


10-1966

L.A. General Data

Walter A. Lawrance
Bates College

Follow this and additional works at: <http://scarab.bates.edu/lawrance>

 Part of the [Earth Sciences Commons](#), and the [Environmental Sciences Commons](#)

Recommended Citation

Walter A. Lawrance Androscoggin River Studies Twenty Fourth Annual Report, October, 1966, Androscoggin River Studies, Box 4, Folder 4, Walter A. Lawrance Papers, Edmund S. Muskie Archives and Special Collections Library, Bates College, Lewiston, Maine.

This Article is brought to you for free and open access by the Muskie Archives and Special Collections Library at SCARAB. It has been accepted for inclusion in Walter Lawrance Papers by an authorized administrator of SCARAB. For more information, please contact batesscarab@bates.edu.

ANDROSCOGGIN RIVER STUDIES

TWENTY-FOURTH
ANNUAL REPORT

1966

by
Walter A. Lawrance

Lewiston, Maine
October, 1966

Twenty-Fourth

ANNUAL REPORT

1966

INDEX

	Pages
1. Lewiston-Auburn General Data	1 to 15
2. Androscoggin River and Pool Analyses	16 to 34
3. Mill Pollution to Androscoggin River	35 to 63
4. Biochemical Activity in the Androscoggin Pool	64 to 87
5. Tabulated Analytical and Test Data	88 to 147
6. Press Reports	p.1 to 98
7. Summaries; Parts One, Two, Three and Four (Placed in front of Page One, Part One.)	15, 34, 63, 87
8. Plots Pages 5, 13; 18, 20, 22, 25, 28, 32; 40, 51, 59; 79, 85.	

Part One

Lewiston-Auburn General Data

1966

Summary

1. River odor was absent in the downtown area except for one evening when pig-pen odor was present for about three hours. Kraft odor was reported again this winter.
2. For the first time this century, no sulphite waste liquors were present in the river water.
3. Increased pollution loads at Jay, resulted in lower Dissolved Oxygen and somewhat similar B.O.D.'s in the Lewiston area, compared with 1965.
4. River flows were higher than those during the summer of 1965. Air temperatures were above the long range averages, except in September.
5. Interest in the formation of Park areas in Lewiston and Auburn, just north of Gulf Island Dam, appears to be increasing.
6. Local press comment remains favorable.

Part Two

Androscoggin River and Pool Analyses

Summary

1. From Berlin to Virginia Bridge, the dissolved oxygen content of the Androscoggin river water was, except for two test days, above five ppm. At Virginia Bridge eight days were recorded below six ppm but none below 5.55 ppm.
2. Downstream from Rumford, only Dixfield recorded no D.O. results below five ppm. Due to reaeration at Riley, the oxygen values at Jay were above five except on five days; no tests were below four ppm.
3. The reaeration at the Riley Dam, June through September, averaged a daily increase of at least 22,110 lbs. of dissolved oxygen.
4. River water entering the Pool had a low oxygen content during July and August. There was a large decrease in D.O. in the Pool, much above the B.O.D. loss. D.O. content was the lowest in years at Deer Rips Dam; there were sixteen zero days.
5. Oxygen consumed from permanganate test was discontinued at all stations except at North Turner Bridge and Deer Rips Dam. pH testing was employed at all stations and was found to be of value for detection of "spills" etc.
6. A recommendation is made to consider the installation of continuous D.O. recorders at Gilead and perhaps at Bethel.

