

**International Lake Superior  
Board of Control  
Semi-Annual Progress Report to the  
International Joint Commission  
Covering the Period September 21, 2001 to March 18, 2002**

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Peaking and Ponding Public Hearing in Sault Ste. Marie, MI

Aerial View of the Edison Sault Electric Company Hydroelectric Plant

Edward L. Ryerson in the Rock Cut (Courtesy of John Belliveau/www.boatnerd.com)

# International Lake Superior Board of Control



## United States

BG Steven R. Hawkins, Member  
John W. Kangas, Secretary

## Canada

Doug Cuthbert, Member  
Peter P. Yee, Secretary

March 18, 2001

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

Commissioners:

This semi-annual report covers the Board's activities from September 21, 2001 to March 18, 2002.

## **1. Highlights**

Lake Superior levels remained below their seasonal averages over the past six months, but ranged from 10 cm (4 in.) to 25 cm (10 in.) above levels of a year ago. Precipitation over the past six months was only slightly below average, but lower than average outflow and improved water supply conditions helped contribute to the improved lake level conditions. During the reporting period, Lake Superior levels remained above chart datum during the navigation season, but fell below datum in the latter part of January. Water supplies to Lake Superior were well below average in September, and well above average in November and December. On March 18, the lake was about 15 cm (5.9 in.) below the average for that time of year, about 22 cm (8.7 in.) higher than a year ago.

Lakes Michigan-Huron levels remained below average but were generally higher than levels of a year earlier. Water supplies to Lakes Michigan-Huron were above average from September through December and below average in January and near average in February. For the last four months on 2001, the levels remained slightly above chart datum, and for the first three months of 2002 they were at or slightly below chart datum. At the end of the reporting period, their levels were about 37 cm (15 in.) below average, and about 20 cm (7.9 in.) higher than a year ago.

Lake Superior outflows were as specified by Regulation Plan 1977-A during the reporting period and the Compensating Works gates were maintained at a setting equivalent to one-half gate open for the main Rapids.

Navigation interests raised the issue of low levels in the St. Marys River associated with peaking and ponding operations at the hydropower plants at Sault Ste. Marie, Michigan and Ontario. In December 2001, the IJC tasked the Board with preparing a report on peaking and ponding operations and making recommendations to the Commission. The Board submitted its report on February 28, 2002. Subsequently, by letter of March 15, 2002, the IJC approved peaking and ponding until March 20, 2003, subject to the Board's supervision.

The Board was briefed on the status of a dredging project authorized by the U.S. Congress. The dredging is planned for several areas in the lower St. Marys River and could begin as early as this Fall.

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

During the reporting period, the Board, through its staff, continuously monitored 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 provided a hydrologic assessment, as well as recommendations on the regulation of outflows from Lake Superior. These reports also indicated 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 supply comparisons.

Precipitation over the Lake Superior basin for the September 2001 – February 2002 period was slightly below average. The water supply to Lake Superior was near average for the six-month period, with November and December being above average, and the other months at or below average. Except for January, the monthly outflows from Lake Superior were below average during the reporting period. While monthly mean lake levels

remained below average they ranged from about 10 cm (4 in) to about 25 cm (10 in) above levels of a year earlier. Levels fell below chart datum in late January and remain there as of the date of this report. A snow survey was made the last week of February to determine the water equivalent of the snow pack on the basin. This survey by the National Weather Service indicated that the snow pack on the basin is about 15% below average for this time of year. On March 18, Lake Superior was at elevation 183.12 m (600.79 ft), 15 cm (5.9 in.) below average for that time of year and 22 cm (8.7 in.) higher than one year ago

Precipitation over the Lakes Michigan-Huron basin was above average for the reporting period. The water supply to Lakes Michigan-Huron, including inflows from Lake Superior, was above average for the reporting period. Lake Michigan-Huron levels remained below average by amounts ranging from 55 cm (22 inches) in September to 33 cm (13 inches) in December. Monthly mean levels ranged about 8 cm (3 inches) below to about 24 cm (9 inches) above monthly mean levels of a year earlier. Water levels fell below chart datum in early January and were 1 cm (0.4 in.) below datum as of this reporting date. On March 18, Lakes Michigan-Huron were at elevation 175.99 m (577.40 ft), 37 cm (15 in.) below average for that time of year, but 20 cm (7.9 in.) higher than one year ago.

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

During the reporting period, the outflows of Lake Superior were as specified by Regulation Plan 1977-A. The gate setting at the Compensating Works supplying the main portion of the St. Marys Rapids was at an equivalent one-half gate open setting during the reporting period. Gate 1, which supplies water to the Fishery Remedial Works, remained set at 15 m<sup>3</sup>/s (530 cfs).

