

ACCOUNTING YEAR 1981
(OCTOBER 1980 - SEPTEMBER 1981)

FORTY-YEAR ACCOUNTING PERIOD

20. During the first year of the forty-year accounting period as stipulated by the modified Supreme Court decree, 1 October 1980 to 30 September 1981, the average diversion was 3106 cfs. This figure represents 97.1% of the normally allowed diversion rate (3200 cfs) as stipulated by the modified decree. A tabulation of average daily Lockport flows and diversion flows for accounting year 1981 is shown on Tables 3 and 4 respectively. The primary components of the Lake Michigan Diversion, as fully described previously in this report, are summarized in Table 5. The primary components are illustrated in Figure 2 along with the approximate contribution of each component to the total 3106 cfs diversion (to nearest percent).

Table 3
LOCKPORT FLOW
(TABULAR SUMMARY FOR OCTOBER 1980 - SEPTEMBER 1981)
PREPARED BY METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO
(CFS)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4083.4	1666.8	2266.9	1749.1	2020.8	2758.9	1914.6	2880.9	2118.2	4290.1	3489.0	5354.9
2	2583.2	1764.9	3903.4	1659.1	2099.3	2697.0	1729.3	2774.2	2561.4	4516.8	5990.9	4757.9
3	2545.7	1853.7	2027.8	1776.2	1885.4	2532.9	3196.1	2407.7	2573.8	4885.9	5620.9	4652.3
4	2753.0	1886.5	2159.2	2084.1	2037.5	3352.7	3134.5	2705.4	2266.2	4773.4	4077.5	4672.9
5	2702.7	1784.2	2255.8	1809.8	1777.3	2174.3	1720.0	2228.5	3571.4	4734.2	4537.7	4554.5
6	2730.9	1643.1	2419.7	2036.7	2121.0	2270.5	1628.1	2113.1	2153.1	3891.1	4008.7	4641.8
7	2656.5	1642.7	4524.3	1955.5	1629.9	1868.4	2099.7	2363.9	2158.8	3582.8	4336.1	5034.0
8	2777.3	2035.2	5866.2	1988.1	1521.9	1877.1	2447.8	2252.4	3590.1	3644.5	3117.5	4742.2
9	2601.8	1810.7	5608.4	2526.8	1692.5	2049.9	3537.1	2036.0	6998.0	3622.1	3971.8	4570.6
10	2740.0	1709.2	3322.7	1955.4	1990.1	2139.6	5407.2	5459.8	2774.7	3331.1	3270.1	4505.8
11	2661.2	1836.5	2907.3	1893.5	2378.8	1937.3	2716.4	11919.9	3614.1	3202.2	3151.5	4456.3
12	2377.4	1706.2	3148.1	3923.0	1767.7	2143.7	3968.3	4787.9	2544.9	12010.4	3023.5	4419.2
13	2707.7	2227.9	2071.1	4852.3	2103.6	1701.7	8371.0	3975.4	19684.2	6060.6	2928.2	4400.5
14	2614.4	2307.8	2283.7	1875.5	1798.5	1968.5	5625.9	6998.0	21040.0	4311.8	7608.5	4603.1
15	2500.4	1816.3	2081.9	1635.6	2259.6	1814.2	6717.3	5568.2	16127.7	4790.0	4420.1	4567.5
16	3893.3	1624.1	1976.8	1835.6	4445.6	1703.6	5939.5	5423.3	7842.4	3024.4	4413.6	4472.4
17	6541.5	1682.5	2095.5	1843.1	4728.1	1888.9	3333.4	3248.6	5783.6	2936.2	4116.0	4491.2
18	3549.5	1739.5	2243.5	2093.3	3913.3	1940.7	2910.0	2920.0	4084.3	2731.2	3003.1	4616.6
19	2807.7	1796.8	1514.8	1690.1	3086.0	1592.3	3001.7	2598.8	4176.8	3850.9	2698.9	4541.8
20	2836.2	1873.8	1853.8	1758.4	2419.9	1744.1	2462.9	2510.8	3362.4	5889.7	2703.8	4436.3
21	2662.6	1638.6	1847.3	1885.4	2865.5	1756.1	2584.0	2461.8	3714.6	3693.0	3235.0	4265.1
22	2676.1	1918.1	1596.5	1890.8	4721.4	1689.3	5718.8	2560.5	3080.4	3019.4	2836.1	3045.1
23	2563.0	1994.9	1728.6	1805.3	3443.8	1821.8	4197.9	2674.6	3312.9	3251.8	2787.8	2684.3
24	3096.3	1822.7	1871.9	1821.4	3431.3	1679.8	3220.2	3368.9	6454.0	3132.0	4335.4	3204.4
25	2808.6	2073.1	1580.0	1492.7	3112.3	2025.7	2384.6	2149.7	4316.6	4573.8	7914.9	4495.9
26	2576.7	1404.2	1788.2	2156.9	2680.8	1816.3	2495.3	3061.4	4209.0	4407.4	5643.2	6216.0
27	2584.4	2438.4	1692.4	1739.6	3816.8	1771.4	2933.7	2170.9	4653.8	5228.7	6261.1	3405.6
28	2422.8	3123.5	1788.1	1913.2	2420.5	1707.1	7124.9	2349.9	4721.4	7319.1	7407.5	3788.8
29	2661.4	1920.1	2387.3	1802.2		2617.2	6853.2	6556.1	6423.0	6023.2	5568.9	4824.1
30	2637.0	1953.1	2275.2	1649.2		2228.6	4104.9	3569.1	4097.0	4501.0	4731.8	4287.5
31	2329.3		1922.2	1803.9		2005.1		3016.4		3617.6	6246.2	
MEAN	2893.0	1889.8	2484.1	2029.1	2656.0	2041.1	3782.6	3584.3	5467.0	4475.1	4434.0	4423.6

