

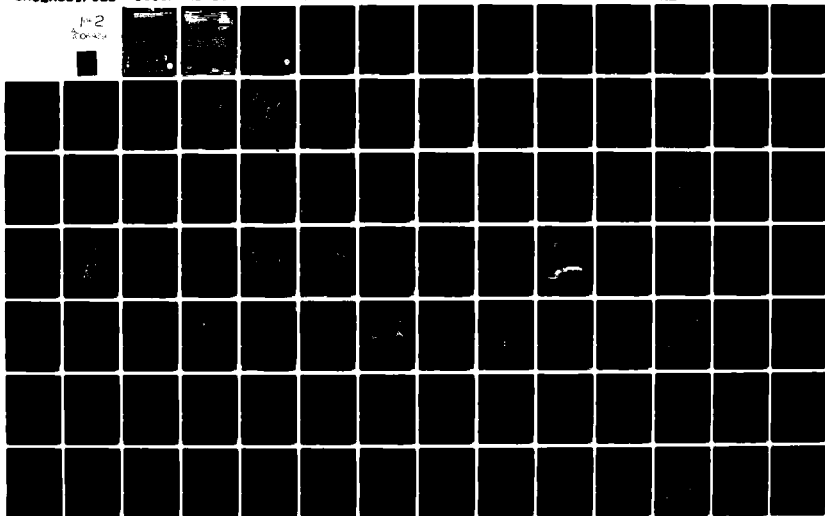
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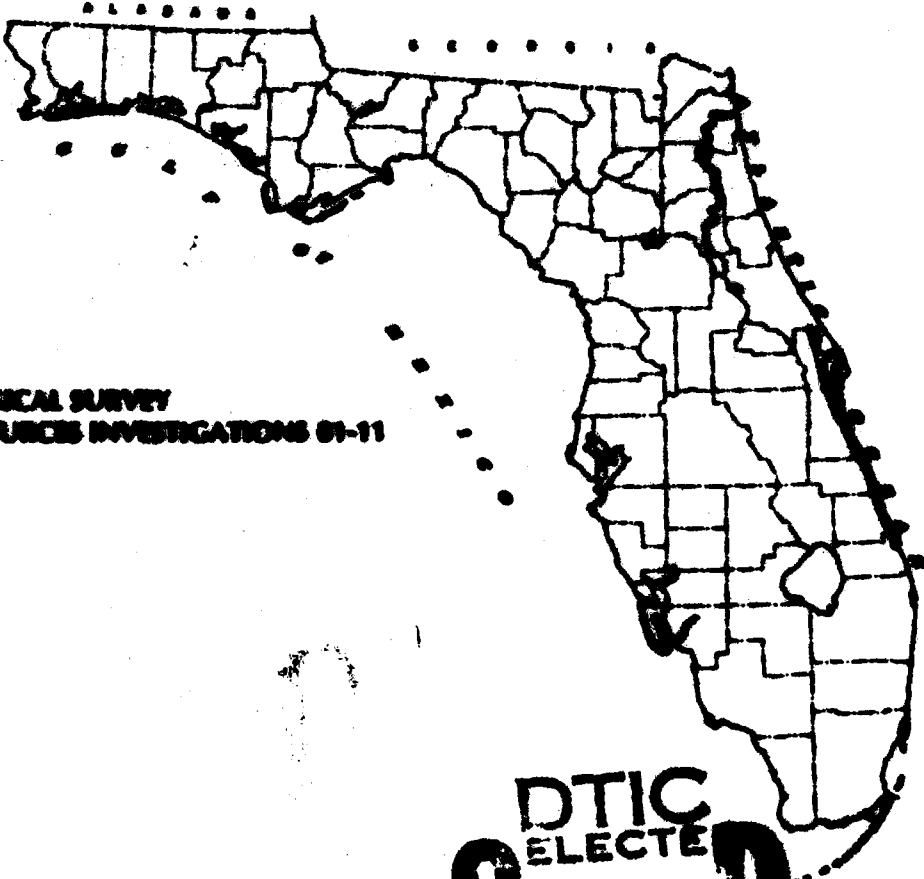
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**WATER-RESOURCES INFORMATION FOR THE
WYLAUCHIE RIVER REGION,
WEST-CENTRAL FLORIDA**

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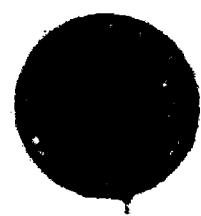
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U.S. Geological Survey, Water Resources Division
325 John Allen Blvd., P-300
Tallahassee, Florida 32309

1. Summary

Prepared in accordance with U.S. Army Corps of Engineers

2. Other than 20 years

The ground-water system in the Tallahassee River region is composed of up to three different aquifers—the surficial, the intermediate, and the Floridan. Little is known about the surficial and intermediate aquifers. The Floridan aquifer contains mostly of limestone and dolomite, and is as up to 1,500 feet thick. Transmissivities are known to be as high as 25 million feet squared per day. The quality of water within the Floridan aquifer is generally excellent except in two areas where sulfates is present. The salinity of the water here average chloride-sulfate concentrations between 250 and 500 milligrams per liter, sodium-chloride specific conductance between 250 and 750 micromhos per centimeter, and average total dissolved concentrations of less than 1.5 milligrams per liter. Samples were collected of more than 1,500 wells, 45 construction-related piping, canals, 21 lakes, and 44 springs.

3. Other than 20 years

Other resources, Ground water, Surface water, Lakes, Springs, Canals, Aquifer characteristics

4. Other than 20 years

Florida, Water use, Groundwater characteristics

**WATER-RESOURCES INFORMATION FOR THE
WITHLACOOCHEE RIVER REGION,
WEST-CENTRAL FLORIDA**

**by Robert A. Miller, Warren Anderson, Anthony S. Navoy,
James L. Smoot, and Roger G. Belles**

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations 81-11

**Prepared in cooperation with the
U.S. ARMY CORPS OF ENGINEERS**

Tallahassee, Florida

1981



UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Doyle G. Frederick, Acting Director

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GLOSSARY

Aquifer.--A formation, group of formations, or part of a formation that is water bearing and will yield significant quantities of water to wells and springs.

Clastic.--Pertains to rocks composed of fragmented material derived from preexisting rocks and transported mechanically to its place of deposition.

Confined aquifer.--A formation constrained between two confining beds, usually having the potentiometric surface above the top of the aquifer. The latter condition is termed artesian.

Confining bed.--A formation that is stratigraphically adjacent to one or more aquifers and has a permeability that is low in relation to the permeabilities of the aquifers.

Drawdown.--The distance the potentiometric surface at a particular point is lowered when water is removed from an aquifer by a pumping well.

Evapotranspiration.--The overall loss of water by evaporation from land and water surfaces and by transpiration from plants growing thereon.

Fault.--A fracture in the Earth's crust accompanied by a displacement of one side of the fracture with respect to the other and in a direction parallel to the fracture.

Formation.--A geologic unit consisting of a group of rocks composed of similar materials and displaying common group characteristics.

Geohydrology.--The science dealing with the laws of the occurrence and movement of subterranean waters, and in which the emphasis is placed on hydrology.

Head (static head).--The height above a standard datum of the surface of a column of water that can be supported by the static pressure at a given point.

Hydraulic conductivity.--The volume of water that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow.

Hydraulic gradient.--The change in head per unit distance in a given direction.

Hydrology.--The science dealing with the properties, distribution, and circulation of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere.

Infiltration.--The movement of water from the land surface downward through the unsaturated zone to the water table.

Karst.--A type of terrain, marked by sinkholes, in which the topography is chiefly formed by the dissolution of rock, usually limestone, by surface and ground water.

Leakance.--The ratio of the vertical hydraulic conductivity of a confining bed to its thickness, which is the volume of water transmitted through the confining bed per unit area per unit of head difference across the confining bed per unit time.

Lithology.--The description of rocks as differentiated by mineral composition and structure.

Milliequivalents.--An equivalent concentration that results when the concentration of a chemical constituent in milligrams per liter is divided by the combining weight of the constituent involved. When expressed in milliequivalents per liter, the unit concentrations of all ions are chemically equivalent. If all the chemical constituents of a water sample are correctly determined, the total milliequivalents of anions should exactly equal the total milliequivalents of cations.

Percolation.--The movement, under hydrostatic pressure, of water through the interstices of rock or soil.

Permeability.--A property of a porous medium that relates to its capacity to transmit a fluid under a potential gradient.

Porosity.--The ratio of volume of interstices or voids in rock or soil to its total volume.

Potentiometric surface.--A surface which represents the static head of water in an aquifer. It is defined by the level to which water will rise in tightly cased wells penetrating the aquifer.

Recharge.--The amount of water which enters the aquifer under consideration.

Runoff.--The part of precipitation that appears in surface streams having reached the stream channel by either surface or subsurface routes.

Specific capacity.--The rate of discharge of water from a well divided by the drawdown of the water level in the well.

Specific (electrical) conductance.--Pertains to the capacity of water to conduct an electrical current. It varies with temperature, ion concentration, and chemical composition of the water. Specific conductance is reported in units of micromhos per centimeter at 25°C.

Specific retention.--The ratio of the volume of water a given body of rock or soil will hold against the pull of gravity to the volume of the body itself.

Specific yield.--The ratio of the volume of water that will drain by gravity from a saturated rock or soil to the volume of rock or soil.

Storage coefficient.--The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head.

Transmissivity.--The rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient.

Water table.--The water surface in an unconfined aquifer at which the pressure is atmospheric. It is defined by the level at which water stands in wells that penetrate the aquifer just far enough to hold standing water.

ABBREVIATIONS, CONVERSION FACTORS, AND GEODETIC DATUM

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

<u>Multiply inch-pound units</u>	<u>By</u>	<u>To obtain metric (SI) units</u>
inch	25.40	millimeter (mm)
foot	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
pound (lb)	0.4535	kilogram (kg)
acre	0.4047	hectare (ha)
gallon (gal)	3.785	liter (L)
cubic foot per second (ft ³ /s)	28.32	cubic decimeter per second (dm ³ /s)
gallon per minute (gal/min)	0.06309	liter per second (L/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m ³ /s)
micromho (μmho)	1.000	microsiemens (μS)

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

$$^{\circ}\text{F} = 1.8 \text{ }^{\circ}\text{C} + 32$$

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is the geodetic datum formerly called mean sea level (msl). Its use is understood when the terms "altitude" or "sea level" are used in this report.

**WATER-RESOURCES INFORMATION FOR THE
WITHLACOOCHEE RIVER REGION, WEST-CENTRAL FLORIDA**

**By Robert A. Miller, Warren Anderson, Anthony S. Navoy,
James L. Smoot, and Roger G. Belles**

ABSTRACT

Daily water use in the Withlacoochee River region in 1977 averaged about 2,005 million gallons per day, 94 percent of which was saline surface water used in thermoelectric power-generation cooling. Industrial and irrigation uses required 73 percent of the freshwater. The largest user of freshwater was Hernando County, using 43.0 million gallons per day.

The ground-water system is comprised of up to three different aquifers--the surficial, the secondary artesian, and the Floridan. Little is known about the surficial and secondary artesian aquifers.

The Floridan aquifer consists mostly of limestones and dolomites, and is as much as 1,500 feet thick. Transmissivities are known to be as high as 25 million feet squared per day. Yields of 2,000 gallons per minute from 12-inch wells are possible. Although the range in fluctuations of the potentiometric surface is as great as 20 feet, no significant change has occurred since the 1930's when data were first collected.

The quality of water within the Floridan aquifer is generally excellent except near the Gulf Coast and in extreme east Marion County, near the St. Johns River where saltwater is present in the aquifer. Iron and hydrogen sulfide are sometimes a problem, but they can usually be controlled by proper well design and aeration of the water. Concentrations of sulfate do not exceed 250 milligrams per liter in the study area, and only in a small part of the area do dissolved-solids concentrations exceed 250 milligrams per liter.

Summaries were compiled of more than 1,000 wells, 43 continuous-record gaging stations, 21 lakes, and 46 springs. The predominant chemical type for both streams and springs is calcium and magnesium bicarbonate due to the dissolution process of the carbonate rocks. Along the coastal areas and near the St. Johns River, water is commonly of the sodium chloride type. The majority of the streams have average dissolved-solids concentrations between 100 and 200 milligrams per

liter, maximum-observed specific conductance between 250 and 750 micro-mhos per centimeter, and average total nitrogen concentrations of less than 1.2 milligrams per liter.

Data for six lakes showed that the range of stage between the 90 and 10 percent exceedance stages is as great as 4.5 feet and as small as 2.2 feet. Little water-quality data for lakes are available, especially for the important constituents such as biochemical oxygen demand, total nitrogen, total phosphorus, and total carbon.

Flow-duration data for springs show small ranges in discharge. The differences between the 10 and 90 percent exceedance discharges are 350 cubic feet per second for Silver Springs and 280 cubic feet per second for Rainbow Springs, the two largest springs in the area. Water quality of the springs is relatively constant with time because of the water's long residence time within the carbonate rocks.

INTRODUCTION

Study Area

The study area of this report, the Withlacoochee River region, is in the counties of Levy, Marion, Citrus, Hernando, and Sumter (fig. 1). These counties are located in the central part and along the Gulf Coast of Florida. The area is about 4,300 mi² in size (2,740,000 acres) (University of Florida, 1974), and has an estimated 1980 population of 209,400 people (University of Florida, 1977). The population growth during 1970-73 for each county except Levy was greater than the state average.

The five counties which comprise the study area border the Withlacoochee River along its lower reaches (fig. 2), hence the name of the area Withlacoochee River region. These five counties also comprise the areas of the Withlacoochee Regional Planning Council and Withlacoochee Regional Water Supply Authority, two organizations involved with the management of the area's water resources.

The county seats are Bronson in Levy County, Ocala in Marion County, Inverness in Citrus County, Brooksville in Hernando County, and Bushnell in Sumter County. These towns are connected by three major north-south highways: U.S. 41 in the west; I-75 and U.S. 301 in the center of the study area; and U.S. 27, a southeast-northwest highway connecting Ocala and Bronson.

The major lakes within the study area include Weir, Rousseau, Tsala Apopka and Panasoffkee. Drainage is provided by the Withlacoochee River, the Waccasassa and Suwannee Rivers in Levy County, the St. Johns and Oklawaha Rivers in Marion County, and several small coastal streams in Levy, Citrus, and Hernando Counties. Land cover is primarily evergreen forest with wetlands vegetation near the rivers and citrus groves in the agriculturally developed highlands.

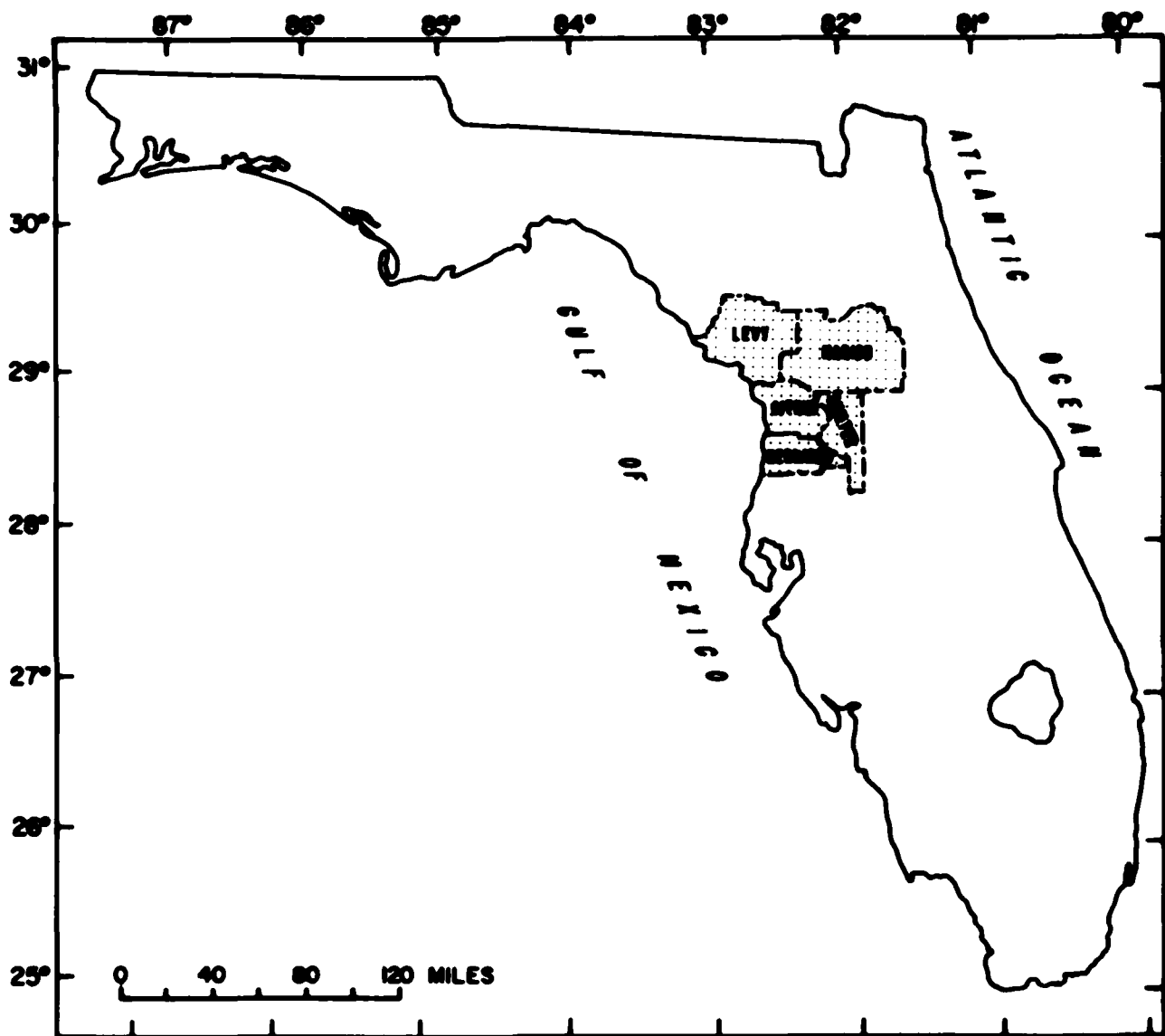


Figure 1.--Location of study area.

Purpose

The Withlacoochee Regional Planning Council and the Withlacoochee Regional Water Supply Authority actively sought and obtained Congressional authorization and funding for a study, to be performed by the U.S. Army Corps of Engineers, that would specifically address the water supply problems within the Withlacoochee Regional Planning Council area. The first stage of the Corps' study is a reconnaissance report documenting all activities required to determine the need and justification for further investigation.

As a part of the first stage, the U.S. Geological Survey, in cooperation with the Corps of Engineers, prepared this report on the water resources of the area to provide basic technical information for use in: assessing future capabilities of various water supply sources, determining future investigation and study needs, and identifying measures that could be taken to prolong or protect existing water-supply sources.

Scope

This report presents a compilation of water resources information available for the Withlacoochee River region and suggests studies that should be initiated in order to better understand the interrelation of the area's water resources. Information provided was taken from existing reports and from available hydrologic records; no new data were collected. If two or more published reports were found to be in conflict regarding data or analysis no attempts were made to resolve the conflict. Rather, the information from each report is presented. Data provided on water use, wells, springs, streams, and lakes are based on records previously collected by the U.S. Geological Survey. Known reports on the water resources of the area are referenced in the bibliography.

Climate

The climate is subtropical. Summers are characterized by large amounts of rainfall, high humidity, and numerous thunderstorms. Winters are mild with dry periods separated by cold, wet weather caused by the invasion of cold fronts from the north.

Temperatures generally range from 70° to 90°F in the summer and from 30° to 75°F in winter. A few periods of freezing weather are recorded per year.

Rainfall

The mean annual rainfall for the State of Florida is presented by Hughes and others (1971) for the period 1931 to 1955. Northern Levy, most of Marion, and Sumter Counties receive about 52 inches per year while southern Levy, Citrus, and Hernando Counties receive about 56 inches per year.

Rainfall records are summarized for Inverness in Citrus County and Ocala in Marion County by Anderson (written commun., 1980) and for the vicinity of Bushnell by Anderson (1980). Average monthly rainfall at

Inverness ranged from a low of 1.60 inches in November to 9.14 inches during July and August, at Ocala from 1.77 inches during November to 8.58 inches during July, and at Bushnell from 1.71 inches in November to 8.42 inches in July. Average monthly rainfall for the three sites are shown in table 1.

For the 40-year period 1937-76 when data were collected near Bushnell, 62 percent of the rain fell during the rainy season, June through October, and 38 percent fell during the dry season, November through May.

Average and extreme monthly rainfall for Bushnell are shown in figure 3 (Anderson, 1980). The monthly rainfall ranged from a maximum of 18.18 inches in July to zero in April and October.

Evapotranspiration

Evapotranspiration is composed of transpiration by plants and evaporation from water bodies and land surfaces. Cherry and others (1970) estimate the evapotranspiration in the Middle Gulf area, Tampa Bay north to Citrus County, to be 38.5 inches per year. Pride and others (1966) estimate the evapotranspiration in the Green Swamp area to be 36.8 inches per year. Grubb and Rutledge (1979) used an estimate of 40 inches per year of evapotranspiration in their modeling work on the Green Swamp area.

The average annual lake evaporation for Florida, as taken from Kohler and others (1959), is shown in figure 4. Lake evaporation in the study area is about 48 inches per year.

WATER USE

General

All water-use data reported in this section are from a 1977 water-use estimate compiled by Leach and Healy (1980). Their sources of information were waterplant operating reports, industry records, county agricultural agents, and water-use specialists of the State Water Management Districts and the U.S. Geological Survey.

Data concerning water consumption, that water which is removed from sources accessible to man, are not presented in this report because of problems associated with the variable. First, all water-use data collectors do not agree on the definition of the term, thereby causing different types of data to be collected. Second, complexities involved with the field measurements cause the data to have a large error component.

Time-dependent trends in water use are not presented because of the short period of water-use records available for estimation. Also changes in rates of use may reflect refinement in data collection rather than represent an actual trend.

Table 1.--Average monthly rainfall, in inches, for three selected sites

[Base period for Ocala and Inverness is 1931-78, for Bushnell is 1937-76]

	<u>Ocala</u>	<u>Inverness</u>	<u>Bushnell</u>	<u>Three-station average</u>
January	2.45	2.55	2.45	2.48
February	3.34	3.32	3.25	3.30
March	3.75	4.03	4.00	3.93
April	3.17	2.64	2.82	2.88
May	3.96	3.70	3.83	3.84
June	7.07	7.34	7.35	7.25
July	8.58	9.14	8.42	8.71
August	7.68	9.14	7.26	8.03
September	6.02	6.26	6.35	6.21
October	3.06	2.89	3.01	2.99
November	1.77	1.60	1.71	1.69
December	2.63	2.43	2.15	2.40

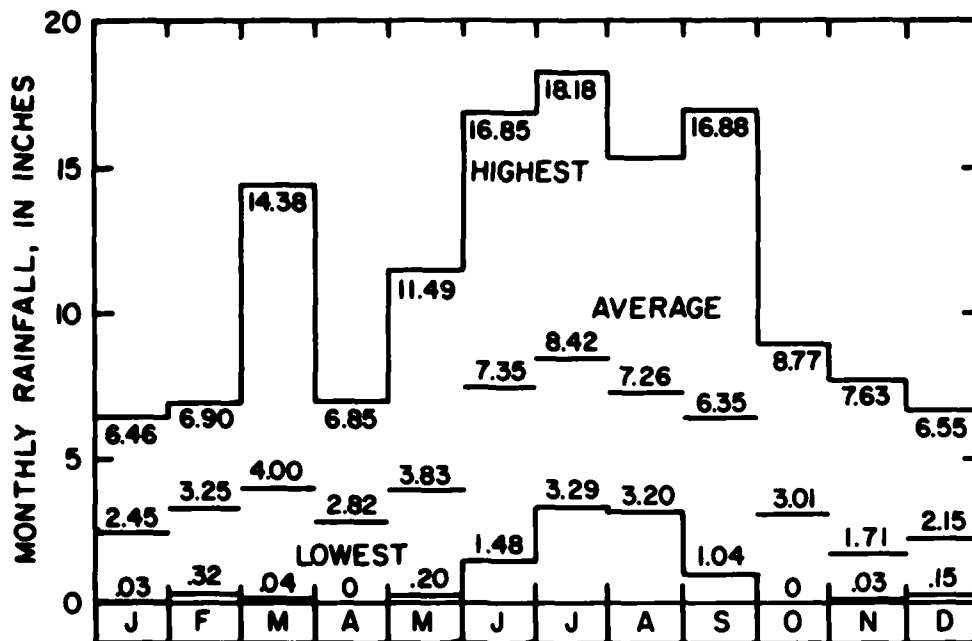


Figure 3.--Average and extreme monthly rainfall 2 miles east of Bushnell, 1937-76 (from Anderson, 1980).

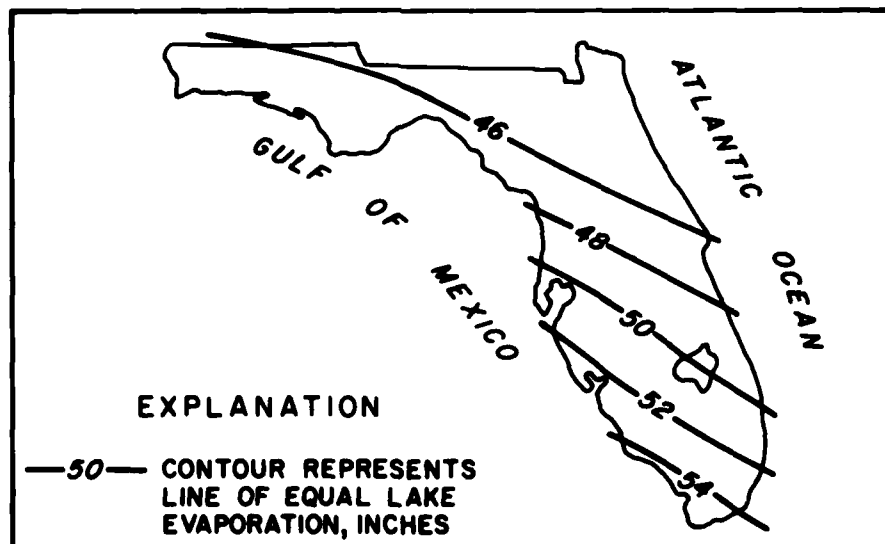


Figure 4.--Average annual lake evaporation (from Kohler and others, 1959).

Public Supply

The public-supply water-use category includes all uses of water distributed by a public-supply utility system. These uses may be further delineated by domestic, agriculture, industry, commercial, and air conditioning subcategories. The domestic subcategory, in addition to including household and lawn watering use, also contains fire protection use, water main flushing, and water not accounted for (source pumpage minus metered usage).

The part of the population served by a public-supply utility averaged about 30 percent for the whole study area and ranged from 14 percent in Citrus County to 47 percent in Levy County.

Ground water is the sole source of public supply water in the region. Table 2 shows that 63,600 people were serviced by a public-supply utility system during 1977. Withdrawal by public supply systems in 1977 totaled 9.63 Mgal/d. The average per capita use was 151 gal/d.

Table 3 shows that the largest use of public-supply water is domestic, 6.72 Mgal/d or about 70 percent of the total use. The average per capita domestic use was 106 gal/d (6.72 Mgal/d used by 63,600 persons). The remaining 30 percent is used for commercial and industrial purposes, mostly in Marion County. Marion County also uses about 63 percent of all public-supply water.

Rural Domestic

The rural domestic water use category consists of uses of water furnished by an individual water supply system for a household. Some examples of use are: toilet flushing, bathing, drinking, cooking, cleaning, laundering, car washing, pool filling, lawn sprinkling, and water conditioner back washing.

An estimated 145,800 people supply their own domestic water needs. As indicated in table 4, this supply is derived solely from ground-water sources through individual wells. These wells withdraw approximately 16.07 Mgal/d or about 110 gal/d per person.

Livestock

Livestock as a water-use category includes water for drinking and to clean commercially raised animals.

Table 4 shows that livestock use totaled 4.04 Mgal/d, 87 percent of which is from ground-water sources. The small amount of surface-water withdrawal is in the coastal counties of Levy and Hernando. The highest level of livestock activity is in Marion County where nearly half of the Withlacoochee River region livestock is raised.

Table 2.--Public-supply water withdrawals during 1977 by county
(from Leach and Healy, 1980)

[All water withdrawn is fresh ground water]

County	Population	Population served	Water withdrawn (Mgal/d)	Per capita use ^{1/} (gal/d)
Citrus	38,600	5,500	0.66	120
Hernando	32,200	5,300	.92	174
Levy	15,900	7,500	1.05	140
Marion	101,100	38,000	6.08	160
Sumter	21,600	7,300	.92	126
Total	209,400	63,600	9.63	151

^{1/} Computed by dividing water withdrawn by population served.

Table 3.--Public-supply water uses during 1977 by county, in million gallons per day (from Leach and Healy, 1980)

Public-supply uses	County					Total
	Citrus	Hernando	Levy	Marion	Sumter	
Domestic	0.43	0.92	1.02	3.49	0.86	6.72
Agriculture	0	0	0	0	0	0
Industry	0	0	0	1.31	0	1.31
Commercial	.23	0	.03	1.28	.06	1.60
Air condi- tioning	0	0	0	0	0	0
Total	0.66	0.92	1.05	6.08	0.92	9.63

Table 4.--Rural domestic and livestock water withdrawals by county for 1977, in million gallons per day (from Leach and Healy, 1980)

[All water withdrawn is freshwater]

County	Rural Domestic			Livestock		
	Surface water	Ground water	Total	Surface water	Ground water	Total
Citrus	0	3.60	3.60	0	0.11	0.11
Hernando	0	2.69	2.69	0.05	.39	.44
Levy	0	.86	.86	.49	.36	.85
Marion	0	7.47	7.47	0	1.90	1.90
Sumter	0	1.45	1.45	0	.74	.74
Total	0	16.07	16.07	0.54	3.50	4.04

Irrigation (Self-Supplied)

The self-supplied irrigation water-use category includes water used for irrigation which is derived from surface-water or ground-water sources, and not supplied by a public-supply utility system.

Marion County is the largest user of irrigation water. Total withdrawal is 18.40 Mgal/d compared to 30.84 Mgal/d for the entire Withlacoochee River region (table 5). Ninety-two percent of the region's irrigation demands are supplied by ground water.

As shown in table 6, Marion County also has the largest amount of irrigated land, over 15,000 acres. Citrus County uses the least irrigation water, 1,663 acre-ft/yr (1.49 Mgal/d), and has the lowest irrigated acreage, 800 acres. However, the irrigation application rate in Citrus County is the highest in the region. About 25 inches of water were applied during 1977. The lowest irrigation application rates were found in Levy and Sumter Counties. About 7 inches were applied during the same annual period.

The type of crops irrigated consisted mostly of citrus and varied truck-farm crops. Watermelons, corn, pasture, tobacco, and other crop types were also irrigated (table 7).

Industrial (Self-Supplied)

This category includes all water used for industrial purposes not included in livestock or thermoelectric power generation categories and not supplied by a public supply system.

In the Withlacoochee River region self-supplied industrial water is derived totally from ground-water sources. Of the 51.45 Mgal/d used by self-supplied industry in the region, 40.46 Mgal/d, or about 79 percent, is used in mining limerock (table 8). Limerock mining is done mostly in Hernando and Sumter Counties and some in Citrus County. Other water-use industries include chemical, citrus, and food products.

Thermoelectric Power Generation

This category includes water used for condenser cooling and for electrical power generation, such as boiler makeup water. Other uses of water at the powerplant are included either under self-supplied industrial or the industrial part of public-supply use.

The only water used for thermoelectric power generation is in the Crystal River area of Citrus County. As shown in table 9, the fresh-water used is derived from ground-water sources and amounted to 0.63 Mgal/d in 1977. In addition, saline surface water was withdrawn at an average rate of 1,892 Mgal/d for cooling purposes during 1977 (to generate 8,240 million Kilowatt-hours of electrical power).

Table 5.--Self-supplied irrigation water withdrawals by county during 1977, in million gallons per day (acre feet per year)(from Leach and Healy, 1980)

[All water withdrawn is freshwater]

County	Source		Total
	Surface water	Ground water	
Citrus	^{1/} 0.37 (413)	1.12 (1,250)	1.49 (1,663)
Hernando	.84 (943)	4.73 (5,300)	5.57 (6,243)
Levy	.05 (59)	1.94 (2,171)	1.99 (2,230)
Marion	.92 (1,030)	17.48 (19,569)	18.40 (20,599)
Sumter	.17 (190)	3.22 (3,604)	3.39 (3,794)
Total	2.35 (2,635)	28.49 (31,894)	30.84 (34,529)

^{1/}1 Mgal/d = 1120.15 acre-feet per year.

Table 6.--Irrigation application rates by county for 1977
(from Leach and Healy, 1980)

County	Land area ^{1/} (acres)	Land area irrigated (acres)	Land area irrigated (percent)	Water withdrawn (acre-ft/yr)	Application rate ^{2/} (in/yr)
Citrus	358,208	800	0.22	1,663	24.95
Hernando	309,952	5,330	1.72	6,243	14.06
Levy	692,800	3,809	.55	2,230	7.03
Marion	1,023,680	15,126	1.48	20,599	16.34
Sumter	355,264	6,580	1.85	3,794	6.92
Total	2,739,904	31,645	1.16	34,529	13.09

^{1/}From University of Florida (1974).

^{2/}Computed by dividing water withdrawn by land area irrigated and neglecting conveyance losses.

**Table 7.--Irrigation crop acreages by county for 1977, in acres
(from Leach and Healy, 1980)**

Crop type	County					Total
	Citrus	Hernando	Levy	Marion	Sumter	
Citrus	300	3,600	0	6,500	500	10,900
Truck farming	0	0	68	3,000	2,500	5,568
Pasture	0	0	484	0	1,000	1,484
Sugar cane	0	0	0	0	0	0
Tobacco	0	0	80	13	15	108
Corn	80	80	1,610	400	100	2,270
Water- melons	160	50	400	990	2,200	3,800
Other	260	1,600	1,167	4,223	265	7,515
Total	800	5,330	3,809	15,126	6,580	31,645

Table 8.--Industrial self-supplied water use by county for 1977, in million gallons per day (from Leach and Healy, 1980)

[All water used is fresh ground water]

Industrial uses	County					Total
	Citrus	Hernando	Levy	Marion	Sumter	
Limerock mining	1.03	23.43	0	0	16.00	40.46
Pulp and paper	0	0	0	0	0	0
Chemical products	0	0	0	0	.04	.04
Phosphate mining	0	0	0	0	0	0
Citrus products	.14	0	0	0	0	.14
Food products	.15	.17	0	0	.02	.34
Air- conditioning	0	0	0	0	0	0
Other	0	10.16	0	.31	0	10.47
Total	1.32	33.76	0	0.31	16.06	51.45

Table 9.--Total water withdrawal in the Withlacoochee River region for 1977 by source, in million gallons per day (from Leach and Healy, 1980)

Use category	Source				Total
	Surface water		Ground water		
	Fresh	Saline	Fresh	Saline	
Public supply	0	0	9.63	0	9.63
Rural domestic	0	0	16.07	0	16.07
Livestock	0.54	0	3.50	0	4.04
Irrigation (self-supplied)	2.35	0	28.49	0	30.84
Industrial (self-supplied)	0	0	51.45	0	51.45
Thermoelectric power generation	0	1,892.20	0.63	0	1,892.83
Total	2.89	1,892.20	109.77	0	2,004.86

Water-Use Summary

Daily water use in the Withlacoochee River region totaled 2005 Mgal/d in 1977 (table 8). Of this total 1,892 Mgal/d, or 94 percent, was saline surface water used for thermoelectric power generation cooling. No saline ground water and only 2.89 Mgal/d of fresh surface water was used. Ground water, the predominant source of freshwater supplied 110 Mgal/d.

As shown in table 10 and figure 5, most freshwater is supplied for industrial and irrigation uses. Together, these two uses comprise 82.29 Mgal/d or 73 percent of all freshwater withdrawal. Other uses of freshwater include rural domestic, public supply, livestock, and thermoelectric power generation. Together they account for the additional 30.37 Mgal/d of freshwater used.

Figure 6 and table 10 show that the largest use of freshwater, 43.38 Mgal/d, is in Hernando County. Nearly 78 percent of the total, or 33.76 Mgal/d, is used by self-supplied industry. Other large areas of water use are in Marion County where 18.40 Mgal/d are used for self-supplied irrigation, and in Sumter County where 16.06 Mgal/d are used for self-supplied industry. Table 10 and figure 7 identify major water-use categories in each of the five counties. In Citrus and Marion Counties, the major uses of freshwater are for rural domestic and irrigation; in Hernando and Sumter Counties, for irrigation and industry; and in Levy County for irrigation and public supply.

The total freshwater withdrawal and the total per-capita freshwater use by county are shown in figure 8. The per capita use of freshwater is calculated by dividing the total use of freshwater for all use categories in the county by the county population. Hernando County has the highest total per capita freshwater use as well as the highest county freshwater withdrawal, 1,347 gal/d and 43.38 Mgal/d, respectively. Citrus County has the lowest total per capita use, 202 gal/d; Levy County has the lowest freshwater withdrawal, 4.75 Mgal/d.

HYDROGEOLOGY

Physiography

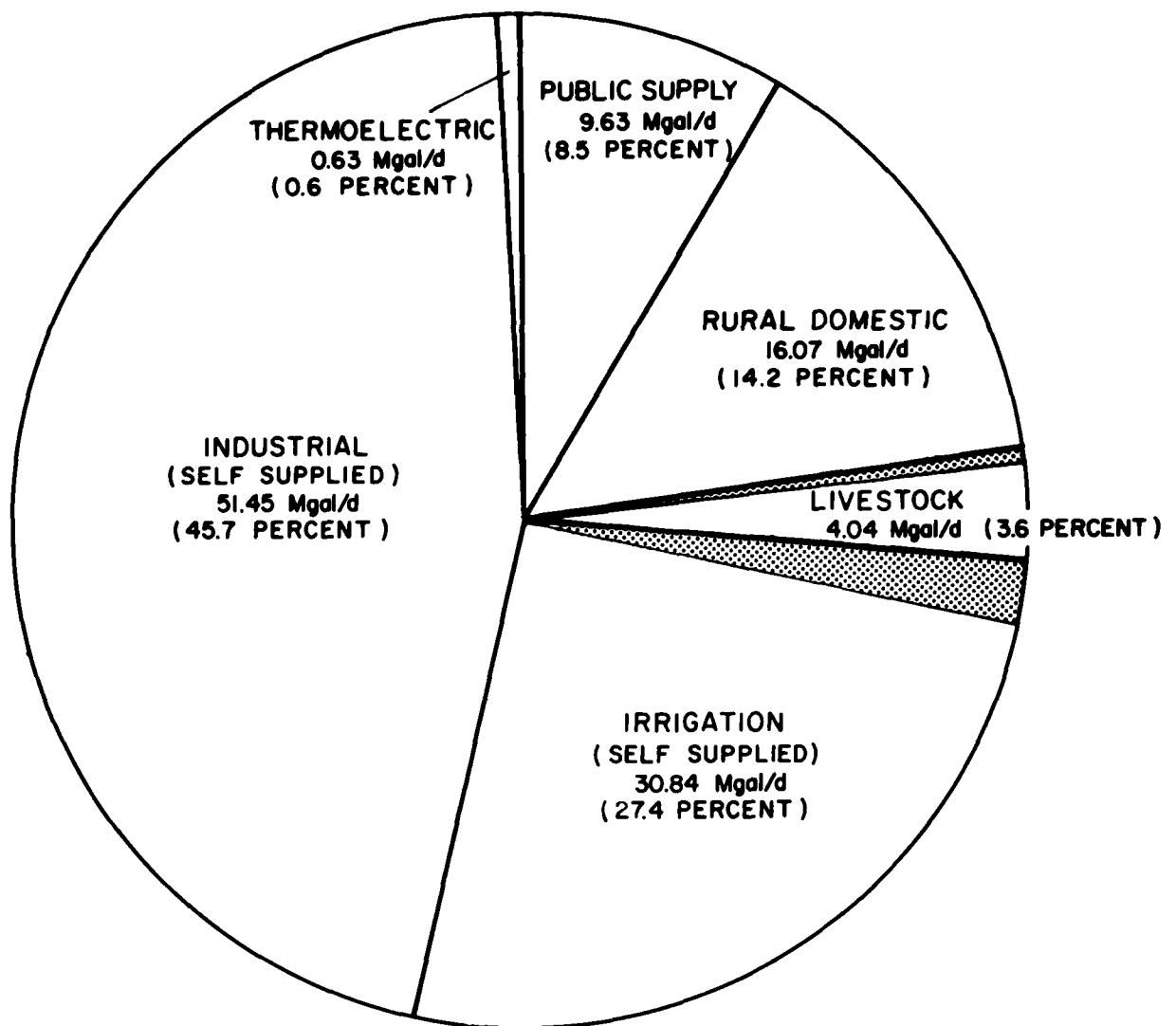
Land forms in the area can be grouped into highland and lowland areas. These areas have been named by White (1970) and are shown on figure 9.

Highland Areas

Brooksville Ridge is the westernmost and the largest of the central Florida ridges. Its alignment is approximately north-south in a coast-parallel direction. The ridge has a very irregular surface with altitudes that range from approximately 70 to 200 feet over short distances. The ridge has been cut through by the Withlacoochee River near Dunnellon in south-western Marion County forming the Dunnellon Gap.

Table 10.--Freshwater withdrawal by county for 1977, in million gallons per day (from Leach and Healy, 1980)

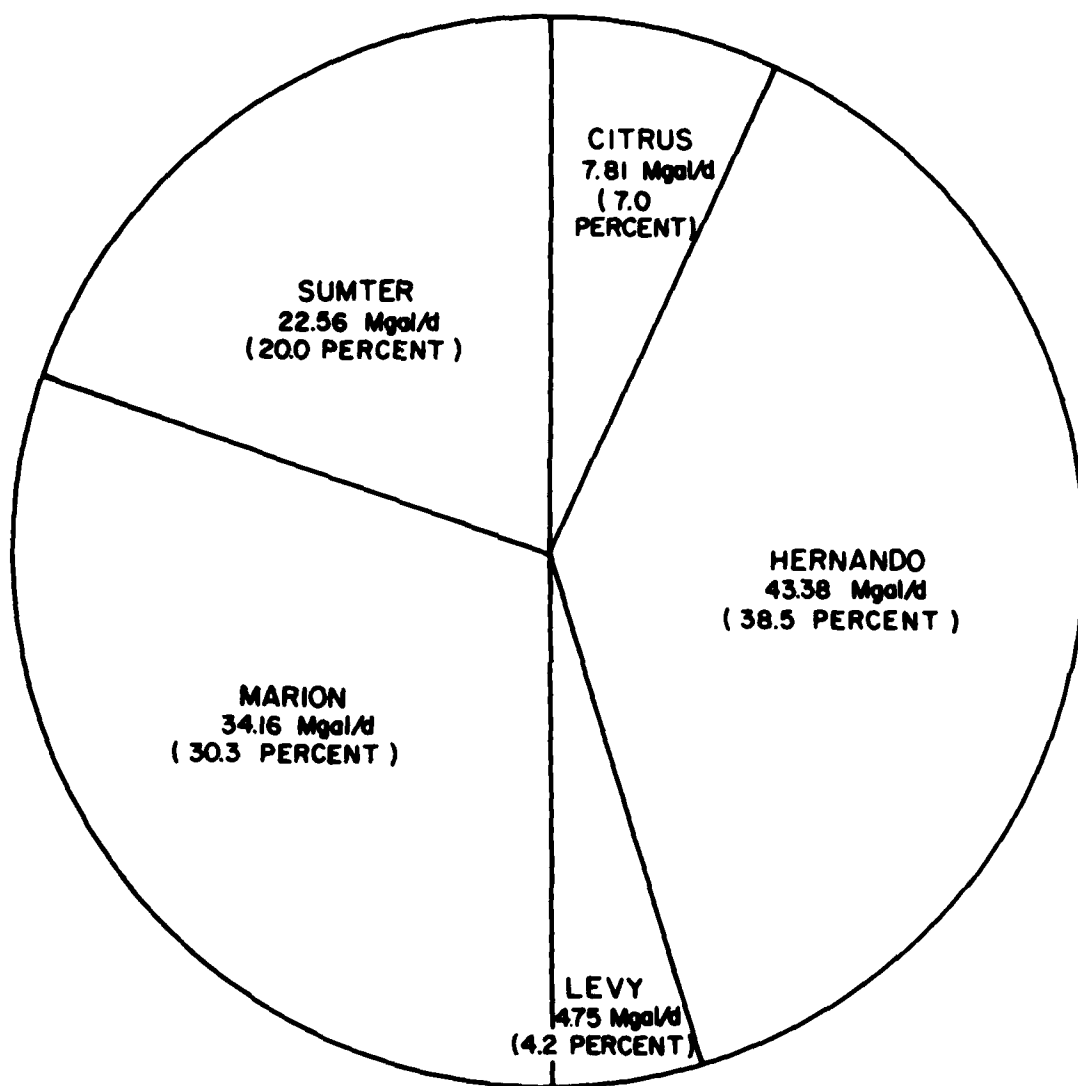
Use category	County					Total
	Citrus	Hernando	Levy	Marion	Sumter	
Public supply	0.66	0.92	1.05	6.08	0.92	9.63
Rural domestic	3.60	2.69	.86	7.47	1.45	16.07
Livestock	.11	.44	.85	1.90	.74	4.04
Irrigation (self-supplied)	1.49	5.57	1.99	18.40	3.39	30.84
Industrial (self-supplied)	1.32	33.76	0	.31	16.06	51.45
Thermoelectric power generation	.63	0	0	0	0	.63
Total	7.81	43.38	4.75	34.16	22.56	112.66



TOTAL = 112.66 Mgal/d

NOTE: SHADED AREA REFLECTS SURFACE WATER
SOURCE. UNSHADED AREA REFLECTS
GROUND WATER SOURCE

Figure 5.--Total freshwater withdrawals in the Withlacoochee River region by use category, in million gallons per day (data from Leach and Healy, 1980).



