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Lake Ontario Beginning-of-Month Water Levels and Monthly Rates of Change of Storage

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2. METHODOLOGY

The beginning-of-month water levels for Lake Ontario were computed by use of a water level gage network located on the periphery of the lake. Ideally, these beginning-of-month levels should represent the instantaneous levels at the beginning of the months. Practically, however, representative instantaneous true water levels are difficult, if not impossible, to measure because of the effect of short-term fluctuations in wind speed and direction and changes in atmospheric pressure over very small time periods. These fluctuations could cause considerable error in computing a true instantaneous level for the lake. This error is lessened by specifying that the beginning-of-month level for each gage shall be equal to the average of the daily mean water levels of the first day of the month and the last day of the previous month.

The computations procedure was set forth by Quinn (1971) and consists of applying weighting factors to each water level gage in the network. The weighting factors were computed from Thiessen polygon networks drawn from the various water level gage networks. This is expressed mathematically as

$$L_o = W_1 L_1 + W_2 L_2 + W_3 L_3 + \dots + W_n L_n$$

$$\text{for } W_1 + W_2 + W_3 + \dots + W_n = 1.0$$

where L_o is the weighted Lake Ontario beginning-of-month water level,
 $L_1 - L_n$ are the beginning-of-month levels at the various gage locations,
 $W_1 - W_n$ are the Thiessen polygon weighting factors for gage locations, 1 to n,
n is the number of water level gages in the network.

The basic data used consist of daily mean water levels for the first and last days of the months for each water level gage in operation. These levels were computed from the gages by use of sampling rates varying from hourly values in the current period to tri-daily readings in the early nineteen hundreds. The gage response time of less than 1 minute is sufficient to filter out wind waves and ship effects but maintain the longer period variations. The water level gages used in the study, along with their period of study, are given in table 1, and their location is shown in figure 1. For this study the Burlington gage data are the combined data of the Hamilton gage which was discontinued at the end of 1970 and the nearby Burlington gage which starts in January 1971. Occasional missing gage data were interpolated from existing gages.

Table 1. Water Level Gages and Period of Study

Gage Location	Period of Study (daily means)
Oswego	1900 - Date
Toronto	1906 - Date
Kingston	1909 - Date
Cape Vincent	1916 - Date
Rochester	1953 - Date
Port Weller	1956 - Date
Cobourg	1956 - Date
Burlington	1961 - Date
Olcott	1967 - Date
Point Petre	1970 - Date

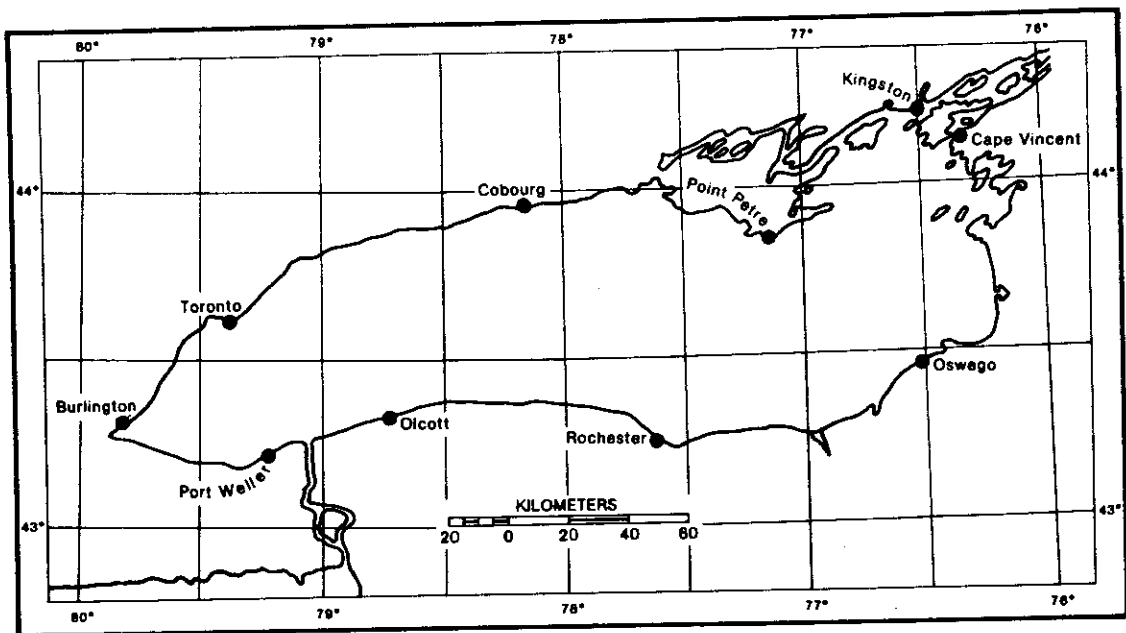


Figure 1. Water level gage locations.

In the initial analysis five different gage networks were developed for the 1950-1970 period to determine the optimum network size as well as to quantify a data set for this period. For obtaining a quantified data set for the 1900-1949 period, an additional three different gage networks were established. The Thiessen polygons shown on figures 2-5 were drawn and weighting factors computed for the gages in the various networks. These networks with their corresponding gages and weighting factors are given in table 2.

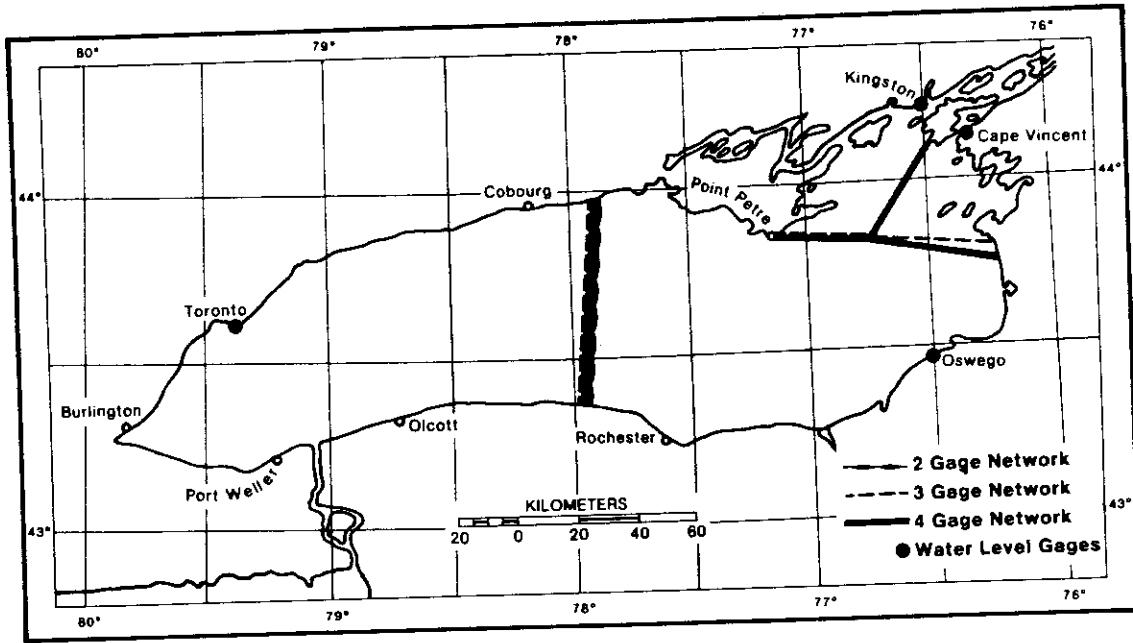


Figure 2. Thiessen polygon networks.

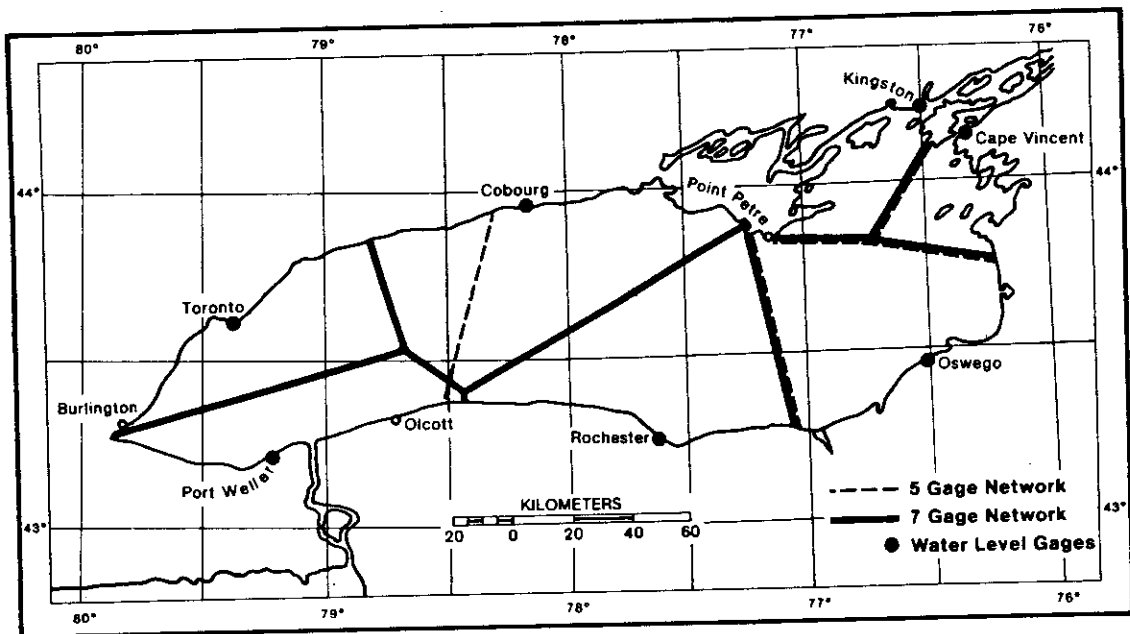


Figure 3. Thiessen polygon networks.