Part Three

Mill Pollution Loads
1966

Summary

1. Based on this seasons analytical results obtained at stations below the Mills, the pollution loads were:
 - a. Brown Company contributed 29,340 lbs. of five day B.O.D. per day. In 1965, 27,040 lbs. per day were discharged to the river.
 - b. At Gilead, Maine, the total pollution load had been reduced to 33,400 lbs. B.O.D.; a 14.7% reduction. In 1965 the reduction was 13.7%.
 - c. At Virginia Bridge the total pollution load had decreased to 16,400 lbs. From Gorham to this station the load has decreased 64.9%; in 1965 the decrease was 67.8%.
 - d. Oxford Paper Company discharge to the river 58,880 lbs. of soluble five day B.O.D. per day, compared to 74,840 lbs. per day in 1965.
 - e. At Riley the total pollution load had decreased to 43,500 lbs. per day.
 - f. International Paper Company's mill at Jay contributed 20,780 lbs. soluble five day B.O.D. during July and August.
 - g. No base was found from which to determine the pollution load from the Otis Mill. The load is probably small but significant.
2. Aeration at the Riley Dam to the Jay station during June through September, averaged 22,100 lbs. D.O. per day. In July and August the average was 19,580 lbs. D.O. per day; 1,200 lbs. less than the Jay Mill five day B.O.D.
3. The average total pollution load entering the Pool at North Turner was 47,820 lbs. per day, that leaving Deer Rips Dam station was 19,780 lbs. of five day B.O.D. per day; the largest in recent years.
4. To have maintained a C. classification at North Turner Bridge and in the Pool, during the first week of July 1966, when the oxygen deficit was the highest it has been estimated that the B.O.D. load reduction and the D.O. increase would have to approximate a total of 90,000 lbs.

Part Four

Biochemical Activity in the Androscoggin Pool 1966

Summary

1. The average soluble pollution load entering the Pool during an eleven week test period was 11,500 lbs/day higher in 1966 than in a similar period in 1965.
2. The average net reduction of B.O.D. and D.O. in the Pool was 9.85 T/d and 23.74 T/d respectively. These figures indicate a minimum Benthic contribution of 13.89 T/d of five day B.O.D.
3. Sector Mile 2.5 to Deer Rips Dam had the largest decrease in B.O.D. (21.8%) and was the only area with an increase in D.O. However, the average daily increase was very small, 360 lbs. Unlike recent previous years the average B.O.D. decrease between Turner Center Bridge and Mile 4.25 was very insignificant; 320 lb/day.
4. The oxygen sag point, which changes with flow, temperature and pollution load, appeared to be in the region of Mile one; two miles south of the 1965 location.
5. Microbial film was present in large discontinuous areas usually north of Mile four. Floating sludge was observed more frequently and in larger amounts than in 1965.
6. Coarse fish were present in the Waterman Road landing area until about July ten.

TWENTY-FOURTH ANNUAL REPORT
PART ONE
LEWISTON-AUBURN GENERAL DATA
1966

Introduction.

The arrangement of this report is similar to that employed for the previous three years. Sulphite pulping process was abandoned late in 1965 and for the first time in this century the Androscoggin River has not received any waste sulphite liquors. However, the pollution load to the river has increased due to the large increase in the production of Kraft pulp at the new Jay mill.

Daily Report Data.

The daily reports, numbered one to ninety-three inclusive, contain a

record of:

- a. River odor, type and intensity
- 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 (occasional)

This year these reports were sent only to Brown Company, Oxford Paper Company and International Paper Company. In previous years copies were sent to the company's lawyers, the Attorney General and the Water Improvement Commission.

River Odor, Types etc. During this summer, river odor was absent in Lewiston-Auburn, except for one evening July 13, when an odor of pig-pen was present for about two or three hours in the down-town area. Intensity was rated at one, at nine p.m.

Kraft odor was reported as being present in the local area several times during late Fall (1965) and during the winter. At 9:00 a.m. January 26, 1966 Kraft odor was present on the College campus, intensity of two; three at Deer Rips.

River odor at the two Dams was absent or at a low level during the summer. On a few occasions hydrogen sulphide was present over the tailrace at Gulf Island Dam.

Air Temperatures. June through August air temperatures were higher than the eighty-two year averages; September was 2.30°F below the average. The mean hourly temperatures June through September are reported in Table #1.

TABLE #1

Mean Hourly Air Temperatures (°F)				
Year	June	July	August	September
1966	64.43	69.01	67.07	56.88
1965	64.89	67.62	67.30	59.22
1964	64.43	68.46	62.12	56.44
1963	65.97	70.89	63.80	56.07
82 year average	63.26	68.87	66.66	59.18
Deviation from aver.	+1.17	+1.14	+0.41	-2.30

Precipitation.