Table 4
TOTAL DIVERGENCE FROM LAKE MICHIGAN BY ILLINOIS
(TABULAR SUMMARY FOR OCTOBER 1980 - SEPTEMBER 1981)
PREPARED BY METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO
(CFS)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3919.3	1550.5	2122.3	1604.5	1875.2	2426.1	1802.0	2592.1	1864.3	4123.0	3269.0	5162.3
2	2428.1	1654.9	3578.6	1523.8	1963.2	2421.2	1611.9	2523.0	2336.2	4358.1	5670.6	4587.1
3	2390.7	1735.2	1789.7	1648.9	1760.9	2305.1	3068.4	2162.6	2350.1	4734.2	5186.4	4497.5
4	2612.0	1740.1	1971.2	1958.3	1902.5	3126.1	2945.6	2449.0	2060.6	4606.6	3734.9	4477.8
5	2577.9	1632.7	2076.0	1705.7	1660.2	1948.1	1607.7	1983.6	3365.4	4589.1	4252.3	4403.6
6	2577.1	1501.3	2251.7	1925.5	1998.8	2052.8	1516.4	1888.6	1966.9	3727.2	3718.8	4507.2
7	2494.9	1494.8	4300.9	1848.1	1519.5	1664.6	1984.9	2151.3	1993.6	3417.3	4103.3	4871.2
8	2625.5	1891.3	5230.5	1878.9	1403.7	1673.0	2326.2	2053.9	3358.2	3480.7	2937.9	4518.5
9	2474.8	1675.9	5033.9	2415.6	1577.6	1860.2	3227.2	1836.5	6494.9	3471.3	3793.2	4354.6
10	2620.5	1581.4	2954.4	1856.9	1862.5	1993.7	5011.3	4995.1	2344.0	3191.0	3062.8	4323.5
11	2551.6	1724.6	2638.0	1794.0	2259.5	1789.7	2337.5	10995.0	3310.4	3075.8	2944.3	4298.0
12	2627.5	1580.2	2937.2	3825.7	1648.4	1986.8	3508.8	4193.4	2307.3	11783.1	2831.8	4306.9
13	2575.7	2105.5	1885.8	4719.3	1981.4	1555.8	7686.9	3589.1	17769.1	5798.1	2766.2	4292.6
14	2489.3	2170.6	2122.0	1739.1	1666.5	1837.5	3900.0	6338.7	19157.4	4084.3	7334.2	4470.6
15	2365.1	1691.7	1923.9	1494.7	2085.8	1702.3	5079.3	4525.6	14945.1	4586.5	4080.1	4447.3
16	3653.7	1506.6	1809.8	1707.4	4271.8	1553.4	5074.7	4829.6	7030.6	2836.1	4123.3	4325.5
17	6147.7	1565.3	1950.5	1724.6	4205.1	1755.5	2830.0	2869.9	5312.8	2653.0	3901.6	3985.3
18	3348.3	1628.5	2097.9	1969.7	3457.6	1822.3	2617.9	2666.4	3671.4	2557.7	2786.2	4043.0
19	2662.6	1676.0	1376.8	1575.4	2726.5	1481.2	2740.5	2420.9	3822.2	3704.5	2510.1	4247.9
20	2682.0	1745.1	1739.6	1626.6	2118.1	1642.5	2218.4	2352.5	3069.1	5727.6	2511.9	4229.4
21	2509.9	1522.3	1733.4	1751.3	2615.8	1658.4	2371.0	2318.7	3438.0	3522.6	3074.1	4101.4
22	2511.3	1808.1	1481.5	1767.4	4424.3	1593.4	5433.8	2421.8	2810.8	2875.7	2715.1	2874.1
23	2402.8	1883.6	1586.1	1675.3	2988.0	1713.5	3732.3	2533.6	3099.0	3108.3	2671.4	2546.4
24	2939.9	1697.1	1750.1	1694.3	3007.0	1574.5	2881.4	3216.0	6239.9	2994.8	4188.6	3012.6
25	2674.5	1954.5	1466.0	1370.3	2734.4	1926.5	2186.9	2009.4	4080.0	4397.4	7589.3	4346.6
26	2438.5	1279.9	1675.3	2010.5	2329.1	1731.5	2284.8	2932.3	4007.0	3705.0	5272.1	5966.1
27	2464.4	2284.6	1576.1	1567.9	3481.6	1673.8	2722.6	2004.7	4465.6	4761.8	5917.2	2995.5
28	2289.5	2889.6	1677.1	1760.8	2063.1	1611.3	6744.9	2191.7	4554.5	6324.5	7077.5	3534.1
29	2544.5	1776.1	2177.8	1666.1		2524.6	6342.3	6291.7	6280.1	5155.7	5169.0	4452.0
30	2522.5	1824.2	2118.2	1510.9		2135.2	3772.7	2865.6	3890.8	4009.3	4424.2	3978.2
31	2205.6		1770.5	1675.0		1899.9		2574.6		3290.8	5952.6	
MEAN	2740.9	1759.1	2284.0	1903.0	2413.9	1891.6	3385.6	3250.1	5046.5	4214.5	4179.7	4205.2

