INTRODUCTION

Lake Hamilton, Middle Lake Hamilton, and Little Lake Hamilton are near the headwaters of the eastern arm of the Peace River system (fig. 1). The lakes, which are used primarily for boating and fishing, are connected by channels that tend to equalize the lake stages. The land surrounding the lakes is used for citrus groves, homesites, recreation, and businesses. Some groves adjacent to the lakes have been irrigated with lake water.

In 1979, the U.S. Geological Survey began a study of the hydrologic conditions of the Hamilton lakes. The lakes are among a series of lakes selected for study as part of a continuing cooperative program with the Southwest Florida Water Management District. The objective of the program is to document hydrologic conditons in and near selected lakes. This atlas was prepared by the U.S. Geological Survey to help fulfill that objective.

Data collected during the investigation from October 1979 through September 1980 include: (1) altitude of the lakes; (2) depth of the lakes; (3) physical and chemical characteristics of the lake-bottom sediments, and of the water in the lakes and wells; and (4) water levels in Floridan aquifer wells and in surficial aquifer wells in the vicinity of the lakes. Station names, site numbers, and file numbers for data-collection sites are given in table 1, and the site locations are shown in figure 2.

THE LAKES AND THEIR SETTING

Origin and Physical Dimensions

The Hamilton lakes probably occupy coalesced sinkhole depressions which formed when dissolution of subsurface limestone permitted the land surface to subside to below the local water table. Figure 3 is an aerial photograph of the lakes and the surrounding areas taken November 26, 1977, when the altitude of the lakes was 118.8 feet. The depth contours shown in figure 3, which are based on fathometer traverses of the lakes in late February 1980, are applicable when the altitude of the lakes is 120 feet. The probable sinkhole origin of the Hamilton lakes is corroborated by figure 4, which is a trace of part of a fathometer traverse of Little Lake Hamilton at the location shown in figure 3. This traverse suggests the presence of a partially filled sinkhole. The trend of the fathometer trace is extended to show two possible configurations of the suggested sinkhole.

Below are the approximate surface areas, volumes, and average depths of the lakes when their altitude is 120 feet.

Lake name	Surface area (acres)	Volume (millions of gallons)	Average depth (feet)
Lake Hamilton	2,160	5,300	7.5
Middle Lake Hamilton	106	225	6.5
Little Lake Hamilton	367	1,180	9.8

Drainage Basin Characteristics and Water-Control Structures

The size of the area that can contribute surface inflow to the Hamilton lakes can range from about 22 to about 71 mi^2 and depends on the settings of several water-control structures in the upper Peace River basin (fig. 2). The contributing area is about 22 mi^2 when the structure P-7 between Lake Fannie and Lake Hamilton is closed, and the drop culvert structure in Lake Fannie at the head of Peace Creek drainage canal is used to bypass Lake Hamilton. When the altitude of the chain of lakes behind the Lake Lulu control structure is less than 131.7 feet, the drop culvert structure in Lake Fannie is blocked, and the P-7 structure is open, the area contributing to Lake Hamilton is about 48 mi^2. If the Lake Lulu control structures were set to prevent flow at lake altitudes above 131.7 feet, the Lake Fannie drop structure were closed, and the P-6 (Smart-Fannie canal) and P-7 structures were open, Lake Hamilton could receive surface drainage from about 71 mi^2. Other control settings could result in Lake Hamilton receiving only part of the drainage. This complex system of controls precludes quantitative analysis of the sources of surface inflow to the Hamilton lakes.

RELATION OF LAKE LEVELS TO GROUND-WATER LEVELS

The potentiometric contours in figure 3 show the altitude of the water level in tightly cased wells in the artesian (Floridan) aquifer in the Hamilton lakes vicinity. The surface defined by these contours is called the potentiometric surface of the Floridan aquifer.

Figure 3 shows the potentiometric surface for September 9, 1980, when the altitude of the lakes was 120 feet. The altitude of the lakes was from 0.5 to 10 feet higher than the altitude of the potentiometric surface at the lakes and, therefore, a potential for seepage from the lakes to the Floridan aquifer existed at all points in the lakes. Logs of wells adjacent to the lakes show 80 to 100 feet of unconsolidated sand and clay materials between the lakes and the Floridan aquifer at the lake shores. Leakage from the lakes to the Floridan aquifer probably is restricted by these materials.

Except for a few isolated hills on the west and north sides, and a sandy ridge on the east side of the lakes, the land adjacent to the Hamilton lakes is very flat, and thus does not afford sufficient gradient in the surrounding surficial aquifer to permit significant exchange of water with the lakes. Water levels in the shallow wells at sites 10 and 17 (figs. 2 and 3) indicate there was very little mounding of the water table under the isolated hills east and west of Lake Hamilton. However, very heavy rainfall may sometimes cause the water table to mound enough under the hills to cause significant lateral seepage of water from the surficial aquifer to the lakes.

Hydrologic sections A-A' and A-B in figure 5 show the relation between water levels in the lakes, shallow wells, and Floridan aquifer wells in profile. The gradient of the water table (section A-A') is shown to be steeper east of U.S. Highway 27A, because a dry sinkhole 1,800 feet north of the east end of the section indicates the altitude of the water table probably is less than 115 feet at the east end of the section.

RELATION OF STAGE CHARACTERISTICS TO RAINFALL

The altitude of Lake Hamilton was recorded either weekly or monthly from June 1945 to mid-February 1963, except in nine periods of 1 to 5 months duration when no observations were made. Daily water levels in Lake Hamilton outlet near structure P-8, which became operative in July 1962, have been made since mid-February 1963. The annual extremes in altitude are shown in figure 6. The range in altitude for the years prior to 1964 was probably more than is shown in figure 6, because the record is incomplete. However, figure 6 probably shows the pattern of year-to-year variation in altitude fairly well.

Figure 6 shows that from 1945 through 1961, the average altitude of Lake Hamilton was about 2 feet higher than the average altitude from 1962 through 1978. Figure 6 also shows that the average annual rainfall from 1945 through 1961 was about 7 inches more than the average annual rainfall from 1962 through 1978. Thus, the lower average altitude of the lake during the latter period was caused, at least in part, by lower rainfall, and perhaps in part, by operation of structure P-8.

WATER QUALITY OF THE LAKES AND AQUIFERS

The physical and chemical character of the water in the Hamilton lakes, in the bottom sediments of Lake Hamilton, and in the surficial and Floridan aquifers were determined by field measurements and by analysis of samples at the U.S. Geological Survey Water-Quality Service Unit, in Ocala, Fla., and at the U.S. Geological Survey National Water-Quality Laboratory—Atlanta, in Doraville, Ga. These data are given in tables 2, 3, and 4. The nature of the phytoplankton community in Lake Hamilton was determined by microscopic inspection of a sample at the U.S. Geological Survey National Water-Quality Laboratory—Atlanta, in Doraville. Water temperature, specific conductance, and the concentration of dissolved oxygen were monitored for Lake Hamilton for 10 consecutive days.

Specific Conductance and Major Ions

Specific conductance is a measure of the ability of water to conduct an electric current and is related to the concentration of dissolved solids in the water. Specific conductance measurements made at several locations in Lake Hamilton averaged 240 μmhos (micromhos per centimeter at 25°C) and ranged from 235 μmhos to 245 μmhos. The average of random measurements of the specific conductance of Lake Hamilton is compared in figure 7 with those of Middle Lake Hamilton, Little Lake Hamilton, and 27 other lakes within 25 miles of Lake Hamilton. These data, which were collected during the period 1970-80, show that the average specific conductance of all the lakes ranged from 91 to 378 μmhos and that the average specific conductance of Lake Hamilton was exceeded by that of 32 percent of the other lakes (fig. 7).

