on the evening of 12 June at Sault College in Sault Ste. Marie, ON. This was the first public meeting where a toll-free telephone line was made available to facilitate the participation of out-of-town residents without having to drive great distances. About nine members of the public and media plus Board and Commission representatives attended while five people called in by phone. A presentation was given that described the IJC, the Board, the control structures, the regulation plan, and the current and expected water levels. The meeting was then opened for public comment, questions, and concerns, with Canadian Member, Mr. David Fay, chairing. The slide presentation shown at the meeting hall was made available online to callers beforehand, and callers were able to interact with the chairman and other participants during the event. Most participants were pleased with the new meeting format. They were also pleased with the rising lake levels, but remain concerned about potential impacts due to climate change and variability. Though people are aware that hydrologic factors (i.e., drought, increased evaporation, decreased runoff, etc.) have resulted in the low levels, many thought that other factors (such as regulatory practices, unreported diversions, consumptive use, erosion in the St. Clair River, etc.) were adding to the problem significantly. Many also reiterated their impatience with having to wait for the International Upper Great Lakes Study Board to resolve whether erosion in the St. Clair River may be impacting levels. People were advised that there were no significant unreported diversions from the upper lakes, that climate variability or possibly climate change were the causes of recent low supplies, and that regulation was of limited benefit in dealing with the widespread drought (that had been affecting the region until recently). After the meeting, attendees had an opportunity to talk to Board and Commission representatives.

The Board continues to recognize the need to coordinate its public communication activities with the IUGLSB to avoid possible confusion of the roles and responsibilities of the two Boards by stakeholders. The date and location of its next meeting with the public will be set by the Board at its spring business meeting.

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.

12. Related Items for Interest

a. Lock Replacement at Sault Ste. Marie, Michigan

A new "Poe sized" lock is proposed to replace the existing Davis and Sabin Locks at the Soo Locks complex at Sault Ste. Marie, MI, to provide for more efficient movement of waterborne commerce. The Water Resources Development Act (2007) directs that construction shall be at full U.S. Federal expense. This precludes the need for a Project Cooperation Agreement (since no real estate or non-Federal funds are required).

$1,969,000 was appropriated for FY 2008 to prepare a letter report documenting actions necessary to move the project forward to construction, complete National Environmental Policy Act (NEPA) compliance activities, update cost information, and prepare an implementation schedule. Plans and specification for the cofferdam will be finalized for a possible FY 2009 construction start if Congress appropriates funds. Design efforts continue on the other project features.

13. Board Membership and Meetings

U.S. Member BG John W. Peabody succeeded BG Bruce A. Berwick on 4 August. U.S. Alternate Member COL Vincent V. Quarles succeeded COL John D. Drolet on 28 July. There were also changes among the Board's support staff and associates in recent months, including the U.S. Regulation Representative and the Canadian On-Site Representative. The U.S. Regulation Representative is now LTC James B. Davis and Mr. Barry Guzzo (Sault Ste. Marie Canal National Historic Site) returned to his former role as the Canadian On-Site Representative.

The Board held a meeting on 15 September in Fort Erie, Ontario, with the Canadian Member and U.S. Alternate Member in attendance.

Respectfully submitted,

David Fay
Member for Canada

BG John W. Peabody
Member for United States

TABLE 1. 2007-2008 Lake Superior Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded[1]		Difference From Average[2]		Monthly Mean Recorded		Exceedence Probability[3]	Monthly Mean Recorded		Percent of Average[4]
	metres	feet	metres	feet	m3/s	tcfs	(%)	m3/s	tcfs	
Apr-07	182.85	599.90	-0.42	-1.38	3230	114	76	1390	49	72
May-07	182.87	599.97	-0.50	-1.64	2360	83	97	1490	53	70
Jun-07	182.94	600.20	-0.51	-1.67	4070	144	55	1510	53	69
Jul-07	183.00	600.39	-0.52	-1.71	2440	86	85	1530	54	67
Aug-07	183.01	600.43	-0.53	-1.74	630	22	96	1540	54	65
Sep-07	183.02	600.46	-0.52	-1.71	3210	113	18	1560	55	67
Oct-07	183.18	600.98	-0.34	-1.12	6390	226	<<1**	1560	55	69
Nov-07	183.18	600.98	-0.30	-0.98	-370	-13	75	1570	55	70
Dec-07	183.11	600.75	-0.30	-0.98	-400	-14	39	1650	58	80
Jan-08	183.08	600.66	-0.26	-0.85	260	9	18	1730	61	89
Feb-08	183.03	600.49	-0.25	-0.82	-660	-23	89	1690	60	88
Mar-08	182.97	600.30	-0.27	-0.89	560	20	72	1620	57	86
Apr-08	183.01	600.43	-0.26	-0.85	6520	230	7	1590	56	82
May-08	183.18	600.98	-0.19	-0.62	4600	162	62	1710	60	81
Jun-08	183.29	601.35	-0.16	-0.52	6270	221	11	2070	73	94
Jul-08	183.41	601.74	-0.11	-0.36	4660	165	19	2230	79	98
Aug-08*	183.42	601.77	-0.12	-0.39	820	29	94	2440	86	103

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

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

[2] Average levels are for period 1918-2007, based on a mean of five gauges. Differences computed as metres and then converted to feet.

[3] Exceedence probabilities are based on the period 1900-2006.

[4] Average flows are for the period 1900-2006.