TOTAL = 112.66 Mgal/d

**Figure 6.—Freshwater withdrawals by county, in million gallons per day
(data from Leach and Healy, 1980).**

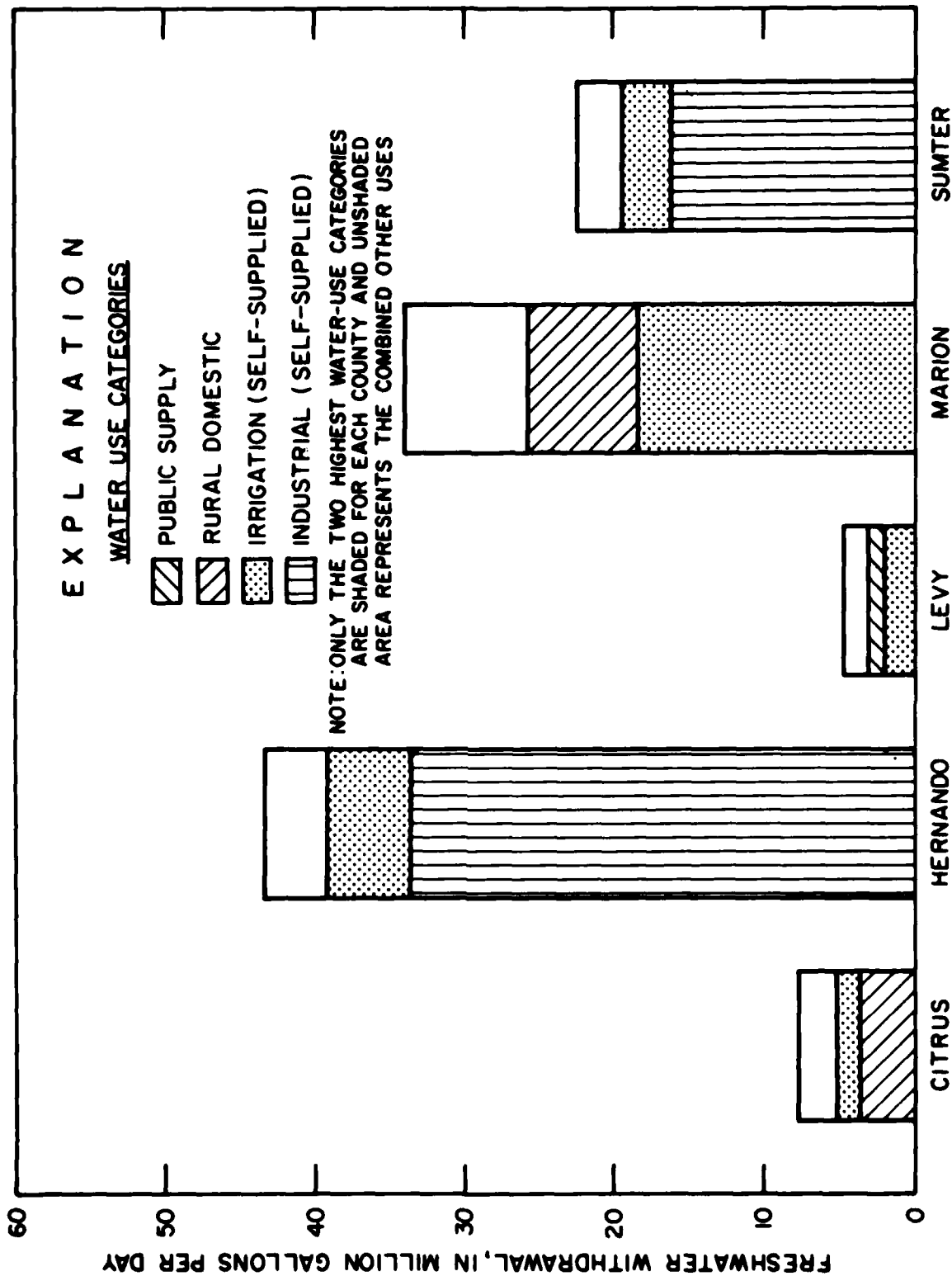


Figure 7.--Freshwater withdrawals in the Withlacoochee River region by county and major use category (data from Leach and Healy, 1980).

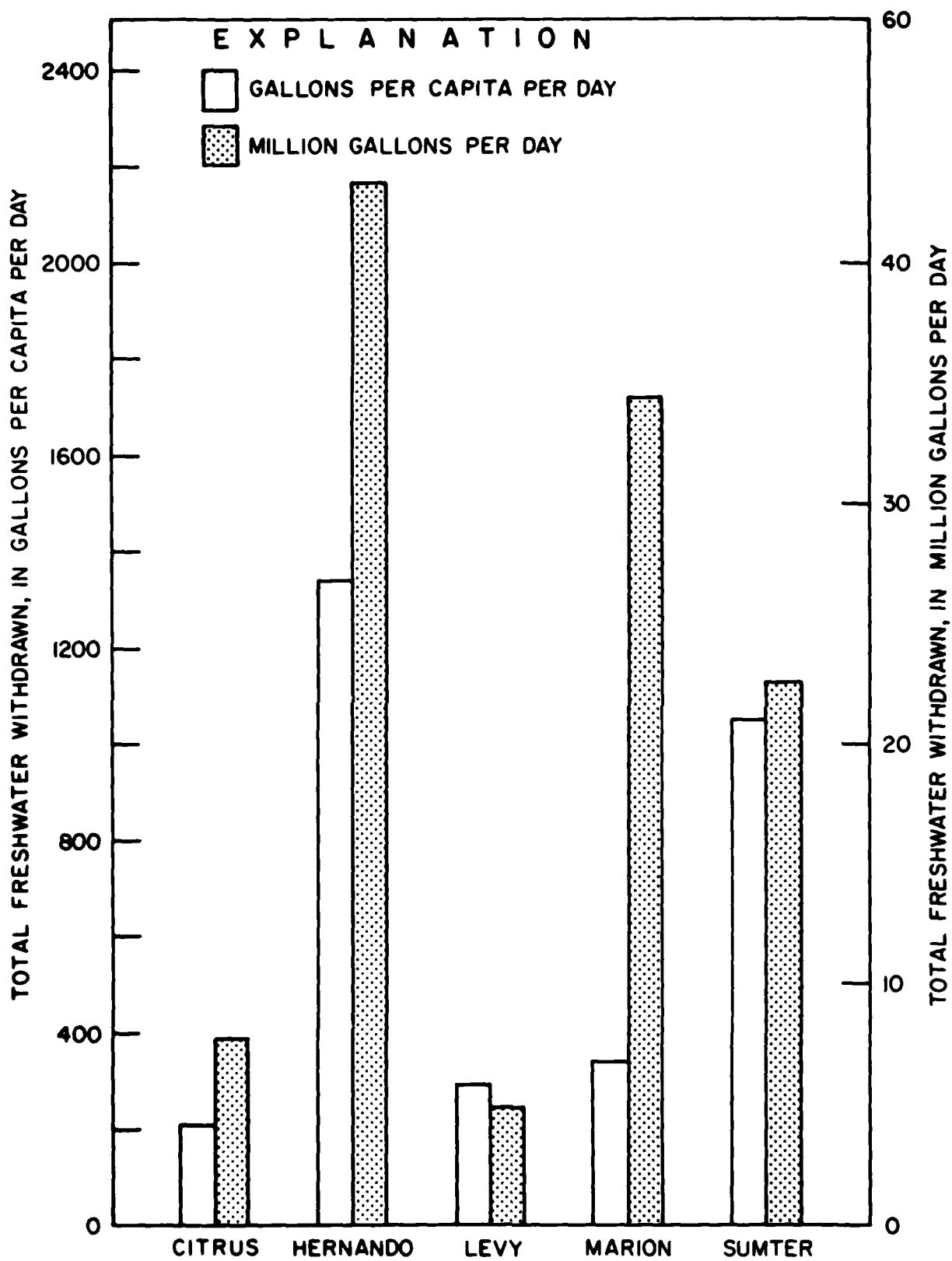


Figure 8.--Freshwater withdrawals by county (data from Leach and Healy, 1980).

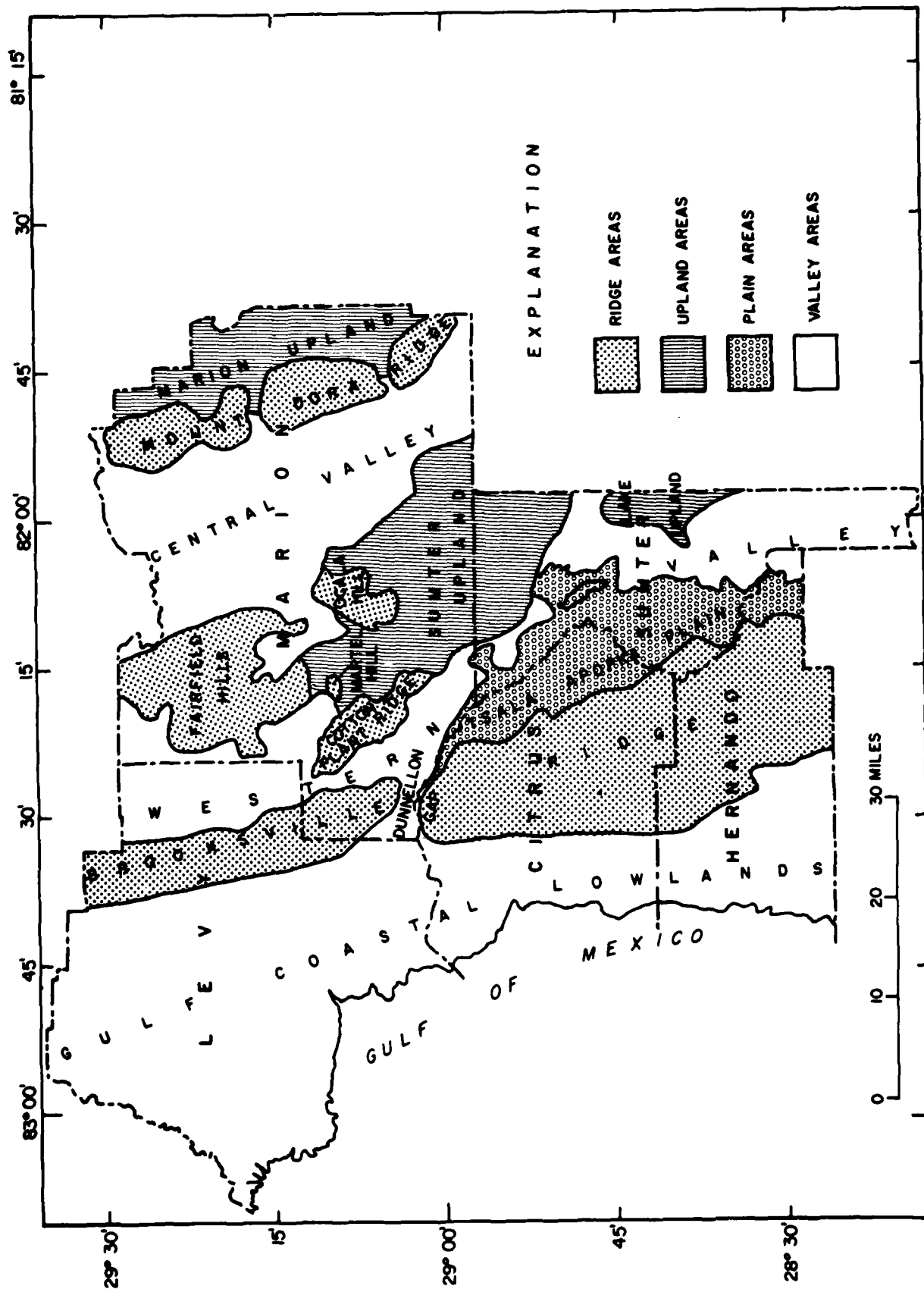


Figure 9.--Physiographic map (modified from White, 1970).

Cotton Plant Ridge in western Marion County is alined anomalously northwest-southeast and is lower in altitude than the nearby Brooksville Ridge. The maximum altitude of the ridge is less than 100 feet. The ridge has little, if any, surface drainage and appears to be an assemblage of dunes.

Fairfield Hills, Martel Hill, and Ocala Hill are irregularly shaped areas of high ground, alined in a north-south direction, and named after nearby communities in western Marion County. These hills, alined consistently with other central Florida ridges, are thought to be part of the relict Atlantic coastal features.

Mount Dora Ridge in eastern Marion County parallels the other central Florida ridges and is thought to be part of the same system of relict coastal features.

The Marion, Sumter, and Lake Uplands, occurring in proximity to the aforementioned ridges, are highlands according to White (1970), that resulted from differential reduction caused by the solution of the underlying sediments. Their altitudes are not as high, however, as the ridges.

Lowland Areas

The Western and Central Valleys are generally located where the differential reduction, solution, and compaction of underlying sediments has produced a lowland. The Western Valley contains the Tsala Apopka Plain and part of the Withlacoochee River (fig. 9).

The Tsala Apopka Plain, a flatter and lower area within the Western Valley includes Lakes Tsala Apopka and Panasoffkee. The Plain is considered to be a remnant of a large lake existing before the Withlacoochee River exited the Western Valley through the Dunnellon Gap (White, 1958, p. 19-27).

The Central Valley, to the east of the Sumter Upland and west of the Mount Dora Ridge, contains more lakes than the Western Valley. The Oklawaha River and its tributary, Orange Creek, drain the Central Valley (White, 1970).

The Gulf Coastal Lowlands occurring in the western part of the study area contain several notable features: terraces, coastal swamps, and an area of drowned karst features.

Terraces, present throughout central Florida, are more identifiable along the Gulf Coastal Lowlands than in other parts of the study area. Terraces were formed in Pleistocene to Holocene geologic time when the relative position of sea level, with respect to the land surface, was stable long enough to form a wave-cut scarp or beach line deposits as the climate alternated between glacial and interglacial periods.

The coastal swamps located along the Gulf coast of the study area have an irregular shoreline. White (1970, p. 149-150) interprets this as relict, drowned karst features where insufficient sand is available to form beaches. This may indicate a young shoreline.

Morphology of the Withlacoochee River

The Withlacoochee River has, within its course, an apparent diffluence with the Hillsborough River. This diffluence occurs shortly before the Withlacoochee turns northward in eastern Pasco County. At this point the Hillsborough River flows off to the southwest. White (1958, p. 20) estimated that the Withlacoochee River receives twice as much flow through the diffluence as does the Hillsborough River.

White (1958, p. 19-27) presents convincing evidence that the Withlacoochee River was at one time tributary to the Hillsborough River. The key to its present course is the channel through the Brooksville Ridge at the Dunnellon Gap. It can be shown that the Gap did not always exist or at best did not influence the river's former course. Without the Gap, there is no surface drainage alternative other than to flow south to the Hillsborough, which would be a normal drainage pattern.

White (1958, p. 22) has discussed how the Withlacoochee River could have been a tributary to the Hillsborough River, and how it reversed its course to the present. The limestone bedrock in the vicinity of Dunnellon is very porous. In addition, Vernon (1951, plate 2) and White (1958, p. 23) mapped faults running through the Gap. It seems evident that when the Withlacoochee River was tributary to the Hillsborough River, there was secondary, subsurface drainage from the ancestral lake through the area now occupied by the Gap. Subsurface drainage may have been concentrated along the fault fractures, which, when widened by solution, collapsed causing the Gap. At this point a new surface outlet to the gulf sea was created, draining the ancestral lake area and reversing the flow of the Withlacoochee River.

Morphology of Sinkholes and Springs

Sinkholes and springs are physiographic features related to the geology and occurrence of ground water in a region. Two kinds of sinkholes are evident, a solution depression and a collapse sink. A solution depression is caused by the solution of carbonate material in the soil or clastic sediment above the bedrock. Very gradual in time, there is no physical disturbance other than the dissolution of the carbonate material and a compaction of the residuals.

A collapse sink is a surface manifestation of the collapse of an underlying solution cavity in carbonate bedrock. Originating from a fracture or bed of high solubility in the bedrock, the cavity will enlarge by solution into ground water until its roof cannot be supported.

Triggered by a decline in water level caused by drought or heavy nearby pumpage, a collapse will occur propagating through the overlying sediments to the land surface. The collapse can be instantaneous or continue for several hours to days. Typically, collapse sinks are round in map view and conical in profile. In area, they are comparable to solution depressions. Cavity formation generally takes place in the upper part of the limestone where ground water is commonly undersaturated in carbonate and where significant ground-water flow occurs. The surface depression of either type of sink can become a lake basin.

Rosenau and others (1977, p. 6) define two kinds of springs, water table and artesian. Ground-water flow above a relatively impermeable bed to an outcrop produces a water-table spring or seep. Usually in Florida such springs have a low and variable flow. An artesian spring is formed where water is under sufficient hydrostatic pressure to cause it to flow to the land surface through a natural breach in the confining beds. Florida's large springs are of this type. Figure 10 is a pictorial representation of solution depression, collapse sinks, and water table and artesian springs.

Morphology of Lakes

The many lakes of central Florida can be classified by their morphology or origin of their lake basins. Zumberge and Ayers (1964) recognized eleven different lake origin types. Ignoring manmade and meteorite impact, four origin processes are relevant to Florida: solution, tectonic, fluvial, and shoreline. Most Florida lakes have morphologies which are a combination of some or all of these types.

Solution processes, including sinkhole and depression formation, have been discussed previously in the section on sinkholes. Central Florida's large lakes are thought to have been formed by a depression process, at least in part, rather than a coalescing of many sinkholes as once thought (White, 1958, p. 69). Lakes formed by collapse sinks generally do not have a good hydraulic connection to the underlying limestone, because the fill material from the overlying clastic sediments provide an effective plug.

Tectonic processes, such as faulting and crustal upwarping, can contribute to lake basin development. These deformation processes may uplift rocks of different weathering or dissolution competence and provide favorable locations for lakes.

Fluvial processes, either erosional, depositional, or a combination of both, can contribute to the origins of lake basins. The Withlacoochee and Oklawaha Rivers provide inlets and outlets to many lakes within the study area. These rivers affect the lakes through scouring or the building of levees.

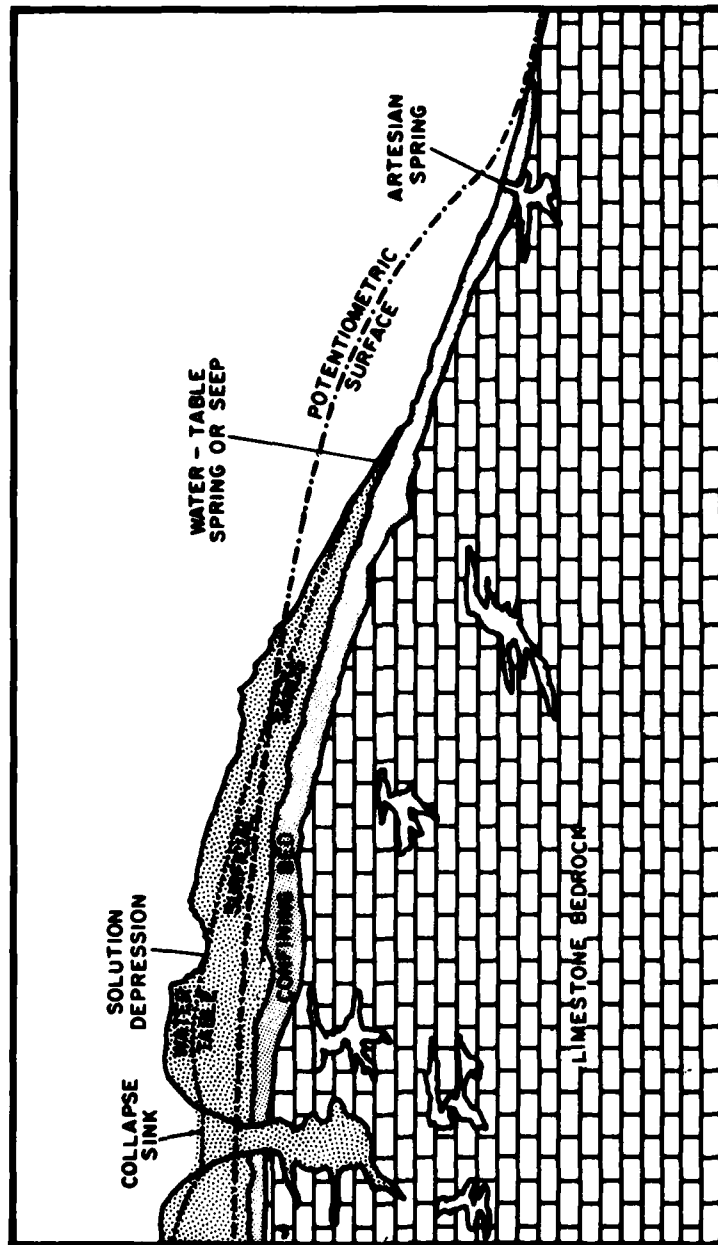


Figure 10.--Collapse sink, solution depression, water-table spring, artesian spring, and their relation to water table, potentiometric surface, and geology.

The shoreline of present and ancestral Florida has associated dunes and barrier islands. When sea level falls these become relict beach ridges. Impounded behind these ridges, lakes form in linear patterns common to central Florida. These lake basins can then be acted upon by the other lake-building processes.

Geology

The geology of the study area is predominantly that of a sedimentary carbonate bedrock overlain by a veneer of clastic sedimentary material of variable thickness. Several episodes of crustal upwarping have superimposed structure upon the nearly horizontally deposited sediments.

The following sections describe the structure and stratigraphy of the study area. Table 11 is an outline of the stratigraphy and figure 11 shows the areal geology underlying the alluvium and terrace deposits of the study area.

Structure

The Peninsular Arch (fig. 12) is one of two major structural features to have an effect upon the geology of the study area. Extending from southern Georgia to Lake Okeechobee, the arch forms the axis of the Florida Peninsula (Stringfield, 1966). The crest of the arch is located approximately 60 miles west of Jacksonville.

The second major structural feature is the Ocala Uplift. Both the Ocala Uplift and the Peninsular Arch are aligned northwesterly (fig. 12), however, the crest of the Ocala Uplift extends through Citrus and Levy Counties, about 40 miles southwest of the Peninsular Arch crest.

Stratigraphy

Pre-Tertiary basement rock.--Basement material, underlying north peninsular Florida is generally composed of sediments, meta-sediments, and igneous rocks. Several oil test wells within the study area have bottomed in meta-sedimentary material believed to be Paleozoic in age (Vernon, 1951). The igneous material, generally diabase, basalt, or rhyolite, have a potassium-argon dating of from 89.3 ± 2.2 to $183. \pm 10$ million years before present (B.P.), which makes them Mesozoic in age (Milton, 1972). These igneous rocks are probably correlative to the widespread Mesozoic volcanism of the Atlantic seaboard and gulf coast.

Cedar Keys Formation.--The lithology of the Cedar Keys Formation of Eocene age is predominantly gray, porous, hard dolomite, and evaporite (gypsum and anhydrite) with some limestone (Chen, 1965). In the study area the top of the Cedar Keys occurs at a depth of approximately 2,500 feet below sea level in the south to 1,500 feet below sea level in the north (Chen, 1965). The thickness of the Cedar Keys in the study area is approximately 400 to 800 feet.

Table 11.--Stratigraphy of study area

Erathem	System	Series	Formation	Thickness (feet)
Cenozoic	Quaternary	Holocene and Pleistocene	Alluvium and terrace deposits	0-50
	Tertiary	Pliocene and Miocene	Fort Preston Formation of Puri and Vernon (1964) (Citronelle(?) Formation)	0-100
			Alachua Formation	0-66
		Miocene	Hawthorn Formation	0-140
			Tampa Limestone	0-100
		Oligocene	Suwannee Limestone	0-200
		Eocene	Ocala Limestone	0-200
			Avon Park Limestone	200-600
			Lake City Limestone	700-900
			Oldsmar Limestone	400-600
		Paleocene	Cedar Keys Formation	400-800
Mesozoic	Basement rock			Unknown
Paleozoic				

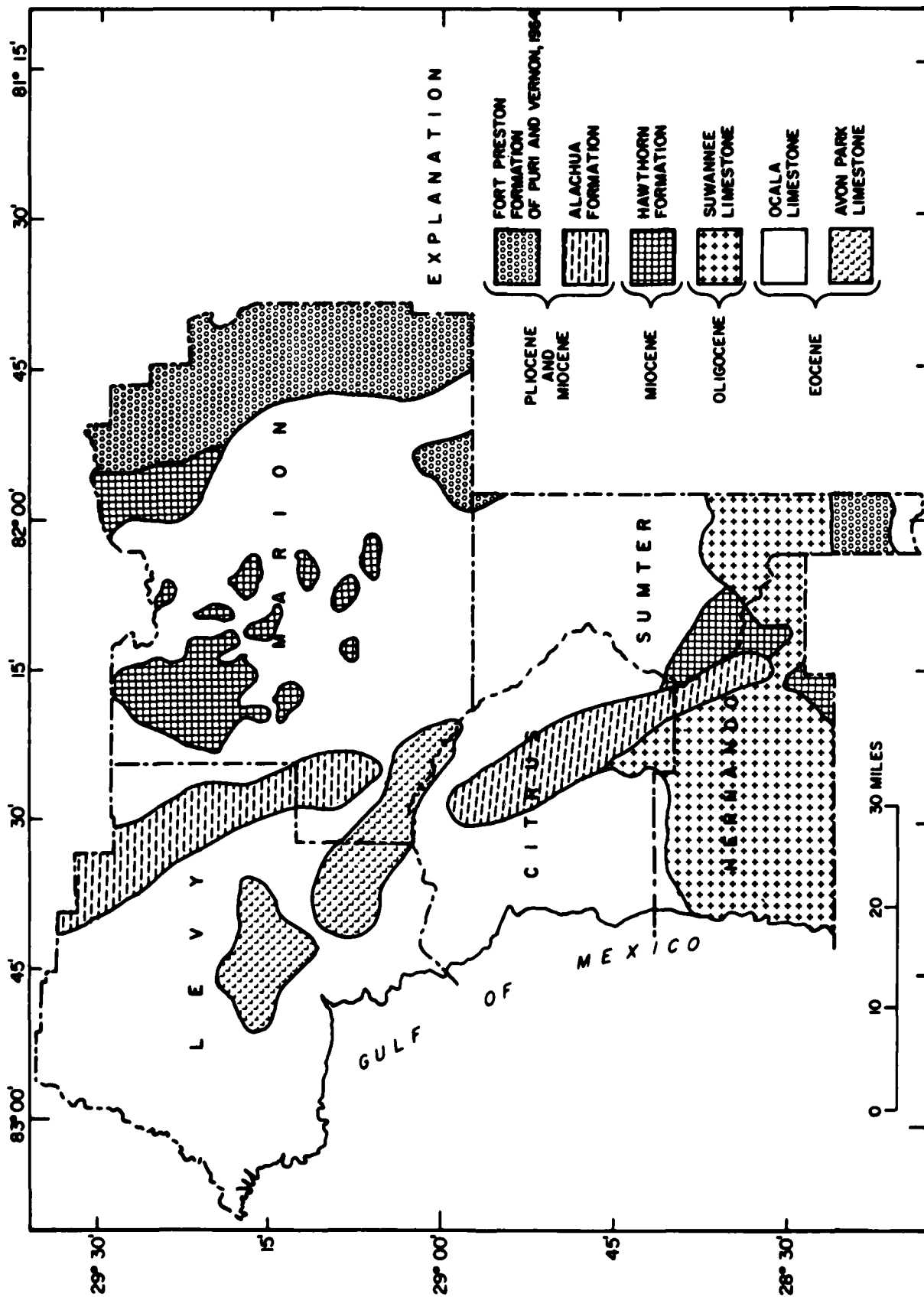


Figure 11.--Geologic map (modified from Puri and Vernon, 1964).

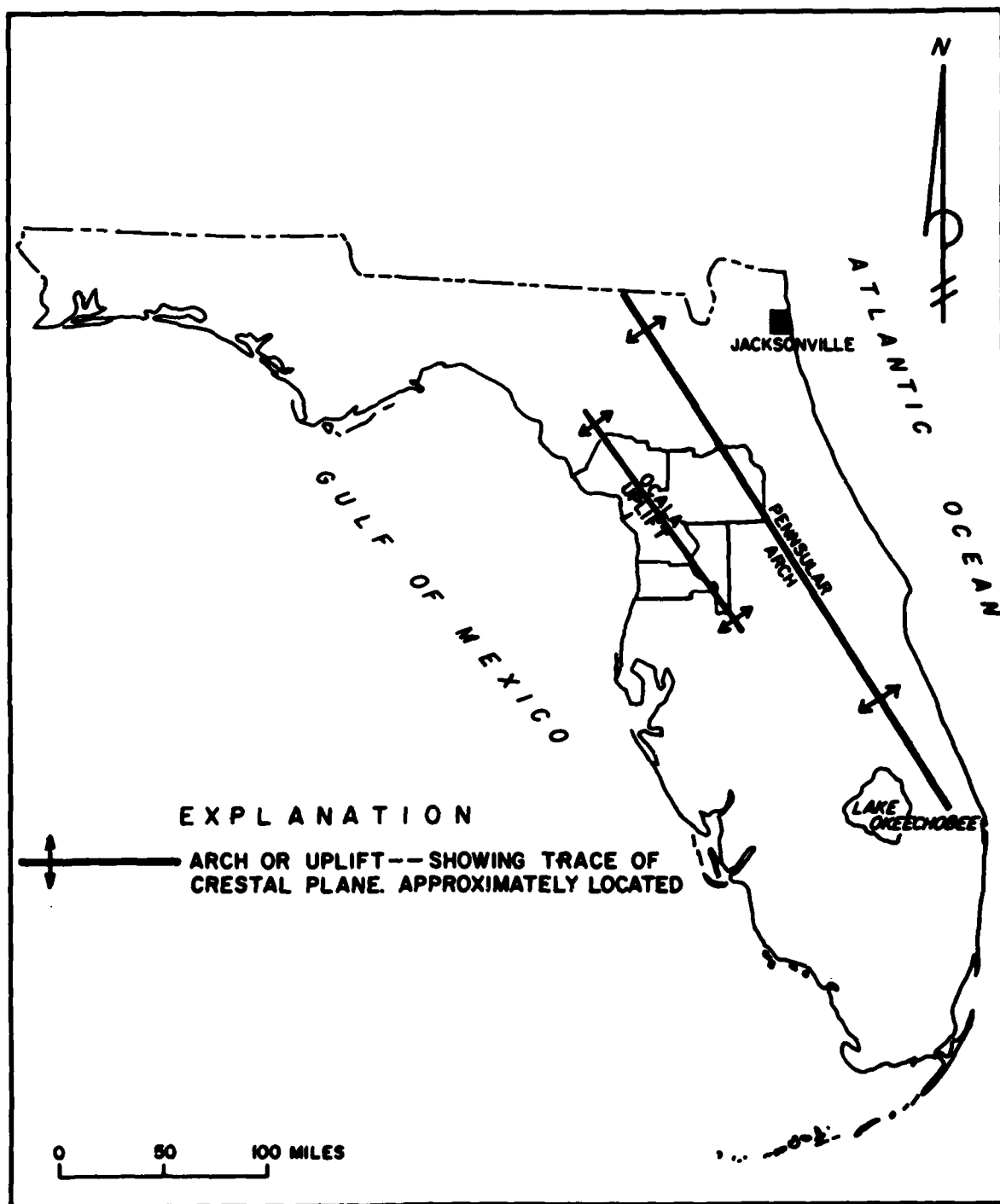


Figure 12.--Orientations of Peninsular Arch and Ocala Uplift (from Chen, 1965).

Oldsmar Limestone.--The Oldsmar Limestone of Eocene age is lithologically different from the Cedar Keys. The upper part of the Oldsmar is white to light-brown, fine-grained, fossiliferous limestone. The lower part of the Oldsmar is a dark-brown, fine- to coarse-grained dolomite. The Oldsmar does contain some evaporites (gypsum and anhydrite) and some chert (Chen, 1965). Within the study area, it occurs at a depth of approximately 1,000 feet below sea level in the north and it has a thickness of approximately 400 feet (Chen, 1965).

Lake City Limestone.--Lithologically, the Lake City Limestone of Eocene age is a light-brown to brown, highly fossiliferous limestone and a brown to dark-brown dolomite. Thin laminae of peat or carbonaceous limestone-dolomite occur at the top of the formation. Very minor amounts of evaporites (gypsum and anhydrite) are also present (Chen, 1965). Within the study area, it occurs at a depth of 300 feet below sea level in the north, with a thickness of approximately 700 feet. In the south it occurs at a depth of 700 feet below sea level and it has a thickness of 900 feet.

Avon Park Limestone.--Lithologically, the upper part of the Avon Park Limestone of Eocene age is a cream to brown, fine-grained, fossiliferous, porous limestone or dolomite. At its base is a nonfossiliferous brown to dark-brown, fine- to medium-grained dolomite. Minor amounts of evaporites and carbonaceous material are also present (Chen, 1965). The Avon Park is very permeable and cavernous in some areas. Within the study area, it is exposed at the land surface in the north and there has a thickness of approximately 200 to 300 feet. In the south it occurs at a depth of 200 feet below land surface and there has a thickness of approximately 600 feet.

Ocala Limestone.--Ocala Limestone of Eocene age is a pure white through cream to yellow colored soft limestone. Typically it has a granular texture. In places the limestone is a microcoquinooid, and in other places, the limestone has been hardened by deposition of travertine or calcite in its pore spaces.

Ocala Limestone can be subdivided into different members. At this point, a difference in nomenclature appears. The U.S. Geological Survey recognizes an upper and lower member (Rosenau and others, 1977) and refers to it as Ocala Limestone. The more locally popular subdivision, into three formations, the Inglis, the Williston, and the Crystal River (oldest to youngest) is supported by the Florida Bureau of Geology who refers to it as the Ocala Group (Puri and Vernon, 1964). In this report, the Ocala Limestone is shown as a single formation in figure 11.

The Ocala Limestone has a thickness of approximately 200 feet throughout the study area. In some areas the upper member has been somewhat eroded. The Ocala Limestone is quite porous and cavernous.

Suwannee Limestone.--The Suwannee Limestone of Oligocene age is a hard yellow or creamy fossiliferous limestone, which locally has a pinkish tinge (Yon and Hendry, 1972). The lower part of the formation in places

is dense and hard. The Suwannee contains many solution cavities. Within the study area the Suwannee is present at or near the surface in Citrus, Hernando, and southern Sumter Counties. The Suwannee ranges in thickness from 0 to 200 feet within the study area.

Tampa Limestone.--The Tampa Limestone of Miocene age is a white to light yellow, soft, moderately sandy and clayey, somewhat fossiliferous limestone. Locally it is very fossiliferous and in some areas it is brecciated. Within the study area, the Tampa ranges from 0 in the north to approximately 100 feet thick in the south.

Hawthorn Formation.--The Hawthorn Formation of Miocene age can generally be differentiated into an upper and a lower part. The lower part is a white to gray, sometimes clayey, phosphatic limestone and dolomite. The upper part is a white to green and gray phosphatic clayey sand, sometimes with interbedded clayey shells. Erosion has reduced the occurrence of the Hawthorn to Marion, Sumter, and Hernando Counties within the study area. The thickness ranges from 0 to about 140 feet.

Alachua Formation.--The Alachua Formation of Pliocene age has a rather diverse lithology. Composed of terrestrial, lacustrine, and fluvial sediment it may also be, in part, in place residuum of older formations. Generally it is composed of interbedded deposits of clay, sand, phosphatic rock and clay, and silicified limestone. Within the study area the Alachua Formation occurs in eastern Hernando County, Citrus County, and Marion County and in western Levy County. The thickness of the Alachua is variable; Vernon (1951) observed a maximum thickness of 66 feet in Citrus County.

Fort Preston Formation of Puri and Vernon (1964) (Citronelle(?) Formation).--A middle Miocene and younger deltaic and nonmarine sediment, composed of gray, yellow, and red sands, gravels, and clays is found in eastern Marion County and elsewhere in central Florida. These sediments, at most 100 feet thick, unconformably overlie the Hawthorn Formation. Cooke (1945, p. 231) correlated these sediments with the Pliocene Citronelle of western Florida. Puri and Vernon (1964) differentiated them from the Citronelle, calling them the Fort Preston Formation.

Quaternary terrace deposits.--Terrace deposits seen throughout Florida are manifestations of a change in sea level over a fixed land surface. At the different stands of sea level, alluvium and terrace material was deposited at various elevations. Table 12 shows the relationship of the terrace deposits to the glacial and to the interglacial periods and their characteristic altitudes. Figure 13 shows the areal distribution of the terraces found in the study area.

Economic Geology

Limestone quarrying and phosphate mining have played a major role in the economy of central Florida since the latter part of the past century. The occurrence of limestone and dolomite bedrock at or

Table 12.--Terraces of central Florida (modified from Stringfield, 1966)

Marine terrace	Present altitude of shore-line (feet)	Quaternary geologic-climate classification	Oscillations of sea level
		Nebraskan Glaciation	Emergence caused by the accumulation of continental ice.
Hazlehurst	270	Aftonian Interglaciation	Submergence to an altitude of 270 feet caused by the melting of continental ice.
		Kansan Glaciation	Emergence caused by the accumulation of continental ice, permitting the formation of sinks in rock now standing at an altitude of 150 feet.
Coharie Sunderland Okefenokee Wicomico Penholoway Talbot	215 170 150 100 70 42	Yarmouth Interglaciation	Submergence to an altitude of 215 feet caused by the melting of continental ice, followed by intermittent emergence of at least 170 feet caused by down-warping of oceanic basins.
		Illinoian Glaciation	Emergence caused by the accumulation of continental ice.
Pamlico	25	Sangamon Interglaciation	Submergence to an altitude of 25 feet caused by the melting of continental ice.
		Early Wisconsin Glaciation	Emergence caused by the accumulation of continental ice
Silver Bluff	6	Middle Wisconsin Glaciation	Submergence to an altitude of 6 feet probably caused by the partial melting of the Wisconsin ice sheet.
		Late Wisconsin Glaciation	Emergence caused by the accumulation of continental ice.
Holocene	0		Submergence to the present sea level probably caused by the melting of continental ice.

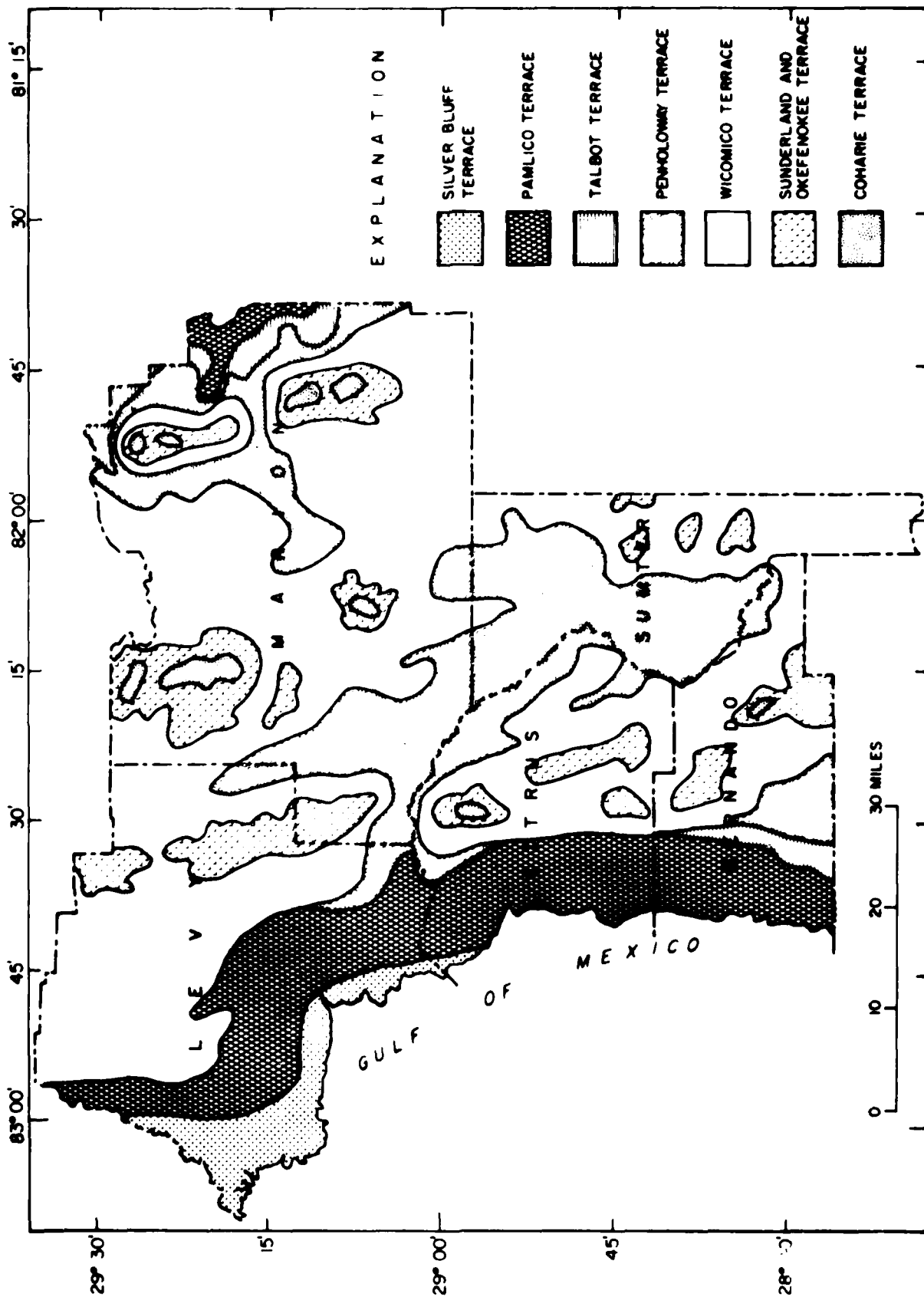


Figure 13.--Terrace map (from Healy, 1975).

near the land surface due to the Ocala Uplift facilitated the growth of the quarrying industry in all the counties within the study area. Limestone, dolomite, and phosphate are used as building material, road base, and as a soil developer. Abandoned quarries and pits are quite numerous and easy to find. Much of the geology of Florida was deciphered through these pits and quarries.

Phosphate mining, by open pit methods, once flourished within the study area (Vernon, 1951, p. 224), but is now largely centered to the south in Polk County. Phosphate is found within the Hawthorn and Alachua Formations. The areal distribution of these formations delineates potential areas for phosphate mining. Vernon (1951, p. 197) suggests that phosphate originated and was concentrated in the sediments through biologic processes, including, curiously, an assumed abundance of bird guano at the time of deposition.