The chemical types of water in the Hamilton lakes, the adjacent surficial aquifer, and the Floridan aquifer at Winter Haven and Haines City are shown in figure 8. The aquifers were sampled even though there was no direct inflow from the Floridan and probably very little from the surficial aquifer to the lakes during the study because the aquifers are sources, either directly or indirectly, along with rainfall and surface inflow, of the water and chemicals in the Hamilton lakes.

Table 1.—*Station names, site numbers, and file numbers for data-collection sites in the Hamilton lakes vicinity*
[See fig. 2 for locations]

Station name	Site number	USGS file number
Haines City public supply	1	280637081374200
Smith irrigation well	2	280456081374301
Digiorgio Fruit well	3	280446081403601
American Trucking well	4	280446081392101
Little Lake Hamilton sampling site	5	280421081382200
McKnights well	6	280419081390401
Zimmerly well	7	280419081384501
Fishback well	8	280415081373501
Middle Lake Hamilton sampling site	9	280408081385500
West shallow well	10	280357081401201
Orange Grove shallow well	11	280354081395301
Paradise standby well	12	280352081383101
Kuder well	13	280351081395701
Paradise main well	14	280346081390701
Haines City Coop. well	15	280341081373201
Davis Bandag Tire well	16	280319081381201
East shallow well	17	280318081375701
Cromer well	18	280315081371401
Open well	19	280314081364401
Grove well	20	280253081380001
Lake Hamilton sampling sites	21,21A	02293660
Smith residence well	22	280245081400901
Country Club shallow well	23	280213081393201
Winter Haven public supply	24	280209081430600
Roger Donley well	25	280159081384501
Lake Hamilton stage gaging site	26	02293664
Edith Anderson well	27	280149081372401
Crump Road well	28	280146081393801

Water from the Floridan aquifer at Winter Haven (site 24) and Haines City (site 1) is primarily a calcium bicarbonate type (fig. 8). These waters, that have a hardness of 120 and 150 mg/L (milligrams per liter) as calcium carbonate, respectively, are classified by Durfor and Becker (1964) as hard. The high concentration of calcium and bicarbonate in the Floridan relative to that in the lakes (fig. 8) may indicate that only a small part of the water in the lakes is derived from the Floridan aquifer. Because the head relations between the lakes and potentiometric surface of the Floridan aquifer in the Lake Hamilton basin are such that there can be no flow from the aquifer to the lakes, any Floridan aquifer water that might be in the lakes must necessarily be pumped water that has made its way to the lakes.

Analyses of water from the surficial aquifer at three locations near Lake Hamilton (fig. 8) indicate that the quality of the water tends to depend on the local environment. At a golf course on the south side of Lake Hamilton (site 23), the water is a mixed type with calcium and bicarbonate predominating. At the edge of an orange grove about 1,800 feet from the northwest shore of Lake Hamilton (site 10), the water is a magnesium and chloride type, and at site 11 about 1,700 feet lakeward from site 10, the water is a magnesium, sodium, and chloride type. The higher concentration of calcium and bicarbonate in the surficial aquifer at site 23 relative to that at sites 10 and 11 is probably the result of applications of lime, dolomite, and water from the Floridan aquifer.

The concentrations of magnesium, potassium, chloride, and nitrate in the three samples from the surficial aquifer adjacent to Lake Hamilton are notably higher than the concentrations of the same constituents in two samples from the surficial aquifer 75 miles to the northeast in an undeveloped area in Volusia County. The area in Volusia County is the only undeveloped area in central Florida for which these data are available. The ranges in the concentration, in milligrams per liter, of these constituents at the two locations are compared in the following table.

Constituent	Location	Concentrations Minimum	Concentrations Maximum
Magnesium	Lake Hamilton area	7.1	9.0
	Volusia County	1.3	1.9
Potassium	Lake Hamilton area	2.0	7.2
	Volusia County	0.0	0.7
Chloride	Lake Hamilton area	22	33
	Volusia County	11	20
Nitrate as nitrogen	Lake Hamilton area	1.01	5.2
	Volusia County	0.03	0.05

The higher concentrations of these constituents in the Hamilton lakes area may be related to the application of agricultural agents that include dolomite, for adjustment of soil pH, and ammonium nitrate and potassium chloride fertilizers.

Water in the Hamilton lakes contains a mixture of ions in which sodium is the dominant cation and either chloride or sulfate is the dominant anion (fig. 8). The concentrations, in milliequivalents per liter, of the major ions in Lake Hamilton are compared with those in 24 other lakes within 25 miles in figure 9. The concentration of sulfate plus chloride as a proportion of total anions for Lake Hamilton is fourth highest, and that of sodium plus potassium as a proportion of total cations is sixth highest among those for the 25 lakes shown. The comparatively unusual mix of major ions in Lake Hamilton may be related to agriculture and urban development in the basin.

Nutrients

Most of the nitrogen in the Hamilton lakes is in the form of organic nitrogen, the form ordinarily most prevalent in lakes. The concentration of organic nitrogen ranged from 1.0 to 1.6 mg/L in the lakes and from 0.52 to 0.68 mg/L in the adjacent water-table aquifer (table 2). The cumulative frequency of organic nitrogen for the Hamilton lakes and 19 other lakes within 25 miles (fig. 7) shows the percentage of the lakes in which the average concentration of organic nitrogen in samples collected between October 1970 and September 1980 was equal to or less than specific values. The average concentration of organic nitrogen in Lake Hamilton was exceeded in about 42 percent of the lakes; in Middle Lake Hamilton in about 79 percent of the lakes; and in Little Lake Hamilton, in about 57 percent of the lakes.

The highest concentration of nitrate nitrogen (5.2 mg/L as N) noted during the study was in the surficial aquifer at site 11. In the Hamilton lakes, the concentration of nitrate nitrogen was 0 mg/L in Middle Lake Hamilton, 0.04 mg/L in Little Lake Hamilton, and 0.19 mg/L in Lake Hamilton. The cumulative frequency curve for concentrations of nitrate nitrogen in the Hamilton lakes and 28 other lakes within 25 miles (fig. 7) shows that in Middle Lake Hamilton, the concentration of nitrate nitrogen was equal to or less than that in all the other lakes, in Little Lake Hamilton the average concentration exceeded about 40 percent of the other lakes, and in Lake Hamilton, about 68 percent of the other lakes.

Small amounts of phosphorus are essential for growth of a desirable community of aquatic vegetation in a lake. The combined concentration of all forms of phosphorus (total phosphorus) ranged from 0.06 to 0.16 mg/L in the Hamilton lakes and from 0.05 to 0.54 mg/L in waters of the surficial aquifer adjacent to Lake Hamilton. A cumulative frequency curve for the concentration of total phosphorus in the Hamilton lakes and the average concentration in samples taken between October 1970 and September 1980 from 22 other lakes within 25 miles is shown in figure 7. This curve shows that the concentration of total phosphorus was higher in Lake Hamilton than in about 90 percent of the lakes, higher in Middle Lake Hamilton than in about 85 percent of the lakes, and higher in Little Lake Hamilton than in about 65 percent of the lakes.

Mackenthun (1973) suggests that total phosphorus in lakes should not exceed 0.025 mg/L. Although this concentration was exceeded in the Hamilton lakes during the study, the lakes did not contain excessive amounts of weeds or algae. This suggests that one or more other essential nutrients were not present in concentrations that permit excessive growth of weeds or algae.

