


11-1963

Odor Report

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ANDROSCOGGIN RIVER STUDIES

TWENTY-FIRST
ANNUAL REPORT

1963

by
Walter A. Lawrance

Lewiston, Maine
November, 1963

TWENTY-FIRST
ANNUAL REPORT

1963

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Part One

Summary

1. Objectionable river odor was not present in Lewiston-Auburn area during the entire season.
2. The Pollution Factor was 0.06; in 1941 it was 5.1. Sulphite spent liquor to river averaged 89.8 T/Wk; 1941, 5820 T/Wk.
3. The dissolved oxygen content in the river water in the Lewiston area was unsatisfactory until about the middle of August. B.O.D.'s usually were small.
4. In general terms, the river is in a better condition than it has been during, at least, the past twenty-three years.
5. Local Press editorials were very favorable.
6. Local committees concerned with Pollution and Parks along the river and Pool have been active.

Part Two

Androscoggin River and Pool Analyses

Summary

1. The B.O.D. record is the subject of separate treatment elsewhere in this report.
2. Dissolved Oxygen in the river water was more than adequate for the five day B.O.D. demands at all sampling stations except Dixfield.
3. The tonnage of available Dissolved Oxygen present , June through September, at the stations chosen for special study has been tabulated. The Pool area lost an average of twenty tons D.O. per day plus all reaeration oxygen.
4. Reaeration downstream from Lewiston is rapid. At Lisbon Falls the river water was at or near saturation all through the summer.
5. Oxygen Consumed from Permanganate tests indicated the lowest average loss in the Pool since these analyses were systematically begun in 1949; 3.0 ppm or 20.55 T/d.
6. Methylene Blue Stabilities were satisfactory but did not indicate expected increases.

Part Three

Mill Pollution

Summary

1. Based on the 1963 season's analytical results and expressed in Population Equivalents:
 - (a) Brown Company Pollution load to the river was 267,000 minus 17,500 equal to 249,500.
 - (b) The total pollution load leaving Public Service was 313,920 P.E. At Gilead, Maine this load was reduced to 220,680 P.E.; a reduction of about 30%
 - (c) Oxford Paper Company pollution load to the river was 367,900 minus 11,000 P.E. equal to 356,900 P.E.
 - (d) International Paper Company probable pollution load to the river was about 65,000 P.E.
2. With the exception of the Berlin area these population equivalents approximate those recorded in the H.E.W. report.
3. The apparent reduction of B.O.D. load in the Pool and to Deer Rips Dam is 6.37 T/d. This indicates considerable B.O.D. increment in the Pool, since the average daily loss of Dissolved Oxygen was 19.13 tons per day, excluding reaeration.
4. Due to stratification, water samples from Gulf Island Dam station were not as representative as those from Deer Rips station.

Part Four

Benthal Activity in the Pool 1963

Summary

1. Biochemical Oxygen Demands and Dissolved Oxygen were determined six days each week for thirteen weeks, at North Turner and Turner Center Bridges and Guld Island Dam. Five days each week at Mile 4.25 and Mile 2.5. The study period at Mile 4.25 was nine weeks.
2. B.O.D. data for a nine week period at all stations has been tabulated.
3. The area between Turner Center Bridge and Mile 4.25 contributed the most Benthal B.O.D. It is not the area containing the largest Benthal deposits.
4. Benthal activity in the Pool is very large and still serious. It has a devastating demand on the oxygen resources in the Pool; at least twenty tons per day.
5. The oxygen sag point appears to be moving slowly northward into the Pool.

TWENTY-FIRST ANNUAL REPORT

PART ONE

LEWISTON-AUBURN GENERAL DATA

1963

Introduction.

The format of this report is somewhat different from that used in previous years. The abandonment of the sulphite pulping process at Berlin and Rumford has produced a decrease in the pollution load which renders obsolete certain comparisons and standards used prior to this year.

Daily Report Data.

The daily reports numbered one to one hundred and eight contain a record of

- a. River Odor, types and intensities
- b. Air temperatures
- c. General weather conditions
- d. Direction of wind
- e. Water passing over Lewiston Falls
- f. Surface appearance of the river
- g. Conditions at Gulf Island and Deer Rips Dams
(occasionally)

River Odor, Types etc.

The river odor in the Lewiston-Auburn city areas was non existent except on six days when a very slight musty odor was recorded. For this reason comparisons of odor observations with previous years have been omitted. There was no general coverage of odor. Odor at the Dams was absent or at a very low level. Hydrogen sulphide was not observed during August and September. Slight traces were recorded occasionally in July.