Sand and gravel occurs within the clastic sediments and terrace deposits. To a small extent this has been mined within the study area for fill and aggregate.

GROUND-WATER RESOURCES

Ground water in the area occurs in three distinct aquifers and in intervening less permeable confining beds that restrict the movement of water from one aquifer to another. The uppermost of these aquifers has been referred to by various investigators as the shallow aquifer, the clastic aquifer, the nonartesian aquifer, the surficial aquifer, and the water-table aquifer. In this report it is designated as the surficial aquifer. The common characteristics attributed to the aquifer by these investigators are that the aquifer is comprised of unconsolidated (clastic) sediments and that it contains the water table.

Below the surficial aquifer, and interbedded with unconsolidated poorly permeable deposits in some parts of the area, are aquifers composed of beds of shell, sand, gravel, and limestone commonly referred to as secondary artesian aquifers. These aquifers are perennially full of water under greater than atmospheric pressure. The poorly permeable deposits are referred to as confining beds when they resist the vertical flow of ground water allowing a buildup of artesian pressure in the aquifer below.

The lowermost and principal aquifer in the area is the Floridan aquifer. The Floridan is composed of a thick sequence of interbedded soft, porous limestone and hard, dense limestone and dolomite. In much of the area, the Floridan is perennially full and is overlain and confined by the less permeable deposits of clastic materials. In some parts of the area, however, the Floridan is unconfined, and contains the water table for the area.

The Surficial Aquifer

Occurrence

The surficial aquifer is present throughout the area except where the limestone of the Floridan is at the land surface. In places where the water table fluctuates in the limestone below the clastic rocks the surficial deposits are unsaturated.

Characteristics

Composition.--The surficial aquifer is composed of undifferentiated clastic deposits of fine- to coarse-grained quartz sand with varying amounts of intermixed clay, hardpan, and shell.

Thickness.--The surficial aquifer is more than 300 feet thick east of the Oklawaha River in Marion County (Faulkner, 1973b; Wolansky, Spechler, and Buono, 1979). At some places east of the Oklawaha River where the intervening Hawthorn is absent or very thin, the surficial aquifer is contiguous or nearly so with the Floridan. Figure 14 shows the thickness of the surficial deposits above the confining bed.

Hydraulic characteristics.--The hydraulic characteristics of the surficial aquifer were investigated at six sites in Hernando and Citrus Counties (Cherry and others, 1970). Undisturbed sediments from depths ranging from 1 to 9 feet were tested for specific retention, porosity, specific yield, and permeability. The specific yield varied from 3.9 percent to 36.9 percent, and the hydraulic conductivity varied from 0.001 (gal/d)/ft² (0.0001 ft/d), to 200 (gal/day)/ft² (30 ft/d). No data are available on surficial aquifer characteristics elsewhere in the area.

Water in the surficial aquifer.--Water occurs in the surficial aquifer under water-table conditions. The depth to the water table ranges from land surface to several tens of feet below land surface. No water-table maps of the area have been prepared. However, figure 15 prepared by Ross, Saarinen, Bolton, and Wilder (1978), shows a generalized delineation of areas in which the water table is either less than or more than 5 feet below land surface. Water-level data for the surficial aquifer have been collected routinely in only three wells in the area. These wells, Green Swamp wells L11MS and L11KS near Dade City and L12BS near Bay Lake, all located in Sumter County, have shown a range in water levels of about 7 feet since 1973 (U.S. Geological Survey, 1978b, p. 319-321).

Wells in the surficial aquifer are most frequently used in eastern Marion County, mostly for domestic use where only small supplies are needed. However, wells in some areas may yield large quantities of water (Faulkner, 1973b).

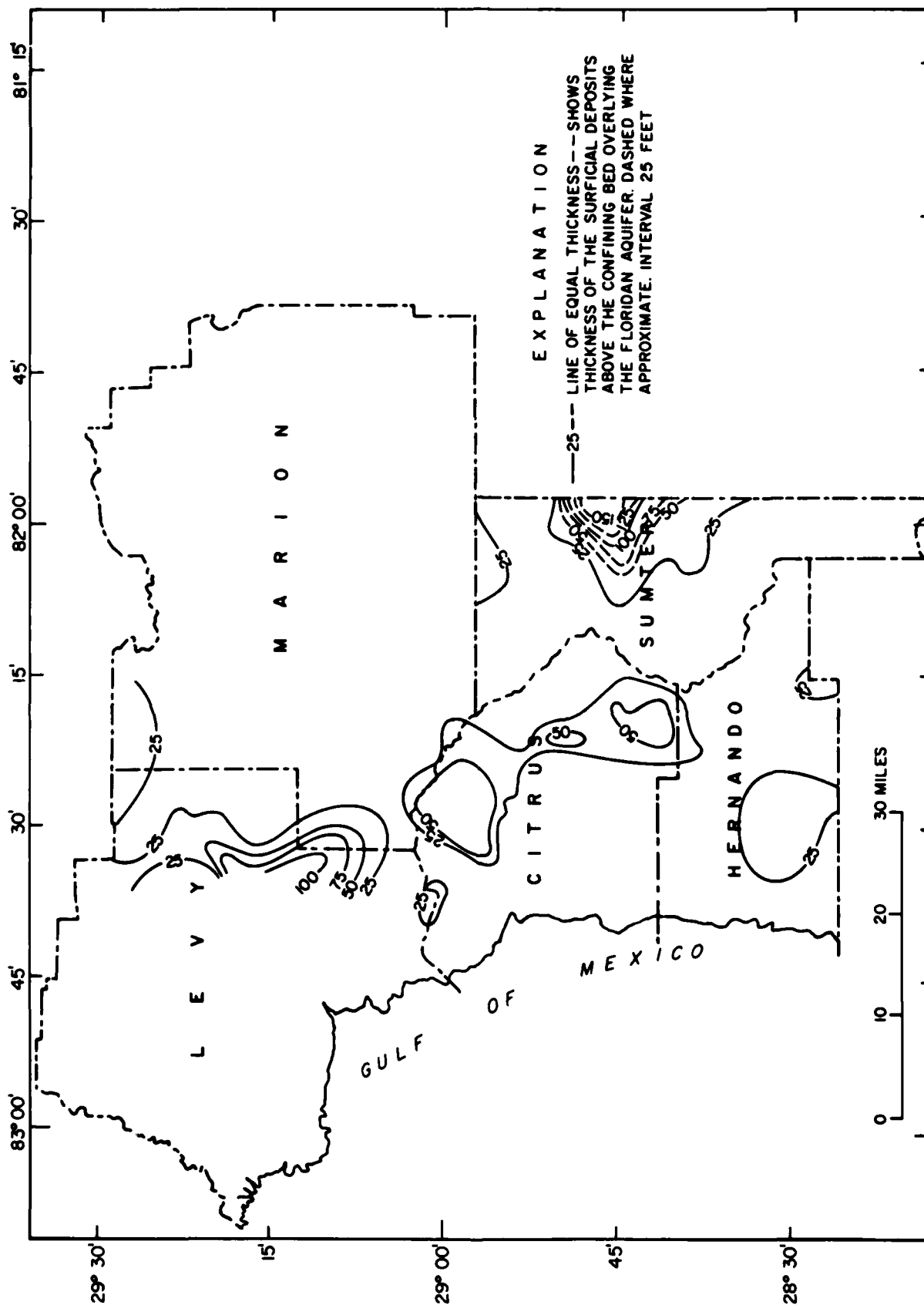


Figure 14.--Thickness of surficial deposits above confining beds for areas where such data have been published (from Wolansky, Spechler, and Buono, 1979).

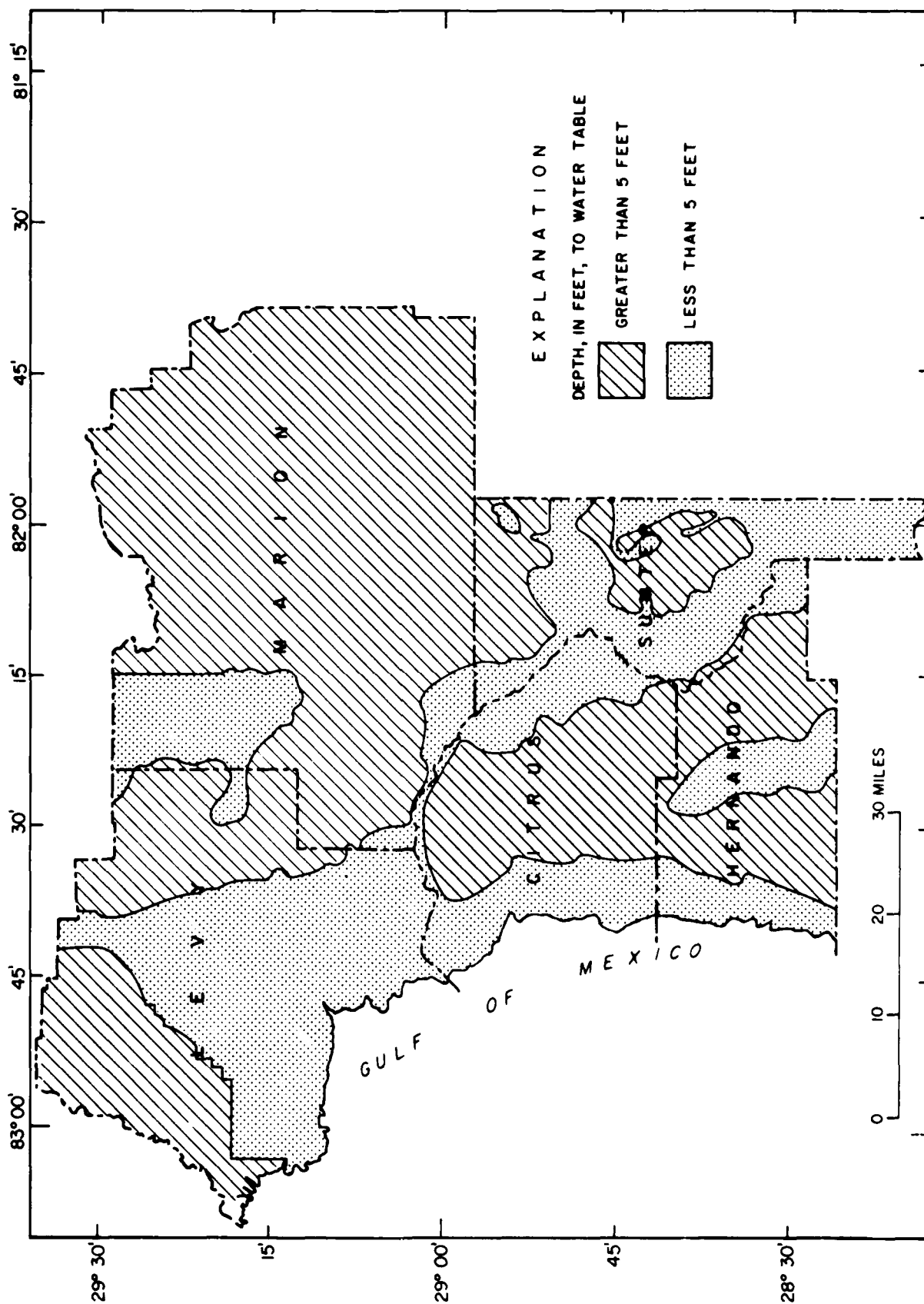


Figure 15.--Generalized depth to water table (from Ross, Saarinen, Bolton, and Wilder, 1978).

Water in the surficial aquifer is generally less mineralized than that in the Floridan aquifer because of the lower solubility of the rocks that make up the nonartesian aquifer. Water in the surficial aquifer often contains excessive dissolved iron, especially near ponds and lakes, and color is frequently present. Clay in suspension is sometimes a problem.

Secondary Artesian Aquifers

The secondary artesian aquifer in the area has not been documented in any report. However, in areas where more than 50 feet of the Alachua and Hawthorn Formations overlie the Floridan, secondary artesian aquifers may exist in sand interlayered with less permeable clay.

Confining Beds

The relatively impermeable deposits lying between the surficial and Floridan aquifers generally act as confining beds. In areas where the potentiometric surface of the Floridan is above the bottom of the confining beds, the water in the Floridan is confined at greater than atmospheric pressure by the beds. In much of the area, however, the water level in the Floridan aquifer is nonartesian and in such areas, the beds permit a perched water table in the surficial aquifer. Figure 16 is a generalized map showing the thickness of the confining beds in the area (Buono and others, 1979).

The Floridan Aquifer

Character and Distribution

The name "Floridan aquifer" is commonly applied in Florida to the principal artesian aquifer of the southeastern United States. The aquifer consists mostly of limestones and dolomites, generally middle Eocene to middle Miocene in age, which act more or less as a single hydrologic unit in most of Florida, in southeastern Georgia, and in parts of Alabama and South Carolina. The aquifer is, however, of variable porosity and permeability and consists in many places of well developed cavernous intervals separated by zones of low permeability that act as confining layers. Thus, the Floridan aquifer may in places be thought of as a compound aquifer consisting of several subaquifers. It is one of the most extensive limestone aquifers in the United States (Stringfield, 1966, p. 95).

Parker and others (1955, p. 189), who first applied the name "Floridan," defined the Floridan aquifer in Florida as being limited to the following sequence: Lake City and Avon Park Limestones of middle Eocene age, Ocala Limestone of late Eocene age, Suwannee Limestone of Oligocene age, Tampa Limestone of Miocene age, and permeable parts of the Hawthorn Formation of Miocene age that are in hydraulic contact with the rest of the aquifer.

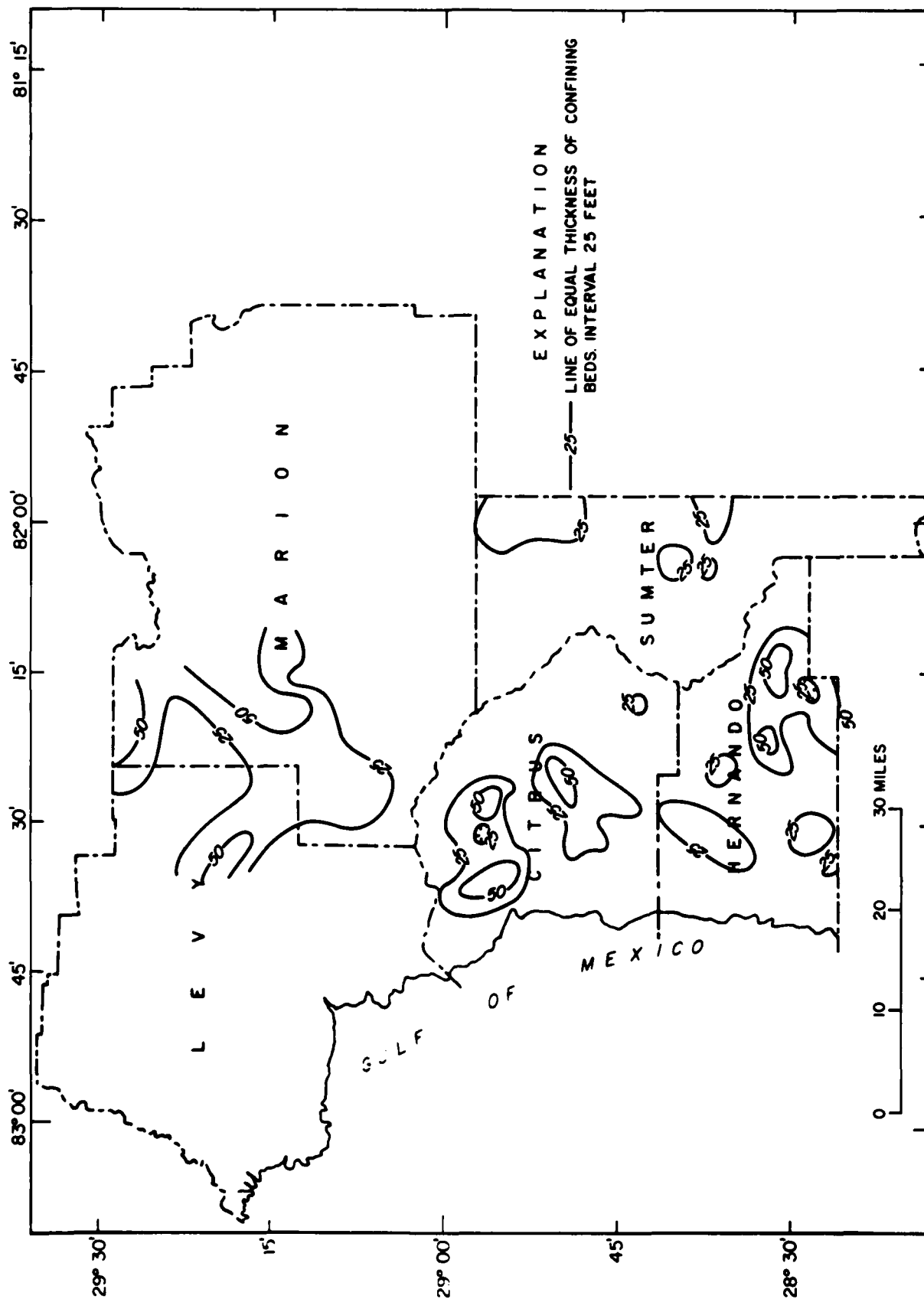


Figure 16.--Thickness of confining beds for areas where such data have been published (from Buono and others, 1979).

The Floridan aquifer is as much as 1,500 feet thick in some areas and is thinnest along the crest of the Ocala uplift (Stringfield, 1966, p. 97). Figures 17 and 18, which show the altitude of the top (Buono and Rutledge, 1979) and bottom (Wolansky, Barr, and Spechler, 1979) of the Floridan, indicate that the Floridan is probably more than 1,500 feet thick in north-central Marion County.

The transmissivity of the Floridan has been investigated at several places in the area. At Weekiwachee, Sinclair (1978) calculated the transmissivity at Weekiwachee Spring to be about $2.1 \times 10^6 \text{ ft}^2/\text{d}$ and about 1 mile upgradient, $1.2 \times 10^6 \text{ ft}^2/\text{d}$. Cherry and others (1970) calculated the transmissivity along a section from just north of Crystal River to the Citrus-Hernando line to be $2.0 \times 10^6 \text{ ft}^2/\text{d}$. Along an 18-mile section from the Citrus-Hernando county line to south of Weekiwachee, Cherry and others (1970) calculated the transmissivity to be about 5 (Mgal/d)/ft ($0.67 \times 10^6 \text{ ft}^2/\text{d}$). Near Silver Springs, Faulkner (1973b) determined the transmissivity to range from 10,700 to $25.5 \times 10^6 \text{ ft}^2/\text{d}$ and to average about $2.0 \times 10^6 \text{ ft}^2/\text{d}$. Pride and others (1966) estimated the transmissivity in their northwest area which includes parts of Sumter and Hernando Counties, to be 500,000 (gal/d)/ft ($0.67 \times 10^5 \text{ ft}^2/\text{d}$).

Storage

A confined aquifer has storage capability through the compressibility of the water and the aquifer skeleton as well as in the volume of void spaces. An unconfined aquifer, however, has storage capability only in the void spaces. Generally the storage coefficient, the dimensionless number used to quantify storage capacity, for confined aquifer ranges from 10^{-3} to 10^{-4} . The storage coefficient of an unconfined aquifer is generally equivalent to its specific storage, usually between 0.1 and 0.3.

The storage capacity of the Floridan aquifer has not been systematically investigated in the area. However, the amount of water stored in the aquifer is probably greatest where the saturated thickness of the aquifer is greatest. The thickness of the potable water zone in the Floridan was delineated by Causey and Leve (1976) as shown by figure 19.

Leakance

Confining beds of artesian aquifers are rarely, if ever, completely impermeable. Ground-water flow will occur through a confining bed, although at a magnitude much less than in the aquifer itself. Flow within the confining bed is usually simplified to a vertical leakage into or out of an aquifer. Leakage through a confining bed is quantified as leakance, with units of (gal/d)/ft³ or 1/d (a simplification of (ft³/d)/ft³). A highly generalized map of selected leakance values of the Floridan aquifer's confining bed is shown in figure 20 (Ross, Saarinen, Bolton, and Wilder, 1978).

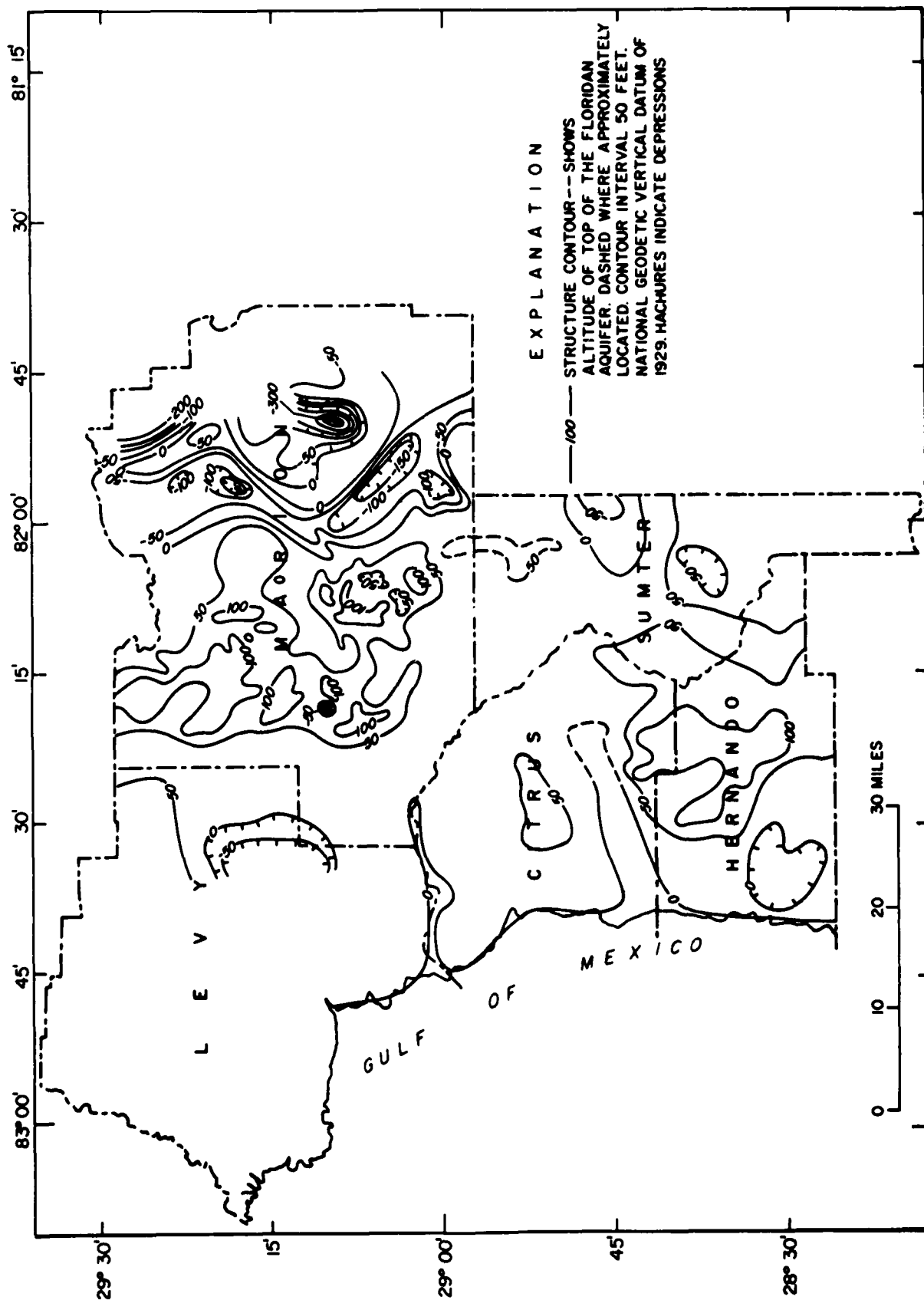


Figure 17.--Altitude of top of the Floridan aquifer for areas where such data have been published (from Buono and Rutledge, 1979).

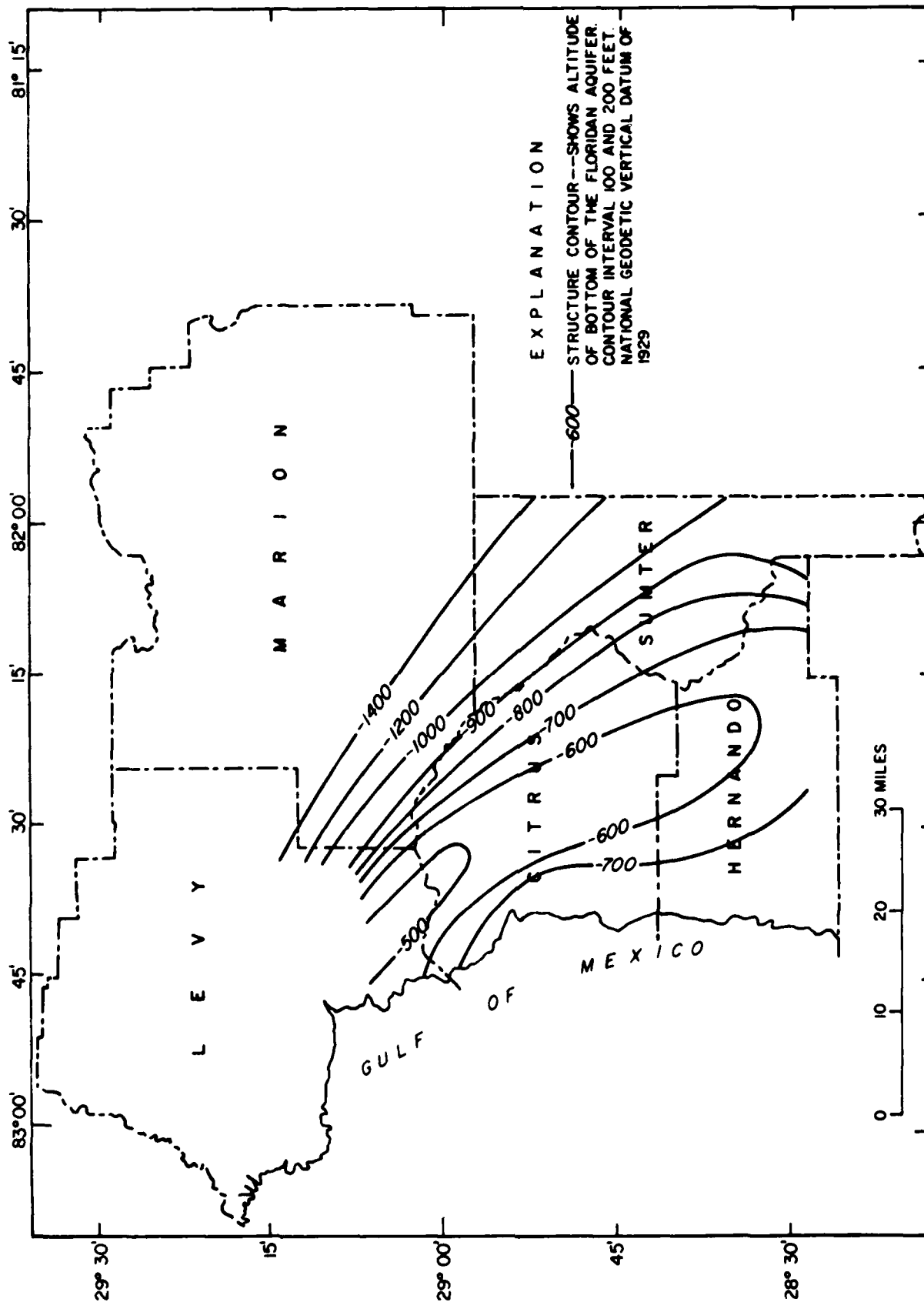


Figure 18.--Altitude of base of the Floridan aquifer for areas where such data have been published (from Wolansky, Barr, and Spechler, 1979).

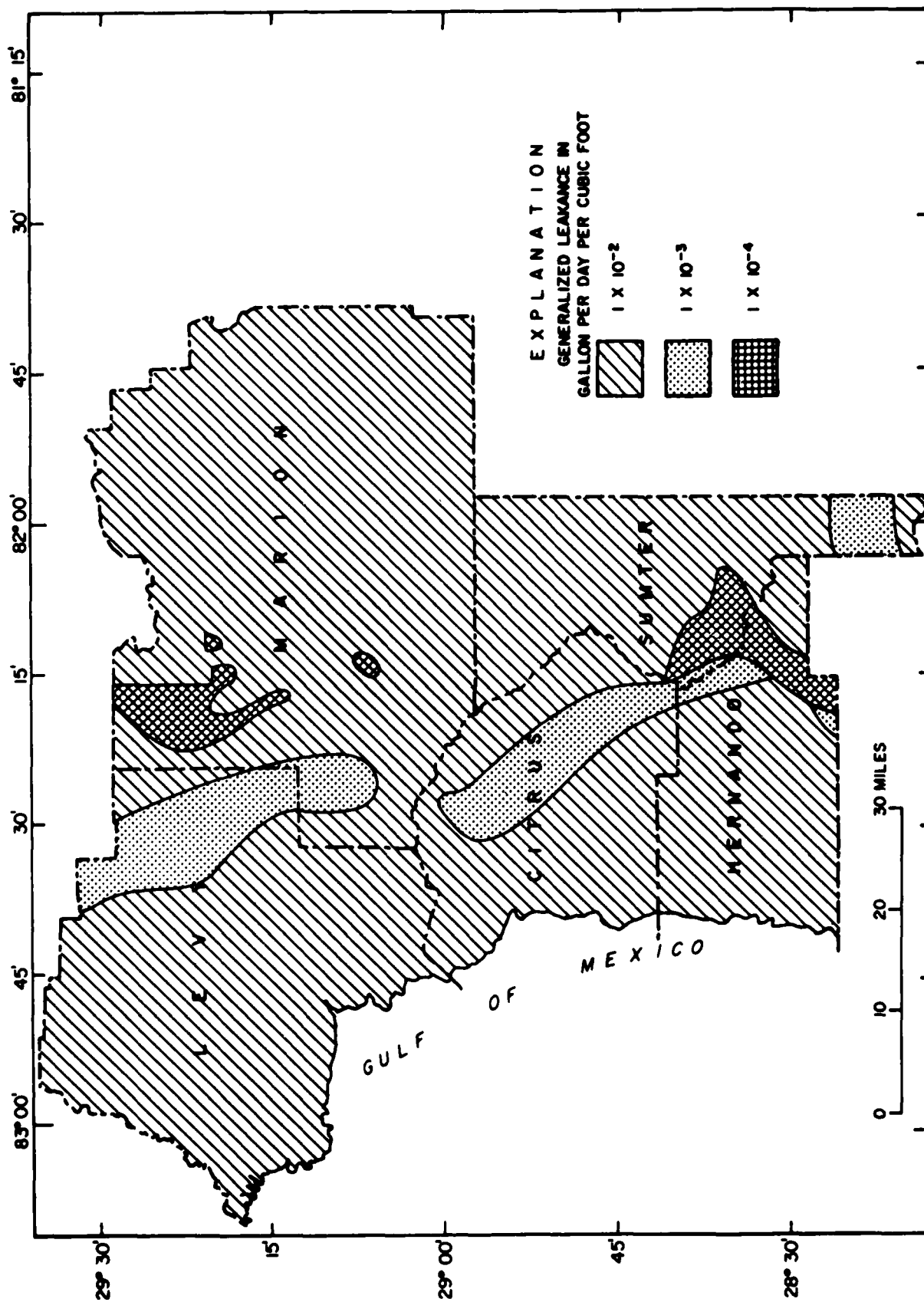


Figure 20.--Generalized leakage map (from Ross, Saarinen, Bolton, and Wilder, 1978).

The direction of leakage is determined by the head differential of the aquifers on either side of the confining bed. Recharge to the Floridan aquifer can, therefore, only occur when the head in the surficial aquifer is higher. Development of the Floridan, through pumpage, can either capture leakage out of the aquifer or induce additional recharge by changing the existing head differential.

Potentiometric Surface

The potentiometric surface of the Floridan aquifer is shown in figure 21. The map is based on water levels measured during May 1979 (Laughlin and others, 1980; and Wolansky, Mills, Woodham, and Laughlin, 1979). Artesian flow from springs causes a lowering of the potentiometric surface nearby (Rosenau and others, 1977).

The fluctuation of the potentiometric surface is small near the coast and ranges up to about 10 feet at U.S. Geological Survey observation well CE31 at Ocala (U.S. Geological Survey, 1978a, p. 497) and up to about 20 feet at the overpass well near Trilacoochee (U.S. Geological Survey, 1978b, p. 247) in southeast Hernando County. The average level of the potentiometric surface in the area has not changed significantly since water levels were first recorded in the 1930's.

Estimated Well Yields

The Floridan aquifer is capable of yielding usable quantities of freshwater to wells throughout the area with the exception of eastern Marion County where water in the aquifer is salty. However, well yields vary both locally and regionally. Figure 22, which indicates the yield that might be expected from 12-inch wells (Pascale, 1975), shows that the highest yields, at least 2,000 gal/min, can be expected in central Marion County and that yields tend to decrease coastward.

Water Quality

The quality of water from the Floridan aquifer is excellent throughout the basin except in a narrow band along the Gulf coast and in extreme eastern Marion County where salt in the water is a problem. The area along the Gulf coast delineated in figure 23 has been intruded by Gulf water as a result of canal construction, pumped withdrawals, and deficient rainfall according to Mills and Ryder (1977).

Iron is sometimes a problem, as is hydrogen sulfide. However, these problems can sometimes be avoided by proper well design. When they cannot be avoided, iron and hydrogen sulfide can be removed by aeration of the water.

As indicated by figure 24, the concentration of sulfate in the Floridan throughout the area (Shampine, 1965a, revised 1975) is less

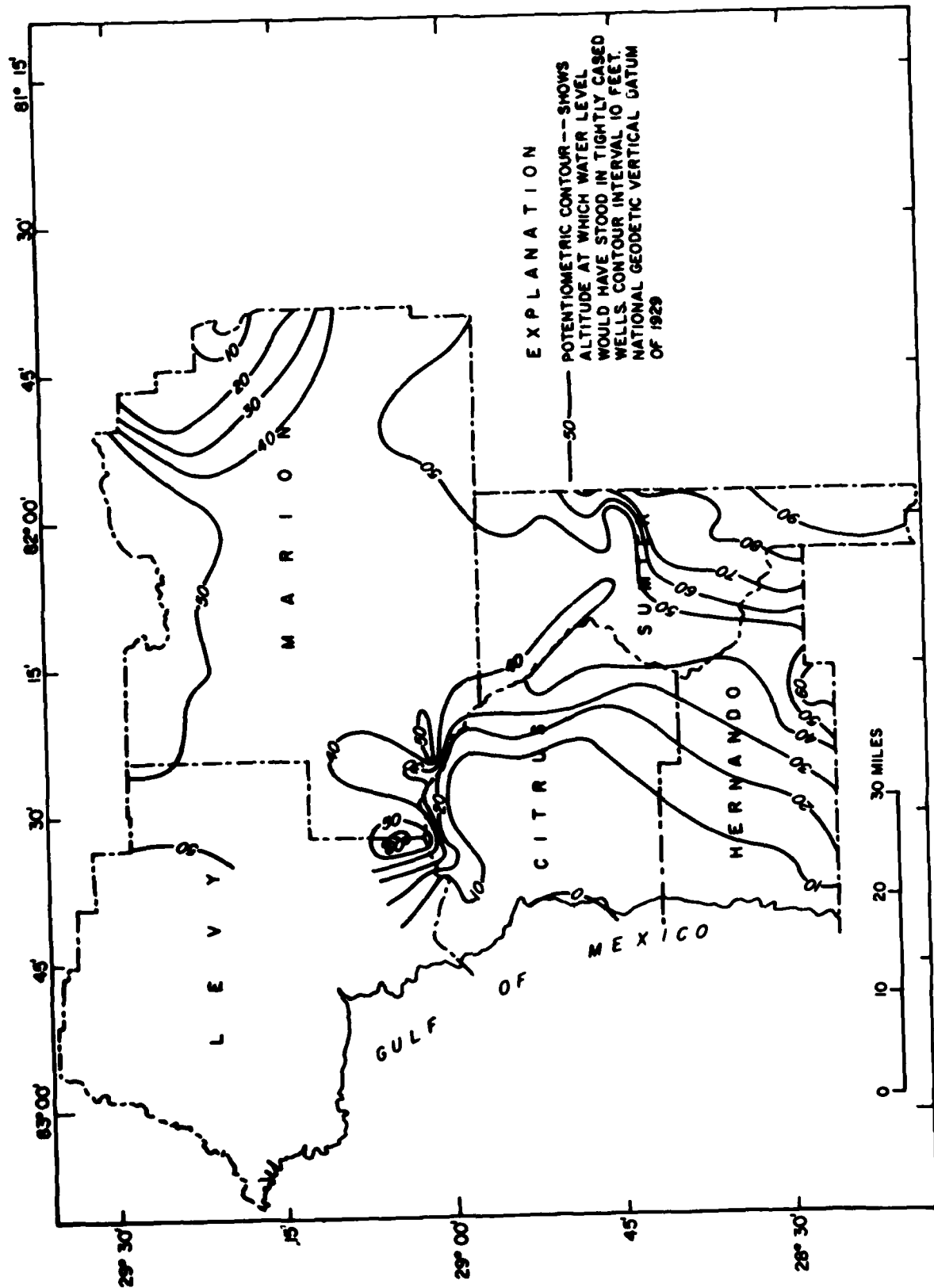


Figure 21.--Potentiometric surface of the Floridan aquifer, May 1979, for areas where such data have been published (from Laughlin and others, 1980; Wolansky, Mills, Woodham, and Laughlin, 1979).

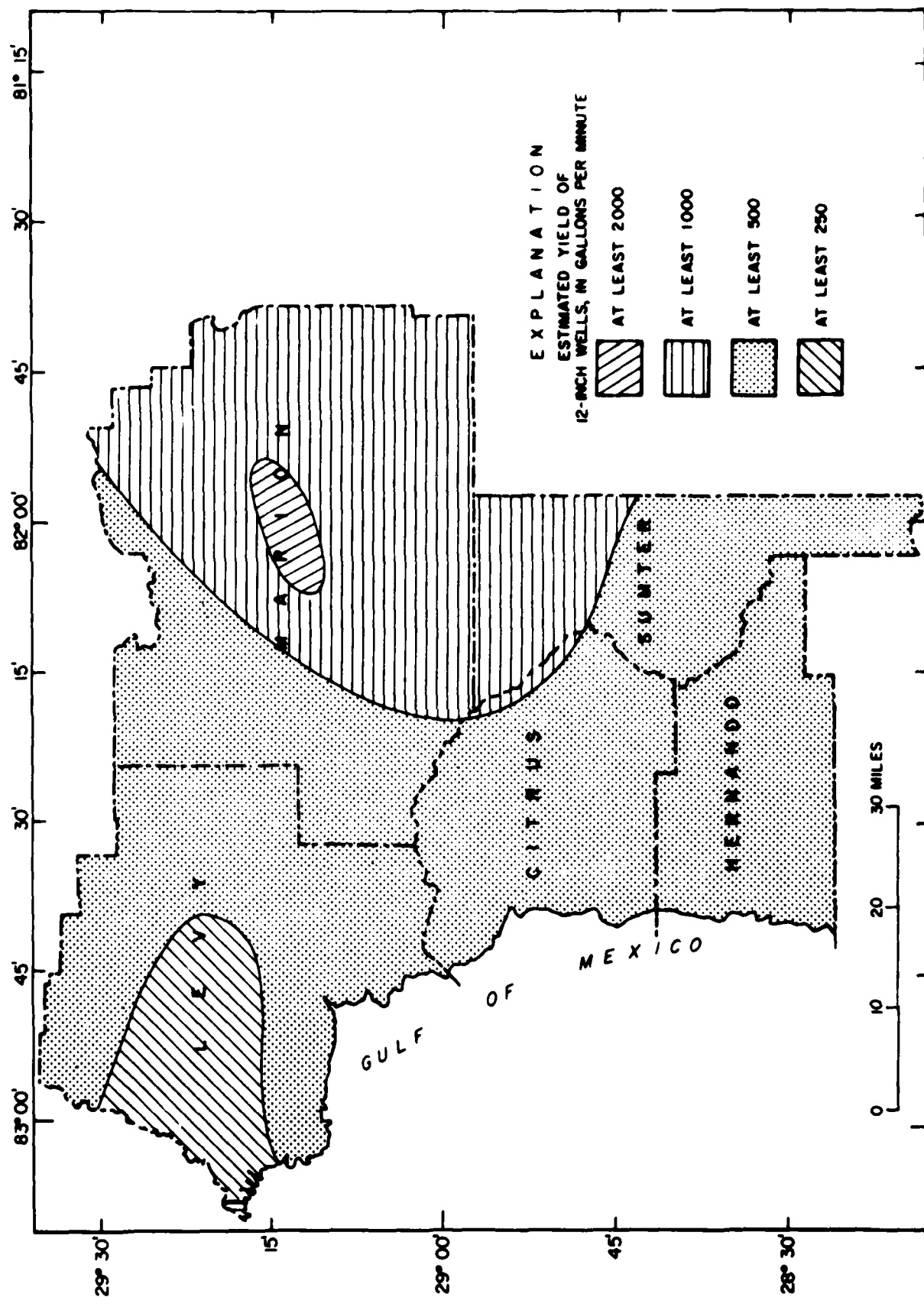


Figure 22.--Yields of 12-inch wells (from Pascale, 1975).

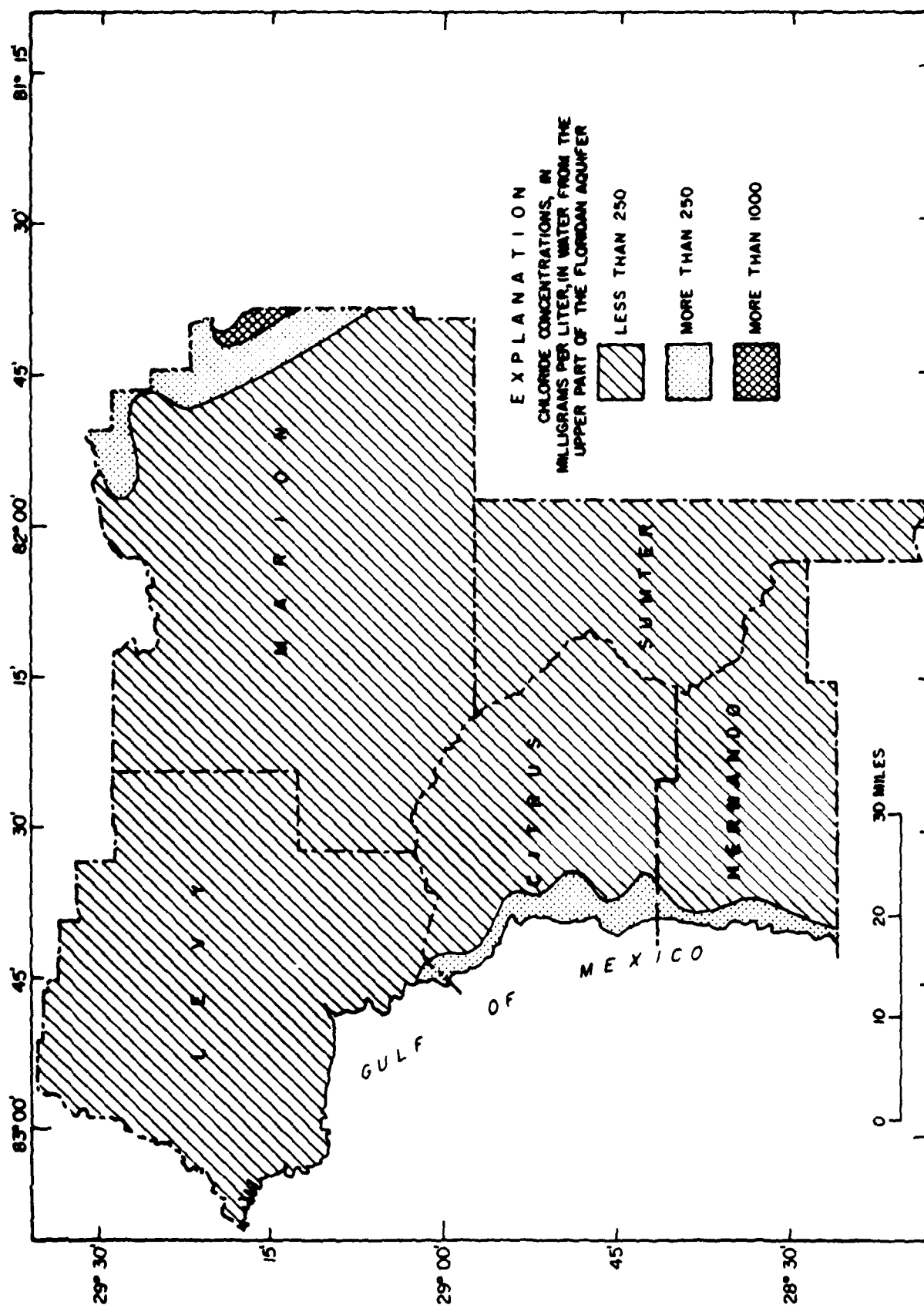


Figure 23.--Chloride concentrations in water from the upper part of the Floridan aquifer (from Mills and Ryder, 1977).