Dissolved Oxygen and Water Temperature

The concentration of DO (dissolved oxygen) and the temperature of the water in Lake Hamilton at site 21A were monitored hourly during the 10-day period, April 12-21, 1980, by a digital recorder. These data, the daily mean concentration, and the concentration required for 100 percent saturation of DO, are shown in figure 10. The minimum concentration of DO in Class III waters (surface water suitable for recreation, and propagation and management of fish and wildlife) specified by the Florida Department of Environmental Regulation (DER) is 5 mg/L (Florida Department of State, 1978). The concentration of DO in Lake Hamilton was slightly less than 5 mg/L for brief periods on five occasions (fig. 10), whereas the daily mean concentration of DO was higher than the specified minimum throughout the period monitored.

The concentration of DO appears generally to vary inversely with water temperature except on April 14, 15, and 16, when the concentration was unexplainably uniform following passage of a cold front on April 13 and 14. This aberration may be due in part to alteration of oxygen demand by factors other than temperature, such as sky cover, the intensity and direction of the wind, and reaeration.

The DO concentration and the water temperature were measured at several uniformly spaced intervals from top to bottom at several locations in the Hamilton lakes on April 22, 1980. The greatest difference in the measurements at any of the locations was only 0.2 mg/L in the DO concentration and 1° in the water temperature. These small variations indicate that the lakes were well mixed when the measurements were made.

Water temperatures in Lake Hamilton measured during the period 1969-77 (fig. 11) show a minimum temperature of 16°C and a maximum temperature of 33.5°C during the period. The data do not adequately define the normal monthly means and extremes, but the seasonal pattern is similar to that for water temperatures in Florida streams (Anderson, 1971).

Phytoplankton

The algae of greatest concern in eutrophic, or nutrient-loaded, lakes are mostly microscopic and free-floating forms called phytoplankton. Eutrophic lakes usually contain large algae populations but relatively few species. Oligotrophic, or unenriched, lakes usually contain small algae populations but a wide variety of species. The diversity index (Wilhm and Dorris, 1968) was devised to indicate the structure of biological communities. In general, a diversity index less than 1 indicates a highly productive and unstable aquatic community with few biological species whereas, an index of 3 or more indicates a stable community having a wide variety of species and low productivity.

The following table shows the cell count, month samples, and generic diversity index for phytoplankton in Lake Hamilton and in lakes in several other counties in central Florida in the spring of 1980.

Lake	County	Month sampled	Cells per milliliter	Generic diversity index
Hamilton	Polk	April	1,400	2.6
Apopka	Orange-Lake	May	220,000	.5
Wier	Marion	May	550,000	.9
Kerr	Marion	May	8,300	.2
Cypress	Osceola	April	460,000	1.7
Blue Cypress	Indian River	April	1,900,000	.2
East Tohopekaliga	Osceola	April	88,000	1.9

The low cell count and high diversity index for Lake Hamilton in comparison with those of the other lakes listed indicate that Lake Hamilton is less eutrophic than the other lakes. However, 84 percent of the algae in the Lake Hamilton sample were the blue-green type which could become a problem if the lake were to become more enriched with the nutrients that support their growth. Some of the more dominant algae genera and the percentage of the total cell count that they represent are as follows: Agmenellum, 36 percent; Anabaena, 23 percent; Anacystis, 15 percent; Oscellatoria, 10 percent; and Cyclotella, 5 percent.

Trace Metals and Pesticides

Samples of water and bottom materials from near the center of Lake Hamilton were analyzed to determine trace metal and herbicide concentrations in the water, and insecticide concentrations in the bottom materials. The concentrations of trace metals and herbicides found in the water and the standards for maximum permissible concentrations of trace metals set by the DER are given in table 3. Mercury was the only trace metal with a concentration as high as the DER standard and no herbicides were detected. Although the bottom sample was tested for the presence of 22 insecticides (table 4), only chlordane, DDD, and DDE were detected. Chlordane is commonly used for domestic and agricultural control of insects. DDE and DDD are products of the biotransformation of DDT. DDD is also a manufactured product. Use of DDD and DDT is banned by the U.S. Environmental Protection Agency. However, the presence of DDD and DDE in the bottom sediments does not necessarily mean this ban has been violated, because the time required for total biotransformation of DDD to DDE exceeds the time since the ban was instituted.

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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*
inch (in)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	4047	square meter (m^2)
square mile (mi^2)	2.589	square kilometer (km^2)
gallon (gal)	3.785	liter (L)

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

$$°F = 1.8°C + 32$$

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called mean sea level. In this report sea level is referred to as NGVD of 1929 and this datum is understood when the term altitude is used.

Table 2.—*Selected water-quality data for the Hamilton lakes and nearby shallow wells*
[See figure 2 for sampling sites. Results in milligrams per liter, except as noted. Samples depth integrated]

Parameter	Lake Hamilton 21	Middle Lake Hamilton 9	Little Lake Hamilton 5	West shallow well 10	Orange Grove shallow well 11	Country Club shallow well 23
Date (month, day, year)	04/22/80	04/22/80	04/22/80	08/08/80	08/08/80	08/08/80
Temperature (°C)	22.5	23.0	22.5	—	—	—
Specific conductance (μmhos at 25°C)	240	211	200	215	139	237
Turbidity (nephelometric turbidity units)	13	4.0	7.0	—	—	—
Transparency (Secchi disk) (inches)	20	24	29	—	—	—
Color (platinum cobalt units)	150	120	50	—	—	—
pH (units)	7.2	7.1	7.1	4.1	5.5	7.2
Alkalinity, as $CaCO_3$	14	13	30	—	—	—
Hardness, as $CaCO_3$	43	48	33	—	—	—
Hardness, noncarbonate, as $CaCO_3$	31	—	—	—	—	—
Calcium, dissolved, as Ca	6.1	8.1	2.6	6.8	3.5	26
Magnesium, dissolved, as Mg	6.7	8.0	7.6	9.0	7.1	7.8
Sodium, dissolved, as Na	20	18	18	6.9	12	11
Potassium, dissolved, as K	6.9	7.2	7.0	6.1	2.0	7.2
Chloride, dissolved, as Cl	29	29	18	33	22	20
Sulfate, dissolved, as SO_4	38	30	29	2.8	5.6	16
Fluoride, dissolved, as F	.3	—	—	—	—	—
Silica, dissolved, as SiO_2	2.5	—	—	—	—	—
Nitrogen, total as N	1.3	1.6	1.2	—	—	—
Nitrogen, organic, total as N	1.0	1.6	1.1	—	.68	.52
Nitrogen, ammonia, total as N	.07	.02	.07	—	—	—
Nitrogen, nitrite, total as N	.01	.01	.01	—	—	—
Nitrogen, nitrate, total as N	.19	0	.04	4.0	5.2	.01
Phosphorus, total as P	.16	.13	.06	—	.05	.54
Carbon, organic, total as C	26	31	22	—	—	—
Solids, residue at 180°C, dissolved	148	—	—	—	—	—

Table 3.—*Concentrations of trace metals and herbicides in a water sample from Lake Hamilton April 22, 1980, and criteria (limits of concentrations) set by Florida Department of Environmental Regulation (DER) for Class III (recreational) waters*
[Sample depth integrated]