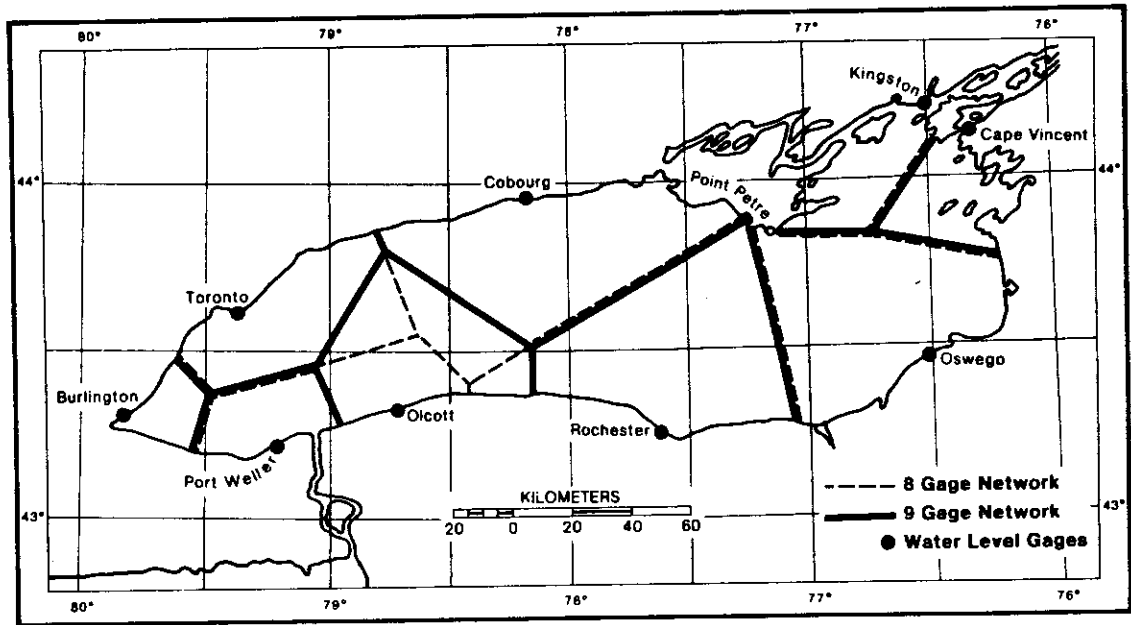


Figure 4. Thiessen polygon networks.

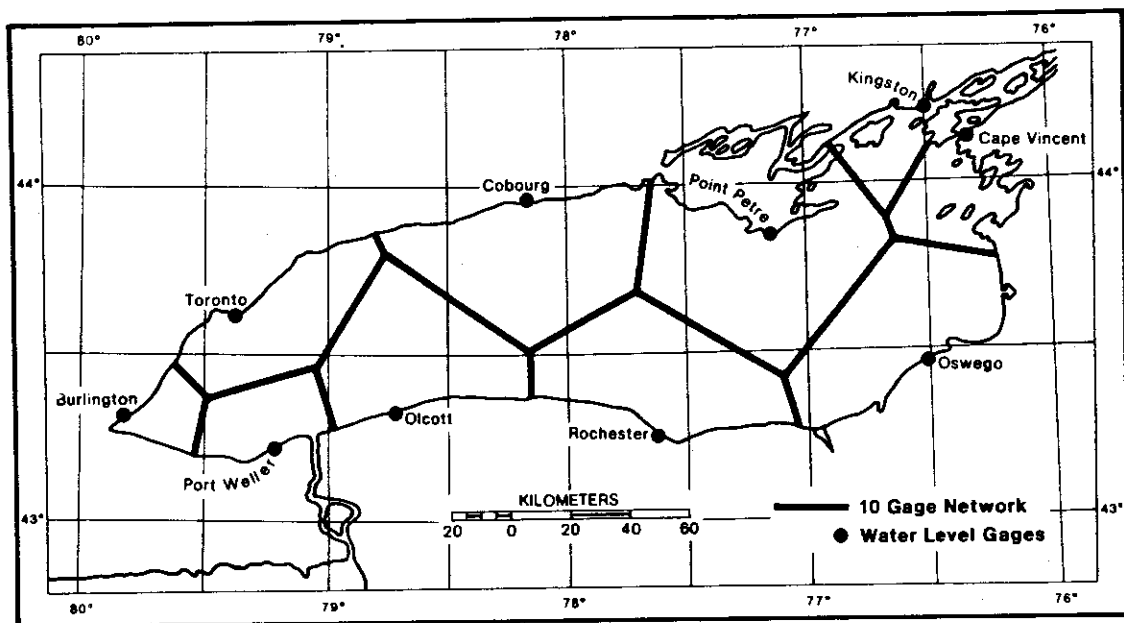


Figure 5. Thiessen polygon network.

Table 2. Gage Networks and Weighting Factors

Gage	Weighting Factors and Period Used							
	2 Gage Network 1906-1974	3 Gage Network 1909-1974	4 Gage Network 1916-1974	5 Gage Network 1953-1974	7 Gage Network 1956-1974	8 Gage Network 1961-1974	9 Gage Network 1967-1974	10 Gage Network 1970-1974
Oswego	0.565	0.449	0.444	0.187	0.187	0.187	0.187	0.128
Toronto	0.435	0.435	0.435	0.296	0.119	0.108	0.084	0.084
Kingston		0.116	0.065	0.065	0.065	0.065	0.065	0.040
Cape Vincent			0.056	0.056	0.056	0.056	0.056	0.055
Rochester				0.396	0.208	0.208	0.198	0.136
Port Weller					0.119	0.102	0.052	0.052
Cobourg					0.246	0.246	0.198	0.161
Burlington						0.028	0.028	0.028
Olcott							0.132	0.132
Point Petre								0.184

3. RESULTS

3.1 Effect of Gage Network Size

This analysis was based on 300 data points for each gage during the 1950-1974 period. The effect of the gage network size was investigated by comparing beginning-of-month lake levels computed by various sized networks during corresponding time periods. The statistical parameters used in the analysis were the standard deviation about zero, the mean, and the maximum of differences in beginning-of-month levels between two different sized networks. Data points were added to the 1953-1974 period to make it statistically compatible with the other periods. These additional points consisted of 5th, 10th, 15th, and 20th of month levels using the same procedure as the beginning-of-month levels. The results are presented in table 3.

The maximum deviation of -0.14 foot and standard deviation of 0.03 foot between the 9 and 10 gage networks results from the addition of the Point Petre gage. This gage has the highest weighting factor and represents a large portion of the lake area. Greater accuracy might be obtained by additional gages in the central portion of the lake.

3.2 Beginning-of-Month Levels

The beginning-of-month water levels computed for each gage are given in tables A.1-A.10 in the Appendix. Lake Ontario beginning-of-month levels, computed with the gage networks given in table 4, are presented in table A.11.

Table 3. Effect of Network Size on Beginning-of-Month Levels

Period	Networks Compared	Mean Dev. * (ft)	Std. Dev. * (ft)	Max. Dev. * (ft)
1950-1974	2 gage vs 3 gage	0.00	0.01	0.03
1950-1974	3 gage vs 4 gage	0.00	0.01	-0.06
1953-1974	4 gage vs 5 gage	0.01	0.02	0.05
1956-1974	5 gage vs 7 gage	0.00	0.02	0.06
1961-1974	7 gage vs 8 gage	0.00	0.01	-0.02
1967-1974	8 gage vs 9 gage	0.00	0.01	-0.03
1970-1974	9 gage vs 10 gage	0.01	0.03	-0.14

* Dev. = Deviation from corresponding beginning-of-month levels

Table 4. Gage Networks Used for Lake Ontario Beginning-of-Month Levels

Period	No. of Gages in Network	Period	No. of Gages in Network
1900-1905	1	1956-1960	7
1906-1908	2	1961-1966	8
1909-1915	3	1967-1969	9
1916-1952	4	1970-1974	10
1953-1955	5		

3.3 Change of Storage

The monthly changes in storage were computed by multiplying the difference between two consecutive beginning-of-month levels by the area of Lake Ontario, 7,340 square miles. The changes in storage were then converted into monthly rates by dividing by the number of seconds in each month. These rates of change are given in table A.12 expressed as thousands of cubic feet per second months (TCFS-months).

3.4 Crustal Movement Analysis

A crustal movement analysis was undertaken to determine relative rates of subsidence, if any, along the longitudinal lake axis, which coincides with the north-south lake orientation. The data used in the analysis consisted of yearly mean-water-level data for the period of study.

The analysis of relative movement along the longitudinal axis showed well defined movement between the Kingston and Oswego gages. As depicted in figure 6, the relative rate of movement between the two gages is 0.25 foot per 100 years.

4. CONCLUSIONS AND RECOMMENDATIONS

This study shows that the present gage network is adequate for both scientific and planning studies, but additional accuracy in beginning-of-month levels might be achieved by increasing the network size over the present level of 10 gages.

The beginning-of-month levels and storage changes listed in tables A.11 and A.12 are recommended for use in scientific and planning studies and should be updated on a yearly basis by the use of the Thiessen polygon procedure.

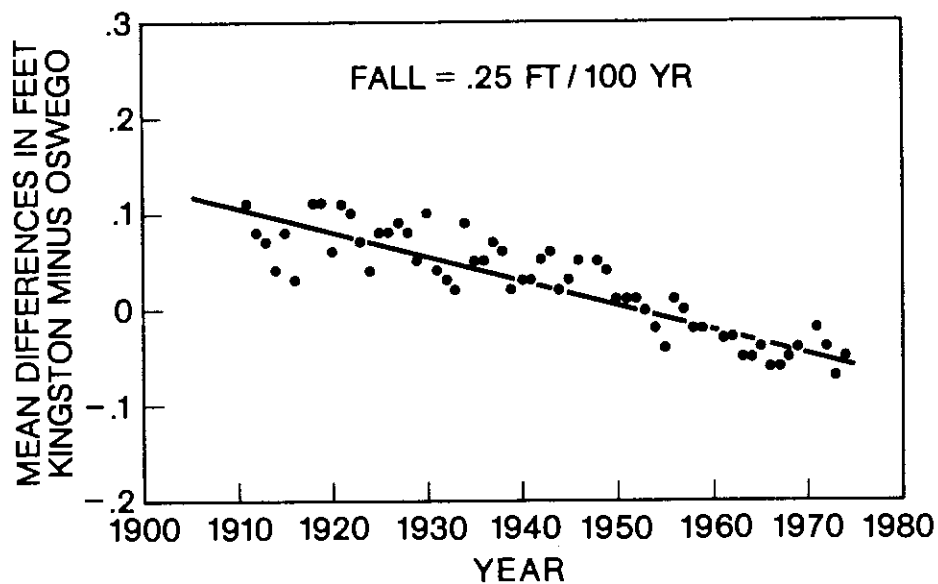


Figure 6. Plot demonstrating the relative crustal movement between Kingston and Oswego gages.

5. ACKNOWLEDGMENTS

The assistance of Raymond N. Kelley in data reduction and report assemblage is gratefully acknowledged.