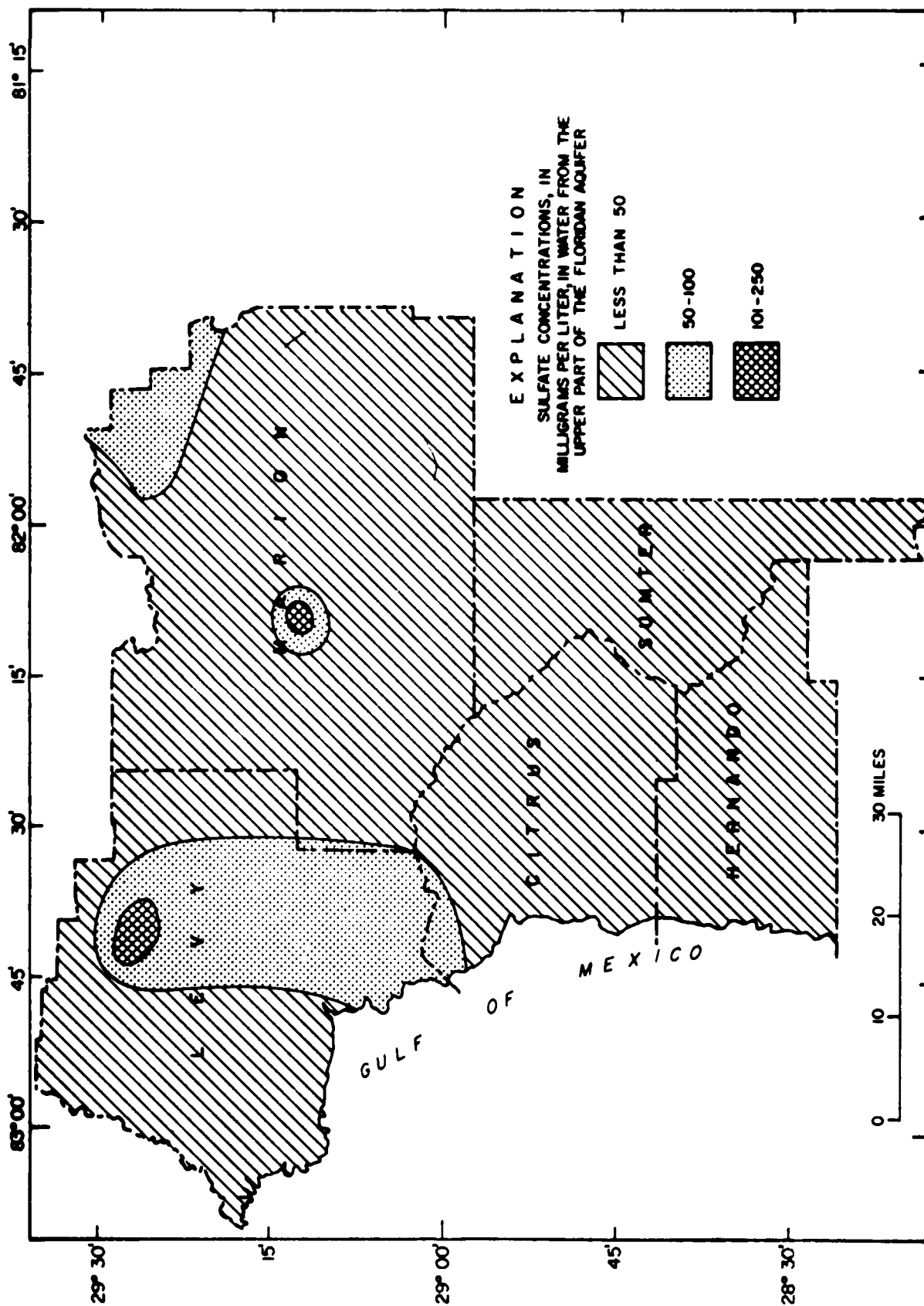


Figure 24.--Sulfate concentrations in water from the upper part of the Floridan aquifer (from Shampine, 1965a, revised 1975).

than 250 milligrams per liter (mg/L), which the Proposed Secondary Drinking Water Regulations (U.S. Environmental Protection Agency, 1977) recommends should not be exceeded.

Dissolved-solids concentrations in the Floridan are less than 250 mg/L throughout much of the area (Shampine, 1965b, revised 1975). In most of the area where dissolved solids exceed 250 mg/L (fig. 25), the predominant constituents are calcium and bicarbonate. However along the coast and in eastern Marion County, the predominant constituents are sodium and chloride. Water in the Floridan is, in general, hard to very hard (fig. 26) (Shampine, 1965c, revised 1975).

Well Record

A record of wells for the study area containing over 1,000 wells is listed in table 13. The record includes all wells for which data have been entered in the computer files of the U.S. Geological Survey. Included are the location, characteristics, and owner of the well, the primary use made of the well water, and the aquifer tapped by the well. The locations of the wells are plotted in figure 27.

The well-numbering system used to catalog wells in this report is that of the U.S. Geological Survey. It is based on the location of wells within a 1-second grid of parallels of latitude and meridians of longitude.

The number used to catalog wells is a 15-digit number that defines the latitude and longitude of the southeast corner of a 1-second quadrangle in which the well is located. The first six digits of the well number give the degrees, minutes, and seconds of latitude, in that order. The following seven digits give the degrees, minutes, and seconds of longitude. The last two digits are assigned sequentially to identify wells inventoried within a 1-second quadrangle.

Ground-Water Modeling

Ground-water modeling within the study area has been confined to an analysis by Grubb and Rutledge (1979) of the long-term water supply potential of the Green Swamp. The Green Swamp lies in eastern Hernando and Pasco Counties, southern Sumter and Lake Counties, and northern Polk County (fig. 2).

Major components of the hydrologic system of the area were characterized and quantified. Estimates of principal water budget items were 52.10 inches of rainfall, less than 0.5 inch of ground-water inflow, 10 inches of surface-water runoff, 2 inches of ground-water outflow, and 40 inches of evapotranspiration per year.

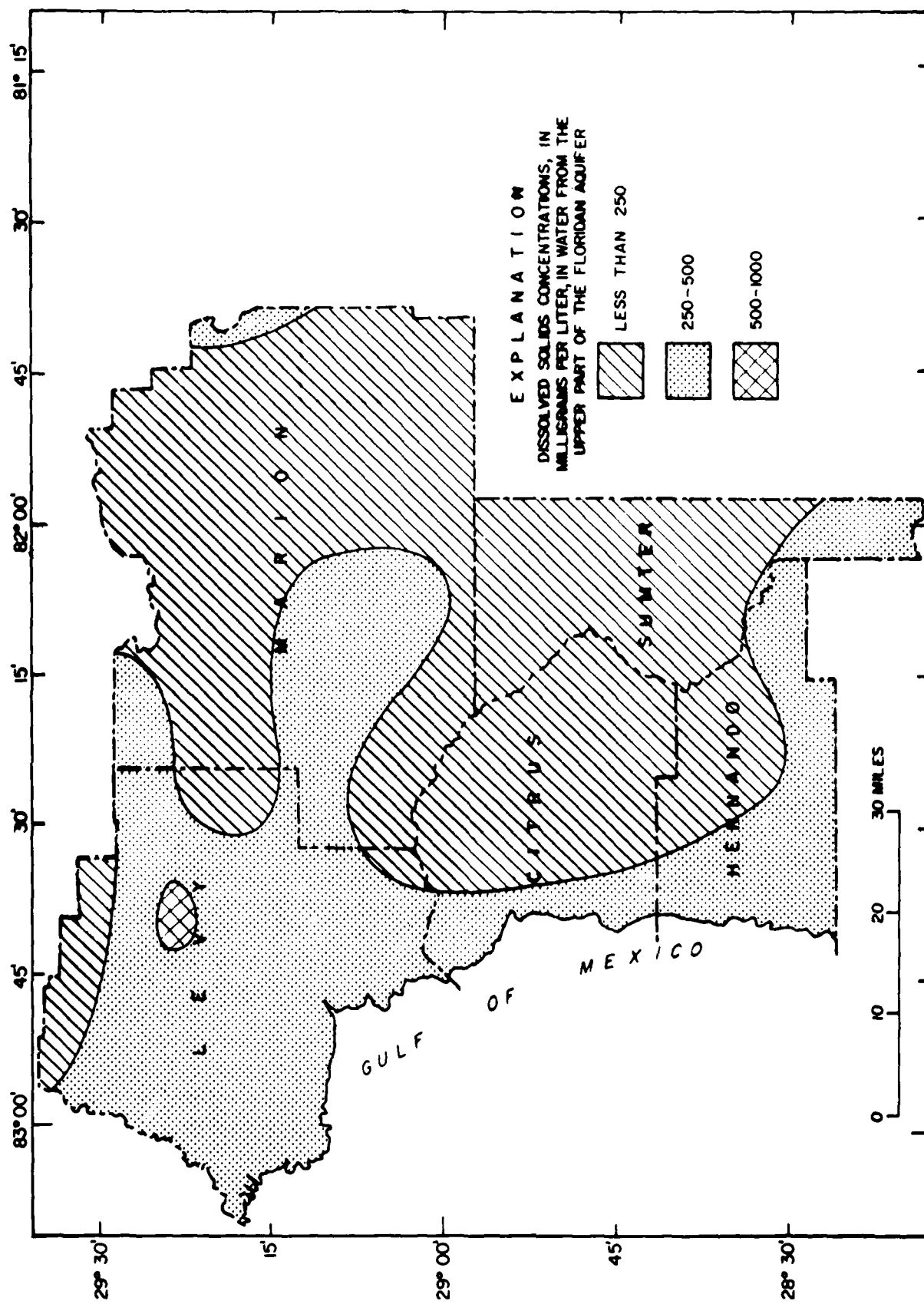


Figure 25.--Dissolved-solids concentrations in water from the upper part of the Floridan aquifer (from Shampine, 1965b, revised 1975).

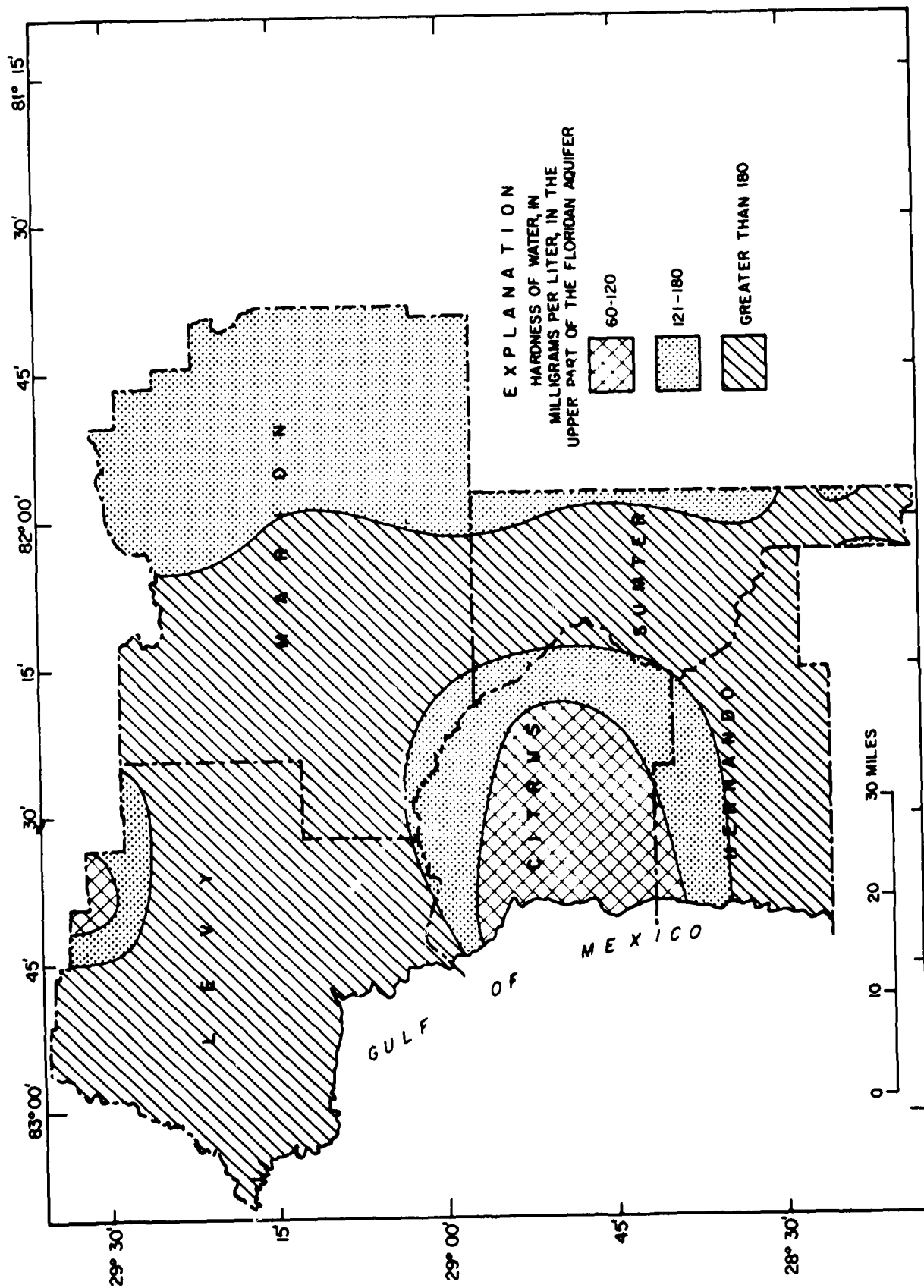


Figure 26.--Hardness of water in the upper part of the Floridan aquifer (from Shampine, 1965c, revised 1975).

Table 13.--Record of wells

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA-METER (IN)	AQUIFER	WATER USE	NAME OF OWNER	
									LAST NAME	FIRST NAME
CITRUS COUNTY										
1	284101082184301	284101	821843	274	245	8	TERTIARY FLORIDAN	PUBLIC	OAK	FOREST
2	284101082184302	284101	821843	266	228	8	TERTIARY FLORIDAN	PUBLIC	OAK	FOREST
3	284144082334501	284144	823345	100	.	.	TERTIARY FLORIDAN	IRRIGATION	R MONTAGUE	
4	284151082215801	284151	822158	185	.	.	TERTIARY FLORIDAN	DOMESTIC	FLORIDA	STATE OF
5	284247082343201	284247	823432	.	.	.	TERTIARY FLORIDAN			
6	284254082343500	284254	823435	.	.	.	TERTIARY FLORIDAN			
7	284255082343200	284255	823432	.	.	.	TERTIARY FLORIDAN			
8	284300082334301	284300	823343	124	.	.	TERTIARY FLORIDAN			
9	284302082330101	284302	823301	87	.	.	TERTIARY FLORIDAN			
10	284302082330201	284302	823302	162	.	.	TERTIARY FLORIDAN			
11	284304082333501	284304	823335	76	.	.	TERTIARY FLORIDAN			
12	284311082332801	284311	823328	.	.	.	TERTIARY FLORIDAN			
13	284311082332901	284311	823329	89	.	.	TERTIARY FLORIDAN			
14	284317082330601	284317	823306	176	.	4	PLEISTOCENE NONARTESIAN SAND	UNUSED	USGS	
15	284317082330602	284317	823306	46	.	4	PLEISTOCENE NONARTESIAN SAND	UNUSED	USGS	
16	284337082270601	284337	822706	.	.	.	TERTIARY FLORIDAN	DOMESTIC	WITHLA ST FORES	
17	284339082245401	284339	822454	.	.	4	TERTIARY FLORIDAN	UNUSED	USGS	
18	284339082270401	284339	822704	168	.	4	TERTIARY FLORIDAN	UNUSED	USGS	
19	284339082270402	284339	822704	41	.	4	PLEISTOCENE NONARTESIAN SAND	UNUSED	USGS	
20	284355082331601	284355	823316	38	.	.	TERTIARY FLORIDAN			
21	284355082331701	284355	823317	47	.	.	TERTIARY FLORIDAN			
22	284357082354800	284357	823548	.	.	.	TERTIARY FLORIDAN			
23	284438082175501	284438	821755	193	135	8	TERTIARY FLORIDAN	PUBLIC	FLORAL CITY	
24	284438082175601	284438	821756	197	.	.	TERTIARY FLORIDAN	PUBLIC	FLO CITY MAT AS	
25	284440082191901	284440	821919	160	126	4	TERTIARY FLORIDAN	UNUSED	CAMP ENINI	HASSE
26	284442082331501	284442	823315	24	.	.	HOLOCENE NONARTESIAN SAND	UNUSED	FLA STATE RD OF	
27	284455082331601	284455	823316	138	.	.	TERTIARY FLORIDAN	DOMESTIC	U S DEPT INT	
28	284501082331301	284501	823313	140	.	.	TERTIARY FLORIDAN	DOMESTIC	U S DEPT INT	
29	284508082174601	284508	821746	400	200	8	TERTIARY FLORIDAN	INDUSTRY	FERRIS PACKING	HOMER
30	284519082150701	284519	821507	60	40	6	TERTIARY FLORIDAN	DOMESTIC	FISHER	
31	284528082211801	284528	822118	.	.	4	TERTIARY FLORIDAN	PUBLIC	WITHA ST	FOREST
32	284531082371101	284531	823711	8	.	.	TERTIARY FLORIDAN	UNUSED	ROOKS BROTHERS	
33	284532082371001	284532	823710	45	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
34	284537082331401	284537	823314	120	.	.	TERTIARY FLORIDAN	DOMESTIC	U S DEPT INT	
35	284540082384901	284540	823849	7	.	.	TERTIARY FLORIDAN	UNUSED	ROOKS BROS	
36	284547082361201	284547	823612	53	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
37	284551082345301	284551	823453	99	.	3	TERTIARY FLORIDAN	IRRIGATION	BRANTLEY	
38	284607082300901	284607	823009	170	.	8	TERTIARY FLORIDAN	IRRIGATION	C M MERCER	
39	284614082293501	284614	822935	150	.	2	TERTIARY FLORIDAN	IRRIGATION	C M JOHNSON	
40	284651082333601	284651	823336	111	.	1	TERTIARY FLORIDAN	UNUSED	R ADKINS	
41	284653082365401	284653	823654	11	.	1	TERTIARY FLORIDAN	PUBLIC	CITRUS COUNTY	
42	284655082365401	284655	823654	16	.	2	TERTIARY FLORIDAN	UNUSED	CITRUS COUNTY	
43	284656082365601	284656	823656	9	.	.	TERTIARY FLORIDAN	UNUSED	WITHL ST FOREST	
44	284702082264201	284702	822642	31	.	4	TERTIARY FLORIDAN	UNUSED	USGS	
45	284705082270101	284705	822701	63	.	.	TERTIARY FLORIDAN	DOMESTIC	ATER DISTRICT # 1	
46	284720082345801	284720	823458	86	.	.	TERTIARY FLORIDAN	FIRE	WELTY MILLER	VFD
47	284727082361401	284727	823614	20	.	4	TERTIARY FLORIDAN	RECREATION	HIGHLAND	
48	284752082202501	284752	822025	114	69	6	TERTIARY FLORIDAN	UNUSED	HOMOSASSA	
49	284758082352000	284758	823520	.	.	.	TERTIARY FLORIDAN	UNUSED	NATURE FISHHOWL	
50	284803082351701	284803	823517	50	.	.	TERTIARY FLORIDAN	PUBLIC	WITHLA ST FOREST	
51	284805082225701	284805	822257	150	.	.	TERTIARY FLORIDAN	IRRIGATION	RANDALL	
52	284809082305501	284809	823055	330	.	10	TERTIARY FLORIDAN	PUBLIC	MORRIS CATTLE	
53	284816082343801	284816	823438	180	.	.	TERTIARY FLORIDAN			

Table 13.--Record of wells--Continued

Obs. No.	Station Number	Lat- ITUDE	Long- ITUDE	Well Depth (FT)	Casing Depth (FT)	Dia- meter (IN)	Aquifer	CITRUS COUNTY	Water Use	Last Name	Name of Owner First Name
54	284844082202801	284844	822828	.	.	4	TERTIARY FLORIDAN		PUBLIC	WITHLA	ST FORES
55	284852082162301	284852	821623	.	.	4	TERTIARY FLORIDAN		UNUSED	INFANTINO	T
56	284857082334801	284857	823348	101	.	.	TERTIARY FLORIDAN		IRRIGATION	CITRO	
57	284907082311701	284907	823117	300	.	.	TERTIARY FLORIDAN			HEAD	
58	284936082350401	284936	823504	94	.	.				D	
59	284938082350301	284938	823503	48	.	.				ORIUM	
60	284939082344701	284939	823447	60	.	.	TERTIARY FLORIDAN		STOCK	LEN YOUNG	
61	284940082291901	284940	822919	71	.	.			UNUSED	USGS	
62	284944082311801	284944	823118	46	.	4	TERTIARY FLORIDAN			CANTO, FLA	
63	284947082311801	284947	823118	.	.	.	TERTIARY FLORIDAN		UNUSED	U S GEOL SURVEY	
64	284952082400301	284952	824003	47	.	3	TERTIARY FLORIDAN		UNUSED	U S GEOL SURVEY	
65	284952082400302	284952	824003	38	.	2	TERTIARY FLORIDAN		UNUSED	USGS	
66	284958082190401	284958	821904	48	.	6	TERTIARY FLORIDAN		IRRIGATION	CITRUS	HIGH SCH
67	285003082202001	285003	822020	130	78	6	TERTIARY FLORIDAN		UNUSED	USGS	
68	285010082384001	285010	823840	55	.	3	TERTIARY FLORIDAN		UNUSED	USGS	
69	285020082365301	285020	823653	41	.	3	TERTIARY FLORIDAN		PUBLIC	INVERNESS	CITY OF
70	285021082200601	285021	822006	450	400	12	TERTIARY FLORIDAN		PUBLIC	CITY INVERNESS	
71	285022082200601	285022	822006	400	.	10	TERTIARY FLORIDAN		PUBLIC	INVERNESS	
72	285022082200701	285022	822007	200	.	10	TERTIARY FLORIDAN		UNUSED	USGS	
73	285026082174101	285026	821741	40	.	6	TERTIARY FLORIDAN		PUBLIC	INVERNESS	VILLAGE
74	285037082213801	285037	822138	.	.	.	TERTIARY FLORIDAN		PUBLIC	INVERNESS	VILLAGE
75	285037082213802	285037	822138	195	175	6	TERTIARY FLORIDAN		UNUSED	USGS	
76	285056082163001	285056	821630	37	.	6	TERTIARY FLORIDAN		DOMESTIC	JAMES GIRBS	
77	285057082291001	285057	822910	63	.	6	TERTIARY FLORIDAN		UNUSED	USGS	
78	285101082135802	285101	821358	31	.	6	TERTIARY FLORIDAN		UNUSED	STATE ROAD DEPT	
79	285102082204001	285102	822040	450	.	18	TERTIARY FLORIDAN		UNUSED	USGS	
80	285102082361001	285102	823610	75	.	3	TERTIARY FLORIDAN		UNUSED	WING	
81	285104082134401	285104	821344	33	30	2	TERTIARY FLORIDAN			CITRUS 11 U S G	EOL SURVEY
82	285105082135801	285105	821358	31	.	.	TERTIARY FLORIDAN			-2 NEAR HOMOSAS SA	SGS, FL
83	285112082354401	285112	823544	111	.	.	Eocene AVON PARK LIMESTONE		PUBLIC	OZELLO WATER CO	
84	285116082351401	285116	823514	100	.	6	TERTIARY FLORIDAN		PUBLIC	OZELLO WATER CO	
85	285116082351402	285116	823514	105	.	6	TERTIARY FLORIDAN		UNUSED	USGS	
86	285124082245601	285124	822456	150	52	6	TERTIARY FLORIDAN		UNUSED	G L HANDLEY	
87	285128082194201	285128	821942	34	.	2	TERTIARY FLORIDAN		DOMESTIC	G L HANDLEY	
88	285130082195001	285130	821950	107	.	6	TERTIARY FLORIDAN		PUBLIC	W F ONIEL	
89	285153082232601	285153	822326	143	.	6	TERTIARY FLORIDAN		UNUSED	LEE WADE	
90	285156082395701	285156	823957	965	.	4	TERTIARY FLORIDAN		IRRIGATION	HOWARD FARMS	
91	285158082245401	285158	822454	225	.	8	TERTIARY FLORIDAN		IRRIGATION	PARADISE PLANT	
92	285205082352001	285205	823520	138	.	.	TERTIARY FLORIDAN		PUBLIC	CRYSTAL SHORES	
93	285220082354401	285220	823544	120	.	.	TERTIARY FLORIDAN		PUBLIC	PALM SP WATER	
94	285220082361001	285220	823610	85	.	.	TERTIARY FLORIDAN		UNUSED	ARTHUR LEWIS	
95	285229082310501	285229	823105	483	.	4	Eocene AVON PARK LIMESTONE		IRRIGATION	NEAR CRYSTAL R	IVER, FL
96	285234082341901	285234	823419	252	.	.	TERTIARY FLORIDAN		UNUSED	PARADISE HOTEL	
97	285238082352001	285238	823520	119	.	.	TERTIARY FLORIDAN		UNUSED	SUNCOAST DEV CO	
98	285242082312801	285242	823128	418	.	.	TERTIARY FLORIDAN		UNUSED	HEATH	ELMER
99	285242082370101	285242	823701	33	.	2	TERTIARY FLORIDAN		UNUSED	CITRUS CO PARK	
100	285246082215601	285246	822156	84	.	2	TERTIARY FLORIDAN		UNUSED	HEATH	
101	285248082183201	285248	821832	53	.	2	TERTIARY FLORIDAN		PUBLIC	PLANTATION PARA	
102	285248082351801	285248	823518	123	.	4	TERTIARY FLORIDAN		DOMESTIC	PARADISE HOTEL	
103	285248082351802	285248	823518	128	.	4	TERTIARY FLORIDAN		UNUSED	USGS	
104	285254082323001	285254	823230	30	.	4	TERTIARY FLORIDAN		IRRIGATION	PARADISE HOTEL	
105	285257082350301	285257	823503	95	.	.	TERTIARY FLORIDAN		UNUSED	ROCK PLANT PS W	ELL
106	285311082345801	285311	823458	51	.	.	TERTIARY FLORIDAN		DOMESTIC	FRANK M LESLIE	
107	285313082191501	285313	821915	45	.	2	TERTIARY FLORIDAN				

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA-METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
CITRUS COUNTY										
108	285313082345901	285313	823459	52	.	6	TERTIARY FLORIDAN	PUBLIC	PARADISE GARDEN	
109	285317082352100	285317	823521	.	.	.	TERTIARY FLORIDAN		CRYSTAL SPRING	WELL
110	285325082353601	285325	823536	59	.	.	TERTIARY FLORIDAN	UNUSED	MORACE ALLEN	
111	285329082353701	285329	823537	36	.	.	TERTIARY FLORIDAN	IRRIGATION	LEROY OLGLES	BURTON
112	285342082312801	285342	823128	418	.	3	TERTIARY FLORIDAN	IRRIGATION	RELLAMY	
113	285346082252401	285346	822524	118	70	8	TERTIARY FLORIDAN	UNUSED	853233224	
114	285348082330301	285348	823303	150	.	.	TERTIARY FLORIDAN	DOMESTIC	DONALD FELS	DONALD
115	285350082162801	285350	821628	44	.	4	TERTIARY FLORIDAN	IRRIGATION	O T BELCHER	
116	285350082162802	285350	821628	65	.	2	TERTIARY FLORIDAN	PUBLIC	CRYSTAL RIVER	
117	285352082350101	285352	823501	32	.	10	TERTIARY FLORIDAN	IRRIGATION	C WASHINGTON	
118	285356082352801	285356	823528	152	.	2	TERTIARY FLORIDAN	UNUSED	USGS	
119	285357082344001	285357	823440	40	.	4	TERTIARY FLORIDAN	IRRIGATION	USGS	
120	285404082334201	285404	823342	80	.	4	MIOCENE HAWTHORN FORMATION	RECREATION	DEE	J ROY
121	285414082284201	285414	822842	335	.	4	TERTIARY FLORIDAN	UNUSED	AKINS MOTEL	
122	285414082284202	285414	822842	78	.	4	TERTIARY FLORIDAN	UNUSED	USGS	
123	285417082180301	285417	821803	401	42	16	TERTIARY FLORIDAN	UNUSED	AS4233234	
124	285417082381300	285417	823813	.	.	.	TERTIARY FLORIDAN	UNUSED	USGS	
125	285419082325601	285419	823256	21.5	.	.	TERTIARY FLORIDAN	UNUSED	AKINS MOTEL	
126	285420082360901	285420	823609	.	.	.	TERTIARY FLORIDAN	UNUSED	USGS	
127	285421082361601	285421	823616	53	.	6	TERTIARY FLORIDAN	UNUSED	AS4233234	
128	285421082361602	285421	823616	176	.	5	TERTIARY FLORIDAN	UNUSED	USGS	
129	285433082331701	285433	823317	34.5	.	.	TERTIARY FLORIDAN	UNUSED	DEE	J ROY
130	285441082165201	285441	821652	13	.	3	TERTIARY FLORIDAN	PUBLIC	ROLLING OAKS	
131	285441082165201	285441	821652	496	.	.	TERTIARY FLORIDAN	PUBLIC	REVERLY HILLS	ELL 5-T
132	285445082271201	285445	822712	200	.	10	TERTIARY FLORIDAN	PUBLIC	REVERLY HILLS	HILLS
133	28545082271202	285445	822712	.	.	.	TERTIARY FLORIDAN	PUBLIC	REVERLY HILLS	HILLS
134	28545082271202	285450	822750	405	238	12	TERTIARY FLORIDAN	PUBLIC	REVERLY HILLS	HILLS
135	285459082280801	285459	822808	240	149	12	TERTIARY FLORIDAN	IRRIGATION	SR 495	
136	285459082354001	285459	823540	108	.	.	TERTIARY FLORIDAN	PUBLIC	CRYSTAL R	
137	285500082264401	285500	822644	190	.	6	TERTIARY FLORIDAN	PUBLIC	INDIAN SPRINGS	SUBDIV
138	285505082353301	285505	823533	54	.	6	TERTIARY FLORIDAN	PUBLIC	ROLLING OAKS	
139	285508082365701	285508	823657	50	.	.	TERTIARY FLORIDAN	PUBLIC	ROLLING OAKS 60	
140	285511082364501	285511	823645	.	.	.	TERTIARY FLORIDAN	PUBLIC	REVERLY HILLS	
141	285514082275401	285514	822754	260	.	10	TERTIARY FLORIDAN	DOMESTIC	S. WOODEN	
142	285514082275402	285514	822754	176	.	4	TERTIARY FLORIDAN	PUBLIC	PINE	RIDGE
143	285538082271001	285538	822710	295	.	.	TERTIARY FLORIDAN	PUBLIC	PINE	RIDGE
144	285538082271002	285538	822710	95	.	2	TERTIARY FLORIDAN	UNUSED	CAMP MINING CO	MINING
145	285543082364401	285543	823644	97	.	8	TERTIARY FLORIDAN	PUBLIC	PINE	RIDGE
146	285548082313801	285548	823138	1.1	130	8	TERTIARY FLORIDAN	UNUSED	DELTONA	CORP
147	285558082272401	285558	822724	180	137	8	TERTIARY FLORIDAN	IRRIGATION	L C COBURN	
148	285608082233401	285608	822334	91	.	4	TERTIARY FLORIDAN	UNUSED	DELTONA	
149	285608082233402	285608	822334	91	.	14	TERTIARY FLORIDAN	PUBLIC	GERRITS	EDWARD
150	285612082294201	285612	822942	200	131	8	TERTIARY FLORIDAN	IRRIGATION	REVERLY	HILLS
151	285622082272301	285622	822723	94	.	2	TERTIARY FLORIDAN	UNUSED	USGS	CORP
152	285642082372100	285642	823721	68	.	4	TERTIARY FLORIDAN	IRRIGATION	USGS	
153	285651082301801	285651	823018	233	82	4	TERTIARY FLORIDAN	IRRIGATION	USGS	
154	285654082350101	285654	823501	109	102	8	TERTIARY FLORIDAN	IRRIGATION	USGS	
155	285659082267701	285659	822627	280	160	8	TERTIARY FLORIDAN	UNUSED	USGS	
156	285701082345201	285701	823452	31	.	4	TERTIARY FLORIDAN	UNUSED	USGS	
157	285714082285601	285714	822856	.	.	4	TERTIARY FLORIDAN	UNUSED	USGS	
158	285720082201301	285720	822013	55	39	6	TERTIARY FLORIDAN	UNUSED	USGS	
159	285736082423001	285736	824230	70	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
160	285737082400601	285737	824006	88	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
161	285737082413001	285737	824130	47	.	3	TERTIARY FLORIDAN	UNUSED	USGS	

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	CITRUS COUNTY	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
162	285740082231901	285740	822319	34	.	.	TERTIARY FLORIDAN	.	INDUSTRY	MANKO CO	
163	285744082415901	285744	824159	50	.	.	TERTIARY FLORIDAN	.	DOMESTIC	FLA POWER CORP	
164	285752082251401	285752	822514	85	.	2	TERTIARY FLORIDAN	.	DOMESTIC	ODUS PRIGDEN	
165	285752082251402	285752	822514	143	.	4	TERTIARY FLORIDAN	.	DOMESTIC	ODUS PRIGDEN	J AND B
166	285752082300601	285752	823006	243	110	4	TERTIARY FLORIDAN	.	UNUSED	CROFT	
167	285809082185200	285809	821852	.	.	.	TERTIARY FLORIDAN	.	RECREATION		
168	285810082381001	285810	823810	60	.	.	TERTIARY FLORIDAN	.	IRRIGATION	RED LEVEL BAPTIST CH	
169	285811082350901	285811	823509	300	156	10	TERTIARY FLORIDAN	.	UNUSED	RUNNELS	LEWIS
170	285812082360901	285812	823609	64	.	2	TERTIARY FLORIDAN	.	UNUSED	U S GEOL SURVEY	
171	285833082233301	285833	822333	41	.	.	TERTIARY FLORIDAN	.	UNUSED	CE 16	
172	285909082283501	285909	822835	192	78	8	TERTIARY FLORIDAN	.	IRRIGATION	CITRUS	SPRINGS
173	285918082381001	285918	823810	27	.	.	TERTIARY FLORIDAN	.	UNUSED	SCE 178	
174	285924082274301	285924	822743	187	91	8	TERTIARY FLORIDAN	.	PUBLIC	CITRUS	SPRINGS
175	285930082283701	285930	822837	187	88	10	TERTIARY FLORIDAN	.	IRRIGATION	CITRUS	SPRINGS
176	285930082283702	285930	822837	102	91	10	TERTIARY FLORIDAN	.	UNUSED	CITRUS	SPRINGS
177	285935082324501	285935	823245	186	128	4	TERTIARY FLORIDAN	.	UNUSED	JOHNSON	MELODY
178	285935082410901	285935	824109	28	.	3	TERTIARY FLORIDAN	.	UNUSED	U S GEOL SURVEY	
179	285951082350901	285951	823509	68	.	2	TERTIARY FLORIDAN	.	UNUSED	U S GEOL SURVEY	
180	285951082350902	285951	823509	18	.	1	TERTIARY FLORIDAN	.	UNUSED	U S GEOL SURVEY	G
181	290010082321601	290010	823216	128	.	4	TERTIARY FLORIDAN	.	DOMESTIC	DOLAN	
182	290023082393601	290023	823936	30	.	3	TERTIARY FLORIDAN	.	DOMESTIC	P O NICHOLS	
183	290027082370501	290027	823705	78	.	.	TERTIARY FLORIDAN	.	DOMESTIC	P D NICHOLS	SPRINGS
184	290027082370701	290027	823707	78	.	.	TERTIARY FLORIDAN	.	PUBLIC	CITRUS	
185	290033082272901	290033	822729	184	121	10	TERTIARY FLORIDAN	.	INDUSTRY	FLA ST	ENGINEER
186	290034082411401	290034	824114	200	65	16	TERTIARY FLORIDAN	.	INDUSTRY	FLA ST	ENGINEER
187	290034082411402	290034	824114	405	53	16	TERTIARY FLORIDAN	.	UNUSED	DELTONA	CORA
188	290041082265101	290041	822651	360	340	10	TERTIARY FLORIDAN	.	PUBLIC	CITRUS	SPRINGS
189	290045082272101	290045	822721	239	145	8	TERTIARY FLORIDAN	.	UNUSED	CITRUS	
190	290047082414101	290047	824141	30	.	3	TERTIARY FLORIDAN	.	DOMESTIC	C W DIAZ	
191	290057082304001	290057	823040	250	.	4	TERTIARY FLORIDAN	.	UNUSED	U S GEOL SURVEY	TRAIL PK
192	290107082400501	290107	824005	58	.	3	TERTIARY FLORIDAN	.	PUBLIC	HAVER LODG	
193	290113082400501	290113	824005	100	52	6	TERTIARY FLORIDAN	.	DOMESTIC	HAVER LODG	
194	290114082351501	290114	823515	.	.	2	TERTIARY FLORIDAN	.	UNUSED	HAVER LODG	
195	290114082420901	290114	824209	24	.	3	TERTIARY FLORIDAN	.	UNUSED	U S GEOL SURVEY	
196	290115082401001	290115	824010	40	.	4	TERTIARY FLORIDAN	.	COMMERCIAL	HAVER LODG	
197	290117082404501	290117	824045	150	43	6	TERTIARY FLORIDAN	.	PUBLIC	COCKE	JOHN
198	290117082404502	290117	824045	152	45	6	TERTIARY FLORIDAN	.	IRRIGATION	COCKE	JOHN
199	290121082331001	290121	823310	246	121	12	TERTIARY FLORIDAN	.	DOMESTIC	COMART	EMORY
200	290132082324201	290132	823242	203	105	6	TERTIARY FLORIDAN	.	UNUSED	COMART	EMORY
201	290137082325501	290137	823255	1142	9	3	TERTIARY FLORIDAN	.	DOMESTIC	COMART	EMORY
202	290145082421901	290145	824219	61	.	3	TERTIARY FLORIDAN	.	DOMESTIC	NAROLD O LOGAN	
203	290147082405501	290147	824055	50	.	4	TERTIARY FLORIDAN	.	DOMESTIC	S DORRRECH	
204	290152082312201	290152	823122	250	.	4	TERTIARY FLORIDAN	.	DOMESTIC	GLENN A BLAND	
205	290154082301701	290154	823017	90	.	.	TERTIARY FLORIDAN	.	DOMESTIC	ED SMIVELY	
206	290154082324401	290154	823244	43	.	3	TERTIARY FLORIDAN	.	DOMESTIC	MERR	
207	290159082285101	290159	822851	440	.	3	TERTIARY FLORIDAN	.	DOMESTIC	CARL M REUMAN	SPRINGS
208	290202082264801	290202	822648	105	60	6	TERTIARY FLORIDAN	.	PUBLIC	CITRUS	
209	290213082284101	290213	822841	78	.	3	TERTIARY FLORIDAN	.	UNUSED	CHARLES RUSH	
210	290216082292001	290216	822920	190	.	4	TERTIARY FLORIDAN	.	PUBLIC	U S GEOL SURVEY	WATER US
211	290225082275501	290225	822750	124	106	12	TERTIARY FLORIDAN	.	DOMESTIC	S DINN	
212	290227082295301	290227	822953	565	.	4	TERTIARY FLORIDAN	.	DOMESTIC	WILLIAM MUSE	
213	290227082294401	290227	822944	380	.	3	TERTIARY FLORIDAN	.	DOMESTIC	JOHN J MASON	
214	290230082295101	290230	822951	460	.	2	TERTIARY FLORIDAN	.	DOMESTIC	MATHUSE	

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
							HERNANDO COUNTY			
215	282601082395101	282601	823951	118	.	.	Eocene Avon Park Limestone	DOMESTIC	PRING HILL, FL	
216	282605082345801	282605	823458	355	.	.		RECREATION	CECIL ANSLEY	
217	282607082180901	282607	821809	304	.	.	TERTIARY FLORIDAN	IRRIGATION	CECIL ANSLEY	RETREAT JOHN
218	282607082383400	282607	823834	.	.	12			CECIL ANSLEY	
219	282613082175001	282613	821750	736	.	.	TERTIARY FLORIDAN	DOMESTIC	LAKWOOD	
220	282620082193801	282620	821938	209	104	4	TERTIARY FLORIDAN	UNUSED	DUGGAN	
221	282620082211801	282620	822118	197	91	6	TERTIARY FLORIDAN	UNUSED		
222	282621082392900	282621	823929	.	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
223	282636082221401	282636	822214	69	.	.	PLEISTOCENE NONARTESIAN SAND	UNUSED	11 NEAR MASARYK TOWN, FL.	
224	282636082221402	282636	822214	.	.	12	TERTIARY FLORIDAN	UNUSED	EL RICO RANCH	
225	282642082335101	282642	823351	481	.	.	TERTIARY FLORIDAN	RECREATION	DELTONA CORP	
226	282652082363701	282652	823637	286	.	8	TERTIARY FLORIDAN	DOMESTIC	W RAULERSON	
227	282657082382501	282657	823825	101	.	1		UNUSED	USGS	
228	282704082394301	282704	823943	195	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
229	282708082390201	282708	823902	246	.	3		STOCK	L C HAWES	
230	282723082202301	282723	822023	450	.	6	TERTIARY FLORIDAN	IRRIGATION	DELTONA CORP	
231	282726082311801	282726	823118	335	.	10	TERTIARY FLORIDAN	PUBLIC	DELTONA CORP	
232	282726082363701	282726	823637	373	.	10	TERTIARY FLORIDAN	PUBLIC	DELTONA CORP	
233	282727082363801	282727	823638	336	.	10	TERTIARY FLORIDAN	PUBLIC	DELTONA CORP	
234	282727082363901	282727	823639	330	.	10	TERTIARY FLORIDAN	PUBLIC	DELTONA CORP	
235	282736082194401	282736	821944	900	.	16	TERTIARY FLORIDAN	UNUSED	L C HAWES	
236	282738082372501	282738	823725	95	.	6		UNUSED	SPG HILL UTIL	
237	282742082375901	282742	823759	880	.	.	Eocene Ocala Limestone		NP ARIPEKA, FL	
238	282742082380001	282742	823800	580	.	.			NEAR ARIPEKA, FL	
239	282744082373801	282744	823738	.	.	.			T PLANT DRINKIN G WATER	
240	282748082303801	282748	823038	320	.	10	TERTIARY FLORIDAN	PUBLIC	DELTONA CORP	
241	282752082313101	282752	823131	230	.	4	TERTIARY FLORIDAN	PUBLIC	DELTONA CORP	
242	282803082191201	282803	821912	340	203	6	TERTIARY FLORIDAN	STOCK	ALDRIDGE	NORRIS
243	282810082333701	282810	823337	.	.	.		DOMESTIC	BLACKETT	RUSSELL
244	282839082190801	282839	821908	428	309	6	TERTIARY FLORIDAN	IRRIGATION	RRINSON	J
245	282842082042401	282842	820424	195	60	6	TERTIARY FLORIDAN	UNUSED	ROYETT	MARGARET
246	282847082042301	282847	820423	134	.	3	TERTIARY FLORIDAN	UNUSED	TALLISMAN	ESTS
247	282847082103401	282847	821034	250	.	.		UNUSED	K	E
248	282847082364101	282847	823641	250	.	.	TERTIARY FLORIDAN	UNUSED	ROYETTE	
249	282851082035301	282851	820353	83	.	3	TERTIARY FLORIDAN	UNUSED	PROOKSVILLE	
250	282851082271601	282851	822716	251	.	8	TERTIARY FLORIDAN	UNUSED	Y WELL	
251	282851082360801	282851	823608	.	.	.		DOMESTIC	PATE	HILTON
252	282857082212101	282857	822121	105	74	6	TERTIARY FLORIDAN	UNUSED	THOMAS	WAYNE
253	282905082163401	282905	821634	456	.	.	TERTIARY FLORIDAN	UNUSED	FT DADE MHP	
254	282910082102601	282910	821026	.	.	4	TERTIARY FLORIDAN	PUBLIC	FT DADE MHP	
255	282911082101001	282911	821010	135	66	6	TERTIARY FLORIDAN	PUBLIC	RARTLET BROS	
256	282917082355701	282917	823557	170	.	8		DOMESTIC	BROWN	GLADYS
257	282921082181101	282921	821811	260	143	6	TERTIARY FLORIDAN		NDS WELL NO 1 0 N REDWING	
258	282923082355201	282923	823552	.	.	.		PUBLIC	HERNANDO COUNTY	
259	282959082105201	282959	821052	300	50	6	TERTIARY FLORIDAN		AD NE CORNER NO T DATA SIT	
260	283000082223000	283000	822230	.	.	.		UNUSED	AD NW CORNER NO T DATA SIT	
261	283000082300000	283000	823000	97	.	.	TERTIARY FLORIDAN	DOMESTIC	FLA FOREST SERV	
262	283001082064701	283001	820647	.	.	6	TERTIARY FLORIDAN	DOMESTIC	WILHLA	ST FORES
263	283001082064702	283001	820647	210	62	6	TERTIARY FLORIDAN	DOMESTIC	WILHLA	SHIRLES
264	283010082161701	283010	821617	421	.	.	TERTIARY FLORIDAN	DOMESTIC	WEDSTRAND	SUSAN
265	283022082160701	283022	821607	84	.	4			W WILKIS	

