Prepared in cooperation with the
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

WATER-RESOURCES INVESTIGATIONS
REPORT 84-4303

INTRODUCTION

ENVIRONMENTAL SETTING

BASIN AND LAKE CHARACTERISTICS

Altitude of water level above National Geodetic Vertical Datum of 1929, in feet

Well	Map No.	Feb. 25, 1981	Apr. 16, 1981	Sept. 22, 1981
Undeveloped 1	7	72.48	72.07	73.27
Undeveloped 2	8	93.83	—	94.92
Undeveloped 3	9	—	—	106.58
Grove 1	11	72.92	—	73.26
Grove 2	12	73.21	—	73.43
Grove 3	13	—	—	77.97

HYDROLOGIC CYCLE OF THE LAKE

WATER QUALITY

REFERENCES

ABBREVIATIONS AND CONVERSION FACTORS

For those readers who may prefer to use metric units (SI) rather than inch-pound units, the conversion factors for the terms used in this report are listed below:

Multiply	by	To obtain
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	4,047	square meter (m^2)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
square mile (mi^2)	2.590	square kilometer (km^2)

Temperature in degrees Celsius can be converted to degrees Fahrenheit as follows:

$°F = 1.8°C + 32$

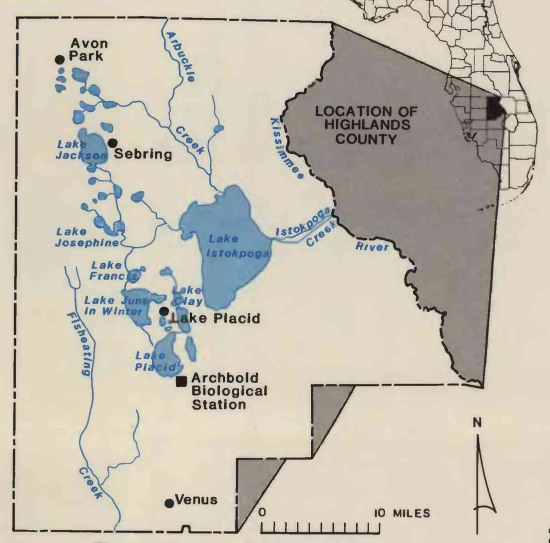

Figure 1.—Location of Lake June in Winter.

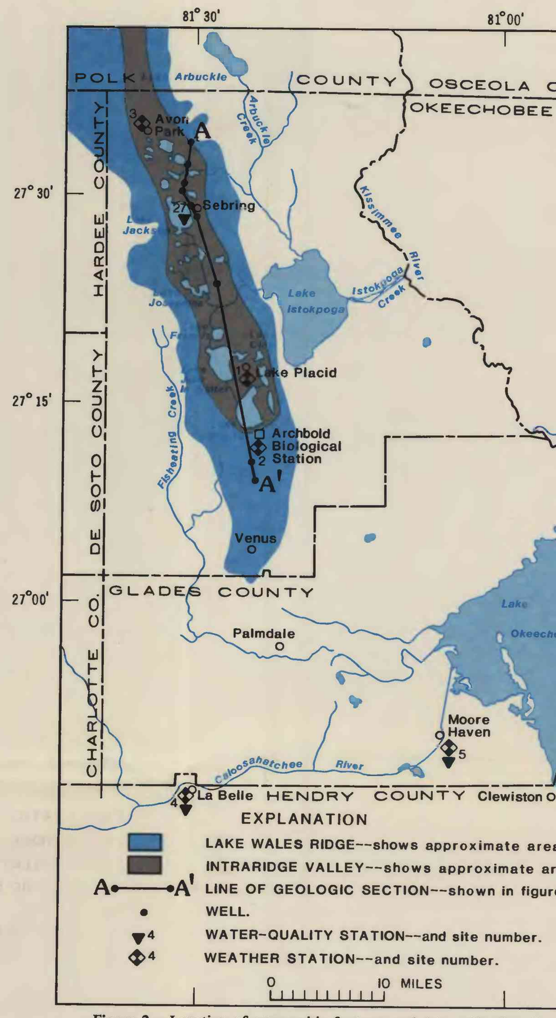

Figure 2.—Location of geographic features and data-collection sites.