Table 5
AVERAGE MONTHLY FLOWS (CFS)
COMPONENTS OF LAKE MICHIGAN DIVERSION
(ACCOUNTING YEAR 1981)

	Oct 80	Nov 80	Dec 80	Jan 81	Feb 81	Mar 81	Apr 81	May 81	Jun 81	Jul 81	Aug 81	Sep 81	Yearly Average
Total Lockages	141	70	32	35	33	37	79	155	192	237	222	169	117
Total Leakages	38	43	47	46	45	49	42	32	26	25	25	34	38
Total Navigational Makeup	117	49	62	148	56	55	187	125	470	319	688	237	210
Total Discretionary	467	0	0	0	0	0	0	0	331	824	470	1746	319
1. Total Direct Diversion	763	162	141	229	134	141	308	312	1019	1405	1405	2186	684
2. Total Storm Runoff & Direct Diversion	1193	277	793	388	889	400	1880	1707	3315	2348	2396	2571	1513
3. Total Storm Runoff	430	115	652	159	755	259	1572	1395	2296	943	991	385	829
4. Total L.M. Diversion	2741	1759	2284	1903	2414	1892	3386	3250	5047	4215	4180	4205	3106
5. Total Domestic Pumpage	1548	1482	1491	1515	1525	1492	1506	1543	1732	1867	1784	1634	1593
6. % to Total Diversion													
Lockages.....													4%
Leakages.....													1%
Navigational Makeup.....													7%
Discretionary.....													10%
Storm Runoff.....													27%
Domestic Pumpage.....													51%
Total													100%

1. Summation of lockages, leakages, navigational makeup, and discretionary flows (as obtained from MSDGC form LMO-6)

2. As obtained from column 17 of monthly hydraulic reports

3. As obtained by subtracting line 1 from line 2

4. As obtained from column 19 of monthly hydraulic reports

5. As obtained by subtracting line 2 from line 4

6. As obtained by dividing yearly averages of each component into average yearly diversion and rounding to nearest percent