Table 13.--Record of wells--continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA-METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER	CITY NAME
HERNANDO COUNTY											
266	283026082200801	283026	822008	195	100	6	TERTIARY FLORIDAN	PUBLIC	HERNANDO	COUNTY	
269	283028082205501	283028	822055	495	180	6	TERTIARY FLORIDAN	IRRIGATION	CROOM	WILLIAM	
270	283033082154101	283033	821541	135		4	TERTIARY FLORIDAN	UNUSED	OGNIRNE	SAMUEL	
271	283036082105501	283036	821055	1300		12	TERTIARY FLORIDAN	PUBLIC	P30210133	RIDGE	MANOR NO
272	283036082105502	283036	821055	3004		12	TERTIARY FLORIDAN	PUBLIC	RIDGE MANOR FST		
273	283041082154201	283041	821542	160	83	6	TERTIARY FLORIDAN	DOMESTIC	OGNIRNE	SAMUEL	
274	283044082343401	283044	823434				TERTIARY FLORIDAN	IRRIGATION	FLINLANDTHEATRE		
275	283049082345100	283049	823451				TERTIARY FLORIDAN	UNUSED	WIDGE MANOR EST		
276	283050082105002	283050	821050	3008		12	TERTIARY FLORIDAN	PUBLIC	FLINLANDTHEATRE		
277	283057082342901	283057	823429	315			TERTIARY FLORIDAN	PUBLIC	L		
278	283058082281001	283058	822810				TERTIARY FLORIDAN	STOCK	FLINLANDTHEATRE		
279	283058082343601	283058	823436	64			TERTIARY FLORIDAN	RECREATION	ST PETERSBURG	CITY OF	
280	283100082342500	283100	823425				TERTIARY FLORIDAN	STOCK	L DIEPOLDR		
281	283101082320601	283101	823206	60			TERTIARY FLORIDAN	IRRIGATION	INLAND THEATRE		
282	283103082341801	283103	823418	305			TERTIARY FLORIDAN	STOCK	INLAND THEATRE		
283	283103082350701	283103	823507				TERTIARY FLORIDAN	UNUSED	41 TRAILER	VILLAGE	
284	283105082245001	283105	822445	140	88	8	TERTIARY FLORIDAN	PUBLIC	41 TRAILER	VILLAGE	
285	283105082245002	283105	822450	242	85	8	TERTIARY FLORIDAN	UNUSED	LE COMPT		
286	283105082380001	283105	823800	68		3	TERTIARY FLORIDAN	INDUSTRY	ST PETERSBURG		
287	283108082123401	283108	821234			6	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY		
288	283108082342301	283108	823423	321		4	TERTIARY FLORIDAN	IRRIGATION	INLAND THEATRE	CARL	
289	283110082341501	283110	823415	91		4	TERTIARY FLORIDAN	DOMESTIC	ASREL		
290	283118082351301	283118	823513	117		4	TERTIARY FLORIDAN	DOMESTIC	GILBERT THAYER		
291	283125082100501	283125	821349	5065	48	8	TERTIARY FLORIDAN	UNUSED	THAYER DAVIS		
292	283130082134901	283130	821349	2098		1A	TERTIARY FLORIDAN	DOMESTIC	RURTON HANSON		
293	283143082134901	283143	821349	116			TERTIARY FLORIDAN	UNUSED	WELL NO 2		
294	283143082281801	283143	822818				TERTIARY FLORIDAN	UNUSED	USGS		
295	283200082354101	283200	823541	259		4	TERTIARY FLORIDAN	UNUSED	WELL 1		
296	283201082315601	283201	823156				TERTIARY FLORIDAN	UNUSED	PRESBYTER YOUTH		
297	283201082354201	283201	823542	75			TERTIARY FLORIDAN	DOMESTIC	TALIS LEWIE		
298	283203082370201	283203	823702	180		4	TERTIARY FLORIDAN	DOMESTIC	FC OFFICE		
299	283213082212101	283213	822121				TERTIARY FLORIDAN	DOMESTIC	ENT WELL		
300	283223082335901	283223	823359	500			TERTIARY FLORIDAN	DOMESTIC	SEDLEY COUCH		
301	283225082295701	283225	822957	190		2	TERTIARY FLORIDAN	PUBLIC	WATSON		
302	283227082335801	283227	823358	62		3	TERTIARY FLORIDAN	PUBLIC	A W CARE		
303	283229082331901	283229	823319	200		3	TERTIARY FLORIDAN	PUBLIC	A W CARE		
304	283231082115101	283231	821151	165		3	TERTIARY FLORIDAN	PUBLIC	A W CARE		
305	283233082364101	283233	823641	155		3	TERTIARY FLORIDAN	PUBLIC	A W CARE		
306	283233082364102	283233	823641	162		3	TERTIARY FLORIDAN	PUBLIC	A W CARE		
307	283233082364103	283233	823641	166		3	TERTIARY FLORIDAN	PUBLIC	WEEKWACH R FST		
308	283233082364104	283233	823641	147			TERTIARY FLORIDAN	UNUSED	THOMAS	WAYNE	
309	283236082334901	283236	823349	212		8	TERTIARY FLORIDAN	UNUSED	NH PAYCOPT, FLA		
310	283236082334901	283236	823349	259	117		TERTIARY FLORIDAN	UNUSED			
311	283237082181901	283237	821819	302			TERTIARY FLORIDAN	UNUSED	M L ARROTT		
312	283243082365701	283243	823651				TERTIARY FLORIDAN	UNUSED	M L ARROTT		
313	283245082371000	283245	823710	195			TERTIARY FLORIDAN	UNUSED	COOGLER		
314	283250082302401	283250	823024	235		3	TERTIARY FLORIDAN	UNUSED	CITYBOOKSVILLE		
315	283251082304201	283251	823042	50		3	TERTIARY FLORIDAN	PUBLIC	CITYBOOKSVILLE		
316	283253082363601	283253	823636	54		3	TERTIARY FLORIDAN	UNUSED			
317	283253082383701	283253	823837	39		4	TERTIARY FLORIDAN	UNUSED			
318	283254082335101	283254	823351	62		15	TERTIARY FLORIDAN	UNUSED			
319	283254082383601	283254	823836	757			TERTIARY FLORIDAN	PUBLIC			
320	283258082231901	283258	822319				TERTIARY FLORIDAN	PUBLIC			
321	283258082232201	283258	822322				TERTIARY FLORIDAN	PUBLIC			

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
							HERNANDO COUNTY			
322	283250082383101	283258	823831	.	.	.	TERTIARY FLORIDAN	DOMESTIC	MRS MCCLINTOCK	
323	283313082094601	283313	820946	26	.	.	.		TSMAN CLAIR NO 3	
324	283326082355201	283326	823552	.	.	.	.		TSMAN CLUR NO 2	
325	283327082355001	283327	823550	.	.	.	.	UNUSED	USGS	
326	283337082333701	283337	823337	56	.	6	TERTIARY FLORIDAN	PUBLIC	WITHLA	ST FORES
327	283356082123301	283356	821233	.	.	4	TERTIARY FLORIDAN	UNUSED	WITHLA	ST FORES
328	283408082123801	283408	821238	.	.	.	.	UNUSED	FRAZIER MALL	
329	283410082301301	283410	823013	225	.	.	.	UNUSED	J C PLUMMER	
330	283432082391401	283432	823914	180	.	.	.	UNUSED	J C PLUMMER	
331	283433082303801	283433	823038	117	.	.	.	UNUSED	J C PLUMMER	
332	283433082391301	283433	823913	33	.	.	.	DOMESTIC	J C PLUMMER	
333	283433082391302	283433	823913	15	.	2	TERTIARY FLORIDAN	PUBLIC	DA MAC UTIL	
334	283443082223701	283443	822237	337	.	10	TERTIARY FLORIDAN	PUBLIC	DA MAC UTIL	
335	283443082223901	283443	822239	238	.	.	.	PUBLIC	DOGWOOD	ESTATES
336	283446082210201	283446	822102	225	169	8	TERTIARY FLORIDAN	UNUSED	WITHLA ST	FOREST
337	283454082131301	283454	821313	65	42	4	TERTIARY FLORIDAN	IRRIGATION	SMITH	CLARENCE
338	283508082215101	283508	822151	361	297	4	TERTIARY FLORIDAN	DOMESTIC	FRAZIER MALL	
339	283516082302201	283516	823022	225	.	12	TERTIARY FLORIDAN	DOMESTIC	FRED HAINES	
340	283522082330701	283522	823307	65	.	2	TERTIARY FLORIDAN	UNUSED	USGS	
341	283527082365701	283527	823657	125	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
342	283529082355801	283529	823558	140	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
343	283532082331201	283532	823312	.	.	8	TERTIARY FLORIDAN	UNUSED	SWFWMD	
344	283537082151501	283537	821515	198	111	.	TERTIARY FLORIDAN	UNUSED	CAMP CONC ROCK	
345	283546082261301	283546	822613	42	.	.	TERTIARY FLORIDAN	UNUSED	KIMACHEE FLA	
346	283550082352901	283555	823529	110	.	.	TERTIARY FLORIDAN	UNUSED	USGS	
347	283550082372901	283555	823729	110	.	3	TERTIARY FLORIDAN	UNUSED	NIX	DELMAS
348	283613082184301	283613	821843	219	200	4	TERTIARY FLORIDAN	DOMESTIC	PAUL HOLSTEIN	
349	283620082325801	283620	823258	10	.	2	TERTIARY FLORIDAN	DOMESTIC	SEARNOARD R R	
350	283632082245101	283632	822451	231	.	6	TERTIARY FLORIDAN	DOMESTIC	LL	
351	283648082275201	283648	822752	.	.	.	.	DOMESTIC	J GILPIN	
352	283652082324701	283652	823247	126	.	.	.	UNUSED	U S GEOL SURVEY	
353	283704082244201	283704	822442	40	.	1	TERTIARY FLORIDAN	PUBLIC	U S D A	
354	283705082215701	283705	822157	804	.	.	TERTIARY FLORIDAN	IRRIGATION	YOUNGLOOD	
355	283724082320901	283724	823209	562	.	.	TERTIARY FLORIDAN	UNUSED	U S D A	
356	283728082222801	283728	822228	360	.	12	TERTIARY FLORIDAN	UNUSED	UNKNOWN	
357	283729082323301	283729	823233	126	.	.	TERTIARY FLORIDAN	PUBLIC	JACK FRANKLIN	
358	283743082213801	283743	822138	149	.	3	TERTIARY FLORIDAN	PUBLIC	HERNANDO COUNTY	
359	283759082214901	283759	822149	150	.	.	TERTIARY FLORIDAN	PUBLIC	EDEN CHRS	SCHOOL
360	283803082323001	283803	823230	160	.	.	TERTIARY FLORIDAN	PUBLIC	ARKSVIL ROCK CO	
361	283806082214801	283806	822148	155	.	4	TERTIARY FLORIDAN	INDUSTRY	ARKSVIL ROCK CO	
362	283815082281701	283815	822817	600	.	.	TERTIARY FLORIDAN	INDUSTRY	ARKSVIL ROCK CO	
363	283815082281901	283815	822819	600	.	.	TERTIARY FLORIDAN	INDUSTRY	ARKSVIL ROCK CO	
364	283816082282201	283816	822816	600	.	18	TERTIARY FLORIDAN	PUBLIC	USDA	
365	283816082282201	283816	822816	600	.	5	TERTIARY FLORIDAN	UNUSED	C C CHANDLER	
366	283819082170801	283819	821708	205	110	.	TERTIARY FLORIDAN	UNUSED	JORGENSEN	
367	283840082154801	283840	821548	140	.	.	TERTIARY FLORIDAN	UNUSED	MR BROOKSVILLE	
368	283849082224801	283849	822248	315	.	.	TERTIARY FLORIDAN	PUBLIC	MSF ENUIRO	CENTER
369	283850082265501	283850	822655	.	125	6	TERTIARY FLORIDAN	DOMESTIC	NEAR BROOKSVILLE	E. FLORIDA
370	283908082201301	283908	822013	143	.	.	TERTIARY FLORIDAN	UNUSED	MOOSER	GUY
371	283924082272301	283924	822723	240	.	6	TERTIARY FLORIDAN	IRRIGATION	COOK	BILL
372	283926082175001	283926	821750	234	107	2	TERTIARY FLORIDAN		NORRIS CATTLE	
373	283941082164401	283941	821644	87	80	.	TERTIARY FLORIDAN		MR BROOKSVILLE	
374	283944082290701	283944	822907	667	.	.	TERTIARY FLORIDAN			
375	283955082293501	283955	822935	.	.	.	TERTIARY FLORIDAN			

Table 13.--Record of wells--Continued

ORS. NO.	STATION NUMBER	LAT- ITUDE	LONG- ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	NAME OF OWNER LAST NAME FIRST NAME
							HERNANDO COUNTY		
376	2A39570A21A1001	283957	821810	140	95	4	TERTIARY FLORIDAN	DOMESTIC	BLIZZARD W
377	2A4039082291801	284039	82291A	.	.	.	TERTIARY FLORIDAN		NG CAMP
378	2A4040082342301	284040	823423	.	.	.			2 NP CHASSAMOW ITZKA, FLA
379	2A43170A2330602	284317	823306	.	.	.			HASSAMOWITZKA, FLA
380	2A43390A2270401	284339	822704	.	.	.			HASSAMOWITZKA, FLA
381	2A43390A2270402	284339	822704	.	.	.			

Table 13.---Record of wells---Continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	NAME OF OWNER LAST NAME	FIRST NAME
382	282310082275001	282310	822750	190	.	8	TERTIARY FLORIDAN	PUBLIC	WILLISTON	
383	2900004082454101	290004	824541	20	.	2	TERTIARY FLORIDAN	DOMESTIC	STATE OF FLA	
384	290112082371101	290112	823711	125	84	6	TERTIARY FLORIDAN	UNUSED	USGS	
385	290112082371102	290112	823711	34	31	4	TERTIARY FLORIDAN	UNUSED	USGS	
386	290118082364101	290118	823641	67	62	2	TERTIARY FLORIDAN	UNUSED	USGS	
387	290118082364102	290118	823641	21	18	2	TERTIARY FLORIDAN	UNUSED	USGS	
388	290128082392801	290128	823928	60	28	2	TERTIARY FLORIDAN	DOMESTIC	CARL M PARCELL	
389	290138082371901	290138	823719	64	47	2	TERTIARY FLORIDAN	UNUSED	USGS	
390	290138082371902	290138	823719	22	19	2	TERTIARY FLORIDAN	UNUSED	USGS	
391	290138082432001	290138	824320	30	.	2	TERTIARY FLORIDAN	UNUSED	CHAS VORISEK	J
392	290151082401201	290151	824012	26	.	2	TERTIARY FLORIDAN	UNUSED	DARRON	
393	290153082401601	290153	824016	57	.	2	TERTIARY FLORIDAN	UNUSED	ALBERT JAMES	
394	290155082415101	290155	824151	515	.	6	TERTIARY FLORIDAN	IPRIGATION	EUGENE KNOTTS	TOM
395	290156082415101	290156	824151	19	.	2	TERTIARY FLORIDAN	STOCK	KNOTTS	
396	290200082425901	290200	824259	47	.	4	TERTIARY FLORIDAN	UNUSED	SCHNEIDER	
397	290200082431501	290200	824315	250	.	.	TERTIARY FLORIDAN	UNUSED	POMP 124 D WELL AT YANKEE	
398	290200082432301	290200	824323	250	.	.	TERTIARY FLORIDAN	UNUSED	AT YANKEETOWN, FL	
399	290201082421101	290201	824211	70	.	6	TERTIARY FLORIDAN	PUBLIC	YANKEETOWN	
400	290202082403901	290202	824039	155	.	4	TERTIARY FLORIDAN	IRRIGATION	FLA POWER CORP	
401	290203082421301	290203	824213	59	49	6	TERTIARY FLORIDAN	PUBLIC	YANKEETOWN	
402	290205082421201	290205	824212	52	.	4	TERTIARY FLORIDAN	PUBLIC	YANKEETOWN	
403	290215082412301	290215	824123	58	.	2	TERTIARY FLORIDAN	UNUSED	LEVY COUNTY	
404	290230082412501	290230	824125	280	.	.	EOCENE AVON PARK LIMESTONE	UNUSED	POMP 125 DP AT	YANKEETOWN
405	290301082335601	290301	823356	271	.	3	TERTIARY FLORIDAN	UNUSED	WRIGHT	DEL
406	290305082333701	290305	823337	16	.	1	TERTIARY FLORIDAN	UNUSED	HUNT CAMP	
407	290344082405601	290344	824056	10	.	2	TERTIARY FLORIDAN	UNUSED	USGS	
408	290402082384901	290402	823849	37	25	2	TERTIARY FLORIDAN	DOMESTIC	T & J RANCH	
409	290503082323101	290503	823231	115	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
410	290551082380901	290551	823809	32	14	2	TERTIARY FLORIDAN	UNUSED	GEOTHE ROAD	
411	290605082372601	290605	823726	.	.	2	TERTIARY FLORIDAN	STOCK	J T GOETHE	
412	290621082332901	290621	823329	30	.	3	TERTIARY FLORIDAN	PUBLIC	LEVY COUNTY	
413	290824083022101	290824	830221	29	.	1	TERTIARY FLORIDAN	INDUSTRY	DIXIE LIME	
414	291004082382901	291004	823829	110	.	4	TERTIARY FLORIDAN	PUBLIC	CEDAR KEY	
415	291048083011801	291048	830118	106	.	8	TERTIARY FLORIDAN	UNUSED	DR ANDREWS	
416	291055083011901	291055	830119	106	.	8	TERTIARY FLORIDAN	PUBLIC	TOWN CEDAR KEYS	
417	291118083010601	291118	830106	98	.	12	TERTIARY FLORIDAN	PUBLIC	CEDAR KEYS	
418	291208082592601	291208	825926	91	.	4	TERTIARY FLORIDAN	DOMESTIC	CARVER	NORMA
419	291250082341901	291250	823419	.	.	4	TERTIARY FLORIDAN	OTHER	SUN OIL COMPANY	
420	291310082464501	291310	824645	10038	.	8	TERTIARY FLORIDAN	DOMESTIC	MERRILL	S
421	291436082291001	291436	822910	100	.	2	TERTIARY FLORIDAN	UNUSED	MERRILL	S
422	291437082291001	291437	822910	109	.	2	TERTIARY FLORIDAN	PUBLIC	GULF HAMMOCK	
423	291508082432901	291508	824329	300	.	4	TERTIARY FLORIDAN	STOCK	PRETTYMAN	DONALD
424	29151608241601	291516	824116	120	84	4	TERTIARY FLORIDAN	DOMESTIC	BLITCH	JAMES
425	291620082255101	291620	822551	.	.	4	TERTIARY FLORIDAN	DOMESTIC	PARKS	
426	291649082392300	291649	823923	.	.	3	TERTIARY FLORIDAN	DOMESTIC	MASONIC	
427	291654082263101	291654	822631	296	.	3	TERTIARY FLORIDAN	IPRIGATION	ROBINSON	
428	291712082351801	291712	823518	154	.	4	TERTIARY FLORIDAN	UNUSED	GULLFITE	JOHN
429	291719082352001	291719	823520	68	.	2	TERTIARY FLORIDAN	UNUSED	USGS	
430	291723082344501	291723	823445	100	.	6	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
431	291806082545601	291806	825456	72	.	6	TERTIARY FLORIDAN	UNUSED	USGS	
432	291807082545001	291807	825450	73	.	6	TERTIARY FLORIDAN	UNUSED	USGS	
433	291910082341101	291910	823411	91	68	4	TERTIARY FLORIDAN	DOMESTIC	OWENS ILLINOIS	
434	291917082455701	291917	824557	95	.	.	TERTIARY FLORIDAN			

Table 13.--Record of wells--Continued

Obs. No.	Station Number	Lat-Itude	Long-Itude	Well Depth (FT)	Casing Depth (FT)	Dia-Meter (IN)	Aquifer	Water Use	Name of Owner Last Name First Name
						LEVY COUNTY			
435	291926082330701	291926	823307	45	45	2	TERTIARY FLORIDAN	DOMESTIC	HUBER G
436	291959082353201	291959	823532	.	.	4	TERTIARY FLORIDAN	DOMESTIC	
437	292009082305901	292009	823059	95	80	4	TERTIARY FLORIDAN	DOMESTIC	ORAWITZ
438	292032082335301	292032	823353	222	207	12	TERTIARY FLORIDAN	IRRIGATION	PENDRAY
439	292109082427901	292109	824229	679	.	18	TERTIARY FLORIDAN	UNUSED	THOMPSON ESTATE
440	292143082282201	292143	822822	135	.	6	TERTIARY FLORIDAN	PUBLIC	WILLISTON AIRPORT
441	292307082265101	292307	822651	300	122	12	TERTIARY FLORIDAN	PUBLIC	WILLISTON
442	292307082313901	292307	823139	207	113	12	TERTIARY FLORIDAN	UNUSED	FUGATE WOODROE
443	292310082373701	292310	823737	94	80	6	TERTIARY FLORIDAN	STOCK	SMITH ERCELL
444	292315082261601	292315	822616	104	38	8	TERTIARY FLORIDAN	UNUSED	S C L RR
445	292430082283001	292430	822834	20	.	.	TERTIARY FLORIDAN	UNUSED	BANTON
446	292500082555001	292500	825550	40	.	24	TERTIARY FLORIDAN	IRRIGATION	ALBERT J MIMS
447	292638082380801	292638	823808	267	.	2	TERTIARY FLORIDAN	PUBLIC	C. M. GRIFFIN
448	292644082381201	292644	823812	270	.	.	TERTIARY FLORIDAN	PUBLIC	H E HARDRE
449	292702082415700	292702	824157	.	.	4	TERTIARY FLORIDAN	RECREATION	
450	292711082312301	292711	823123	18	.	.	TERTIARY FLORIDAN	UNUSED	MATHEWS
451	292844082514201	292844	825142	45	.	3	TERTIARY FLORIDAN	INDUSTRY	DRUMMOND LUMBER
452	292844082513301	292844	825133	85	.	6	TERTIARY FLORIDAN	PUBLIC	CITY CHIEFLAND
453	292920082513701	292920	825137	85	.	2	TERTIARY FLORIDAN	PUBLIC	MELROY MOTEL
454	292922082583700	292922	825837	.	.	.	TERTIARY FLORIDAN	RECREATION	FLORIDA STATE OF
455	293125082443501	293125	824435	40	.	.	TERTIARY FLORIDAN	DOMESTIC	H L GLEASON
456	293127082443701	293127	824437	31	.	4	TERTIARY FLORIDAN	UNUSED	DODGE
457	293511082560700	293511	825607	.	.	.	TERTIARY FLORIDAN	RECREATION	
458	293515082560800	293515	825608	.	.	.	TERTIARY FLORIDAN	RECREATION	

Table 13.--Record of wells--Continued

ORS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA-METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
459	285739081470901	285739	814709	114	.	.	TERTIARY FLORIDAN	STOCK	DRAKE	T
460	285740082190800	285740	821908	.	.	.	TERTIARY FLORIDAN	IRRIGATION	C M THOMAS	
461	285741081421201	285741	814212	245	.	4	TERTIARY FLORIDAN	IRRIGATION	LEONARD GWYNN	
462	285750082033001	285750	820330	157	.	6	TERTIARY FLORIDAN	IRRIGATION	GORDON HUNT AT	DALLAS FLA
463	285755082021901	285755	820219	95	.	.	TERTIARY FLORIDAN	UNUSED	LAZY K RANCH	
464	285760082072001	285760	820720	66	.	6	TERTIARY FLORIDAN	UNUSED	SCE 141 LAZY K RANCH	
465	285760082080401	285760	820904	111	.	.	TERTIARY FLORIDAN	UNUSED	LAZY K RANCH	
466	285760082090401	285760	820904	111	.	.	TERTIARY FLORIDAN	DOMESTIC	NELSON E	
467	2857620821490501	285762	815005	152	.	6	TERTIARY FLORIDAN	DOMESTIC	STOKES FERRY FI SH CAMP	
468	285762082205801	285762	822058	.	.	.	TERTIARY FLORIDAN	DOMESTIC	W SWEETZ	
469	285763082022001	285763	820220	134	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
470	2857633082192501	285763	821925	45	.	2	TERTIARY FLORIDAN	IRRIGATION	KEY SCALES JR	
471	2857640081522001	285764	815220	500	.	6	TERTIARY FLORIDAN	DOMESTIC	K JOHNSTON	
472	2857647082144201	285764	821442	43	.	.	TERTIARY FLORIDAN	DOMESTIC	MARION OAKS NO 1	
473	285765082103801	285765	821038	110	.	.	TERTIARY FLORIDAN	UNUSED	MARION OAKS NO 3	
474	285765082103901	285765	821039	170	.	.	TERTIARY FLORIDAN	UNUSED	FLORIDA HIGHLAN DS	
475	285765082191501	285765	821915	27.29	.	.	TERTIARY FLORIDAN	UNUSED	FLORIDA HIGHLAN DS	
476	285765082191502	285765	821915	51	.	.	TERTIARY FLORIDAN	UNUSED	FLORIDA HIGHLAN DS	
477	285765082195001	285765	821950	51	.	.	TERTIARY FLORIDAN	IRRIGATION	L R PFACOCK FLA HIGHLANDS	
478	285765082202101	285765	822021	36	.	.	TERTIARY FLORIDAN	IRRIGATION	LLOYD MONROE	
479	285765082191401	285765	821914	90	.	.	TERTIARY FLORIDAN	UNUSED	M L STANSEL NR ROSS PRAIR	
480	2857650822064401	285765	820644	172	.	8	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
481	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	M L STANSEL NR ROSS PRAIR	
482	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
483	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
484	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
485	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
486	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
487	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
488	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
489	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
490	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
491	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
492	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
493	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
494	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
495	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
496	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
497	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
498	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
499	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
500	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
501	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
502	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
503	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
504	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
505	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
506	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
507	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
508	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
509	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
510	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
511	2857650822064401	285765	820644	46	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LATITUDE	LONGITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA. METER (IN)	AQUIFER	WATER USE	NAME OF OWNER LAST NAME FIRST NAME
							MARION COUNTY		
512	290312082202301	290312	822023	74	.	4	TERTIARY FLORIDAN	UNUSED	PAUL OTTING
513	290312082250801	290312	822508	190	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
514	290312082250802	290312	822508	20	.	2	TERTIARY NONARTESIAN SAND	UNUSED	U S GEOL SURVEY
515	290314082232501	290314	822325	.	.	2	TERTIARY FLORIDAN	UNUSED	DUNNELLON FIRE TOWNR
516	290322508228701	290325	822837	115	.	.	TERTIARY FLORIDAN	UNUSED	AK:54 WELL NEAR VOGT SPR
517	290333082292401	290333	822924	200	.	.	TERTIARY FLORIDAN	UNUSED	A C WIGHT
518	290339082032001	290339	820320	300	.	.	TERTIARY FLORIDAN	PUBLIC	CITY HELLEVIEW
519	290340082032001	290340	820322	300	.	.	TERTIARY FLORIDAN	PUBLIC	CITY HELLEVIEW
520	290340082113101	290340	821310	77	.	.	TERTIARY FLORIDAN	UNUSED	R F CRANE
521	290340082151001	290340	821510	68	.	.	TERTIARY FLORIDAN	UNUSED	R F CRANE
522	290350082281201	290359	822812	100	.	4	TERTIARY FLORIDAN	UNUSED	CITY DUNNELLON
523	290400082091001	290400	820910	80	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
524	290404082264201	290404	822642	118	.	4	TERTIARY FLORIDAN	UNUSED	TENN VALLEY AUT
525	290405082270701	290405	822707	175	.	2	TERTIARY FLORIDAN	PUBLIC	U S GEOL SURVEY
526	290406082270501	290406	822705	175	.	4	TERTIARY FLORIDAN	INDUSTRY	J T GOETHE CO
527	290409082270601	290409	822706	175	.	4	TERTIARY FLORIDAN	INDUSTRY	J T GOETHE CO
528	2904200821482001	290420	814820	97	.	.	TERTIARY FLORIDAN	COMMERCIAL	U S FOREST SERV
529	290421082190802	290421	821908	69	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
530	290421082190802	290421	821908	64	.	1	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
531	290444082043101	290444	820431	50	.	.	TERTIARY FLORIDAN	UNUSED	JIM DEAN
532	290447082250901	290447	822509	93	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
533	2904550821530401	290455	815304	225	.	.	TERTIARY FLORIDAN	UNUSED	USGS OB WELL AT
534	290510082061001	290510	820610	28	.	3	TERTIARY FLORIDAN	UNUSED	CORPS OF ENGRS
535	290514082270701	290514	822707	442	.	6	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
536	2905300821543001	290530	815430	110	.	4	TERTIARY FLORIDAN	UNUSED	NORRIS CATTLE CO
537	2905500821393001	290550	813930	175	.	4	TERTIARY FLORIDAN	PUBLIC	U S FOREST SERV
538	290552082044701	290552	820447	40	.	.	TERTIARY FLORIDAN	IRRIGATION	MORRIS RURRELL
539	290608082261600	290608	822616	.	.	.	TERTIARY FLORIDAN	RECREATION	RAINBOW SPRINGS
540	290614082274801	290614	822748	180	.	6	TERTIARY FLORIDAN	IRRIGATION	JUNIF COUNTS
541	290620082080001	290620	820800	30	.	.	TERTIARY FLORIDAN	DOMESTIC	U S GEOL SURVEY
542	290623082180701	290623	821807	60	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
543	290623082180702	290623	821807	23	.	2	TERTIARY NONARTESIAN SAND	UNUSED	GEORGE PERRY
544	290643082045001	290643	820450	78	.	3	TERTIARY FLORIDAN	UNUSED	VERNON D LOWDER
545	290650082053001	290650	820530	110	.	6	TERTIARY FLORIDAN	IRRIGATION	VERNON D LOWDER
546	290650082053002	290650	820530	62	.	4	TERTIARY FLORIDAN	DOMESTIC	U S GEOL SURVEY
547	290700082015001	290700	820150	157	.	2	TERTIARY FLORIDAN	UNUSED	W E KENNER
548	2907300821544001	290730	815440	30	.	2	TERTIARY NONARTESIAN SAND	DOMESTIC	U S GEOL SURVEY
549	290739082245701	290739	822457	46	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
550	290739082245702	290739	822457	18	.	1	TERTIARY NONARTESIAN SAND	UNUSED	U S GEOL SURVEY
551	290745082153501	290745	821535	82	.	2	TERTIARY FLORIDAN	UNUSED	NORRIS CATTLE
552	290745082153501	290745	821535	78	.	.	TERTIARY FLORIDAN	DOMESTIC	MR SANDERS
553	290749082304701	290749	823047	250	.	3	TERTIARY FLORIDAN	UNUSED	NORRIS CATTLE CO
554	2907500821570001	290750	815700	120	.	4	TERTIARY FLORIDAN	UNUSED	MARION COUNTY
555	290750082035001	290750	820350	37	.	.	TERTIARY FLORIDAN	DOMESTIC	MR KISHLER
556	290751082311701	290751	823117	303	.	3	TERTIARY FLORIDAN	UNUSED	RAINBOW ACRES
557	290752082271101	290752	822711	78	.	.	TERTIARY FLORIDAN	UNUSED	MR CLARK
558	290752082312801	290752	823128	336	.	3	TERTIARY FLORIDAN	DOMESTIC	MR THEIR
559	290758082294301	290758	822943	170	.	3	TERTIARY FLORIDAN	DOMESTIC	BONNIE HEATH FR
560	290800082115001	290800	821150	133	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY
561	290810082025001	290810	820250	110	.	3	TERTIARY FLORIDAN	UNUSED	ELLIS SAVAGE
562	290810082063001	290810	820630	75	.	6	TERTIARY FLORIDAN	DOMESTIC	REID MANOR MOTL
563	290810082063002	290810	820630	75	.	.	TERTIARY FLORIDAN	COMMERCIAL	MR SIMMS
564	290810082275401	290810	822754	150	.	.	TERTIARY FLORIDAN	DOMESTIC	TILTON BOUTWELL
565	290820082031301	290820	820313	87	.	2	TERTIARY FLORIDAN	DOMESTIC	

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LA. ITUDE	LONG- ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
566	290820082032001	290820	820320	72	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
567	290820082031010	290822	823101	749	.	12	TERTIARY FLORIDAN	RECREATION	RAINBOW LAKES	
568	290825082264801	290825	822648	130	.	.	TERTIARY FLORIDAN	DOMESTIC	MR FOLKERTSON	
569	290830081584001	290830	815840	219	.	.	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
570	290830081584002	290830	815840	41	.	2	TERTIARY NONARTESIAN SAND	UNUSED	U S GEOL SURVEY	
571	290837082030701	290837	820307	240	.	.	TERTIARY FLORIDAN	UNUSED		
572	290838082030601	290838	820306	62	.	.	TERTIARY FLORIDAN	UNUSED		
573	290838082030602	290838	820306	82	.	.	TERTIARY FLORIDAN	DOMESTIC	CORPS OF ENGRS	
574	290840082265901	290840	822659	141	.	.	TERTIARY FLORIDAN	PUBLIC	MR KAISER	
575	290841082285001	290841	822850	541	.	6	TERTIARY FLORIDAN	UNUSED	RAINBOW LAKES	
576	290843082053801	290843	820538	172	.	4	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
577	290850082065101	290850	820651	325	.	8	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
578	290850082080001	290850	820800	170	.	6	TERTIARY FLORIDAN	DOMESTIC	E B DUNCAN	
579	290850082094001	290850	820940	.	.	.	TERTIARY FLORIDAN	STOCK	REVERIE KNOLL F	
580	290850082100001	290850	821000	86	.	.	TERTIARY FLORIDAN	UNUSED	REVERIE KNOLL F	
581	290850082180501	290850	821805	100	.	4	TERTIARY FLORIDAN	DOMESTIC	J H BROWN	
582	290900082070001	290900	820700	145	.	.	TERTIARY FLORIDAN	DOMESTIC	REYER WISF	
583	290900082175701	290900	821757	125	.	8	TERTIARY FLORIDAN	IPRIGATION	LEO E LEWIS	
584	290910082045001	290910	820450	45	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
585	290910082315001	290910	823150	205	.	.	TERTIARY FLORIDAN	RECREATION	SCE 138 LITTLE LAKE BONAH	
586	290913082245601	290913	822456	.	.	6	TERTIARY FLORIDAN	UNUSED	LAKE TROPICANA	
587	290915082023301	290915	820233	258	46	13	TERTIARY FLORIDAN	UNUSED	CORP ENG.	
588	290916082023201	290916	820232	41	36	24	TERTIARY FLORIDAN	UNUSED	C OF ENG	
589	290916082023202	290916	820232	49	.	.	TERTIARY FLORIDAN	UNUSED	CAPT 2	
590	290930082055001	290930	820550	35	.	.	TERTIARY FLORIDAN	UNUSED	JOHN CLARDY	
591	290951082211201	290951	822112	84	.	4	TERTIARY FLORIDAN	UNUSED	RAINBOW PARK ES	
592	290953082031301	290953	820313	86	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
593	290956082073901	290956	820739	27	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
594	291000081383001	291000	813830	166	.	6	TERTIARY FLORIDAN	UNUSED	STATE ROAD DEPT	
595	291015081385001	291015	813850	175	.	6	TERTIARY FLORIDAN	UNUSED	STATE ROAD DEPT	
596	291021082073901	291021	820739	.	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
597	291022082071001	291022	820710	149	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
598	291024082074601	291024	820746	.	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
599	291025082064301	291025	820643	.	.	.	TERTIARY FLORIDAN	DC STIC	K A MACKICHEN	
600	291030081453001	291030	814530	370	.	6	TERTIARY FLORIDAN	UNUSED	CORPS OF ENGRS	
601	291030081520001	291030	815200	130	.	.	TERTIARY FLORIDAN	UNUSED	U S FOREST SER	
602	291030082003001	291030	820300	183	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
603	291030082035001	291030	820350	210	.	4	TERTIARY FLORIDAN	DOMESTIC	M BRINSON	
604	291034082073701	291034	820737	.	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
605	291040082075601	291040	820756	.	.	8	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
606	291040082083801	291040	820838	.	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
607	291040082142001	291040	821420	100	.	4	TERTIARY FLORIDAN	DOMESTIC	MARION COUNTY	
608	291040082081101	291040	820811	385	.	20	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
609	291050082142301	291050	821423	100	.	.	TERTIARY FLORIDAN	UNUSED	ARTHUR CONTR OL	
610	291052082045001	291052	820450	128	.	3	TERTIARY FLORIDAN	DOMESTIC	R H MUSGROVE	
611	291053082071901	291053	820719	129	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
612	291055082052501	291055	820525	.	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
613	291056082074701	291056	820747	135	.	.	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
614	291056082080501	291056	820805	381	.	10	TERTIARY FLORIDAN	DOMESTIC	ROGER PARKER	
615	291057082033401	291057	820334	115	.	.	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
616	291057082080401	291057	820804	350	.	12	TERTIARY FLORIDAN	DOMESTIC	CITY OF OCALA	
617	291059082065201	291059	820652	440	.	14	TERTIARY FLORIDAN	UNUSED	FOREST HS	
618	291100081422900	291100	814229	.	.	.	TERTIARY FLORIDAN	RECREATION	U S GOVAT	
619	291100081502001	291100	815020	288	.	6	TERTIARY FLORIDAN	PUBLIC	U S FOREST SERV	

