WATER-QUALITY DATA FOR SAUK LAKE AND TRIBUTARIES NEAR SAUK CENTRE, MINNESOTA, 1988-89

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
inch (in.)	25.4	millimeter
foot (ft)	0.3048	meter
cubic foot per second	0.02832	cubic meter per second
degrees Fahrenheit (^{o}F)	5/9 x (^{o}F-32)	degrees Celsius

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929--a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

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ABSTRACT

The U.S. Army Corps of Engineers is planning to reduce aquatic growth and siltation in Sauk Lake in west-central Minnesota in order to improve recreation. A detailed water-quality survey of the lake and surrounding watershed was needed to plan remedial activities.

Water-quality data were collected at 11 sites on Sauk Lake, at sites on 3 major tributaries to the lake, and at the outflow from the lake from September 1988 through August 1989. Data collected from five selected lake sites comprise alkalinity, dissolved-solids concentration, concentrations of nutrients, plankton counts, and chlorophyll *a* and *b*. Vertical profiles of specific conductance, pH, temperature, and dissolved oxygen, as well as transparency depths were measured at all lake sites. Discharge, specific conductance, pH, temperature, and dissolved oxygen were measured at the stream sites. Water samples were collected to determine alkalinity and concentrations of suspended solids and nutrients.

INTRODUCTION

Dense growth of aquatic vegetation limits recreational uses of Sauk Lake. The U.S. Army Corps of Engineers is planning to reduce aquatic growth and siltation (U.S. Army Corps of Engineers, St. Paul, Minnesota, written commun., 1988). This report contains data collected at 11 sites on Sauk Lake, at 3 tributaries, and at a site on the outflow stream (fig. 1).

Sauk Lake is on the Sauk River in west-central Minnesota immediately upstream from the town of Sauk Centre. The land in the watershed is predominantly agricultural--a mixture of cropland, dairy, and grazing. The land is underlain by glacial drift ranging in thickness from 100 to 200 ft (feet). The topography is gently rolling and ranges in altitude from 1,200 to 1,400 ft above sea level (Helgesen and others, 1975). Seasonal and year-round residences border most of the lake.

Lake sites were visited monthly from September 1988 through August 1989 (except for October, December, and March). Specific conductance, pH, temperature, Secchi-disk transparency, and dissolved oxygen were measured each visit. Water samples were collected at five of the sites (sites 2, 4, 7, 10 and 11) for laboratory analyses to determine concentrations of selected nitrogen and phosphorus species, suspended solids, and chlorophyll *a* and *b*, and to determine cell counts of phytoplankton and zooplankton.

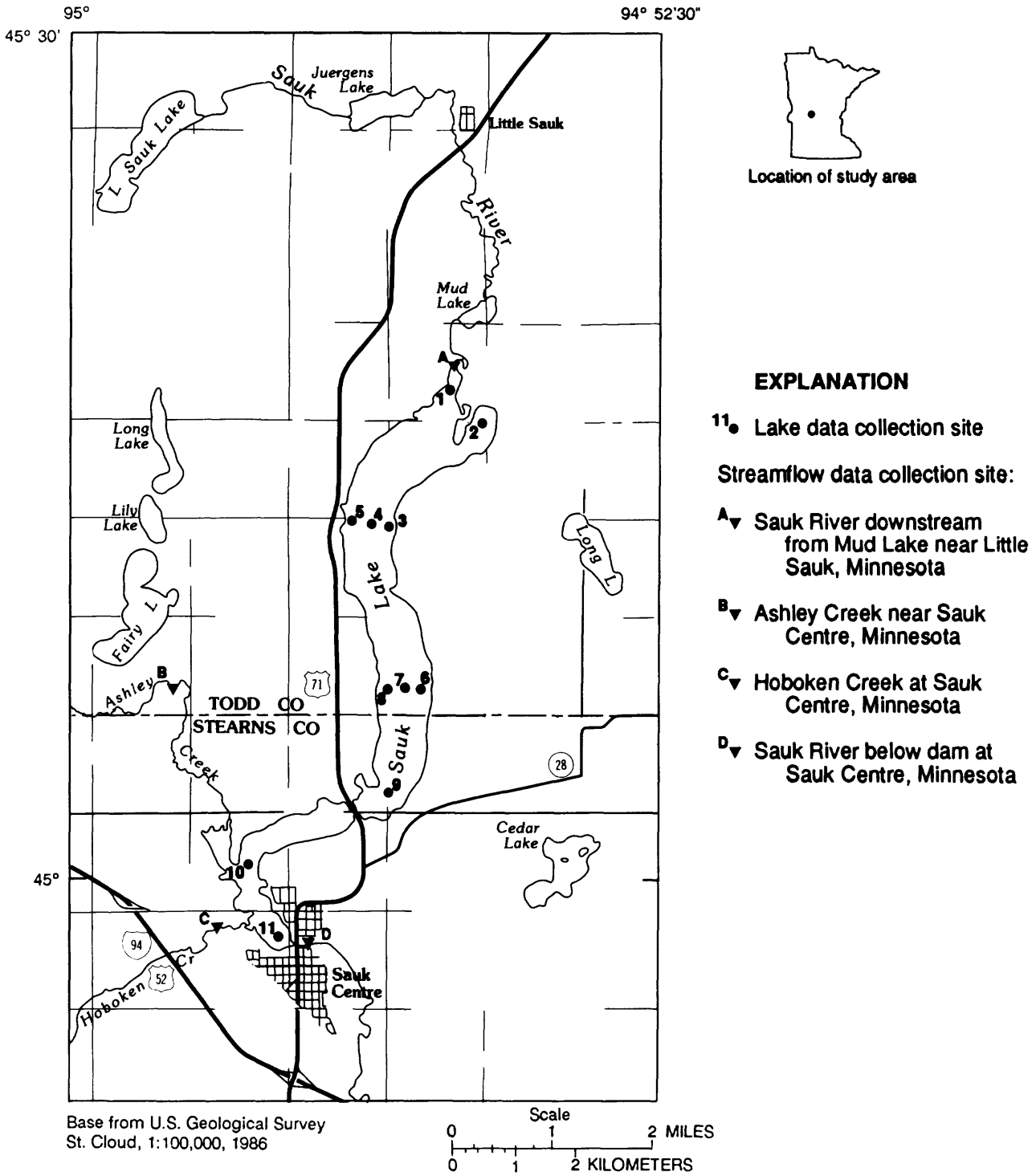

Figure 1.--Location of data collection sites in the Sauk Lake area, Minnesota.

Streamflow data were collected from September 1988 through October 1989. Sites were visited monthly from September 1988 through February 1989 (except for October and December), biweekly from March through June 1989, and monthly from July through August 1989. Stream discharge, specific conductance, pH, temperature, and dissolved oxygen were measured during each visit. Water samples also were collected for later laboratory analyses to determine alkalinity and concentrations of suspended solids and selected nitrogen and phosphorus species.

METHODS

Instantaneous stream discharge was measured at each site with a current meter using standard U.S. Geological Survey methods (Carter and Davidian, 1968). Daily mean stream discharge was determined from instantaneous discharge measurements and gage-height records using standard U.S. Geological Survey methods (Kennedy, 1983). Water at the streamflow sites was well mixed; therefore, samples were collected by depth integration at one vertical near the middle of the stream. Specific conductance, pH, temperature, and dissolved oxygen were measured using a portable four-parameter instrument. Alkalinities were determined by titration methods using sulfuric acid (Fishman and Friedman, 1989).

Vertical profiles of specific conductance, pH, temperature, and dissolved oxygen were determined at all lake sites using the four-parameter instrument. A white Secchi-disk, 7.9 inches in diameter was used to determine transparency. At the five lake sampling sites (2, 4, 7, 10, and 11) a peristaltic pump with tubing was used to collect depth-integrated samples for analysis of nutrients, phytoplankton, and chlorophyll. The orifice of the tube was moved through the euphotic zone, which was determined by doubling the Secchi-disk readings (Greeson and others, 1979). Zooplankton were collected by lowering an 80 micrometer-mesh Wisconsin net below the euphotic zone and pulling it straight up. The depth the net was lowered at each site was kept constant during the project period. This selected depth was enough to ensure that the euphotic zone was sampled completely, and was kept constant to allow for quantitative comparison of results at each site over time. Phytoplankton taxa were determined using the membrane filter method (McNabb, 1960) on samples preserved with Lugol's solution. Plankton analyses were performed by Aquatic Analysts of Portland, Oregon[1]. Alkalinity and concentrations of suspended solids and nutrients were determined for samples collected at mid-depth and near the bottom at sites 4 and 7 in July and August. Analyses for concentrations of suspended solids and nutrients were performed by the U.S. Geological Survey National Water Quality Laboratory, Arvada, Colorado.

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[1] Use of trade or firm names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

DESCRIPTION OF DATA TABLES

This report contains 31 data tables following the list of references. Tables 1 through 23 contain data from Sauk Lake. Data from the streamflow sites are contained in tables 24 through 31. Vertical profile data from the 11 sites on Sauk Lake are contained in tables 1 through 11. Data include specific conductance, pH, temperature, and dissolved oxygen measured at different depths, and transparency for each vertical. Results of analyses for samples collected at mid-depth and bottom of the vertical at lake sites 4 and 7 in July and August of 1989 are contained in tables 12 and 13. The constituents that were analyzed for are alkalinity, bicarbonate, carbonate, suspended solids, and selected nitrogen and phosphorus species. Specific conductance, pH, temperature, and dissolved oxygen were determined in the field at the time of sampling. Tables 14 through 18 contain results of analyses for depth-integrated samples collected at lake sites 2, 4, 7, 10, and 11. The constituents that were analyzed for are alkalinity, bicarbonate, carbonate, total suspended solids, selected nitrogen and phosphorus species, and chlorophyll *a* and *b*. Tables 19 through 23 contain results of analyses for phytoplankton and zooplankton species. The organisms are identified from the Phylum to the Genus level (or Family level in a few cases). Quantitative data include cell counts per milliliter and percentage of total volume. Water-quality data for the 4 streamflow sites are contained in tables 24 through 27. Tables 28 through 31 list the daily mean discharges at the four streamflow sites from October 1, 1988 through September 30, 1989.

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Carter, R.W. and Davidian, Jacob, 1968, General procedures for gaging streams: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6, 13 p.

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Helgesen, J.O., Erickson, D.W., and Lindholm, G.F., 1975, Water resources of the Mississippi and Sauk Rivers watershed, central Minnesota: U.S. Geological Survey Hydrologic Investigations Atlas HA-534, 3 sheets.

Kennedy, E.J., 1983, Computation of continuous records of streamflow: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A13, 53 p.

McNabb, C.D., 1960, Enumeration of fresh-water phytoplankton concentrated on the membrane filter: Limnology and Oceanography, v. 5, p. 57-61.

Table 1.-- *Vertical profile data for Sauk Lake-Site 1*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
26	1340	1.0	17.5	388	10.3	8.6	3.28	3.3
26	1345	3.0	17.0	384	10.7	8.6	--	--
Nov								
03	1355	1.0	5.0	403	14.5	8.9	4.20	4.3
03	1356	3.3	4.5	425	15.7	8.9	--	--
Jan 1989								
12	0855	2.0	.5	549	4.3	7.5	--	4.3
12	0900	3.0	.5	546	4.7	7.6	--	--
12	0905	3.5	.5	549	2.9	7.5	--	--
Feb								
16	0900	2.0	1.5	555	4.0	7.6	--	3.5
Apr								
26	1540	3.0	8.0	370	14.3	8.7	4.40	6.2
26	1541	5.2	7.0	374	12.6	8.5	--	--
May								
24	1140	.5	19.0	410	7.3	8.3	4.10	4.1
24	1143	3.50	19.0	409	7.2	8.3	--	--
Jun								
21	1343	1.0	23.5	401	7.0	8.4	3.28	3.3
21	1345	2.3	23.5	400	6.8	8.4	--	--
Jul								
19	1320	1.0	24.0	332	10.2	8.8	4.59	4.6
19	1321	4.0	24.0	338	10.2	8.8	--	--
Aug								
16	1408	2.0	24.0	334	7.9	8.6	3.90	3.9
16	1410	3.0	22.5	361	6.5	8.3	--	--

Table 2.-- *Vertical profile data for Sauk Lake-Site 2*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
26	1420	1.0	17.5	371	8.7	8.5	2.99	63.0
26	1422	5.0	16.5	372	8.6	8.5	--	--
26	1424	8.0	16.0	373	8.1	8.5	--	--
26	1426	12.0	16.0	374	7.5	8.5	--	--
26	1428	17.0	16.0	375	6.4	8.4	--	--
26	1430	22.0	15.5	378	5.4	8.3	--	--
26	1432	23.0	15.5	382	3.8	8.2	--	--
26	1434	24.0	15.5	388	1.4	8.0	--	--
26	1436	25.0	14.0	412	0	7.8	--	--
26	1438	27.0	12.0	458	0	7.5	--	--
26	1440	29.0	8.5	475	0	7.4	--	--
26	1442	31.0	8.0	480	0	7.4	--	--
26	1444	33.0	7.5	481	0	7.4	--	--
26	1446	37.0	7.5	484	0	7.3	--	--
26	1448	42.0	7.0	492	0	7.3	--	--
26	1450	52.0	6.5	513	0	7.2	--	--
26	1452	62.0	6.5	559	0	7.1	--	--
Nov								
03	1410	1.0	5.5	376	13.5	8.9	4.69	50.0
03	1411	5.0	5.0	378	12.5	8.9	--	--
03	1412	15.0	5.0	379	12.0	8.9	--	--
03	1413	25.0	5.0	379	12.0	8.9	--	--
03	1414	35.0	5.0	379	12.0	8.9	--	--
03	1415	45.0	5.0	379	11.9	8.9	--	--
03	1416	49.0	5.0	379	11.9	8.8	--	--
Jan 1989								
12	1130	3.0	1.5	400	12.3	8.7	4.69	51.0
12	1131	10.0	2.0	400	11.9	8.7	--	--
12	1132	12.0	2.0	405	10.8	8.6	--	--
12	1133	14.0	2.5	402	9.4	8.6	--	--
12	1134	16.0	2.5	405	6.7	8.4	--	--
12	1135	20.0	2.5	408	3.7	8.2	--	--
12	1136	25.0	2.5	417	3.2	8.1	--	--
12	1137	30.0	2.5	422	2.6	8.0	--	--
12	1138	40.0	2.5	430	.6	7.9	--	--
12	1139	45.0	3.0	440	.3	7.7	--	--
12	1140	50.0	3.0	455	.1	7.7	--	--
Feb								
16	0311	3.0	1.5	423	7.7	8.3	5.18	53.0
16	0321	6.0	3.0	415	7.1	8.1	--	--
16	0331	10.0	3.0	416	5.8	8.1	--	--
16	0341	15.0	3.0	420	4.7	7.9	--	--
16	0351	20.0	3.0	426	1.5	7.9	--	--
16	0361	30.0	3.0	436	.8	7.8	--	--
16	0371	40.0	3.0	450	1.3	7.7	--	--
16	0381	52.0	3.0	490	.5	7.4	--	--