Air Temperatures.

The mean hourly temperatures during June and July were above the long range average; those for August and September were below the average.

TABLE #1

Mean Hourly Air Temperatures (°F)

<u>Year</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
1963	65.97	70.89	63.80	56.07
1962	64.82	65.39	65.68	57.35
1961	64.08	67.27	68.06	66.03
79 year average	63.20	68.88	66.70	59.20
Deviation from Average	+2.77	+2.01	-2.90	-2.13

Precipitation.

During June, July and September precipitation was very small, however, August rainfall was above average. A considerable deficit existed for the four month period.

TABLE #2

Precipitation (Inches) Lewiston

<u>Year</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
1963	1.02	1.23	5.71	1.74
1962	1.40	2.81	4.57	3.05
1961	3.15	3.46	1.61	3.92
89 year average	3.34	3.47	3.09	3.55
Deviation from Average	-2.32	-2.24	+2.62	-1.81

River Surface
Conditions.

Whitish foam, film and occasionally brownish scum were present usually covering small areas of the river between the North and South Bridges.

Floating sludge was visible on the surface of the Andros-coggin Pool north of Mile Three in somewhat larger amounts than were observed in 1962. However, after the third week of July there was a marked decrease and only very small amounts of floating sludge were observed during August and September. The production of gas appeared to have a similar sequence. Pig-pen odor was present near floating sludge areas in the Pool.

Pollution Load
Factors.

These factors are calculated from the tons of sulphite waste liquor discharged to the river and the daily river flows. During the 1963 season there was no sulphite liquor discharged to the river north of Chisholm. From June 3 to September 30 the International Paper Company's average weekly discharge of waste sulphite liquor to the lagoon was that produced in excess of about ninety tons. The weekly data of tonnage discharged to the river are recorded in Table P.L.F. #1. The factors which are at an all-time low do not, of course, include the pollutional effect of any Kraft black liquor discharged to the river, suspended solids etc.

The magnitude of the reduction of spent sulphite liquor discharged to the river may be shown by comparing the 1941 data with that of 1963. In the 1941 season the weekly tonnage averaged 5820 and the pollution factor 5.1. The corresponding

P.L.F. #1

Weekly Pollution Factors*
(Based on Sulphite Waste Liquor)

Week Ending	International Paper Co. Equiv. Tons per week	Factor Gulf Island Dam Flow
June 9	97.7	0.04
16	99.8	0.05
23	94.5	0.06
30	99.6	0.07
July 7	0.0	0.0
14	99.1	0.08
21	99.2	0.07
28	99.9	0.08
Aug. 4	99.3	0.08
11	94.5	0.07
18	91.5	0.05
25	99.0	0.07
Sept. 1	98.3	0.07
8	90.8	0.06
15	90.9	0.07
22	93.5	0.07
29	78.8	0.06
Season average	89.8	0.06 0.06 0.060

*Brown Company and Oxford Paper Company Factors were zero.

figures for 1963 are 89.8 and 0.06.

River Flows.

The river flow during May was approximately equal to the twenty-six year average. In the entire period June through September, river flows were consistently below this long-time average. June flows were about 35% below the twenty-six year average. During the period July through September, the river flow was more uniform than most similar periods in other years.

Table A.D.F. #1
Average Daily Flows
C.F.S.

Gulf Island Dam

Year	May	June	July	August	September	J.A.S. Average
1963	10414	3175	2279	2397	2299	2325
1962	8429	2730	2345	3275	3327	2982
1961	10545	5192	3450	2452	2422	2775
1960	14346	4782	3093	2637	3464	3065
1959	4115	5964	3222	2707	3212	3050
1938- 1963 Average (26 years)	10393	4903	2882	2495	2976	2784

ANDROSCOGGIN RIVER FLOW

C. F. S.

APRIL, 1963

Date	BERLIN	RUMFORD	GULF ISLAND DAM
1	2743	5700	9230
2	2874	7330	10460
3	3420	8240	14270
4	3651	7720	15270
5	3455	6980	14190
6	2966	5680	11860
7	2876	5370	10200
8	2768	5610	10480
9	2601	5540	10780
10	2440	5180	10550
11	2442	4580	9640
12	2585	5040	9470
13	2783	6110	11240
14	2672	6130	11590
15	2690	6210	11800
16	2692	6230	11510
17	3049	6630	11370
18	3560	7630	12180
19	3803	8620	13590
20	5194	11120	15100
21	6787	13070	20920
22	7994	14560	23020
23	5942	11260	22180
24	4954	8910	16890
25	4464	7780	14010
26	4119	7229	12490
27	3582	6700	11350
28	3322	6100	10430
29	3214	5900	10200
30	3755	6910	10200