6. REFERENCES

Quinn, F. H. 1971. Quantitative Mathematical Models for Great Lakes Research. Ph.D. Dissertation, University of Michigan, Ann Arbor, Michigan.

APPENDIX

Beginning-of-Month Levels
and Rates of Storage Change

Table A.1. Beginning-of-Month Levels at Cape Vincent (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1916	243.57	244.21	244.16	244.53	245.57	246.26	246.87	246.40	245.80	245.14	244.68	244.33
1917	244.14	243.84	243.81	244.48	245.17	245.42	246.16	246.38	246.03	245.59	245.70	245.45
1918	245.07	244.74	245.08	245.82	246.07	245.68	245.85	245.49	245.08	244.93	244.91	244.81
1919	244.78	244.88	244.77	245.11	245.73	246.74	246.73	246.50	245.95	245.31	245.05	245.03
1920	244.43	243.88	243.71	244.19	244.44	244.39	244.46	244.61	244.37	244.14	244.09	243.97
1921	244.37	244.08	244.28	245.08	245.53	245.47	245.29	245.11	244.42	244.23	243.54	243.62
1922	243.78	243.40	243.75	244.25	245.26	245.34	245.72	245.51	245.00	244.59	244.01	243.79
1923	243.47	243.28	243.23	243.86	244.27	244.53	244.71	244.33	243.99	243.62	243.27	243.17
1924	243.36	243.56	243.67	243.78	244.48	245.11	245.09	244.87	244.65	244.53	244.03	243.43
1925	242.96	242.97	243.73	244.30	244.39	244.27	244.12	243.83	243.40	243.11	242.97	243.26
1926	243.33	242.73	242.82	243.17	244.02	244.10	244.14	243.79	243.76	243.65	243.83	244.35
1927	244.14	244.10	244.29	244.78	244.69	244.97	244.87	244.83	244.32	243.85	243.56	244.08
1928	244.84	244.86	244.80	245.15	245.41	245.36	245.53	245.52	245.29	244.60	244.48	244.53
1929	244.54	244.78	244.57	245.56	246.57	247.32	247.32	247.08	246.46	245.81	245.45	245.21
1930	245.28	245.93	246.11	246.75	246.79	246.99	247.04	246.70	245.94	245.44	244.84	244.36
1931	244.03	243.52	243.43	243.52	243.83	244.18	244.09	243.90	243.50	243.30	242.91	242.80
1932	242.52	243.71	243.95	244.18	244.84	244.98	244.76	244.44	244.18	243.55	243.24	243.15
1933	243.14	243.11	242.98	243.04	243.85	244.20	244.12	243.76	243.39	243.09	242.44	242.38
1934	242.29	242.75	242.43	242.60	243.34	243.68	243.05	242.64	242.03	242.04	241.61	241.57
1935	241.53	241.79	241.98	242.30	242.75	242.74	243.09	243.12	242.70	242.39	242.00	241.93
1936	241.84	241.83	241.56	243.28	244.05	244.00	243.78	243.44	242.95	242.75	242.54	242.71
1937	242.45	243.41	243.60	243.55	244.24	244.78	244.76	244.73	244.55	243.76	243.65	243.52
1938	242.84	243.23	243.82	244.43	244.69	244.15	244.54	244.65	244.17	244.05	243.59	243.25
1939	243.36	243.04	243.22	244.02	244.92	244.84	244.45	244.67	244.22	243.80	243.38	242.92
1940	243.03	242.58	242.50	242.73	244.12	244.53	244.83	244.67	244.14	243.91	243.32	243.44
1941	243.85	243.92	243.92	243.99	244.43	244.13	243.92	243.76	243.47	243.12	242.81	242.76
1942	242.74	242.70	242.73	243.86	244.38	244.77	244.82	244.72	244.35	244.22	244.05	244.14
1943	244.10	244.72	244.94	245.67	246.07	247.24	247.51	247.24	246.68	246.09	245.77	245.58
1944	245.08	244.79	244.61	244.74	245.59	245.91	246.01	245.87	245.30	244.88	244.35	244.16
1945	244.02	244.12	244.22	245.47	245.83	246.66	246.71	246.54	246.10	246.08	246.22	246.07
1946	246.11	246.11	245.87	246.15	245.84	245.95	246.05	245.67	245.30	244.98	244.77	244.60
1947	244.45	245.05	244.86	245.22	246.03	246.94	247.73	247.80	247.16	246.52	245.73	245.58
1948	244.90	244.98	245.22	246.29	246.80	247.12	247.07	246.69	246.02	245.40	244.94	244.96
1949	244.65	245.15	245.23	245.35	245.78	245.66	245.36	244.97	244.72	244.06	243.66	243.45
1950	243.53	244.25	244.84	245.31	246.03	246.09	246.01	245.77	245.35	244.86	244.61	244.96
1951	244.76	245.21	245.91	246.42	247.55	247.50	247.46	247.22	246.44	246.08	245.63	245.49
1952	245.62	246.22	246.46	247.04	247.82	248.17	247.74	247.43	246.92	246.41	245.78	245.42
1953	245.38	245.52	245.48	246.04	246.09	246.71	246.53	246.19	245.76	245.36	244.67	244.43
1954	244.70	244.31	244.71	245.53	246.41	246.58	246.46	245.89	245.45	245.20	245.31	245.45
1955	245.51	245.45	245.70	246.64	247.28	247.17	246.76	246.11	245.93	245.25	245.56	245.37
1956	244.96	244.62	244.48	244.90	245.89	246.62	246.40	245.98	245.70	245.33	244.62	244.33
1957	244.19	244.14	244.09	244.28	244.74	244.97	245.37	245.14	244.50	244.34	243.66	243.58
1958	243.88	243.69	243.50	243.87	244.22	244.21	244.25	243.97	243.72	243.66	243.18	243.12
1959	242.66	242.99	243.34	244.04	245.12	245.04	244.68	244.33	243.69	243.01	243.07	243.08
1960	243.00	243.77	244.33	244.25	245.62	246.10	245.83	245.28	244.59	244.00	243.88	244.02
1961	243.48	243.21	243.28	243.92	244.96	245.53	245.54	245.17	244.81	244.40	243.81	243.43
1962	243.44	243.14	243.19	243.56	244.66	245.32	245.30	245.20	244.92	244.54	244.37	244.17
1963	244.02	243.43	243.05	243.86	244.87	245.68	245.75	245.59	245.29	244.50	243.77	243.59
1964	243.13	242.46	242.11	242.55	243.57	244.36	244.55	244.36	244.05	243.31	242.56	241.97
1965	241.69	241.71	242.13	242.58	243.58	244.22	244.57	244.49	244.38	244.13	244.11	244.29
1966	244.19	244.13	244.11	244.57	244.75	245.09	245.32	245.13	244.92	244.63	244.00	244.02
1967	244.27	244.34	244.13	244.17	245.14	245.67	245.99	246.06	245.65	245.42	245.12	244.88
1968	244.57	244.37	244.43	245.01	245.13	245.42	245.81	245.80	245.19	244.85	244.09	244.12
1969	244.20	244.24	244.38	244.67	245.37	245.27	246.10	245.60	244.86	244.08	243.63	243.60
1970	243.54	243.59	243.67	243.96	244.93	245.32	245.44	245.77	244.97	244.55	244.17	244.02
1971	244.00	244.25	244.42	244.54	245.42	245.46	245.47	245.11	244.84	244.39	243.93	243.42
1972	243.79	244.02	244.13	244.84	245.81	246.40	246.64	246.73	246.17	245.08	244.38	244.60
1973	244.79	245.88	246.10	247.10	247.75	247.95	247.63	246.85	246.10	245.02	244.62	244.19
1974	244.00	245.03	245.60	245.81	246.88	247.53	247.34	246.86	245.96	245.11	244.05	243.49