* Provisional estimates

** New record high supply
August & September 2007 monthly mean levels were new record lows

TABLE 2. 2007-2008 Lakes Michigan-Huron Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded[1]		Difference From Average[2]		Monthly Mean Recorded		Exceedence Probability[3]	Monthly Mean Recorded		Percent of Average[4]
	metres	feet	metres	feet	m3/s	tcfs	(%)	m3/s	tcfs	
Apr-07	176.02	577.49	-0.38	-1.25	6390	226	74	4560	161	89
May-07	176.06	577.62	-0.44	-1.44	4460	158	89	4520	160	85
Jun-07	176.08	577.69	-0.48	-1.57	2730	96	96	4600	162	85
Jul-07	176.05	577.59	-0.54	-1.77	2350	83	79	4680	165	85
Aug-07	176.00	577.43	-0.57	-1.87	910	32	62	4590	162	84
Sep-07	175.95	577.26	-0.57	-1.87	-990	-35	81	4500	159	83
Oct-07	175.88	577.03	-0.58	-1.90	320	11	40	4470	158	83
Nov-07	175.77	576.67	-0.63	-2.07	-2860	-101	99***	4430	156	83
Dec-07	175.68	576.38	-0.67	-2.20	420	15	58	4210	149	82
Jan-08	175.70	576.44	-0.62	-2.03	6010	212	<<1**	4080	144	91
Feb-08	175.76	576.64	-0.54	-1.77	4100	145	13	3910	138	89
Mar-08	175.78	576.71	-0.54	-1.77	3330	118	77	3970	140	82
Apr-08	175.92	577.17	-0.48	-1.57	11660	412	7	4230	149	83
May-08	176.04	577.56	-0.46	-1.51	6510	230	59	4560	161	86
Jun-08	176.16	577.95	-0.40	-1.31	8950	316	6	4680	165	86
Jul-08	176.24	578.22	-0.35	-1.15	4450	157	28	4800	170	87
Aug-08*	176.22	578.15	-0.35	-1.15	-1000	-35	94	4940	174	90

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

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

[2] Average levels are for period 1918-2007, based on a mean of six gauges. Differences computed as metres and then converted to feet.

[3] Exceedence probabilities are based on the period 1900-2006.

[4] Average flows are for the period 1900-2006.

* Provisional estimates

** New record high supply

*** New record low supply

Table 3

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOW

OUTFLOW IN m^3/s THROUGH

	POWER CANALS					NAVIGATION CANALS				DOMESTIC USAGE			FISHERY	TOTAL LAKE
YEAR AND MONTH	US GOVT HYDRO	EDISON SAULT EL. CO	US TOTAL	GREAT LAKES POWER	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S.STE MARIE US+CAN	ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	SUPERIOR OUTFLOW m^3/s
2007														
JAN	398	320	718	710	1428	5.0	0.0	5	0.2	9.4	0.3	10	97	1540
FEB	296	319	615	643	1258	2.1	0.0	2	0.2	8.0	0.3	8	96	1364
MAR	338	248	586	585	1171	4.0	0.0	4	0.2	8.3	0.3	9	94	1278
APR	379	251	630	641	1271	11.3	0.0	11	0.2	8.8	0.3	9	96	1387
MAY	368	341	709	671	1380	12.9	0.5	13	0.3	9.7	0.3	10	83	1486
JUN	348	341	689	709	1398	14.3	1.6	16	0.4	10.1	0.3	11	82	1507
JUL	346	351	697	722	1419	14.6	2.2	17	0.4	8.3	0.3	9	81	1526
AUG	360	353	713	721	1434	14.8	2.1	17	0.4	8.5	0.3	9	81	1541
SEP	392	335	727	727	1454	14.0	0.9	15	0.3	10.5	0.3	11	81	1561
OCT	395	337	732	720	1452	12.0	0.0	12	0.3	10.2	0.3	11	83	1558
NOV	403	332	735	727	1462	10.4	0.0	10	0.3	10.2	0.3	11	84	1567
DEC	401	374	775	769	1544	10.4	0.0	10	0.3	9.3	0.3	10	84	1648
2008														
JAN	405	411	816	812	1628	5.6	0.0	6	0.2	10.2	0.3	11	84	1729
FEB	401	401	802	791	1593	2.1	0.0	2	0.3	9.5	0.3	10	83	1688
MAR	405	364	769	760	1529	4.0	0.0	4	0.3	9.7	0.3	10	82	1625
APR	373	371	744	741	1485	10.8	0.0	11	0.3	10.0	0.3	11	83	1590
MAY	395	406	801	801	1602	12.7	0.4	13	0.4	10.2	0.3	11	85	1711
JUN	402	582	984	978	1962	13.5	1.3	15	0.4	9.8	0.3	10	85	2072
JUL	405	659	1064	1052	2116	14.4	2.0	16	0.4	9.2	0.3	10	85	2227
AUG	409	722	1131	1112	2243	14.3	2.0	16	0.4	11.1	0.3	12	167	2438