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

The monthly mean levels of Lake Superior were within the limits of 182.76 and 183.86 meters (599.6 and 603.2 feet) specified in the Commission's Orders of Approval.

The daily mean water levels in the lower St. Marys River at the U.S. Slip Gage down-stream of the U.S. Lock varied between elevation 176.02 m and 176.71 m (577.49 and 579.78 feet respectively). Thus the requirement for maintaining the river level at that location below 177.94 meters (583.8 feet) was satisfied.

### **5. Repairs, Inspection and Flow Calibration at the Compensating Works**

The U.S. Army Corps of Engineers (Corps) and Great Lakes Power Limited 5-year periodic inspection of the U.S. and Canadian portions of the Compensating Works during May 2000 showed there was leakage at the seals of the U.S. gates. Repairs to the gate seals are scheduled for a ten-week period during 2002, if water level conditions permit. During repairs, one gate at a time will be raised to a full open position to facilitate repairs. This will result in a flow to the main rapids greater than the equivalent of one-half gate open. The potential impacts of this work on Lake superior regulation will be evaluated and the Board will advise the Commission if there is a need to deviate from the regulation plan. At this time the impacts, if any, are expected to be minimal. Great Lakes Power plans to do concrete repairs to the nose caps of the piers this summer. If Plan 1977-A specifies two gates open this summer, Great Lakes Power plans to also paint their gates.

As part of the ongoing program to re-calibrate and upgrade the discharge ratings for the Compensating Works gates, flow measurements were conducted in July 2001. Additional measurements may be conducted at the Compensating Works during summer 2003.

## **6. Repairs, Maintenance and Flow Determination at the Hydropower Facilities**

Automation of the U.S. Government hydropower plant continues. Completion is expected in late autumn of 2002. This will be followed by flow measurements to verify reported flows.

Review of options to remediate the scour depression below the U.S. government hydropower plant spillway gates continues.

Since December 2000, the U.S. Government hydropower plant reported flows have been adjusted by 9% to more accurately reflect the actual discharges. The adjustment factor, as directed by the Board, was derived from flow measurements in the power canal in 1998, 1999 and 2000. These flow measurements showed actual flows at the plant were 9% greater than the amounts reported by the plant. This adjustment is considered an interim measure. A Corps study team was formed in December 2000 to examine and make recommendations to resolve the under-reporting of flows. When the plant automation is complete and the System Control and Data Acquisition (SCADA) system is on-line plans call for development of tables relating turbine gate opening to power generated, water flow rates and plant head. These tables will be used to provide the SCADA system real time flow rates that, in turn, will provide water usage reports that better reflect the actual water flow in the power canal and through the plant.

As directed by the Board at the September 20, 2001 semi-annual meeting teleconference, the Regulation Representatives will conduct flow measurements to re-verify ESEC's reported flows in the summer of 2002.

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

Table 3 (Table 4 in U.S. Customary Units) lists the distribution of the outflows from Lake Superior for January 2001 through February 2002. 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 from Lake Superior is shared equally between the U.S. and Canada for hydropower purposes. Any remaining flow allotment, beyond the discharge capacity of the hydropower plants, is normally discharged through the Compensating Works into the St. Marys Rapids.

As shown in the tables, the amount of water used for domestic purposes averaged about 4 m<sup>3</sup>/s (141 cfs).

The flow through the locks depended on traffic volume and varied from 2 to 17 m<sup>3</sup>/s (74 to 601 cfs respectively). The U.S. locks were closed on January 15, 2002 and are expected to open on March 25, 2002. The Canadian lock closed for the season October 15, 2001 and is expected to reopen in mid-May 2002.

In accordance with the Commission's Orders to fulfill the fishery needs in the Rapids, a minimum gate setting of one-half gate open, or its equivalent, is required at all times at the Compensating Works. In addition, a flow of at least 15 m<sup>3</sup>/s (530 cfs) in the Fishery Remedial Works (through Gate No. 1) must be maintained. A setting equivalent to one-half gate open was maintained in the Compensating Works during the reporting period. The flow in the St. Marys Rapids, including that through the Fishery Remedial Works, averaged about 100 m<sup>3</sup>/s (3,530 cfs) for the reporting period. Gate No. 1 remained set at 15 m<sup>3</sup>/s (530 cfs). This setting is expected to continue.

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

Ontario Power Generation continued to provide the Board with information on the operations of the Long Lac and Ogoki Diversions. The Ogoki Diversions into Lake Nipi-

gon (which flows into Lake Superior) averaged 150 m<sup>3</sup>/s (5,300 cfs) from September 2001 through February 2002. The Long Lac Diversion averaged 39.6 m<sup>3</sup>/s (1,400 cfs) for the same period. Combined, these diversions were about 137% of average for the period.