In marked contrast to 1965 precipitation during June (5.57") was the largest in many years, and produced good river flows during the entire month. July was below (1.36") the ninety-two year average but August and September were 0.63" and 0.45" respectively above this average.

TABLE #2

Monthly Precipitation

Year	June	July	August	September
1966	5.57	2.09	3.72	3.94
1965	2.15	1.39	2.30	1.91
1964	1.58	4.63	3.75	1.28
1963	1.02	1.23	5.71	1.74
1962	1.40	2.81	4.57	3.05
92 year average	3.33	3.45	3.09	3.49
Deviation from aver.	+2.24	-1.36	+0.63	+0.45

River Surface
Conditions.

Whitish foam and film were present, usually in small amounts, on the river surface from the Lewiston Falls to the Grand Trunk railway bridge. Brown scum was occasionally observed along the Auburn shore near the railway bridge.

Floating sludge was observed in the Pool, north of Mile Three to beyond Mile Eight, the most northerly point visited this year. The floaters were seen late in May and were present until late July in amounts that appeared somewhat larger than during the previous two years.

Pollution Load Factors.

Pollution load factors which were based on the equivalent tons of sulphite waste liquor discharged to the river per million cubic feet of water, now have no meaning since the closing of the sulphite mill in Chisholm.

River Flow.

River flows recorded at Gulf Island Dam, although lower than the previous twenty-nine year average during May through September, were considerably higher than the same period in 1965. The data are recorded in Table #3.

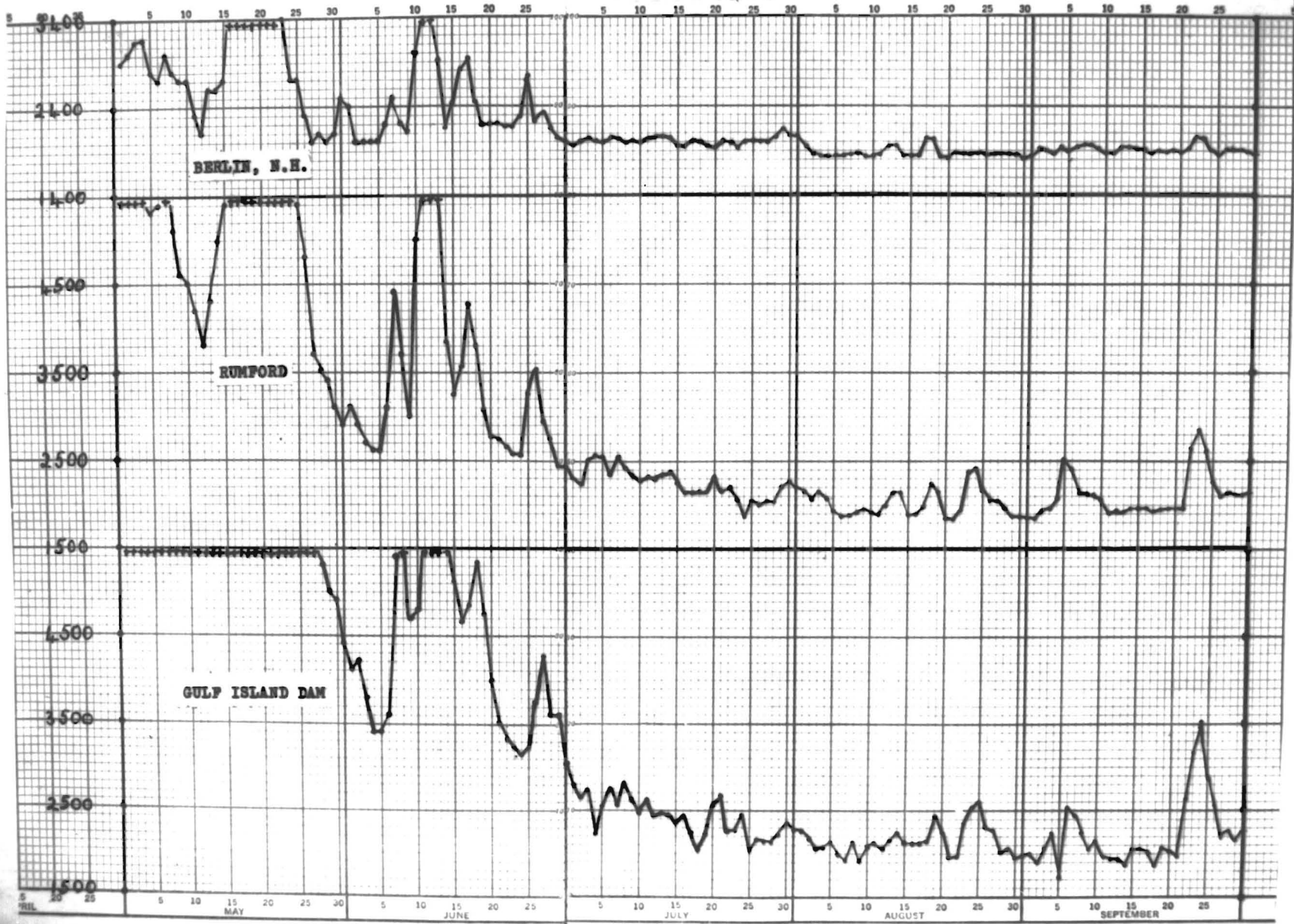
TABLE #3
Average Daily Flows
C.F.S.