ANDROSCOGGIN RIVER FLOW

C. F. S.

MAY, 1963

Date	BERLIN	RUMFORD	GULF ISLAND DAM
1	4724	9640	13460
2	3795	8790	15970
3	2877	6670	13680
4	3152	6510	10800
5	5275	8420	11050
6	5496	8780	12760
7	3995	7550	11970
8	3578	6210	10260
9	4027	7200	9010
10	4832	7370	10240
11	4726	6880	10210
12	3479	6400	9700
13	3528	6240	10060
14	4074	6710	9820
15	4263	7100	10120
16	4512	6690	10160
17	4848	6490	9250
18	5279	7060	9030
19	6207	11040	12050
20	7065	9500	15780
21	7678	9590	14270
22	7044	9060	13610
23	6276	8300	12050
24	5477	7190	10680
25	4320	6310	9470
26	3466	5140	8290
27	3252	4380	7100
28	2999	4120	5540
29	2788	3790	5560
30	2785	3780	5420
31	2619	3360	5460

ANDROSCOGGIN RIVER FLOW

C. F. S.

JUNE, 1963

Date	BERLIN	GILEAD	RUMFORD	LIVERMORE Falls	GULF ISLAND Dam
1	2540		3420	4020	4590
2	2490		3360	3760	4050
3	2567	2790	3240	4090	4710
4	2523		3270	3770	4230
5	2489		3060	3660	4000
6	2520	2730	3160	3500	3870
7	2515		3160	3390	3590
8	2440		3070	3520	3830
9	2494		2940	3150	3210
10	2383	2580	2990	3450	3880
11	2323		2840	3380	3710
12	2325		2660	3110	3340
13	2297	2440	2730	2940	3180
14	2203		2630	3010	3250
15	2077		2530	2580	2540
16	2019		2400	2750	2930
17	2065	2180	2400	3010	3530
18	2044		2360	2620	2850
19	2044		2350	2510	2640
20	2009	2100	2290	2560	2650
21	2026		2410	2600	2800
22	1951		2360	2320	2770
23	1865		2250	2690	2280
24	2805	2106	2140	2440	3060
25	1804		2010	2200	2700
26	1816		1970	2200	2370
27	1825	1832	2020	2160	2330
28	1810		2040	2140	2250
29	1815		2020	2190	2310
30	1808		1980	1900	1790

ANDROSCOGGIN RIVER FLOW

C. F. S.

JULY, 1963

Date	BERLIN	GILEAD	RUMFORD	LIVERMORE Falls	GULF ISLAND Dam
1	1756	1760	1870	2000	2010
2	1760		1940	2020	2150
3	1791		1960	2070	2180
4	1750	1768	2310	1990	2010
5	1753		2190	2200	2110
6	1737		2030	2170	2160
7	1821		2030	1950	1890
8	2072	2215	2500	2520	2940
9	1942		3470	2900	3240
10	1661		2450	3840	4150
11	1836	1931	2120	2770	3050
12	1813		2190	2080	2050
13	1781		2080	2040	1920
14	1829		2080	2040	2000
15	1790	1977	2350	2410	2700
16	1777		2130	2540	2710
17	1795		2110	2310	2460
18	1798	1882	2050	2190	2260
19	1781		2080	2160	2260
20	1761		2020	2140	2190
21	1771		2060	1830	1660
22	1820	1913	2100	2320	2540
23	1797		2090	2220	2320
24	1772		2020	2100	2220
25	1717	1778	1900	2040	2060
26	1804		1870	1890	1880
27	1826		1910	1850	1840
28	1772		1890	1750	1610
29	1785	1807	1850	2040	2160
30	1771		1880	1950	2030
31	1803		1850	1910	1940