## **9. Vidal Shoals and Lower St. Marys River Dredging**

The previously reported dredging of the Vidal Shoals in the St. Marys River began in June, 2001 following approval from the U.S. State Department which had consulted with Canada's Department of Foreign Affairs and International Trade. This dredging project consists of deepening and modifying widths in existing channels in the Upper St. Marys River between Pointe Louise Turn and the South Canal to the navigation locks, upstream of Sault Ste. Marie, Michigan and Ontario. The depths in specific areas will be increased by up to one foot and channel widths will be modified as necessary. A hydraulic analysis showed that this dredging project would have no measurable impacts on water levels, including transboundary water level impacts. About 230 cubic meters (300 cubic yards) of the dredging is in Canadian waters. This portion of the work is being done using the Corps' Soo Area Office personnel and equipment and is over 50% complete. Completion is expected by mid-summer 2002. Except for the Vidal Shoals Channel portion, the work in U.S. waters is nearly complete.

There is a "differing site conditions" claim pending on the U.S. portion of the Vidal Shoals Channel reach. The contractor claims the bottom material is different from what was expected and different equipment and additional time are required to accomplish this portion of the work. It is expected that negotiation and funding will be completed by the end of March 2002. Completion of the work is expected by late summer 2002, pending resolution of the claim.

In accordance with Section 343 of the Water Resources Development Act of 2000, the Corps also plans to dredge 45,000 to 75,000 cubic yards (36,000 to 60,000 cubic meters) of material in the Lower St. Marys River navigation channel extending from the south approach of the Soo Locks to the northern end of the rock cut on the west side of Neebish Island (Courses 1 through 5). The required depth has not been finalized, but will be 28.0 feet (8.53 m) or 28.5 feet (8.69 m) below LWD with an allowance for 1 foot (0.3 meters) of over-depth dredging to allow for the inaccuracies inherent to the dredging process. This work will be entirely in U.S. waters. A hydraulic analysis by the Corps shows this dredging project will lower water levels in the dredged area by up to 0.13 feet (4 cm) at low flows. The impact on transboundary levels, or flow distribution around Sugar Island, is

not known at this time. The environmental coordination for the project is underway. Contract award is expected in late summer 2002 with completion in December 2002. The Board requested the Corps to keep it informed of the project scope, status, and potential impacts.

## **10. Upper Great Lakes Study**

By letter dated August 14, 2001 the Commission established the Upper Great Lakes Plan of Study team (POS). The U.S. Regulation Representative and the Canadian Secretary of the Lake Superior Board were appointed team members of the six-member bi-national team. This study identifies the needs of the interest groups and users affected by water levels and flows on the upper Great Lakes from Lake Superior through Lake Erie and identifies potential improvements to Lake Superior regulation. The POS team held eight public meetings between October 31 and November 15, 2001. The meetings were held at various locations around the basin to inform the public of the study and to solicit comments on its draft report. The team submitted its plan of study to the IJC on January 11, 2002.

## **11. Peaking and Ponding**

Flow variations at the hydropower plants at Sault Ste. Marie cause the water levels to fluctuate in the St. Marys River downstream of the plants. With the water levels and Lake Superior outflows below average, the fluctuations have become a subject of concern for the commercial navigation users. To provide timely information to the users, the Corps began distributing monthly notices on expected Lake Superior outflows, and schedule of flow variations at the hydropower plants. The notices also contain instructions for mariners on who to contact to obtain additional information related to water levels and flows.

In November 2001 the Shipping Federation of Canada requested a change to the flow strategy of "peaking and ponding" due to the alleged hardship it imposes on navigation. The Board conducted a conference call on November 21, 2001 between parties to discuss the issue. The board advised the IJC of this discussion. The IJC, by letter of December 10, 2001 requested the Board to review peaking and ponding operations and provide a report with findings and recommendations by February 28, 2002. Public hearings were held on January 28, 2002 in Sault Ste. Marie, Michigan and Ontario by the IJC to gather information from interested parties on the issue. The Board briefed the IJC on the peaking and ponding study's progress on February 13, 2002. The Board's report was

presented to the IJC on February 28, 2002, recommending a one-year extension, along with proposed guidelines.

On March 15, 2002, the IJC approved peaking and ponding until March 20, 2003, under the prior approval and supervision of the Board. The Board will make a decision at the beginning of each month whether ponding may be conducted throughout, or only for a portion of, the month. The Board is coordinating operational details with the power entities.

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

The Board will hold its 2002 annual public meeting in Paradise, MI. The meeting is scheduled for June 25 from 7:00 PM to 9:00 PM.

The Board continues to issue, at the beginning of each month, news releases informing the public about Lake Superior regulation and water level conditions. In support of the Board and the Commission, the Detroit District of the Corps of Engineers maintains a Board home page on the Internet. Content includes information on Board members and responsibilities as well as news releases, semi-annual reports and hydrologic data summaries.