Table 2.-- *Vertical profile data for Sauk Lake-Site 2*--Continued

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Apr 1989								
26	1508	3.0	9.5	355	14.7	8.7	4.26	55.0
26	1509	10.0	7.5	371	11.9	8.4	--	--
26	1510	15.0	5.5	407	3.6	7.8	--	--
26	1511	20.0	4.5	427	1.0	7.7	--	--
26	1512	30.0	4.0	442	.2	7.6	--	--
26	1513	40.0	4.0	459	.3	7.4	--	--
26	1514	50.0	3.5	473	.2	7.3	--	--
26	1515	54.0	4.0	477	.4	7.3	--	--
May								
24	1205	1.0	19.0	361	11.8	9.0	6.99	44.5
24	1207	8.0	19.0	362	11.8	9.0	--	--
24	1210	10.0	16.0	371	15.4	8.9	--	--
24	1212	12.0	11.5	385	13.3	8.7	--	--
24	1216	16.0	9.0	393	5.3	8.1	--	--
24	1218	20.0	8.5	394	3.2	7.9	--	--
24	1220	30.0	7.0	409	.6	7.7	--	--
24	1222	40.0	5.5	441	1.5	7.5	--	--
24	1225	43.5	5.0	447	1.1	7.5	--	--
Jun								
21	1253	1.0	22.0	372	9.2	8.9	8.86	48.0
21	1255	10.0	21.5	374	8.2	8.8	--	--
21	1256	13.0	17.5	386	5.3	8.4	--	--
21	1257	15.0	16.0	398	3.6	8.2	--	--
21	1258	17.0	12.5	412	.6	7.6	--	--
21	1259	20.0	10.5	417	.3	7.9	--	--
21	1300	30.0	7.0	444	.2	7.6	--	--
21	1301	40.0	6.0	474	.2	7.4	--	--
21	1302	47.0	5.5	484	.2	7.2	--	--
Jul								
19	1222	2.0	25.0	335	9.0	8.8	4.10	52.0
19	1223	8.0	24.5	335	8.9	8.8	--	--
19	1224	12.0	24.0	340	4.6	8.5	--	--
19	1225	15.0	18.5	370	.4	7.9	--	--
19	1227	20.0	11.0	388	.5	7.7	--	--
19	1229	30.0	7.5	411	.7	7.3	--	--
19	1231	40.0	6.0	429	.7	7.0	--	--
19	1234	50.0	5.5	463	.8	7.0	--	--
Aug								
16	1302	2.0	23.5	316	8.0	8.9	3.31	46.0
16	1303	5.0	23.5	317	8.1	8.8	--	--
16	1304	10.0	23.0	325	3.0	8.6	--	--
16	1305	15.0	20.5	353	.2	8.0	--	--
16	1307	20.0	13.0	396	.1	7.6	--	--
16	1308	30.0	8.0	422	.0	7.2	--	--
16	1309	40.0	7.0	436	.0	7.1	--	--
16	1311	45.0	6.0	459	.0	6.9	--	--

Table 3.--*Vertical profile data for Sauk Lake-Site 3*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
26	1537	1.0	18.0	367	10.0	8.6	2.62	9.3
26	1539	8.0	18.0	368	9.8	8.6	--	--
Nov								
03	1330	1.0	6.0	360	13.1	9.0	4.99	7.6
03	1331	6.6	5.0	364	13.2	9.1	--	--
Jan 1989								
12	1515	3.0	1.5	396	12.9	8.8	--	9.2
12	1516	6.0	3.0	389	12.2	8.8	--	--
12	1517	8.0	3.5	387	11.6	8.8	--	--
Feb								
16	1500	3.0	1.0	415	12.2	8.6	--	9.2
16	1501	8.0	2.0	409	11.2	8.6	--	--
Apr								
26	1345	3.0	8.5	371	12.6	8.6	4.69	7.6
26	1346	6.6	7.5	381	11.5	8.5	--	--
May								
24	1512	1.0	18.0	377	10.6	8.8	7.71	11.0
24	1516	6.0	18.0	378	10.5	8.8	--	--
24	1518	10.5	18.0	377	10.4	8.8	--	--
Jun								
21	1227	1.0	21.0	380	9.2	8.7	6.30	10.2
21	1228	5.0	20.5	382	8.9	8.7	--	--
21	1229	8.0	20.0	396	5.4	8.4	--	--
21	1230	9.7	20.0	401	2.9	8.3	--	--
Jul								
19	1053	2.0	25.0	334	8.9	8.8	4.59	10.1
19	1054	5.0	24.5	335	8.7	8.8	--	--
19	1055	9.0	24.0	336	6.9	8.6	--	--
Aug								
16	1136	2.0	23.5	327	10.2	8.9	2.59	8.80
16	1137	5.0	23.5	328	9.2	8.9	--	--
16	1138	8.0	23.5	329	9.9	8.8	--	--

Table 4.-- *Vertical profile data for Sauk Lake-Site 4*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
27	1150	1.0	16.0	365	6.8	8.4	3.08	45.1
27	1152	10.0	16.0	365	6.8	8.4	--	--
27	1154	15.0	16.0	365	6.7	8.4	--	--
27	1156	20.0	16.0	366	6.7	8.4	--	--
27	1158	25.0	16.0	366	6.6	8.3	--	--
27	1200	30.0	16.0	366	6.6	8.3	--	--
27	1202	35.0	16.0	366	6.6	8.3	--	--
27	1204	40.0	16.0	366	6.4	8.3	--	--
27	1206	43.0	16.0	366	6.5	8.3	--	--
Nov								
03	1229	1.0	5.5	360	12.8	9.1	4.40	45.4
03	1230	5.0	5.0	362	12.5	9.1	--	--
03	1231	15.0	5.0	363	12.1	9.1	--	--
03	1232	25.0	5.0	363	12.1	9.1	--	--
03	1233	35.0	5.0	363	12.0	9.1	--	--
03	1234	44.5	5.0	363	11.7	9.0	--	--
Jan 1989								
12	1700	3.0	2.0	390	12.1	8.8	4.20	45.0
12	1701	10.0	2.5	387	11.4	8.8	--	--
12	1702	20.0	3.0	394	9.2	8.6	--	--
12	1703	25.0	3.0	399	7.9	8.4	--	--
12	1704	30.0	3.5	404	6.6	8.3	--	--
12	1705	35.0	3.5	413	5.3	8.2	--	--
12	1706	40.0	3.5	427	4.1	8.1	--	--
12	1707	44.0	4.0	449	3.1	8.0	--	--
Feb								
16	1323	3.0	2.0	402	10.0	8.5	4.99	45.0
16	1324	10.0	3.5	403	8.1	8.2	--	--
16	1325	20.0	3.0	417	6.8	8.1	--	--
16	1326	30.0	3.0	427	4.6	7.9	--	--
16	1327	37.0	4.0	443	2.8	7.8	--	--
16	1328	44.0	4.0	486	1.0	7.7	--	--
Apr								
26	1401	3.0	8.5	356	15.3	8.8	4.00	46.2
26	1402	15.0	8.0	361	13.6	8.7	--	--
26	1403	25.0	7.5	380	11.0	8.4	--	--
26	1404	35.0	6.5	405	7.8	8.0	--	--
26	1405	45.2	6.0	407	6.6	7.9	--	--

Table 4.-- *Vertical profile data for Sauk Lake-Site 4*--Continued

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
May 1989								
24	1548	1.0	18.5	377	10.4	8.8	8.07	45.2
24	1552	10.0	18.5	377	10.9	8.8	--	--
24	1554	16.0	17.5	379	10.4	8.8	--	--
24	1556	20.0	13.0	386	8.0	8.4	--	--
24	1558	25.0	12.0	387	7.5	8.2	--	--
24	1559	30.0	11.5	387	7.1	8.2	--	--
24	1600	35.0	10.5	387	6.2	8.1	--	--
24	1601	44.0	10.0	390	3.5	8.0	--	--
Jun								
21	1156	1.0	20.5	385	9.4	8.8	6.99	45.9
21	1157	10.0	20.5	386	9.1	8.8	--	--
21	1158	20.0	20.0	389	8.4	8.7	--	--
21	1159	30.0	18.0	395	7.2	8.4	--	--
21	1201	40.0	17.5	399	6.2	8.3	--	--
21	1202	43.0	17.0	401	5.5	8.1	--	--
21	1203	45.0	11.5	421	.4	7.8	--	--
Jul								
19	1104	2.0	25.0	333	9.2	8.8	4.10	45.2
19	1105	10.0	24.5	336	8.2	8.7	--	--
19	1107	15.0	24.5	339	7.3	8.6	--	--
19	1108	20.0	24.0	349	4.9	8.3	--	--
19	1109	22.0	23.0	360	1.9	8.0	--	--
19	1110	25.0	22.0	368	.3	7.8	--	--
19	1112	30.0	19.5	376	.2	7.7	--	--
19	1115	40.0	17.0	387	.4	7.6	--	--
19	1117	44.0	16.5	389	.5	7.5	--	--
Aug								
16	1148	2.0	23.5	325	11.1	8.9	2.69	44.0
16	1149	5.0	23.5	328	9.1	8.8	--	--
16	1150	10.0	23.5	330	8.0	8.8	--	--
16	1152	15.0	23.0	334	5.3	8.5	--	--
16	1153	25.0	23.0	336	4.5	8.4	--	--
16	1154	30.0	22.5	347	.4	8.0	--	--
16	1155	40.0	17.5	404	.1	7.4	--	--

Table 5.-- *Vertical profile data for Sauk Lake-Site 5*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth st sample location, total (feet)
Sep 1988								
27	1130	1.0	16.0	363	8.3	8.6	2.69	7.2
27	1132	7.0	16.0	364	8.3	8.6	--	--
Nov								
03	1215	1.0	5.5	362	13.3	9.0	4.69	9.6
03	1216	8.5	5.0	363	12.8	9.0	--	--
Jan 1989								
12	1600	3.0	1.5	391	12.6	9.0	--	7.7
12	1601	6.0	2.0	391	12.6	9.0	--	--
12	1602	8.0	2.5	392	12.5	8.9	--	--
Feb								
16	1245	3.5	.5	387	12.3	8.6	--	5.2
16	1246	6.5	1.5	397	11.3	8.6	--	--
Apr								
26	1435	3.0	9.5	354	15.9	8.9	4.20	6.1
26	1436	5.1	9.5	354	15.7	8.9	--	--
May								
24	1527	1.0	18.5	377	10.0	8.8	7.91	16.5
24	1530	10.0	18.0	379	10.1	8.8	--	--
24	1533	16.0	17.5	378	9.9	8.8	--	--
Jun								
21	1138	1.0	21.0	384	10.0	8.8	6.69	10.4
21	1140	7.0	21.0	384	9.9	8.8	--	--
21	1141	9.5	20.5	384	8.8	8.8	--	--
Jul								
19	1202	2.0	25.0	331	10.2	8.9	3.81	10.8
19	1203	5.0	25.0	331	10.2	8.9	--	--
19	1204	10.0	25.5	331	10.1	8.8	--	--
Aug								
16	1240	2.0	23.5	324	12.2	9.0	2.69	8.6
16	1241	5.0	23.5	327	9.9	8.9	--	--
16	1243	8.0	23.5	329	9.3	8.8	--	--

Table 6.--*Vertical profile data for Sauk Lake-Site 6*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
27	1300	1.0	16.0	362	9.4	8.6	2.30	7.1
27	1302	6.0	16.0	362	9.4	8.6	--	--
Nov								
03	1000	1.0	5.0	355	13.0	9.0	4.89	6.0
03	1001	5.0	4.5	363	12.5	9.0	--	--
Jan 1989								
18	1145	3.0	2.0	389	13.8	8.7	--	9.0
18	1146	6.0	2.5	383	13.0	8.7	--	--
18	1147	8.0	3.0	384	10.5	8.7	--	--
Feb								
17	0945	3.0	1.5	406	11.5	8.7	--	9.0
17	0946	8.0	3.5	411	12.1	8.7	--	--
Apr								
26	1325	3.0	8.5	387	11.7	8.4	4.30	8.6
26	1326	7.6	8.0	398	10.2	8.3	--	--
May								
24	1645	1.0	17.5	375	10.7	8.8	7.51	12.8
24	1648	6.0	17.5	375	10.9	8.8	--	--
24	1649	12.3	17.0	375	10.3	8.8	--	--
Jun								
21	1027	1.0	18.5	391	7.8	8.3	4.29	11.0
21	1029	6.0	17.5	399	6.0	8.2	--	--
21	1030	10.0	17.5	400	4.5	8.1	--	--
Jul								
19	1034	2.0	24.5	344	7.6	8.6	4.10	9.8
19	1035	5.0	24.0	344	7.5	8.6	--	--
19	1036	8.5	24.0	345	7.2	8.6	--	--
Aug								
16	1109	2.0	23.5	325	10.7	8.9	2.49	9.1
16	1110	5.0	23.5	327	9.0	8.9	--	--
16	1111	8.0	23.5	328	8.5	8.8	--	--

Table 7.-- *Vertical profile data for Sauk Lake-Site 7*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
27	1315	1.0	16.5	360	9.7	8.7	2.39	25.6
27	1317	10.0	16.5	362	9.0	8.6	--	--
27	1319	24.0	16.5	362	8.8	8.6	--	--
Nov								
03	1031	1.0	5.0	359	12.8	9.0	4.30	25.0
03	1032	5.0	5.0	361	12.5	9.0	--	--
03	1033	15.0	5.0	362	12.3	9.0	--	--
03	1034	24.0	5.0	363	11.9	9.0	--	--
Jan 1989								
18	1111	3.0	2.0	387	13.0	8.8	6.99	24.0
18	1112	10.0	3.0	387	11.8	8.6	--	--
18	1113	15.0	3.5	392	10.1	8.5	--	--
18	1114	20.0	3.5	396	9.1	8.4	--	--
18	1115	23.0	3.5	398	8.6	8.4	--	--
Feb								
16	1645	3.0	3.0	396	13.4	8.8	4.20	25.5
16	1646	10.0	4.5	391	12.8	8.7	--	--
16	1647	17.0	4.5	405	4.5	8.2	--	--
16	1648	24.5	5.0	407	3.6	8.1	--	--
Apr								
26	1300	3.0	8.5	367	13.4	8.6	4.20	25.2
26	1301	10.0	8.5	368	13.2	8.6	--	--
26	1302	15.0	8.0	372	12.6	8.5	--	--
26	1303	20.0	8.0	388	10.9	8.4	--	--
26	1304	24.2	8.0	406	7.9	8.0	--	--
May								
24	1712	1.0	17.5	374	10.7	8.8	8.46	27.5
24	1714	5.0	17.5	374	10.7	8.8	--	--
24	1715	10.0	17.5	375	10.8	8.8	--	--
24	1716	15.0	17.5	376	10.7	8.8	--	--
24	1718	20.0	17.5	376	10.5	8.7	--	--
24	1720	26.5	16.5	381	6.0	8.6	--	--
Jun								
21	1040	1.0	18.0	398	7.3	8.3	6.40	27.6
21	1041	5.0	17.5	397	7.1	8.3	--	--
21	1042	10.0	17.5	398	6.9	8.3	--	--
21	1044	20.0	17.5	398	6.8	8.3	--	--
21	1045	26.5	16.5	403	4.3	8.1	--	--
Jul								
19	0938	2.0	24.5	339	7.9	8.7	3.71	26.4
19	0939	5.0	24.5	340	7.8	8.6	--	--
19	0941	13.0	24.0	341	7.1	8.6	--	--
19	0943	20.0	24.0	342	7.0	8.6	--	--
19	0944	25.0	24.0	347	5.4	8.4	--	--
Aug								
16	1012	2.0	23.5	326	9.4	8.8	2.30	26.0
16	1013	5.0	23.5	328	8.1	8.8	--	--
16	1014	10.0	23.0	329	7.7	8.7	--	--
16	1015	15.0	23.0	330	6.9	8.7	--	--
16	1017	20.0	23.0	338	3.9	8.4	--	--
16	1018	25.0	22.5	345	.9	8.0	--	--

Table 8.-- *Vertical profile data for Sauk Lake-Site 8*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
27	1310	1.0	16.5	361	9.6	8.6	2.59	8.3
27	1312	7.0	16.0	362	9.2	8.6	--	--
Nov								
03	1145	1.0	5.5	361	13.1	9.1	5.51	9.9
03	1146	9.0	5.0	362	13.1	9.1	--	--
Jan 1989								
18	1320	3.0	1.5	394	12.8	8.8	--	8.0
18	1321	7.0	2.5	389	12.5	8.8	--	--
Feb								
17	0900	3.0	2.0	404	11.4	8.7	--	8.5
17	0901	7.5	3.5	398	10.4	8.7	--	--
Apr								
26	1235	3.0	9.0	365	14.1	8.7	3.81	9.2
26	1240	8.2	9.0	366	13.9	8.7	--	--
May								
24	1658	1.0	18.0	374	10.1	8.8	7.19	10.6
24	1700	5.0	18.0	374	10.1	8.8	--	--
24	1702	8.0	18.0	376	9.3	8.6	--	--
24	1704	10.0	17.5	391	3.3	8.2	--	--
Jun								
21	1111	1.0	19.5	386	8.9	8.5	4.30	9.5
21	1112	5.0	19.0	393	6.6	8.4	--	--
21	1114	7.0	17.5	399	4.7	8.1	--	--
21	1115	9.0	17.0	404	2.2	8.0	--	--
Jul								
19	0926	2.0	24.5	333	8.7	8.7	4.20	9.0
19	0928	5.0	24.5	331	8.9	8.8	--	--
19	0929	8.0	24.5	331	8.8	8.8	--	--
Aug								
16	1001	2.0	23.5	324	10.4	8.9	2.30	8.7
16	1002	5.0	23.5	325	9.7	8.8	--	--
16	1003	7.5	23.5	324	10.4	8.9	--	--