Table 13.---Record of wells--Continued

OBS. NO.	STATION NUMBER	DATE 1900	COM- PLET	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
MARION COUNTY										
674	291154002001101	291154	820811	78	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
675	291155002005001	291155	820524	68	.	2	TERTIARY FLORIDAN	DOMESTIC	B F JOYNER	
676	291156002008001	291156	820804	181	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
677	291158002007501	291158	820735	76	.	8	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
678	291200002007001	291200	820720	105	.	.	TERTIARY FLORIDAN	UNUSED	CITY OF OCALA	
679	291201002007501	291201	820755	935	.	26	TERTIARY FLORIDAN	INDUSTRY	LIBBY MCNEIL	
680	291207002007601	291207	822616	52	.	24	TERTIARY FLORIDAN	IRRIGATION	E J HARRINGTON	
681	291215002005101	291215	820514	265	.	24	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
682	2912150020052701	291215	820527	187	.	24	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
683	291220002008001	291220	820800	62	.	.	TERTIARY FLORIDAN	COMMERCIAL	J A LEAPROT	
684	291221002005101	291221	820514	240	.	24	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
685	2912270020052101	291227	820521	230	.	24	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
686	2912270020052701	291227	820527	198	.	24	TERTIARY FLORIDAN	PUBLIC	CITY OF OCALA	
687	291230001594001	291230	815940	.	.	3	TERTIARY FLORIDAN	UNUSED	CORPS OF ENGRS	
688	2912330020082201	291233	820822	90	.	2	TERTIARY FLORIDAN	DOMESTIC	V W FABELLA	
689	2912400020034001	291240	820340	104	.	.	TERTIARY FLORIDAN	UNUSED	CORPS OF ENGRS	
690	2912500015082001	291250	815820	65	.	4	TERTIARY FLORIDAN	UNUSED	NUBY SHEALY	
691	2912570020031100	291257	820311	.	.	.	TERTIARY FLORIDAN	RECREATION		
692	291307001393600	291307	813936	.	.	.	TERTIARY FLORIDAN	UNUSED	WILBUR GRIGGS	
693	291310001521001	291310	815210	78	.	.	TERTIARY FLORIDAN	UNUSED	CORPS OF ENGRS	
694	2913100020022001	291310	820220	100	.	.	TERTIARY FLORIDAN	UNUSED	CORPS OF ENGRS	
695	2913100020045001	291310	820450	81	.	4	TERTIARY FLORIDAN	UNUSED	IMP FLA OIL CO	
696	291320002009001	291320	820900	40	.	4	TERTIARY FLORIDAN	UNUSED	OCALA ICE & MFG	
697	291330002004001	291330	820400	150	.	.	TERTIARY FLORIDAN	DOMESTIC	CASTRO FARMS	
698	291340002145001	291340	821450	175	.	6	TERTIARY FLORIDAN	STOCK	P W REED	
699	291354002160801	291354	821608	171	.	.	TERTIARY FLORIDAN	DOMESTIC	IDA LUFFMAN	
700	291400002007001	291400	820700	70	.	3	TERTIARY FLORIDAN	STOCK	C L DRESSER	
701	29140000200501	291400	820505	76	.	.	TERTIARY FLORIDAN	STOCK	SARA JONES	
702	2914410020070501	291441	820705	44	.	2	TERTIARY FLORIDAN	DOMESTIC	DUPONT CO	TRUSTEES
703	291443001383700	291443	813837	.	.	.	TERTIARY FLORIDAN	DOMESTIC	MARVIN SPINKS	
704	2914500020071201	291445	820712	75	.	2	TERTIARY FLORIDAN	UNUSED	U S FOREST SERV	
705	291450001520001	291450	815200	179	.	6	TERTIARY FLORIDAN	UNUSED	VERNON PRIEST	
706	2915100020082001	291510	820820	69	.	4	TERTIARY FLORIDAN	DOMESTIC	OLIVE S SMITH	
707	2915200020052001	291520	820520	80	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
708	291600001550001	291600	815500	165	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
709	291600001550002	291600	815500	43	.	4	TERTIARY FLORIDAN	UNUSED	FLA FOREST SERV	
710	291610002194001	291610	821950	124	.	4	TERTIARY FLORIDAN	PUBLIC	JOHN J HILL	
711	291620001415001	291620	814150	215	.	6	TERTIARY FLORIDAN	DOMESTIC	U S FOREST SERV	
712	29165000222001	291650	822230	120	.	4	TERTIARY FLORIDAN	UNUSED	U S FOREST SERV	
713	291700001522001	291700	815220	156	.	.	TERTIARY FLORIDAN	UNUSED	U S FOREST SERV	
714	291728001390501	291728	813905	.	.	.	TERTIARY FLORIDAN	UNUSED	E R SCHARPS	
715	291728001390502	291728	813905	.	.	4	TERTIARY FLORIDAN	STOCK	C E ROX	
716	291729002008001	291729	820800	80	.	4	TERTIARY FLORIDAN	DOMESTIC	M G RYERS	
717	291730001390001	291730	813900	110	.	1	TERTIARY FLORIDAN	UNUSED	M K PRIEST	
718	291730002001001	291730	820010	23	.	.	TERTIARY FLORIDAN	DOMESTIC	N J TOWNSEND	
719	2917300020051001	291730	820510	95	.	.	TERTIARY FLORIDAN	DOMESTIC	H J CARR	
720	291730002115301	291730	821153	89	.	4	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
721	291736002115301	291736	821153	280	.	6	TERTIARY FLORIDAN	RECREATION	MOODY	
722	291740001562001	291740	815620	25	.	2	TERTIARY FLORIDAN	UNUSED	U S A CORPS ENG	
723	291740001562002	291740	815620	140	.	6	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
724	291743001392201	291743	813922	184	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
725	291750001494001	291750	814940	200	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
726	291810001570001	291810	815700	18	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
727	291810001570002	291810	815700	18	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
						MARION COUNTY				
728	291816082042701	291816	820427	180	.	6	TERTIARY FLORIDAN	IRRIGATION	J V SIMS	
729	291835082045901	291835	820459	41	.	3	TERTIARY FLORIDAN	STOCK	HUGH C TEUTON	
730	291900081570001	291900	815700	350	.	10	TERTIARY FLORIDAN	IRRIGATION	HUGH C TEUTON	
731	291916082161001	291916	821610	218	.	8	TERTIARY FLORIDAN	IRRIGATION	MCLAUGHLIN	BEN
732	291920081580001	291920	815800	145	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
733	291939082080101	291939	820801	93	.	4	TERTIARY FLORIDAN	IRRIGATION	NORRIS CATTLE	
734	292000081452001	292000	814520	257	.	6	TERTIARY FLORIDAN	DOMESTIC	BAPTIST CHURCH	
735	292015082065001	292015	820650	62	.	3	TERTIARY FLORIDAN	UNUSED	E M GRIGGS	
736	29201708223201	292017	822322	32	.	.	TERTIARY FLORIDAN	STOCK	DIXIE-LILLY RCH	
737	292100081435001	292100	814350	72	.	6	TERTIARY FLORIDAN	COMMERCIAL	SALT SPRGS CORP	
738	292100081435800	292100	814358	.	.	.	TERTIARY FLORIDAN	RECREATION		
739	292107082140101	292107	821401	.	.	.	TERTIARY FLORIDAN	STOCK	RO BETT FARMS	
740	292110081510001	292110	815100	300	.	6	TERTIARY FLORIDAN	DOMESTIC	U S DEPT AGR	
741	292119082135601	292119	821356	.	.	.	TERTIARY FLORIDAN	STOCK	RO BETT FARMS	
742	292127082134601	292127	821346	.	.	.	TERTIARY FLORIDAN	STOCK	RO BETT FARMS	
743	292130082003001	292130	820030	117	.	.	TERTIARY FLORIDAN	STOCK	MUDSON PAPER CO	
744	292134082144001	292134	821440	170	.	3	TERTIARY FLORIDAN	DOMESTIC	ROOSEVELT BLUNT	
745	292135082145301	292135	821453	.	.	.	TERTIARY FLORIDAN	DOMESTIC	FMMA LOU CARTER	
746	292138082141501	292138	821415	120	.	.	TERTIARY FLORIDAN	STOCK	RO BETT FARMS	
747	292139082152501	292139	821525	182	.	.	TERTIARY FLORIDAN	DOMESTIC	RUBY REYN. DS	
748	292140082150501	292140	821505	182	.	.	TERTIARY FLORIDAN	DOMESTIC	DWIGHT JAMES	
749	292140082153401	292140	821534	154	.	2	TERTIARY FLORIDAN	DOMESTIC	J W REYNOLDS	
750	292140082160301	292140	821603	275	.	.	TERTIARY FLORIDAN	DOMESTIC	G THOMPSON	
751	292140082160501	292140	821605	250	.	.	TERTIARY FLORIDAN	DOMESTIC	G THOMPSON	
752	292143082145001	292143	821450	195	.	4	TERTIARY FLORIDAN	DOMESTIC	POSALIERORINSON	
753	292149082144601	292149	821446	165	.	4	TERTIARY FLORIDAN	DOMESTIC	WILLIE SAVAGE	
754	292150081484001	292150	814840	22	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
755	292150081491001	292150	814910	500	.	3	TERTIARY FLORIDAN	DOMESTIC	U S FOREST SERV	
756	292151082140901	292151	821409	.	.	.	TERTIARY FLORIDAN	STOCK	RO BETT FARMS	
757	292151082145401	292151	821454	148	.	4	TERTIARY FLORIDAN	DOMESTIC	R L MCLAUCHLIN	
758	292151082163201	292151	821632	161	.	4	TERTIARY FLORIDAN	DOMESTIC	STARLITE FARMS	
759	292152082152601	292152	821526	185	.	2	TERTIARY FLORIDAN	DOMESTIC	ROY RIGGSRY	
760	292153082152601	292153	821526	.	.	2	TERTIARY FLORIDAN	DOMESTIC	BRUCE REED	
761	292155082150401	292155	821504	193	.	2	TERTIARY FLORIDAN	DOMESTIC	M M MACK	
762	292156082155201	292156	821552	21	.	.	TERTIARY FLORIDAN	DOMESTIC	M R BAILEY	
763	292156082155301	292156	821553	.	.	6	TERTIARY FLORIDAN	UNUSED	RO BETT FARMS	
764	292157082143001	292157	821430	200	.	.	TERTIARY FLORIDAN	IRRIGATION	TRE ORIPE	
765	292159082034501	292159	820345	107	.	4	TERTIARY FLORIDAN	DOMESTIC	A J MCLAUCHLIN	
766	292159082150801	292159	821508	165	.	2	TERTIARY FLORIDAN	UNUSED	U S GEOL SURV	
767	292200081510001	292200	815100	90	.	6	TERTIARY FLORIDAN	DOMESTIC	J R LONGMIRE	
768	292200081574001	292200	815740	108	.	2	TERTIARY FLORIDAN	DOMESTIC	J E THIGPIN	
769	292205082151401	292205	821514	103	.	2	TERTIARY FLORIDAN	DOMESTIC		
770	292207082150701	292207	821507	.	.	.	TERTIARY FLORIDAN	STOCK	U S GEOL SURVEY	
771	2922100821524001	292210	815240	69	.	2	TERTIARY FLORIDAN	UNUSED	CHAS DESTELLE	
772	292215082141001	292215	821410	.	.	6	TERTIARY FLORIDAN	DOMESTIC		
773	292218082142301	292218	821423	.	.	.	TERTIARY FLORIDAN	DOMESTIC	T E REYNOLDS	
774	292220082141001	292220	821410	215	.	.	TERTIARY FLORIDAN	PUBLIC	FAIRFIELD P S	
775	292220082151201	292220	821512	417	.	.	TERTIARY FLORIDAN	DOMESTIC	CARL LEVERETT	
776	292222082142201	292222	821422	175	.	.	TERTIARY FLORIDAN	DOMESTIC	F W REYNOLDS	
777	292222082142401	292222	821424	200	.	4	TERTIARY FLORIDAN	DOMESTIC	A E DODSON	
778	292222082144501	292222	821445	190	.	.	TERTIARY FLORIDAN	DOMESTIC	FLOOMER TYRE	
779	292224082140301	292224	821403	184	.	.	TERTIARY FLORIDAN	DOMESTIC	A G YONGUE	
780	292224082141201	292224	821412	180	.	4	TERTIARY FLORIDAN	DOMESTIC		
781	292224082142601	292224	821426	190	.	.	TERTIARY FLORIDAN	DOMESTIC	E L OFAN	

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LATITUDE	LONGITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA-METER (IN)	AQUIFER	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
							MARION COUNTY			
782	292224082154001	292224	821540	.	.	2		STOCK	L K EDWARDS	
783	292225082151901	292225	821519	90	.	.		DOMESTIC	ARMOND LEVERETT	
784	292227082145601	292227	821456	.	.	.		DOMESTIC	K BUFORD	
785	292230082115001	292230	821150	36	.	.	TERTIARY FLORIDAN	UNUSED	J W WILSON	
786	292230082115002	292230	821150	47	.	36	TERTIARY FLORIDAN	UNUSED	H G YOUNG	
787	292238082154201	292238	821542	225	.	6		DOMESTIC	FRANK MACKLE	
788	292240081541001	292240	815410	224	.	2	TERTIARY FLORIDAN	DOMESTIC	J W REED	
789	292246082155401	292246	821554	250	.	6		STOCK	FRANK MACKLE	
790	292256082164001	292256	821640	.	.	4		DOMESTIC	L K EDWARDS	
791	292349082191501	292349	821915	73	.	.	TERTIARY FLORIDAN	DOMESTIC	E H UPDIKE	
792	292430082145001	292430	821450	98	.	4		COMMERCIAL	STD OIL OF KY	
793	292450081581001	292450	815810	112	.	3	TERTIARY FLORIDAN	STOCK	O C BRYAN	
794	292500082063801	292500	820638	94	.	4	TERTIARY FLORIDAN	COMMERCIAL	RAYMOND BOYT	
795	292500082125001	292500	821250	100	.	4	TERTIARY FLORIDAN	COMMERCIAL	LARRY WILLIAMS	
796	292501082064001	292501	820640	26	.	3	TERTIARY FLORIDAN	DOMESTIC	HARRY SMITH	
797	292530081454001	292530	814540	80	.	6	TERTIARY FLORIDAN	DOMESTIC	KARL NEWBERN	
798	292546081513301	292546	815133	340	.	6	TERTIARY FLORIDAN	UNUSED	U S GEOL SURVEY	
799	292610081550001	292610	815500	254	.	.	TERTIARY FLORIDAN	DOMESTIC	U S FOREST SERV	
800	292640082022601	292640	820226	22	.	.	TERTIARY FLORIDAN	DOMESTIC	CHRIS LIMPP	
801	292650081545001	292650	815450	160	.	.	TERTIARY FLORIDAN	DOMESTIC	H M WARNOCK	
802	292650082133701	292650	821337	180	.	8	TERTIARY FLORIDAN	PUBLIC	CITY MCINTOSH	
803	292711082021701	292711	820217	11	.	.	TERTIARY FLORIDAN	DOMESTIC	DR MILLER	
804	292730081501001	292730	815010	.	.	.	TERTIARY FLORIDAN	DOMESTIC	R G NEVERS	
805	292730081550001	292730	815500	60	.	2	TERTIARY FLORIDAN	UNUSED	CLYDE L PARKER	
806	292730081550002	292730	815500	60	.	.	TERTIARY FLORIDAN	DOMESTIC	CLYDE L PARKER	
807	292854082241701	292854	822417	52	.	2	TERTIARY FLORIDAN	DOMESTIC	C N SMITH	
808	292900081543001	292900	815430	290	.	6	TERTIARY FLORIDAN	UNUSED	U S FOREST SERV	
809	292910081595001	292910	815950	96	.	2	TERTIARY FLORIDAN	DOMESTIC	ISLAND LAKE EST	
810	292930081551001	292930	815510	99	.	4	TERTIARY FLORIDAN	DOMESTIC	WM M VANCE	
811	293020081495001	293020	814950	149	.	6	TERTIARY FLORIDAN	PUBLIC	U S FOREST SERV	
812	293020081532001	293020	815320	125	.	6	TERTIARY FLORIDAN	UNUSED	U S FOREST SERV	
813	293038081563800	293038	815638	.	.	.	TERTIARY FLORIDAN	RECREATION		

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LAT- ITUDE	LONG- ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	WATER USE	NAME OF OWNER	
									LAST NAME	FIRST NAME
SUMTER COUNTY										
814	281216082010101	281216	820101	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
815	281849081575601	281849	815756	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
816	281927082005001	281927	820050	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
817	281929081575901	281929	815759	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
818	281929081595401	281929	815954	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
819	281933081584701	281933	815847	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
820	281951082012001	281951	820120	49	.	.	TERTIARY FLORIDAN	UNUSED	L 11 MD SWFMD	
821	281951082012002	281951	820120	18	.	.	TERTIARY FLORIDAN	UNUSED	L 11 MM SWFMD	
822	281951082012003	281951	820120	9	.	.	TERTIARY FLORIDAN	UNUSED	L 11 MS SWFMD	
823	282010081590501	282010	815905	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
824	282016081575201	282016	815752	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
825	282018081595201	282018	815952	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
826	282020082005101	282020	820051	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
827	282109082001201	282109	820012	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
828	282111081585401	282111	815854	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
829	282113081575701	282113	815757	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
830	282123082022301	282123	820223	148	.	4	TERTIARY FLORIDAN	UNUSED	CUMMER CYPRESS	
831	282127082022501	282127	820225	143	.	6	TERTIARY FLORIDAN	UNUSED	USGS	
832	282152082011201	282152	820112	35.5	.	.	TERTIARY FLORIDAN	UNUSED	L 11 KD SWFMD	
833	282152082011202	282152	820112	17	.	.	PLEISTOCENE NONARTESIAN SAND	UNUSED	L 11 KS SWFMD	
834	282154082002701	282154	820027	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
835	282201081575501	282201	815755	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
836	282204081585701	282204	815857	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
837	282208082010701	282208	820107	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
838	282258081585501	282258	815855	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
839	282259082004701	282259	820047	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
840	282303081575403	282303	815754	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
841	282307081593901	282307	815939	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
842	282350081575201	282350	815752	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
843	282351082100301	282351	821003	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
844	282353081585301	282353	815853	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
845	282357081595201	282357	815952	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
846	282430081595801	282430	815958	21	33	2	PLEISTOCENE-PLIOCENE SERIES	UNUSED	USGS	
847	282430081595802	282430	815958	102	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
848	282434082002401	282434	820024	.	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
849	282441081585001	282441	815850	.	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
850	282443081575101	282443	815751	.	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
851	282509082010801	282509	820108	40	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	USGS	
852	282522082010901	282522	820109	96.89	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	USGS	
853	282616081592101	282616	815921	24	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	USGS	
854	282631082003301	282631	820303	98.89	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	USGS	
855	282632082004801	282632	820048	.	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
856	282719081594101	282719	815941	.	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
857	282721082004401	282721	820044	.	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
858	282722081584701	282722	815847	.	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	SWFMD	
859	282740082012101	282740	820121	30	.	.	TERTIARY FLORIDAN	UNUSED	L 12 RD SWFMD	
860	282740082012102	282740	820121	10	.	.	PLEISTOCENE NONARTESIAN SAND	UNUSED	L 12 RS SWFMD	
861	282741081585701	282741	815857	175	.	3	TERTIARY FLORIDAN	UNUSED	USGS	
862	282816081585101	282816	815851	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
863	282816081594901	282816	815949	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
864	282816082004501	282816	820045	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	
865	282840081585301	282840	815835	40.09	.	.	PLEISTOCENE-PLIOCENE SERIES	UNUSED	USGS	
866	282905081584801	282905	815848	.	.	.	MIOCENE SERIES	UNUSED	SWFMD	

Table 13.--Record of wells--Continued

ORS. NO.	STATION NUMBER	LAT- ITUDE	LONG- ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA- METER (IN)	AQUIFER	SUMTER COUNTY	WATER USE	LAST NAME	NAME OF OWNER FIRST NAME
867	282906082005101	282906	820051	.	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
868	282908081594501	282908	815945	.	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
869	282957081505301	282957	815053	.	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
870	282957081594201	282957	815942	.	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
871	283007081575901	283007	815759	166	.	.	FLA FOREST SERV	.	UNUSED	FLA FOREST SERV	
872	283053081575201	283053	815752	.	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
873	283055081505001	283055	815050	.	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
874	283055081505001	283055	815050	30	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
875	2832520820643201	283252	820432	30	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
876	283318082041001	283318	820410	95	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
877	283324082050601	283324	820506	.	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
878	283324082050601	283324	820506	166	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
879	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
880	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
881	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
882	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
883	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
884	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
885	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
886	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
887	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
888	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
889	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
890	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
891	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
892	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
893	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
894	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
895	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
896	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
897	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
898	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
899	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
900	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
901	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
902	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
903	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
904	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
905	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
906	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
907	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
908	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
909	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
910	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
911	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
912	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
913	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
914	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
915	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
916	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
917	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
918	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
919	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	
920	283324082050601	283324	820506	210	.	.	MIOCENE SERIES	.	UNUSED	SWFMD	

Table 13.--Record of wells--Continued

Obs. No.	Station Number	Lat-Itude	Long-Itude	Well Depth (ft)	Casing Depth (ft)	Dia-Meter (in)	Aquifer	Water Use	Last Name	Name of Owner	First Name
							SUMTER COUNTY				
921	28A104082055801	28A104	820558	92	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 30		
922	28A113082080701	28A115	820807	23	.	2	TERTIARY FLORIDAN	UNUSED	JC 07 C H BEVIL LE		
923	28A115082062601	28A115	820626	75	.	3	TERTIARY FLORIDAN	UNUSED	JC 27A		
924	28A119082034501	28A119	820345	22	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 44 PARROT RA NCH		
925	28A120082061301	28A120	820613	32	.	4	TERTIARY FLORIDAN	IRRIGATION	WITHLACOOCHEE P ROJECT 31		
926	28A126082034501	28A126	820345	100	.	1	TERTIARY FLORIDAN	IRRIGATION	JC 45 PARROT RA NCH		
927	28A127082033901	28A127	820339	500	.	8	TERTIARY FLORIDAN	IRRIGATION	JC 46 PARROT RA NCH		
928	28A132082092801	28A132	820928	261	.	10	TERTIARY FLORIDAN	IRRIGATION	JC 05 C H BEVIL LE		
929	28A137082032801	28A137	820328	100	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 40 PARROT RA NCH		
930	28A139082045601	28A139	820456	75	.	4	TERTIARY FLORIDAN	IRRIGATION	C H BEVILLE		
931	28A139082082501	28A139	820825	40	.	2	TERTIARY FLORIDAN	IRRIGATION	JC 06 C H BEVIL LE		
932	28A143082032901	28A143	820329	41	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 39 PARROT RA NCH		
933	28A143082050801	28A143	820508	82	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 23 C H BEVIL LE		
934	28A143082051401	28A143	820514	75	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 22 C H BEVIL LE		
935	28A146082045901	28A146	820459	65	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 24 C H BEVIL LE		
936	28A146082060901	28A146	820609	190	.	4	TERTIARY FLORIDAN	IRRIGATION	WITHLACOOCHEE P ROJECT 32		
937	28A146082061401	28A146	820614	190	.	.	TERTIARY FLORIDAN	IRRIGATION	JC 32		
938	28A147082051301	28A147	820513	82	.	.	TERTIARY FLORIDAN	IRRIGATION	JC 21 C H BEVIL LE		
939	28A147082052801	28A147	820528	50	.	1	TERTIARY FLORIDAN	IRRIGATION	JC 34		
940	28A148082064301	28A148	820643	27	.	2	TERTIARY FLORIDAN	IRRIGATION	JC 33 C H BEVIL LE		
941	28A155082043901	28A155	820439	68	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 25 C H BEVIL LE		
942	28A155082051401	28A155	820514	400	.	10	TERTIARY FLORIDAN	IRRIGATION	JC 17 C H BEVIL LE		
943	28A157082051701	28A157	820517	.	.	.	TERTIARY FLORIDAN	UNUSED	ALTMAN NO 2		
944	28A158082043301	28A158	820433	23	.	.	TERTIARY FLORIDAN	UNUSED	JC 26 C H BEVIL LE		
945	28A158082045101	28A158	820451	48	40	2	TERTIARY FLORIDAN	UNUSED	USGS		
946	28A159082043301	28A159	820433	25	.	4	TERTIARY FLORIDAN	UNUSED			
947	28A159082081601	28A159	820816	50	40	4	TERTIARY FLORIDAN	IRRIGATION	JC 62 U S GEOL SURVEY		
948	28A208082051701	28A208	820517	199	.	8	TERTIARY FLORIDAN	IRRIGATION	JC 18 C H BEVIL LE		
949	28A208082054601	28A208	820546	490	.	2	TERTIARY FLORIDAN	IRRIGATION	JC 19 C H BEVIL LE		
950	28A209082060101	28A209	820601	234	.	8	TERTIARY FLORIDAN	IRRIGATION	JC 20 C H BEVIL LE		
951	28A212082044301	28A212	820443	54	.	2	TERTIARY FLORIDAN	UNUSED	JC 16 C H BEVIL LE		
952	28A212082071701	28A212	820717	48	40	4	TERTIARY FLORIDAN	UNUSED	USGS		
953	28A215082092301	28A215	820923	43	40	2	TERTIARY FLORIDAN	IRRIGATION	JC 61 U S GEOL SURVEY		
954	28A225082072101	28A225	820721	48	.	4	TERTIARY FLORIDAN	IRRIGATION	WALTER G WYNN		
955	28A237082044401	28A237	820444	500	.	10	TERTIARY FLORIDAN	IRRIGATION	JC 13 C H BEVIL LE		
956	28A241082034201	28A241	820342	37	.	6	TERTIARY FLORIDAN	IRRIGATION	JC 14 C H BEVIL LE		
957	28A242082054401	28A242	820544	500	.	10	TERTIARY FLORIDAN	IRRIGATION	JC 09 C H BEVIL LE		
958	28A249082053101	28A249	820531	400	.	.	TERTIARY FLORIDAN	IRRIGATION	JC 10 C H BEVIL LE		
959	28A252082045201	28A255	820452	342	.	6	TERTIARY FLORIDAN	IRRIGATION	JC 12 C H BEVIL LE		
960	28A258082072101	28A258	820721	.	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 08 C H BEVIL LE		
961	28A259082052101	28A259	820521	.	.	4	TERTIARY FLORIDAN	IRRIGATION	JC 11 C H BEVIL LE		
962	28A259082053101	28A259	820531	400	.	10	TERTIARY FLORIDAN	IRRIGATION	JC 62 U S GEOL SURVEY		
963	28A259082081601	28A259	820816	50	.	10	TERTIARY FLORIDAN	IRRIGATION	JC 3 C H BEVIL LE		
964	28A309082090401	28A309	820904	489	.	10	TERTIARY FLORIDAN	IRRIGATION	C H BEVILLE		
965	28A310082091001	28A310	820910	48	.	.	TERTIARY FLORIDAN	UNUSED	JC 01 C H BEVIL LE		
966	28A311082081801	28A311	820818	25	.	1	TERTIARY FLORIDAN	UNUSED	HI ACRES EAST O F CENTER H		
967	28A312081574701	28A312	815747	.	.	.	TERTIARY FLORIDAN	UNUSED	TRAILER PARK NW OF WAHO0		
968	28A317082142601	28A317	821426	.	.	.	TERTIARY FLORIDAN	UNUSED	JC 02 C H BEVIL LE		
969	28A323082083601	28A323	820836	27	.	1	TERTIARY FLORIDAN	UNUSED	JC 66 SANDPIT W ELL		
970	28A334082042701	28A334	820427	83	.	.	TERTIARY FLORIDAN	UNUSED	JC 04 C H BEVIL LE		
971	28A406082084001	28A406	820840	285	.	.	TERTIARY FLORIDAN	UNUSED	JC 72 GEO ALTHA N IRR		
972	28A430082063001	28A430	820630	.	.	.	TERTIARY FLORIDAN	UNUSED	L G GODWIN		
973	28A440082032201	28A440	820322	174	.	6	TERTIARY FLORIDAN	UNUSED	WOODWARD RESIDE NCE		
974	28A449082055201	28A449	820552	130	.	.	TERTIARY FLORIDAN	UNUSED			

Table 13.--Record of wells--Continued

OBS. NO.	STATION NUMBER	LAT-ITUDE	LONG-ITUDE	WELL DEPTH (FT)	CASING DEPTH (FT)	DIA-METER (IN)	AQUIFER	SUMTER COUNTY	WATER USE	NAME OF OWNER LAST NAME	FIRST NAME
975	284456082035901	284456	820359	41	.	.	TERTIARY FLORIDAN	.	COMMERCIAL	STD OIL CO KY	
976	284515082061301	284515	820613	65	.	2	TERTIARY FLORIDAN	.	UNUSED	JC 54	
977	284520082081301	284520	820813	28	.	2	TERTIARY FLORIDAN	.	UNUSED	DIXIE LIME	
978	284521082014901	284521	820149	137	.	.	TERTIARY FLORIDAN	.	IRRIGATION	M L MARSH	
979	284541082080701	284541	820807	104	.	8	TERTIARY FLORIDAN	.		JC 70	
980	284548082073601	284548	820736	.	.	.	TERTIARY FLORIDAN	.		WHITES ALUMINUM	
981	284558082073601	284558	820736	.	.	.	TERTIARY FLORIDAN	.		LK PANASOFFEE W ATER ASSOC	
982	284609082073901	284609	820739	19	.	.	TERTIARY FLORIDAN	.	UNUSED	SFWMD	
983	284612082071301	284612	820713	170	.	.	TERTIARY FLORIDAN	.	IRRIGATION	W N BURKETT	
984	284619082039101	284619	820351	180	62	8	TERTIARY FLORIDAN	.	STOCK	L J REINHOLZ	P
985	284628082074501	284628	820745	267	.	.	TERTIARY FLORIDAN	.	UNUSED	BIGHAM	
986	284712082072601	284712	820726	50	.	2	TERTIARY FLORIDAN	.	UNUSED	DORIS BAUGHMAN	
987	284742082021900	284742	820219	.	.	2	TERTIARY FLORIDAN	.	RECREATION	JAMES PINSON	
988	284746082081001	284746	820810	150	.	.	TERTIARY FLORIDAN	.		HOWARD KENT	
989	284748082080401	284748	820804	65	.	.	TERTIARY FLORIDAN	.	DOMESTIC	GATOR LODGE	
990	284754082084501	284754	820845	.	.	.	TERTIARY FLORIDAN	.		L NP WILWOOD.F LA.	
991	284804082020901	284804	820209	62.5	.	.	TERTIARY FLORIDAN	.		USGS	
992	284807082040301	284807	820403	.	.	6	TERTIARY FLORIDAN	.	UNUSED	LESTER KING	
993	284809082080701	284809	820807	150	.	6	TERTIARY FLORIDAN	.	IRRIGATION	J T LIPMAN	
994	284925082105501	284925	821055	.	.	6	TERTIARY FLORIDAN	.	PUBLIC	CITY WILWOOD	
995	285059081593001	285059	815930	220	.	10	TERTIARY FLORIDAN	.	UNUSED	U S GEOL SURVEY	
996	285110082015701	285110	820157	.	.	2	TERTIARY FLORIDAN	.		CITY WILWOOD	
997	285110082515901	285110	825159	.	.	12	TERTIARY FLORIDAN	.	PUBLIC	A M LEE JR	
998	285112082124001	285112	821240	22	.	.	TERTIARY FLORIDAN	.	IRRIGATION	HORNES WELL W O F WILWOOD	
999	285121082112201	285121	821122	31	.	6	TERTIARY FLORIDAN	.	IRRIGATION	J T LIPMAN	
1000	285124082104901	285124	821049	66	.	6	TERTIARY FLORIDAN	.	IRRIGATION	W L DUELL	
1001	285133082014201	285133	820142	155	.	6	TERTIARY FLORIDAN	.	IRRIGATION	MAJOR BELLAMY	
1002	285141082015501	285141	820155	700	.	6	TERTIARY FLORIDAN	.	IRRIGATION	C DAVIS	
1003	285150082044001	285150	820440	38	.	6	TERTIARY FLORIDAN	.	IRRIGATION	J M NICHOLS	
1004	285203082100001	285203	821000	38	.	6	TERTIARY FLORIDAN	.	IRRIGATION	C & L FARMS	
1005	285207082014501	285207	820145	125	.	10	TERTIARY FLORIDAN	.	IRRIGATION	M A DAVIS	
1006	285209082090201	285209	820902	155	.	6	TERTIARY FLORIDAN	.	IRRIGATION	M A DAVIS	
1007	285224082054201	285224	820542	.	.	6	TERTIARY FLORIDAN	.	IRRIGATION	GEORGE FUSSELL	
1008	285240082012001	285240	820120	100	.	6	TERTIARY FLORIDAN	.	OTHER	G N SMITH	
1009	285244082005401	285244	820054	135	.	6	TERTIARY FLORIDAN	.	IRRIGATION	L M NICHOLS	
1010	285329082140201	285329	821402	93	.	6	TERTIARY FLORIDAN	.	IRRIGATION	R M NICHOLS	
1011	285343082085001	285343	820850	125	.	6	TERTIARY FLORIDAN	.	RECREATION	SMITH	MCGREGOR
1012	285414082074501	285414	820745	.	.	6	TERTIARY FLORIDAN	.			
1013	2854400820752901	285440	820529	150	.	10	TERTIARY FLORIDAN	.			
1014	285453082110901	285453	821109	62	.	4	TERTIARY FLORIDAN	.			
1015	285456082114701	285456	821147	90	.	6	TERTIARY FLORIDAN	.			
1016	285502082027001	285502	820220	150	.	6	TERTIARY FLORIDAN	.			
1017	285536082044001	285536	820440	130	.	6	TERTIARY FLORIDAN	.			
1018	285538082021301	285538	820213	110	.	8	TERTIARY FLORIDAN	.			
1019	285606082081001	285606	820810	63	.	6	TERTIARY FLORIDAN	.			
1020	285703082065701	285703	820657	125	.	6	TERTIARY FLORIDAN	.			
1021	285731082134400	285731	821354	.	.	.	TERTIARY FLORIDAN	.			

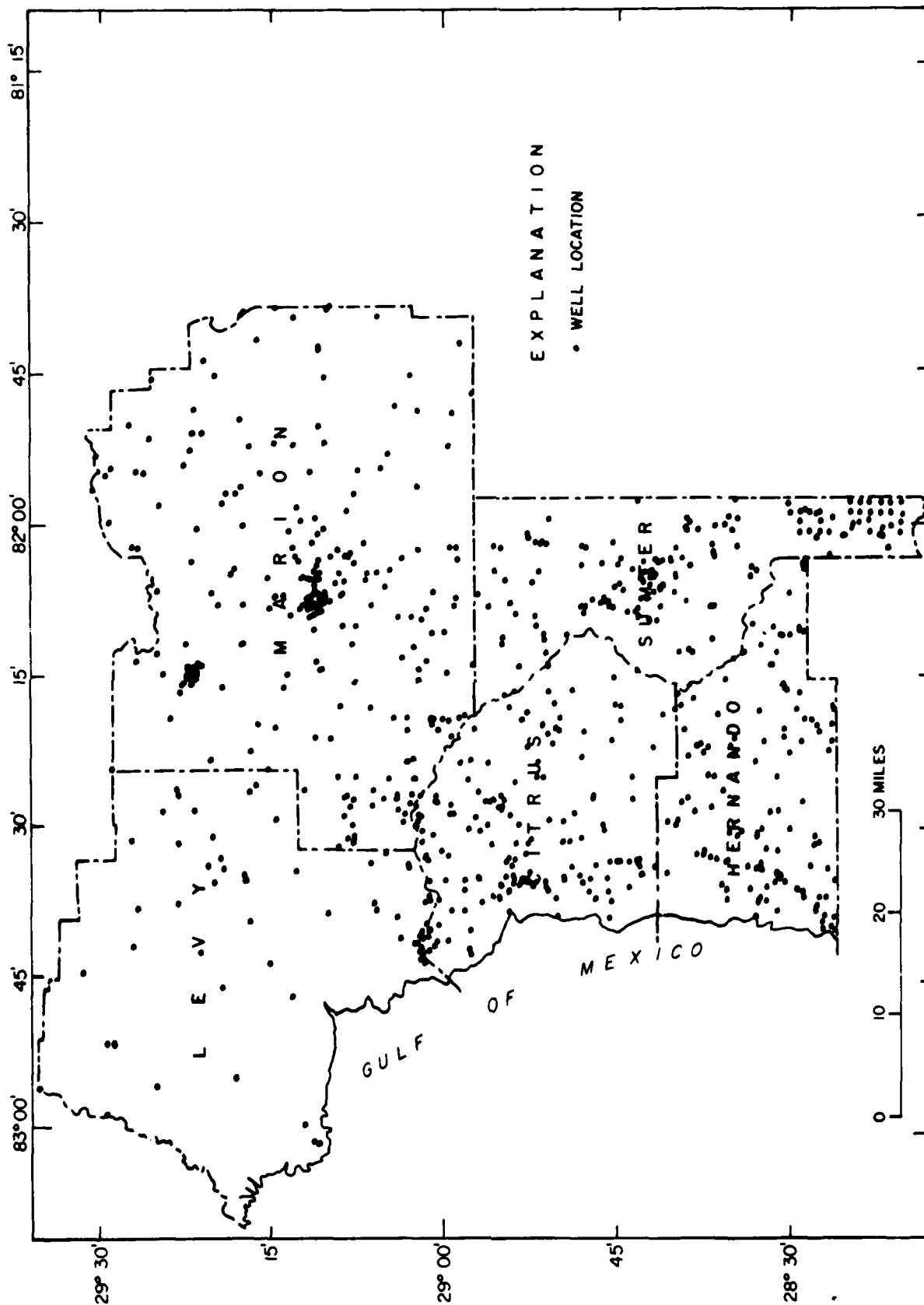


Figure 27.--Locations of wells listed in table 13.

Water supply would be developed through pumping the Floridan aquifer which would divert water from ground-water outflow and surface-water runoff. The evaluation of the water supply potential was undertaken using a two dimensional, finite difference, steady state ground water flow model. Pride and others (1966) reported the transmissivity in the given swamp area to range from about 2,900 to 94,000 ft²/d. Initial estimates of transmissivity for the simulation ranged from 26,750 to 160,430 ft²/d. Initial upper confining bed vertical hydraulic conductivity ranged from 8.6×10^{-6} to 4.3×10^{-3} ft/d. Several nodes had zero vertical hydraulic conductivity. The two dimensional model was calibrated to the May 1977 potentiometric surface. Calibration required the following adjustments to the model: (1) Reducing initial estimated aquifer transmissivity by at least 60 percent over about 70 percent of the model area, and (2) increasing the initial estimated values of upper confining bed hydraulic conductivity from 6 to 100 times over about one-third of the model area. The average error per node on the calibrated model was 0.68 foot. The maximum node error was 3.39 feet. A sensitivity analysis of the aquifer parameters was performed on the calibrated model. It was found that a 1 percent change in surficial aquifer head, a 50 percent change in the confining bed vertical hydraulic conductivity and a 50 percent change in the Floridan transmissivity create about the same error in calibration. Several development schemes were simulated with the calibrated model. Six pumping centers yielding 91 Mgal/d resulted in a 1 foot or more drawdown over approximately 100 mi² with a maximum drawdown of 32 feet at one pumping center. This development is equivalent to approximately 2 feet of drawdown over the entire area.

Twelve pumping centers yielding 182 Mgal/d resulted in a 1 foot or more drawdown over approximately 500 mi² with a maximum drawdown of 34 feet at one pumping node. The equivalent drawdown over the entire area was approximately 4 feet.

Eighteen pumping centers yielding 274 Mgal/d resulted in a 1 foot or more drawdown over approximately 700 mi² with a maximum drawdown of 38 feet at one pumping node. The equivalent drawdown over the entire area was approximately 6 feet. A flood detention area inducing additional recharge reduced the maximum drawdown from 38 to 32 feet and reduced the average drawdown over the entire area from 6 to 5 feet.

It was not the intention of Grubb and Rutledge (1979) to choose an optimal development scheme. They did suggest, however, that further study should give priority to improving estimates of vertical hydraulic conductivity of the confining bed and should involve a multilayer, three dimensional simulation.

At present, the U.S. Geological Survey is undertaking a large scale, regional study of the Floridan aquifer (Johnston, 1978). Its purpose is to simulate the multilayer Floridan aquifer and surficial aquifer to better define their characteristics and interrelations. A three dimensional, finite difference ground-water flow model of the

Florida peninsula will be involved. This study, when completed, will provide a basis for determining boundary conditions and areal differences of the aquifer characteristics for small scale, problem oriented simulation studies such as the one by Grubb and Rutledge (1979).

SURFACE-WATER RESOURCES

This section includes data and information relating to the surface-water resources of the study area, namely streams, lakes, and springs. Although treated in this report as surface-water features it must be recognized that they are in some instances intimately associated with ground-water features because of the geohydrology of the area.

Streams

Drainage Basins

The study area includes parts of six drainage basins as delineated by Kenner and others (1967). The basins are shown in figure 28 and include:

- Suwannee River
- Coastal area between Withlacoochee River and Suwannee River
- Oklawaha River
- St. Johns River above Oklawaha River
- Withlacoochee River
- Coastal area south and west of Withlacoochee River

Runoff

Areal variations in runoff are caused by several factors, including regional differences in rainfall, differences in slope and infiltration characteristics of the land surface, evaporation from land and water surfaces, transpiration by plants, and man's activities (diversion, storage by dams, and drainage by canals).

The average annual runoffs for the basins in the study area are shown in figure 28 (from Hughes, 1978). The Withlacoochee River and coastal area basins in Levy County have an average annual runoff between 5 and 10 inches, the Oklawaha River, St. Johns River and Suwannee River basins between 10 and 15 inches, and the coastal area of Citrus and Hernando Counties between 25 and 30 inches. The unusually high runoff of the coastal area of Citrus and Hernando Counties is attributed to substantial subsurface inflow from the Withlacoochee River basin (Hughes, 1978; Cherry and others, 1970). The gross, area-weighted average of annual runoff for the study area is 13 inches.

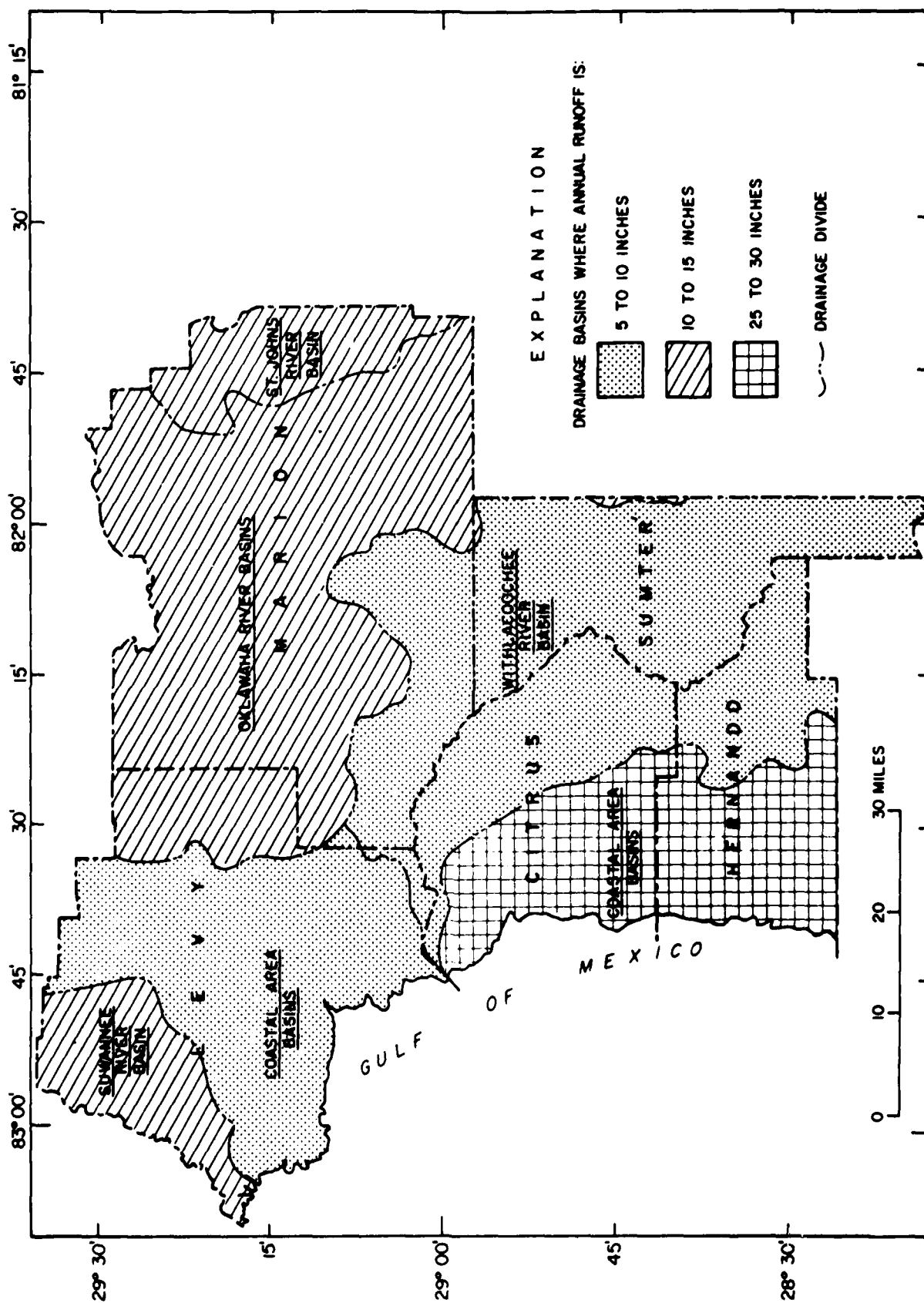


Figure 28.--Drainage basins (from Kenner and others, 1967) and average annual basin runoff (from Hughes, 1978).

Station Record

Gaging stations located in the study area are listed in table 14. Included are continuous-record stations presently (1980) operating and stations which have been discontinued. The station locations are plotted in figure 29. The inventory includes station name and number, latitude and longitude of the station, drainage area, gage datum, and statistics of stage and discharge. The statistics are minimum, mean, and maximum daily average values. For those stations affected by tides, some statistics are instantaneous values rather than daily average values.

Seasonal Variation of Discharge

Mean monthly discharges for all stations in the study area having more than 10 years of record are listed in table 15. Mean monthly discharges for August and September are generally larger than for other months because of the seasonal rainfall.

According to Kenner (1969) month to month variation in average streamflow is relatively small because of: (1) the relatively high rate of evapotranspiration in the summer which tends to offset larger amounts of rainfall during the summer, (2) the large volume of natural storage in Florida's numerous lakes which tends to smooth out changes in streamflow, and (3) the large and relatively stable inflow of ground water to streams from extensive limestone aquifer systems.

Flow Duration

Flow-duration data based on daily discharges for streamflow-gaging stations having more than 10 years of record are listed in table 16. These data are the discharges, in cubic feet per second, that were exceeded for the indicated percentages of time.

When the data in table 16 are plotted (discharge against percent of time) a flow-duration curve is produced. A flow duration curve shows the integrated effect of the various factors that affect runoff, such as climate, topography, and geology. According to Searcy (1959) a curve with a steep slope throughout denotes a stream whose flow is highly variable and largely from direct runoff, whereas a curve with a flat slope reveals the presence of surface- or ground-water storage, which tends to attenuate flood flows and sustain low flows. The slope of the lower end of the duration curve shows the characteristics of the perennial storage in the drainage basin--a flat slope indicates a large amount of storage; a steep slope indicates a negligible amount.