By letter dated January 4, 2002 the Board received proposed guidelines on the public release of its minutes. The Board will begin to post its minutes on the Internet within the timeframe established by the Commission.

The booklet "Living with the Lakes," continues to be distributed to all interested parties. About 47,000 copies have been distributed since its release in November 1999.

### 13. Board Membership and Meetings

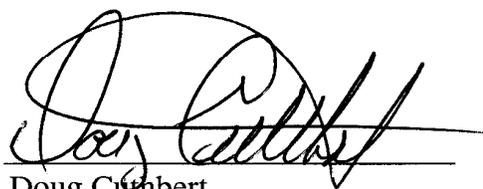
No changes have been made to the Board during this period.

The Board met on March 18, 2002 in Detroit with both members and the U.S. alternate member (Colonel Mark Roncoli) in attendance.

Respectfully submitted,

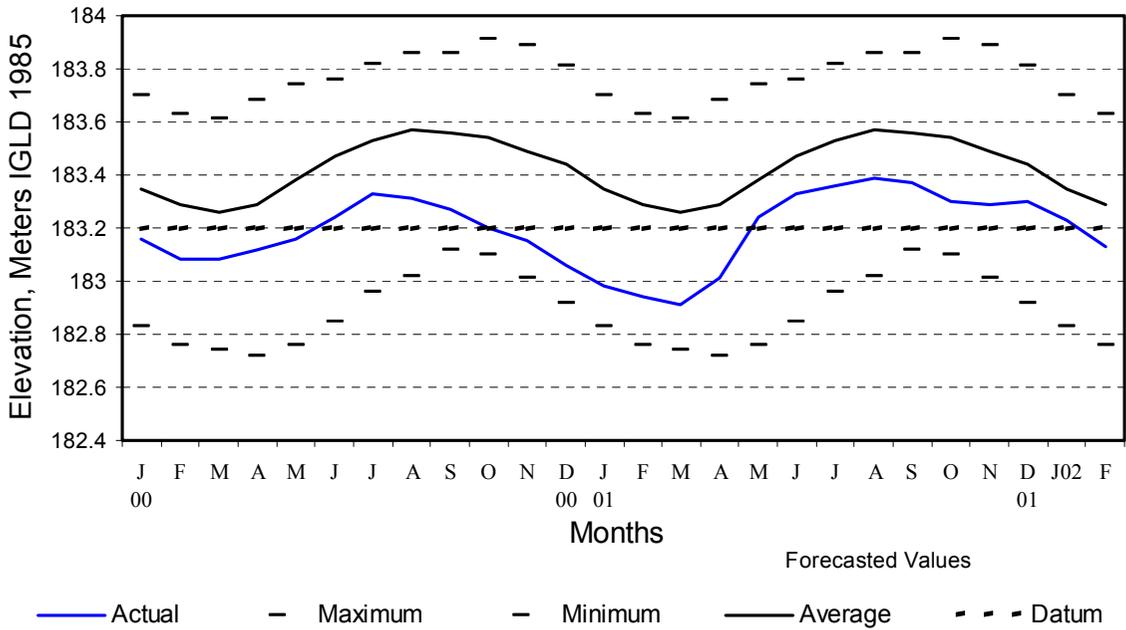


BG Steven R. Hawkins  
Member for United States



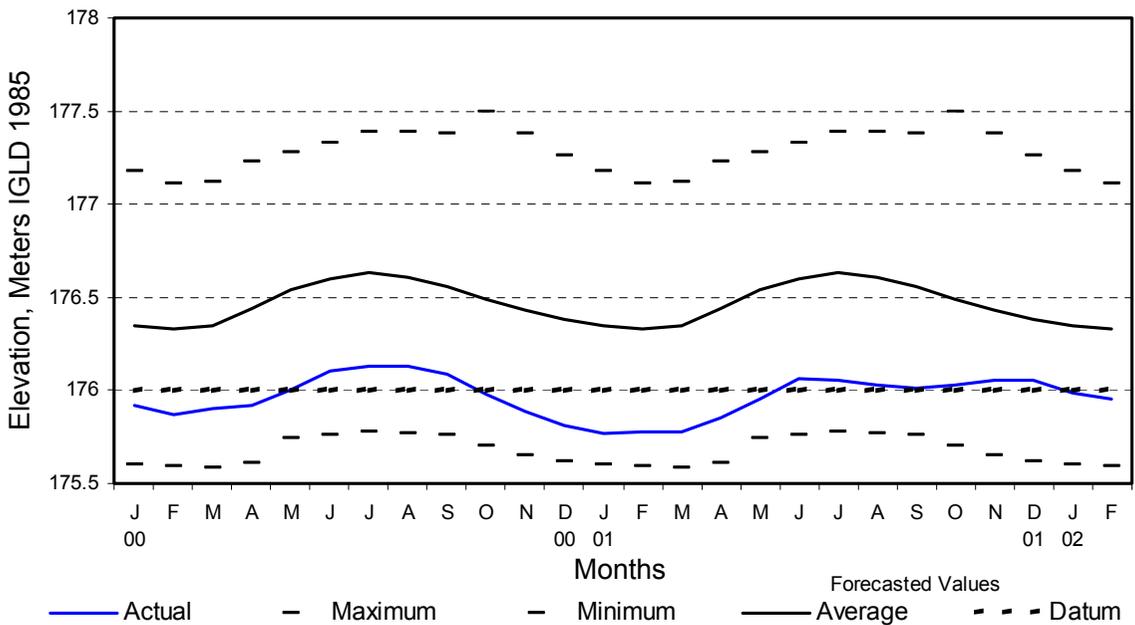
Doug Cuthbert  
Member for Canada

### Monthly Mean Levels Lake Superior



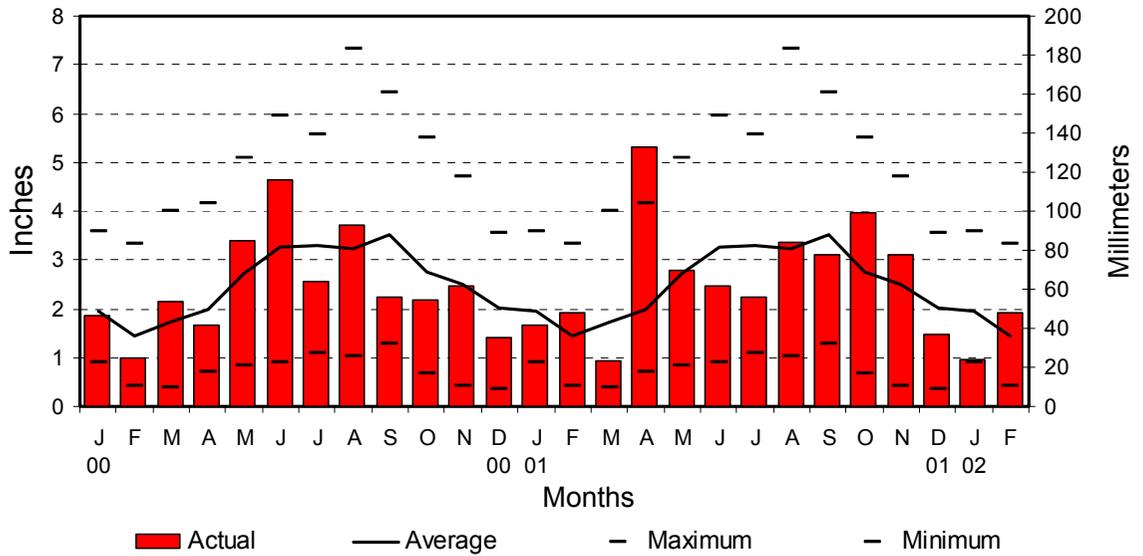
Based on a mean of 5 gages. Average, Maximum and Minimum values for the Period of Record 1918-2001