Table 9.-- *Vertical profile data for Sauk Lake-Site 9*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
27	1400	1.0	16.0	361	9.7	8.6	2.39	11.2
27	1402	10.0	16.0	362	9.5	8.6	--	--
Nov								
03	0930	1.0	4.5	356	12.8	9.0	4.99	10.0
03	0931	5.0	4.5	362	12.8	9.0	--	--
03	0932	9.0	4.5	363	12.6	9.0	--	--
Jan 1989								
18	1046	3.0	3.0	388	12.8	8.8	--	10.5
18	1047	6.0	3.5	381	12.0	8.8	--	--
18	1048	9.5	4.0	389	7.3	8.5	--	--
Feb								
17	0830	3.0	2.5	403	11.0	8.7	--	6.8
17	0831	8.0	4.5	403	7.0	8.5	--	--
Apr								
26	1215	3.0	9.0	406	9.9	8.2	4.99	11.5
26	1220	10.5	9.0	408	6.8	8.1	--	--
May								
24	1753	1.0	18.0	375	10.4	8.8	7.51	11.9
24	1756	6.0	17.5	375	10.2	8.8	--	--
24	1758	9.0	17.5	375	10.1	8.7	--	--
24	1800	11.0	15.5	383	4.7	8.1	--	--
Jun								
21	0958	1.0	18.5	395	8.0	8.5	4.89	10.6
21	1000	5.0	17.5	399	6.0	8.2	--	--
21	1002	10.0	16.5	403	2.5	8.0	--	--
Jul								
19	0910	2.0	23.5	341	7.4	8.6	3.51	9.4
19	0911	5.0	23.5	342	7.3	8.5	--	--
19	0912	8.5	23.5	345	6.1	8.4	--	--
Aug								
16	0946	2.0	23.5	315	12.2	8.8	2.30	9.6
16	0948	5.0	23.5	317	11.4	8.9	--	--
16	0949	8.0	23.5	318	10.2	8.8	--	--

Table 10.-- *Vertical profile data for Sauk Lake-Site 10*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
27	1015	1.0	15.5	357	8.2	8.8	1.41	7.8
27	1017	6.0	15.0	358	7.9	8.8	--	--
Nov								
03	1700	1.0	4.0	426	12.6	8.9	3.61	7.8
03	1701	6.8	3.5	446	10.3	8.9	--	--
Jan 1989								
13	1015	3.0	2.5	451	11.7	8.5	--	7.9
13	1016	5.0	4.0	447	7.9	8.1	--	--
13	1017	7.0	4.5	483	6.1	7.9	--	--
Feb								
14	1600	3.0	2.0	458	6.3	8.0	6.50	8.0
14	1630	7.0	5.0	496	1.0	7.7	--	--
Apr								
26	0930	3.0	12.5	429	15.5	8.8	3.71	8.5
26	0935	8.0	12.5	428	15.1	8.8	--	--
May								
24	1831	1.0	18.5	406	10.0	8.7	5.31	8.3
24	1832	7.3	17.5	436	1.7	8.0	--	--
Jun								
21	1450	1.0	24.0	409	11.0	8.9	4.99	8.9
21	1451	5.0	23.0	433	9.1	8.8	--	--
21	1453	6.0	22.5	449	6.5	8.6	--	--
21	1454	7.9	22.0	471	1.1	8.1	--	--
Jul								
19	1411	2.0	25.0	343	10.2	8.8	2.49	7.9
19	1413	5.0	25.0	342	10.2	8.8	--	--
19	1415	7.0	24.0	357	4.5	8.4	--	--
Aug								
16	1500	2.0	26.0	311	16.1	9.3	1.80	7.1
16	1501	4.0	23.5	321	10.1	9.0	--	--
16	1505	6.0	23.0	339	1.0	8.3	--	--

Table 11.-- *Vertical profile data for Sauk Lake-Site 11*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Transparency, Secchi disk (feet)	Depth at sample location, total (feet)
Sep 1988								
27	0915	1.0	15.0	371	8.2	8.8	1.61	6.2
27	0917	5.0	15.0	370	8.1	8.8	--	--
Nov								
03	1430	1.0	4.0	432	12.7	8.9	4.00	7.4
03	1431	6.4	4.0	440	13.1	8.8	--	--
Jan 1989								
18	1431	3.0	2.0	471	11.7	8.1	--	6.7
18	1432	5.5	2.5	526	6.0	7.8	--	--
Feb								
15	1600	3.0	1.5	532	7.0	8.0	4.00	7.5
15	1630	6.5	3.0	635	2.2	7.8	--	--
Apr								
26	1030	3.0	13.5	447	17.4	8.9	3.22	8.8
26	1035	7.8	12.5	455	13.4	8.7	--	--
May								
24	1915	1.0	18.5	437	12.6	8.8	4.89	7.7
24	1917	7.0	17.5	496	.6	8.2	--	--
Jun								
21	1530	1.0	23.5	437	10.3	8.8	5.31	7.5
21	1532	4.0	20.0	473	9.9	8.3	--	--
21	1534	6.5	18.5	493	1.2	7.8	--	--
Jul								
19	1447	2.0	26.0	362	11.0	8.8	2.00	7.3
19	1448	4.0	25.5	364	9.0	8.6	--	--
19	1450	6.5	24.0	373	3.1	8.1	--	--
Aug								
16	1533	2.0	24.5	325	11.3	9.0	2.39	7.7
16	1535	4.0	23.0	330	7.3	8.9	--	--
16	1538	6.5	23.0	335	3.7	8.6	--	--

Table 12.-- *Selected water-quality data at mid-depth and bottom of vertical for Sauk Lake-Site 4*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data; <, less than]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Alkalinity (mg/L as $CaCO_3$)	Carbonate (mg/L as CO_3)
Jul 1989								
19	1130	22.0	23.0	360	1.9	8.0	182	0
19	1140	44.0	16.5	389	.5	7.5	194	0
Aug								
16	1153	25.0	23.0	336	4.5	8.4	154	4
16	1155	40.0	17.5	404	.1	7.4	188	0

Date	Time	Sampling depth (feet)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)	Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)		Depth at sample location, total (feet)
					Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved	
Jul										
19	1130	22.0	222	<1	0.220	1.3	<0.100	0.060	0.040	45.2
19	1140	44.0	237	<1	.940	1.5	<.100	.340	.230	--
Aug										
16	1153	25.0	178	10	.080	.50	<.100	.050	<.010	44.0
16	1155	40.0	230	10	1.00	1.1	<.100	.240	.180	--

Table 13.-- *Selected water-quality data at mid-depth and bottom of vertical for Sauk Lake-Site 7*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data; <, less than]

Date	Time	Sampling depth (feet)	Water temperature (degrees Celsius)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Alkalinity (mg/L as $CaCO_3$)	Carbonate (mg/L as CO_3)
Jul 1989								
19	1000	13.0	24.0	341	7.1	8.6	154	4
19	1010	25.0	24.0	347	5.4	8.4	164	2
Aug								
16	1015	15.0	23.0	330	6.9	8.7	157	9
16	1018	25.0	22.5	345	.9	8.0	161	3

Date	Time	Sampling depth (feet)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)	Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)		Depth at sample location, total (feet)
					Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved	
Jul 1989										
19	1000	13.0	180	<1	0.020	0.80	<0.100	0.050	<0.010	26.4
19	1010	25.0	196	1	.030	.70	<.100	.050	<.010	--
Aug										
16	1015	15.0	174	13	.080	.60	<.100	.070	.010	26.0
16	1018	25.0	190	17	.160	.60	<.100	.050	<.010	--

Table 14.--*Alkalinity, suspended solids, nutrient, and chlorophyll data for Sauk Lake-Site 2*

[mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Time	Alkalinity (mg/L as $CaCO_3$)	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)
Sep 1988					
26	1500	--	--	--	5
Nov					
03	1430	176	2	212	32
Jan 1989					
12	1125	--	--	--	1
Feb					
16	1030	--	--	--	7
Apr					
26	1505	172	13	183	4
May					
24	1230	176	18	179	<1
Jun					
21	1315	188	0	229	6
Jul					
19	1240	164	5	190	<1
Aug					
16	1302	151	0	184	26

		Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)		Chlorophyll (µg/L)	
Date	Time	Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved	a	b
Sep 1988								
26	1500	<0.01	0.90	<0.10	0.08	0.02	44.0	0.70
Nov								
03	1430	.04	.70	<.10	.04	<.01	81.0	<1.20
Jan 1989								
12	1125	.11	1.0	<.10	.02	.01	.60	<.10
Feb								
16	1030	.14	.80	<.10	.02	<.01	.20	<.10
Apr								
26	1505	<.01	.50	<.10	.05	<.01	31.0	1.20
May								
24	1230	.02	.80	<.10	.03	<.01	6.60	<.20
Jun								
21	1315	.02	.80	<.10	.03	.01	4.60	.40
Jul								
19	1240	.03	2.0	<.10	.04	<.01	4.50	.20
Aug								
16	1302	.03	.80	<.10	.04	<.01	18.0	<.30

Table 15.--*Alkalinity, suspended solids, nutrient, and chlorophyll data for Sauk Lake-Site 4*

[mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Time	Alkalinity (mg/L as $CaCO_3$)	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)
Sep 1988					
27	1500	165	1	199	13
Nov					
03	1245	170	12	195	17
Jan 1989					
12	1655	193	17	201	<1
Feb					
16	1320	208	10	234	6
Apr					
26	1400	165	14	172	29
May					
24	1610	184	10	208	2
Jun					
21	1210	176	14	187	17
Jul					
19	1120	160	12	171	<1
Aug					
16	1148	157	21	150	10

		Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)		Chlorophyll (µg/L)	
Date	Time	Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved	a	b
Sep 1988								
27	1500	0.05	0.90	0.10	0.08	0.02	35.0	0.30
Nov								
03	1245	<.01	.70	<.10	.05	<.01	39.0	<.60
Jan 1989								
12	1655	.04	1.0	<.10	.02	.01	.80	<.10
Feb								
16	1320	.03	.90	<.10	.02	<.01	.40	<.10
Apr								
26	1400	.01	.70	.15	.06	<.01	38.0	.90
May								
24	1610	.02	.70	<.10	.06	<.01	3.60	.70
Jun 1989								
21	1210	.03	.80	<.10	.03	<.01	3.80	<.20
Jul								
19	1120	.03	.60	<.10	.04	<.01	12.0	.40
Aug								
16	1148	.04	.50	<.10	.06	<.01	40.0	<.80

Table 16.--*Alkalinity, suspended solids, nutrient, and chlorophyll data for Sauk Lake-Site 7*

[mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Time	Alkalinity (mg/L as $CaCO_3$)	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)
Sep 1988					
27	1330	168	10	186	11
Nov					
03	1030	168	12	193	27
Jan 1989					
18	1110	186	12	199	<1
Feb					
16	1640	196	16	207	4
Apr					
26	1255	169	2	201	6
May					
24	1730	198	14	218	<1
Jun					
21	1055	180	0	220	4
Jul					
19	0950	160	2	191	<1
Aug					
16	1012	155	15	159	21

		Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)		Chlorophyll (µg/L)	
Date	Time	Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved	a	b
Sep 1988								
27	1330	<0.01	0.80	<0.10	0.10	0.01	57.0	0.50
Nov								
03	1030	.02	.90	<.10	.03	<.01	36.0	<.60
Jan 1989								
18	1110	.04	1.2	<.10	.02	<.01	.50	<.10
Feb								
16	1640	.04	.80	<.10	.02	<.01	.50	<.10
Apr								
26	1255	.03	.50	.13	.06	<.01	36.0	.90
May								
24	1730	.02	.60	<.10	.02	<.01	2.90	<.50
Jun								
21	1055	.13	.90	<.10	.04	.02	2.80	<.20
Jul								
19	0950	.05	.60	<.10	.04	<.01	15.0	<.30
Aug								
16	1012	.07	.70	<.10	.06	<.01	44.0	<.80

Table 17.--*Alkalinity, suspended solids, nutrient, and chlorophyll data for Sauk Lake-Site 10*

[mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Time	Alkalinity (mg/L as $CaCO_3$)	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)
Sep 1988					
27	1030	e170	14	180	18
Nov					
03	1715	180	2	217	19
Jan 1989					
13	1010	219	0	267	7
Feb					
14	1600	217	0	265	3
Apr					
26	0925	184	16	190	10
May					
24	1830	180	2	218	6
Jun					
21	1500	176	14	187	6
Jul					
19	1420	154	14	160	4
Aug					
16	1500	143	18	138	22

		Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)		Chlorophyll (µg/L)	
Date	Time	Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved	a	b
Sep 1988								
27	1030	0.01	0.90	<0.10	0.18	0.03	55.0	0.50
Nov								
03	1715	.02	.80	<.10	.03	<.01	12.0	.30
Jan 1989								
13	1010	.07	1.2	<.10	.03	.01	.60	<.10
Feb								
14	1600	.09	1.0	<.10	.02	<.01	.20	<.10
Apr								
26	0925	.03	.60	<.10	.05	<.01	37.0	.90
May								
24	1830	.03	.70	<.10	.07	<.01	4.50	<.50
Jun								
21	1500	.02	.80	<.10	.04	.01	4.40	.20
Jul								
19	1420	.03	3.6	<.10	.06	<.01	34.0	1.10
Aug								
16	1500	.04	.90	<.10	.09	<.01	19.0	<.30

Table 18.--*Alkalinity, suspended solids, nutrient, and chlorophyll data for Sauk Lake-Site 11*

[mg/L, milligrams per liter; µg/L, micrograms per liter; --, no data; <, less than]

Date	Time	Alkalinity (mg/L as $CaCO_3$)	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)
Sep 1988					
27	930	172	18	173	26
Nov					
03	1430	178	2	215	16
Jan 1989					
18	1430	222	0	271	1
Feb					
15	1600	232	0	283	6
Apr					
26	1025	180	17	185	14
May					
24	1920	168	12	185	3
Jun					
21	1545	184	0	224	7
Jul					
19	1500	162	2	194	1
Aug					
16	1533	146	13	152	21

		Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)		Chlorophyll (µg/L)	
Date	Time	Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved	a	b
Sep 1988								
27	0930	<0.01	0.90	<0.10	0.15	0.04	52.0	1.00
Nov								
03	1430	<.01	.70	<.10	.03	<.01	13.0	.40
Jan 1989								
18	1430	.09	1.0	.20	.02	<.01	.50	<.10
Feb								
15	1600	.13	1.1	.22	.02	<.01	.30	<.10
Apr								
26	1025	.01	.70	<.10	.05	<.01	42.0	1.20
May								
24	1920	.03	.70	<.10	.03	<.01	6.50	<.50
Jun								
21	1545	.01	.80	<.10	.03	.01	1.80	<.20
Jul								
19	1500	.03	1.1	<.10	.10	<.01	52.0	2.70
Aug								
16	1533	.08	.90	<.10	.07	<.01	31.0	1.10

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Table 19.--*Plankton data for*