* IGLD - International Great Lakes Datum

Table A.2. Beginning-of-Month Levels at Oswego (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1900	243.25	243.58	243.67	244.08	244.87	244.65	244.72	244.48	244.10	243.68	243.24	243.55
1901	243.40	243.40	243.06	243.91	244.83	244.63	244.77	244.47	244.06	243.72	243.10	242.93
1902	243.52	243.20	243.05	244.33	244.38	244.27	244.46	244.96	244.68	244.31	243.93	243.77
1903	243.62	243.62	243.96	245.08	245.59	245.14	245.35	245.33	244.94	244.46	244.36	243.97
1904	243.74	243.62	244.08	245.08	246.08	246.51	246.65	246.54	246.22	245.83	245.38	244.86
1905	244.57	244.41	244.16	244.48	244.96	245.14	245.56	245.71	245.60	245.37	245.03	244.74
1906	244.77	244.93	244.80	244.83	245.10	245.04	245.35	245.21	244.88	244.34	244.37	244.53
1907	244.48	245.17	245.03	245.69	245.74	245.85	245.93	245.87	245.42	245.25	244.88	245.03
1908	245.63	245.53	245.88	246.50	246.95	247.52	247.22	246.92	246.26	245.64	245.03	245.00
1909	244.13	243.98	244.35	244.78	245.37	246.17	245.98	245.89	245.40	244.90	244.28	243.98
1910	243.75	243.80	243.87	244.68	244.97	245.27	245.13	244.49	244.65	244.30	243.90	243.88
1911	243.40	243.55	243.78	244.07	244.28	244.32	244.45	244.08	243.67	243.48	243.37	243.30
1912	243.43	243.63	243.68	244.23	245.42	246.08	245.95	245.68	245.15	245.20	244.77	244.85
1913	244.76	245.75	245.23	246.45	246.68	246.78	246.67	246.37	245.88	245.26	245.02	244.65
1914	244.52	244.28	244.33	245.03	245.72	245.73	245.62	245.18	245.02	244.65	244.18	243.75
1915	243.37	243.52	244.21	243.97	243.90	243.88	243.87	243.88	244.24	243.99	243.88	243.61
1916	243.57	244.10	244.17	244.55	245.53	246.25	246.92	246.36	245.77	245.25	244.60	244.20
1917	244.03	243.87	243.70	244.40	245.18	245.35	246.03	246.31	245.93	245.54	245.48	245.35
1918	245.00	244.63	245.02	245.72	245.97	245.82	245.65	245.48	244.93	244.88	244.33	244.81
1919	244.80	244.97	244.68	245.06	245.54	246.73	246.64	246.49	246.01	245.47	245.06	244.89
1920	244.38	243.79	243.71	244.28	244.46	244.36	244.44	244.61	244.49	244.23	244.14	243.93
1921	244.21	244.22	244.20	244.97	245.38	245.42	245.28	245.17	244.41	244.06	243.65	243.58
1922	243.57	243.27	243.73	244.12	245.27	245.33	245.72	245.54	244.98	244.57	244.05	243.66
1923	243.21	243.15	243.15	243.50	244.28	244.48	244.72	244.23	243.95	243.68	243.27	243.13
1924	243.42	243.57	243.58	243.80	244.48	245.08	245.05	244.92	244.63	244.45	243.88	243.52
1925	243.03	242.88	243.65	244.33	244.40	244.30	244.13	243.80	243.35	243.18	242.88	243.11
1926	243.27	242.90	242.85	243.00	244.07	244.05	244.12	243.75	243.72	243.68	243.82	244.25
1927	244.08	244.15	244.20	244.76	244.69	244.92	244.83	244.78	244.33	243.77	243.48	244.00
1928	244.70	244.78	244.73	245.07	245.31	245.33	245.51	245.49	245.29	244.62	244.46	244.51
1929	244.41	244.82	244.57	245.42	246.61	247.32	247.17	247.07	246.46	245.91	245.47	245.46
1930	245.14	245.74	245.97	246.60	246.76	246.96	246.95	246.66	245.82	245.46	244.67	244.22
1931	243.87	243.62	243.44	243.57	243.82	244.19	244.06	244.02	243.47	243.24	242.92	242.82
1932	242.64	243.67	243.99	244.17	244.84	244.96	244.69	244.51	244.14	243.49	243.12	243.12
1933	243.11	243.07	243.10	243.12	243.88	244.26	244.11	243.80	243.44	242.96	242.34	242.31
1934	242.16	242.57	242.27	242.49	243.27	243.05	242.96	242.59	241.90	242.01	241.58	241.53
1935	241.43	241.75	241.87	242.27	242.64	242.79	243.09	243.10	242.65	242.31	241.98	241.86
1936	241.73	241.86	241.53	243.37	244.00	243.91	243.73	243.35	242.97	242.62	242.43	242.34
1937	242.38	243.28	243.61	243.48	244.29	244.80	244.85	244.71	244.39	243.71	243.58	243.63
1938	243.22	243.31	243.91	244.36	244.75	244.67	244.50	244.49	244.16	244.07	243.56	243.35
1939	243.14	243.05	243.42	244.03	244.93	244.91	244.85	244.58	244.21	243.75	243.36	242.89
1940	242.89	242.58	242.50	242.68	244.04	244.55	244.82	244.81	244.12	243.93	243.37	243.49
1941	243.91	243.94	244.00	244.08	244.42	244.14	243.94	243.78	243.40	242.95	242.73	242.76
1942	242.74	242.70	242.75	243.86	244.42	244.81	244.81	244.67	244.31	244.18	243.95	244.00
1943	244.30	244.58	244.93	245.62	246.09	247.30	247.49	247.20	246.76	246.11	245.77	245.59
1944	245.10	244.85	244.67	244.78	245.50	245.88	246.12	245.88	245.29	244.91	244.35	244.32
1945	244.07	244.23	244.24	245.45	245.93	246.66	246.70	246.48	246.10	245.95	246.25	246.32
1946	246.15	246.00	245.83	246.17	245.97	246.02	245.98	245.68	245.30	245.13	244.81	244.58
1947	244.44	244.92	244.81	245.17	246.11	246.94	247.74	247.87	247.17	246.54	245.79	245.44
1948	245.09	245.01	245.22	246.19	246.79	247.13	247.06	246.70	246.09	245.38	244.96	244.86
1949	244.67	244.86	245.41	245.45	245.75	245.05	245.21	244.98	244.43	244.06	243.73	243.45
1950	243.57	244.36	244.86	245.32	246.08	246.08	246.02	245.79	245.38	244.87	244.66	244.87
1951	244.46	245.28	245.83	246.51	247.59	247.56	247.43	247.23	246.52	246.04	245.56	245.47
1952	245.62	246.10	246.52	247.06	247.86	248.16	247.80	247.44	246.70	246.37	245.67	245.51
1953	245.42	245.49	245.49	246.02	246.18	246.74	246.49	246.23	245.77	245.31	244.74	244.45
1954	244.59	244.38	244.87	245.49	246.39	246.53	246.48	245.95	245.47	245.14	245.28	245.53
1955	245.53	245.55	245.64	246.60	247.31	247.20	246.72	246.02	245.87	245.22	245.61	245.48
1956	245.05	244.64	244.43	244.92	245.87	246.58	246.35	246.02	245.72	245.30	244.64	244.39
1957	244.33	244.17	244.15	244.31	244.81	244.99	245.30	245.14	244.51	244.28	243.69	243.65
1958	243.76	243.72	243.58	243.92	244.24	244.21	244.18	244.04	243.73	243.61	243.23	243.16
1959	242.68	243.17	243.46	244.14	245.13	245.08	244.74	244.36	243.69	243.08	243.11	243.08

*IGLD - International Great Lakes Datum

Table A.2. Beginning-of-Month Levels at Oswego (IGLD* 1955) (continued)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1960	243.55	243.85	244.46	244.31	245.62	246.09	245.85	245.26	244.65	244.07	243.76	244.04
1961	243.53	243.19	243.27	243.98	244.97	245.54	245.56	245.22	244.84	244.23	243.85	243.51
1962	243.49	243.28	243.30	243.75	244.74	245.31	245.31	245.19	244.93	244.51	244.42	244.25
1963	244.34	243.56	243.15	243.84	244.96	245.71	245.77	245.62	245.35	244.54	243.81	243.83
1964	243.23	242.64	242.10	242.76	243.65	244.41	244.55	244.43	244.10	243.35	242.61	242.14
1965	241.87	241.71	242.20	242.74	243.64	244.23	244.60	244.46	244.31	244.07	244.16	244.23
1966	244.20	244.39	244.16	244.66	244.72	245.10	245.34	245.08	244.85	244.53	243.86	244.04
1967	244.20	244.34	244.18	244.13	245.06	245.69	245.94	246.10	245.76	245.42	245.13	245.02
1968	244.66	244.39	244.52	245.07	245.15	245.42	245.78	245.70	245.20	244.83	244.16	244.21
1969	244.49	244.60	244.42	244.56	245.35	245.92	246.08	245.61	244.90	244.10	243.58	243.71
1970	243.66	243.55	243.73	243.98	244.90	245.32	245.46	245.53	245.05	244.59	244.10	244.06
1971	244.15	244.20	244.43	244.67	245.44	245.55	245.46	245.17	244.87	244.40	243.93	243.66
1972	243.78	244.24	244.31	244.84	245.89	246.41	246.63	246.60	246.08	245.27	244.48	244.66
1973	245.41	245.91	246.06	247.10	247.86	247.98	247.64	246.85	246.10	245.10	244.62	244.37
1974	244.75	245.52	245.69	246.02	246.88	247.53	247.34	246.84	245.92	245.11	244.07	243.92

* IGLD - International Great Lakes Datum

Table A.3. Beginning-of-Month Levels at Rochester (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1953	245.42	245.46	245.46	246.05	246.24	246.73	246.57	246.18	245.74	245.25	244.80	244.43
1954	244.50	244.38	244.91	245.45	246.45	246.56	246.47	245.91	245.52	245.13	245.29	245.45
1955	245.57	245.57	245.56	246.60	247.30	247.22	246.75	246.06	245.86	245.26	245.59	245.43
1956	245.09	244.68	244.46	244.90	245.89	246.62	246.35	246.00	245.71	245.27	244.74	244.33
1957	244.18	244.08	244.09	244.28	244.82	245.05	245.26	245.09	244.52	244.26	243.71	243.47
1958	243.69	243.73	243.57	243.88	244.25	244.26	244.23	244.06	243.72	243.57	243.23	243.04
1959	242.68	243.14	243.41	244.11	245.14	245.13	244.75	244.34	243.71	243.19	243.02	243.03
1960	243.48	243.79	244.34	244.35	245.66	246.13	245.88	245.34	244.67	244.12	243.83	243.93
1961	243.52	243.16	243.27	244.01	244.99	245.55	245.58	245.26	244.88	244.25	243.75	243.55
1962	243.42	243.31	243.22	243.75	244.77	245.26	245.32	245.13	244.95	244.55	244.41	244.25
1963	244.26	243.62	243.16	243.82	244.92	245.71	245.76	245.54	245.27	244.54	243.78	243.68
1964	243.20	242.62	242.06	242.72	243.68	244.40	244.56	244.41	244.07	243.34	242.61	242.09
1965	241.78	241.68	242.14	242.68	243.62	244.24	244.60	244.44	244.24	244.01	244.02	244.18
1966	244.18	244.08	244.06	244.68	244.73	245.10	245.38	245.09	244.85	244.46	243.87	243.93
1967	244.23	244.35	244.16	244.22	245.13	245.72	245.99	246.07	245.78	245.43	245.19	245.07
1968	244.66	244.50	244.51	245.07	245.19	245.49	245.88	245.69	245.26	244.81	244.18	244.24
1969	244.37	244.54	244.47	244.53	245.41	245.95	246.12	245.71	244.97	244.15	243.67	243.77
1970	243.74	243.57	243.74	243.98	244.95	245.34	245.52	245.51	245.03	244.57	244.22	244.07
1971	244.21	244.11	244.35	244.77	245.50	245.57	245.51	245.18	244.96	244.41	243.97	243.67
1972	243.89	244.24	244.39	244.93	245.89	246.36	246.61	246.57	246.06	245.26	244.55	244.66
1973	245.39	246.00	246.13	247.15	247.88	247.98	247.66	246.87	246.13	245.16	244.52	244.39
1974	244.76	245.48	245.71	245.97	246.90	247.57	247.37	246.89	245.94	245.07	244.11	244.00

* IGLD - International Great Lakes Datum

Table A.4. Beginning-of-Month Levels at Olcott (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1967	244.24	244.38	244.07	244.22	245.16	245.73	246.06	246.04	245.73	245.41	245.24	245.09
1968	244.68	244.60	244.43	245.07	245.18	245.51	245.91	245.69	245.26	244.76	244.18	244.25
1969	244.28	244.54	244.51	244.54	245.41	246.02	246.11	245.75	244.95	244.18	243.75	243.74
1970	243.75	243.61	243.74	244.04	245.04	245.41	245.52	245.57	244.95	244.61	244.35	244.16
1971	244.23	244.07	244.27	244.83	245.53	245.60	245.57	245.21	244.96	244.53	244.06	243.62
1972	243.88	244.23	244.45	244.97	245.91	246.40	246.66	246.62	246.10	245.28	244.59	244.67
1973	245.36	246.15	246.20	247.26	247.96	248.05	247.75	246.87	246.12	245.24	244.58	244.33
1974	244.76	245.44	245.74	246.04	246.89	247.60	247.46	246.89	245.97	245.01	244.15	244.13