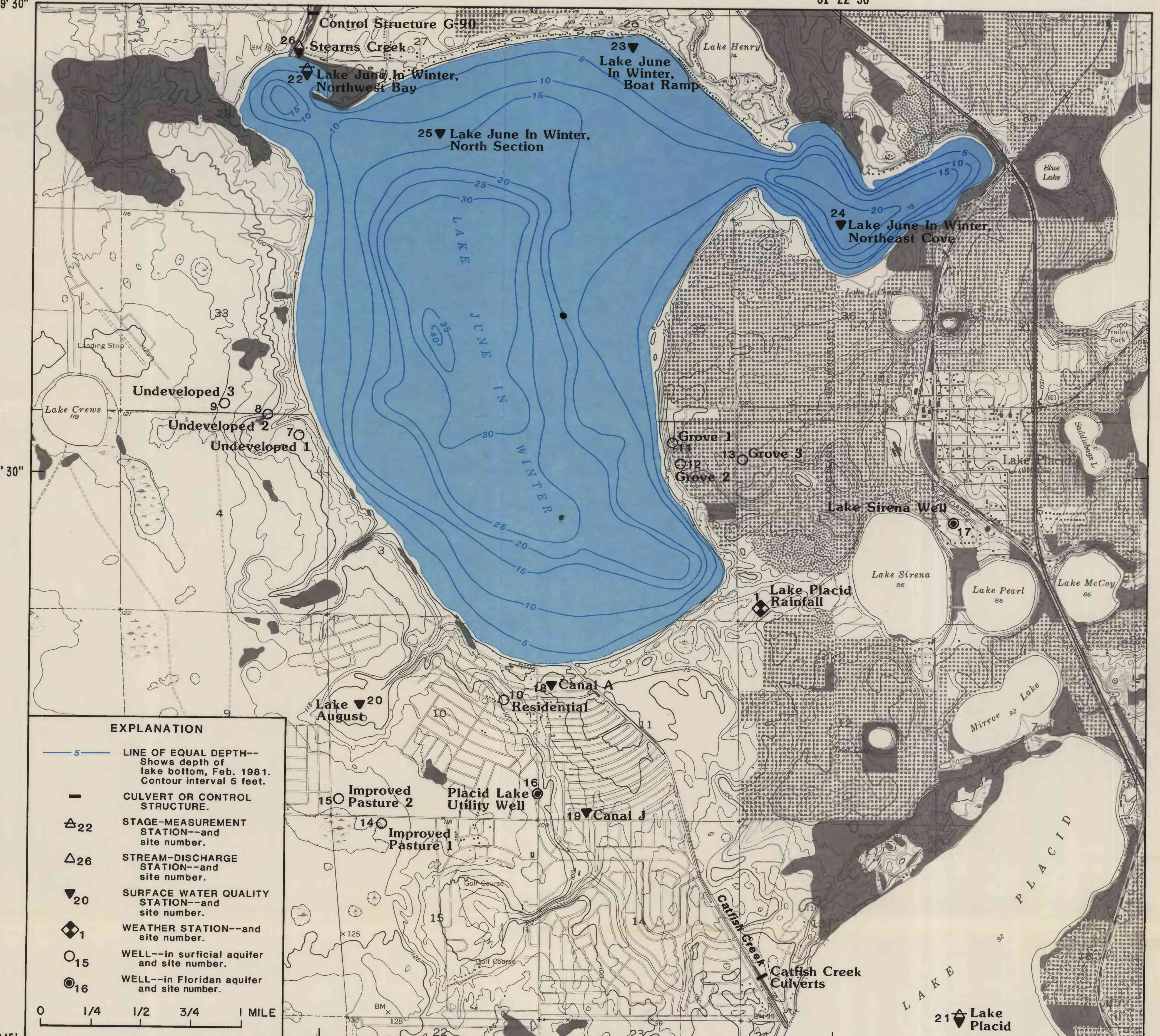

Figure 3.—Station locations and lake depth contours.

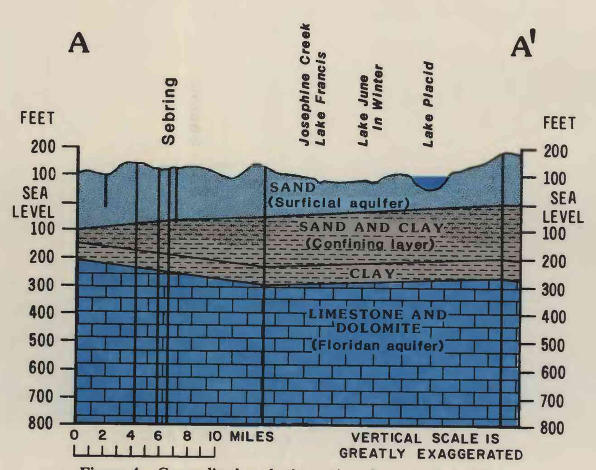

Figure 4.—Generalized geologic section along the Lake Wales Ridge (from Hammett, 1981).