Parameter	Concentration in micrograms per liter: Lake Hamilton	Concentration in micrograms per liter: DER Standard
Trace metals		
Aluminum, total recoverable as Al	100	1,500
Arsenic, total as As	2	50
Berylium, total recoverable as Be	0	11
Cadmium, total recoverable as Cd	0	.8
Chromium, total recoverable as Cr	20	50
Copper, total recoverable as Cu	2	30
Iron, total recoverable as Fe	290	1,000
Lead, total recoverable as Pb	0	30
Manganese, total recoverable as Mn	40	—
Mercury, total recoverable as Hg	.2	<.2
Nickel, total recoverable as Ni	5	100
Selenium, total as Se	0	25
Strontium, dissolved as Sr	60	—
Zinc, total recoverable as Zn	10	30
Herbicides		
2,4-D, total	0	—
2-4-DP, total	0	—
2,4,5-T, total	0	—
Silvex, total	0	—

Table 4.—*Concentrations of insecticides in bottom sediments of Lake Hamilton April 22, 1980*

Insecticide	Concentration in micrograms per liter
Aldrin, total	0.0
Chlordane, total	1
DDD, total	.5
DDE, total	3.6
DDT, total	0
Diazinon, total	0
Dieldrin, total	0
Endosulfan	0
Endrin, total	0
Ethion, total	0
Heptachlor epoxide, total	0
Heptachlor, total	0
Lindane, total	0
Malathion, total	0
Methoxychlor, total	0
Methyl parathion, total	0
Methyl trithion, total	0
Parathion, total	0
Polychlorinated biphenyls, total	0
Polychlorinated naphalenes, total	0
Toxaphene, total	0
Trithion, total	0

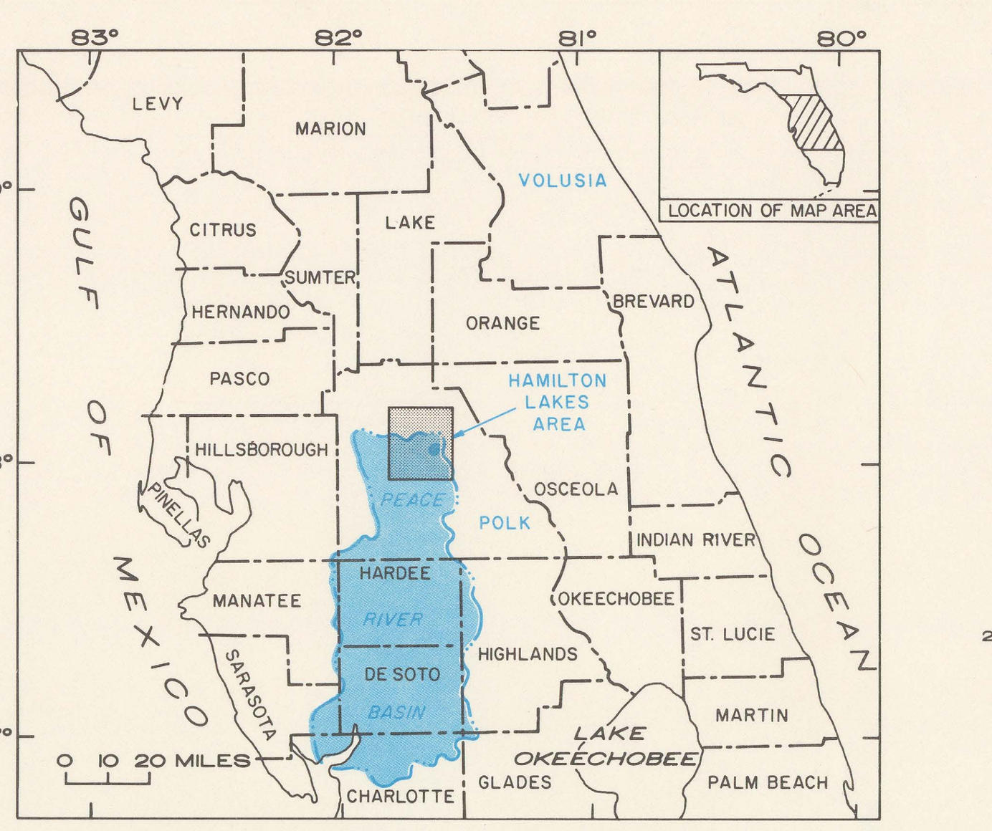

Figure 1.—Central Florida showing the Peace River basin and Hamilton lakes and vicinity.

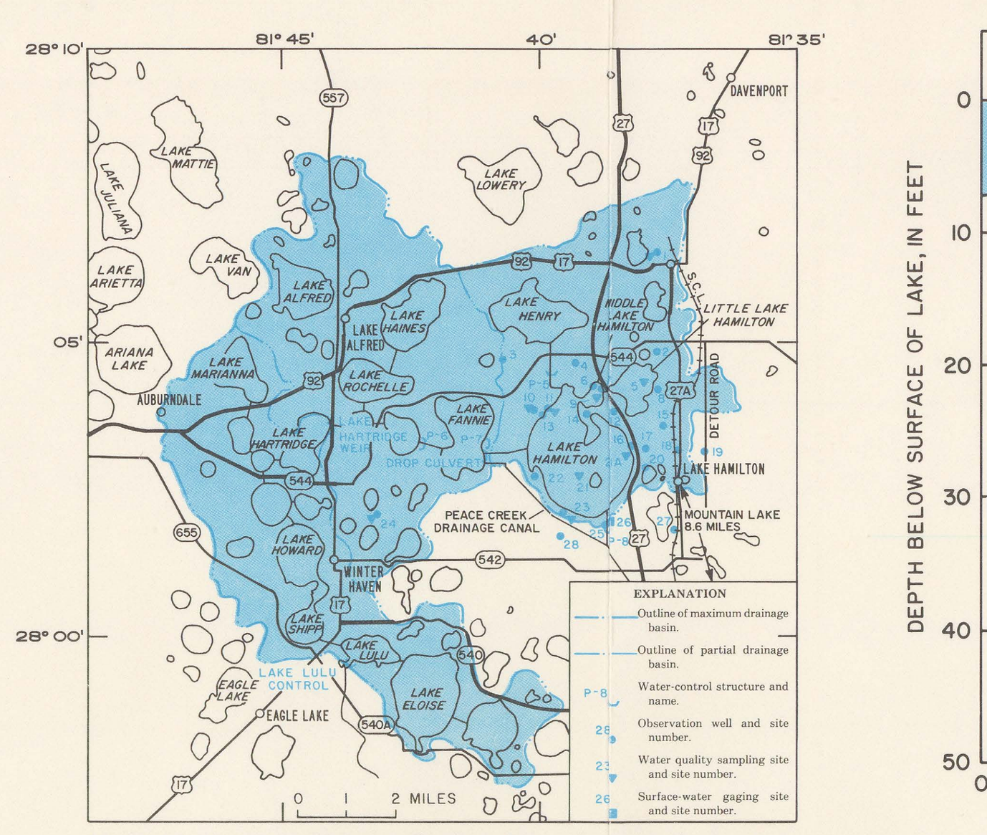

Figure 2.—Locations of data-collection sites, water-control structures, and outlines of the maximum and partial drainage basins for Hamilton lakes and vicinity.