ANDROSCOGGIN RIVER FLOW

C. F. S.

August, 1963

Date	BERLIN	GILEAD	RUMFORD	LIVERMORE Falls	GULF ISLAND Dam
1	1829	1846	1880	1830	1820
2	1889		1990	1890	2000
3	1854		2090	2020	2040
4	1857		2070	2160	2220
5	1893	1995	2200	2210	2330
6	1789		2080	2260	2320
7	1904		1980	2230	2350
8	2113	2257	2080	2020	2060
9	1870		2290	2110	2130
10	1788		1980	2330	2370
11	1813		1910	2020	2060
12	1839	1873	1940	1940	1960
13	1890		2070	2030	2100
14	2679		3040	2300	2500
15	2285	2697	3520	3400	3700
16	2194		2670	3820	4070
17	2013		2500	2880	3060
18	1869		2260	2690	2850
19	1807	1918	2140	2410	2530
20	1816		2030	2310	2450
21	1824		2050	2210	2370
22	1758	1835	1990	2240	2400
23	1824		1930	2030	2070
24	1948		2110	2110	2260
25	2006		2210	2120	2140
26	1914	2019	2230	2370	2500
27	1935		2080	2430	2600
28	1857		2080	2240	2380
29	1859	1903	1990	2190	2280
30	1997		2060	2050	2110
31	2176		2190	2180	2290

ANDROSCOGGIN RIVER FLOW

C. F. S.

September, 1963

Date	BERLIN	GILEAD	RUMFORD	LIVERMORE Falls	GULF ISLAND Dam
1	2236		2220	2440	2650
2	2028	2129	2330	2060	1930
3	1987		2160	2540	2920
4	2157		2120	2400	2600
5	2100	2187	2360	2310	2480
6	2030		2230	2490	2610
7	1914		2140	2310	2380
8	1936		2060	1940	1770
9	1942	1981	2060	2390	2670
10	1968		2030	2100	2140
11	1966		2060	2130	2210
12	2033	2082	2020	2240	2400
13	1980		2180	2360	2130
14	2008		2050	2140	2110
15	1992		2090	2070	2080
16	1942	1988	2080	2180	2250
17	1962		2090	2180	2260
18	2000		2130	2150	2200
19	2024	2059	2130	2240	2340
20	2044		2130	2190	2240
21	2016		2160	2160	2180
22	2012		2140	1890	1660
23	2007	2048	2130	2400	2630
24	2003		2120	2240	2340
25	2027		2150	2200	2270
26	2034	2069	2140	2250	2230
27	2100		2180	2150	2160
28	2104		2260	2170	2170
29	2113		2320	2250	2240
30	2043		2490	2530	2710