Quality of Surface Water

Quality of water is a generalized expression which encompasses the concentrations and measurements of many constituents and physical

Table 14.--Continuous-record gaging stations

Number	Station name		Drainage area, square miles	Altitude of gage datum, feet	Daily stage, feet		Daily discharge, cubic feet per second	
	Latitude	Longitude			min	mean	min	mean
1.	Oklawaha River above Moss Bluff Dam at Moss Bluff							
02238499	29°04'52"	81°52'51"	879.	0.00	45.47	58.02	-	-
2.	Oklawaha River at Moss Bluff							
02238500	29°04'52"	81°52'51"	879.	0.00	34.05	37.61	0.00	1,960.
3.	Oklawaha River near Ocala							
02239000	29°11'	82°00'	1,020.	36.52	-	-	4.19	410.
4.	Silver Springs near Ocala							
02239500	29°13'	82°03'	-	38.96	-0.77	0.88	539.	810.
5.	Silver River near Ocala							
02239501	29°12'53"	82°02'29"	-	0.00	38.72	40.00	-	-
6.	Oklawaha River near Conner							
02240000	29°12'52"	81°59'10"	1,200.	31.79	2.27	4.34	631.	-
7.	Oklawaha River at Eureka							
02240500	29°22'	81°54'	1,370.	15.44	-	-	634.	-
8.	Orange Creek at Orange Springs							
02243000	29°30'34"	81°56'47"	1,070	19.81	1.07	-	2.00	-
9.	Oklawaha River near Orange Springs							
02243500	29°30'15"	81°54'45"	2,750.	7.12	-	-	741.	1,690.
10.	Weekiwachee River near Bayport							
02310550	28°31'56"	82°37'33"	-	-	-	-	205.	264.
11.	Chassahowitzka River near Homosassa							
02310650	28°42'54"	82°34'38"	-	0.00	-0.05*	-	-	-
12.	Homosassa River at Homosassa							
02310700	28°47'06"	82°37'05"	-	0.00	-1.73*	-	-	-
13.	Crystal River near Crystal River							
02310750	28°54'17"	82°38'13"	-	0.00	-2.72*	-	-1,520.	970.
14.	Weekiwachee River at Trilby							
02310800	28°28'47"	82°10'40"	570.	49.27	0.54	3.74	7.40	367.
15.	Weekiwachee River near Terrytown							
02310850	28°31'17"	82°03'18"	85.	80.00	1.39	3.74	0.00	47.4

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GEOLOGICAL SURVEY TALLAHASSEE FLA WATER RESOURCES DIV F/G 8/8
WATER-RESOURCES INFORMATION FOR THE WITHLACOCHEE RIVER REGION--ETC(U)
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USGS/WRI-81-11

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Table 14.--Continuous-record gaging stations - Continued

Number	Station name	Latitude	Longitude	Drainage area, square miles	Altitude of gage datum, feet	Daily stage, feet		Daily discharge, cubic feet per second	
						min	max	min	max
16.	Big East Canal at S-11 near Webster	28°34'47"	82°05'45"	18.	0.00	72.12	76.38	-	-
02312194									
17.	Big East Canal at Structure WC-2 at Birdell	28°34'16"	82°08'52"	30.	0.00	65.00	70.00	-	-
02312197									
18.	Big East Canal below Structure WC-2 at Birdell	28°34'16"	82°08'54"	30.	0.00	62.10	70.30	-	-
02312198									
19.	Little Withlacoochee River at Birdell	28°34'21"	82°09'20"	145.	59.02	0.93	12.30	0.00	47.1 1,180.
02312200									
20.	Withlacoochee River at Croom	28°35'13"	82°11'20"	810.	38.94	1.43	11.15	16.0	476. 8,630.
02312500									
21.	Withlacoochee River near Floral City	28°44'34"	82°13'13"	995.	0.00	38.80	40.67	-	-
02312600									
22.	Jumper Creek Canal near Center Mill	28°37'03"	81°59'39"	6.72	78.89	5.55	6.38	-	-
02312625									
23.	Jumper Creek Canal at Center Mill	28°38'58"	82°00'19"	13.6	77.32	3.88	5.35	-	-
02312630									
24.	Jumper Creek Canal near Suckerville	28°41'46"	82°03'18"	28.6	68.04	4.10	7.27	1.10	66.0
02312635									
25.	Jumper Creek Canal near Bushnell	28°41'45"	82°06'34"	40.0	55.00	1.56	2.67	5.10	26.7 203.
02312640									
26.	Jumper Creek Canal near Union	28°42'15"	82°09'26"	50.6	0.00	46.30	47.82	11.0	37.3 155.
02312645									
27.	Chitty Chitty Creek near Wildwood	28°48'33"	81°58'59"	38.0	52.70	3.83	5.28	0.00	171.
02312690									
28.	Outlet River at Pamlicochee Retreats	28°49'01"	82°08'40"	420.	0.00	38.83	42.47	0.00	191. 536.
02312700									
29.	Withlacoochee River above Wynon Dam, at Carleton	28°49'27"	82°10'56"	1,520.	0.00	37.05	38.78	-	-
02312719									
30.	Withlacoochee River at Wynon Dam, at Carleton	28°49'23"	82°11'00"	1,520.	0.00	36.36	37.94	85.0	666. 2,790.
02312720									

Table 14.--Continued record gaging stations - Continued

Number	Station name	Latitude	Longitude	Drainage area, square miles	Altitude of gage datum, feet	Daily stage, feet		Daily discharge, cubic feet per second	
						Min	Max	Min	Max
31.	Teala Apopka Outfall Canal at S-353, near Hernando								
02312975	28°57'19"	82°20'13"	-	-	0.00	36.40	39.98	0.00	20.0
32.	Teala Apopka Outfall Canal below S-353, near Hernando								
02312976	28°57'19"	82°20'13"	-	-	0.00	27.78	30.33	-	-
33.	Withlacoochee River near Holder								
02313000	28°59'19"	82°20'59"	1,820	27.52	0.35	2.87	9.62	113.	1,100
34.	Rainbow Springs near Dunnellon								
02313100	29°06'08"	82°26'16"	-	28.34	2.19	3.08	3.51	538.	734.
35.	Withlacoochee River at Inglis Dam, near Dunnellon								
02313230	29°00'35"	82°37'01"	2,020	0.00	-	-	-	70.0	364.
36.	Withlacoochee River below Inglis Dam, near Dunnellon								
02313231	29°00'35"	82°37'01"	-	0.00	-1.84	1.26	8.16	-	-
37.	Cross-Florida Barge Canal at Inglis Lock, near Inglis								
02313237	29°01'30"	82°37'00"	-	-	-	-	-	0.00	12.9
38.	Withlacoochee River Bypass Channel near Inglis								
02313250	29°01'15"	82°38'17"	-	0.00	21.72	26.80	27.85	53.0	1,130.
39.	Withlacoochee River Bypass Channel below structure, near Inglis								
02313251	29°01'15"	82°38'20"	-	0.00	0.73	2.79	5.90	-	-
40.	Withlacoochee River at Crackertown								
02313265	29°01'49"	82°40'41"	2,030.	0.00	-3.96*	-	6.31*	-	-
41.	Waccasassa River near Otter Creek								
02313500	29°21'15"	82°44'06"	300.	-	-	-	-	6.69	-
42.	Waccasassa River near Gulf Hammock								
02313700	29°12'14"	82°46'09"	480.	-0.51	-2.67*	-	6.96*	-1,810.	309.
43.	Otter Creek at Otter Creek								
02314000	29°19'08"	82°47'03"	300.	-	-	-	-	0.00	50.1
44.	Tomdle Creek at Lebanon Station								
02314200	29°09'39"	82°38'21"	26.	15.00	2.89	4.56	10.40	0.00	30.0
45.	Savannee River near Wilcox								
02323500	29°35'22"	82°56'12"	9,640	-0.53	1.39	5.12	18.55	3,270	10,630

* Stage records affected by tide; values given is instantaneous.
Negative discharge indicates flow is upstream.

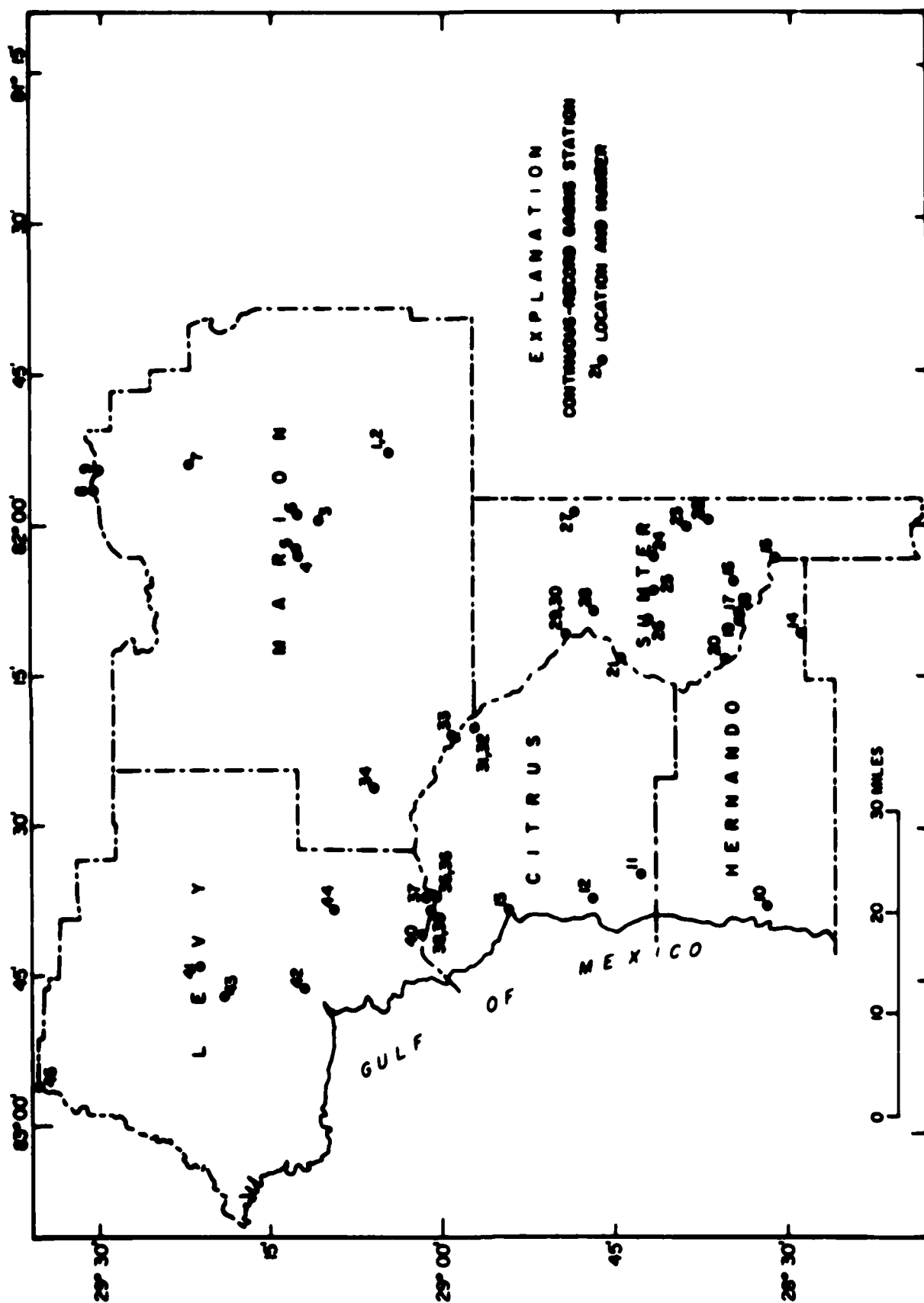


Figure 29.--Locations of continuous-record gaging stations listed in table 14.

Table 15.—Mean monthly discharges of selected streamflow-measuring stations

Station number	Station name	Mean monthly discharges, in cubic feet per second											
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
2.	02230500 Ohlawaha River at Moss Bluff	318	283	274	309	305	340	326	241	244	269	309	346
3.	02230600 Ohlawaha River near Ocala	479	374	359	386	411	451	415	317	325	385	474	540
4.	02230500 Silver Springs near Ocala	873	857	826	802	789	792	797	781	766	773	805	854
6.	02240000 Ohlawaha River near Commar	1,204	1,157	1,135	1,153	1,135	1,107	1,156	1,071	1,100	1,170	1,264	1,403
7.	02240500 Ohlawaha River at Huron	1,591	1,449	1,395	1,407	1,359	1,411	1,381	1,178	1,246	1,331	1,494	1,741
8.	02241300 Orange Creek at Orange Springs	239	168	134	143	171	227	199	111	79.6	101	188	250
13.	02310750 Crystal River near Crystal River	907	831	801	897	983	1,116	1,083	1,181	975	898	941	953
14.	02312000 Withlacoochee River at Trilby	593	236	162	204	248	404	329	135	213	408	643	874
15.	02312100 Little Withlacoochee River near Tarrytown	57.2	29.1	20.2	37.9	43.0	53.1	23.9	2.50	10.5	29.1	76.0	116
19.	02312200 Little Withlacoochee River at Bordall	113	44.5	33.7	59.7	83.0	170	77.1	21.9	33.8	74.7	146	186
20.	02312500 Withlacoochee River at Green	771	342	254	297	348	554	428	198	193	443	831	1,055
25.	02312640 Jumper Creek Canal near Bushnell	26.0	23.9	22.8	24.8	31.2	31.2	26.1	20.5	21.8	26.6	31.2	35.3
28.	02312700 Outlet River at Panacoochee Retreats	214	170	163	176	208	208	191	163	152	166	230	246
30.	02312720 Withlacoochee River at Wyong Dam at Carlson	842	542	408	593	696	767	606	403	390	611	854	1,008
31.	02312975 Teala Appala Outlet Canal at S-353, near Hernando	21.4	5.90	13.4	18.0	17.3	29.5	17.7	3.46	6.48	26.0	31.9	45.7
33.	02313000 Withlacoochee River near Bolder	1,870	1,173	868	858	905	1,035	1,016	685	615	957	1,464	1,912
35.	02313230 Withlacoochee River at Ingalls Dam, near Dunnellon	780	436	325	321	400	453	260	117	108	173	432	525
42.	02313700 Waccassee River near Gulf Hammock	258	123	209	325	487	403	224	135	151	279	636	479
44.	02314200 Tomoka Creek at Lebanon Station	26.4	6.65	11.6	31.2	55.6	48.9	20.1	8.13	11.4	38.4	129	86.6
45.	02323500 Suwannee River near Wilcox	9,251	8,020	8,195	10,080	11,850	14,370	15,520	11,520	9,174	8,835	9,810	10,070

Table 16.—Flow-duration values of selected stations

Station number	Station name	Discharge, in cubic feet per second, exceeded for indicated percents of time							
		95	90	75	70	50	25	10	
2.	02238500	Oklawaha River at Moss Bluff	10	18	36	58	260	450	700
3.	02239000	Oklawaha River near Ocala	38	75	190	220	330	550	870
4.	02239500	Silver Springs near Ocala	620	650	710	730	790	900	1,000
6.	02240000	Oklawaha River near Conner	710	750	890	940	1,200	1,400	1,600
7.	02240500	Oklawaha River at Eureka	760	880	1,100	1,100	1,300	1,700	2,000
8.	02243000	Orange Creek at Orange Springs	6	9	25	33	84	230	480
13.	02310750	Crystal River near Crystal River	39	220	550	640	930	1,400	1,800
14.	02312000	Withlacoochee River at Trilby	25	35	66	76	150	440	950
15.	02312180	Little Withlacoochee River near Terrytown	0	0	.08	.2	3.7	38	140
19.	02312200	Little Withlacoochee River at Berdell	.70	2.1	6.7	8.7	23	82	250
20.	02312500	Withlacoochee River at Croon	56	73	120	130	230	560	1,200
25.	02312640	Jumper Creek Canal near Bushnell	11	13	17	18	23	31	45
28.	02312700	Outlet River at Panacoochee Retreats	74	91	130	140	170	240	320
30.	02312720	Withlacoochee River at Wyeong Dam at Carlson	180	220	330	370	500	780	1,400
31.	02312975	Teale Apopka Outlet Canal at S-353, near Hernando	.03	.10	.20	.20	.30	1.0	70
33.	02313000	Withlacoochee River near Holder	250	330	500	550	780	1,300	2,300
34.	02313100	Rainbow Springs near Dunnellon	570	590	640	660	700	790	870
35.	02313230	Withlacoochee River at Inglis Dam, near Dunnellon	71	72	74	75	78	270	930
42.	02313700	Waccasassa River near Gulf Hammock	20	38	82	96	170	370	750
44.	02314200	Tennile Creek at Lebanon Station	.07	.10	.40	.70	6.0	29	100
45.	02323500	Savannah River near Wilcox	4,300	4,800	6,100	6,600	8,700	13,000	19,000

characteristics associated with the chemistry of water. Presented in this section are generalizations concerning the concentrations, physical characteristics, and loads found in streams within the study area.

Chemical type.--The chemical type of water is based on the predominant cations and anions found in the water when expressed in milliequivalents per liter. In the study area three chemical types are found (Kaufman, 1972), fig. 30: calcium and magnesium bicarbonate type, sodium chloride type, and mixed type (no predominant cation or anion). Two other chemical types commonly found in Florida, but not in the study area, are sodium bicarbonate and chloride type, and calcium and magnesium sulfate type.

Calcium and magnesium bicarbonate type water is associated with Tertiary carbonate terranes constituting the Floridan aquifer in the study area. Water of the sodium chloride type is associated with saline water in the low-lying coastal areas and saline water that has moved upward from the Floridan aquifer along fracture or fault traces, for example, along the east boundary of Marion County. Water containing no predominant cation or anion is considered to be a mixed type, and is usually associated with noncarbonate terranes such as natural swampland areas. Water of the mixed type may also result from the mixing of calcium and magnesium bicarbonate water and sodium chloride water.

The predominant chemical type of streams in the study area is calcium and magnesium bicarbonate. The sodium chloride type is present in the coastal area of Levy and Citrus Counties and along part of the east boundary of Marion County near the St. Johns River. The mixed type is found in the extreme southern tip of Sumter County and along the northern boundary of Marion County.

The above generalizations are for low-flow conditions, or base flow. During high-flow conditions the chemical composition of the stormwater fraction may be dominant enough to change the chemical type of the water.

Dissolved solids.--Material transported by streams is either in a dissolved or suspended state. Dysart and Goolsby (1977), estimated that for Florida streams the dissolved-solids load slightly exceeds the suspended-solids load. Little data, however, exist for suspended solids in Florida streams.

The concentration of dissolved solids is a measure of the amount of inorganic and organic material in solution. In the study area the dissolved solids consist mainly of bicarbonates, chlorides, and sulfates of calcium, magnesium, sodium, and, in lesser amounts, potassium.

The average concentrations of dissolved solids for the study area, estimated from specific conductance data, are shown in figure 31. The central part of the study area has concentrations of less than 100 mg/L. Most of the area, including the western part and eastern part, has concentrations between 100 and 200 mg/L. A small band in northeast Marion

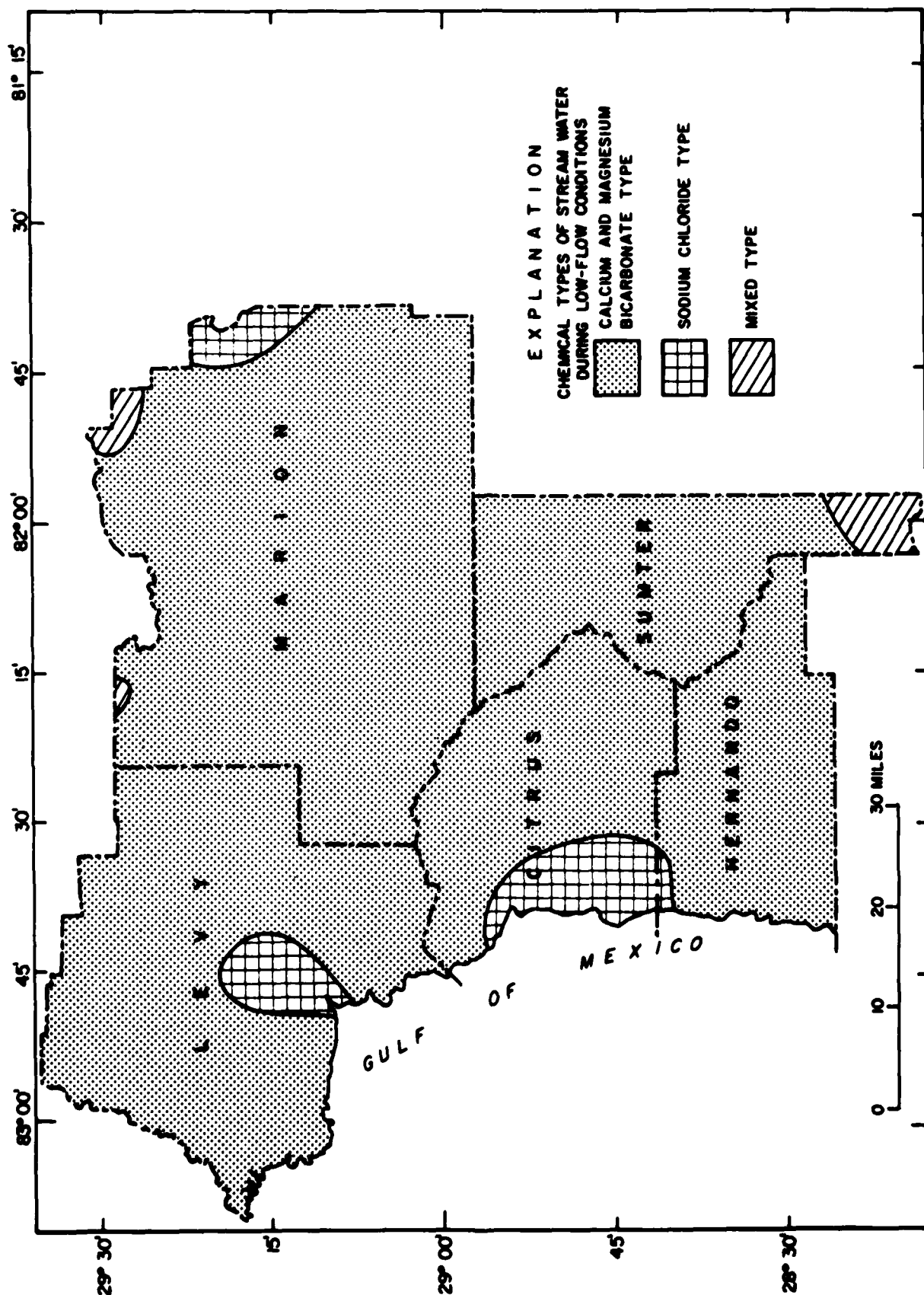


Figure 30.--Chemical types of streams during low-flow conditions (from Kaufman, 1972).

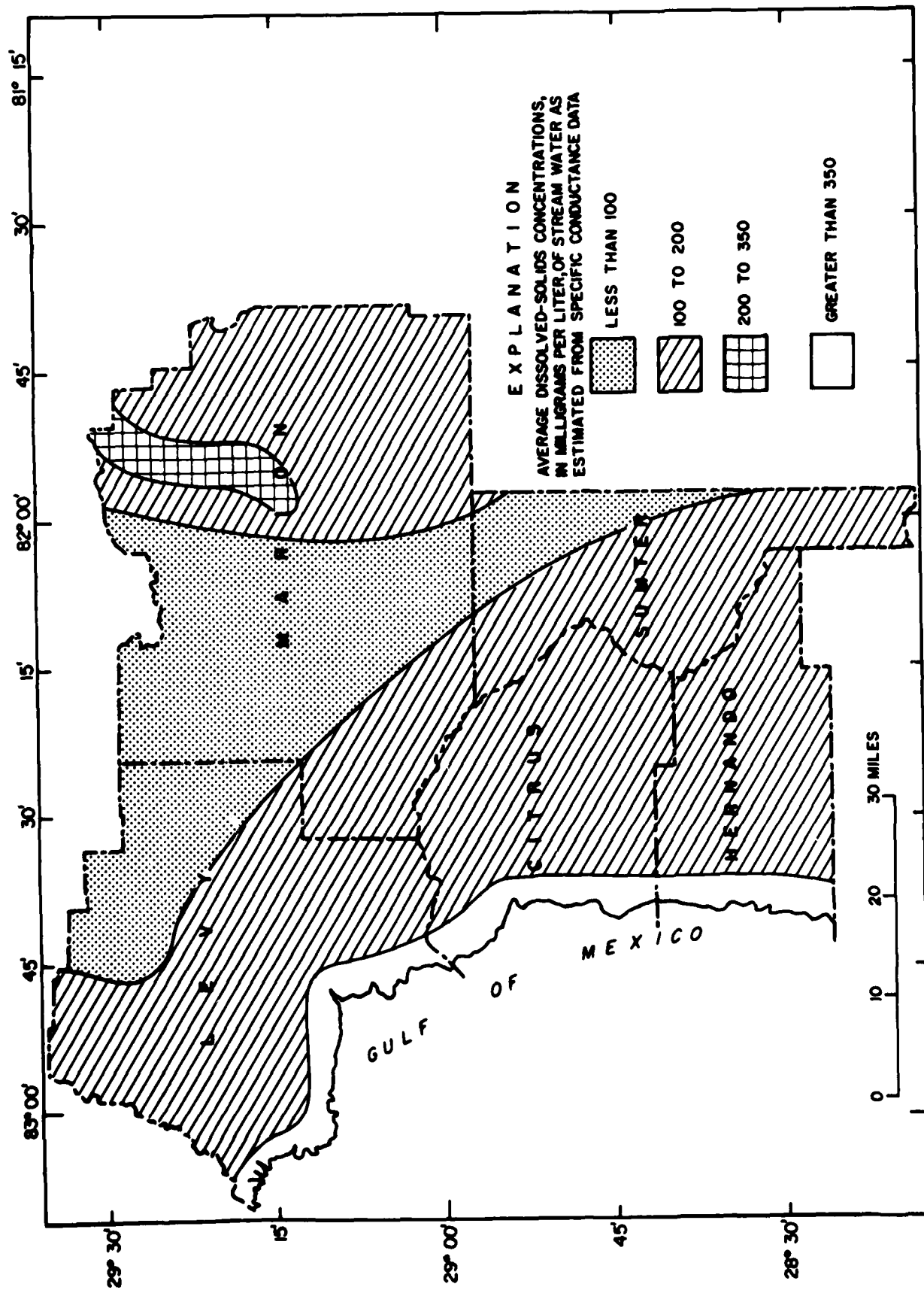


Figure 31.--Dissolved-solids concentrations in streams (from Dysart and Goolsby, 1977).

County, along the Oklawaha River, has concentrations between 200 and 350 mg/L, and along the coast where streams are influenced by tidal action concentrations are greater than 500 mg/L.

The load of a particular constituent is the amount, or weight, of that constituent transported by the stream water. It is computed as the product of the constituent concentration (mg/L), discharge (ft^3/s), and 0.0027, a conversion factor.

Load, in tons per square mile per year, of dissolved solids for the various basins have been estimated as follows (Dysart and Goolsby, 1977):

<u>River</u>	<u>Dissolved-solids load, in tons per square mile per year</u>
Suwannee	126
St. Johns	614
Withlacoochee	104

The estimated total loads of dissolved solids per year is 1.40 million tons for the Suwannee River, 0.27 million tons for the Withlacoochee River, and 5.60 million tons for the St. Johns River.

Conductance.--The distribution of the maximum-observed specific conductance for Florida is presented by Slack and Kaufman (1973, revised 1975). The distribution for the study area is shown in figure 32. The highest values are along the coast in Citrus County, in south-central Levy County along the downstream reaches of Waccasassa River, and along the northeast boundary of Marion County along the St. Johns River. These areas coincide with areas having a chemical type of sodium chloride. In most of the study area conductance values range from 250 to 750 micromhos per centimeter.

Nutrients.--The primary nutrients are principally nitrogen and phosphorus. Other essential nutrients include carbon and sulfur along with several minor constituents. These constituents are essential in the growth of both terrestrial and aquatic plants.

The generalized distribution of average total nitrogen concentrations--the sum of organic nitrogen, ammonia, nitrite, and nitrate concentrations--is presented by Slack and Goolsby (1976). The distribution of total nitrogen for the study area is presented in figure 33. The majority of the area has total nitrogen concentrations of less than 1.2 mg/L.

Annual nitrogen loads for major streams in the study area are calculated as follows:

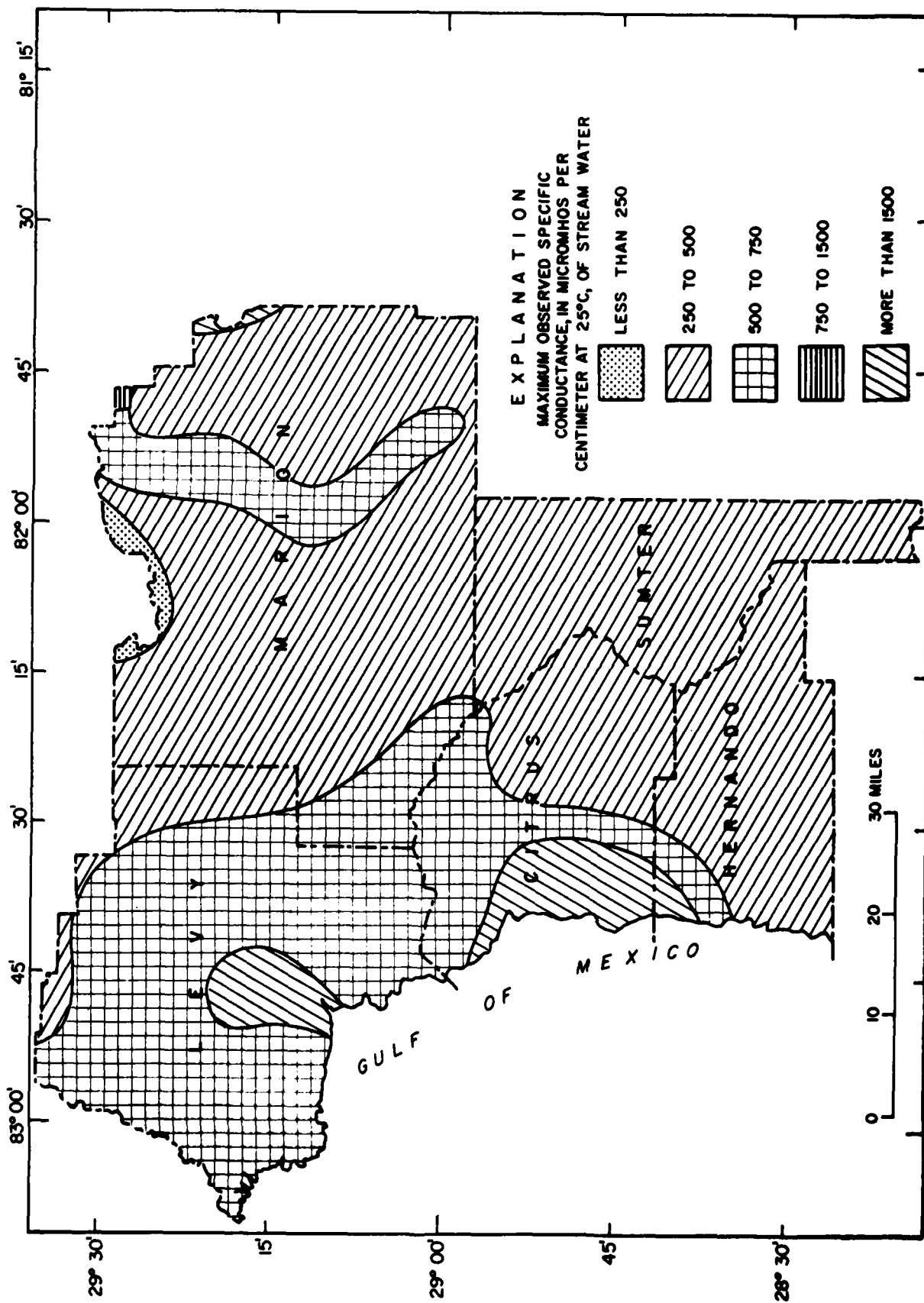


Figure 32.--Maximum-observed specific conductance of streams (from Slack and Kaufman, 1973).

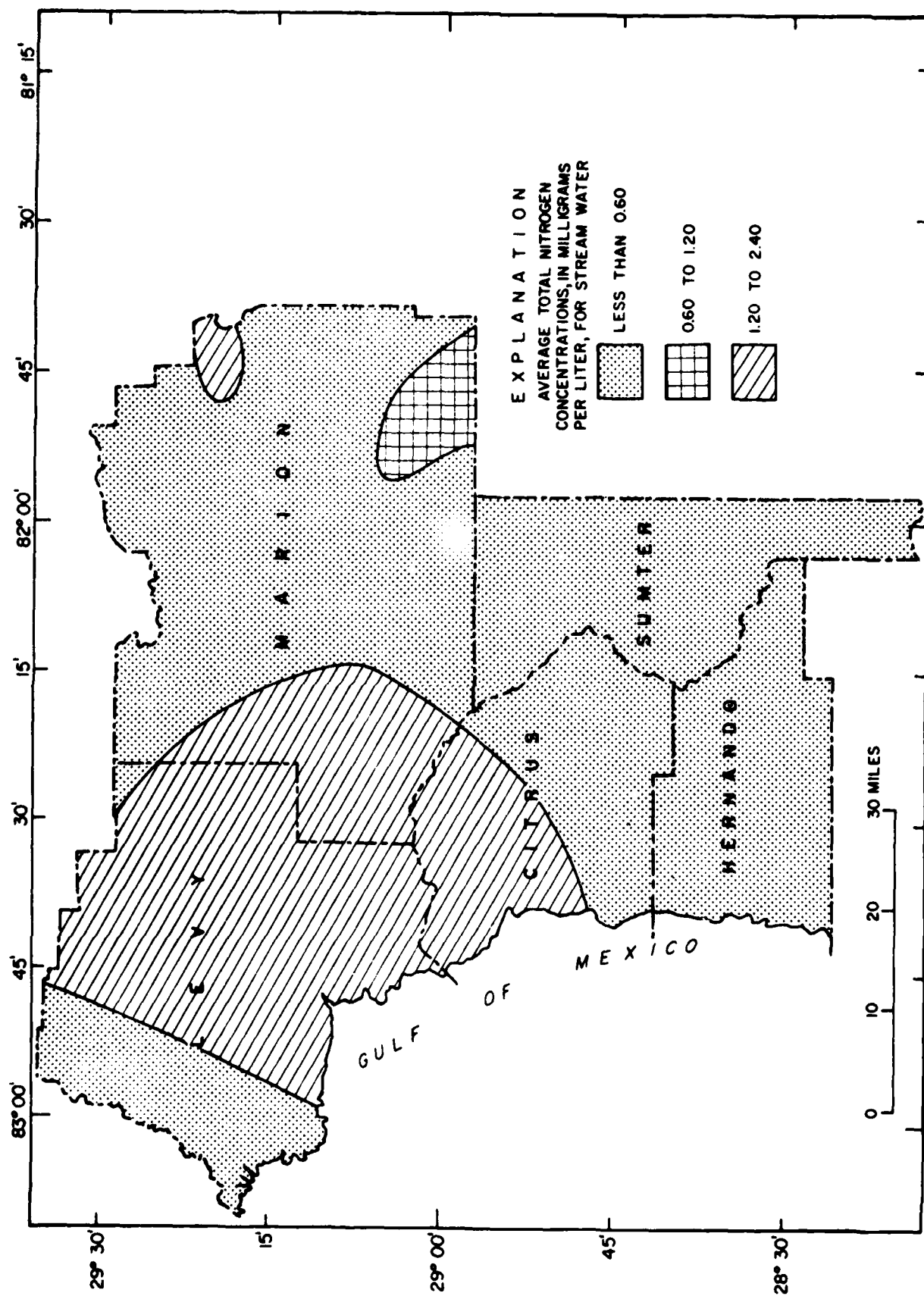


Figure 33.—Average total nitrogen concentrations in streams (from Slack and Goolsby, 1976)

<u>River</u>	<u>Nitrogen load, in tons per square mile per year</u>
Oklawaha	0.45
St. Johns	1.3
Withlacoochee	.50
Suwannee	.80

Orthophosphate is one of three chemical types of phosphate, the other two being acid-hydrolyzable and organic. Orthophosphate is any compound containing the trivalent group PO_4 , and is most commonly found in fertilizers.

The distribution of maximum orthophosphate concentrations for the study area, shown in figure 34, was taken from Kaufman (1969b, revised 1975). Orthophosphate concentrations as PO_4 are less than 0.5 mg/L for most of the study area. Three areas, lower Withlacoochee River basin in western Levy and Citrus Counties, south Sumter County, and along the northern boundary of Marion and Levy Counties, have concentrations in excess of 0.5 mg/L. The latter area has concentrations in the 1.0 to 5.0 mg/L range.

The orthophosphate load for streams in the study area is estimated to be less than 2.0 pounds per square mile per day.

Color.--The color of water is due to charged colloidal particles contained within the water. The particles are of mineral and organic origin, such as decaying vegetation, tannins, peat, and iron and manganese compounds.

The general distribution of the maximum color of water in the study area, shown in figure 35, was taken from Kaufman (1969a). The color of the surface water from the larger part of the study area is between 200 and 300 platinum-cobalt units. It is less along the coastal areas of Citrus and Hernando Counties. The highest values of color, 300 to 400 units, are found in streams along the southwest and north boundary of Marion County and southeast Sumter County.

Color values vary due to fluctuations in runoff. In general, increased color is observed immediately following rainfall due to the initial flush of decayed organic matter into the stream. Dilution occurs with increased discharge following the initial flush.

pH.--The pH of a solution is a measure of the hydrogen-ion activity and is expressed as the negative logarithm (base 10) of the effective hydrogen-ion concentration. The pH controls, to a great degree, chemical processes such as solubility, hydroxide precipitation, degree of complexation, and sorption of solutes by particulate matter.

In streams draining natural environments, the pH ranges mostly from 4 to 9 units. In an organic-rich environment, under aerobic conditions,

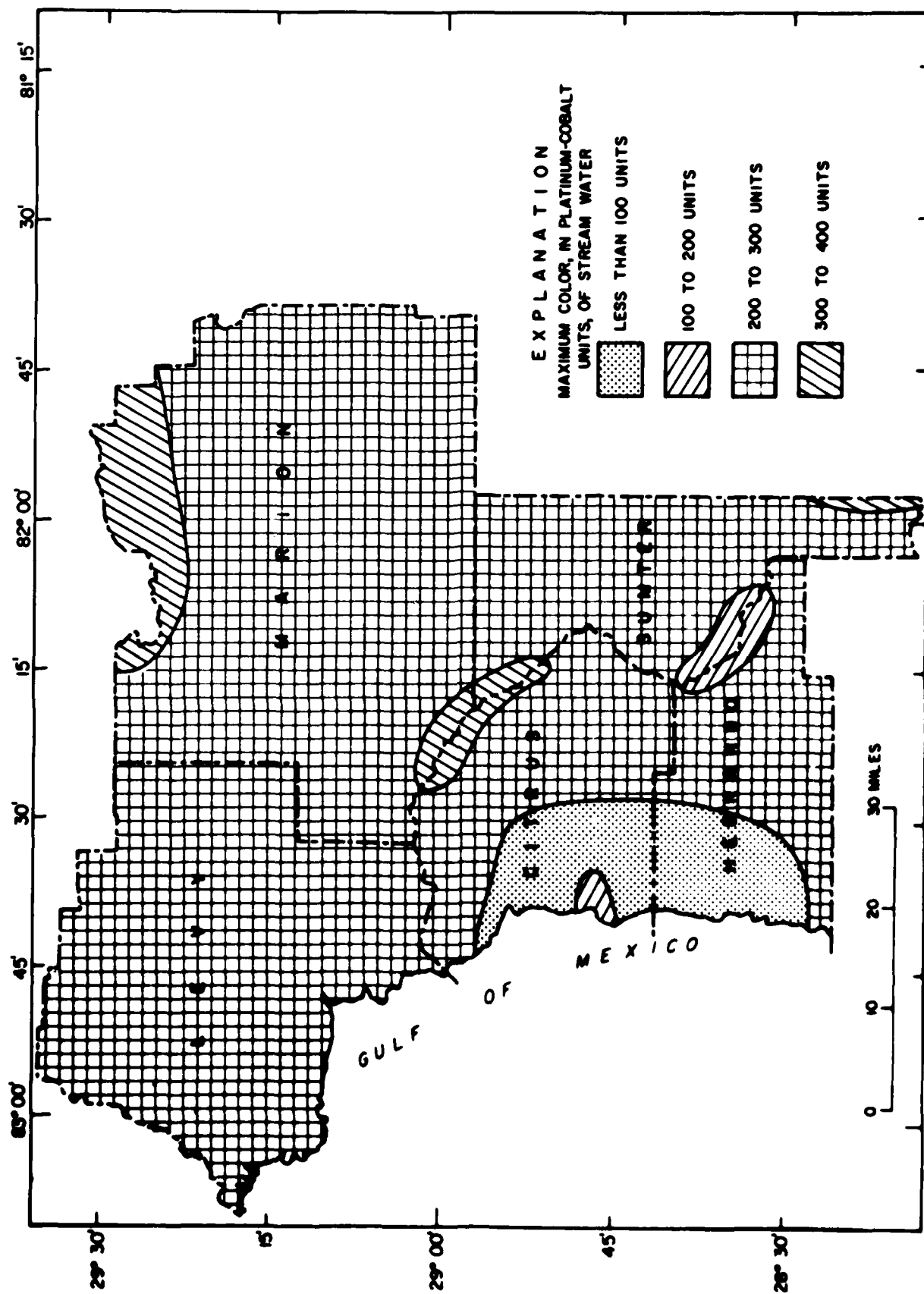


Figure 35.--Maximum color of water in streams (from Kaufman, 1969a).

the pH of the stream water would be about 4 units; a little lower in the presence of decaying vegetation. In limestone areas the carbonate and bicarbonate ions may control the pH of the stream water, causing it to vary from 5 to 9 units, depending on amount of influence of the ions.

The distribution of minimum pH in the study area is shown in figure 36 (Kaufman, 1970). For the large part of the area the pH is 6.0 to 7.0 units or greater. These values reflect the presence of areas where limestone crops out or where significant alkaline ground-water inflow occurs. The southern tip of Sumter County and a small part of the northern area of Marion County have values in the 5.0 to 6.0 unit range, indicating drainage from swamps.

Temperature.--A map of the average annual stream temperature of surface waters is presented by Anderson (1971). For most streams in the study area the average annual temperature varies from 68° to 72°F. Only a very small part of southeast Marion County has average annual stream temperatures in the 72° to 76° range.

Lakes

Lakes Record

The Gazetteer of Florida lakes (Florida Board of Conservation, 1969) lists 803 lakes for the study area. Included are all freshwater lakes named on topographic maps of the U.S. Geological Survey and all unnamed lakes which are 10 acres or more in size. Many of the lakes in the study area are unnamed and few have water-level data.

Listed in table 17 are data for 21 lake stations in the study area where continuous-stage data have been collected. The listing includes the name, number, and location of the station, and the minimum, mean, and maximum observed stages. The locations of these stations are shown in figure 37. Five of the lake-stage stations are on Taala Apopka Lake, parts of which are regulated at different levels.

Stage Fluctuations

The fluctuations of lake stages, or lake levels, are caused by the net effect of hydrologic factors, such as rainfall, evaporation, and surface and subsurface flows, and of man-induced factors, such as pumpage and regulation.