LAKE MICHIGAN DIVERSION

ACCOUNTING YEAR 1981

AVERAGE ANNUAL DIVERSION = 3106 CFS

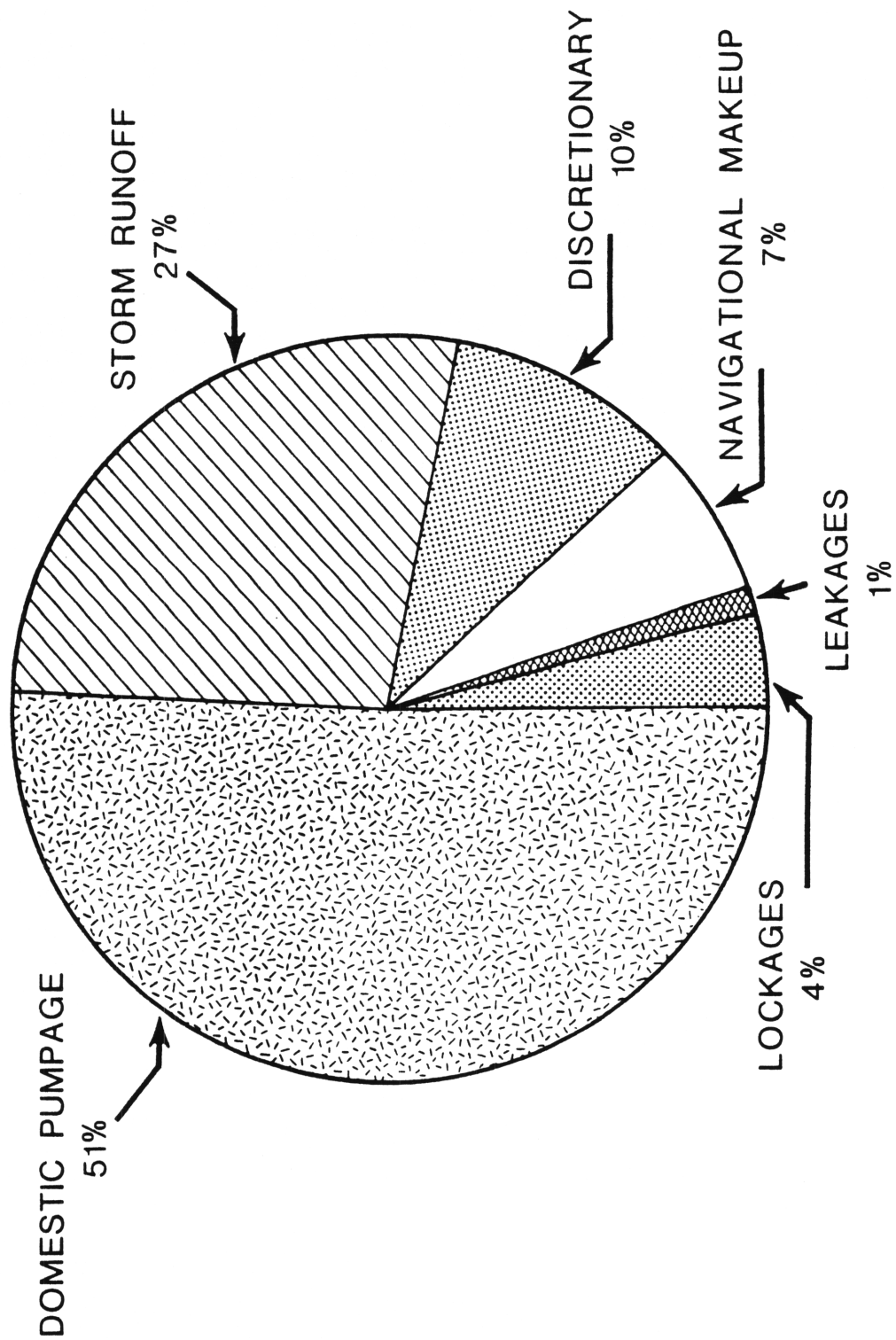


Figure 2

SIGNIFICANT HYDROLOGIC EVENTS

21. The following is a detailed itemization of events of strictly a hydrologic nature which occurred during accounting year 1981:

8 January 1981 - Canal bank failure approximately 600 feet upstream of the junction of the upper and lower access roads to the Lockport powerhouse. The problem was discovered when a subsidence in the road appeared that was approximately 15 feet by 10 feet. The subsidence effectively stopped any leakage since none was observed at that time. Within one hour a drawdown was started to lower canal level from -3.00 CCD to -5.00 CCD for repairs. After repairs were completed, navigational makeup water was required to restore normal elevations, which was measured at Lockport and accounted for as diversion. No estimate of leakage was made prior to the subsidence.