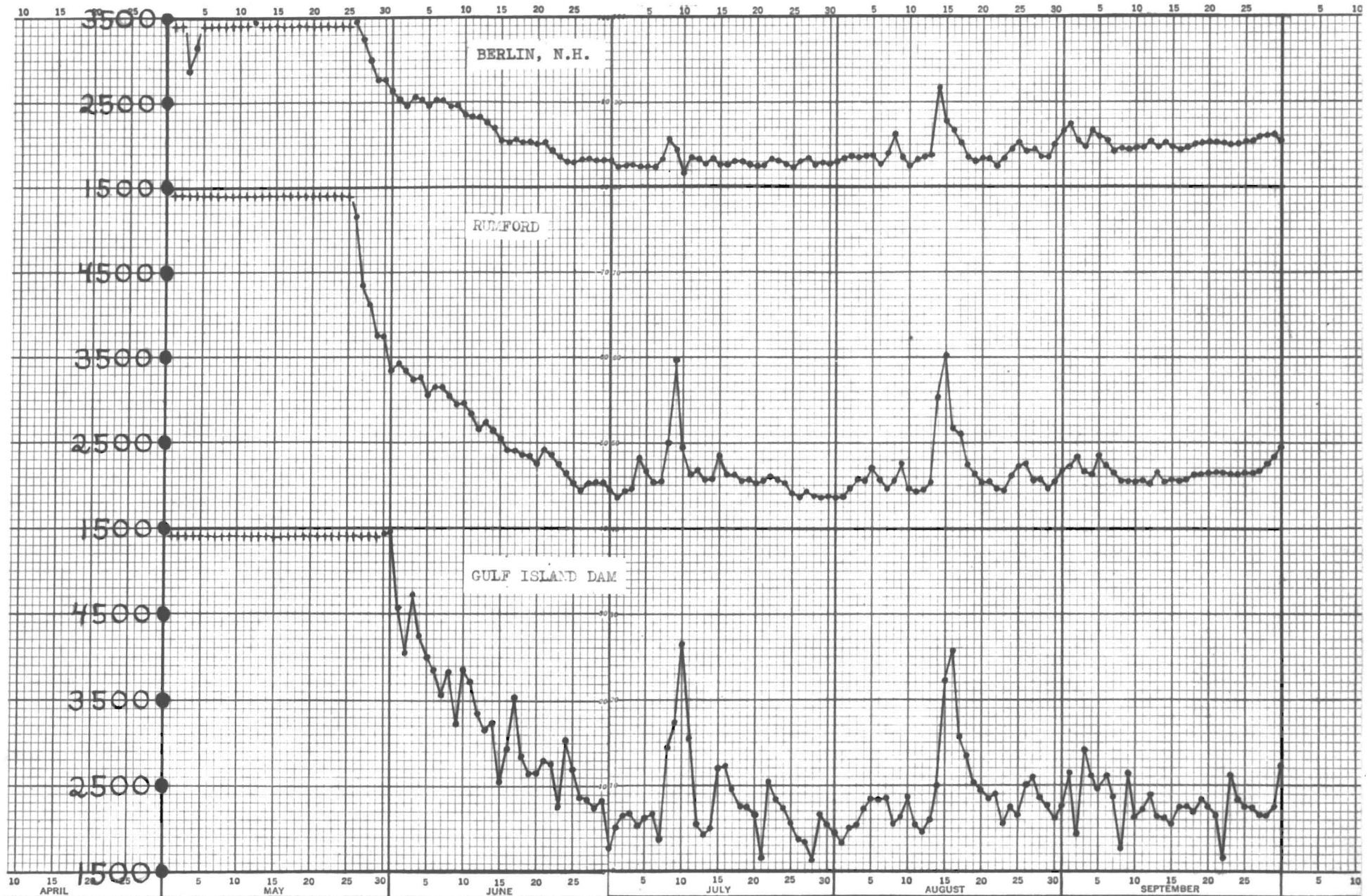
ANDROSCOGGIN RIVER FLOW

C. F. S.

OCTOBER, 1963

Date	BERLIN	RUMFORD	GULF ISLAND DAM
1	2044	2280	2900
2	2069	2300	2520
3	2014	2250	2560
4	1998	2240	2510
5	2041	2260	2480
6	2055	2130	1850
7	2043	2280	2780
8	1995	2210	2430
9	1987	2160	2280
10	2004	2170	2300
11	2009	2180	2180
12	1987	2150	2360
13	2002	2190	1840

RIVER FLOW cfs



1963

YEAR OF 19

Water Temperatures.

The temperature of the river water at Gulf Island Dam approximated the twenty-one year average during May and July, was above this average in June and below during August and September. The water temperature was above that of last year June through August, but lower during September.