* IGLD - International Great Lakes Datum

Table A.5. Beginning-of-Month Levels at Port Weller (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1956	245.08	244.65	244.45	244.85	245.92	246.61	246.39	245.95	245.75	245.26	244.82	244.30
1957	244.16	244.17	244.28	244.38	244.80	244.99	245.01	245.01	244.48	244.19	243.63	243.33
1958	243.63	243.62	243.58	243.86	244.19	244.19	244.08	243.86	243.53	243.46	243.08	242.92
1959	242.81	243.11	243.48	244.25	245.14	245.13	244.69	244.20	243.71	243.14	243.00	243.02
1960	243.63	243.90	244.34	244.32	245.71	246.09	245.85	245.26	244.64	244.10	243.98	243.82
1961	243.56	243.16	243.34	244.03	245.05	245.55	245.52	245.22	244.78	244.23	243.63	243.53
1962	243.34	243.26	243.16	243.72	244.84	245.31	245.31	245.07	244.94	244.68	244.40	244.25
1963	244.00	243.64	243.15	243.87	244.91	245.74	245.75	245.47	244.47	244.34	244.04	243.31
1964	243.20	242.61	241.97	242.65	243.79	244.37	244.47	244.34	244.04	243.31	242.56	242.04
1965	241.72	241.58	242.11	242.67	243.60	244.22	244.50	244.45	244.22	244.06	243.87	244.07
1966	244.11	243.76	243.99	244.65	244.75	245.05	245.30	245.03	244.82	244.37	243.93	243.88
1967	244.19	244.34	244.01	244.20	245.16	245.69	246.05	245.98	245.68	245.37	245.20	245.05
1968	244.63	244.56	244.38	245.00	245.10	245.50	245.88	245.65	245.24	244.69	244.16	244.26
1969	244.26	244.57	244.52	244.52	245.40	246.02	246.07	245.70	244.94	244.12	243.81	243.70
1970	243.77	243.61	243.74	244.05	245.03	245.41	245.51	245.60	244.86	244.59	244.44	244.20
1971	244.23	244.05	244.28	244.84	245.54	245.61	245.56	245.21	245.01	244.57	244.05	243.60
1972	243.89	244.21	244.57	245.01	245.91	246.37	246.63	246.57	246.08	245.25	244.60	244.66
1973	245.37	246.21	246.23	247.30	247.99	248.07	247.74	246.85	246.07	245.26	244.62	244.29
1974	244.75	245.43	245.73	246.07	246.85	247.62	247.51	246.85	245.94	244.96	244.13	244.18

*IGLD - International Great Lakes Datum

Table A.6. Beginning-of-Month Levels at Burlington (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1961	243.64	243.03	243.35	244.05	244.96	245.44	245.39	245.20	244.67	244.09	243.48	243.43
1962	243.21	243.15	243.02	243.65	244.74	245.18	245.25	244.95	244.81	244.60	244.32	244.18
1963	243.88	243.54	243.05	243.84	244.86	245.62	245.63	245.35	245.07	244.39	243.61	243.37
1964	243.12	242.50	241.84	242.59	243.83	244.27	244.37	244.29	243.97	243.31	242.49	242.02
1965	241.82	241.44	242.07	242.72	243.55	244.15	244.41	244.44	244.13	244.00	243.73	243.92
1966	243.94	243.54	243.99	244.68	244.75	244.95	245.13	244.90	244.65	244.20	243.74	243.68
1967	244.05	244.30	243.84	244.17	245.09	245.63	245.91	245.85	245.61	245.21	245.12	245.03
1968	244.50	244.53	244.25	244.90	245.00	245.36	245.75	245.51	245.16	244.50	244.09	244.19
1969	244.04	244.44	244.41	244.38	245.29	245.94	245.90	245.60	244.80	244.09	243.77	243.62
1970	243.73	243.38	243.58	244.07	244.93	245.41	245.64	245.73	244.97	244.72	244.86	244.36
1971	244.45	244.10	244.30	245.01	245.67	245.75	245.62	245.28	245.16	244.68	244.22	243.72
1972	243.97	244.26	244.61	245.10	246.06	246.51	246.77	246.71	246.26	245.41	244.77	244.77
1973	245.79	246.56	246.35	247.47	248.12	248.14	247.86	247.01	246.15	245.44	244.70	244.42
1974	244.86	245.45	245.82	246.23	246.99	247.71	247.55	246.99	246.03	245.11	244.27	244.59

* IGLD - International Great Lakes Datum

Table A.7. Beginning-of-Month Levels at Toronto (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1906	244.77	244.93	244.80	244.83	245.10	245.08	245.10	245.11	244.76	244.39	244.30	244.53
1907	244.48	245.17	245.03	245.69	245.74	245.82	245.67	245.64	245.17	244.98	244.84	244.94
1908	245.63	245.53	245.88	246.50	246.95	247.30	247.17	246.79	246.22	245.40	244.70	245.00
1909	244.13	243.98	244.35	244.78	245.28	246.00	245.77	245.72	245.12	244.56	244.19	243.98
1910	243.75	243.80	243.87	244.68	244.97	245.27	245.13	244.49	244.65	244.30	243.90	243.58
1911	242.90	242.99	243.49	243.53	243.86	244.07	244.11	243.64	243.35	243.08	242.78	242.67
1912	243.24	243.44	243.26	243.55	244.93	245.57	245.70	245.15	244.82	244.57	244.26	243.99
1913	244.53	245.51	245.26	245.92	246.75	246.82	246.64	246.27	245.74	245.17	244.73	244.80
1914	244.48	244.46	243.94	244.46	245.18	245.48	245.32	244.97	244.65	244.20	243.76	243.58
1915	243.18	243.36	243.53	243.49	243.61	243.57	243.71	243.86	244.02	243.94	243.52	243.36
1916	243.60	243.84	243.95	244.40	245.44	246.11	246.72	246.30	245.57	244.89	244.44	244.09
1917	243.76	243.86	243.64	244.41	245.21	245.42	245.96	246.19	245.84	245.25	244.38	245.17
1918	245.01	244.50	244.91	245.72	245.90	245.82	245.68	245.32	244.89	244.67	244.68	244.60
1919	244.81	244.56	244.50	244.93	245.75	246.71	246.69	246.22	245.78	245.31	244.98	244.36
1920	244.24	243.99	243.52	244.23	244.22	244.32	244.33	244.40	244.21	244.05	243.90	244.01
1921	244.39	244.33	244.24	244.99	245.40	245.44	245.21	244.78	244.39	243.79	243.69	243.56
1922	243.36	243.43	243.56	244.24	245.19	245.27	245.65	245.38	244.93	244.46	243.99	243.50
1923	243.23	243.29	243.16	243.62	244.14	244.47	244.61	244.31	243.87	243.54	243.10	243.05
1924	243.21	243.55	243.45	243.74	244.38	244.98	244.93	244.83	244.56	244.21	243.90	243.33
1925	243.17	242.90	243.58	244.20	244.38	244.19	243.94	243.73	243.27	243.19	242.95	243.24
1926	242.95	242.88	242.74	243.20	244.03	244.08	244.12	243.78	243.68	243.71	243.72	244.14
1927	243.98	243.79	244.13	244.69	244.57	244.74	244.80	244.73	244.20	243.81	243.58	243.97
1928	244.51	244.64	244.51	244.83	245.36	245.27	245.46	245.40	245.08	244.58	244.38	244.39
1929	244.45	244.82	244.26	245.41	246.61	247.24	247.06	246.89	246.36	245.90	245.47	244.84
1930	245.10	245.73	246.08	246.65	246.78	246.81	246.86	246.51	245.95	245.15	244.63	244.22
1931	243.69	243.58	243.39	243.58	243.75	244.08	244.04	243.78	243.27	243.13	242.82	242.53
1932	242.49	243.39	243.94	243.97	244.80	244.89	244.60	244.38	243.97	243.40	243.17	243.16
1933	243.06	243.12	242.82	243.14	243.93	244.13	244.04	243.64	243.46	242.92	242.48	242.13
1934	242.33	242.48	242.33	242.82	243.35	243.16	242.98	242.56	242.09	241.96	241.48	241.57
1935	241.35	241.87	241.87	242.36	242.40	242.77	243.10	242.95	242.51	242.22	242.02	241.84
1936	241.82	241.56	241.59	243.33	244.07	243.97	243.75	243.28	242.89	242.82	242.50	242.40
1937	242.39	243.19	243.52	243.56	244.39	244.81	244.85	244.60	244.48	243.90	243.64	243.59
1938	243.52	243.14	243.57	244.44	244.72	244.81	244.60	244.46	244.18	244.02	243.64	243.28
1939	243.06	243.12	243.40	244.15	244.89	244.98	244.84	244.60	244.31	243.80	243.40	242.98
1940	242.69	242.63	242.59	242.60	244.14	244.67	244.74	244.69	244.31	243.90	243.61	243.50
1941	243.82	243.95	243.93	244.14	244.43	244.24	243.94	243.83	243.30	242.92	242.89	242.83
1942	242.42	242.74	242.71	243.79	244.48	244.90	244.85	244.79	244.43	244.14	243.90	244.04
1943	244.15	244.40	244.79	245.69	245.97	247.40	247.43	247.17	246.86	246.24	245.92	245.66
1944	245.13	244.69	244.61	244.87	245.59	245.91	246.06	245.82	245.32	245.02	244.41	243.95
1945	244.00	243.88	244.21	245.43	245.91	246.02	246.72	246.76	246.06	246.20	246.21	246.42
1946	246.08	245.86	246.02	246.41	245.97	246.07	245.99	245.75	245.21	244.79	244.76	244.50
1947	244.55	244.69	244.74	245.19	246.18	246.58	247.74	247.68	247.24	246.43	245.97	245.36
1948	245.35	245.12	245.40	246.39	246.80	247.13	247.00	246.57	246.10	245.47	244.97	244.80
1949	244.41	244.80	245.28	245.56	245.92	245.69	245.40	244.84	244.26	244.08	243.61	243.36
1950	243.70	244.47	244.63	245.46	246.17	246.19	246.03	245.80	245.53	244.93	244.76	244.71
1951	245.02	245.45	245.95	246.64	247.67	247.58	247.45	247.22	246.67	245.97	245.47	245.52
1952	245.75	246.16	246.55	247.19	247.86	248.21	247.97	247.34	246.96	246.40	245.67	245.44
1953	245.49	245.34	245.40	246.01	246.31	246.81	246.54	246.11	245.69	245.30	244.77	244.49
1954	244.33	244.37	245.10	245.46	246.48	246.67	246.48	245.89	245.59	245.19	245.30	245.34
1955	245.66	245.65	245.66	246.62	247.30	247.13	246.72	246.20	245.84	245.24	245.65	245.34
1956	245.07	244.68	244.47	244.87	245.97	246.63	246.37	245.96	245.81	245.22	244.84	244.32
1957	244.17	244.21	244.31	244.42	244.81	245.07	245.08	245.09	244.57	244.24	243.72	243.43
1958	243.73	243.70	243.73	243.95	244.30	244.28	244.20	243.97	243.60	243.53	243.18	243.00
1959	242.42	243.11	243.53	244.26	245.19	245.16	244.69	244.22	243.82	243.22	243.06	243.03