28 April 1981 - Severe thunderstorms occurred in the Chicago area. From 1:00 P.M. to 4:00 P.M., 1.74 inches of rain were recorded by the National Weather Service with about one inch of rain occurring over a two hour period. At the Wilmette Pumping Station, a backflow event discharged approximately 24.5 million gallons of water from the North Shore Channel into Lake Michigan. The sluice gates were opened from 2:33 P.M. to 4:16 P.M. for a total time of one hour and 43 minutes.

29 May 1981 - 1.45 inches of rain fell in the metropolitan Chicago area between 6:00 P.M. and 12:00 A.M. which brought the total amount to 3.45 inches for the 24 hour period ending at 12:00 A.M. The rain which was accompanied by high winds caused minor flooding in some low lying areas. At the Wilmette Pumping Station, a backflow event discharged approximately 10.5 million gallons of water from the North Shore Channel into Lake Michigan. The sluice gates were opened from 8:45 P.M. to 9:49 P.M. for a total time of one hour and 4 minutes.

13 June 1981 - a major storm event occurred in the southern Chicago area and northwestern Indiana which resulted in a backflow event at O'Brien Lock and Dam of approximately 377.0 million gallons of Calumet River water. This storm ranged from 3-6 inches over the Little Calumet River basin. At Joliet, Illinois a total 18-hour precipitation of 7.67 inches was recorded. The resultant runoff from this storm had an estimated probability of occurrence of once in 40 years. 4-6 inches of rain fell over the Kankakee River Basin, primarily over the upper half of the basin. The sluice gates at O'Brien were opened from 5:54 P.M. to 10:37 P.M., a total of 4 hours and 43 minutes.

12 July 1981 - Heavy thunderstorms in the Chicago area caused basement and roadway flooding. The storms major impact was along the North Shore of Chicago. The cities of Wilmette and Evanston reported 3.69 inches and 3.42 inches of rain, respectively for the 24 hour period ending at 12:00 A.M. Chicago O'Hare Weather Service Office, Airport Station, reported a rainfall of 1.76 inches between 7:00 A.M. and 10:00 A.M. The sluice gate at the Wilmette Pumping Station was opened from 9:14 A.M. to 2:03 P.M. discharging approximately 202.0 million gallons of sewage-tainted water into Lake Michigan.

14-15 August 1981 - More than two inches of rain fell in the Chicago area with the main concentration in the northern suburbs. Glenview, Illinois reported 2.15 inches of rainfall by 8:45 P.M. on 14 August and Chicago O'Hare Weather Survey Office Airport Station reported 1.57 inches of rainfall for the 24 hour period ending 12:00 A.M., 15 August. The heavy rain caused flooded basements. Minor flooding was reported in the northwest suburbs of Wonder Lake and Crystal Lake. The sluice gate at Wilmette Pumping Station was opened from 9:29 P.M. 14 August to 12:17 A.M. 15 August discharging approximately 98.0 million gallons of canal water into Lake Michigan.

It should be noted that the volumes in the backflow events discussed above are not included in the diversion flows which were computed for this accounting year.

OTHER SIGNIFICANT EVENTS RELATING TO THE DIVERSION

22. The following is a detailed itemization of events of a more general nature (unrelated to natural phenomena) affecting the diversion accounting system during accounting year 1981:

15 December 1980 - IDOT allocated Lake Michigan water to 86 water systems for the first time. Most of these allocations will not be implemented for several years.

13 May 1981 - Letter sent from IDOT to Chicago District requesting a meeting with the Corps and IDOT in order to formally initiate diversion negotiations (in accordance with provisions of the modified Supreme Court decree concerning Lake Michigan Diversion adopted 1 December 1980).

17 June 1981 - First diversion negotiation meeting held between the Corps and IDOT.

11 September 1981 - Second diversion negotiation meeting held between the Corps and IDOT.

CORPS' ACTIVITIES - SUPERVISION, DIRECTION AND AUDIT

23. During accounting year 1981, the Corps was extremely active in fulfilling the requirements placed upon it by the modified Supreme Court Decree with respect to supervision, direction and audit. In specific, the Corps procured the services of and provided guidance for the first three member technical committee which was convened in June, 1981. Additionally, Corps' personnel were present to observe and assist in leakage tests conducted by the MSDGC at Lockport Lock twice yearly. It should also be noted that all twelve monthly hydraulic reports of Lake Michigan diversion covering this accounting year were checked and verified in the following accounting year.