TABLE T#1

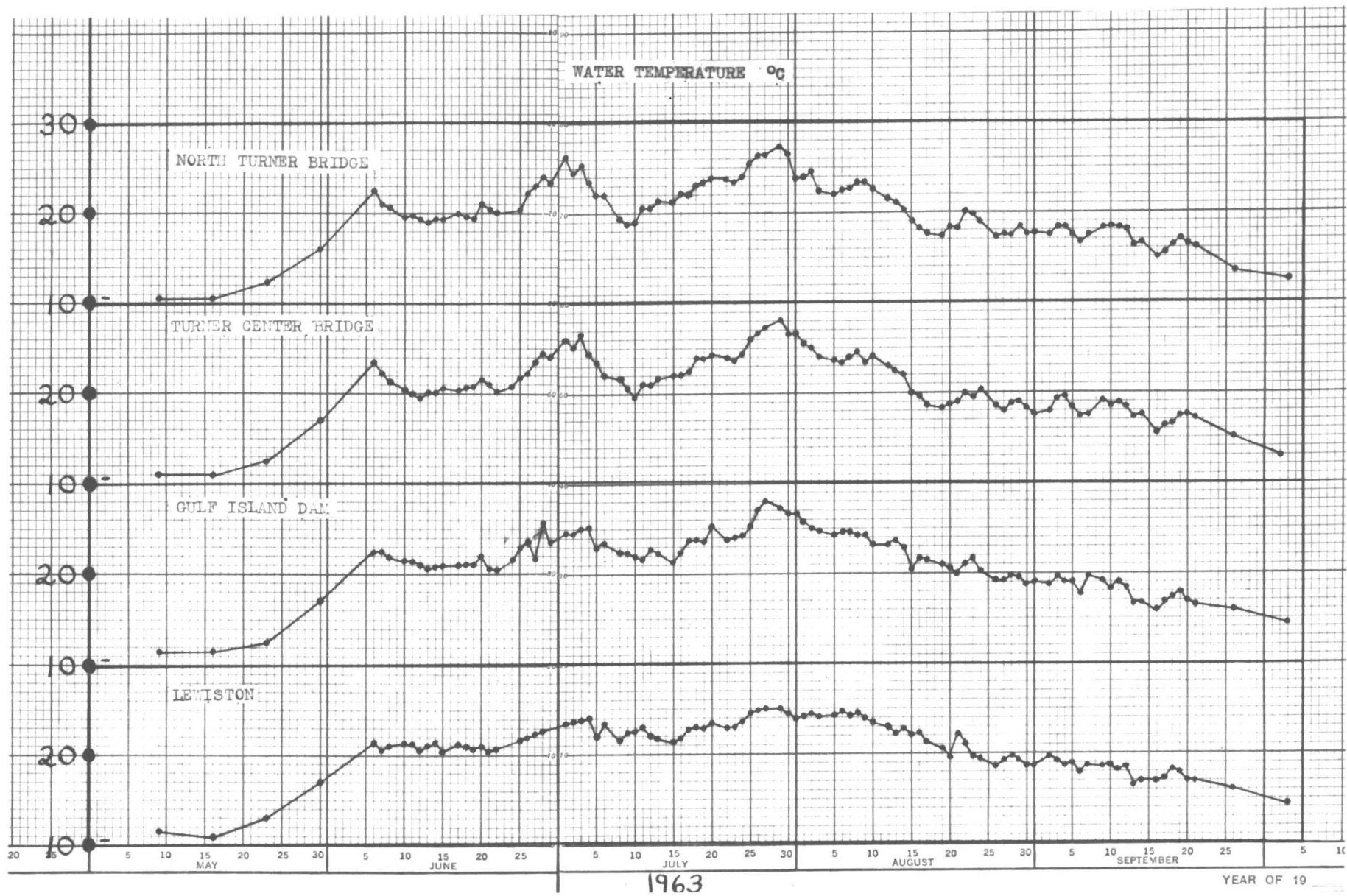
Water Temperatures (°C)

Gulf Island Dam
(Monthly Averages)

<u>Year</u>	<u>May*</u>	<u>June</u>	<u>July</u>	<u>Aug.</u>	<u>Sept.</u>
1963**	12.0	21.6	23.5	22.3	17.9
1962	11.5	21.3	21.9	21.5	19.0
1961	10.9	19.2	23.0	23.5	22.4
1960	13.6	20.6	22.8	23.0	18.9
Twenty-one Year Average	12.2	19.8	23.5	23.1	19.3
1963 Comparison with average	-0.2	-1.8	0.0	-0.8	-1.4

*Based on Thursday reports

**June through mid September based on daily reports.



Lewiston 1963.

For the fourth successive year there was no objectionable river odor in the down-town Lewiston-Auburn area, and there was no general odor coverage.

Biochemical oxygen demands were low, usually below two ppm and occasionally below one ppm. The dissolved oxygen content of the river water arriving in Lewiston was unsatisfactory for most of June and all of July. About the middle of August a marked improvement occurred and was maintained during the remainder of the season. The probable reasons for this change are discussed elsewhere in this report.

Local editorial press reports were favorable. The news item in the Journal (cf page 46 "Press reports" in this report) created considerable interest among certain local sports groups.

Local committees appointed by the Mayor have become interested in establishing park and boating facilities in the Pool areas north of the Dam. Visits by boat have been made but nothing specific has been done to date. (cf Press Reports).

TABLE #7

Lewiston 1963 River Data*

Date	Water Temp. °C.	B.O.D. 5 day ppm	D.O. ppm	River** Flow C.F.S.
June 6	21.5	2.17	5.40	3870
13	21.0	1.63	2.83	3180
20	21.0	2.11	1.73	2650
27	22.5	2.14	1.28	2330
July 4	24.0	1.37	1.05	2010
11	23.0	1.72	1.15	3050
18	23.0	1.20	2.58	2260
25	24.5	1.19	1.25	2060
Aug. 1	25.5	1.22	1.45	1820
8	24.5	2.17	0.30	2060
15	22.0	1.25	3.15	3700
22	21.0	1.22	4.00	2400
29	19.5	0.95	3.70	2280
Sept. 5	19.0	1.28	5.48	2480
12	18.5	0.88	4.63	2400
19	18.0	0.90	4.93	2340
26	16.0	1.00	5.15	2230
Oct. 3	14.5	1.68	5.38	2560

*Thursday data

**G.I.D.