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

Table 4

INTERNATIONAL LAKE SUPERIOR BOARD OF CONTROL

MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOW

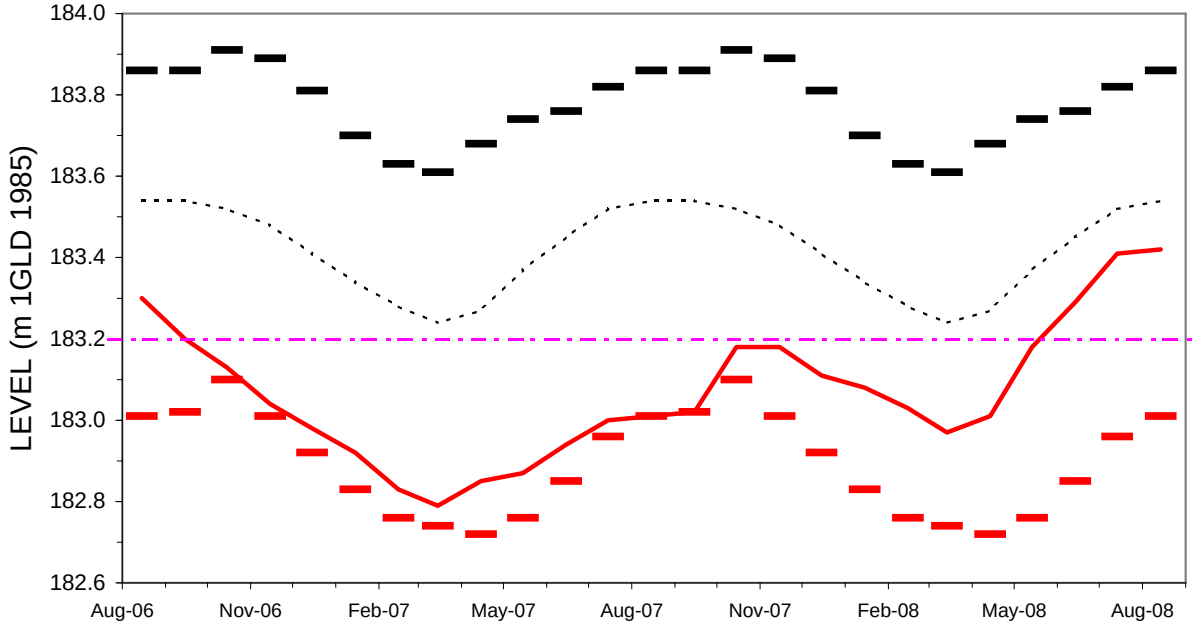
OUTFLOW IN CFS THROUGH

	POWER CANALS					NAVIGATION CANALS				DOMESTIC USAGE			FISHERY	TOTAL LAKE
YEAR AND MONTH	US GOVT HYDRO	EDISON SAULT EL. CO	US TOTAL	GREAT LAKES POWER	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S.STE MARIE US+CAN	ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	SUPERIOR OUTFLOW CFS
2007														
JAN	14100	11300	25400	25100	50500	177	0	177	7	332	11	350	3430	54500
FEB	10500	11300	21800	22700	44500	74	0	74	7	283	11	301	3390	48300
MAR	11900	8800	20700	20700	41400	141	0	141	7	293	11	311	3320	45200
APR	13400	8900	22300	22600	44900	399	0	399	7	311	11	329	3390	49000
MAY	13000	12000	25000	23700	48700	456	18	474	11	343	11	365	2930	52500
JUN	12300	12000	24300	25000	49300	505	57	562	14	357	11	382	2900	53100
JUL	12200	12400	24600	25500	50100	516	78	594	14	293	11	318	2860	53900
AUG	12700	12500	25200	25500	50700	523	74	597	14	300	11	325	2860	54500
SEP	13800	11800	25600	25700	51300	494	32	526	11	371	11	393	2860	55100
OCT	13900	11900	25800	25400	51200	424	0	424	11	360	11	382	2930	54900
NOV	14200	11700	25900	25700	51600	367	0	367	11	360	11	382	2970	55300
DEC	14200	13200	27400	27200	54600	367	0	367	11	328	11	350	2970	58300
2008														
JAN	14300	14500	28800	28700	57500	198	0	198	7	360	11	378	2970	61000
FEB	14200	14200	28400	27900	56300	74	0	74	11	335	11	357	2930	59700
MAR	14300	12900	27200	26800	54000	141	0	141	11	343	11	365	2900	57400
APR	13200	13100	26300	26200	52500	381	0	381	11	353	11	375	2930	56200
MAY	13900	14300	28200	28300	56500	448	14	462	14	360	11	385	3000	60300
JUN	14200	20600	34800	34500	69300	477	46	523	14	346	11	371	3000	73200
JUL	14300	23300	37600	37200	74800	509	71	580	14	325	11	350	3000	78700
AUG	14400	25500	39900	39300	79200	505	71	576	14	392	11	417	5900	86100

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

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

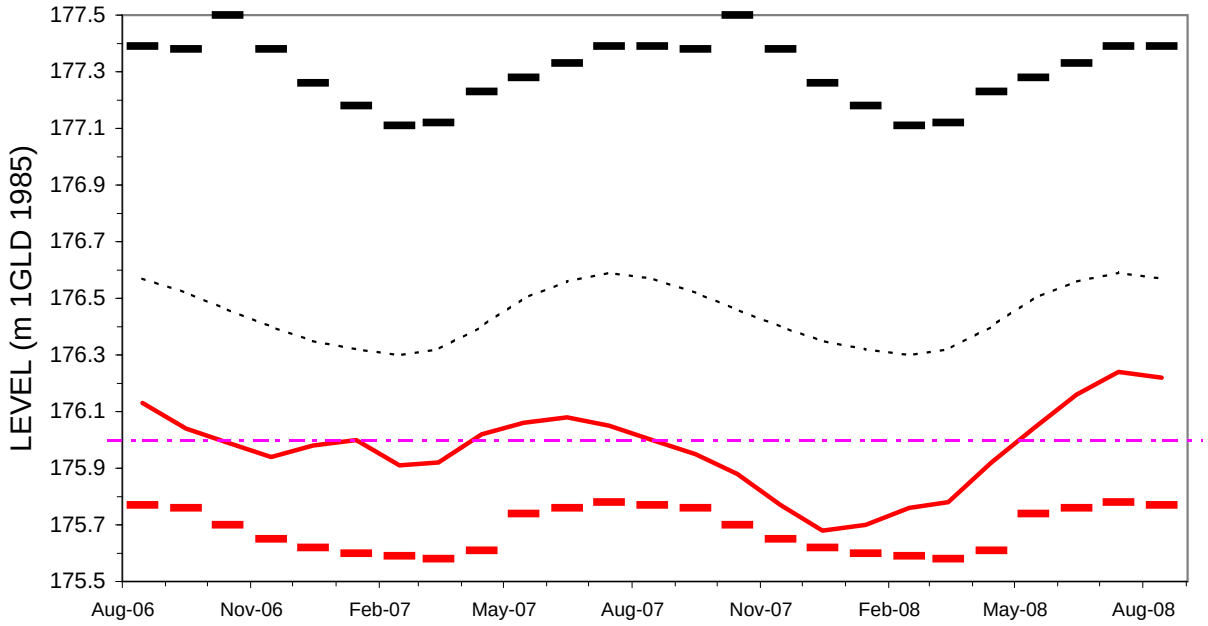
LAKE SUPERIOR MONTHLY WATER LEVELS



Based on a mean of 5 gauges. Average, maximum, and minimum for period 1918-2007.