Year	Gulf Island Dam					J.A.S. Average
	May	June	July	August	September	
1966	8025	4664	2725	2146	2228	2366
1965	4600	2552	1832	1747	1990	1856
1964	5345	2466	2440	2326	2251	2339
1963	10414	3175	2279	2397	2299	2325
1962	8429	2730	2345	3275	3327	2982
1938- 1966 averages (29 years)	9938	4730	2825	2452	2891	2688 2713

Water Temperatures.

At Gulf Island Dam water temperatures were higher than the twenty-four year averages for June through September. The average peak

RIVER FLOW cfs



1966

YEAR OF 11

ANDROSCOGGIN RIVER FLOW

C. F. S.

APRIL, 1966

Date	BERLIN	RUMFORD	LIVERMORE	GULF ISLAND DAM
1	1940	3560	5580	6950
2	1983	3470	5400	6960
3	1879	3480	4960	6230
4	1853	3360	4990	6270
5	1867	3260	4880	6170
6	1948	3400	4760	6010
7	1989	3370	4910	6190
8	2120	3630	5280	6900
9	2170	3970	5930	7900
10	2050	3830	6130	7970
11	2028	3640	5990	7830
12	2010	3600	5780	7600
13	2044	3690	5770	7620
14	2162	4010	5880	7750
15	2383	4950	6210	8080
16	2623	5910	7470	9610
17	2837	6540	8440	10590
18	3189	7500	9140	11360
19	3397	7970	9950	12060
20	3506	8200	10300	12290
21	3892	7840	10040	11610
22	5513	13230	10290	12380
23	4872	12930	15320	17100
24	4300	11200	14700	16200
25	3851	10080	13010	14550
26	3653	10050	12210	14030
27	2810	7280	11380	12520
28	2308	5400	8640	9800
29	2159	4300	6960	8280
30	2292	4220	5870	7200

ANDROSCOGGIN RIVER FLOW

C. F. S.

MAY, 1966

Date	BERLIN	RUMFORD	LIVERMORE	GULF ISLAND DAM
1	2926	6610	6080	7670
2	3009	7740	8500	10110
3	3166	6080	8890	9870
4	3190	5960	7420	8560
5	2811	5320	7160	8160
6	2706	5370	6510	7510
7	3009	5910	6820	8060
8	2797	5090	7030	7990
9	2697	4610	6240	7220
10	2742	4450	5960	7100
11	2277	4220	5760	6880
12	2125	3800	5390	6390
13	2586	4330	5060	6140
14	2669	4960	5760	6980
15	2730	5400	6230	7310
16	3479	6220	6570	7560
17	4381	7870	7360	8340
18	4622	8100	8730	9470
19	4967	9380	8900	9580
20	5424	11220	10980	12340
21	5560	10660	12520	13630
22	4724	9070	11430	12090
23	3450	7270	9730	10290
24	2771	5850	8150	8900
25	2768	5390	6860	7720
26	2330	4830	6310	7090
27	2041	3730	5480	6040
28	2068	3470	4610	5360
29	2040	3360	4320	5040
30	2050	3110	4210	4940
31	2483	2910	3820	4420