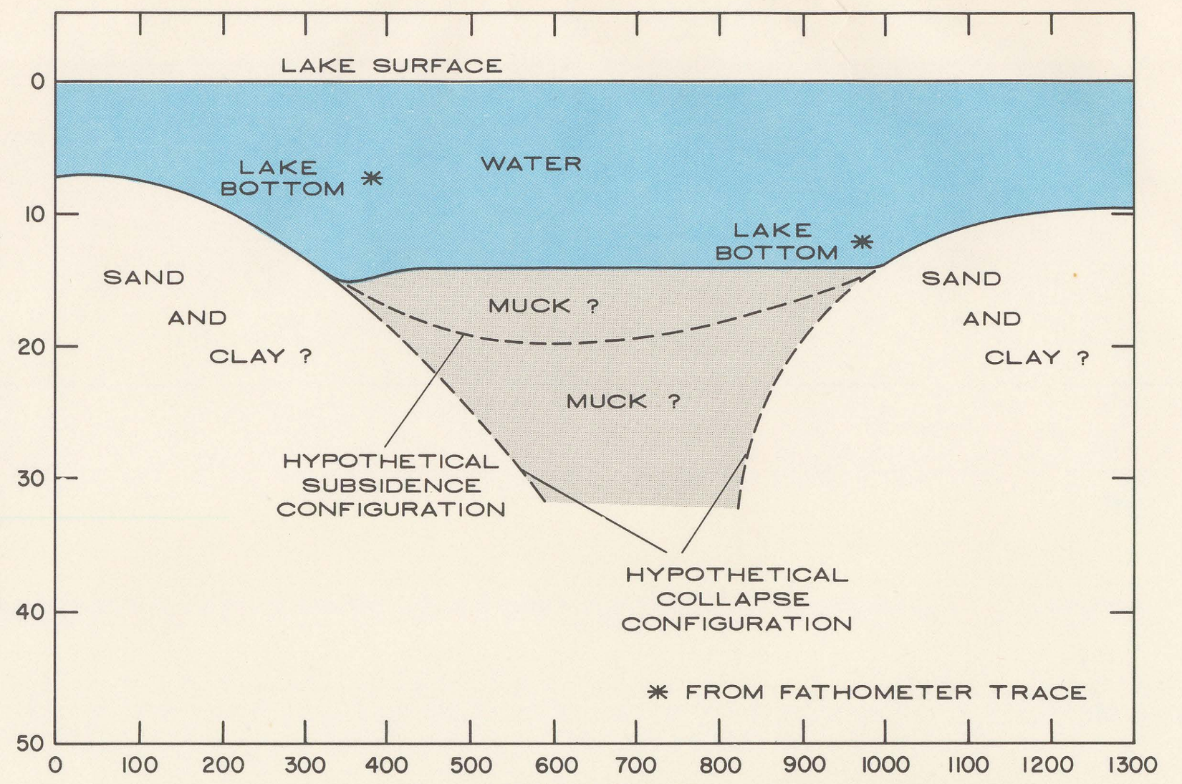

Figure 4.—Part of a fathometer traverse that suggests a partly filled sinkhole depression in Little Lake Hamilton.

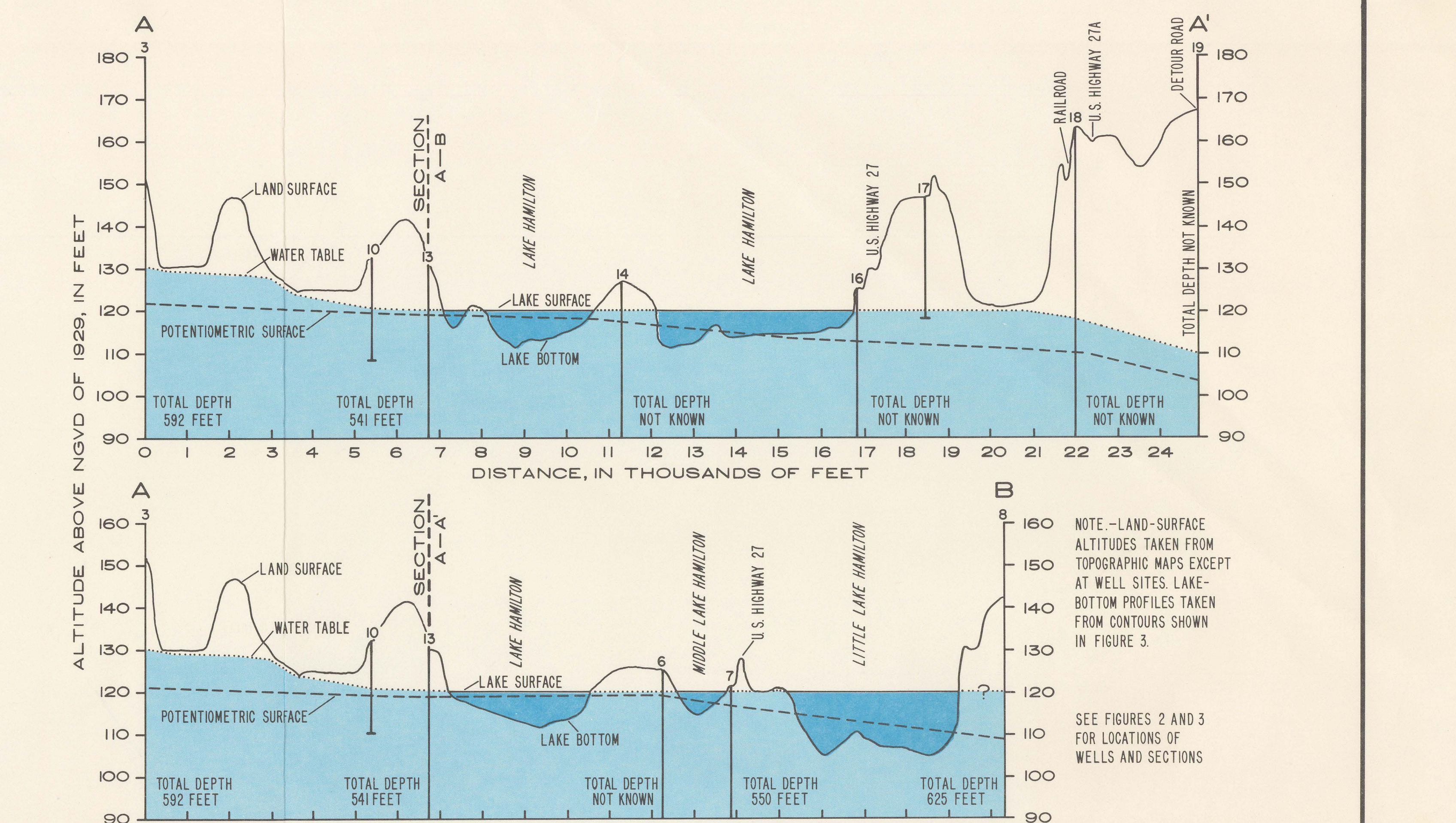

Figure 5.—Relation of the land surface, lake surfaces, water table, and potentiometric surface of the Floridan aquifer.