[Cell counts are reported only for genus. See footnote 1 for explanation of

Date	Sept. 26, 1988		Nov. 03, 1988		Jan. 12, 1989		Feb. 16, 1989		Apr. 26, 1989	
Time	1500		1430		1125		1030		1505	
Total cells per mL	3684		2336		146		788		11770	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
				PHYTOPLANKTON						
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...OOCYSTACEAE										
....ANKISTRODESMUS	--	--	--	--	1	1	--	--	--	--
....CLOSTERIOPSIS	94	3	--	--	--	--	94	12	--	--
....OOCYSTIS	31	<1	--	--	--	--	31	4	--	--
....QUADRIGULA	--	--	--	--	--	--	--	--	--	--
....SELENASTRUM	--	--	--	--	--	--	--	--	110	<1
...SCENEDESMACEAE	--	--	--	--	--	--	--	--	--	--
....SCENEDESMUS	--	--	--	--	--	--	--	--	--	--
..TETRASPORALES	--	--	--	--	--	--	--	--	--	--
...PALMELLACEAE	--	--	--	--	--	--	--	--	--	--
....SPHAEROCYSTIS	--	--	--	--	--	--	--	--	--	--
..VOLVOCALES	--	--	--	--	--	--	--	--	--	--
...CHLAMYDOMONADACEAE	--	--	--	--	--	--	--	--	--	--
....CHLAMYDOMONAS	--	--	--	--	--	--	--	--	--	--
...VOLVOCACEAE	--	--	--	--	--	--	--	--	--	--
....EUDORINA	--	--	--	--	--	--	--	--	--	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE)										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....MELOSIRA	94	3	17	<1	--	--	94	12	--	--
....STEPHANODISCUS	160	4	1800	78	--	--	160	20	6500	54
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	31	<1	17	<1	--	--	31	4	--	--
...FRAGILARIACEAE										
....ASTERIONELLA	--	--	--	--	--	--	--	--	--	--
....FRAGILARIA	--	--	17	<1	--	--	--	--	--	--
....SYNEDRA	--	--	--	--	--	--	--	--	2700	23
...GOMPHONEMATACEAE										
....GOMPHONEMA	--	--	17	<1	--	--	--	--	--	--
...NITZSCHIACEAE										
....NITZSCHIA	31	<1	--	--	--	--	31	4	--	--
.CHRYSOPHYCEAE										
..CHROMULINALES										
...CHROMULINACEAE										
....CHRYSOCOCCUS	--	--	17	<1	--	--	--	--	--	--
...MALLOMONADACEAE										
....MALLOMONAS	--	--	--	--	--	--	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES	--	--	--	--	--	--	--	--	--	--
...CHROOCOCCACEAE	--	--	--	--	--	--	--	--	--	--
....ANACYSTIS	--	--	--	--	--	--	--	--	--	--
..OSCILLATORIALES										
...NOSTOCACEAE										
....ANABAENA	160	4	--	--	--	--	160	20	--	--
....APHANIZOMENON	1700	46	310	13	51	34	29	4	--	--
EUGLENOPHYTA (EUGLENOIDS)										
.CRYPTOPHYCEAE										
..CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										

Sauk Lake-Site 2

headings in the organism column; mL, milliliter; --, not found; <, less than]

Date		Sept. 26, 1988		Nov. 03, 1988		Jan. 12, 1989		Feb. 16, 1989		Apr. 26, 1989	
Time		1500		1430		1125		1030		1505	
Total cells per mL		3684		2336		146		788		11770	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					PHYTOPLANKTON--Continued						
....RHODOMONAS		750	20	33	1	12	8	1	<1	2000	17
...CRYPTOMONODACEAE											
....CRYPTOMONAS		470	13	66	3	6	4	1	<1	340	3
.EUGLENOPHYCEAE											
..EUGLENALES											
...EUGLENACEAE											
....TRACHELOMONAS		--	--	--	--	--	--	--	--	110	<1
PYRRHOPHYTA (FIRE ALGAE)											
.DINOPHYCEAE											
..DINOKONTAE											
...CERATIACEAE											
....CERATIUM		130	4	17	<1	--	--	130	16	--	--
...GYMNODINIACEAE											
....GYMNODINIUM		--	--	--	--	--	--	--	--	--	--
..PERIDINIALES											
...CERATIACEAE											
....CERATIUM		--	--	--	--	--	--	--	--	--	--
...PERIDINIACEAE											
....PERIDINIUM		--	--	--	--	--	--	--	--	--	--
					ZOOPLANKTON						
ARTHROPODA (ARTHROPODS)											
.CRUSTACEA											
..CALANOIDA											
...DIAPTOMIDAE											
....DIAPTOMUS		3	<1	5	<1	4	3	8	1	1	<1
..CLADOCERA											
...BOSMINIDAE											
....BOSMINA		--	--	--	--	--	--	--	--	--	--
...CHYDORIDAE		11	<1	7	<1	--	--	--	--	--	--
...DAPHNIDAE											
....CERIODAPHNIA		--	--	2	<1	--	--	--	--	--	--
....DAPHNIA		13	<1	7	<1	64	43	9	1	--	--
..CYCLOPOIDA											
...CYCLOPIDAE											
....CYCLOPS		4	<1	3	<1	5	4	5	<1	1	<1
....MESOCYCLOPS		--	--	--	--	--	--	--	--	--	--
....TROPOCYCLOPS		2	<1	--	--	--	--	--	--	--	--
ROTIFERA (ROTIFERS)											
.MONOGONONTA											
..FLOSCULARIACEAE											
...TESTUDINELLIDAE											
....FILINIA		--	--	--	--	--	--	--	--	4	<1
..PLOIMA											
...ASPLANCHNIDAE											
....ASPLANCHNA		--	--	--	--	3	2	--	--	--	--
...BRACHIONIDAE											
....KELLICOTTIA		--	--	--	--	--	--	--	--	--	--
....KERATELLA		--	--	1	<1	--	--	4	<1	4	<1
...SYNCHAETIDAE											
....POLYARTHRA		--	--	--	--	--	--	--	--	--	--

Date		May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time		1230		1315		1240		1302	
Total cells per mL		8029		*		*		5101	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
				PHYTOPLANKTON					
CHLOROPHYTA (GREEN ALGAE)									
.CHLOROPHYCEAE									
..CHLOROCOCCALES									
...OOCYSTACEAE									
....ANKISTRODESMUS		210	3	120	13	280	13	130	3
....CLOSTERIOPSIS		--	--	--	--	--	--	--	--
....OOCYSTIS		--	--	31	3	150	7	230	5
....QUADRIGULA		--	--	25	1	--	--	--	--
....SELENASTRUM		--	--	--	--	--	--	45	<1
...SCENEDESMACEAE									
....SCENEDESMUS		--	--	--	--	25	1	45	<1
..TETRASPORALES									
...PALMELLACEAE									
....SPHAEROCYSTIS		--	--	93	10	130	6	90	2
..VOLVOCALES									
...CHLAMYDOMONADACEAE									
....CHLAMYDOMONAS		--	--	62	7	25	1	90	2
...VOLVOCACEAE									
....EUDORINA		--	--	--	--	--	--	45	<1
CHRYSOPHYTA (YELLOW-GREEN ALGAE)									
.BACILLARIOPHYCEAE									
..CENTRALES									
...COSCINODISCACEAE									
....MELOSIRA		--	--	--	--	--	--	360	7
....STEPHANODISCUS		4300	54	--	--	51	2	45	<1
..PENNALES									
...ACHNANTHACEAE									
....COCCONEIS		--	--	31	3	--	--	--	--
...FRAGILARIACEAE									
....ASTERIONELLA		550	7	--	--	--	--	--	--
....FRAGILARIA		140	2	31	3	--	--	--	--
....SYNEDRA		1800	23	--	--	25	1	45	<1
...GOMPHONEMATACEAE		--	--	--	--	--	--	--	--
....GOMPHONEMA		--	--	31	3	25	1	--	--
...NITZSCHIACEAE									
....NITZSCHIA		68	<1	--	--	100	5	45	<1
.CHRYSOPHYCEAE									
..CHROMULINALES									
...CHROMULINACEAE									
....CHRYSOCOCCUS		--	--	--	--	--	--	--	--
...MALLOMONADACEAE									
....MALLOMONAS		--	--	--	--	25	1	45	<1
CYANOPHYTA (BLUE-GREEN ALGAE)									
.CYANOPHYCEAE									
..CHROOCOCCALES									
...CHROOCOCCACEAE		--	--	--	--	25	1	45	<1
....ANACYSTIS		--	--	--	--	--	--	45	<1
..OSCILLATORIALES									
...NOSTOCACEAE									
....ANABAENA		--	--	--	--	330	15	450	9
....APHANIZOMENON		--	--	--	--	680	31	2500	49
EUGLENOPHYTA (EUGLENOIDS)									
.CRYPTOPHYCEAE									
..CRYPTOMONIDALES									
...CRYPTOCHRYSIDACEAE									

Date	May 24, 1989		Jun. 19, 1989		Jul. 12, 1989		Aug. 16, 1989	
Time	1230		1315		1240		1302	
Total cells per mL	8029		*		*		5101	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
			PHYTOPLANKTON--Continued					
....RHODOMONAS	480	6	280	31	100	5	320	6
...CRYPTOMONODACEAE								
....CRYPTOMONAS	410	5	160	18	100	5	450	9
.EUGLENOPHYCEAE								
..EUGLENALES								
...EUGLENACEAE								
....TRACHELOMONAS	--	--	--	--	--	--	--	--
PYRRHOPHYTA (FIRE ALGAE)								
.DINOPHYCEAE								
..DINOKONTAE								
...CERATIACEAE								
....CERATIUM	--	--	--	--	--	--	--	--
...GYMNODINIACEAE								
....GYMNODINIUM	--	--	--	--	25	1	--	--
..PERIDINIALES								
...CERATIACEAE								
....CERATIUM	--	--	62	7	51	2	--	--
...PERIDINIACEAE								
....PERIDINIUM	--	--	--	--	--	--	45	<1
			ZOOPLANKTON					
ARTHROPODA (ARTHROPODS)								
.CRUSTACEA								
..CALANOIDA								
...DIAPTOMIDAE								
....DIAPTOMUS	--	--	*		*		16	<1
..CLADOCERA								
...BOSMINIDAE								
....BOSMINA	6	<1	*		*		--	--
...CHYDORIDAE	2	<1	*		*		27	<1
...DAPHNIDAE								
....CERIODAPHNIA	--	--	*		*		--	--
....DAPHNIA	2	<1	*		*		16	<1
..CYCLOPOIDA								
...CYCLOPIDAE								
....CYCLOPS	4	<1	*		*		--	--
....MESOCYCLOPS	1	<1	*		*		6	<1
....TROPOCYCLOPS	--	--	*		*		--	--
ROTIFERA (ROTIFERS)								
.MONOGONONTA								
..FLOSCULARIACEAE								
...TESTUDINELLIDAE								
....FILINIA	23	<1	*		*		3	<1
..PLOIMA								
...ASPLANCHNIDAE								
....ASPLANCHNA	2	<1	*		*		--	--
...BRACHIONIDAE								
....KELLICOTTIA	4	<1	*		*		--	--
....KERATELLA	22	<1	*		*		8	<1
...SYNCHAETIDAE								
....POLYARTHRA	5	<1	*		*		--	--

[1]Headings in the organism column represent the following levels in the classification of plankton:

Phylum
.Class
..Order
...Family
....Genus

*Zooplankton counts not available

Table 20.--*Plankton data for*

[Cell counts are reported only for genus. See footnote 1 for explanation of

Date	Sept. 27, 1988		Nov. 03, 1988		Jan. 12, 1989		Feb. 16, 1989		Apr. 26, 1989	
Time	1500		1245		1655		1320		1400	
Total cells per mL	1086		1795		671		79		25231	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
PHYTOPLANKTON										
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...COELASTRACEAE										
....COELASTRUM	--	--	--	--	3	<1	--	--	--	--
...OOCYSTACEAE										
....CLOSTERIOPSIS	--	--	13	<1	--	--	--	--	--	--
....ANKISTRODESMUS	--	--	--	--	--	--	--	--	--	--
....OOCYSTIS	11	1	--	--	11	2	--	--	--	--
...SCENEDESMACEAE										
....SCENEDESMUS	--	--	--	--	1	<1	--	--	--	--
..TETRASPORALES	--	--	--	--	--	--	--	--	--	--
...PALMELLACEAE	--	--	--	--	--	--	--	--	--	--
....SPHAEROCYSTIS	--	--	--	--	--	--	--	--	--	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE)										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	--	--	--	1	<1	--	--	--	--
....MELOSIRA	22	2	--	--	22	3	--	--	--	--
....STEPHANODISCUS	420	38	1500	83	420	62	--		20000	80
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	11	1	--	--	11	2	--	--	--	--
...CYMBELLACEAE										
....CYMBELLA	--	--	--	--	1	<1	--	--	--	--
...FRAGILARIACEAE										
....ASTERIONELLA	--	--	--	--	16	2	2	3	--	--
....FRAGILARIA	--	--	40	2	--	--	--	--	--	--
....SYNEDRA	11	1	66	4	11	2	--	--	3700	15
...NITZSCHIACEAE	--	--	--	--	--	--	--	--	--	--
....NITZSCHIA	--	--	--	--	--	--	--	--	--	--
.CHRYSOPHYCEAE	--	--	--	--	--	--	--	--	--	--
..CHROMULINALES	--	--	--	--	--	--	--	--	--	--
...CHROMULINACEAE	--	--	--	--	--	--	--	--	--	--
....CHRYSOCOCCUS	--	--	--	--	--	--	--	--	--	--
...MALLOMONADACEAE	--	--	--	--	--	--	--	--	--	--
....MALLOMONAS	--	--	--	--	--	--	--	--	--	--
...OCHROMONADACEAE	--	--	--	--	--	--	--	--	--	--
....DINOBRYON	--	--	--	--	--	--	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES	--	--	--	--	--	--	--	--	--	--
...CHROOCOCCACEAE	--	--	--	--	--	--	--	--	--	--
....ANACYSTIS	--	--	--	--	--	--	--	--	--	--
..OSCILLATORIALES										
...NOSTOCACEAE										
....ANABAENA	43	4	--	--	43	6	--	--	--	--
....APHANIZOMENON	500	45	79	4	50	7	18	22	--	--
EUGLENOPHYTA (EUGLENOIDS)										
.CRYPTOPHYCEAE										
..CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
....RHODOMONAS	11	1	26	1	59	9	16	20	1400	6
...CRYPTOMONODACEAE										
....CRYPTOMONAS	22	2	13	<1	1	<1	3	4	--	--

headings in the organism column; mL, milliliter; --, not found; <, less than]

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 12, 1989		Feb. 16, 1989		Apr. 26, 1989	
Time		1500		1245		1655		1320		1400	
Total cells per mL		1086		1795		671		79		25231	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					PHYTOPLANKTON--Continued						
PYRRHOPHYTA (FIRE ALGAE)		--	--	--	--	--	--	--	--	--	--
.DINOPHYCEAE		--	--	--	--	--	--	--	--	--	--
..PERIDINIALES		--	--	--	--	--	--	--	--	--	--
...CERATIACEAE		--	--	--	--	--	--	--	--	--	--
....CERATIUM		--	--	--	--	--	--	--	--	--	--
					ZOOPLANKTON						
ARTHROPODA (ARTHROPODS)											
.CRUSTACEA											
..CALANOIDA											
...DIAPTOMIDAE											
....DIAPTOMUS		5	<1	15	<1	13	2	14	17	7	<1
..CLADOCERA											
...CHYDORIDAE		23	2	25	1	--	--	23	28	1	<1
...BOSMINIDAE		--	--	--	--	--	--	--	--	--	--
....BOSMINA		--	--	--	--	--	--	--	--	--	--
...CHYDORIDAE		--	--	--	--	--	--	--	--	--	--
...DAPHNIDAE											
....DAPHNIA		4	<1	13	<1	5	<1	2	3	--	--
..CYCLOPOIDA											
...CYCLOPIDAE											
....CYCLOPS		2	<1	4	<1	1	<1	--	--	--	--
....TROPOCYCLOPS		1	<1	--	--	--	--	--	--	--	--
....MESOCYCLOPS		--	--	--	--	--	--	--	--	--	--
ROTIFERA (ROTIFERS)											
.MONOGONONTA											
..FLOSCULARIACEAE											
...TESTUDINELLIDAE											
....FILINIA		--	--	--	--	--	--	--	--	84	<1
..PLOIMA											
...BRACHIONIDAE											
...ASPLANCHNIDAE		--	--	--	--	--	--	--	--	--	--
....ASPLANCHNA		--	--	--	--	--	--	--	--	--	--
...BRACHIONIDAE		--	--	--	--	--	--	--	--	--	--
....KELLICOTTIA		--	--	--	--	--	--	--	--	--	--
....KERATELLA		--	--	1	<1	2	<1	1	2	37	<1
...SYNCHAETIDAE											
....SYNCHAETA		--	--	--	--	--	--	--	--	2	<1