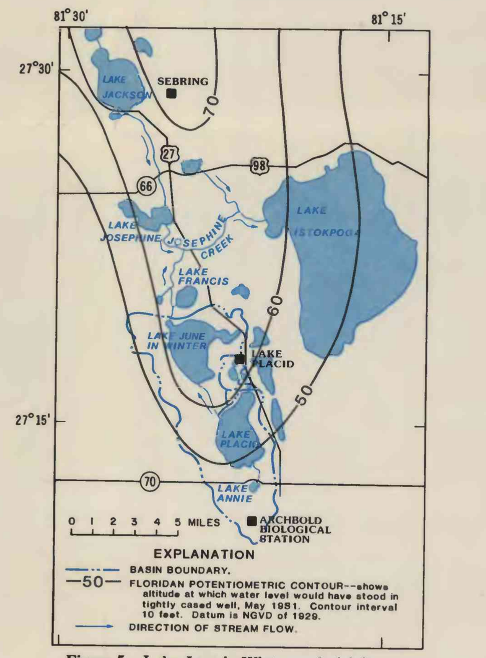

Figure 5.—Lake June in Winter and vicinity showing the potentiometric surface of the Floridan aquifer May 1981 (from Schiner and Hayes, 1981).

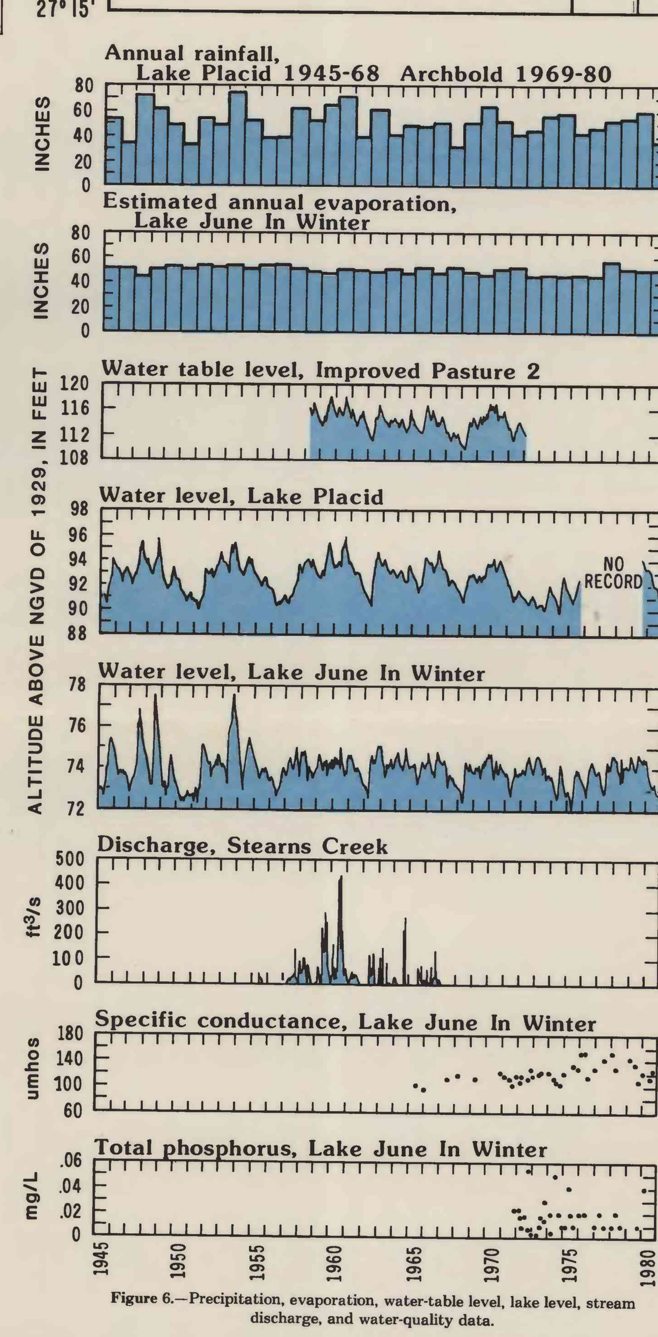

Figure 6.—Precipitation, evaporation, water-table level, lake level, stream discharge, and water-quality data.