ACTUAL AVERAGE MAX MIN DATUM

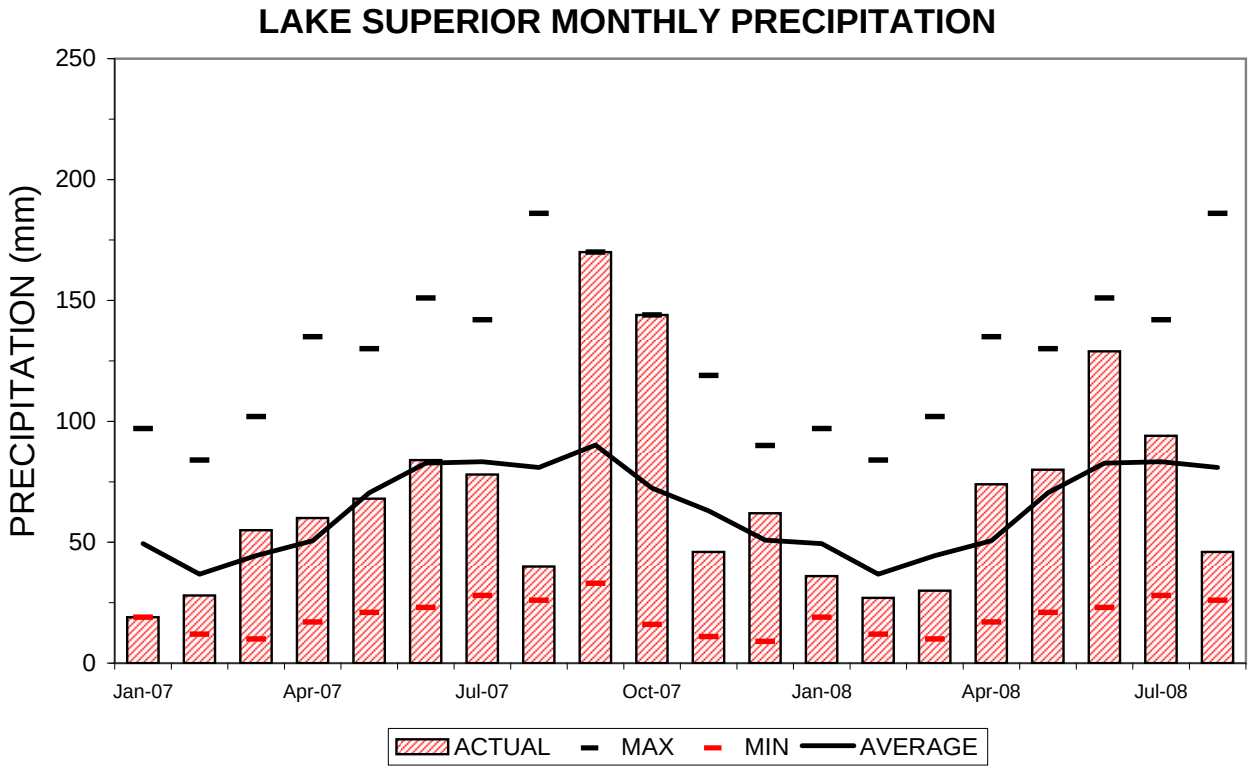
LAKES MICHIGAN-HURON MONTHLY WATER LEVELS

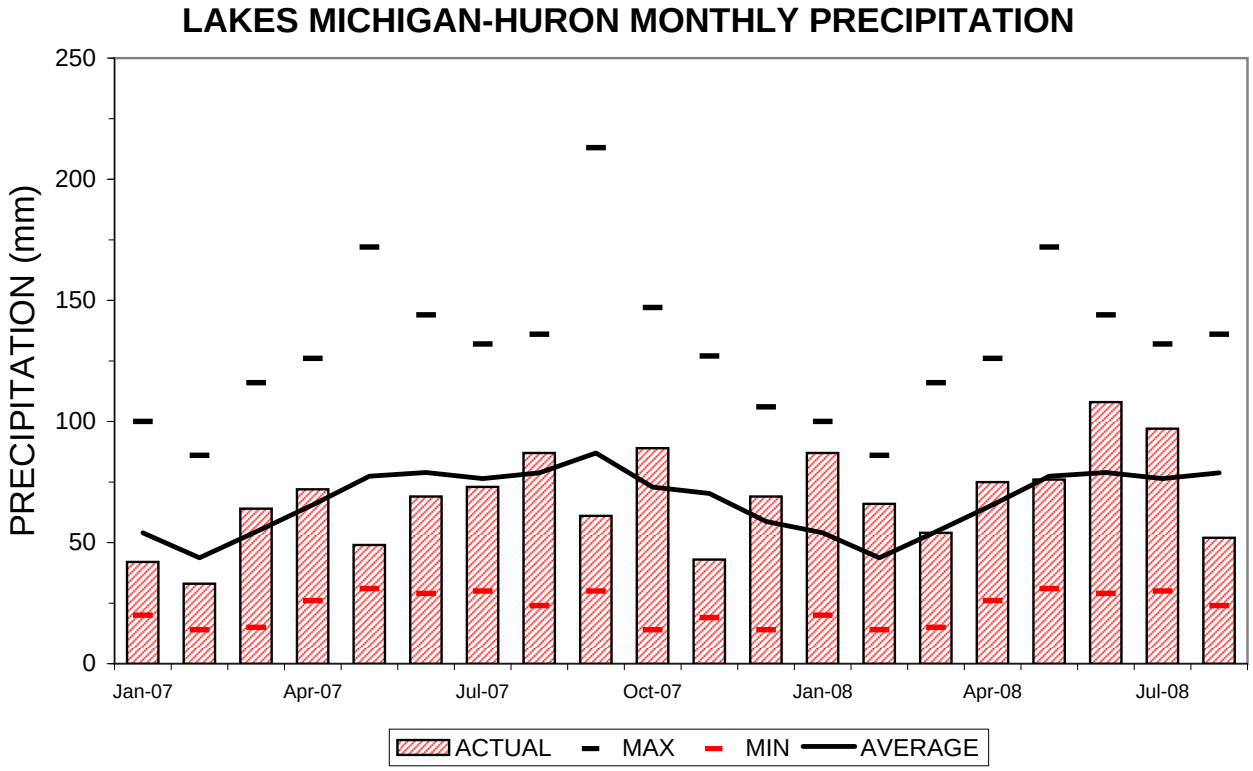


Based on a mean of 6 gauges. Average, maximum, and minimum for period 1918-2007.