Rainfall in a localized area such as a lake is quite variable and, along with the resulting stormwater runoff, may cause a substantial rise in the lake level. Although the annual evaporation loss from lakes is quite large in the study area it is fairly constant with time and space. Thus the effect of annual evaporation on lake level fluctuations is about the same for all lakes in the general area. Seasonal lake evaporation

Table 17.--Record of lake stations having continuous stage data

Station number	Station name	Latitude	Longitude	Length of record (years)	Daily stage, in feet above NGVD of 1929		
					minimum	mean	maximum
1.	Lake Delancy near Eureka 02236190	29° 25' 30"	81° 45' 40"	8	16.34	18.74	22.28
2.	Lake Kerr near Eureka 02236200	29° 20' 10"	81° 46' 00"	25	19.91	-	27.00
3.	Lake George near Salt Springs 02236210	29° 17' 44"	81° 39' 06"	6	-0.49	0.78	2.90
4.	Nicotoon Lake near Altoona 02238170	28° 59' 22"	81° 43' 25"	2	56.25	-	59.39
5.	Lake Weir at Oklawaha 02238800	29° 02' 30"	81° 55' 40"	38	53.46	56.88	59.53
6.	Neff Lake near Brooksville 02310220	28° 28' 45"	82° 19' 15"	10	85.30	-	101.31
7.	Hunters Lake near Aripeka 02310400	28° 26' 40"	82° 37' 40"	2	18.04	-	19.81
8.	Highlands Lake near Brooksville 02310502	28° 32' 50"	82° 33' 48"	2	16.46	-	19.48
9.	Lake Lindsey near Brooksville 02312520	28° 37' 43"	82° 21' 45"	4	65.00	67.79	70.14
10.	Lake Deaton near Wildwood 02312688	28° 49' 42"	81° 58' 51"	3	61.08	-	63.18

Table 17.--Record of lake stations having continuous stage data--Continued

Station number	Station name	Latitude	Longitude	Length of record (years)	Daily stage, in feet above NGVD of 1929		
					minimum	mean	maximum
11.	Lake Oklahumpka near Wildwood	28°49'45"	82°00'06"	3	55.91	-	58.12
12.	Lake Miona near Oxford	28°54'21"	82°00'19"	2	49.74	-	51.82
13.	Lake Panasoffkee near Lake Panasoffkee	28°49'01"	82°08'40"	18	15.66	40.41	42.47
14.	Little Lake at Floral City	28°44'51"	82°17'17"	5	37.41	39.98	42.16
15.	Tsala Apopka Lake at Floral City	28°45'03"	82°16'49"	21	35.24	40.46	44.21
16.	Tsala Apopka Lake at Moccasin Slough near Inverness	28°49'30"	82°14'40"	1	39.20	-	41.65
17.	Tsala Apopka Lake at Spivey Lake near Inverness	28°49'50"	82°17'30"	1	38.45	-	40.67
18.	Tsala Apopka Lake at Inverness	28°50'39"	82°19'21"	22	36.13	39.17	49.93
19.	Tsala Apopka Lake at Hernando	28°54'08"	82°22'30"	22	34.93	38.07	41.74

Table 17.--Record of lake stations having continuous stage data--Continued

Station number	Station name	Latitude	Longitude	Length of record (years)	Daily stage, in feet above NGVD of 1929		
					minimum	mean	maximum
20. 02313229	Lake Rousseau near Dunnellon	29°00'36"	82°37'00"	17	21.69	27.20	28.00
21. 02313510	Chunky Pond near Bronson	29°23'36"	82°37'19"	11	45.80	-	56.00

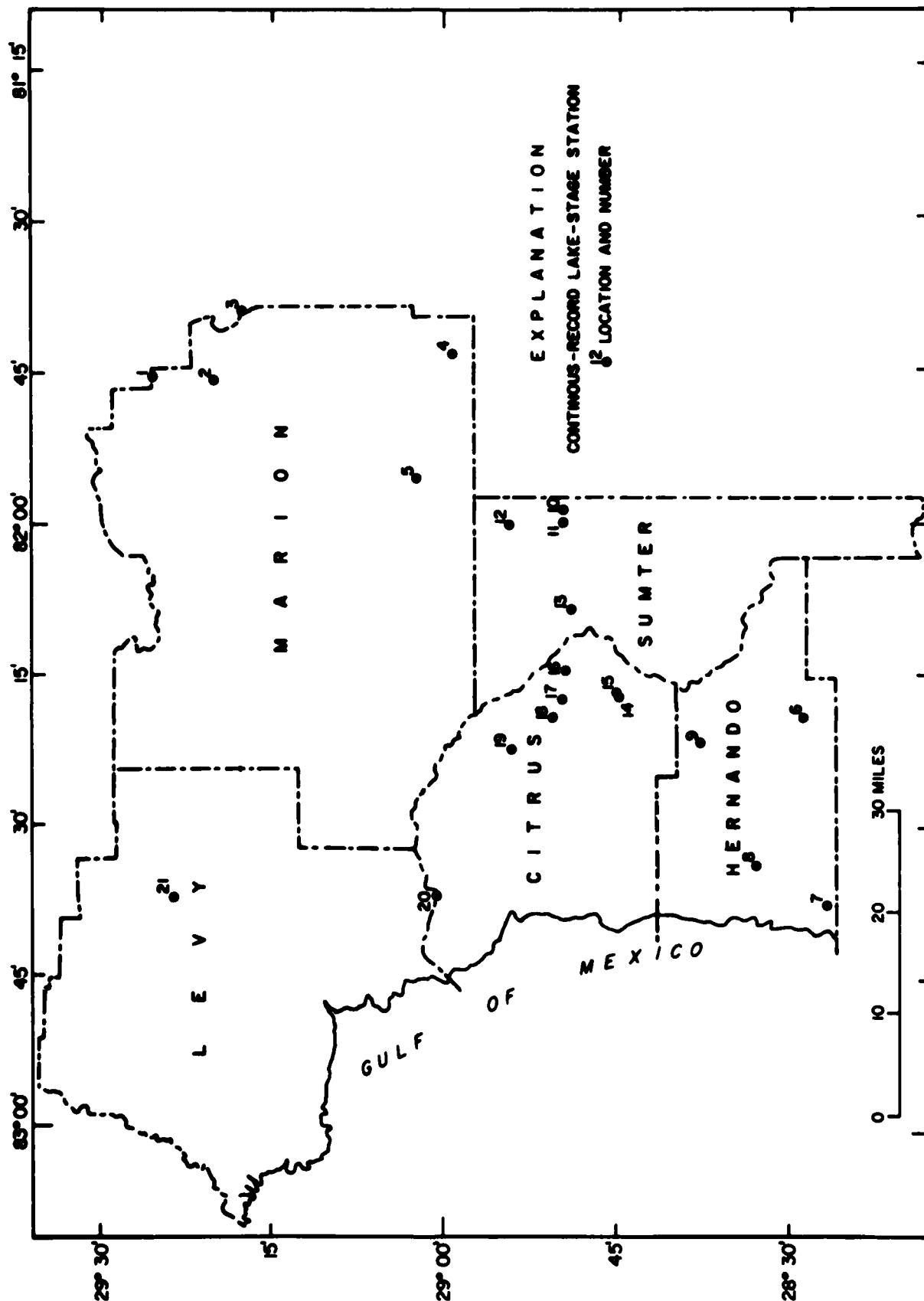


Figure 37.--Locations of lakes having continuous stage data.

is not nearly as constant as annual lake evaporation due to varying hydrologic factors, such as wind speed, temperature, and humidity, throughout the year.

Surface outflow from a nonregulated lake is normally a function of the lake's water level and the size and location of the outlet opening. More water is discharged when lake levels are high and the outlet opening is large. Conversely, both low lake levels and small outlet openings cause less flow to be discharged.

One of the important causes of lake level fluctuations is the interchange of water between lakes and aquifers. This process is controlled by the permeability of the materials in the aquifer system through which the water travels and the difference between the level of the lake and the level of the water in the aquifer system.

Hughes (1974) presents a frequency curve of maximum lake level fluctuations for 110 lakes in Florida having greater than 10 years of records. The curve shows that about 1 percent of the lakes had a maximum fluctuation greater than 25 feet, about 25 percent greater than 10 feet, and 50 percent greater than 8 feet. All lakes studied had a maximum fluctuation greater than about 2 feet.

Stage-duration data for seven lakes having more than 10 years of record are listed in table 18. These data are based on period of record for each station. The range of stage between the 90 and 10 percent exceedance stages are:

	<u>Feet</u>
Lake Kerr	4.5
Lake Weir	2.4
Lake Panasoffkee	2.2
Tsala Apopka Lake at Floral City	2.9
Tsala Apopka Lake at Inverness	2.6
Tsala Apopka Lake at Hernando	2.8

Water Quality

Water-quality data are available for about 50 lakes in the study area. However, for many lakes only one or two grab samples were collected, thereby making the data unsuitable for statistical evaluation. Water-quality data for 12 lakes where analyses for selected constituents and physical characteristics are available from five or more samples are listed in table 19. Three of the lakes listed have more than one sampling site. Only Lakes Kerr, Weir, Panasoffkee, and Rousseau have complete data for all of the selected constituents and characteristics.

Table 18.--Duration table of daily stages for selected lake stations

Station number	Station name	Stage, in feet above NGVD of 1929, that was exceeded for indicated percent of time						
		95	90	75	70	50	25	10
02236200	Lake Kerr near Eureka	20.7	21.2	22.6	22.8	23.6	24.6	25.7
02238800	Lake Weir at Oklawaha	54.7	55.5	56.6	56.7	57.1	57.6	57.9
02312698	Lake Panasoffkee near Lake Panasoffkee	39.0	39.3	39.9	40.1	40.6	41.1	41.5
02312800	Tsala Apopka Lake at Floral City	38.5	39.1	39.9	40.0	40.5	41.3	42.0
02312900	Tsala Apopka Lake at Inverness	37.4	37.8	38.5	38.7	39.3	39.9	40.4
02312950	Tsala Apopka Lake at Hernando	35.8	36.6	37.5	37.8	38.3	38.8	39.4
02311329	Lake Rousseau near Dunnellon	25.9	26.6	27.2	27.5	-	-	-

Table 19.—Summary of water quality data for lakes

Station number	Station name	Maximum temperature (°C)	Maximum specific conductance (micro/cm at 25°C)	Minimum dissolved oxygen (mg/L)	Biochemical oxygen demand 5-day	Maximum concentrations (mg/L)			
						Total as N	Total phosphorus as P	Total carbon as C	
02236200	Lake Kerr near Eureka	31.5	159	0.8	6.9	1.1	0.0	15	
02236330	Big Bass Lake near Starke Ferry	30.0	54	5.3	2.3	-	-	-	
02236800	Lake Weir at Oklawaha	32.5	298	0.6	2.8	1.1	0.0	24	
02240200	Lake Bryant near Silver Springs	31.0	111	-	-	-	-	-	
02240400	Mud Lake near Salt Springs	30.6	670	-	-	-	-	-	
02310220	Woff Lake near Brooksville	34.0	640	0	-	-	-	-	
02312320	Lake Lindsey near Brooksville	32.0	58	-	-	-	-	-	
02312696	Lake Panasoffkee near Lake Panasoffkee	32.5	400	-	-	-	-	-	
02312800	Teala Apopka Lake at Floral City	34.0	310	-	-	-	-	-	
02236200	Lake Kerr near Eureka	31.5	159	0.8	6.9	1.1	0.0	15	
02236330	Big Bass Lake near Starke Ferry	30.0	54	5.3	2.3	-	-	-	
02236800	Lake Weir at Oklawaha	32.5	298	0.6	2.8	1.1	0.0	24	
02240200	Lake Bryant near Silver Springs	31.0	111	-	-	-	-	-	
02240400	Mud Lake near Salt Springs	30.6	670	-	-	-	-	-	
02310220	Woff Lake near Brooksville	34.0	640	0	-	-	-	-	
02312320	Lake Lindsey near Brooksville	32.0	58	-	-	-	-	-	
02312696	Lake Panasoffkee near Lake Panasoffkee	32.5	400	-	-	-	-	-	
02312800	Teala Apopka Lake at Floral City	34.0	310	-	-	-	-	-	
02312900	Teala Apopka Lake at Inverness	34.0	420	-	-	-	-	-	
02312950	Teala Apopka Lake at Hernando	33.0	305	-	-	-	-	-	
02313310	Chunky Pond near Bronson	36.5	360	2.1	-	-	-	-	
284535082034701	Lake Panasoffkee at I-74 Crossing	27.5	418	2.0	4.2	1.13	.12	22	
284735042070401	Lake Panasoffkee near Coleman Landing	32.-	350	6.9	2.-	1.-	.00	20	
290146082333600	Lake Rousseau near Dunnellon	31.0	330	3.0	3.1	0.9	0.1	17	
290230082301500	Lake Rousseau near Dunnellon	31.0	295	2.4	1.9	.71	.06	36	
290247082293300	Lake Rousseau near Dunnellon	27.0	298	1.2	3.6	.71	.06	19	
292502082531000	Lake Oklawaha near Orange Springs	25.0	465	4.5	-	-	-	-	

Specific Lake Studies

Detailed studies have been completed for five lakes in the study area (fig. 2). These include Lake Rousseau, Tsala Apopka Lake, and Lake Panasoffkee in the Withlacoochee River basin; Lake Kerr in northeast Marion County; and Lake Ocklawaha on the Ocklawaha River in north Marion County.

Lake Rousseau.—Lake Rousseau is on the Withlacoochee River, west of Dunnellon, on the boundaries of Levy, Citrus, and Marion Counties. It is an impoundment formed by the Inglis dam that was completed in 1909. The lake is about 11 miles long and has a surface area of 6.3 mi². It contains many floating and rooted plant species and appears to be in a state of advanced eutrophication. According to German (1978) the average flow through the dam for the period 1971-76 was about 1,400 ft³/s.

Inflow to the lake is made up of the flows of the Withlacoochee River above Holder and of Blue Run, a tributary, which originates at Rainbow Springs. Flow-duration curves for inflows to the lake, Blue Run, and Withlacoochee River near Holder are shown in figure 38. During high-flow periods most of the inflow to Lake Rousseau is from the Withlacoochee River; however during periods of low flow most of the inflow is from Blue Run.

Waters in Lake Rousseau, Blue Run, and Withlacoochee River are calcium bicarbonate type. German (1978) showed that specific conductance for 90 percent of the water samples collected upstream of the lock and the dam were within the range of 190 to 320 umho/cm at 25°C. Saltwater from the Gulf of Mexico is present in the canal below the lock.

Lamonds and Merritt (1976) computed the following nutrient budget for Lake Rousseau for 1975:

	<u>Nitrogen, in tons</u>	<u>Phosphorus, in tons</u>
Withlacoochee River	285	15
Blue Run	281	22
Rainfall	22	1.2
Total inflow	588	38.2
Total outflow	504	41.8
Excess inflow	84	-3.6

They concluded that the net retention of nitrogen in the lake was probably due to uptake by the prolific aquatic plant community and that the gain in phosphorus in the lake may indicate the existence of an unmeasured source such as ground-water seepage into the east part of the lake, or

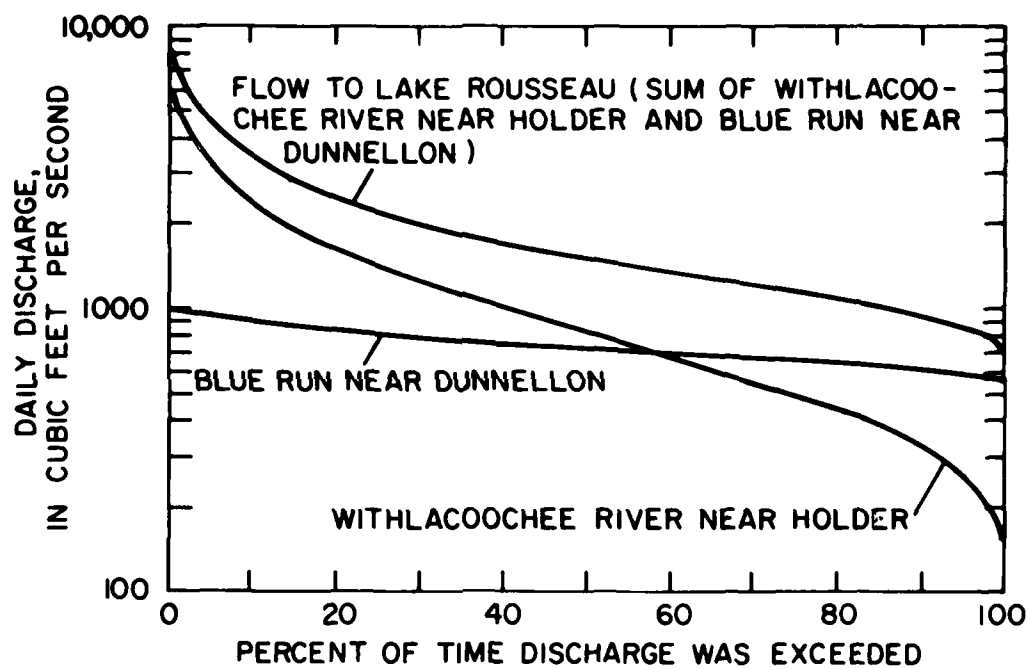


Figure 38.--Flow-duration curves for Lake Rousseau, Blue Run, and Withlacoochee River, 1966-76 (from German, 1978).

more likely, release of phosphorus from the thick layer of organic debris on the lake bottom. They further indicated that concentrations of constituents such as toxic metals and pesticides in Lake Rousseau are low enough that no problems related to these substances exist.

Tsala Apopka Lake.--Tsala Apopka Lake is in eastern Citrus County, near the Withlacoochee River. The lake is not a continuous expanse of open water, but a series of shallow, interconnected lakes, ponds, and marshes. Flow is not channelized sufficiently to permit measuring. Therefore, an accounting of the surface flow is not feasible.

According to Rutledge (1977) the specific conductance of water in the lake decreases northward. The 10-year average specific conductance is 191 $\mu\text{mho/cm}$ at 25°C at Floral City, 150 $\mu\text{mho/cm}$ at 25°C at Inverness, and 139 $\mu\text{mho/cm}$ at 25°C at Hernando.

Lake Panasoffkee.--Lake Panasoffkee is in Sumter County, east of the Withlacoochee River. The lake is about 6 miles long, about 1.5 miles wide at its widest point, and has a surface area of 7.5 mi^2 . The drainage basin area is 420 mi^2 , but because of karstic terrane only 60 mi^2 contribute surface runoff.

The stage-duration curve presented by Taylor (1977) based on data collected from 1966 through 1973, after the Wysong Dam was built downstream of the lake, shows that the 10 percent exceedance altitude is about 41.7 feet, the 50 percent exceedance altitude is 40.95 feet, and the 90 percent exceedance altitude is about 40.4 feet.

According to Taylor (1977) an estimate of the annual water balance is:

	<u>Cubic feet per second</u>
Rainfall onto the lake	29
Surface-water inflow	44
Net ground-water inflow	<u>160</u>
Total	233
Surface-water outflow	207
Evaporation from lake	<u>26</u>
Total	233

Taylor (1977) also states that the quality of the lake water does not exceed standards recommended for public supplies by the National Academy of Sciences and National Academy of Engineering (1973). The water is moderately hard and slightly colored from tannins. Dissolved solids concentrations are less than 200 mg/L, hardness concentrations less than 12.5 mg/L, and chloride concentrations 10 mg/L or less.

Lake Ocklawaha.--A study was completed by an Interagency Federal Task Force and private consultants (Gardner and others, 1972) which assessed the environmental impacts of continuous flooding on the forest of the Ocklawaha River floodplain. Little hydrologic data were presented and analyzed.

Lake Kerr.--Lake Kerr is in northeast Marion County. It has a surface area of about 4 mi² and a drainage area of about 60 mi². The lake, which has no surface-water outflow, occupies an irregularly shaped depression that probably was formed by subsidence of the land surface resulting from dissolution of limestone below the surface.

An annual water balance analysis for the lake was calculated by Hughes (1974) for the period 1962-69. Annual rainfall averaged 54 inches while annual lake evaporation was estimated to average about 46 inches. The net ground-water flow was calculated to be 12 inches out of the lake. Therefore the surface-water inflow required to maintain the balance was 4 inches per year.

Springs

Springs Record

The study area has several springs whose average discharge exceeds 100 ft³/s. These include: Chassahowitzka, Crystal River, and Homosassa Springs in Citrus County; Weekiwachee Springs in Hernando County; Fannin and Manatee Springs in Levy County; and Rainbow, Silver Glen, and Silver Springs in Marion County.

All known springs in the study area having average discharge greater than 1 ft³/s are listed in table 20. Also included are selected water-quality data and discharges. Locations of these springs and identifying numbers are shown on the map in figure 39. The data for table 20 were taken from Rosenau and others (1977).

Twenty-seven of the springs are located along the coast of Citrus and Hernando Counties; the remaining 19 springs are scattered across Levy, Marion, Sumter, and eastern Citrus Counties.

Discharge

Two springs in the study area have had maximum discharges which exceeded 1,000 ft³/s--Silver Springs with a maximum of 1,290 ft³/s and Rainbow Springs with a maximum of 1,230 ft³/s. Both are located in Marion County. Ten springs have had a maximum discharge between 100 and 1,000 ft³/s, two in Citrus County, three in Hernando, three in Levy County, and two in Marion County.

Continuous data are available for Silver Springs and Rainbow Springs. The range of discharges for both is quite small, 539 to 1,290 ft³/s for

Table 20.—Record of selected springs

Spring No.	Spring name	Latitude	Longitude	Period of record	Minimum and maximum of variable					
					Discharge (ft ³ /s)	Temperature (°C)	Dissolved solids (mg/L)	Specific conductance (µmho/cm)	Hardness as CaCO ₃ (mg/L)	Chloride (mg/L)
Citrus County										
1	Blue Spring	28°58'09"	82°18'52"	1932-75	11.1/19.6	23.0/24.5	164/-	302/-	150/-	6.0/-
2	Chassebawitzka Springs	28°42'54"	82°34'35"	1946-72	31.8/197	22.2/26.0	289/771	470/1,370	160/260	53/320
3	Crab Creek Spring	-	-	1961-62	20/40	-	-	-	-	-
4	Crystal River Springs	28°53'1-	82°35'1-	1975	-	25.0/-	460/-	555/-	160/-	180/-
5	Homoassa Springs	28°47'58"	82°35'20"	1931-74	113/294	23.5/23.5	1,530/-	2,370/3,740	320/480	640/1,100
6	Potter Spring	28°43'54"	82°35'48"	1961	22/-	-	-	-	-	-
7	Ruth Spring	28°43'57"	82°35'48"	1964-72	6.56/11.8	23.0/23.5	564/691	300/1,610	240/248	240/370
8	Salt Creek Springs	-	-	1961	-	23.9/-	-	6,500/-	-	1,900/-
9	Unnamed Springs	-	-	1961	20/-	-	-	-	-	-
Hernando County										
1	Blind Springs	28°39'1-	82°38'1-	1961-64	28.4/139	23.5/-	-	25,600/-	3,060/-	9,200/-
2	Boat Springs	28°26'21"	82°39'29"	1962-64	1.5/6.0	24.0/-	174/-	268/295	120/130	12/21
3	Bobhill Springs	28°26'07"	82°38'34"	1961-72	2.00/4.43	24.0/-	217/221	210/246	3/110	4.0/7.5
4	Little Springs	28°30'49"	82°34'51"	1962-75	7.8/14.7	23.5/24.5	168/-	260/286	140/150	4.0/6.0
5	Mud Springs	28°32'1-	82°37'1-	1960-75	83.1/128	20.5/-	-	23,000/-	-	8,000/-
6	Salt Spring	28°32'46"	82°37'09"	1961-75	24.7/38.9	24.0/25.0	2,180/-	1,800/6,430	15/440	490/1,900
7	Unnamed Spring 1	28°26'1-	82°39'1-	1962	5+/-	-	-	-	-	-
8	Unnamed Spring 2	28°27'1-	82°38'1-	1960	1+/-	24.0/-	-	176/-	90/-	5.0/-
9	Unnamed Spring 3	28°31'1-	82°37'1-	1962	1.5+/-	-	-	-	-	-
10	Unnamed Spring 4	28°31'1-	82°37'1-	1962	10+/-	-	-	5,500/-	-	1,600+/-
11	Unnamed Spring 5	28°31'1-	82°37'1-	1962	12+/-	-	-	5,000/-	-	1,500+/-
12	Unnamed Spring 6	28°32'1-	82°37'1-	1960	5+/-	-	-	8,500/-	-	2,700+/-
13	Unnamed Spring 7	28°39'1-	82°38'1-	1961	50+/-	-	-	-	-	-
14	Unnamed Spring 8	28°40'1-	82°38'1-	1961	40+/-	24.0/-	-	19,000/-	-	6,400+/-
15	Unnamed Spring 9	28°41'1-	82°35'1-	1961	30.1/-	23.5/-	-	650/-	-	110+/-
16	Unnamed Spring 10	28°41'1-	82°36'1-	1961	5+/-	23.5/-	-	12,900/-	1,550/-	4,300/-
17	Unnamed Spring 11	28°41'1-	82°36'1-	1961	5+/-	22.0/-	-	11,400/-	1,360/-	3,700/-
18	Unnamed Spring 12	28°41'1-	82°36'1-	1961	9.1/-	24.0/-	-	7,060/-	2,150/-	2,120/-
19	Weeki Wachee Springs	28°31'00"	82°31'00"	1917-74	101/275	21.5/24.0	159/180	262/284	140/150	4.0/8.0

Table 20.--Record of selected springs--Continued

Spring No.	Spring name	Latitude	Longitude	Period of record	Discharge (ft. ³ /s)	Temperature (°C)	Minimum and maximum of variable				
							Dissolved solids (mg/L)	Specific conductance (umho/cm)	Hardness as CaCO ₃ (mg/L)	Chloride (mg/L)	
Levy County											
1	Big Spring	-	-	-	-	-	-	-	-	-	-
2	Blue Spring	29°27'02"	82°41'57"	1917-74	4.5/22.0	23.0/23.5	-	175/550	87/-	3.5/-	-
3	Panmin Springs	29°35'15"	82°56'08"	1930-73	90*/170*	22.0/23.0	200/-	330/357	170/180	1.0/4.5	-
4	Little Spring	-	-	-	-	-	-	-	-	-	-
5	Manatee Spring	29°29'22"	82°58'37"	1932-73	110/238	22.0/23.0	235/-	390/413	210/220	4.0/5.1	-
6	Wakiva Springs	29°16'49"	82°39'23"	1917-74	29/100	23.5/-	90/-	156/-	79/-	3.0/-	-
Marion County											
1	Blue Spring	29°30'51"	81°51'25"	1935	10.6/-	-	-	-	-	-	-
2	Pera Hammock Springs	29°11'00"	81°42'29"	1935-72	11.6/19.9	21.5/-	63/-	110/-	48/-	4.3/-	-
3	Juniper Springs	29°11'01"	81°42'46"	1931-72	.5*/16.8	22.0/-	68/-	110/-	52/-	5.0/-	-
4	Orange Springs	29°30'38"	81°56'38"	1972	7.59/-	24.0/-	169/-	280/-	130/-	6.0/-	-
5	Rainbow Springs	29°06'08"	82°26'16"	1899-1974	487/1,230	22.0/25.5	82/-	121/145	63/73	3.0/3.5	-
6	Salt Springs	29°21'00"	81°43'58"	1924-72	54.0/107	24.0/-	5,210/5,850	6,500/9,330	1,000/1,300	1,900/2,800	-
7	Silver Glen Springs	29°14'43"	81°38'37"	1931-72	90/129	22.8/23.0	1,400/-	2,220/2,480	340/410	520/610	-
8	Silver Springs	29°12'57"	82°03'11"	1932-74	53*/1,290	22.5/24.5	237/274	40/420	210/220	7.7/8.0	-
9	Sweetwater Springs	29°13'07"	81°39'36"	1963	-	21.5/-	-	4,300/-	-	1,250/-	-
10	Wilson Head Spring	28°58'40"	82°19'08"	1972	2.4/-	23.5/-	189/-	300/-	150/-	6.0/-	-
Sumter County											
1	Penny Springs	28°47'42"	82°02'19"	1947-72	4.66/95.5	20.0/-	175/-	230/-	120/-	1.2/0	-
2	Cum Springs	28°57'31"	82°13'54"	1932-72	11.1/85.8	23.0/24.5	208/-	358/-	150/-	5.0/-	-

* Discharge value estimated.

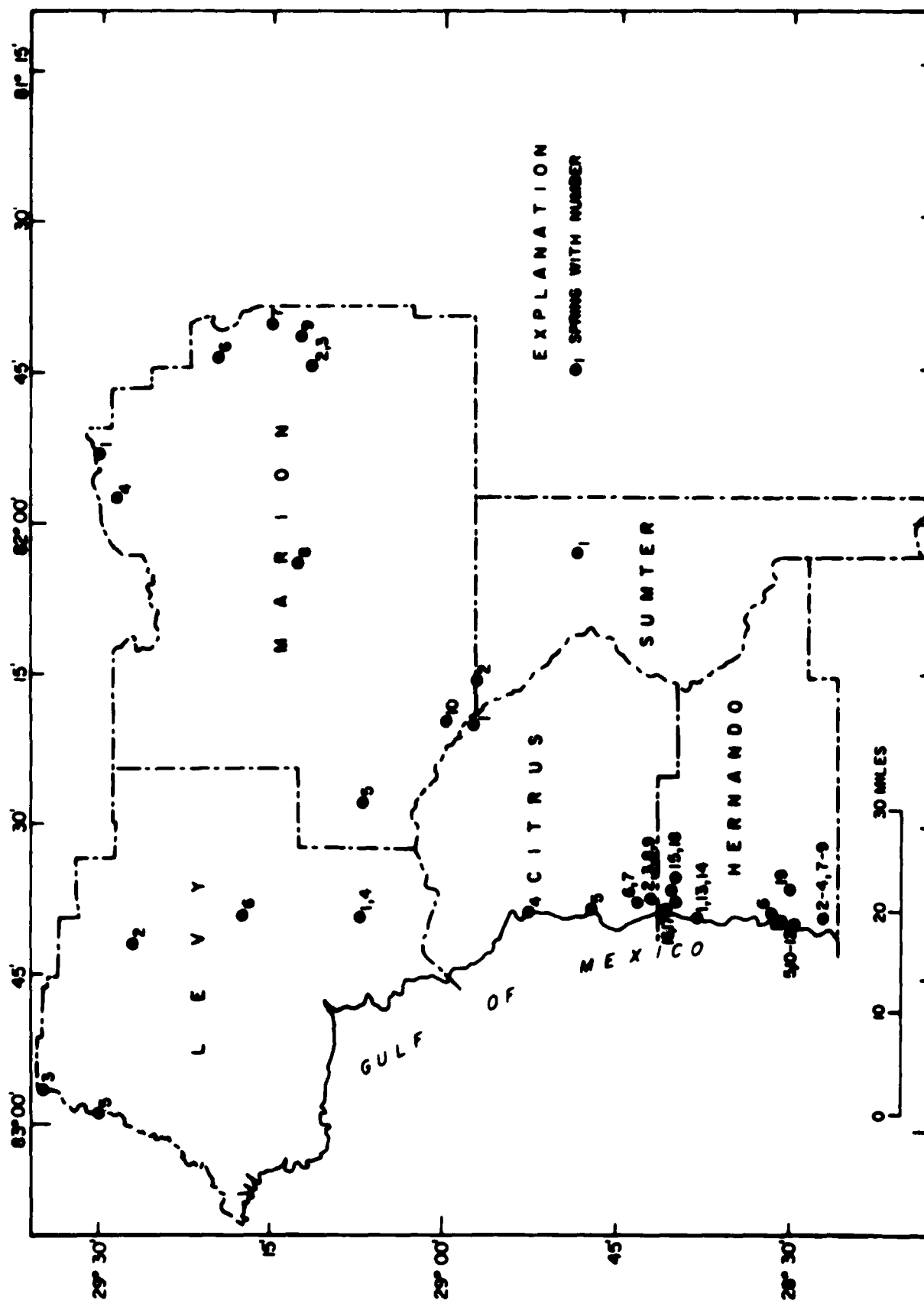


Figure 39.--Locations of springs with discharge greater than 1 cubic foot per second.

Silver Springs and 487 to 1,230 ft³/s for Rainbow Springs. Flow duration data are listed in table 16 for both springs. For Silver Springs the difference between the 10 percent exceedance and 90 percent exceedance values is only 350 ft³/s. For Rainbow Springs the difference is 280 ft³/s. The median discharge for Silver Springs is 790 ft³/s, and for Rainbow Springs, 700 ft³/s.

Quality

The predominant chemical type of spring waters in the study area is calcium and magnesium bicarbonate, due to the dissolution process of the carbonate rocks (limestones and dolomites). Springs of this chemical type are found in all the counties (Slack and Rosenau, 1979). Springs near the coast and St. Johns River are of the sodium chloride type because of saltwater intrusion or saline residues from earlier invasions of the sea. Some mixed type springs (spring water which lacks a prevalent constituent) are present in coastal Citrus and Hernando Counties (Slack and Rosenau, 1979).

The water quality of springs in the study area is relatively constant with respect to time. However, a few saline springs have concentrations of chloride that fluctuate widely because of the variations in the mixing of freshwater and saline water that contribute to the springs.

Spring waters are usually free of color and turbidity because of the filtering and absorbing action of the soil and aquifer materials that the water passes through. Some springs may have turbid or organic brown-colored water due to the recharging of the aquifer by turbid, brown "swamp" water in proximity of the spring. Springs with relatively high concentrations of dissolved solids may have a whitish, cloudy appearance, possibly the result of the precipitation of calcium carbonate from rapid pressure or temperature changes. The bluish appearance of some springs is characteristic of water in large volumes and is not necessarily caused by impurities.

Surface-Water Modeling

There have been two studies involving surface-water modeling, one on estuarine water quality (Seaburn and others, 1979) and one on riverine waste-assimilative capacity (Lamonds and Merritt, 1976).

The estuarine model was developed for two-dimensional, steady-state, intertidal conditions to simulate longitudinal and lateral variations in concentrations of both conservative and nonconservative substances. The basis of the model is the general equations that express the law of conservation of mass. Simulated concentrations of substances are averages over one-half of a mixed tide cycle.

Time-averaged input data of all types are required because of the steady-state nature of the model. The model assumes cross-sectional uniformity of flow and velocity data. The use of average concentration values in the model for each reach requires water-quality measurements to be averaged not only in cross section but also along the length of each reach.

Two estuaries in the study area were modeled, Crystal River and Homosassa River, both in Citrus County. Constituents simulated were dissolved oxygen, carbonaceous biochemical oxygen demand, total Kjeldahl nitrogen, and chloride.

The model was calibrated for each estuary, but because of limited resources and because the study was designed for evaluation purposes, the calibration parameters were not verified. Sensitivity analyses involving model parameters, such as dispersion coefficient, decay rates, photosynthesis, and respiration were made. Caution should be used in utilizing this model as the model was designed for use with a diurnal tide, not a mixed tide such as occurs in the Gulf of Mexico adjacent to Citrus County.

The second study, pertaining to the waste-assimilation capacity of riverine environments, modeled the downstream reaches of both the Withlacoochee and Oklawaha Rivers.

The model is based primarily on the Streeter-Phelps oxygen-sag equation. It is a steady-state model, utilizing a one-dimensional system with constant streamflow. The input parameters are constant average values for each reach, and include BOD decay rate, background BOD, net productivity, reaeration rate, channel width and depth, temperature, and velocity of flow.

Two sets of data were used to calibrate the Oklawaha River model and one data set was used to calibrate the Withlacoochee River model. No mention is made of verifying the model, even though two data sets were available for the Oklawaha River. Sensitivity analyses were performed by calculating the change in dissolved oxygen caused by changes in BOD concentrations, net productivity, and reaeration rate.

Results of the modeling indicated that in the natural, high-velocity reaches of the rivers, the factor having the greatest influence on dissolved oxygen concentration is reaeration. In the slow-moving reaches of the rivers, such as in the Oklawaha River near Moss Bluff and in Lakes Ocklawaha and Rousseau, reaeration and productivity are major factors controlling dissolved oxygen concentration.

AREAS OF TECHNICAL NEEDS

Water Use

Analysis of Recent Water-Use Data

The accuracy of water-use data has improved in recent years, reflecting a refinement in the sampling and data collection process. Therefore, the data presented for 1977 by Leach and Healy (1980) may be upgraded with more complete and more accurate 1978 and 1979 data currently being assembled for publication.

Ground-Water Source Delineation

Ground-water sources account for 97 percent of freshwater withdrawals in the region. Therefore, it would augment the usefulness of the water-use estimates if ground-water withdrawals were subdivided into surficial (water table) aquifer and artesian (Floridan) aquifer sources. This delineation would indicate the dependence on each source of water.

Irrigation Application Rates

Irrigation is a significant use of freshwater in the region. Present irrigation water-use figures would be more useful if they showed rates of application by crop type and irrigation method. This would provide the data needed to evaluate the effect on water use of crop rotation, change in total crop acreages, and changes in the type of irrigation system utilized.

Limerock-Mining Water Use

Self-supplied industrial water use, and specifically water use for limerock mining, has been shown to be singularly the most significant freshwater use in the Withlacoochee River region. A more detailed regional assessment of this type of water use would improve the accuracy of the total freshwater use figures.

Industrial Water-Use Rates

Because industrial water use is a major use of freshwater in the region, it would be beneficial to delineate industrial water use by a more detailed breakdown of industrial use categories, such as the Standard Industrial Classification product codes (Florida Chamber of Commerce). Then water-use rates could be derived for items produced or services rendered. For instance, water use for food products could be further delineated as dairy products, or more specifically, as a creamery butter product with water use presented per pound of butter produced. Water-use figures in this form would be more usable for predicting the impact of industry expansion in the region.

Water Consumption

To fully determine the impact of water withdrawals, the disposition of the withdrawn water needs to be known. This consists of determining quantities returned to the source, quantities recharged to another usable source, and quantities actually consumed. A pilot project could be developed to estimate these quantities for a specific segment of a use category. This estimate could then be extrapolated to predict the disposition of water withdrawn for the total use category.

Ground-water Resources

Hydraulic Characteristics of the Floridan Aquifer

Few transmissivity, storage, and leakance values for the Floridan aquifer have been documented in the literature. Some effort should be directed into properly designing, performing, and analyzing multi-well aquifer tests. These data would be very useful if detailed digital modeling is attempted for the area.

Evaluation of the Surficial and Secondary Artesian Aquifers

Probably the most needed work concerning the ground-water resources of the area is an evaluation of the surficial and secondary artesian aquifers. Needs include: delineation of where the aquifers occur; description of their lithology; determination of their hydraulic properties such as transmissivity, storage coefficient, vertical hydraulic conductivity, and connection with the underlying Floridan aquifer; water-level fluctuations; and the quality of their waters.

Analysis of Water-Rich Areas

The Withlacoochee River region has several water-rich areas including Rainbow Springs, Silver Springs, and Tsala Apopka Lake. An appraisal would be useful concerning the effects of heavy withdrawals, both ground water and surface water, on these areas. If the relation between withdrawal and effects on these resources are not linear, then some optimum development might be determined.

Effects of Mining on the Water Resources

Limerock mining uses large amounts of self-supplied water in Hernando and Sumter Counties (table 7). Little is known about the effects that mining is having on the ground-water and surface-water resources, and perhaps most important, on water quality.

Surface-water Resources

Time of Travel

No data were found pertaining to the traveltime of water in the streams of the Withlacoochee River region. Although discharge measurements have an associated mean velocity, it may not relate to traveltime because discharge measurements are often made at contracted channel sections such as bridges. Dye studies can be used to determine travel times at various frequencies of discharge. Results of time-of-travel studies would allow estimating when accidental or detrimental spills would appear at various points along the course of a stream. The results are also needed if water-quality modeling of the streams is to be done.

Flow Routing

Step-backwater analyses have been made on the lower Withlacoochee River from the Marion County-Sumter County line downstream to Lake Rousseau. Flow routing, or flood routing, has not been studied for the streams of the Withlacoochee River region. Such a study would determine the effects of flooding and areas of inundation.

Quality Modeling

Only one report on riverine modeling was found (Lamonds and Merritt, 1976). It covered the lower Withlacoochee and lower Oklawaha Rivers, utilizing a dissolved oxygen steady-state model. Modeling the full courses of the two rivers, especially the Withlacoochee River, would lead to better understanding of the movement of conservative substances under flood conditions and the waste-assimilative capacity under base-flow conditions.

Water-quality Data Pertaining to Public Supplies

Nearly all of the water-quality data collected in the Withlacoochee River region are of the major-ion type. Little data, if any, have been collected concerning pesticides (insecticides and herbicides), phenolic compounds, polychlorinated biphenyls, and heavy metals. A program for analyzing these constituents in the water and the sediments would delineate the areal extent and concentrations of these compounds.

Effects on Surface-Water Resources Due to Ground-Water Pumpage

Concentrated, heavy pumpage of ground water can affect the surface-water resources, such as by lowering lake levels, reducing spring discharges, and reducing streamflow. In many places, such as Silver Springs and Tsala Apopka Lake, the lakes and springs have economic, recreational,

and hydrologic connotations. In places of expected large withdrawals, an analysis of pumping effects on surface water would alert the user to possible undesirable impacts.

Stage Data for Lakes

Relatively few lakes have data available on stage. Most available data are either continuous (daily interval) or periodic. Although continuous records offer the most precise and the largest amount of data, much meaningful data could be assembled through a program of maximum and minimum, or range of stage, collection. The program might consist of establishing gages which record maximum stage and minimum stage at numerous lakes either in a study area or political area. Several years of such data collection would be needed before analyses such as frequency or correlation could be attempted. But the availability of this type of data would be most valuable.

Relation Between Lake and Aquifer Water Levels

Some work has been completed on the relation, or response, between lake water levels and aquifer water levels in the State, but none in the study area. A study of this sort would indicate the connection between the ground water (artesian and surficial aquifers) and the lake body. This information would also help to evaluate the effect of large ground-water withdrawals on lakes.

Quality of Water in Lakes

Little water-quality data other than major ions are available for lakes. A systematic program of collecting water-quality data relating to eutrophication and effects of man's activities would provide information on the stage of eutrophication of the lakes, and as data are collected through time, trends or changes in water quality.

Precise Inventory of Lakes

An inventory of lakes has been assembled but the collection of additional information, such as mean depth, discharge, water-surface elevation, and water-quality characteristics, as well as descriptions and photographs would provide data valuable in studies of water quality and surface water-ground water relations.

Water Quality of Springs

A compilation of springs has been completed that includes their location, description, discharge, and one or more analyses of water quality. No attempt has been made to determine the range of concentrations of various constituents. A detailed study of the range of water quality constituents in spring flow would be useful in a study of surface water-ground water quality relations.

Discharge of Springs

The discharge of a spring is a function of the gradient of the potentiometric surface near the spring. Analytical calculations made to relate spring discharges to the gradient could be used to estimate spring discharges at ungaged sites.

SUMMARY

Information on the water resources of the Withlacoochee River region, the counties of Levy, Marion, Citrus, Sumter, and Hernando, have been summarized in this report. All known reports on the water resources were consulted and are referenced in the bibliography. No new data were collected, but computer files were searched and their data summarized.

Daily water use in the Withlacoochee River region averaged 2,005 Mgal/d in 1977. Of this total, 94 percent was saline-surface water used in thermoelectric power-generation cooling.

Most freshwater withdrawn, 73 percent, is used for industrial and irrigation purposes. Other uses of freshwater include rural domestic, public supply, livestock, and thermoelectric power generation.

Hernando County is the largest user of freshwater, 43.4 Mgal/d, followed by Marion County with 34.2 Mgal/d. The largest per capita user of freshwater is also Hernando County, using more than 1,300 gallons per person per day. Second in per capita use is Sumter County with more than 1,000 gallons per person per day.

The ground-water system is comprised of up to three different aquifers--the surficial, the secondary artesian occurring within the confining beds, and the Floridan.

The surficial aquifer is composed of undifferentiated clastic deposits of fine-to-coarse quartz sand and varying amounts of clay and shell. Its thickness is as much as 300 feet. Little information is known about the hydraulic characteristics, water levels, or water quality within the surficial aquifer.

The secondary artesian aquifer has not been documented, but may exist within the confining bed that separates the surficial and Floridan aquifers in areas where the bed is more than 50 feet thick.

The Floridan aquifer consists mostly of limestones and dolomites and is as much as 1,500 feet thick in some localities. Transmissivities have been documented to be as high as 25 million ft²/d. Yields from 12-inch wells can exceed 2,000 gal/min.

The potentiometric surface of the Floridan aquifer responds to hydrologic variables such as rainfall and evaporation, hydraulic

characteristics of the aquifer, and physiographic features. The fluctuation of the surface is small near the coast and ranges up to about 10 feet near Ocala, and up to about 20 feet in southern Hernando County. The average level of the potentiometric surface has not changed significantly in the area since the 1930's when data were first collected.

The quality of water from the Floridan aquifer within the study area is excellent except near the gulf coast and in northeast Marion County where salty water is a problem. Iron and hydrogen sulfide are problems in places but can be solved through proper well design and aeration of the water.

A summary of wells lists more than 1,000 wells in the five county area. Included in the listing are location, characteristics, owner of the well, primary use of the water, and the aquifer tapped by the well.

A summary of continuous-record streamflow-gaging stations was also made. The inventory includes 43 stations, some presently discontinued. Statistics on stage and discharge are part of the inventory.

Monthly mean and flow duration discharges were calculated and tabulated for all stations in the study area having more than 10 years of discharge record.

The predominant chemical type for streams in the study area is calcium and magnesium bicarbonate resulting from the relation between the water and the carbonate terranes of the Floridan aquifer. Sodium chloride type water is present along the coastal areas of Levy and Citrus Counties and along part of the east boundary of Marion County near the St. Johns River.

Most of the streams in the area have dissolved-solids concentrations of between 100 and 200 mg/L, specific conductance between 250 and 750 μ mho/cm, and total nitrogen concentrations of less than 1.2 mg/L.

A summary of 21 lakes having continuous stage data was made. Stage duration tables for six lakes, those having more than 10 years of data, show that the range of stage between the 90 and 10 percent exceedance stages is as great as 4.5 feet and as little as 2.2 feet.

Water-quality data are available for about 50 lakes in the study area. But only four lakes have five or more analyses for the important constituents of biochemical oxygen demand, total nitrogen, total phosphorus, and total carbon.

Forty-six springs whose average discharge was greater than 1 ft³/s were also recorded. Spring discharge has been gaged for Silver Springs and Rainbow Springs. The flow-duration data show a difference between the 10 percent exceedance and 90 percent exceedance values of only 350 ft³/s for Silver Springs, and only 280 ft³/s for Rainbow Springs.

The water quality of springs is relatively constant with time. The predominant chemical type is calcium and magnesium bicarbonate due to the dissolution of the carbonate rocks.

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