### Monthly Water Levels Lakes Michigan Huron

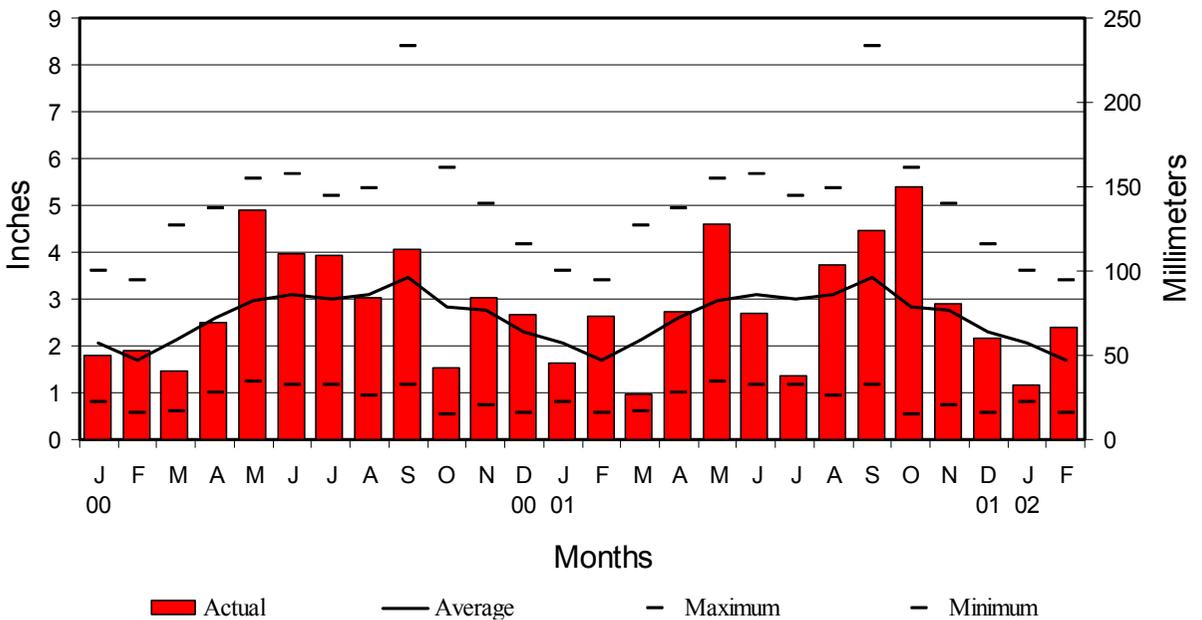


Based on a mean of 5 gages. Average, Maximum and Minimum values for the Period of Record 1918-2001