ANDROSCOGGIN RIVER FLOW

C. F. S.

JUNE, 1966

Date	BERLIN	RUMFORD	LIVERMORE	GULF ISLAND DAM
1	2367	3110	3540	4080
2	2060	2880	3710	4220
3	2038	2670	3350	3750
4	2016	2590	3050	3380
5	2045	2600	3050	3440
6	2208	3090	3130	3590
7	2519	4400	4350	5420
8	2160	3740	5330	6120
9	2132	3030	4260	4700
10	3060	4960	4000	4820
11	4979	8360	6910	8570
12	4625	7500	9060	9660
13	2915	5670	7890	8230
14	2175	3860	6060	6400
15	2431	3260	4530	5110
16	2812	3580	4020	4680
17	2935	4280	4270	4870
18	2420	3800	4850	5330
19	2198	3080	4310	4740
20	2191	2780	3580	4000
21	2204	2720	3170	3510
22	2177	2650	3050	3330
23	2175	2590	2970	3250
24	2286	2580	2900	3160
25	2855	3270	2930	3220
26	2215	3620	3530	3760
27	2315	2920	3980	4290
28	2159	2780	3300	3620
29	2034	2470	3230	3620
30	1999	2460	2780	3050

ANDROSCOGGIN RIVER FLOW

C. F. S.

JULY, 1966

Date	BERLIN	RUMFORD	LIVERMORE	GULF ISLAND DAM
1	1967	2300	2640	2800
2	2004	2240	2460	2630
3	2027	2510	2500	2720
4	2013	2580	2350	2220
5	1999	2560	2550	2530
6	2069	2360	2660	2750
7	2044	2540	2470	2560
8	1992	2410	2690	2810
9	2011	2340	2520	2610
10	2004	2290	2420	2490
11	2024	2320	2460	2610
12	2039	2300	2390	2450
13	2064	2360	2400	2480
14	2044	2390	2420	2470
15	1945	2270	2380	2370
16	1951	2140	2360	2440
17	2003	2140	2190	2240
18	2001	2160	2090	2050
19	1966	2160	2190	2210
20	1963	2310	2390	2580
21	2014	2150	2510	2690
22	1992	2200	2200	2250
23	1923	2060	2250	2290
24	1997	1880	2260	2440
25	2006	2040	1970	2040
26	2043	2000	2120	2190
27	2033	2030	2090	2160
28	2048	2020	2090	2150
29	2128	2200	2120	2210
30	2070	2280	2290	2360
31	2060	2200	2290	2290

ANDROSCOGGIN RIVER FLOW

C. F. S.

AUGUST, 1966

Date	BERLIN	RUMFORD	LIVERMORE FALLS	GULF ISLAND DAM
1	1938	2130	2240	2270
2	1880	2070	2160	2180
3	1826	2140	2070	2070
4	1830	2080	2110	2090
5	1848	1920	2110	2140
6	1836	1880	1960	2000
7	1852	1890	1900	1910
8	1881	1910	2020	2140
9	1827	1950	1910	1910
10	1828	1910	2030	2090
11	1870	1900	2020	2110
12	1937	2000	1990	2070
13	1959	2160	2090	2160
14	1838	2160	2200	2230
15	1826	1890	2140	2120
16	1845	1900	2010	2110
17	2045	1970	2010	2110
18	2017	2250	2060	2140
19	1830	2150	2350	2430
20	1809	1860	2200	2250
21	1887	1830	1920	1970
22	1872	1940	1910	1980
23	1853	2370	2160	2340
24	1877	2410	2450	2520
25	1854	2190	2510	2600
26	1854	2070	2250	2310
27	1845	2040	2180	2270
28	1855	1980	2020	2010
29	1839	1880	2020	2050
30	1801	1870	1920	1950
31	1831	1860	1930	1990