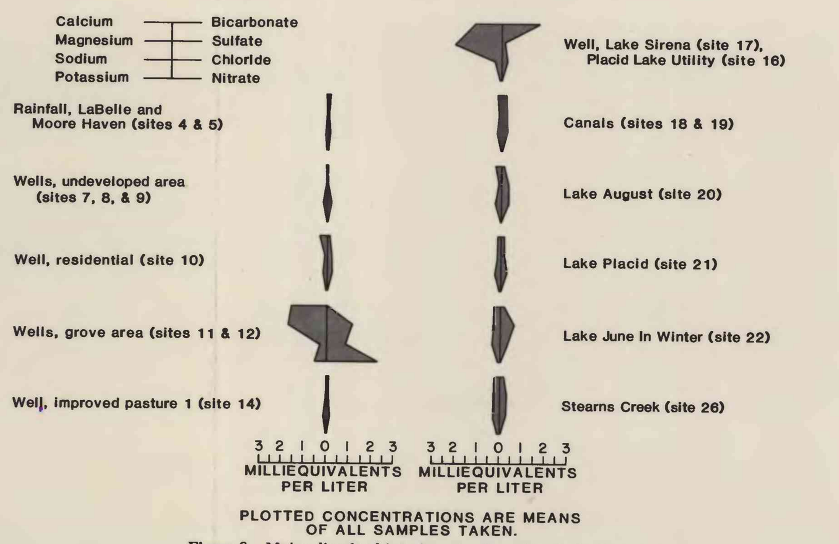

Figure 8.—Major dissolved ions in water from the study area.

Table 1.—Data sites in study area

Map No.	Site identification No.	Name	Latitude	Longitude	Station type	Data type	Period of record
1	271700081230001	Lake Placid rainfall	27 17 00	81 23 00	Rainfall	Quantity	1945-68
2	271100081210001	Archbold Biological Station rainfall	27 11 00	81 21 00	Rainfall	Quantity	1969-80
3	273600081320001	Avon Park rainfall	27 36 00	81 32 00	Rainfall	Quantity	1945-80
4	264718081181504	LaBelle rainfall	26 47 18	81 18 15	Rainfall	Quality	1978-79
5	265029081051101	Moore Haven rainfall	26 50 29	81 05 11	Rainfall	Quality	1978-79
6	264000080380000	Belle Glade Experiment Station	26 40 00	80 38 00	Evaporation	Quantity	1945-80
7	271746081250501	Undeveloped 1	27 17 46	81 25 05	Surficial aquifer	Water level, quality	1981
8	271750081251601	Undeveloped 2	27 17 50	81 25 16	Surficial aquifer	Water level, quality	1980
9	271755081253001	Undeveloped 3	27 17 55	81 25 30	Surficial aquifer	Water level, quality	1981
10	271630081241001	Residential	27 16 30	81 24 10	Surifical aquifer	Quality	1980-81
11	271734081232101	Grove 1	27 17 34	81 23 21	Surficial aquifer	Water level, quality	1981
12	271733081231901	Grove 2	27 17 33	81 23 19	Surficial aquifer	Water level, quality	1981
13	271733081230001	Grove 3	27 17 46	81 25 00	Surficial aquifer	Water level	1981
14	271559081242501	Improved Pasture 1	27 15 59	81 24 25	Surficial aquifer	Quality	1981
15	271611081245701	Improved Pasture 2	27 16 11	81 24 57	Surifcial aquifer	Water level	1958-71
16	271610081240290	Placid Lake Utility	27 16 10	81 24 02	Floridan aquifer	Water level, quality	1945-80
17	271712081215801	Lake Sirena well	27 17 12	81 21 58	Floridan aquifer	Quality	1976
18	271635081235401	Canal A	27 16 35	81 23 54	Surface water	Quality	1981
19	271602081234501	Canal J	27 16 02	81 23 45	Surface water	Quality	1981
20	271630081244501	Lake August	27 16 30	81 24 45	Surface water	Quality	1981
21	02270750	Lake Placid	27 15 44	81 22 08	Surface water	Stage quality	1945-82
22	02270950	Lake June in Winter, Northwest Bay	27 19 19	81 25 08	Surface water	Stage quality	1945-82
23	271922081240000	Lake June in Winter, Boat Ramp	27 19 22	81 23 40	Surface water	Quality	1974-80
24	271835081215500	Lake June in Winter, Northeast Cove	27 18 35	81 21 55	Surface water	Quality	1975-76
25	271855108124200	Lake June in Winter, North Section	27 18 55	81 24 20	Surface water	Quality	1975-76
26	02271000	Stearns Creek	27 19 22	81 25 09	Surface water	Quality, discharge	1955-67
27	2729458127501	Lake Jackson	27 29 45	81 27 50	Surface water	Quality	1965-78