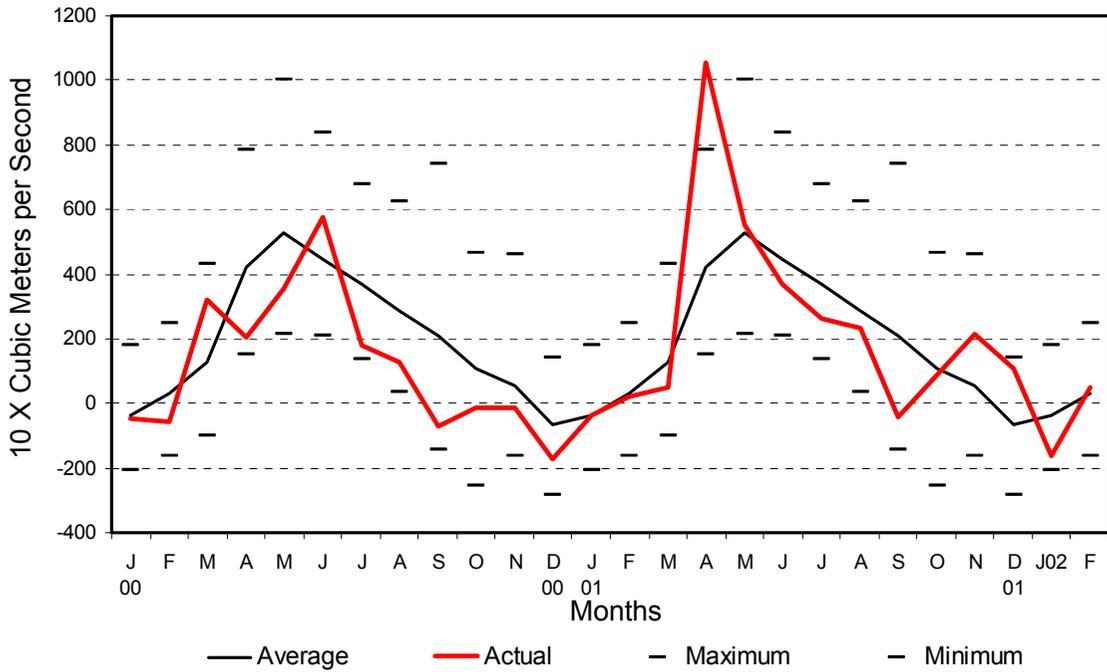
### Monthly Precipitation Lake Superior



### Monthly Precipitation Lakes Michigan-Huron

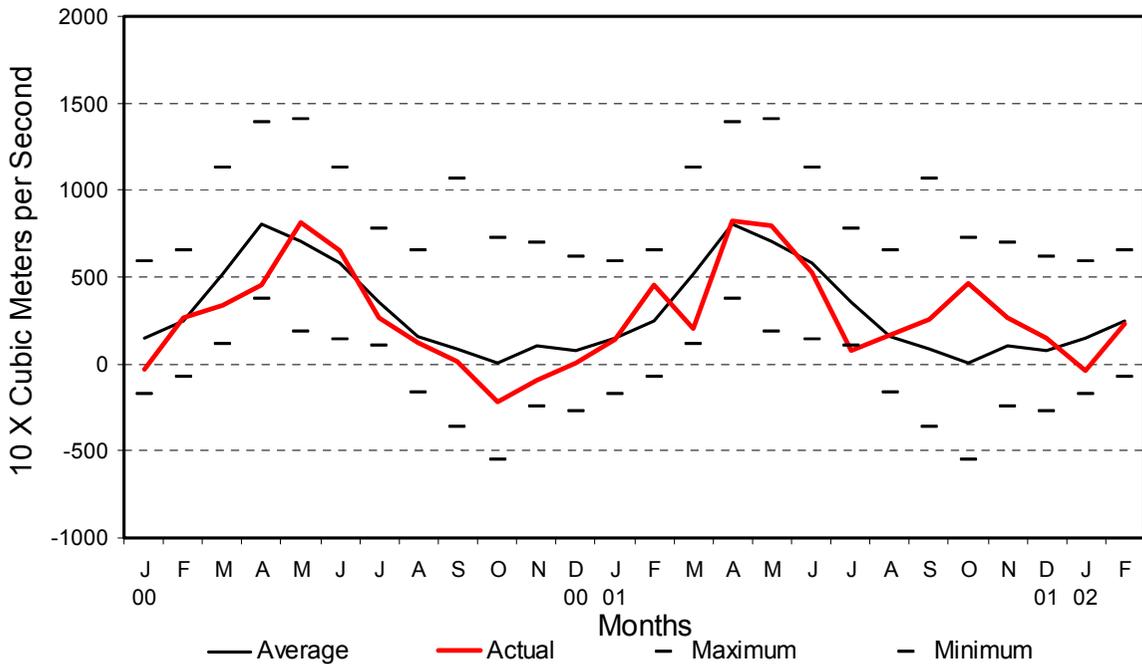


### Monthly Net Basin Supplies Lake Superior



Average, Maximum and Minimum Based on Cordinated Period of Record 1900-1989

### Monthly Net Basin Supplies Lakes Michigan-Huron



Average, Maximum and Minimum Based on Cordinated Period of Record 1900-1989

**TABLE 1**  
**2001 - 2002 Lake Superior Hydrologic Factors**

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedence Probability (%)	Monthly Mean Recorded		Percent of Average <sup>3</sup>
	meters	feet	meters	feet	m3/s	tcfs		m3/s	tcfs	
2001										
Jan	182.98	600.33	-0.37	-1.21	-390	-14	49	1600	57	82
Feb	182.94	600.20	-0.35	-1.15	210	7	52	1570	55	83
Mar	182.91	600.10	-0.35	-1.15	510	18	72	1540	54	82
Apr	183.01	600.43	-0.27	-0.89	10560	373	<<1	1530	54	78
May	183.24	601.18	-0.14	-0.46	5530	195	43	1980	70	93
Jun	183.33	601.48	-0.14	-0.46	3670	130	68	2110	75	96
Jul	183.36	601.57	-0.17	-0.56	2630	93	81	2280	81	100
Aug	183.39	601.67	-0.17	-0.56	2350	83	64	2240	79	94
Sep	183.37	601.61	-0.19	-0.62	-440	-16	96	2230	79	94
Oct	183.30	601.38	-0.24	-0.79	870	31	55	1960	69	85
Nov	183.29	601.35	-0.20	-0.66	2130	75	11	1740	61	77
Dec	183.30	601.38	-0.13	-0.43	1060	37	1	1950	69	94
2002										
Jan	183.23	601.15	-0.12	-0.39	-1620	-57	97	2020	71	104
Feb	183.14	600.85	-0.15	-0.49	190	7	53	1900	67	100