ANDROSCOGGIN RIVER FLOW

C. F. S.

September, 1966

Date	BERLIN	RUMFORD	LIVERMORE FALLS	GULF ISLAND DAM
1	1930	1850	1940	2000
2	1903	1940	1880	1900
3	1877	1960	2020	2090
4	1926	2090	2110	2230
5	1897	2510	1890	1720
6	1937	2410	2510	2510
7	1967	2140	2430	2450
8	1974	2110	2190	2240
9	1917	2100	2070	2040
10	1879	2040	2120	2140
11	1883	1900	2000	1970
12	1920	1910	1930	1950
13	1926	1910	1930	1950
14	1921	1960	1890	1880
15	1916	1990	2010	2060
16	1888	1970	2030	2070
17	1905	1920	2000	2020
18	1895	1950	1890	1860
19	1899	1960	2020	2080
20	1891	1940	1990	2020
21	1915	1960	1960	1980
22	2067	2650	2320	2630
23	2022	2870	2940	3150
24	1904	2620	3220	3510
25	1856	2270	2770	2890
26	1909	2100	2420	2550
27	1900	2140	2160	2210
28	1916	2110	2200	2280
29	1898	2110	2140	2170
30	1886	2140	2200	2280

was in July as usual, but the decline to lower temperatures was slower than normal. The highest temperature was 25.0°C observed on July 12; river odor was present down-town the evening of the thirteenth.

TABLE #4

Water Temperatures (°C)

Gulf Island Dam

Year	May*	June	July	August	September
1966**	10.9	20.4	24.1	23.0	20.2
1965**	14.1	20.0	22.8	23.2	19.0
1964**	15.1	20.3	22.0	20.7	19.9
1963**	12.0	21.6	23.5	22.3	17.9
24 year average	12.3	19.8	23.5	22.9	19.3
Deviation from aver.	-1.4	±0.6	±0.6	±0.1	±0.9

*Based on Thursday reports

**June through mid-September based on daily reports.

Lewiston 1966.