Date		May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time		1610		1200		1120		1148	
Total cells per mL		1376		*		*		6147	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
				PHYTOPLANKTON					
CHLOROPHYTA (GREEN ALGAE)									
.CHLOROPHYCEAE									
..CHLOROCOCCALES									
...COELASTRACEAE									
....COELASTRUM									
...OOCYSTACEAE									
....CLOSTERIOPSIS		--	--	--	--	--	--	--	--
....ANKISTRODESMUS		22	2	--	--	150	5	--	--
....OOCYSTIS		--	--	72	5	31	<1	160	3
...SCENEDESMACEAE									
....SCENEDESMUS		11	<1	--	--	--	--	--	--
..TETRASPORALES									
...PALMELLACEAE									
....SPHAEROCYSTIS		--	--	--	--	62	2	--	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE)									
.BACILLARIOPHYCEAE									
..CENTRALES									
...COSCINODISCACEAE									
....CYCLOTELLA		--	--	--	--	--	--	--	--
....MELOSIRA		--	--	36	2	190	6	680	11
....STEPHANODISCUS		440	31	--	--	--	--	--	--
..PENNALES									
...ACHNANTHACEAE									
....COCCONEIS		--	--	--	--	--	--	52	<1
...CYMBELLACEAE		--	--	--	--	--	--	--	--
....CYMBELLA		--	--	--	--	--	--	--	--
...FRAGILARIACEAE									
....ASTERIONELLA		150	11	--	--	--	--	--	--
....FRAGILARIA		56	4	1400	88	--	--	--	--
....SYNEDRA		44	3	--	--	31	<1	110	2
...NITZSCHIACEAE									
....NITZSCHIA		11	<1	--	--	31	<1	--	--
.CHRYSOPHYCEAE									
..CHROMULINALES									
...CHROMULINACEAE									
....CHRYSOCOCCUS		11	<1	--	--	--	--	--	--
...MALLOMONADACEAE									
....MALLOMONAS		11	<1	--	--	--	--	--	--
...OCHROMONADACEAE									
....DINOBRYON		22	2	--	--	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)									
.CYANOPHYCEAE									
..CHROOCOCCALES									
...CHROOCOCCACEAE									
....ANACYSTIS		--	--	--	--	--	--	110	2
..OSCILLATORIALES									
...NOSTOCACEAE									
....ANABAENA		--	--	--	--	190	6	1200	20
....APHANIZOMENON		--	--	18	1	990	30	3400	56
EUGLENOPHYTA (EUGLENOIDS)									
.CRYPTOPHYCEAE									
..CRYPTOMONIDALES									
...CRYPTOCHRYSIDACEAE									
....RHODOMONAS		490	35	18	1	1200	36	110	2
...CRYPTOMONODACEAE									
....CRYPTOMONAS		22	2	--	--	340	10	52	<1

Date	May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time	1610		1200		1120		1148	
Total cells per mL	1376		*		*		6147	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
			PHYTOPLANKTON--Continued					
PYRRHOPHYTA (FIRE ALGAE)								
.DINOPHYCEAE								
..PERIDINIALES								
...CERATIACEAE								
....CERATIUM	--	--	36	2	62	2	110	2
			ZOOPLANKTON					
ARTHROPODA (ARTHROPODS)								
.CRUSTACEA								
..CALANOIDA								
...DIAPTOMIDAE								
....DIAPTOMUS	6	<1	*		*		18	<1
..CLADOCERA								
...CHYDORIDAE	--	--	*		*		--	--
...BOSMINIDAE								
....BOSMINA	5	<1	*		*		--	--
...CHYDORIDAE	4	<1	*		*		110	2
...DAPHNIDAE								
....DAPHNIA	5	<1	*		*		7	<1
..CYCLOPOIDA								
...CYCLOPIDAE								
....CYCLOPS	3	<1	*		*		4	<1
....TROPOCYCLOPS	--	--	*		*		--	--
....MESOCYCLOPS	--	--	*		*		5	<1
ROTIFERA (ROTIFERS)								
.MONOGONONTA								
..FLOSCULARIACEAE								
...TESTUDINELLIDAE								
....FILINIA	5	<1	*		*		2	<1
..PLOIMA								
...BRACHIONIDAE	--	--	*		*		--	--
...ASPLANCHNIDAE								
....ASPLANCHNA	1	<1	*		*		--	--
...BRACHIONIDAE								
....KELLICOTTIA	5	<1	*		*		--	--
....KERATELLA	50	4	*		*		17	<1
...SYNCHAETIDAE								
....SYNCHAETA	2	<1	*		*		--	--

[1]Headings in the organism column represent the following levels in the classification of plankton:

Phylum
.Class
..Order
...Family
....Genus

*Zooplankton counts not available

Table 21.--*Plankton data for*

[Cell counts are reported only for genus. See footnote 1 for explanation of

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 12, 1989		Feb. 16, 1989		Apr. 26, 1989	
Time		1330		1030		1110		1640		1255	
Total cells per mL		1941		1807		507		700		22637	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					PHYTOPLANKTON						
CHLOROPHYTA (GREEN ALGAE)											
.CHLOROPHYCEAE											
..CHLOROCOCCALES											
...OOCYSTACEAE											
....ANKISTRODESMUS		19	1	--	--	19	4	22	3	190	<1
....CLOSTERIOPSIS		38	2	--	--	38	7	--	--	--	--
....OOCYSTIS		--	--	--	--	--	--	--	--	--	--
....QUADRIGULA		--	--	--	--	--	--	--	--	--	--
..TETRASPORALES											
...PALMELLACEAE											
....SPHAEROCYSTIS		--	--	13	<1	1	<1	--	--	--	--
..VOLVOCALES		--	--	--	--	--	--	--	--	--	--
...CHLAMYDOMONADACEAE		--	--	--	--	--	--	--	--	--	--
....CHLAMYDOMONAS		--	--	--	--	--	--	--	--	--	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE											
.BACILLARIOPHYCEAE											
..CENTRALES											
...COSCINODISCACEAE											
....CYCLOTELLA		--	--	--	--	--	--	--	--	--	--
....MELOSIRA		19	1	40	2	19	4	--	--	--	--
....STEPHANODISCUS		270	14	1300	72	270	53	370	53	19000	83
..PENNALES											
...ACHNANTHACEAE											
....ACHNANTHES		--	--	--	--	1	<1	--	--	--	--
....COCCONEIS		--	--	--	--	--	--	--	--	--	--
...FRAGILARIACEAE											
....ASTERIONELLA		--	--	--	--	7	2	1	<1	--	--
....FRAGILARIA		--	--	--	--	--	--	--	--	--	--
....SYNEDRA		--	--	120	7	--	--	22	3	2600	11
...NAVICULACEAE		--	--	--	--	--	--	--	--	--	--
....NAVICULA		--	--	--	--	--	--	--	--	--	--
...NITZSCHIACEAE											
....NITZSCHIA		--	--	--	--	--	--	22	3	190	<1
.CHRYSOPHYCEAE		--	--	--	--	--	--	--	--	--	--
..CHROMULINALES		--	--	--	--	--	--	--	--	--	--
...CHROMULINACEAE		--	--	--	--	--	--	--	--	--	--
....CHRYSOCOCCUS		--	--	--	--	--	--	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)											
.CYANOPHYCEAE											
..CHROOCOCCALES		--	--	--	--	--	--	--	--	--	--
...CHROOCOCCACEAE		--	--	--	--	--	--	--	--	--	--
....ANACYSTIS		--	--	--	--	--	--	--	--	--	--
..OSCILLATORIALES											
...NOSTOCACEAE											
....ANABAENA		--	--	13	<1	19	4	110	16	--	--
....APHANIZOMENON		1300	68	190	11	17	3	8	1	--	--
EUGLENOPHYTA (EUGLENOIDS)											
.CRYPTOPHYCEAE											
..CRYPTOMONIDALES											
...CRYPTOCHRYSIDACEAE											
....RHODOMONAS		96	5	66	4	19	4	4	<1	560	2
...CRYPTOMONODACEAE											
....CRYPTOMONAS		57	3	--	--	5	1	1	<1	--	--

Sauk Lake-Site 7

headings in the organism column; mL, milliliter; --, not found; <, less than]

Date	Sept. 27, 1988		Nov. 03, 1988		Jan. 12, 1989		Feb. 16, 1989		Apr. 26, 1989	
Time	1330		1030		1110		1640		1255	
Total cells per mL	1941		1807		507		700		22637	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
PHYTOPLANKTON										
PYRRHOPHYTA (FIRE ALGAE)										
.DINOPHYCEAE										
..DINOKONTAE										
..PERIDINIALES	--	--	--	--	--	--	--	--	--	--
...CERATIACEAE										
....CERATIUM	57	3	--	--	57	11	22	3	--	--
...PERIDINIACEAE										
....PERIDINIUM										
ZOOPLANKTON										
ARTHROPODA (ARTHROPODS)										
.CRUSTACEA										
..CALANOIDA										
...DIAPTOMIDAE										
....DIAPTOMUS	20	1	22	1	26	5	100	14	10	<1
..CLADOCERA										
...BOSMINIDAE	--	--	--	--	--	--	--	--	--	--
....BOSMINA	--	--	--	--	--	--	--	--	--	--
...CHYDORIDAE	60	3	24	1	--	--	--	--	--	--
...DAPHNIDAE										
....DAPHNIA	--	--	15	<1	5	1	2	<1	--	--
...SIDIDAE	--	--	--	--	--	--	--	--	--	--
....DIAPHANOSOMA	--	--	--	--	--	--	--	--	--	--
..CYCLOPOIDA										
...CYCLOPIDAE										
....CYCLOPS	5	<1	2	<1	--	--	4	<1	2	<1
....MESOCYCLOPS	--	--	--	--	--	--	--	--	--	--
ROTIFERA (ROTIFERS)										
.MONOGONONTA										
..FLOSCULARIACEAE										
...TESTUDINELLIDAE										
....FILINIA	--	--	--	--	--	--	2	<1	54	<1
..PLOIMA										
...BRACHIONIDAE										
....KELLICOTTIA	--	--	--	--	--	--	--	--	--	--
....KERATELLA	--	--	2	<1	4	<1	10	1	31	<1

Table 21.--*Plankton data for*

Date		May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time		1730		1055		0950		1012	
Total cells per mL		1586		1004		2655		7858	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
				PHYTOPLANKTON					
CHLOROPHYTA (GREEN ALGAE)									
.CHLOROPHYCEAE									
..CHLOROCOCCALES									
...OOCYSTACEAE									
....ANKISTRODESMUS		15	<1	10	1	--	--	68	<1
....CLOSTERIOPSIS		--	--	--	--	--	--	68	<1
....OOCYSTIS		15	<1	10	1	130	5	68	<1
....QUADRIGULA		--	--	--	--	26	<1	--	--
..TETRASPORALES									
...PALMELLACEAE									
....SPHAEROCYSTIS		--	--	10	1	79	3	68	<1
..VOLVOCALES									
...CHLAMYDOMONADACEAE									
....CHLAMYDOMONAS		--	--	--	--	26	<1	--	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE									
.BACILLARIOPHYCEAE									
..CENTRALES									
...COSCINODISCACEAE									
....CYCLOTELLA		--	--	--	--	26	<1	--	--
....MELOSIRA		--	--	50	5	260	10	820	10
....STEPHANODISCUS		170	11	20	2	--	--	--	--
..PENNALES									
...ACHNANTHACEAE									
....ACHNANTHES									
....COCCONEIS		--	--	--	--	--	--	68	<1
...FRAGILARIACEAE									
....ASTERIONELLA		180	11	30	3	--	--	--	--
....FRAGILARIA		--	--	760	76	--	--	--	--
....SYNEDRA		46	3	--	--	--	--	--	--
...NAVICULACEAE									
....NAVICULA		15	<1	--	--	--	--	--	--
...NITZSCHIACEAE									
....NITZSCHIA		15	<1	--	--	26	<1	--	--
.CHRYSOPHYCEAE									
..CHROMULINALES									
...CHROMULINACEAE									
....CHRYSOCOCCUS		15	<1	--	--	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)									
.CYANOPHYCEAE									
..CHROOCOCCALES									
...CHROOCOCCACEAE		--	--	10	1	79	3	--	--
....ANACYSTIS		--	--	--	--	52	2	68	<1
..OSCILLATORIALES									
...NOSTOCACEAE									
....ANABAENA		--	--	--	--	260	10	1000	13
....APHANIZOMENON		--	--	--	--	1200	44	5200	66
EUGLENOPHYTA (EUGLENOIDS)									
.CRYPTOPHYCEAE									
..CRYPTOMONIDALES									
...CRYPTOCHRYSIDACEAE									
....RHODOMONAS		680	43	50	5	290	11	68	<1
...CRYPTOMONODACEAE									
....CRYPTOMONAS		380	24	10	1	130	5	270	3

Sauk Lake-Site 7--Continued

Date	May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time	1730		1055		0950		1012	
Total cells per mL	1586		1004		2655		7858	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
PHYTOPLANKTON								
PYRRHOPHYTA (FIRE ALGAE)								
.DINOPHYCEAE								
..DINOKONTAE	--	--	--	--	--	--	--	--
..PERIDINIALES								
...CERATIACEAE								
....CERATIUM	--	--	30	3	--	--	--	--
...PERIDINIACEAE								
....PERIDINIUM	--	--	--	--	26	<1	--	--
ZOOPLANKTON								
ARTHROPODA (ARTHROPODS)								
.CRUSTACEA								
..CALANOIDA								
...DIAPTOMIDAE								
....DIAPTOMUS	4	<1	8	<1	17	<1	10	<1
..CLADOCERA								
...BOSMINIDAE								
....BOSMINA	6	<1	--	--	--	--	--	--
...CHYDORIDAE	4	<1	--	--	9	<1	56	<1
...DAPHNIDAE								
....DAPHNIA	1	<1	4	<1	1	<1	8	<1
...SIDIDAE								
....DIAPHANOSOMA	--	--	--	--	1	<1	1	<1
..CYCLOPOIDA								
...CYCLOPIDAE								
....CYCLOPS	2	<1	--	--	6	<1	3	<1
....MESOCYCLOPS	--	--	--	--	2	<1	2	<1
ROTIFERA (ROTIFERS)								
.MONOGONONTA								
..FLOSCULARIACEAE								
...TESTUDINELLIDAE								
....FILINIA	--	--	--	--	1	<1	3	<1
..PLOIMA								
...BRACHIONIDAE								
....KELLICOTTIA	8	<1	--	--	2	<1	--	--
....KERATELLA	30	2	2	<1	6	<1	9	<1

[1]Headings in the organism column represents the following levels in the classification of plankton:

Phylum
.Class
..Order
...Family
....Genus

Table 22.--*Plankton data for*

[Cell counts are reported only for genus. See footnote 1 for explanation of

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 13, 1989		Feb. 14, 1989		Apr. 26, 1989	
Time		1030		1715		1010		1600		0925	
Total cells per mL		1871		1610		109		434		21849	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					PHYTOPLANKTON						
CHLOROPHYTA (GREEN ALGAE)											
.CHLOROPHYCEAE											
..CHLOROCOCCALES											
...COELASTRACEAE											
....COELASTRUM	--	--	--	--	--	--	14	3	--	--	
...OOCYSTACEAE											
....ANKISTRODESMUS	99	5	62	4	2	2	99	23	230	1	
....OOCYSTIS	14	<1	--	--	--	--	14	3	--	--	
....QUADRIGULA	--	--	--	--	--	--	--	--	--	--	
....SELENASTRUM	--	--	87	5	--	--	--	--	--	--	
...SCENEDESMACEAE											
....CRUCIGENIA	28	1	--	--	--	--	28	6	--	--	
....SCENEDESMUS	14	<1	37	2	--	--	28	6	--	--	
..TETRASPORALES											
...PALMELLACEAE											
....SPHAEROCYSTIS	--	--	--	--	--	--	1	<1	--	--	
..VOLVOCALES	--	--	--	--	--	--	--	--	--	--	
...CHLAMYDOMONADACEAE	--	--	--	--	--	--	--	--	--	--	
....CHLAMYDOMONAS	--	--	--	--	--	--	--	--	--	--	
CHRYSOPHYTA (YELLOW-GREEN ALGAE)											
.BACILLARIOPHYCEAE											
..CENTRALES											
...COSCINODISCACEAE											
....CYCLOTELLA	70	4	--	--	2	2	70	16	450	2	
....MELOSIRA	230	12	62	4	--	--	28	6	230	1	
....STEPHANODISCUS	380	20	330	21	7	7	28	6	18000	82	
..PENNALES											
...ACHNANTHACEAE											
....ACHNANTHES	--	--	12	<1	4	4	2	<1	--	--	
....COCCONEIS	--	--	12	<1	2	2	--	--	--	--	
....RHOICOSPHENIA	--	--	--	--	--	--	1	<1	--	--	
...CYMBELLACEAE											
....CYMBELLA	--	--	--	--	2	2	--	--	--	--	
...FRAGILARIACEAE											
....ASTERIONELLA	--	--	--	--	--	--	--	--	450	2	
....FRAGILARIA	--	--	36	2	3	3	--	--	680	3	
....SYNEDRA	--	--	24	2	--	--	--	--	230	1	
...GOMPHONEMATACEAE											
....GOMPHONEMA	--	--	12	<1	--	--	--	--	--	--	
...NAVICULACEAE											
....NAVICULA	--	--	12	<1	--	--	--	--	--	--	
...NITZSCHIACEAE											
....NITZSCHIA	14	<1	12	<1	--	--	14	3	450	2	
.CHRYSOPHYCEAE											
..CHROMULINALES											
...CHROMULINACEAE											
...OCHROMONADACEAE	--	--	--	--	--	--	--	--	--	--	
....CHRYSOCOCCUS	--	--	25	2	--	--	--	--	--	--	
....DINOBRYON	--	--	--	--	--	--	--	--	--	--	

Sauk Lake-Site 10

headings in the organism column; mL, milliliter; --, not found; <, less than]

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 13, 1989		Feb. 14, 1989		Apr. 26, 1989	
Time		1030		1715		1010		1600		0925	
Total cells per mL		1871		1610		109		434		21849	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					PHYTOPLANKTON						
CYANOPHYTA (BLUE-GREEN ALGAE)											
.CYANOPHYCEAE											
..CHROOCOCCALES		--	--	--	--	--	--	--	--	--	--
...CHROOCOCCACEAE		--	--	--	--	--	--	--	--	--	--
....ANACYSTIS		--	--	--	--	--	--	--	--	--	--
..OSCILLATORIALES											
...NOSTOCACEAE											
....ANABAENA		28	1	--	--	--	--	28	6	--	--
....APHANIZOMENON		350	18	25	2	14	13	9	2	--	--
EUGLENOPHYTA (EUGLENOIDS)											
.CRYPTOPHYCEAE											
..CRYPTOMONIDALES											
...CRYPTOCHRYSIDACEAE											
....RHODOMONAS		14	<1	760	48	--	--	29	7	1100	5
...CRYPTOMONODACEAE											
....CRYPTOMONAS		270	14	50	3	14	13	3	<1	--	--
PYRRHOPHYTA (FIRE ALGAE)		--	--	--	--	--	--	--	--	--	--
.DINOPHYCEAE		--	--	--	--	--	--	--	--	--	--
..PERIDINIALES		--	--	--	--	--	--	--	--	--	--
...PERIDINIACEAE		--	--	--	--	--	--	--	--	--	--
....PERIDINIUM		--	--	--	--	--	--	--	--	--	--
					ZOOPLANKTON						
ARTHROPODA (ARTHROPODS)											
.CRUSTACEA											
..CALANOIDA											
...DIAPTOMIDAE											
....DIAPTOMUS		2	<1	1	<1	50	45	10	2	6	<1
..CLADOCERA		--	--	--	--	--	--	--	--	--	--
...BOSMINIDAE											
....BOSMINA		8	<1	10	<1	--	--	8	2	--	--
...CHYDORIDAE		310	16	9	<1	--	--	--	--	--	--
...DAPHNIDAE											
....CERIODAPHNIA		11	<1	--	--	--	--	11	3	--	--
....DAPHNIA		16	<1	1	<1	3	3	--	--	--	--
..CYCLOPOIDA											
...CYCLOPIDAE											
....CYCLOPS		8	<1	--	--	--	--	--	--	--	--
....MESOCYCLOPS		3	<1	--	--	--	--	3	<1	--	--
....TROPOCYCLOPS		2	<1	--	--	--	--	2	<1	--	--

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 13, 1989		Feb. 14, 1989		Apr. 26, 1989	
Time		1030		1715		1010		1600		0925	
Total cells per mL		1871		1610		109		434		21849	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					ZOOPLANKTON--Continued						
ROTIFERA (ROTIFERS)											
.MONOGONONTA											
..FLOSCULARIACEAE											
...TESTUDINELLIDAE											
....FILINIA		--	--	--	--	--	--	--	--	14	<1
..PLOIMA											
...ASPLANCHNIDAE											
....ASPLANCHNA		--	--	--	--	4	4	--	--	--	--
...BRACHIONIDAE											
....KELLICOTTIA		--	--	--	--	--	--	--	--	2	<1
....KERATELLA		--	--	20	1	2	3	4	<1	7	<1
...SYNCHAETIDAE											
....POLYARTHRA		--	--	11	<1	--	--	--	--	--	--
....SYNCHAETA		--	--	--	--	--	--	--	--	--	--

Date	May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time	1830		1500		1420		1500	
Total cells per mL	1800		700		5900		7800	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
			PHYTOPLANKTON					
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...COELASTRACEAE	--	--	--	--	--	--	--	--
....COELASTRUM	--	--	--	--	--	--	--	--
...OOCYSTACEAE								
....ANKISTRODESMUS	57	3	25	4	120	2	66	<1
....OOCYSTIS	28	2	--	--	300	5	66	<1
....QUADRIGULA	28	2	8	1	--	--	--	--
....SELENASTRUM	--	--	--	--	59	1	--	--
...SCENEDESMACEAE								
....CRUCIGENIA	--	--	--	--	--	--	--	--
....SCENEDESMUS	--	--	25	4	--	--	--	--
..TETRASPORALES								
...PALMELLACEAE								
....SPHAEROCYSTIS	14	<1	8	1	--	--	--	--
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	--	8	1	240	4	130	2
...VOLVOCACEAE	--	--	--	--	--	--	--	--
....EUDORINA	--	--	--	--	--	--	66	<1
CHRYSOPHYTA (YELLOW-GREEN ALGAE)								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	14	<1	17	2	--	--	--	--
....MELOSIRA	42	2	50	7	1900	32	800	10
....STEPHANODISCUS	260	14	220	32	--	--	--	--
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	--	8	1	--	--	--	--
....COCCONEIS	--	--	8	1	--	--	--	--
....RHOICOSPHENIA	--	--	--	--	--	--	--	--
...CYMBELLACEAE	--	--	--	--	--	--	--	--
....CYMBELLA	--	--	--	--	--	--	--	--
...FRAGILARIACEAE								
....ASTERIONELLA	140	8	--	--	--	--	--	--
....FRAGILARIA	14	<1	110	16	--	--	66	<1
....SYNEDRA	--	--	--	--	59	1	--	--
...GOMPHONEMATACEAE								
....GOMPHONEMA	14	<1	25	4	59	1	--	--
...NAVICULACEAE	--	--	--	--	--	--	--	--
....NAVICULA	--	--	--	--	--	--	--	--
...NITZSCHIACEAE								
....NITZSCHIA	28	2	50	7	--	--	--	--
.CHRYSOPHYCEAE								
..CHROMULINALES								
...CHROMULINACEAE	--	--	--	--	--	--	--	--
...OCHROMONADACEAE								
....CHRYSOCOCCUS	--	--	--	--	--	--	--	--
....DINOBRYON	280	16	--	--	--	--	--	--

Table 22.--*Plankton data for*

Date	May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time	1830		1500		1420		1500	
Total cells per mL	1800		700		5900		7800	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
			PHYTOPLANKTON					
CYANOPHYTA (BLUE-GREEN ALGAE)								
.CYANOPHYCEAE								
..CHROOCOCCALES								
...CHROOCOCCACEAE	--	--	8	1	--	--	--	--
....ANACYSTIS	--	--	--	--	59	1	--	--
..OSCILLATORIALES								
...NOSTOCACEAE								
....ANABAENA	--	--	33	5	590	10	730	9
....APHANIZOMENON	14	<1	--	--	770	13	5100	65
EUGLENOPHYTA (EUGLENOIDS)								
.CRYPTOPHYCEAE								
..CRYPTOMONIDALES								
...CRYPTOCHRYSIDACEAE								
....RHODOMONAS	340	19	25	4	770	13	66	<1
...CRYPTOMONODACEAE								
....CRYPTOMONAS	200	11	8	1	890	15	130	2
PYRRHOPHYTA (FIRE ALGAE)								
.DINOPHYCEAE								
..DINOKONTAE								
...CERATIACEAE								
....CERATIUM	--	--	--	--	--	--	332	4
..PERIDINIALES								
...PERIDINIACEAE								
....PERIDINIUM	--	--	--	--	59	1	--	--
			ZOOPLANKTON					
ARTHROPODA (ARTHROPODS)								
.CRUSTACEA								
..CALANOIDA								
...DIAPTOMIDAE								
....DIAPTOMUS	8	<1	--	--	5	<1	17	<1
..CLADOCERA								
...BOSMINIDAE								
....BOSMINA	160	9	--	--	--	--		
...CHYDORIDAE	22	1	20	3	4	<1	72	<1
...DAPHNIDAE								
....CERIODAPHNIA	3	<1	2	<1	--	--	6	<1
....DAPHNIA	7	<1	1	<1	10	<1	59	<1
..CYCLOPOIDA								
...CYCLOPIDAE								
....CYCLOPS	26	1	7	1	--	--	2	<1
....MESOCYCLOPS	--	--	--	--	2	<1	9	<1
....TROPOCYCLOPS	--	--	--	--	--	--	4	<1

Date	May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time	1830		1500		1420		1500	
Total cells per mL	1809		700		5900		7800	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
			ZOOPLANKTON--Continued					
ROTIFERA (ROTIFERS)								
.MONOGONONTA								
..FLOSCULARIACEAE								
...TESTUDINELLIDAE								
....FILINIA	--	--	--	--	2	<1	18	<1
..PLOIMA								
...ASPLANCHNIDAE								
....ASPLANCHNA	8	<1	13	2	--	--	--	--
...BRACHIONIDAE								
....KELLICOTTIA	8	<1	--	--	--	--	--	--
....KERATELLA	65	4	2	<1	9	<1	12	<1
...SYNCHAETIDAE								
....POLYARTHRA	3	<1	--	--	--	--	--	--
....SYNCHAETA	--	--	2	<1	--	--	--	--

[1]Headings in the organism column represent the following levels in the classification of plankton:

Phylum
.Class
..Order
...Family
....Genus

Table 23.--*Plankton data for*

[Cell counts are reported only for Genus. See footnote 1 for explanation of

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 18, 1989		Feb. 15, 1989		Apr. 26, 1989	
Time		0930		1430		1430		1600		1025	
Total cells per mL		2819		5117		277		98		28241	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					PHYTOPLANKTON						
CHLOROPHYTA (GREEN ALGAE)											
.CHLOROPHYCEAE											
..CHLOROCOCCALES											
...CHLOROCOCCACEAE											
....TETRAEDRON		25	<1	--	--	--	--	--	--	--	--
...OOCYSTACEAE											
....ANKISTRODESMUS		250	9	380	7	8	3	--	--	230	<1
....CLOSTERIOPSIS		--	--	--	--	--	--	--	--	--	--
....OOCYSTIS		50	2	--	--	--	--	--	--	--	--
....SELENASTRUM		75	3	230	5	--	--	--	--	--	--
...SCENEDESMACEAE											
....CRUCIGENIA		--	--	--	--	--	--	--	--	--	--
....SCENEDESMUS		150	5	47	<1	8	3	--	--	--	--
..TETRASPORALES											
...PALMELLACEAE											
....SPHAEROCYSTIS		25	<1	--	--	--	--	--	--	--	--
..VOLVOCALES		--	--	--	--	--	--	--	--	--	--
...CHLAMYDOMONADACEAE		--	--	--	--	--	--	--	--	--	--
....CHLAMYDOMONAS		--	--	--	--	--	--	--	--	--	--
CHRYSOPHYTA (YELLOW-GREEN ALGAE)											
.BACILLARIOPHYCEAE											
..CENTRALES											
...COSCINODISCACEAE											
....CYCLOTELLA		200	7	280	5	8	3	--	--	--	--
....MELOSIRA		450	16	47	<1	12	4	--	--	--	--
....STEPHANODISCUS		650	23	2200	43	32	11	--	--	25000	89
..PENNALES											
...ACHNANTHACEAE											
....ACHNANTHES		--	--	--	--	4	2	3	4	230	<1
....COCCONEIS		50	2	--	--	31	11	--	--	--	--
....RHOICOSPHENIA		--	--	--	--	4	2	--	--	--	--
...CYMBELLACEAE											
....CYMBELLA		--	--	--	--	8	3	--	--	--	--
....EPITHEMIA		--	--	--	--	4	2	--	--	--	--
...FRAGILARIACEAE											
....ASTERIONELLA		--	--	--	--	4	2	--	--	450	2
....FRAGILARIA		25	<1	--	--	8	3	--	--	680	2
....SYNEDRA		--	--	47	<1	8	3	--	--	--	--
...GOMPHONEMATACEAE											
....GOMPHONEMA		--	--	--	--	12	4	--	--	230	<1
...NAVICULACEAE											
....NAVICULA		--	--	47	<1	--	--	--	--	230	<1
....PINNULARIA		--	--	--	--	4	2	--	--	--	--
...NITZSCHIACEAE											
....NITZSCHIA		--	--	--	--	8	3	--	--	680	2
...SURIRELLACEAE											
....SURIRELLA		--	--	--	--	--	--	--	--	230	<1
.CHRYSOPHYCEAE											
..CHROMULINALES											
...CHROMULINACEAE											
....CHRYSOCOCCUS		--	--	47	<1	--	--	--	--	--	--
...MALLOMONADACEAE											
....MALLOMONAS		--	--	--	--	--	--	--	--	--	--
...OCHROMONADACEAE		--	--	--	--	--	--	--	--	--	--
....DINOBRYON		--	--	--	--	--	--	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)											

headings in ths Organism column; mL, milliliter; --, not found; <, less than]