ACTUAL AVERAGE MAX MIN DATUM

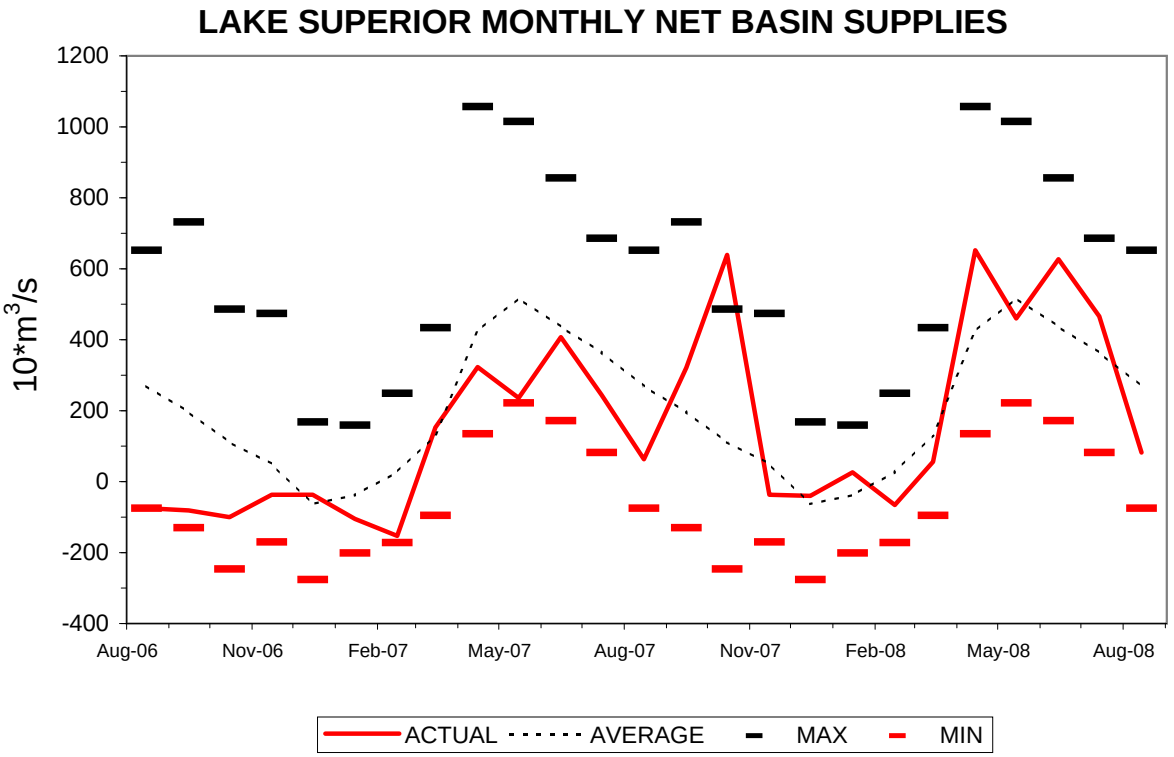
Figure 1

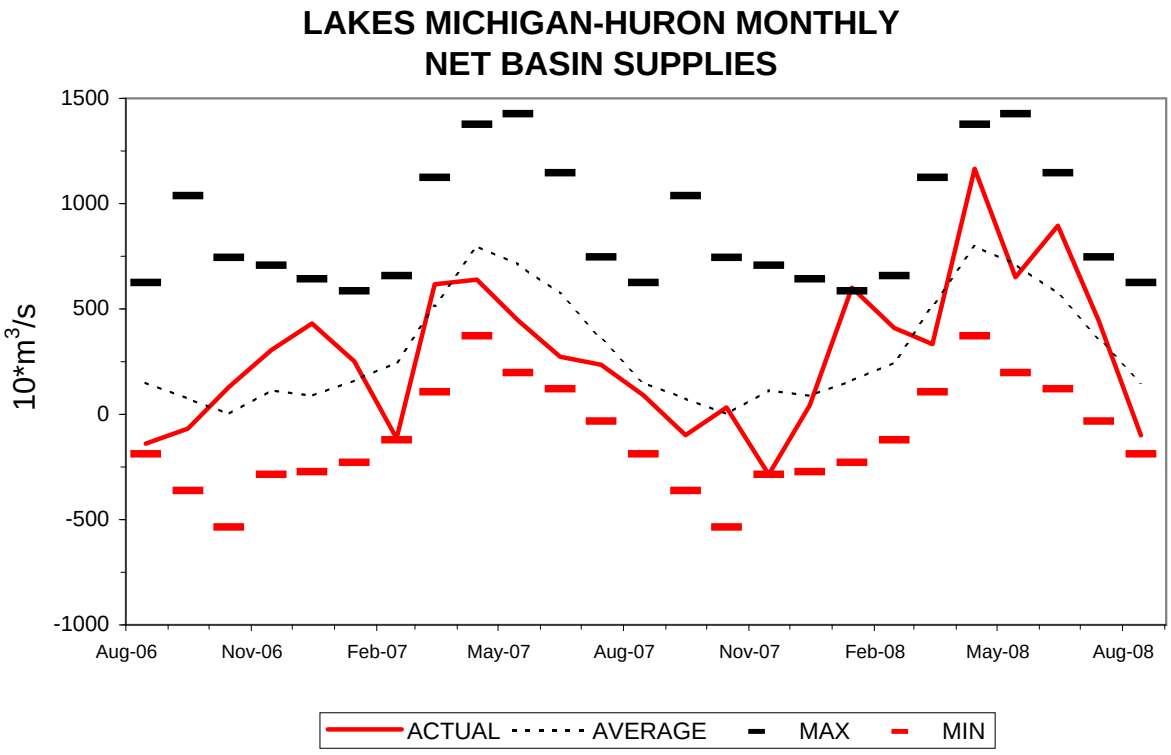




Average, maximum and minimum values based on period of record 1900-2007.