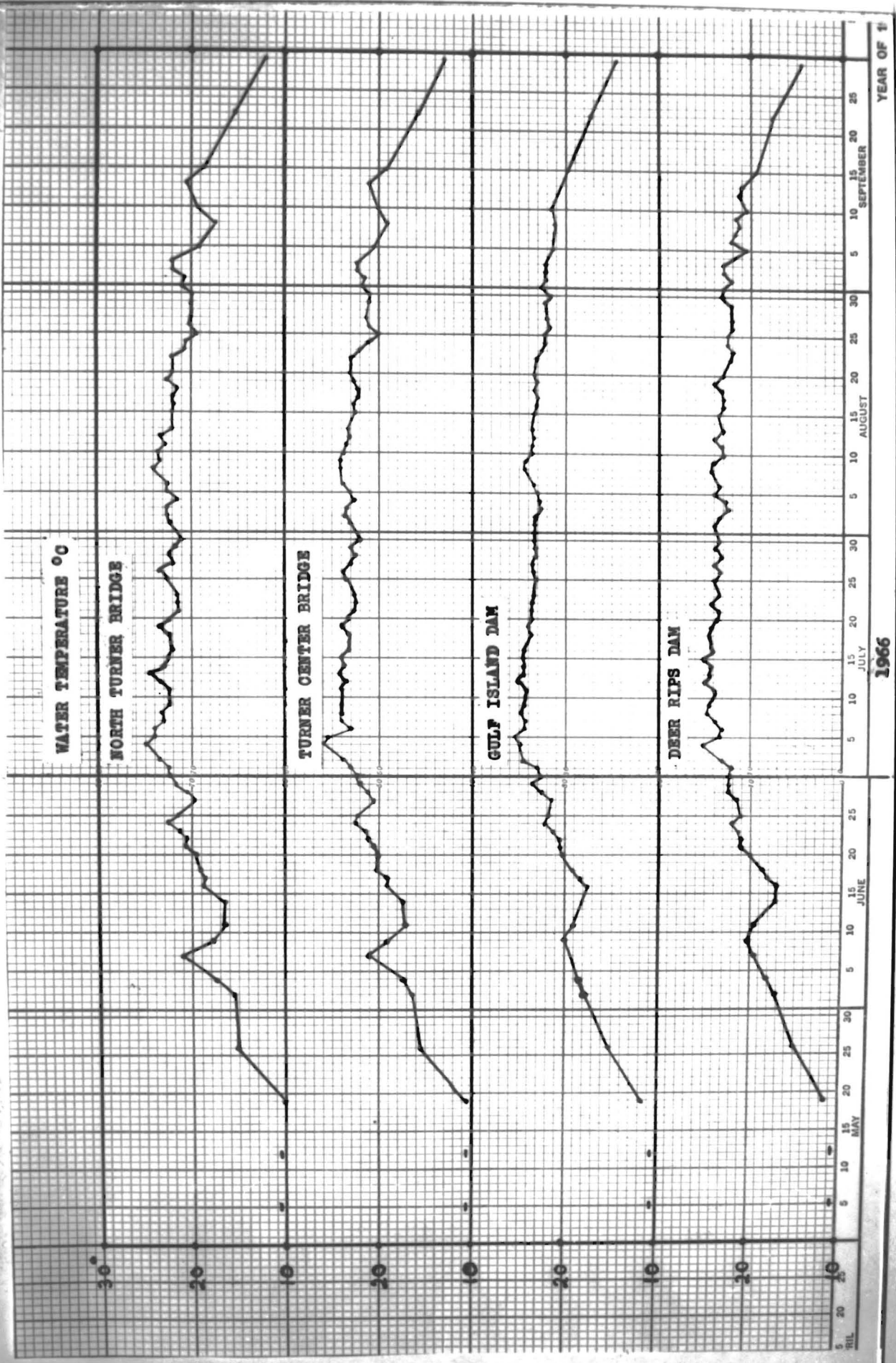
For the seventh consecutive year

there was no wide-spread coverage

of odor in the Lewiston-Auburn area during the summer months.

During the late Fall and early Spring, a few complaints were made when Kraft odor was present in the Deer Rips areas in Lewiston and Auburn.

Biochemical oxygen demands in the water at Chestnut Street Bridge were usually below 1.75 ppm but on July 14, 3.15 ppm were present. Dissolved oxygen levels were generally much lower than in 1965. Amazingly river flows were much higher this season than in 1966.



Water surface appearance was usually good and seldom unsightly. Color of the water appeared to be somewhat browner than that observed in 1965.

More interest in the proposed parks above Gulf Island Dam, on the Lewiston and Auburn sides, is indicated by comments made by responsible citizens in both cities.

TABLE #5

Lewiston 1966 River Data*

Date	Water Temp. °C	pH	B.O.D. 5 day ppm	D.O. ppm	G.I.D. Flow C.F.S.
June 2	17.3	6.5	1.62	5.77	4220
9	19.2	6.7	2.97	4.67	4700
16	16.7	6.6	1.92	6.93	4680
23	20.4	6.6	2.00	3.90	3250
30	21.2	6.5	2.46	1.89	3050
July 7	23.9	6.5	1.42	0.77	2560
14	23.7	6.7	3.15	0.53	2470
21	23.0	6.9	0.88	2.08	2690
28	22.9	6.8	1.15	1.83	2150
Aug. 4	22.3	6.7	1.35	2.25	2090
11	23.0	6.65	1.25	2.00	2110
18	23.0	6.7	1.00	2.05	2140
25	22.0	6.7	0.58	2.18	2600
Sept. 1	21.9	6.7	1.38	2.78	2000
8	20.9	6.5	1.02	2.83	2240
15	19.3	6.7	1.69	1.80	2060
22	17.2	6.82	1.65	3.90	2630
29	14.3	6.9	1.45	5.30	2170

*Thursday data.