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 18, 1989		Feb. 15, 1989		Apr. 26, 1989	
Time		0930		1430		1430		1600		1025	
Total cells per mL		2819		5117		277		98		28241	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					PHYTOPLANKTON--Continued						
.CYANOPHYCEAE											
..CHROOCOCCALES											
...CHROOCOCCACEAE											
....ANACYSTIS											
..OSCILLATORIALES											
...NOSTOCACEAE											
....ANABAENA		130	5	--	--	--	--	--	--	--	--
....APHANIZOMENON		130	5	47	<1	8	3	2	3	--	--
EUGLENOPHYTA (EUGLENOIDS)											
.CRYPTOPHYCEAE											
..CRYPTOMONIDALES											
...CRYPTOCHRYSIDACEAE											
....RHODOMONAS		25	<1	1500	29	82	28	55	55	230	<1
...CRYPTOMONODACEAE											
....CRYPTOMONAS		320	11	230	5	4	2	7	8	--	--
.EUGLENOPHYCEAE											
..EUGLENALES											
...EUGLENACEAE											
....EUGLENA											
....TRACHELOMONAS		--	--	--	--	--	--	1	2	--	--
PYRRHOPHYTA (FIRE ALGAE)											
.DINOPHYCEAE											
..DINOKONTAE											
...GYMNODINIACEAE											
....GYMNODINIUM											
..PERIDINIALES											
...CERATIACEAE											
....CERATIUM		25	<1	--	--	--	--	--	--	--	--
...PERIDINIACEAE											
....PERIDINIUM											

Table 23.--*Plankton data for*

Date		Sept. 27, 1988		Nov. 03, 1988		Jan. 18, 1989		Feb. 15, 1989		Apr. 26, 1989	
Time		0930		1430		1430		1600		1025	
Total cells per mL		2819		5117		277		98		28241	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
					ZOOPLANKTON						
ARTHROPODA (ARTHROPODS)											
.CRUSTACEA											
..CALANOIDA											
...DIAPTOMIDAE											
....DIAPTOMUS	4	<1	4	<1	11	4	11	11	1	<1	
..CLADOCERA											
...BOSMINIDAE											
....BOSMINA	15	<1	2	<1	--	--	--	--	--	--	
...CHYDORIDAE	190	7	3	<1	--	--	--	--	9	<1	
...DAPHNIDAE											
....CERIODAPHNIA	13	<1	--	--	--	--	13	13	--	--	
....DAPHNIA	9	<1	5	<1	3	1	--	--	--	--	
...SIDIDAE	--	--	--	--	--	--	--	--	--	--	
....DIAPHANOSOMA	--	--	--	--	--	--	--	--	--	--	
..CYCLOPOIDA											
...CYCLOPIDAE											
....CYCLOPS	2	<1	--	--	--	--	--	--	--	--	
....MESOCYCLOPS	1	<1	--	--	--	--	1	2	--	--	
....TROPOCYCLOPS	2	<1	--	--	--	--	2	3	--	--	
ROTIFERA (ROTIFERS)											
.MONOGONONTA											
..FLOSCULARIACEAE											
...TESTUDINELLIDAE											
....FILINIA	--	--	--	--	--	--	31	<1	--	--	
..PLOIMA											
...ASPLANCHNIDAE											
....ASPLANCHNA	--	--	1	<1	--	--	--	--	--	--	
...BRACHIONIDAE											
....KELLICOTTIA	--	--	--	--	--	--	--	--	--	--	
....KERATELLA	--	--	1	<1	5	2	3	3	8	<1	
...SYNCHAETIDAE											
....POLYARTHRA	3	<1	--	--	--	--	--	--	--	--	
....SYNCHAETA	--	--	--	--	--	--	2	<1	--	--	

Date	May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time	1920		1545		1500		1533	
Total cells per mL	5604		963		6428		5285	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
			PHYTOPLANKTON					
CHLOROPHYTA (GREEN ALGAE)								
.CHLOROPHYCEAE								
..CHLOROCOCCALES								
...CHLOROCOCCACEAE	--	--	--	--	--	--	--	--
....TETRAEDRON	--	--	--	--	--	--	--	--
...OOCYSTACEAE								
....ANKISTRODESMUS	450	8	--	--	400	6	--	--
....CLOSTERIOPSIS	--	--	--	--	--	--	42	<1
....OOCYSTIS	45	<1	--	--	660	10	290	5
....SELENASTRUM	180	3	--	--	130	2	84	2
...SCENEDESMACEAE								
....CRUCIGENIA	--	--	--	--	--	--	84	2
....SCENEDESMUS	--	--	--	--	270	4	210	4
..TETRASPORALES								
...PALMELLACEAE								
....SPHAEROCYSTIS	--	--	--	--	66	1	130	2
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	--	34	4	930	15	42	<1
CHRYSOPHYTA (YELLOW-GREEN ALGAE)								
.BACILLARIOPHYCEAE								
..CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	90	2	--	--	--	--	--	--
....MELOSIRA	90	2	34	4	930	15	1500	28
....STEPHANODISCUS	1100	20	34	4	--	--	--	--
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	--	--	--	--	--	--	--
....COCCONEIS	--	--	34	4	--	--	42	<1
....RHOICOSPHENIA	--	--	34	4	--	--	--	--
...CYMBELLACEAE								
....CYMBELLA	--	--	34	4	--	--	--	--
....EPITHEMIA	--	--	--	--	--	--	--	--
...FRAGILARIACEAE								
....ASTERIONELLA	45	<1	--	--	--	--	--	--
....FRAGILARIA	--	--	34	4	--	--	--	--
....SYNEDRA	45	<1	--	--	--	--	--	--
...GOMPHONEMATACEAE								
....GOMPHONEMA	--	--	34	4	66	1	42	<1
...NAVICULACEAE	--	--	--	--	--	--	--	--
....NAVICULA	--	--	--	--	--	--	--	--
....PINNULARIA	--	--	--	--	--	--	--	--
...NITZSCHIACEAE	--	--	--	--	--	--	--	--
....NITZSCHIA	--	--	--	--	--	--	--	--
...SURIRELLACEAE	--	--	--	--	--	--	--	--
....SURIRELLA	--	--	--	--	--	--	--	--
.CHRYSOPHYCEAE								
..CHROMULINALES								
...CHROMULINACEAE	--	--	--	--	--	--	--	--
....CHRYSOCOCCUS	--	--	--	--	--	--	--	--
...MALLOMONADACEAE								
....MALLOMONAS	90	2	--	--	--	--	--	--
...OCHROMONADACEAE								
....DINOBRYON	130	2	--	--	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)								

Table 23.--*Plankton data for*

Date		May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time		1920		1545		1500		1533	
Total cells per mL		5604		963		6428		5285	
Organism[1]		Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
				PHYTOPLANKTON--Continued					
.CYANOPHYCEAE									
..CHROOCOCCALES									
...CHROOCOCCACEAE									
....ANACYSTIS		--	--	--	--	--	--	330	6
..OSCILLATORIALES									
...NOSTOCACEAE									
....ANABAENA		--	--	--	--	730	11	170	3
....APHANIZOMENON		--	--	--	--	460	7	1400	26
EUGLENOPHYTA (EUGLENOIDS)									
.CRYPTOPHYCEAE									
..CRYPTOMONIDALES									
...CRYPTOCHRYSIDACEAE									
....RHODOMONAS		2200	39	170	18	860	13	42	<1
...CRYPTOMONODACEAE									
....CRYPTOMONAS		860	15	400	42	270	4	590	11
.EUGLENOPHYCEAE									
..EUGLENALES									
...EUGLENACEAE									
....EUGLENA		--	--	--	--	--	42	<1	--
....TRACHELOMONAS		45	<1	34	4	--	--	--	--
PYRRHOPHYTA (FIRE ALGAE)									
.DINOPHYCEAE									
..DINOKONTAE									
...GYMNODINIACEAE									
....GYMNODINIUM		--	--	--	--	--	--	42	<1
..PERIDINIALES									
...CERATIACEAE									
....CERATIUM		--	--	--	--	66	1	42	<1
...PERIDINIACEAE									
....PERIDINIUM		--	--	--	--	130	2	--	--

Date	May 24, 1989		Jun. 21, 1989		Jul. 19, 1989		Aug. 16, 1989	
Time	1920		1545		1500		1533	
Total cells per mL	5604		963		6428		5285	
Organism[1]	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent	Cells /mL	Per-cent
			ZOOPLANKTON					
ARTHROPODA (ARTHROPODS)								
.CRUSTACEA								
..CALANOIDA								
...DIAPTOMIDAE								
....DIAPTOMUS	5	<1	--	--	12	<1	5	<1
..CLADOCERA								
...BOSMINIDAE								
....BOSMINA	44	<1	--	--	--	--	--	--
...CHYDORIDAE	10	<1	7	<1	12	<1	76	1
...DAPHNIDAE								
....CERIODAPHNIA	3	<1	78	8	--	--	6	<1
....DAPHNIA	2	<1	--	--	43	<1	29	<1
...SIDIDAE								
....DIAPHANOSOMA	--	--	--	--	--	--	6	<1
..CYCLOPOIDA								
...CYCLOPIDAE								
....CYCLOPS	27	<1	2	<1	2	<1	--	--
....MESOCYCLOPS	--	--	--	--	4	<1	5	<1
....TROPOCYCLOPS	--	--	--	--	1	<1	3	<1
ROTIFERA (ROTIFERS)								
.MONOGONONTA								
..FLOSCULARIACEAE								
...TESTUDINELLIDAE								
....FILINIA	2	<1	--	--	380	6	12	<1
..PLOIMA								
...ASPLANCHNIDAE								
....ASPLANCHNA	10	<1	--	--	2	<1	3	<1
...BRACHIONIDAE								
....KELLICOTTIA	7	<1	--	--	--	--	1	<1
....KERATELLA	110	2	--	--	4	<1	10	<1
...SYNCHAETIDAE								
....POLYARTHRA	14	<1	--	--	--	--	5	<1
....SYNCHAETA	--	--	--	--	--	--	--	--

[1]Headings in the organism column represent the following levels in the classification of plankton:

Phylum
.Class
..Order
...Family
....Genus

Table 24.--*Selected water-quality data for Sauk River below Mud Lake near Little Sauk, Minnesota*

[*, integrated through time; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data available; <, less than; e, estimated]

Date	Time	Water temperature (degrees Celsius)	Discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Alkalinity (mg/L as $CaCO_3$)
Sep 1988							
27	1600	14.0	--	475	4.4	7.8	230
Nov							
02	1600	5.0	1.4	507	14.9	8.5	--
Jan 1989							
12	1630	.0	3.2	494	5.2	7.7	--
Feb							
15	1300	.5	.62	555	4.5	7.6	--
Mar							
07	1000	1.0	.0	541	4.7	7.7	286
Mar							
29	1500	.5	21	466	7.8	7.7	--
30	1300	1.5	--	470	8.8	7.5	196
Apr							
11	1045	2.5	100	379	9.6	7.7	155
25	1640	17.0	26	356	22.0	9.3	170
May							
10	1310	16.0	35	426	14.0	8.6	190
23	1300	21.5	29	439	9.7	8.4	196
Jun							
20	1355	22.0	-1.0	415	5.5	8.4	202
Jul							
18	1355	22.5	4.1	347	3.4	7.8	172
Aug							
15	1355	20.5	e1.0	395	--	7.4	--

Date	Time	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)	Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)	
					Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved
Sep 1988									
27	1600	0	280	<1	0.13	1.1	<0.10	0.07	0.02
Mar 1989									
07	1000	0	349	5	.36	.9	.35	.05	.02
Mar									
*28-30			--	--	*.32	*.9	*.42	*.09	*.05
30	1300	0	239	--	--	--	--	--	--
Apr									
11	1045	0	189	<1	.56	1.8	1.90	.20	.10
25	1640	26	154	14	.04	.9	<.10	.09	.01
May									
10	1310	5	232	7	.03	.5	<.10	.05	<.01
23	1300	2	235	<1	.04	.7	<.10	.05	.01
Jun									
20	1355	0	246	1	--	--	--	--	.04
Jul									
18	1355	0	210	<1	.08	2.0	<.10	.11	.06
Aug									
15	1355	--	--	5	.12	1.1	<.10	.16	.04

Table 25.--*Selected water-quality data for Ashley Creek near Sauk Centre, Minnesota*

[*, integrated through time; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data available; <, less than; e, estimated]

Date	Time	Water temperature (degrees Celsius)	Discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Alkalinity (mg/L as $CaCO_3$)
Sep 1988							
28	0930	9.5	3.6	723	7.0	7.70	305
Nov							
04	0930	3.5	8.0	655	10.8	8.20	--
Jan 1989							
11	1600	.0	4.0	673	6.2	7.50	--
Feb							
15	1530	.0	2.9	668	11.0	7.80	--
Mar							
07	1545	.0	2.5	663	10.2	7.80	280
Mar							
*28-30		--	--	--	--	--	*60
29	1000	.0	268	245	11.7	7.80	--
Apr							
11	1315	3.5	143	443	10.2	7.60	157
25	1745	17.0	53	561	13.7	8.50	230
May							
10	1610	17.5	54	608	15.9	8.60	220
23	1520	21.0	31	621	8.3	8.10	260
Jun							
20	1605	26.0	12	616	9.2	8.30	252
Jul							
18	1530	23.0	2.0	582	12.0	8.30	282
Aug							
15	1520	22.0	1.6	603	8.5	7.90	--

Date	Time	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)	Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)	
					Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved
Sep 1988									
28	0930	0	372	6	0.01	0.5	0.68	0.06	0.05
Mar 1989									
07	1545	0	341	2	.15	.7	3.00	.03	.01
Mar									
*28-30			73	--	*1.40	*3.1	*3.00	*.49	*.35
Apr									
11	1315	0	191	<1	.60	1.6	2.00	.17	.08
25	1745	0	280	3	.05	1.1	.30	.05	.02
May									
10	1610	7	264	1	.04	2.7	.32	.03	<.01
23	1520	0	312	4	.10	.8	.56	.09	.05
Jun									
20	1605	0	307	<1	--	--	--	--	.05
Jul									
18	1530	0	344	13	.04	1.2	<.10	.15	.06
Aug									
15	1520	--	--	2	.04	.6	<.10	.12	.06

Table 26.--*Selected water-quality data for Hoboken Creek at Sauk Centre, Minnesota*

[*, integrated through time; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data available; <, less than; e, estimated]

Date	Time	Water temperature (degrees Celsius)	Discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Alkalinity (mg/L as $CaCO_3$)
Mar 1989							
*28-30	1600	--	--	--	--	--	--
30...	1030	.0	143	275	12.4	7.9	69
Apr							
10...	1645	3.5	28	497	10.8	7.7	132
25...	1530	16.0	2.7	896	12.6	8.3	265
May							
10...	1455	16.5	7.7	966	16.7	8.6	228
23...	1415	19.5	2.3	924	9.8	8.1	306
Jun							
20...	1500	24.5	.1	868	11.9	8.4	318

Date	Time	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)	Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)	
					Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved
Mar 1989									
*28-30		--	--	--	*1.20	*3.5	*3.80	*0.62	*0.50
30...	1030	0	84	--	--	--	--	--	--
Apr									
10...	1645	0	161	3	1.60	3.5	6.30	.64	.45
25...	1530	0	323	4	.07	1.1	2.90	.09	.02
May									
10...	1455	14	278	6	.07	1.1	5.60	.07	.01
23...	1415	0	368	<1	.17	1.1	.51	.12	.05
Jun									
20...	1500	0	388	5	.03	.8	<.10	.05	.03

Table 27.--*Selected water-quality data for Sauk River below dam at Sauk Centre, Minnesota*

[*, integrated through time; ft^3/s, cubic feet per second; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; --, no data available; <, less than; e, estimated]

Date	Time	Water temperature (degrees Celsius)	Discharge, instantaneous (ft^3/s)	Specific conductance (µS/cm)	Oxygen dissolved (mg/L)	pH (standard unit)	Alkalinity (mg/L as $CaCO_3$)
Sep 1988							
27...	1715	12.5	1.4	547	12.4	8.3	261
Nov							
04...	0800	8.0	.7	564	3.7	7.8	--
Jan 1989							
11...	1210	2.0	22	520	12.3	7.8	--
Feb							
15...	0900	1.0	13	557	9.6	7.7	--
Mar							
06...	1745	1.5	18	530	9.2	8.0	242
Mar							
*28-30		--	--	--	--	--	*92
29...	0915	.5	77	279	12.4	7.9	--
30...	1435	.5	317	272	12.8	7.6	--
Apr							
11...	1530	3.5	183	420	10.9	8.0	172
25...	1300	13.5	99	423	12.2	9.0	181
May							
10...	1130	13.0	113	494	11.9	8.6	186
23...	1145	19.5	69	449	9.8	8.8	166
Jun							
20...	1230	21.0	7.4	426	7.6	8.6	178
Jul							
18...	1200	23.0	6.8	388	5.1	7.9	178
Aug							
15...	1250	20.5	1.1	455	7.2	8.1	--