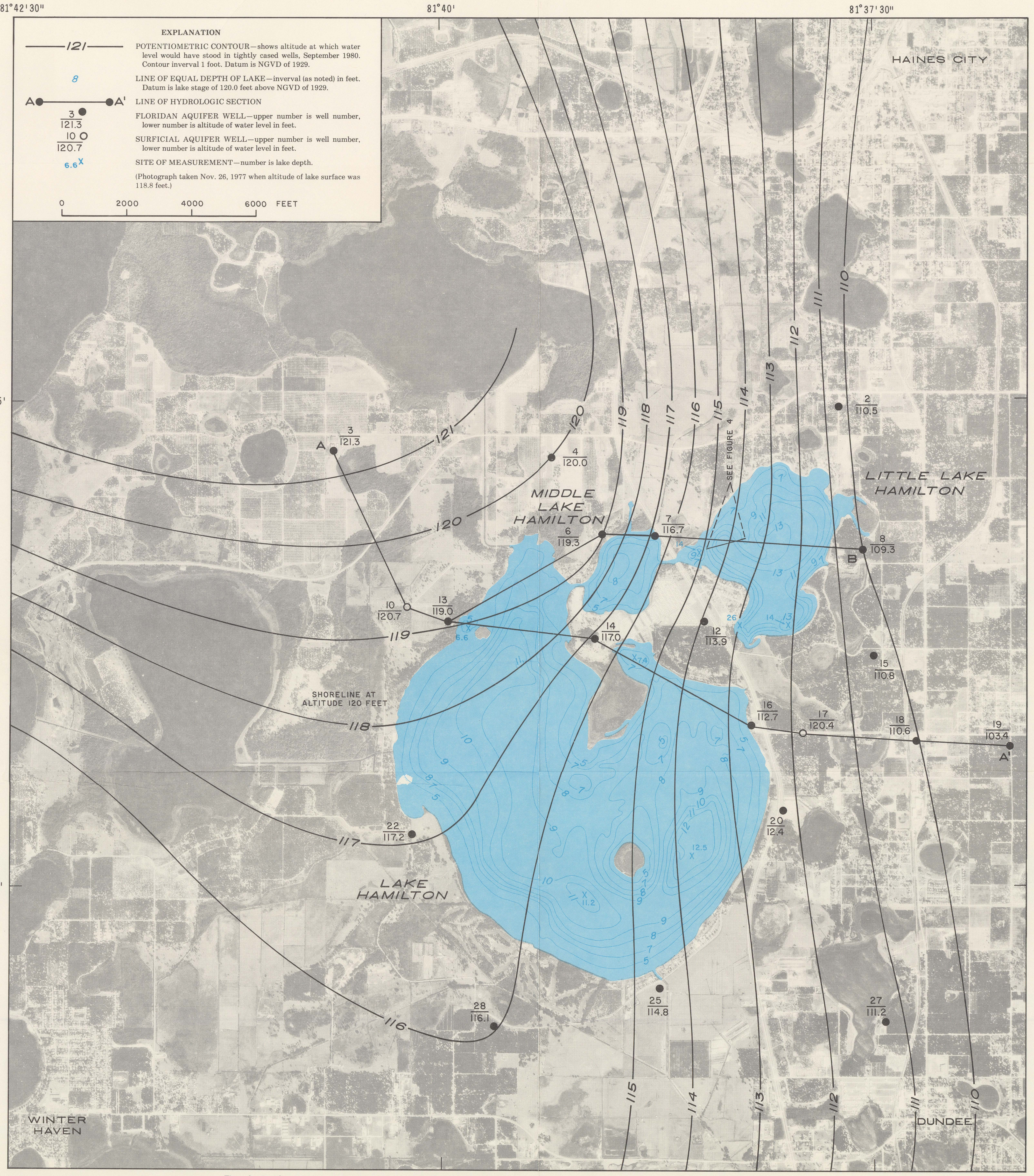

Figure 3.—Hamilton lakes and vicinity showing observation wells, lines of hydrologic section, lake depths, potentiometric surface of the Floridan aquifer, and water levels in wells.

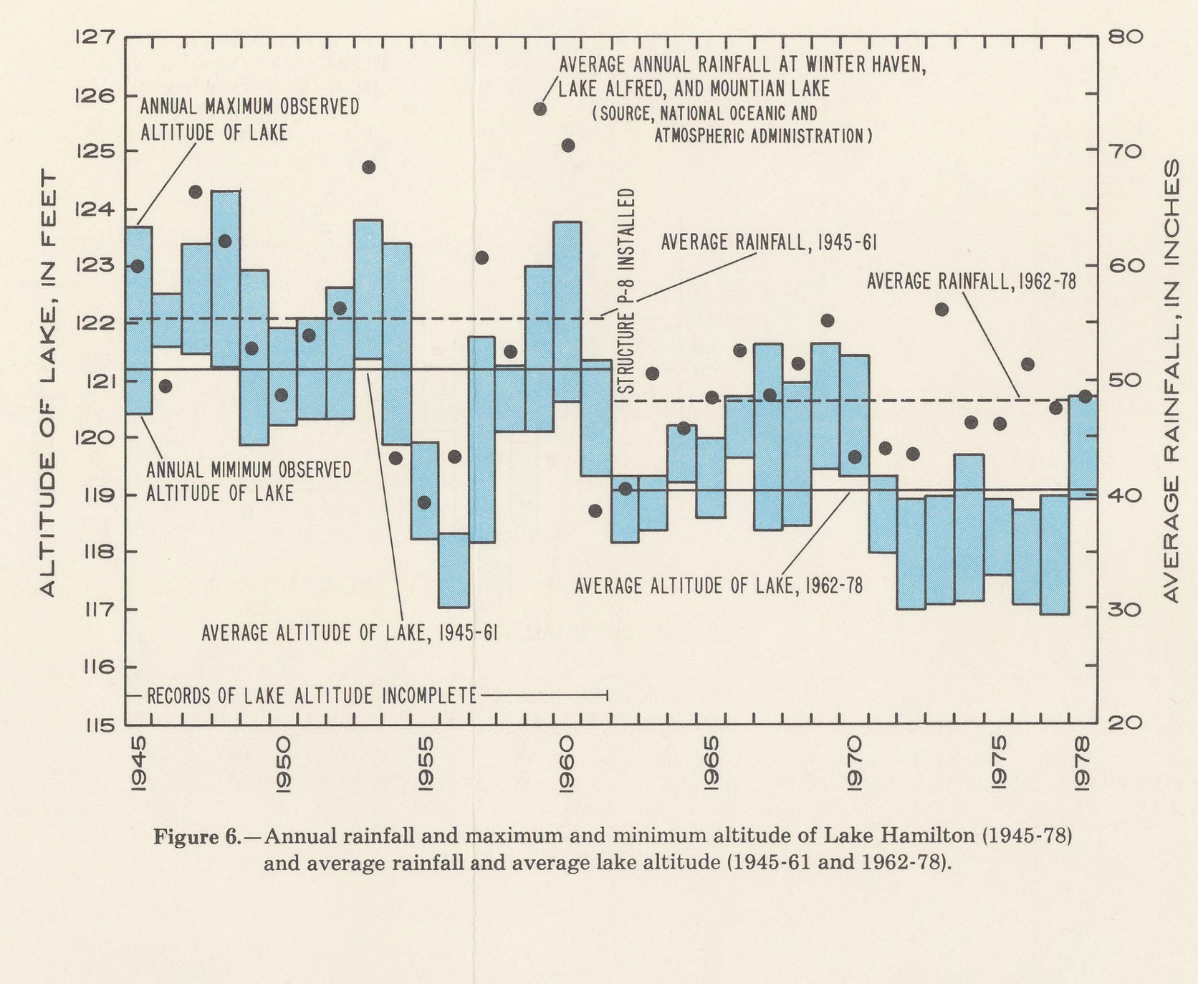

Figure 6.—Annual rainfall and maximum and minimum altitude of Lake Hamilton (1945-78) and average rainfall and average lake altitude (1945-61 and 1962-78).