Notes: m<sup>3</sup>/s = cubic meters per second      tcfs = 1000 cubic feet per second

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

<sup>2</sup> Average levels are for period 1918-2000, based on a mean of five gauges.

<sup>3</sup> Average flows are for the period 1900-1989.

**TABLE 2**  
**2001 - 2002 Lakes Michigan-Huron Hydrologic Factors**

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded <sup>1</sup>		Difference From Average <sup>2</sup>		Monthly Mean Recorded		Exceedence Probability	Monthly Mean Recorded		Percent of Average <sup>3</sup>
	meters	feet	meters	feet	m <sup>3</sup> /s	tcfs	(%)	m <sup>3</sup> /s	tcfs	
2001										
Jan	175.77	576.67	-0.58	-1.90	1430	50	48	3830	135	85
Feb	175.78	576.71	-0.56	-1.84	4520	160	8	4210	149	97
Mar	175.78	576.71	-0.57	-1.87	2010	71	93	4350	153	90
Apr	175.85	576.94	-0.59	-1.94	8260	292	45	4340	153	84
May	175.95	577.26	-0.59	-1.94	7970	281	32	4500	159	84
Jun	176.06	577.62	-0.54	-1.77	5300	187	58	4640	164	85
Jul	176.05	577.59	-0.58	-1.90	750	26	99	4730	167	86
Aug	176.03	577.53	-0.58	-1.90	1660	59	46	4700	166	85
Sep	176.01	577.46	-0.55	-1.80	2570	91	18	4710	166	86
Oct	176.03	577.53	-0.46	-1.51	4620	163	3	4700	166	86
Nov	176.05	577.59	-0.38	-1.25	2700	95	19	4800	170	89
Dec	176.05	577.59	-0.33	-1.08	1530	54	34	4730	167	91
2002										
Jan	175.99	577.40	-0.36	-1.18	-370	-13	92	4690	166	105
Feb	175.95	577.26	-0.39	-1.28	3140	111	30	4500	159	103