Date	Time	Carbonate (mg/L as CO_3)	Bicarbonate (mg/L as HCO_3)	Solids, total at 105 °C, suspended (mg/L)	Dissolved nitrogen (mg/L as N)			Phosphorus (mg/L as P)	
					Ammonia	Ammonia plus organic	Nitrite plus nitrate	Total	Ortho, dissolved
Sep 1988									
27...	1715	0	318	24	0.12	1.0	<0.10	0.31	0.02
Mar 1989									
06...	1745	0	295	4	.22	1.1	.50	.03	.01
Mar									
*28-30		--	*112	--	*.98	*2.6	*2.60	*.45	*.33
Apr									
11...	1530	0	210	<1	.36	1.2	1.20	.11	.04
25...	1145	16	189	14	.04	.6	<.10	.05	<.01
May									
10...	1130	12	227	13	.03	.7	.13	.04	<.01
23...	1145	5	198	<1	.03	.7	<.10	.04	<.01
Jun									
20...	1230	10	201	<1	--	--	--	--	<.01
Jul									
18...	1200	0	217	<1	.23	3.4	<.10	.10	.02
Aug									
15...	1250	--	--	13	.12	.5	<.10	.14	<.01

Table 28.--*Daily mean discharge for Sauk River below Mud Lake near Little Sauk, Minnesota, October 1, 1988 through September 30, 1989*

[Values in cubic feet per second; e, estimated; <, less than]

	Month											
DAY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
1	e0.75	e1.3	e4.3	e3.6	e1.3	e0.13	e150	e35	e6.0	e2.1	e2.0	e11
2	e.79	e1.4	e4.4	e3.6	e1.3	<.10	e146	e38	e5.0	e2.2	e1.9	e10
3	e.84	e1.5	e4.5	e3.5	e1.2	<.10	e140	e42	e3.0	e2.4	e1.8	e9.6
4	e.86	e1.6	e4.5	e3.5	e1.1	<.10	e135	e43	e2.5	e2.5	e1.6	e12
5	e.89	e1.8	e4.5	e3.5	e1.0	<.10	e130	e44	e2.3	e2.6	e1.5	e15
6	e.93	e1.9	e4.5	e3.5	e.90	<.10	e125	e45	e2.1	e2.7	e1.4	e13
7	e.98	e2.0	e4.5	e3.4	e.83	<.10	e121	e44	e2.0	e2.7	e1.4	e12
8	e1.0	e2.1	e4.5	e3.4	e.76	<.10	e116	e42	e1.9	e2.7	e1.3	e10
9	e1.1	e2.3	e4.5	e3.4	e.72	<.10	e107	e39	e1.7	e2.8	e1.2	e9.4
10	e1.2	e2.5	e4.4	e3.3	e.69	<.10	e103	e35	e1.6	e2.9	e1.2	e9.0
11	e1.3	e2.6	e4.4	e3.3	e.67	<.10	e100	e33	e1.4	e3.0	e1.1	e8.4
12	e1.4	e2.8	e4.3	e3.3	e.65	<.10	e92	e32	e1.3	e3.2	e1.1	e7.6
13	e1.4	e3.0	e4.3	e3.2	e.64	<.10	e83	e30	e1.3	e3.3	e1.1	e6.8
14	e1.5	e3.1	e4.3	e3.1	e.63	<.10	e76	e29	e1.2	e3.4	e1.0	e6.2
15	e1.5	e3.1	e4.3	e3.1	e.62	<.10	e69	e28	e1.1	e3.5	e1.0	e5.7
16	e1.5	e3.2	e4.2	e3.0	e.59	<.10	e62	e27	e1.1	e3.7	e1.2	e4.7
17	e1.5	e3.3	e4.2	e3.0	e.57	<.10	e55	e26	e1.0	e3.9	e1.3	e4.0
18	e1.5	e3.3	e4.2	e2.9	e.54	<.10	e50	e25	e1.0	e4.1	e1.5	e3.7
19	e1.5	e3.4	e4.2	e2.9	e.51	<.10	e44	e25	e.0	e3.9	e1.4	e3.4
20	e1.5	e3.4	e4.1	e2.8	e.46	e.15	e41	e25	e-1.0	e3.7	e1.3	e3.8
21	e1.5	e3.4	e4.1	e2.8	e.43	e.18	e37	e24	e1.0	e3.6	e1.0	e4.5
22	e1.5	e3.4	e4.0	e2.7	e.42	e.47	e32	e26	e1.0	e3.5	e1.0	e4.0
23	e1.5	e3.4	e4.0	e2.7	e.40	e.60	e29	e29	e1.0	e3.2	e1.1	e3.7
24	e1.5	e3.4	e4.0	e2.6	e.38	e.90	e28	e29	e1.1	e3.0	e1.3	e3.0
25	e1.5	e3.5	e3.9	e2.6	e.36	e1.3	e26	e30	e1.1	e2.8	e1.8	e2.5
26	e1.5	e3.7	e3.9	e2.5	e.34	e1.9	e25	e28	e1.2	e2.6	e3.0	e2.2
27	e1.4	e3.8	e3.8	e2.3	e.26	e3.0	e25	e23	e1.4	e2.5	e4.5	e1.9
28	e1.4	e4.0	e3.8	e2.0	e.18	e9.0	e26	e19	e1.6	e2.4	e5.2	e1.7
29	e1.3	e4.1	e3.7	e1.8	---	e21	e29	e15	e1.7	e2.3	e6.5	e1.6
30	e1.3	e4.2	e3.7	e1.6	---	e150	e33	e10	e1.9	e2.2	e7.2	e1.5
31	e1.3	---	e3.7	e1.4	---	e160	---	e8.2	---	e2.1	e7.6	---

Table 29.--*Daily mean discharge for Ashley Creek near Sauk Centre, Minnesota, October 1, 1988 through September 30, 1989*

[Values in cubic feet per second; e, estimated]

	Month											
DAY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
1	e3.6	6.8	e5.8	e4.3	e2.8	e2.5	186	e80	26	12	3.6	19
2	e3.7	7.5	e5.6	e4.2	e2.8	e2.5	185	e85	24	12	3.3	13
3	e3.8	7.8	e5.5	e4.2	e2.8	e2.5	195	e90	23	11	2.5	13
4	e3.9	8.0	e5.4	e4.1	e2.8	e2.5	200	e94	22	8.6	1.5	34
5	e4.0	e8.1	e5.3	e4.1	e2.8	e2.5	196	e98	21	6.5	1.2	36
6	e4.1	e8.2	e5.2	e4.1	e2.8	e2.5	186	e97	21	5.3	2.6	30
7	e4.8	e8.3	e5.1	e4.0	e2.8	e2.5	177	e95	20	4.7	2.3	25
8	e5.4	e8.3	e5.0	e4.0	e2.8	e2.5	164	e89	19	6.5	1.8	20
9	e6.2	e8.4	e4.9	e3.9	e2.9	e2.5	146	e81	18	8.2	.76	17
10	e6.4	e8.5	e4.9	e3.9	e2.9	e2.6	142	e70	17	7.4	e.50	15
11	e6.6	e8.4	e4.9	e3.9	e2.9	e2.6	143	50	16	6.7	e.50	15
12	e6.5	e8.3	e4.9	e3.9	e2.9	e2.6	137	45	21	7.7	.78	15
13	e6.3	e8.2	e4.9	e3.9	e3.0	e2.7	125	42	22	7.3	.74	14
14	e6.2	e8.1	e4.9	e3.8	e3.0	e2.7	113	39	21	5.2	1.5	13
15	e6.2	e8.0	e4.8	e3.8	e3.0	e2.8	103	37	19	2.2	1.7	12
16	e6.1	e7.9	e4.8	e3.8	e2.9	e2.8	94	35	17	.87	1.4	12
17	e6.0	e7.8	e4.8	e3.8	e2.9	e2.8	88	32	16	.93	.93	11
18	e5.9	e7.8	e4.8	e3.8	e2.8	e2.9	80	33	15	1.5	.71	10
19	e5.9	e7.8	e4.8	e3.7	e2.7	e2.9	74	34	14	3.0	1.2	9.7
20	e5.8	e7.8	e4.8	e3.6	e2.7	e3.0	69	31	12	3.3	2.7	11
21	e5.7	e7.7	e4.8	e3.5	e2.6	e3.0	65	28	12	2.0	2.7	13
22	5.5	e7.6	e4.8	e3.5	e2.6	e3.1	64	26	12	4.6	1.6	12
23	5.2	e7.3	e4.8	e3.5	e2.6	e3.0	62	30	12	8.0	.80	9.6
24	5.0	e6.9	e4.7	e3.5	e2.5	e3.0	59	37	11	7.0	.43	8.7
25	4.9	e6.7	e4.7	e3.4	e2.5	e3.0	55	47	12	5.9	.29	8.0
26	4.7	e6.4	e4.7	e3.2	e2.5	e5.0	52	39	15	4.8	12	6.9
27	5.1	e6.3	e4.6	e3.0	e2.5	e30	51	33	15	4.1	43	7.0
28	5.4	e6.2	e4.6	e2.9	e2.5	e120	55	29	13	3.5	42	6.7
29	4.2	e6.1	e4.5	e2.8	---	e270	67	29	11	3.4	25	6.0
30	4.3	e5.9	e4.4	e2.8	---	229	71	31	11	3.5	14	5.8
31	4.7	---	e4.3	e2.8	---	186	---	29	---	3.3	15	---

Table 30.--*Daily mean discharge for Hoboken Creek at Sauk Centre, Minnesota, October 1, 1988 through September 30, 1989*

[Values in cubic feet per second; e, estimated]

Day	Month											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
1	0.00	0.00	0.00	0.00	0.00	0.00	102	9.9	1.8	0.17	0.00	2.4
2	.00	.00	.00	.00	.00	.00	69	7.7	1.7	e.00	.00	2.7
3	.00	.00	.00	.00	.00	.00	103	6.2	1.3	e.00	.00	2.9
4	.00	.00	.00	.00	.00	.00	91	5.8	1.1	e.13	.00	7.9
5	.00	.00	.00	.00	.00	.00	91	6.2	.90	e.11	.00	10
6	.00	.00	.00	.00	.00	.00	53	5.0	.76	e.00	.00	10
7	.00	.00	.00	.00	.00	.00	35	4.3	.72	e.00	.00	8.0
8	.00	.00	.00	.00	.00	.00	29	7.5	.70	e.00	.00	5.3
9	.00	.00	.00	.00	.00	.00	29	9.5	.68	e.00	.00	3.3
10	.00	.00	.00	.00	.00	.00	28	7.8	.55	e.00	.00	2.3
11	.00	.00	.00	.00	.00	.00	e18	6.1	.35	e.00	.00	2.2
12	.00	.00	.00	.00	.00	.00	e12	4.8	.56	e.00	.00	1.8
13	.00	.00	.00	.00	.00	.00	e8.5	4.1	.59	e.00	.00	1.6
14	.00	.00	.00	.00	.00	.00	e6.6	3.4	.70	.00	.00	1.3
15	.00	.00	.00	.00	.00	.00	e5.8	2.7	.56	.00	.00	.96
16	.00	.00	.00	.00	.00	.00	e5.1	2.4	.45	.00	.00	.78
17	.00	.00	.00	.00	.00	.00	e4.6	2.0	.36	.00	.00	.65
18	.00	.00	.00	.00	.00	.00	e4.2	2.3	.20	.00	.00	.55
19	.00	.00	.00	.00	.00	.00	e3.9	2.7	.20	.00	e.10	.45
20	.00	.00	.00	.00	.00	.00	3.8	2.1	.11	.00	e.00	.50
21	.00	.00	.00	.00	.00	.00	3.7	1.7	.10	.00	.00	.60
22	.00	.00	.00	.00	.00	e.00	4.2	1.5	.16	.00	.00	.53
23	.00	.00	.00	.00	.00	e1.0	3.7	2.1	.14	.00	.00	.47
24	.00	.00	.00	.00	.00	22	3.2	2.8	.12	.00	.00	.40
25	.00	.00	.00	.00	.00	61	2.8	5.1	.16	.00	.00	.36
26	.00	.00	.00	.00	.00	127	2.8	4.0	.13	.00	e1.5	.24
27	.00	.00	.00	.00	.00	e160	3.2	2.8	.37	.00	1.1	.20
28	.00	.00	.00	.00	.00	e190	4.8	2.2	.62	.00	1.7	.19
29	.00	.00	.00	.00	---	e175	15	2.2	.30	.00	2.1	.17
30	.00	.00	.00	.00	---	169	14	2.6	.28	.00	1.1	.17
31	.00	---	.00	.00	---	129	---	2.1	---	.00	1.3	---

Table 31.--*Daily mean discharge for Sauk River below dam at Sauk Centre, Minnesota, October 1, 1988 through September 30, 1989*

[Values in cubic feet per second; e, estimated]

Day	Month											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
1	e1.3	e0.66	e8.8	e20	e12	e14	357	111	58	14	2.9	41
2	e1.3	e.67	e9.0	e20	e12	e14	367	111	55	12	2.5	39
3	e1.3	e.68	e9.2	e20	e12	e15	401	106	52	14	2.4	40
4	e1.3	e.71	e9.3	e20	e12	e16	532	112	49	12	1.9	75
5	e1.3	e.73	e9.5	e21	e12	e17	642	132	40	9.2	1.4	77
6	e1.2	e.75	e9.7	e21	e13	e18	619	109	39	11	.99	74
7	e1.2	e.81	e9.9	e21	e13	e19	591	98	36	9.0	.92	76
8	e1.2	e.86	e10	e22	e13	e19	572	115	34	9.9	.96	71
9	e1.2	e.88	e18	e22	e13	e20	517	113	29	10	1.2	64
10	e1.1	e.95	e20	e22	e13	e20	466	113	24	10	1.3	56
11	e1.1	e1.0	e20	e22	e13	e21	293	106	21	9.0	1.2	55
12	e1.0	e1.1	e21	e22	e13	e21	193	106	24	8.0	1.7	51
13	e1.0	e1.2	e21	e21	e13	e20	202	102	22	7.9	.91	45
14	e.96	e1.2	e21	e21	e13	e19	186	96	24	7.4	.92	42
15	e.91	e1.3	e21	e21	e13	e17	175	91	19	7.2	1.3	37
16	e.88	e1.4	e22	e21	e13	e16	174	84	18	6.3	2.0	35
17	e.86	e1.5	e22	e21	e13	e16	127	73	16	5.3	2.6	32
18	e.81	e1.7	e22	e20	e12	e16	68	80	17	6.0	2.8	27
19	e.78	e1.9	e22	e20	e12	e16	76	84	15	5.6	2.3	31
20	e.76	e2.1	e22	e20	e11	e16	83	78	10	5.1	.63	33
21	e.74	e2.4	e22	e19	e11	e16	89	73	13	4.8	.72	36
22	e.77	e2.7	e22	e19	e11	e17	94	67	15	4.4	.72	43
23	e.78	e3.0	e22	e19	e12	17	96	74	14	3.9	1.3	27
24	e.79	e3.4	e22	e19	e12	19	98	80	13	3.8	1.5	19
25	e.76	e3.9	e18	e11	e12	20	101	71	14	3.7	1.9	23
26	e.75	e4.3	e18	e11	e12	22	102	78	18	3.4	10	20
27	e.74	e4.7	e18	e11	e13	25	102	65	18	3.5	17	15
28	e.74	e5.0	e18	e11	e13	41	95	57	16	3.2	19	18
29	e.73	e8.5	e19	e11	---	102	107	70	12	3.2	22	18
30	e.69	e8.6	e19	e11	---	273	109	72	16	3.0	21	15
31	e.66	---	e19	e11	---	345	---	65	---	3.0	32	---