Figure 2

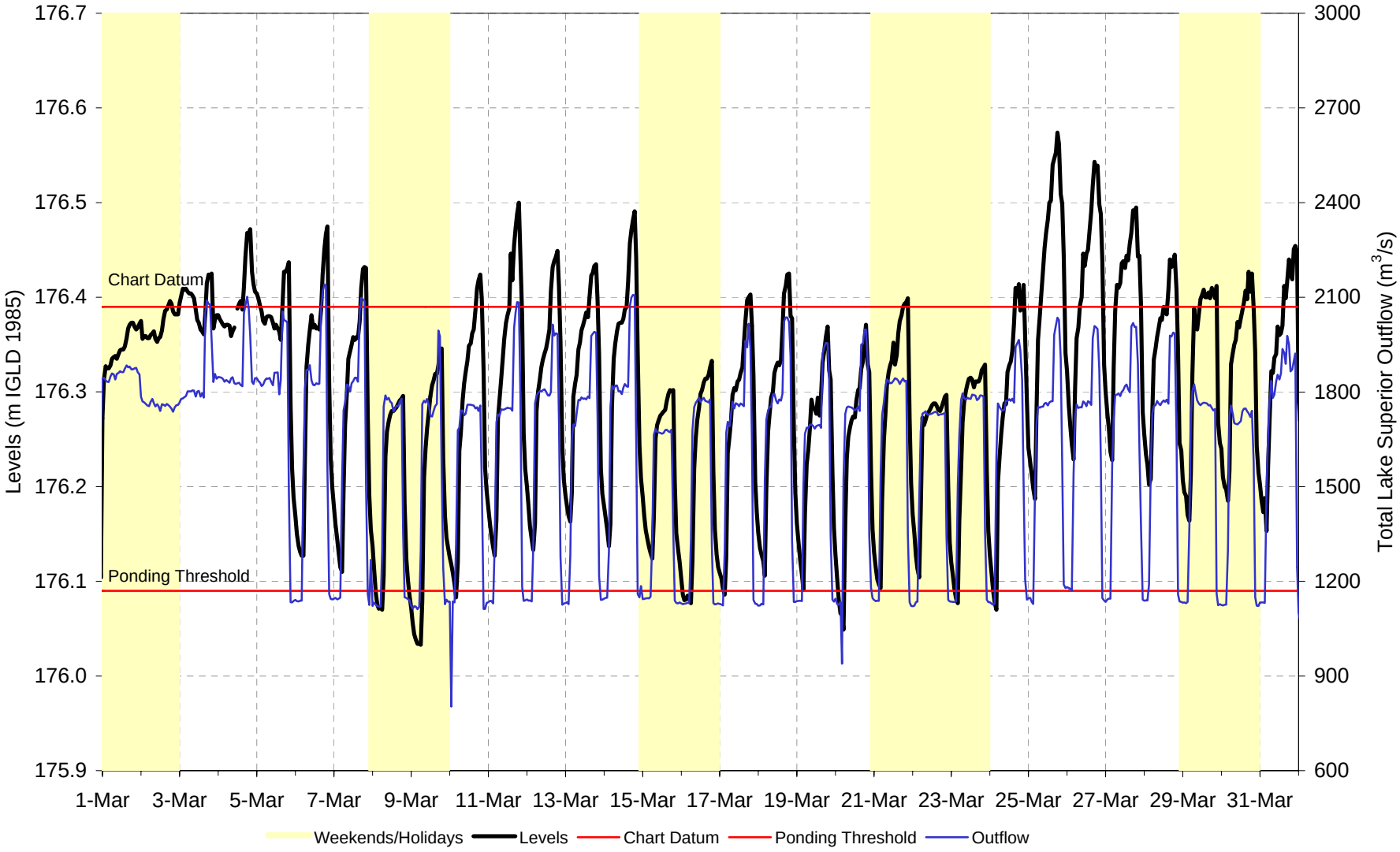




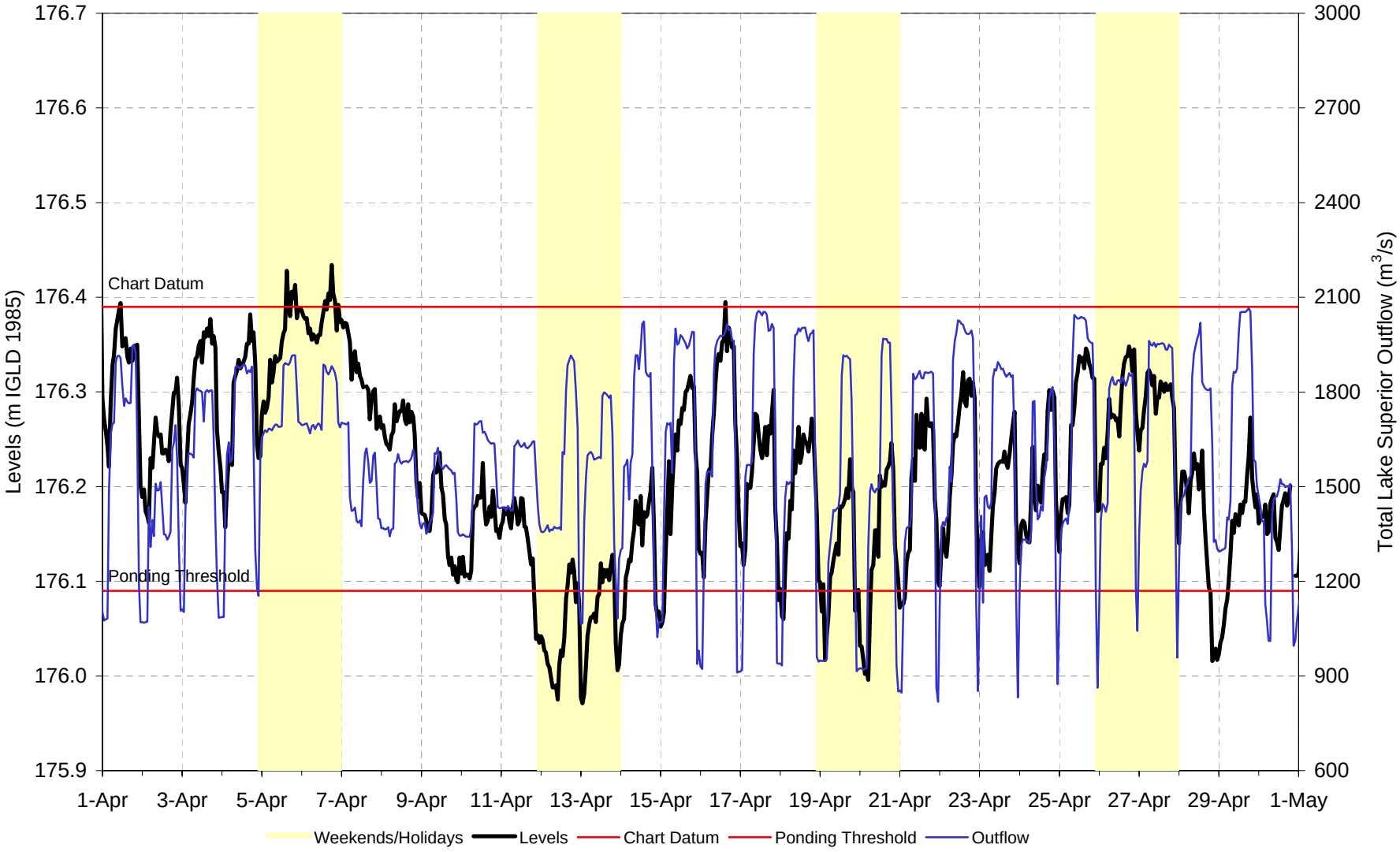
Average, maximum and minimum values based on coordinated period of record 1900-2006.