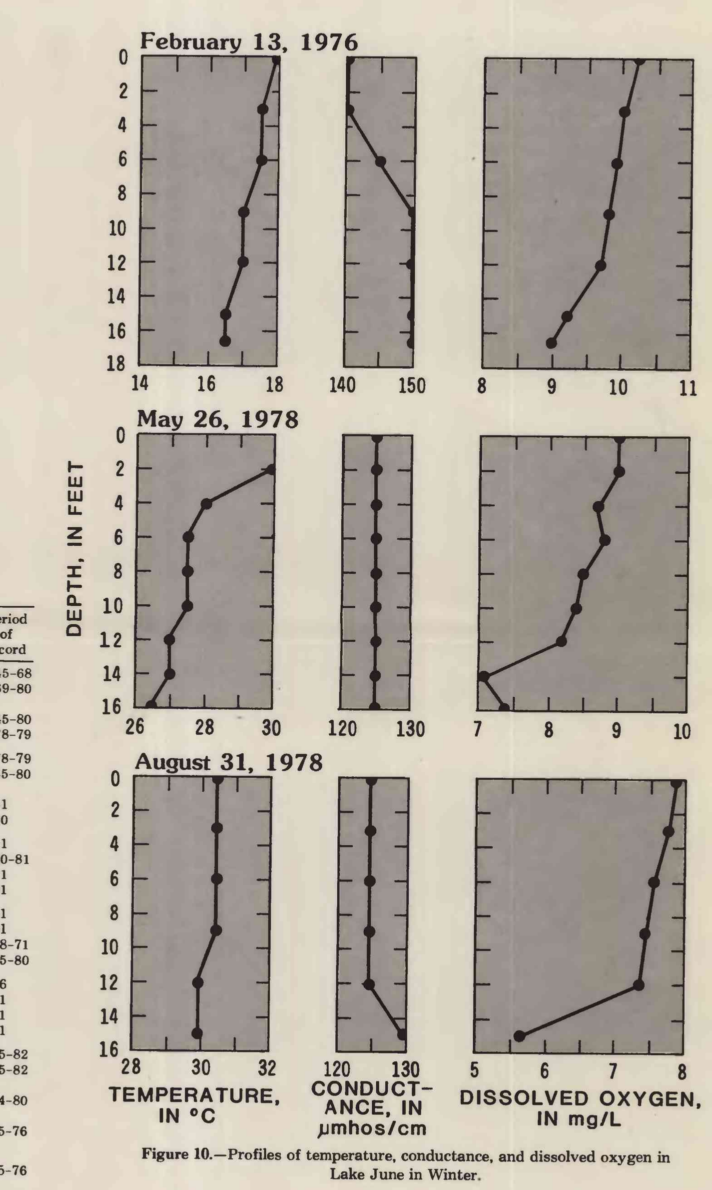

Figure 10.—Profiles of temperature, conductance, and dissolved oxygen in Lake June in Winter.

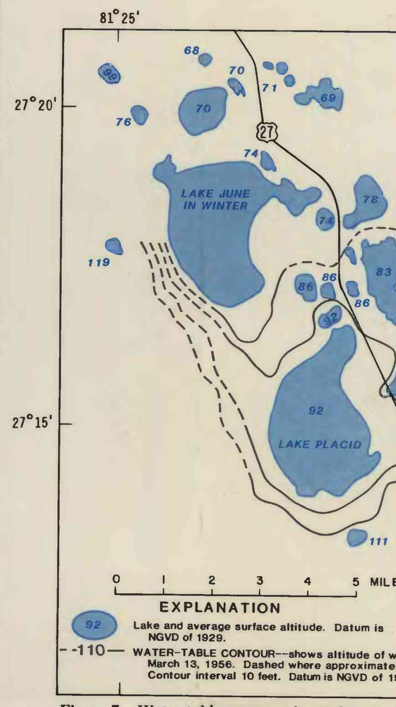

Figure 7.—Water-table contours in study area (modified from Kohout and Meyer, 1959).