* IGLD - International Great Lakes Datum

Table A.7. Beginning-of-Month Levels at Toronto (IGLD* 1955) (continued)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1960	243.64	243.96	244.39	244.40	245.76	246.15	245.92	245.30	244.70	244.11	244.05	243.79
1961	243.61	243.17	243.40	244.10	245.10	245.59	245.56	245.32	244.82	244.31	243.64	243.60
1962	243.42	243.30	243.17	243.75	244.85	245.36	245.35	245.14	245.03	244.77	244.44	244.32
1963	243.99	243.69	243.20	243.93	244.89	245.75	245.81	245.49	245.28	244.63	243.76	243.48
1964	243.31	242.73	242.14	242.75	243.87	244.44	244.54	244.39	244.13	243.38	242.65	242.05
1965	241.76	241.70	242.15	242.71	243.66	244.29	244.58	244.56	244.34	244.18	243.87	244.13
1966	244.21	243.81	244.06	244.71	244.78	245.07	245.36	245.15	244.89	244.39	243.97	243.90
1967	244.28	244.43	244.04	244.30	245.24	245.79	246.13	246.04	245.71	245.39	245.28	245.12
1968	244.69	244.67	244.44	245.07	245.17	245.55	245.96	245.70	245.31	244.69	244.20	244.32
1969	244.50	244.62	244.59	244.56	245.46	246.06	246.11	245.78	244.98	244.23	243.89	243.75
1970	243.87	243.68	243.79	244.14	245.10	245.51	245.55	245.65	244.91	244.59	244.47	244.26
1971	244.28	244.07	244.31	244.92	245.62	245.66	245.59	245.30	245.05	244.61	244.10	243.68
1972	244.02	244.27	244.51	245.08	246.03	246.48	246.75	246.69	246.17	245.34	244.70	244.71
1973	245.44	246.26	246.29	247.31	248.03	248.10	247.82	246.92	246.12	245.32	244.66	244.34
1974	244.79	245.43	245.79	246.09	246.90	247.66	247.48	246.90	245.96	245.02	244.21	244.22

* IGLD - International Great Lakes Datum

Table A.8. Beginning-of-Month Levels at Cobourg (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1956	245.07	244.68	244.47	244.87	245.97	246.63	246.37	245.94	245.87	245.32	244.84	244.29
1957	244.16	244.13	244.23	244.34	244.76	245.11	245.12	245.14	244.59	244.33	243.76	243.44
1958	243.76	243.72	243.73	243.98	244.31	244.30	244.21	244.00	243.63	243.55	243.15	242.96
1959	242.88	243.10	243.57	244.26	245.20	245.18	244.69	244.29	243.85	243.25	242.84	242.99
1960	242.70	243.99	244.41	244.44	245.80	246.20	245.94	245.31	244.66	244.12	244.09	243.84
1961	243.60	243.17	243.38	244.10	245.13	245.04	245.60	245.27	244.73	244.26	243.66	243.55
1962	243.56	243.41	243.15	243.72	244.89	245.39	245.38	245.13	245.04	244.70	244.49	244.31
1963	244.04	243.77	243.20	243.88	244.95	245.73	245.77	245.49	245.25	244.55	243.79	243.43
1964	243.16	242.60	241.97	242.63	243.70	244.34	244.58	244.38	244.18	243.48	242.65	241.97
1965	241.76	241.75	242.21	242.74	243.66	244.26	244.60	244.59	244.37	244.23	243.95	244.18
1966	244.27	243.92	244.18	244.78	244.84	245.15	245.45	245.11	244.96	244.40	243.97	243.94
1967	244.24	244.41	244.14	244.36	245.22	245.80	246.12	246.10	245.75	245.43	245.30	245.11
1968	244.08	244.61	244.50	245.11	245.22	245.53	245.93	245.70	245.28	244.67	244.14	244.22
1969	244.24	244.58	244.54	244.45	245.37	245.95	246.02	245.72	245.01	244.19	243.88	243.75
1970	243.84	243.67	243.78	244.13	245.24	245.46	245.51	245.51	244.93	244.59	244.39	244.22
1971	244.29	244.12	244.27	244.83	245.59	245.64	245.55	245.30	245.00	244.55	244.15	243.73
1972	244.03	244.29	244.53	245.05	246.00	246.49	246.72	246.71	246.16	245.27	244.70	244.73
1973	245.47	246.10	246.29	247.24	247.95	248.06	247.79	246.93	246.11	245.26	244.68	244.27
1974	244.04	245.45	245.77	246.10	246.89	247.62	247.42	246.85	245.93	244.94	244.23	244.16

* IGLD - International Great Lakes Datum

Table A.9. Beginning-of-Month Levels at Kingston (IGLD^{*} 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1909	244.13	243.98	244.35	244.78	245.29	246.12	245.99	245.86	245.46	244.90	244.29	244.00
1910	243.75	243.80	243.87	244.68	245.13	245.43	245.30	245.17	244.83	244.51	244.25	243.92
1911	243.74	243.59	243.82	244.04	244.44	244.53	244.47	244.19	243.81	243.52	243.31	243.56
1912	243.82	243.73	243.77	244.08	245.38	246.17	246.04	245.70	245.34	245.21	245.02	244.98
1913	244.93	245.88	245.33	246.27	246.77	246.96	246.83	246.52	245.99	245.26	245.12	244.91
1914	244.51	244.64	244.40	244.87	245.61	245.79	245.70	245.31	245.10	244.62	244.30	243.88
1915	243.57	243.37	244.06	244.01	243.73	243.92	243.91	243.95	244.32	244.11	244.04	243.79
1916	243.60	244.19	244.20	244.20	245.17	246.30	246.94	246.46	245.91	245.18	244.77	244.41
1917	244.22	243.93	243.87	244.57	245.30	245.49	246.20	246.42	246.06	245.65	245.74	245.53
1918	245.05	244.76	245.09	245.87	246.09	245.94	245.83	245.55	245.13	244.98	244.95	244.82
1919	244.82	244.88	244.79	245.12	245.81	246.89	246.78	246.52	246.08	245.42	245.20	245.05
1920	244.46	243.90	243.77	244.29	244.58	244.45	244.53	244.67	244.43	244.19	244.11	243.93
1921	244.47	244.17	244.31	245.17	245.44	245.54	245.37	245.14	244.54	244.28	243.55	243.64
1922	243.83	243.44	243.75	244.25	245.36	245.42	245.82	245.62	245.07	244.64	244.08	243.85
1923	243.47	243.28	243.23	243.89	244.34	244.58	244.78	244.39	244.03	243.65	243.31	243.23
1924	243.36	243.61	243.69	243.82	244.55	245.18	245.15	244.93	244.71	244.56	244.09	243.45
1925	243.00	243.02	243.81	244.40	244.48	244.34	244.15	243.87	243.45	243.17	243.03	243.36
1926	243.34	242.74	242.84	243.19	244.11	244.14	244.19	243.84	243.81	243.72	243.90	244.41
1927	244.19	244.13	244.32	244.83	244.75	245.02	244.95	244.92	244.37	243.91	243.62	244.11
1928	244.87	244.91	244.87	245.06	245.48	245.42	245.60	245.60	245.35	244.67	244.56	244.58
1929	244.59	244.81	244.61	245.63	246.63	247.33	247.31	247.12	246.51	245.85	245.52	245.67
1930	245.34	245.97	246.15	246.83	246.85	247.01	247.00	246.69	245.95	245.46	244.71	244.41
1931	244.06	243.64	243.43	243.53	243.86	244.22	244.12	243.92	243.51	243.30	242.94	242.85
1932	242.52	243.67	243.98	244.20	244.88	244.95	244.73	244.47	244.18	243.58	243.24	243.18
1933	243.15	243.16	242.97	243.09	243.89	244.21	244.13	243.76	243.42	243.10	242.43	242.39
1934	242.29	242.75	242.43	242.67	243.33	243.07	243.04	242.61	242.06	242.06	241.63	241.56
1935	241.54	241.79	241.98	242.30	242.73	242.81	243.12	243.12	242.71	242.40	242.00	241.93
1936	241.84	241.83	241.56	243.28	244.05	243.98	243.78	243.44	242.95	242.71	242.58	242.32
1937	242.54	243.44	243.68	243.53	244.28	244.84	244.91	244.76	244.43	243.86	243.64	243.73
1938	243.12	243.25	243.82	244.56	244.83	244.73	244.55	244.60	244.19	244.06	243.62	243.30
1939	243.22	242.97	243.49	244.10	244.92	244.91	244.94	244.61	244.24	243.68	243.38	242.97
1940	243.01	242.59	242.49	242.72	244.10	244.58	244.87	244.73	244.19	243.92	243.44	243.47
1941	243.84	243.95	243.94	244.09	244.46	244.18	243.96	243.80	243.44	243.10	242.84	242.74
1942	242.80	242.74	242.78	243.89	244.43	244.82	244.94	244.79	244.41	244.25	244.05	244.07
1943	244.21	244.71	245.02	245.73	246.11	247.38	247.55	247.28	246.84	246.16	245.83	245.63
1944	245.12	244.78	244.60	244.85	245.54	245.54	246.14	245.92	245.36	244.96	244.47	244.19
1945	244.09	244.19	244.25	245.41	246.01	246.08	246.76	246.63	246.20	246.14	246.32	246.09
1946	246.21	246.15	245.93	246.16	245.97	245.93	246.08	245.70	245.42	244.91	244.84	244.61
1947	244.44	245.02	244.87	245.23	246.08	247.02	247.80	247.85	247.20	246.49	245.77	245.57
1948	244.95	244.99	245.23	246.33	246.84	247.18	247.11	246.75	246.04	245.42	244.95	244.93
1949	244.83	245.07	245.31	245.41	245.81	245.67	245.36	244.95	244.52	244.06	243.67	243.46
1950	243.55	244.29	244.84	245.35	246.05	246.13	246.04	245.74	245.39	244.88	244.66	244.96
1951	245.02	245.21	245.88	246.48	247.59	247.57	247.44	247.24	246.40	246.08	245.61	245.54
1952	245.73	246.22	246.44	247.10	247.86	248.16	247.80	247.44	246.90	246.44	245.78	245.45
1953	245.36	245.51	245.41	246.04	246.11	246.73	246.54	246.17	245.78	245.36	244.72	244.46
1954	244.49	244.35	244.86	245.51	246.35	246.56	246.45	245.91	245.46	245.20	245.28	245.39
1955	245.53	245.41	245.61	246.61	247.26	247.14	246.72	246.07	245.91	245.28	245.56	245.36
1956	244.92	244.57	244.40	244.87	245.85	246.61	246.39	245.97	245.70	245.31	244.63	244.31
1957	244.19	244.12	244.13	244.33	244.77	244.98	245.34	245.11	244.49	244.33	243.64	243.55
1958	243.87	243.68	243.45	243.85	244.23	244.19	244.24	244.00	243.71	243.72	243.18	243.12
1959	242.68	243.07	243.45	244.13	245.13	245.07	244.67	244.29	243.69	242.99	243.07	243.07