Figure 3

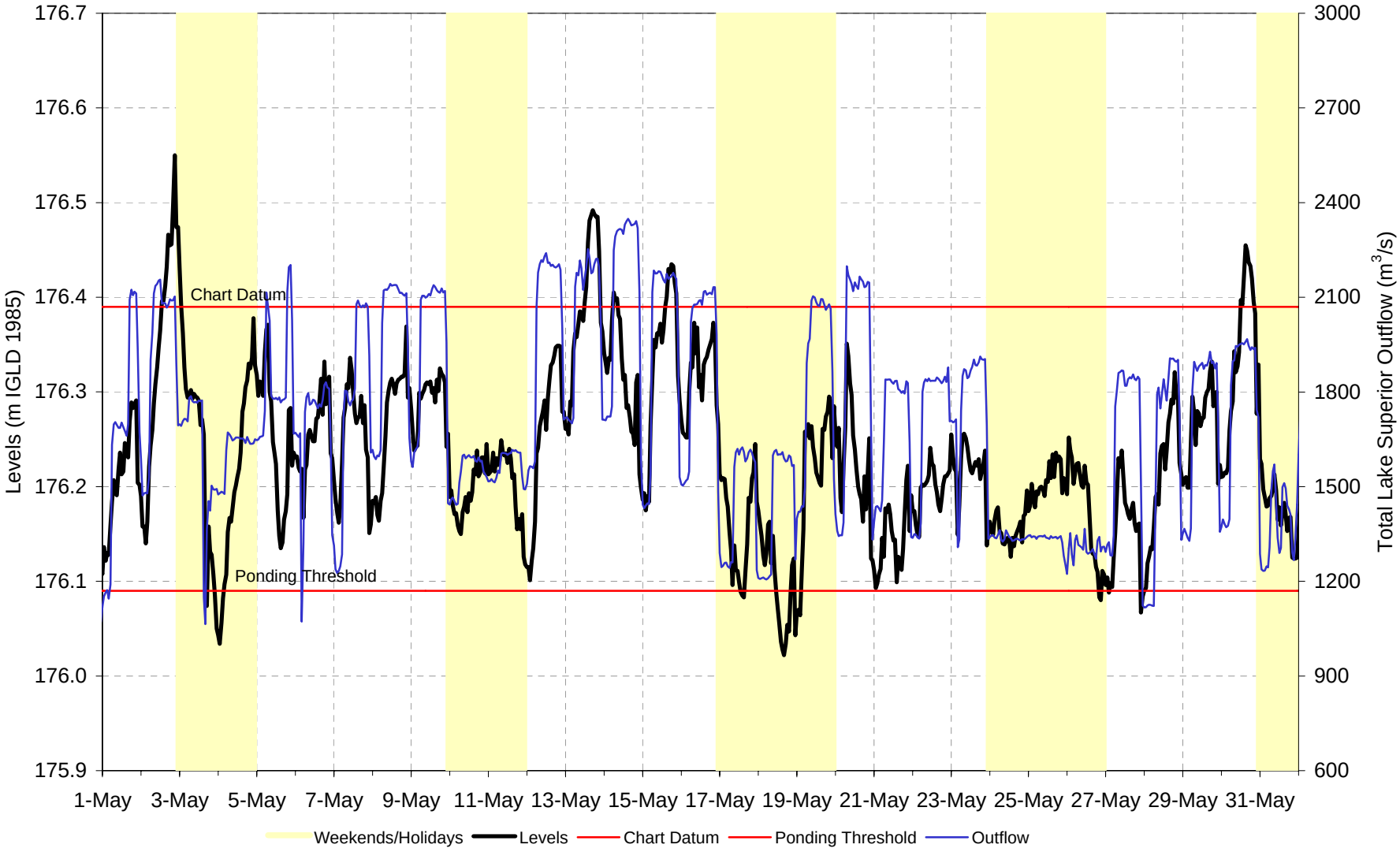
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4a - March 2008