Table 2.—Summary of selected physical-characteristics data for study sites

[Average of all samples; units are mg/L (milligrams per liter); asterisk indicates JTU[1]]

Map No.[2]	Name	No. of samples	Specific conductance (µmho/cm) at 25°C)	Temperature	Transparency (Secchi disk) (inches)	Color (platinum-cobalt units)	Turbidity (NTU[3])	pH (units)	Hardness, as $CaCO_3$ (mg/L)	Period of record
4	LaBelle rainfall	5	24	—	—	0	2*	—	3	1978-79
5	Moore Haven rainfall	6	31	—	—	0	1*	—	4	1978-79
7	Undeveloped 1	2	36	—	—	130	90*	4.3	—	1981
8	Undeveloped 2	1	30	—	—	20	—	4.5	—	1980
9	Undeveloped 3	2	42	—	—	12	2*	4.4	—	1981
10	Residential	2	68	—	—	12	2*	4.4	—	1980-81
11	Grove 1	2	496	23	—	20	130*	5.6	—	1981
12	Grove 2	1	492	—	—	5	1*	4.4	—	1981
14	Improved Pasture 1	1	125	23.5	—	720	—	6.0	2	1981
16	Placid Lake Utility	1	350	24	—	5	1*	7.2	—	1979
17	Lake Sirena well	2	170	26	—	5	1*	7.8	54	1976
18	Canal A	1	60	—	—	70	—	5.7	14	1981
19	Canal J	1	50	—	—	140	—	5.7	0	1981
20	Lake August	1	74	—	—	360	—	6.2	—	1981
21	Lake Placid	26	71	24	94	5	2	6.5	26	1966-82
22	Lake June in Winter, Northwest Bay	191	126	25	101	11	3.8	6.8	28	1964-82
26	Stearns Creek	2	98	28	—	8	—	6.2	—	1966-67
27	Lake Jackson	18	93	24	—	5	2*	6.7	16	1965-78

[1]JTU: Jackson turbidity units.
[2]From figures 2 and 3.
[3]NTU: Nephelometric turbidity units.

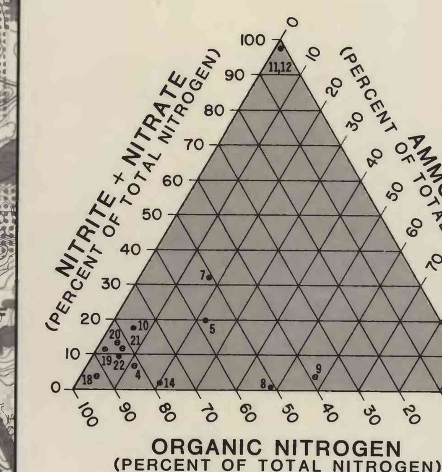

Figure 9.—Nitrogen species as percentage of total nitrogen.

Table 3.—*Summary of major-constituent data for study sites*

[Average of all samples; units are mg/L (milligrams per liter) unless noted; asterisk indicates dissolved component]