Notes: m<sup>3</sup>/s = cubic meters per second                      tcfs = 1000 cubic feet per second

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

<sup>2</sup> Average levels are for period 1918-2000, based on a mean of six gauges.

<sup>3</sup> Average flows are for the period 1900-1989.

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

		POWER CANALS				NAVIGATION CANALS			DOMESTIC USAGE				Fishery St. Marys Rapids	Total Lake Superior Outflow m <sup>3</sup> /s
Year and Month	US Govern't Hydro.	Edison Sault Electric	US Total	Great Lakes Power	Total Power Canals	United States	Canada	Total Navigation Canals	Sault Ste. Marie US+Can.	Algoma Steel	St. Marys Paper	Ttotal Domestic Usage		
2001														
JAN	368	399	767	730	1497	3.3	0	3	0.3	3.4	0.3	4	93	1597
FEB	336	416	752	718	1470	2.1	0	2	0.3	3.1	0.3	4	93	1569
MAR	335	401	736	700	1436	3.3	0.3	4	0.3	3.3	0.3	4	92	1536
APR	396	420	816	606	1422	11.3	2.0	13	0.4	3.4	0.3	4	94	1533
MAY	403	482	885	978	1863	12.9	0.7	14	0.3	3.3	0.3	4	97	1978
JUN	386	654	1040	954	1994	14.0	2.1	16	0.3	3.3	0.3	4	98	2112
JUL	401	660	1061	1044	2105	14.8	2.6	17	0.3	3.4	0.3	4	155	2281
AUG	408	641	1049	1061	2110	14.9	2.5	17	0.4	3.5	0.3	4	104	2235
SEP	406	637	1043	1062	2105	14.0	1.8	16	0.3	3.2	0.3	4	103	2228
OCT	410	476	886	952	1838	13.0	0.6	14	0.3	3.3	0.3	4	103	1959
NOV	407	368	775	843	1618	11.0	0	11	0.3	3.3	0.3	4	103	1736
DEC	407	511	918	914	1832	9.8	0	10	0.3	3.0	0.3	4	103	1949
2002														
JAN	408	549	957	951	1908	4	0	4	0.3	3.2	0.3	4	102	2018
FEB	408	485	893	897	1790	2.1	0	2	0.3	3.2	0.3	4	102	1880

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

		POWER CANALS				NAVIGATION CANALS			DOMESTIC USAGE				Fishery St. Marys Rapids	Total Lake Superior Outflow m <sup>3</sup> /s
Year and Month	US Govern't Hydro.	Edison Sault Electric	US Total	Great Lakes Power	Total Power Canals	United States	Canada	Total Navigation Canals	Sault Ste. Marie US+Can.	Algoma Steel	St. Marys Paper	Ttotal Domestic Usage		
2000														
JAN	13000	14100	27100	25800	52900	117	0	117	11	120	11	142	3280	56400
FEB	11900	14700	26600	25400	51900	74	0	74	11	109	11	131	3280	55400
MAR	11800	14200	26000	24700	50700	117	11	128	11	117	11	139	3250	54200
APR	14000	14800	28800	21400	50200	399	71	470	14	120	11	145	3320	54100
MAY	14200	17000	31300	34500	65800	456	25	481	11	117	11	139	3430	69900
JUN	13600	23100	36700	33700	70400	494	74	568	11	117	11	139	3460	74600
JUL	14200	23300	37500	36900	74300	523	92	615	11	120	11	142	5470	80500
AUG	14400	22600	37000	37500	74500	526	88	614	14	124	11	149	3670	78900
SEP	14300	22500	36800	37500	74300	494	64	558	11	113	11	135	3640	78600
OCT	14500	16800	31300	33600	64900	459	21	480	11	117	11	139	3640	69200
NOV	14400	13000	27400	29800	57100	388	0	388	11	117	11	139	3640	61300
DEC	14400	18000	32400	32300	64700	346	0	346	11	106	11	128	3640	68800
2001														
JAN	14400	19400	33800	33600	67400	141	0	141	11	113	11	135	3600	71300
FEB	14400	17100	31500	31700	63200	74	0	74	11	117	11	139	3600	67200

NOTES 1. 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.