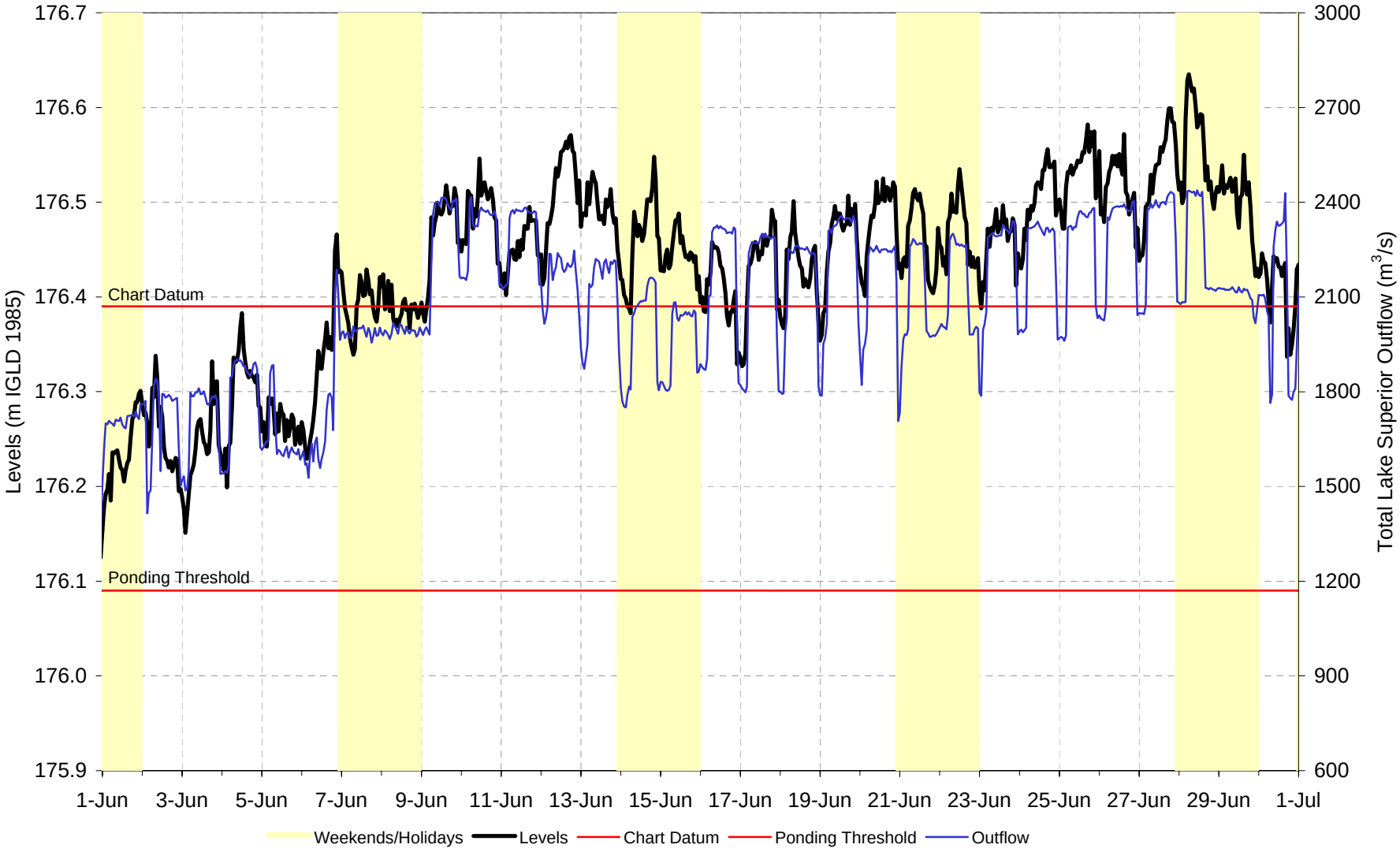
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4b - April 2008



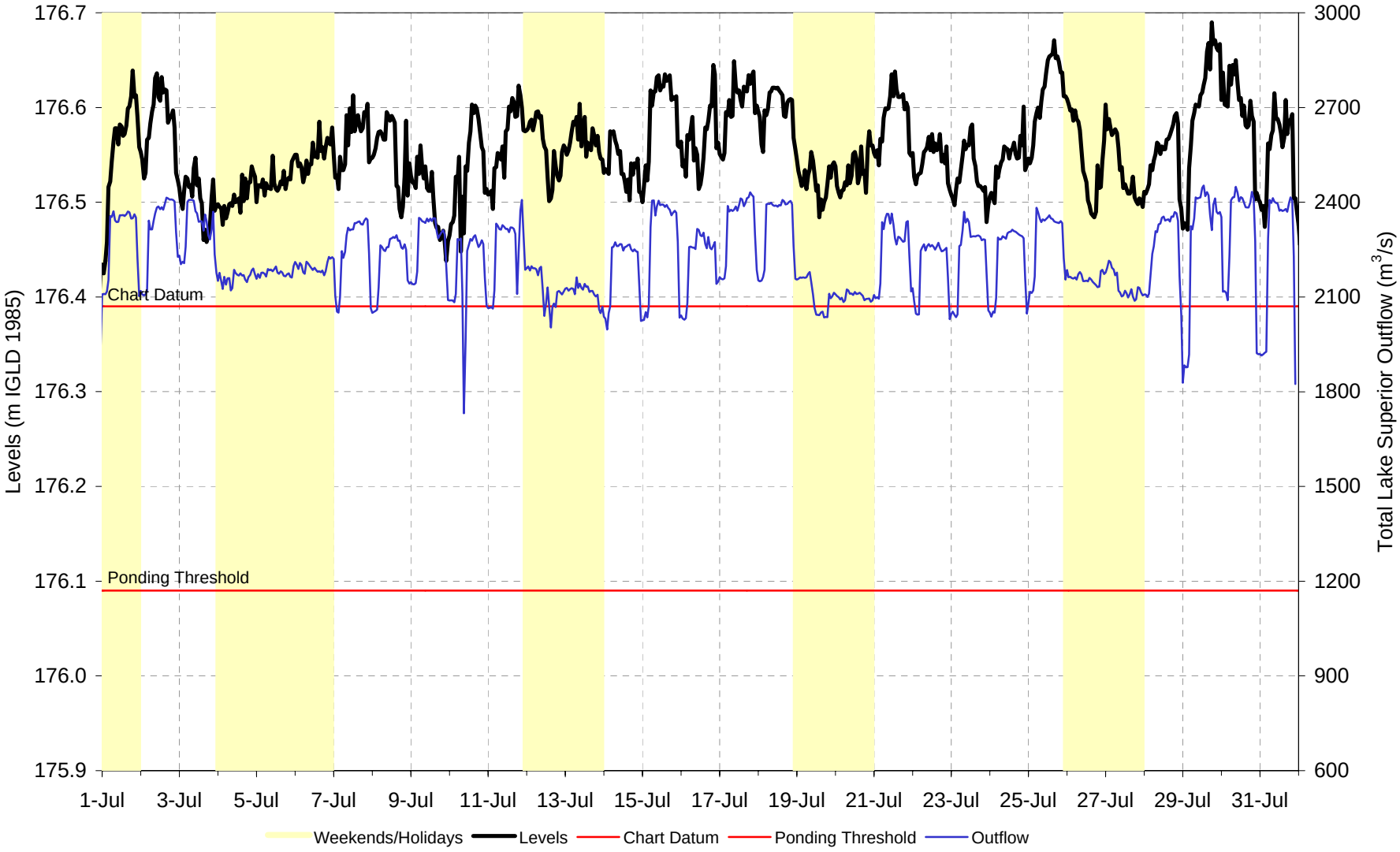
Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4c - May 2008



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4d - June 2008



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4e - July 2008



Hourly U.S. Slip Levels & Lake Superior Outflows
Figure 4f - August 2008