Map No.[1]	Name	No. of samples	Calcium, dissolved	Magnesium, dissolved	Sodium, dissolved	Potassium, dissolved	Bicarbonate	Sulfate, dissolved	Chloride, dissolved	Nitrate, total as N	Strontium dissolved (µg/L)	Carbonate	Fluoride, dissolved	Silica, dissolved	Alkalinity	Period of record
4	LaBelle rainfall	5	0.9	0.2	1.5	1.2	9.0	1.5	1.6	0.14	50	0.0	0.0	0.1	—	1978-79
5	Moore Haven rainfall	6	1.0	.3	1.9	.2	4.0	1.5	4.5	.27	60	.0	.0	.0	—	1978-79
7	Undeveloped 1	2	1.0	.5	2.9	.1	1.0	1.8	5.4	.19	40	.0	.4	3.2	1.0	1981
8	Undeveloped 2	1	.8	.5	3.3	.2	2.0	.9	6.6	.0*	—	.0	—	—	2.0	1980
9	Undeveloped 3	2	.5	.6	4.6	.05	1.0	.9	7.8	.03	40	.0	.5	2.8	1.0	1981
10	Residential	2	6.6	1.2	4.0	.8	5.0	8.6	83	.06	120	.0	.4	5.6	4.0	1980-81
11	Grove 1	2	35	21	6.2	20	1.5	58	30	34	120	.0	.1	8.5	1.5	1981
12	Grove 2	1	27	20	7.2	22	.0	52	31	28*	—	.0	—	—	.0	1981
14	Improved Pasture 1	1	.3	.2	2.1	.9	8	5.2	3.3	.00	20	.0	.0	6.0	6.0	1981
16	Placid Lake Utility	1	44	13	8.5	1.1	190	2.3	13	—	1,100	.0	.1	27	160	1979
17	Lake Sirena well	2	16	32	5.0	.5	54	8.0	9.3	1.5	810	.0	.1	8.4	44	1976
18	Canal A	1	2.9	1.6	4.8	1.1	8.0	8	7.4	.06	90	.0	.1	2.5	4.0	1981
19	Canal J	1	4.8	1.5	4.5	1.2	10	11	7.0	.17	100	—	.3	3.6	—	1981
20	Lake August	1	5.4	1.4	6.4	2.0	4.0	14	12	.09*	200	—	.3	.0	5.0	1981
21	Lake Placid	26	2.8	1.5	5.5	.9	7.2	7.1	9.7	.05	71	.0	.1	.6	5.7	1966-82
22	Lake June in Winter, Northwest Bay	19	5.5	3.5	8.0	2.5	9.7	20	13	.05	63	.0	.1	.6	8.0	1964-82
26	Stearns Creek	2	4.8	2.9	6.6	2.2	10	16	11	50*	20	.0	.2	1.3	8.0	1966-67
27	Lake Jackson	12	3.5	2.2	7.1	1.9	9.2	12	12	.65	—	—	.15	.9	7.5	1965-78

[1]From figures 2 and 3.

Table 4.—*Summary of nutrient, dissolved oxygen, and phytoplankton data for study sites*

[Average of all samples; units are mg/L (milligrams per liter) total recoverable from water-suspended solids mixture unless noted; asterisk indicates dissolved component]

Map No.[1]	Name	No. of samples	Nitrogen, total as N	Nitrogen, total organic as N	Ammonia, total as N	Nitrite + nitrate, total as N	Phosphorus, total as P	Orthophosphate, total as P	Carbon, total organic	Carbon, total inorganic	Oxygen, dissolved	Phytoplankton, total (cells per mL)	Percent organic nitrogen	Percent ammonia	Percent $NO_2 + NO_3$	Period of record
4	LaBelle rainfall	5	2.0	1.6	0.22	0.15	0.10	0.09	1.5	—	—	—	81.2	11.2	7.6	1978-79
5	Moore Haven rainfall	6	1.4	.84	.32	.29	.11	.06	2.8	—	—	—	57.9	22.1	20.0	1978-79
7	Undeveloped 1	2	.67	.34	.11	.22	.22	.21	—	—	—	—	50.7	16.4	32.8	1981
8	Undeveloped 2	1	.29*	.15*	.14*	.00*	.02*	.02*	—	—	—	—	51.7	48.3	.0	1980
9	Undeveloped 3	1	.73	.28	.42	.03	.03	.01	—	—	—	—	38.4	57.5	4.1	1981
10	Residential	2	.38	.29	.02	.07	.45	.44	—	—	—	—	76.3	5.3	18.4	1980-81
11	Grove 1	2	34	.37	.01	34	.02	.01	—	—	—	—	1.1	.0	98.9	1981
12	Grove 2	1	28*	.12*	.02*	28*	.02*	.01*	—	—	—	—	.4	.1	99.5	1981
14	Improved Pasture 1	1	.55	.43	.11	.01	.03	.03	—	—	—	—	78.2	20.0	1.8	1981
17	Lake Sirena well	2	—	—	—	1.5	—	—	—	—	—	—				1976
18	Canal A	1	1.3	1.2	.04	.06	.06	.06	—	—	—	—	92.3	3.1	4.6	1981
19	Canal J	1	1.4	1.2	.01	.17	.17	.14	—	—	—	—	87.0	.7	12.3	1981
20	Lake August	1	1.6	1.3	.06	.21	.21	.21	—	—	—	—	82.8	3.8	13.4	1981
21	Lake Placid	26	.46	.38	.02	.06	.02	.0*	7.3	1.2	8.1	107,000	82.6	4.4	13.0	1966-82
22	Lake June in Winter, Northwest Bay	21	.60	.51	.03	.06	.02	.01	12	3.1	8.5	70,000	85.0	5.0	10.0	1964-82
26	Stearns Creek	2	—	—	—	≤.5	—	—	—	—	5.3	—				1966-67
27	Lake Jackson	8	.35	.33	.04	.01			6.8	1.0	8.7	24,800	—	—	—	1965-78

[1]From figures 2 and 3.