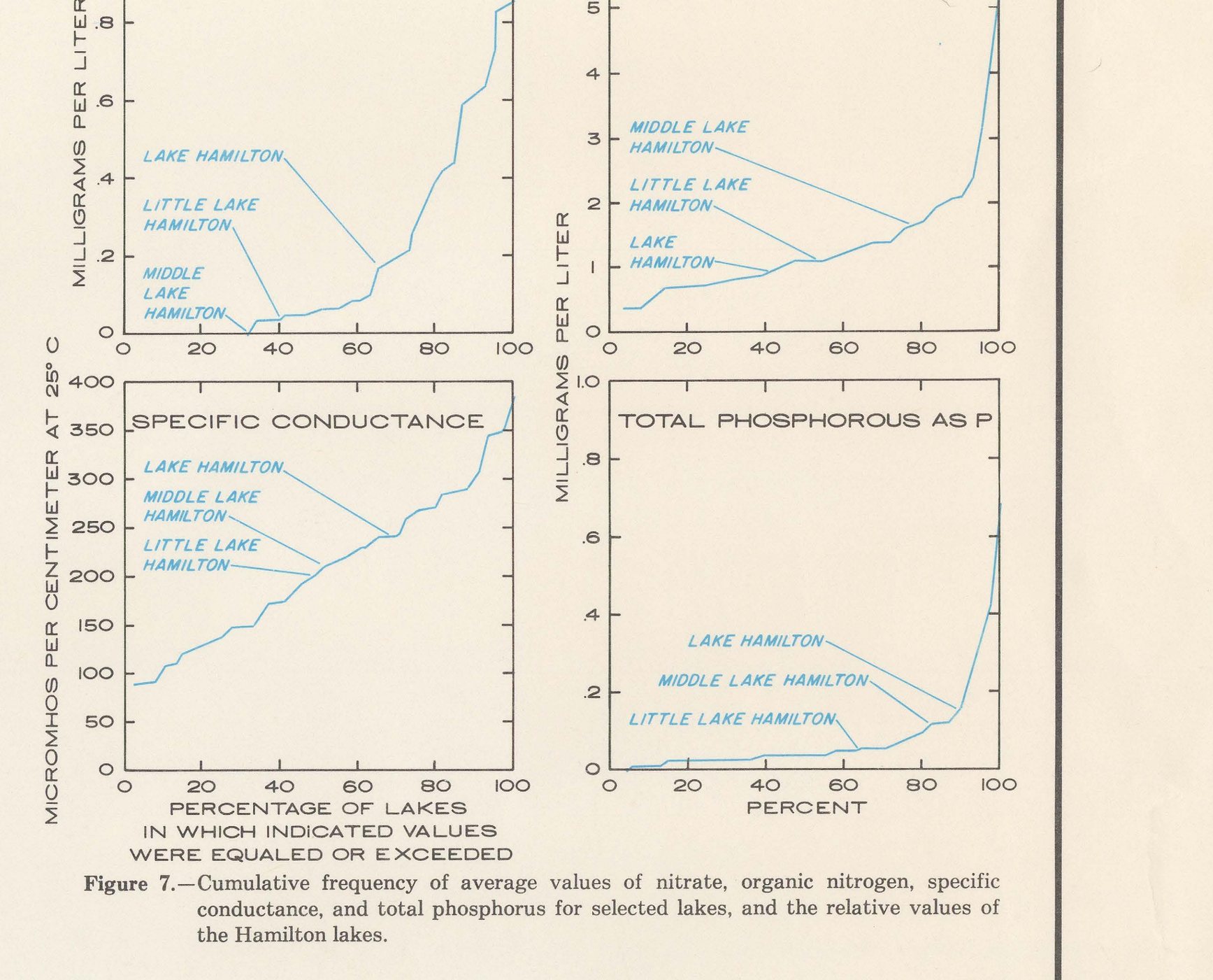

Figure 7.—Cumulative frequency of average values of nitrate, organic nitrogen, specific conductance, and total phosphorus for selected lakes, and the relative values of the Hamilton lakes.

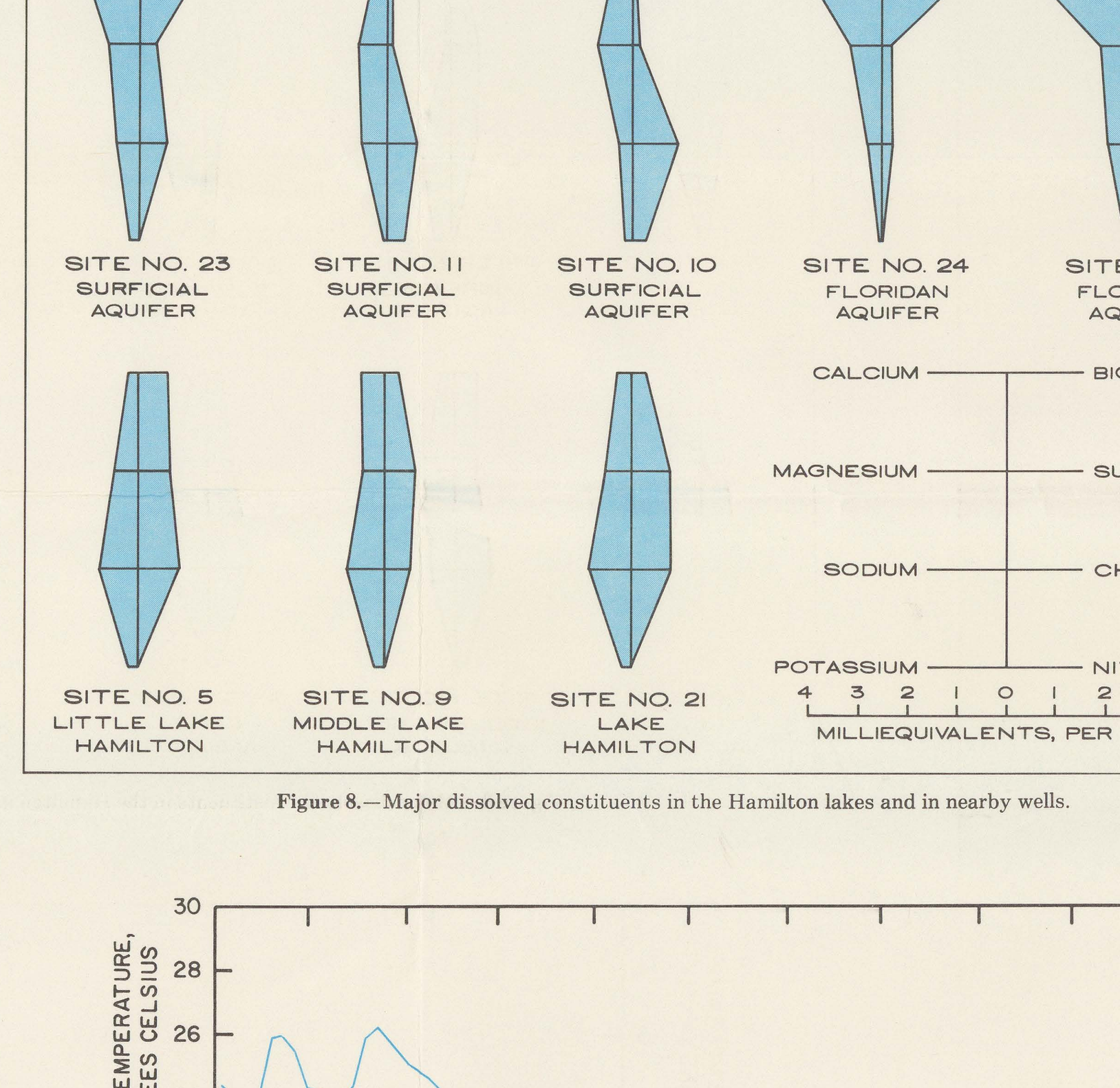

Figure 8.—Major dissolved constituents in the Hamilton lakes and in nearby wells.