* IGLD - International Great Lakes Datum

Table A.9. Beginning-of-Month Levels at Kingston (IGLD* 1955) (continued)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1960	243.50	243.81	244.36	244.28	245.64	246.10	245.85	245.26	244.58	243.95	243.92	243.95
1961	243.46	243.13	243.27	243.91	244.91	245.50	245.52	245.15	244.79	244.42	243.78	243.44
1962	243.50	243.20	243.21	243.63	244.67	245.31	245.29	245.16	244.91	244.51	244.37	244.21
1963	244.02	243.56	243.11	243.74	244.86	245.64	245.71	245.53	245.23	244.48	243.74	243.54
1964	243.16	242.63	242.08	242.69	243.58	244.33	244.51	244.34	244.01	243.28	242.56	241.96
1965	241.67	241.72	242.13	242.62	243.59	244.23	244.55	244.50	244.41	244.22	244.04	244.23
1966	244.20	244.13	244.16	244.57	244.70	245.07	245.30	245.07	244.83	244.54	243.95	243.94
1967	244.21	244.27	244.06	244.10	245.01	245.64	245.95	246.00	245.61	245.37	245.12	244.86
1968	244.57	244.37	244.43	245.01	245.14	245.40	245.81	245.79	245.23	244.85	244.10	244.13
1969	244.41	244.52	244.32	244.54	245.32	245.91	246.06	245.59	244.86	244.11	243.66	243.60
1970	243.51	243.59	243.67	243.96	244.87	245.31	245.45	245.53	244.92	244.54	244.17	244.06
1971	244.02	244.22	244.42	244.66	245.46	245.46	245.47	245.16	244.87	244.61	243.96	243.47
1972	243.84	244.21	244.27	244.87	245.82	246.34	246.57	246.62	246.09	245.16	244.43	244.62
1973	245.39	245.81	246.06	246.95	247.73	247.93	247.59	246.82	246.06	245.05	244.64	244.24
1974	244.69	245.42	245.66	245.90	246.80	247.51	247.32	246.81	245.93	245.01	244.06	243.73

* IGLD - International Great Lakes Datum

Table A.10. Beginning-of-Month Levels at Point Petre (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1970	243.51	243.47	243.58	243.86	244.80	245.18	245.31	245.41	245.28	244.47	244.39	244.22
1971	244.29	244.12	244.27	244.62	245.41	245.40	245.32	245.05	244.76	244.31	243.99	243.67
1972	243.90	244.05	244.24	244.87	245.64	246.30	246.47	246.53	245.97	245.26	244.43	244.92
1973	245.83	245.82	246.02	246.96	247.70	247.88	247.50	246.73	246.01	244.99	245.01	244.61
1974	244.88	245.73	245.77	245.99	246.88	247.46	247.27	246.74	245.93	245.05	244.09	243.86

* IGLD - International Great Lakes Datum

Table A.11. Lake Ontario Beginning-of-Month Levels (IGLD* 1955)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1900	243.25	243.58	243.67	244.08	244.87	244.68	244.72	244.48	244.10	243.68	243.24	243.55
1901	243.40	243.40	243.06	243.91	244.83	244.63	244.77	244.47	244.06	243.72	243.10	242.93
1902	243.32	243.20	243.05	244.33	244.38	244.27	244.46	244.96	244.68	244.31	243.93	243.77
1903	243.62	243.62	243.96	245.08	245.59	245.16	245.35	245.33	244.94	244.46	244.36	243.97
1904	243.74	243.62	244.08	245.08	246.08	246.51	246.65	246.54	246.22	245.83	245.38	244.86
1905	244.57	244.41	244.16	244.48	245.10	245.08	245.24	245.17	244.83	244.36	244.34	244.53
1906	244.77	244.53	244.80	244.83	244.96	245.19	245.56	245.71	245.60	245.37	245.03	244.74
1907	244.48	245.16	245.03	245.68	245.74	245.83	245.82	245.76	245.31	245.13	244.86	244.99
1908	245.03	245.53	245.88	246.50	246.94	247.42	247.19	246.86	246.24	245.54	244.89	245.00
1909	244.13	243.98	244.34	244.78	245.32	246.09	245.89	245.81	245.29	244.75	244.24	243.98
1910	243.74	243.80	243.86	244.68	244.98	245.28	245.15	244.56	244.67	244.32	243.94	243.75
1911	243.22	243.31	243.65	243.83	244.12	244.24	244.30	243.90	243.54	243.31	243.10	243.06
1912	243.39	243.56	243.51	243.92	245.20	245.87	245.85	245.45	245.02	244.93	244.57	244.49
1913	244.68	245.66	245.25	246.19	246.72	246.82	246.67	246.34	245.83	245.22	244.91	244.74
1914	244.50	244.40	244.17	244.76	245.47	245.63	245.50	245.10	244.87	244.45	244.01	243.69
1915	243.30	243.43	243.89	243.76	243.75	243.75	243.80	243.88	244.15	243.98	243.74	243.52
1916	243.38	244.00	244.07	244.46	245.47	246.19	246.83	246.34	245.68	245.08	244.55	244.17
1917	243.93	243.86	243.69	244.42	245.20	245.39	246.02	246.26	245.90	245.44	245.47	245.28
1918	245.01	244.59	244.98	245.74	245.95	245.83	245.68	245.42	244.93	244.80	244.82	244.72
1919	244.80	244.78	244.61	245.01	245.66	246.73	246.68	246.38	245.91	245.39	245.03	244.68
1920	244.35	243.88	243.63	244.25	244.36	244.35	244.39	244.52	244.36	244.13	244.03	243.96
1921	244.31	244.25	244.23	244.99	245.40	245.44	245.25	244.99	244.41	243.97	243.65	243.58
1922	243.30	243.35	243.65	244.19	245.23	245.31	245.69	245.47	244.96	244.52	244.02	243.61
1923	243.25	243.23	243.16	243.60	244.22	244.46	244.68	244.28	243.92	243.61	243.19	243.10
1924	243.32	243.55	243.53	243.77	244.44	245.04	245.00	244.88	244.61	244.35	243.91	243.42
1925	243.08	242.90	243.63	244.28	244.40	244.25	244.05	243.78	243.32	243.18	242.92	243.19
1926	243.13	242.87	242.80	243.11	244.04	244.07	244.12	243.77	243.71	243.69	243.78	244.21
1927	244.05	243.98	244.18	244.73	244.64	244.85	244.83	244.77	244.28	243.80	243.54	244.00
1928	244.04	244.73	244.65	244.96	245.35	245.30	245.49	245.46	245.20	244.60	244.43	244.46
1929	244.44	244.82	244.44	245.44	246.60	247.29	247.14	247.00	246.42	245.89	245.47	245.19
1930	245.14	245.76	246.04	246.64	246.78	246.90	246.92	246.59	245.89	245.32	244.66	244.24
1931	243.81	243.60	243.42	243.57	243.79	244.14	244.06	243.90	243.39	243.20	242.88	242.69
1932	242.78	243.55	243.96	244.08	244.83	244.93	244.65	244.44	244.07	243.46	243.16	243.14
1933	243.09	243.10	242.96	243.12	243.90	244.20	244.08	243.73	243.44	242.96	242.41	242.24
1934	242.24	242.55	242.32	242.65	243.31	243.10	242.98	242.58	242.00	241.99	241.54	241.55
1935	241.40	241.80	241.87	242.31	242.55	242.78	243.10	243.04	242.59	242.28	242.00	241.86
1936	241.78	241.72	241.56	243.34	244.04	243.95	243.74	243.33	242.93	242.72	242.47	242.38
1937	242.40	243.26	243.57	243.52	244.33	244.80	244.84	244.67	244.44	243.80	243.61	243.61
1938	243.32	243.22	243.75	244.41	244.73	244.73	244.55	244.49	244.17	244.05	243.60	243.31
1939	243.12	243.07	243.40	244.09	244.90	244.93	244.85	244.60	244.25	243.77	243.38	242.93
1940	242.82	242.60	242.53	242.65	244.09	244.60	244.79	244.74	244.20	243.91	243.47	243.49
1941	243.86	243.94	243.96	244.10	244.42	244.19	243.94	243.80	243.36	242.96	242.81	242.79
1942	242.82	242.72	242.72	243.83	244.44	244.85	244.83	244.73	244.36	244.17	243.94	244.03
1943	244.22	244.52	244.87	245.66	246.03	247.35	247.46	247.19	246.80	246.17	245.84	245.62
1944	245.11	244.77	244.64	244.82	245.55	245.89	246.09	245.86	245.31	244.96	244.38	244.14
1945	244.03	244.06	244.23	245.43	245.92	246.64	246.71	246.61	246.09	246.07	246.23	246.33
1946	246.12	245.95	245.92	246.27	245.96	246.03	245.99	245.71	245.26	244.96	244.78	244.55
1947	244.49	244.92	244.78	245.19	246.13	246.96	247.74	247.78	247.20	246.49	245.86	245.42
1948	245.18	245.05	245.30	246.29	246.80	247.13	247.04	246.64	246.08	245.42	244.96	244.84
1949	244.55	244.86	245.34	245.48	245.83	245.66	245.31	244.92	244.38	244.07	243.67	243.41
1950	243.62	244.40	244.76	245.38	246.11	246.13	246.02	245.78	245.44	244.89	244.70	244.80
1951	244.98	245.34	245.88	246.56	247.62	247.57	247.43	247.23	246.57	246.01	245.53	245.50
1952	245.68	246.14	246.52	247.11	247.86	248.18	247.87	247.40	246.84	246.39	245.68	245.47
1953	245.43	245.44	245.44	246.03	246.23	246.15	246.54	246.16	245.73	245.28	244.77	244.45
1954	244.48	244.37	244.94	245.47	246.43	246.59	246.47	245.90	245.52	245.16	245.29	245.43
1955	245.58	245.57	245.62	246.61	247.30	247.18	246.73	246.10	245.86	245.25	245.60	245.40
1956	245.05	244.66	244.45	244.88	245.91	246.61	246.36	245.98	245.76	245.29	244.75	244.32
1957	244.20	244.14	244.18	244.33	244.75	245.04	245.19	245.10	244.53	244.28	243.70	243.48
1958	243.74	243.70	243.62	243.92	244.26	244.24	244.19	244.00	243.66	243.56	243.18	243.04
1959	242.77	243.12	243.46	244.18	245.16	245.13	244.71	244.29	243.75	243.15	243.00	243.03