Table 5.—*Summary of selected chemical data for Lake June in Winter*

[Units are mg/L (milligrams per liter) unless noted]

	Specific conductance (µmho/cm at 25°C)	pH (units)	Transparency Secchi disk (inches)	Turbidity (Jackson turbidity units)	Oxygen, dissolved	Biochemical oxygen demand (5-day at 20°C)	Hardness, total (as calcium carbonate)	Hardness, noncarbonate (as calcium carbonate)	Calcium, dissolved	Magnesium, dissolved	Sodium, dissolved	Potassium, dissolved	Bicarbonate, dissolved	Carbonate, dissolved	Sulfate, dissolved	Chloride, dissolved	Fluoride, dissolved	Silica, dissolved	Dissolved solids (residue at 180°C)	Nitrogen, total recoverable as N	Phosphorus, total recoverable as P	Iron, total (µg/L)	Carbon, total	Carbon, total organic	Temperature (°C)
Northwest Bay, 1964 to 1982, site map No. 22[1]																									
Maximum	153	7.5	168	9.0	11.6	0.6	35	25	7.2	4.6	9.3	3.2	13	0	24	16	0.30	1.3	86	1.4	0.05	60	28	24	33
Mean	126	6.8	101	3.8	8.5	.6	28	21	5.5	3.5	8.0	2.5	9.7	0	20	13	.12	.62	68	.57	.02	45	15	12	25
Minimum	90	5.3	65	.03	5.7	.6	22	18	3.8	1.6	6.3	1.3	3.7	0	17	11	.00	.00	46	.21	.00	30	4	.03	15
Number of observations	101	41	9	39	49	1	19	17	19	19	18	18	17	13	19	19	18	33	17	21	36	2	8	10	186
Boat Ramp, 1974-80, site map No. 23[1]																									
Maximum	165	7.5	77	3	10.2	1.1	—	—	4.0	4.0	10	4	—	—	—	—	—	—	—	—	.11	250	—	6	—
Mean	145	7.1	61	2.0	8.6	.8	—	—	3.0	3.6	9.0	3.1	—	—	—	—	—	—	—	—	.04	175	—	5.2	—
Minimum	120	6.0	39	1	7.1	.6	—	—	2.0	3.1	8	2.2	—	—	—	—	—	—	—	—	.01	100	—	4	—
Number of observations	6	9	4	8	12	2	—	—	2	2	2	2	—	—	—	—	—	—	—	—	9	2	—	4	—
Northeast cove, 1975-76, site map No. 24[1]																									
Maximum	—	—	—	2.0	8.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.02	—	—	—	—
Mean	170	8.4	—	1.5	7.8	1.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.02	—	—	—	—
Minimum	—	—	—	1.0	7.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.02	—	—	—	—
Number of observations	1	1	—	2	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—
North section, 1975-76, site map No. 25[2]																									
Maximum	—	—	—	2	8.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.03	—	—	—	—
Mean	170	7.9	—	1.5	7.9	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.02	—	—	—	—
Minimum	—	—	—	1	7.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.02	—	—	—	—
Number of observations	1	1	—	2	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—

NOTE: One sample collected by FDER, 1976, at east side of lake had specific conductance of 170, dissolved oxygen concentration of 8.2, and total phosphorus concentration of 0.02.

One sample collected by FDER, 1976, at center of lake had specific conductance of 165, dissolved oxygen concentration of 7.5, and total phosphorus concentration of 0.02.

One sample collected by FDER, 1976, at south side of lake had specific conductance of 170, dissolved oxygen of 8.1, and total phosphorus of 0.02.

[1]Data from U.S. Geological Survey.

[2]Data from Florida Department of Environmental Regulation, 1976.

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HYDROLOGY OF LAKE JUNE IN WINTER, HIGHLANDS COUNTY, SOUTH-CENTRAL FLORIDA

By
Roger G. Belles and Edward H. Martin

1985