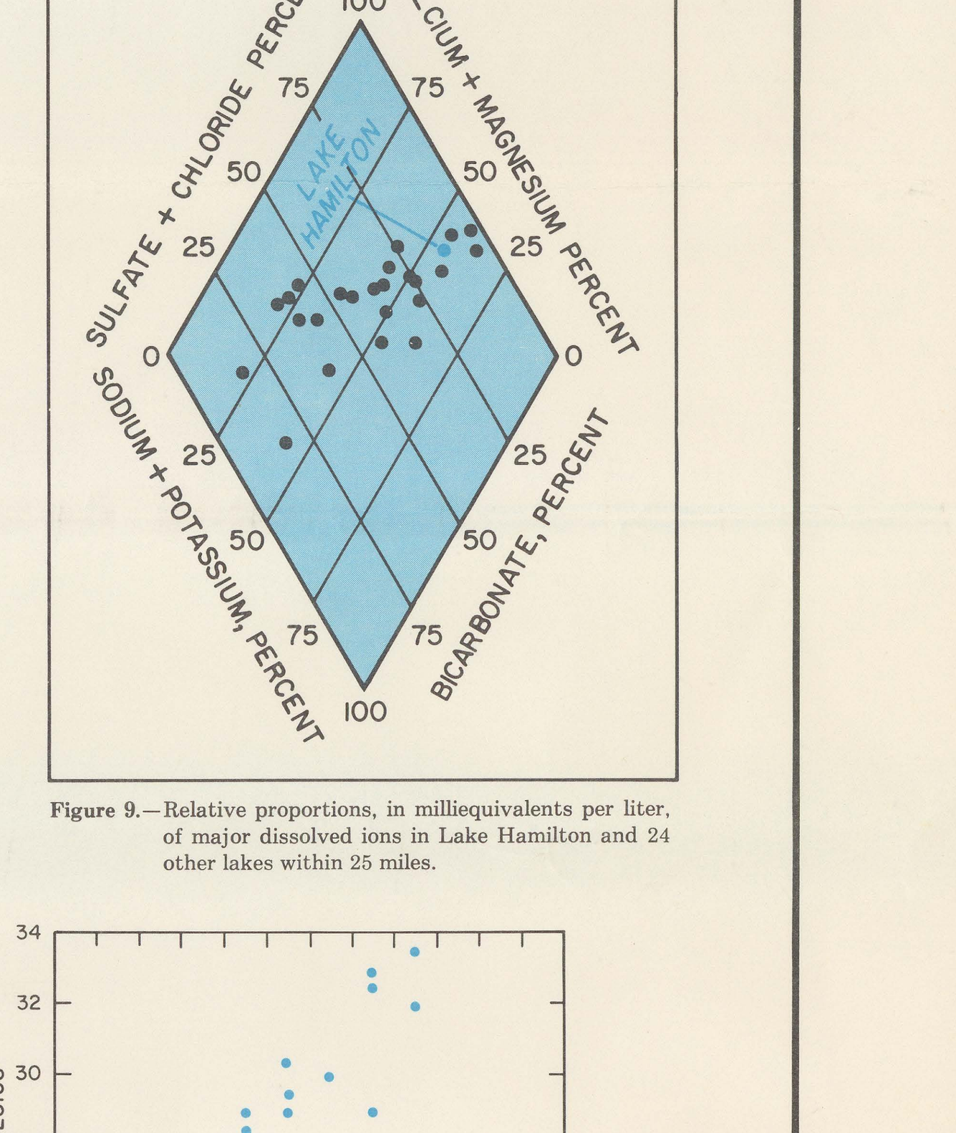

Figure 9.—Relative proportions, in milliequivalents per liter, of major dissolved ions in Lake Hamilton and 24 other lakes within 25 miles.

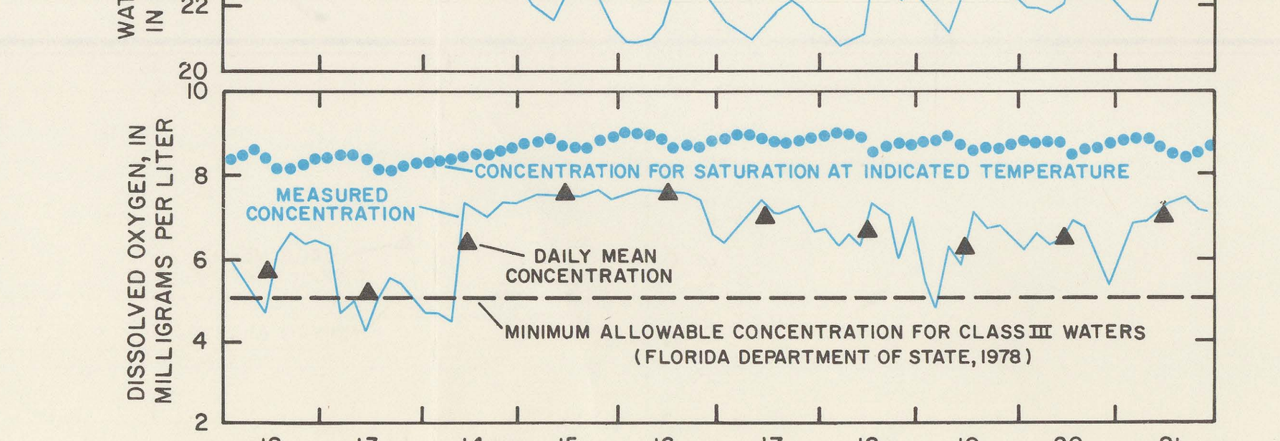

Figure 10.—Water temperatures and concentrations of dissolved oxygen in Lake Hamilton (April 12-21, 1980).

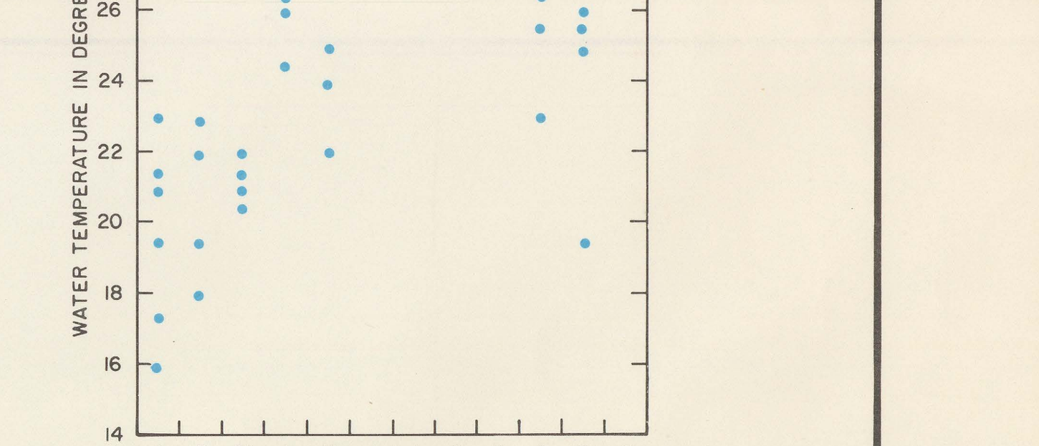

Figure 11.—Observed water temperatures in Lake Hamilton (1969-77).

HYDROLOGY OF HAMILTON LAKES AND VICINITY, POLK COUNTY, CENTRAL FLORIDA

By
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