* IGLD - International Great Lakes Datum

Table A.11. Lake Ontario Beginning-of-Month Levels (IGLD* 1955) (continued)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1960	243.59	243.88	244.38	244.35	245.70	246.13	245.88	245.58	244.65	244.89	243.93	243.98
1961	243.55	243.16	243.32	244.03	245.03	245.57	245.56	245.24	244.80	244.27	243.72	243.53
1962	243.46	243.30	243.20	243.72	244.79	245.32	245.33	245.13	244.97	244.61	244.42	244.26
1963	244.12	243.64	243.16	243.85	244.92	245.71	245.76	245.53	245.26	244.54	243.77	243.58
1964	243.20	242.62	242.04	242.69	243.70	244.38	244.54	244.39	244.10	243.37	242.61	242.04
1965	241.77	241.69	242.16	242.70	243.63	244.25	244.58	244.50	244.31	244.11	243.99	244.17
1966	244.20	244.03	244.11	244.69	244.76	245.09	245.38	245.09	244.87	244.45	243.92	243.94
1967	244.22	244.36	244.11	244.22	245.14	245.72	246.02	246.06	245.73	245.41	245.23	245.05
1968	244.65	244.51	244.47	245.06	245.17	245.48	245.87	245.78	245.25	244.76	244.16	244.22
1969	244.33	244.55	244.47	244.53	245.38	245.96	246.08	245.68	244.94	244.15	243.73	243.72
1970	243.75	243.57	243.71	244.01	244.99	245.35	245.47	245.53	245.02	244.56	244.32	244.16
1971	244.22	244.12	244.32	244.75	245.50	245.55	245.49	245.19	244.92	244.46	244.03	243.63
1972	243.90	244.19	244.39	244.94	245.87	246.39	246.62	246.62	246.09	245.26	244.55	244.72
1973	245.46	246.02	246.15	247.14	247.88	248.00	247.68	246.85	246.09	245.16	244.69	244.37
1974	244.75	245.49	245.73	246.02	246.89	247.57	247.39	246.84	245.94	245.03	244.13	244.01
1975	244.64	244.39	244.94	245.39	245.75	245.81	245.76	245.28	244.91	244.74	244.42	244.16
1976	244.32	244.42	245.11	246.39	247.11	247.51	247.24	246.69	245.93	245.28	244.85	244.26

* IGLD - International Great Lakes Datum

Table A.12. Lake Ontario Monthly Change in Storage in TCFS-Months*

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1900	25	6	32	62	-14	3	-18	-29	-33	-34	24	-12
1901	0	-29	65	73	-15	10	-23	-31	-27	-47	-14	46
1902	-24	-13	97	5	-9	16	38	-21	-30	-29	-12	-12
1903	0	29	86	40	-31	13	-2	-29	-38	-8	-32	-17
1904	-9	38	76	79	33	11	-8	-24	-31	-34	-41	-22
1905	-12	-21	24	38	18	24	12	-8	-18	-26	-23	2
1906	12	-11	2	21	-2	13	-5	-26	-37	-2	15	-4
1907	52	-11	50	5	7	-1	-5	-34	-14	-21	10	49
1908	-8	29	47	35	37	-18	-25	-47	-55	-50	9	-66
1909	-12	30	34	43	59	-16	-6	-40	-43	-39	-20	-18
1910	5	5	63	24	23	-10	-45	8	-28	-29	-15	-40
1911	7	29	14	23	9	5	-31	-28	-18	-16	-3	25
1912	13	-4	31	101	51	-2	-31	-33	-7	-28	-6	14
1913	75	-35	72	42	8	-12	-25	-39	-48	-24	-13	-18
1914	-8	-20	45	56	12	-10	-31	-18	-33	-34	-25	-30
1915	10	39	-10	-1	0	4	6	21	-13	-18	-17	5
1916	32	6	30	80	55	50	-37	-50	-47	-40	-30	-18
1917	-5	-14	56	62	14	50	18	-28	-36	2	-15	-21
1918	-32	33	56	17	-9	-12	-20	-37	-10	2	-8	6
1919	-2	-14	31	51	82	-4	-23	-36	-41	-28	-28	-25
1920	-36	-20	47	9	-1	3	10	-12	-18	-8	-6	27
1921	-5	-2	58	32	3	-15	-20	-44	-35	-24	-6	-6
1922	-12	25	41	82	6	30	-17	-39	-35	-38	-32	-28
1923	-2	-6	34	49	20	16	-31	-28	-24	-32	-7	17
1924	18	-2	18	53	46	-3	-9	-21	-20	-34	-39	-26
1925	-14	62	50	10	-12	-16	-21	-35	-11	-20	21	-5
1926	-20	-6	24	73	2	4	-27	-5	-2	7	34	-12
1927	-5	17	42	-7	16	-2	-5	-37	-38	-20	36	49
1928	7	-6	24	31	-4	15	-2	-20	-47	-13	2	-2
1929	29	-32	76	92	53	-12	-11	-44	-42	-32	-22	-4
1930	47	24	46	11	9	2	-25	-54	-45	-50	-33	-33
1931	-16	-15	12	17	27	-6	-12	-39	-15	-24	-15	7
1932	59	34	5	59	8	-22	-16	-28	-48	-23	-2	-4
1933	1	-12	12	62	23	-10	-27	-22	-38	-42	-13	0
1934	24	-20	25	52	-16	-10	-31	-44	-1	-34	1	-12
1935	31	6	34	19	18	25	-5	-34	-24	-21	-11	-6
1936	-5	-13	136	55	-7	-17	-31	-31	-17	-19	-7	2
1937	66	26	-4	64	36	3	-13	-18	-50	-14	0	-22
1938	-8	45	50	25	0	-14	-5	-24	-10	-34	-23	-14
1939	-4	28	53	64	2	-6	-19	-27	-38	-30	-36	-8
1940	-17	-6	9	114	39	15	-4	-41	-23	-34	2	28
1941	6	2	11	25	-18	-20	-11	-34	-32	-12	-2	2
1942	-8	0	85	48	31	-2	-8	-28	-15	-18	7	14
1943	23	30	60	29	101	9	-21	-30	-50	-25	-17	-39
1944	-26	-11	14	58	26	16	-18	-42	-28	-44	-19	-8
1945	2	14	92	39	55	6	-8	-40	-2	12	8	-16
1946	-13	-2	27	-24	5	-3	-21	-34	-24	-14	-18	-5
1947	33	-12	31	74	63	62	3	-44	-56	-48	-35	-18
1948	-10	20	76	40	25	-7	-31	-43	-52	-35	-10	-22
1949	24	41	11	28	-13	-28	-30	-41	-24	-31	-20	16
1950	60	30	47	58	2	-9	-18	-26	-43	-14	8	14
1951	28	46	52	84	-4	-11	-15	-50	-44	-37	-2	14
1952	35	31	45	59	24	-24	-36	-43	-36	-54	-17	-2
1953	1	0	45	16	40	-17	-29	-33	-36	-39	-25	2
1954	-8	48	40	76	12	-10	-44	-29	-28	10	11	12
1955	-1	4	76	54	-9	-36	-48	-18	-48	27	-16	-27
1956	-30	-17	33	81	54	-20	-29	-17	-37	-41	-34	-9
1957	-5	3	12	36	19	12	-7	-44	-20	-44	-17	20
1958	-3	-7	23	27	-2	-4	-14	-26	-8	-29	-11	-21
1959	27	30	54	77	-2	-33	-32	-41	-47	-12	2	43

*TCFS-Months - thousands of cubic feet per second months

Table A.12. Lake Ontario Monthly Change in Storage in TCFS-Months* (continued)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1960	22	41	-2	107	33	-20	-44	-50	-44	-12	-2	-27
1961	-30	14	54	79	41	-1	-24	-34	-42	-42	-15	-5
1962	-12	-2	40	84	40	1	-15	-12	-28	-14	-13	-11
1963	-37	-41	53	84	60	4	-18	-21	-57	-59	-15	-29
1964	-44	-47	50	80	52	13	-12	-22	-58	-58	-45	-21
1965	-6	40	41	73	47	26	-6	-14	-16	-9	14	2
1966	-13	7	44	6	25	21	-21	-17	-33	-40	2	21
1967	11	-21	8	73	44	24	3	-25	-25	-16	-12	-31
1968	-11	-3	45	9	24	31	-13	-34	-39	-46	5	8
1969	17	-7	5	67	44	10	-31	-56	-62	-32	-1	5
1970	-14	12	23	77	28	10	5	-39	-36	-18	-13	5
1971	-8	17	33	59	4	-5	-23	-21	-36	-33	-30	19
1972	22	16	42	73	40	18	0	-40	-66	-54	13	56
1973	43	11	77	57	9	-25	-63	-58	-73	-36	-25	29
1974	56	20	22	69	52	-14	-42	-69	-72	-69	-10	2
1975	27	46	34	28	5	-4	-37	-28	-13	-24	-20	11
1976	8	56	98	57	30	-21	-43	-58	-52	-33	-47	-15

*TCFS-Months - thousands of cubic feet per second months