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WATER-RESOURCES INFORMATION FOR THE WITHLACOOCHEE RIVER REGION,--ETC(U)
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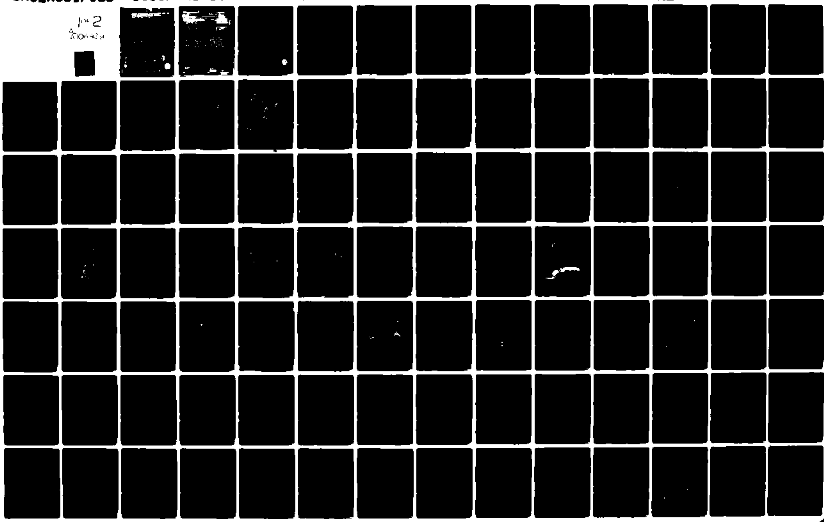
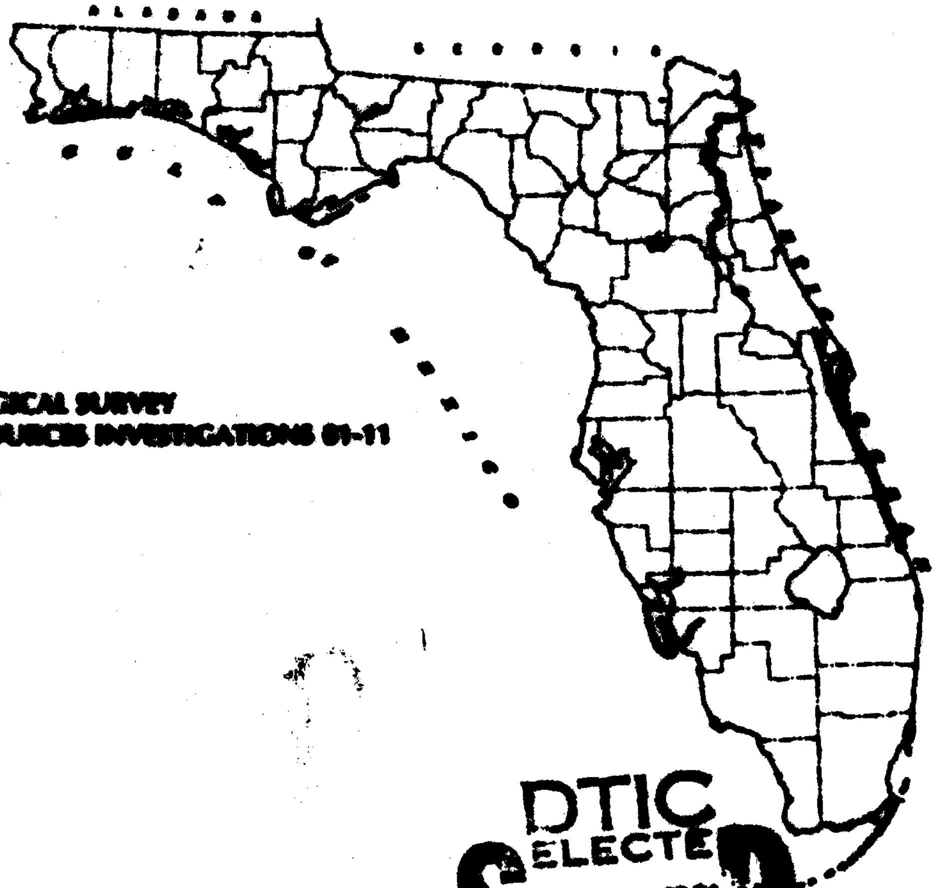


# WATER-RESOURCES INFORMATION FOR THE WITHLACOOCHEE RIVER REGION, WEST-CENTRAL FLORIDA





U.S. GEOLOGICAL SURVEY
WATER-RESOURCES INVESTIGATIONS 81-11

Prepared in cooperation with the
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# 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

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U.S. GEOLOGICAL SURVEY

Water-Resources Investigations 81-11

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Tallahassee, Florida

1981

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Doyle G. Frederick, Acting Director

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Tallahassee, FL 32303

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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:

| Multiply inch-pound units | By | To obtain metric (SI) units |
|---|---|---|
| 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:

$$°F = 1.8\ °C + 32$$

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

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## 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 micromhos 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 $mi^2$ 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.

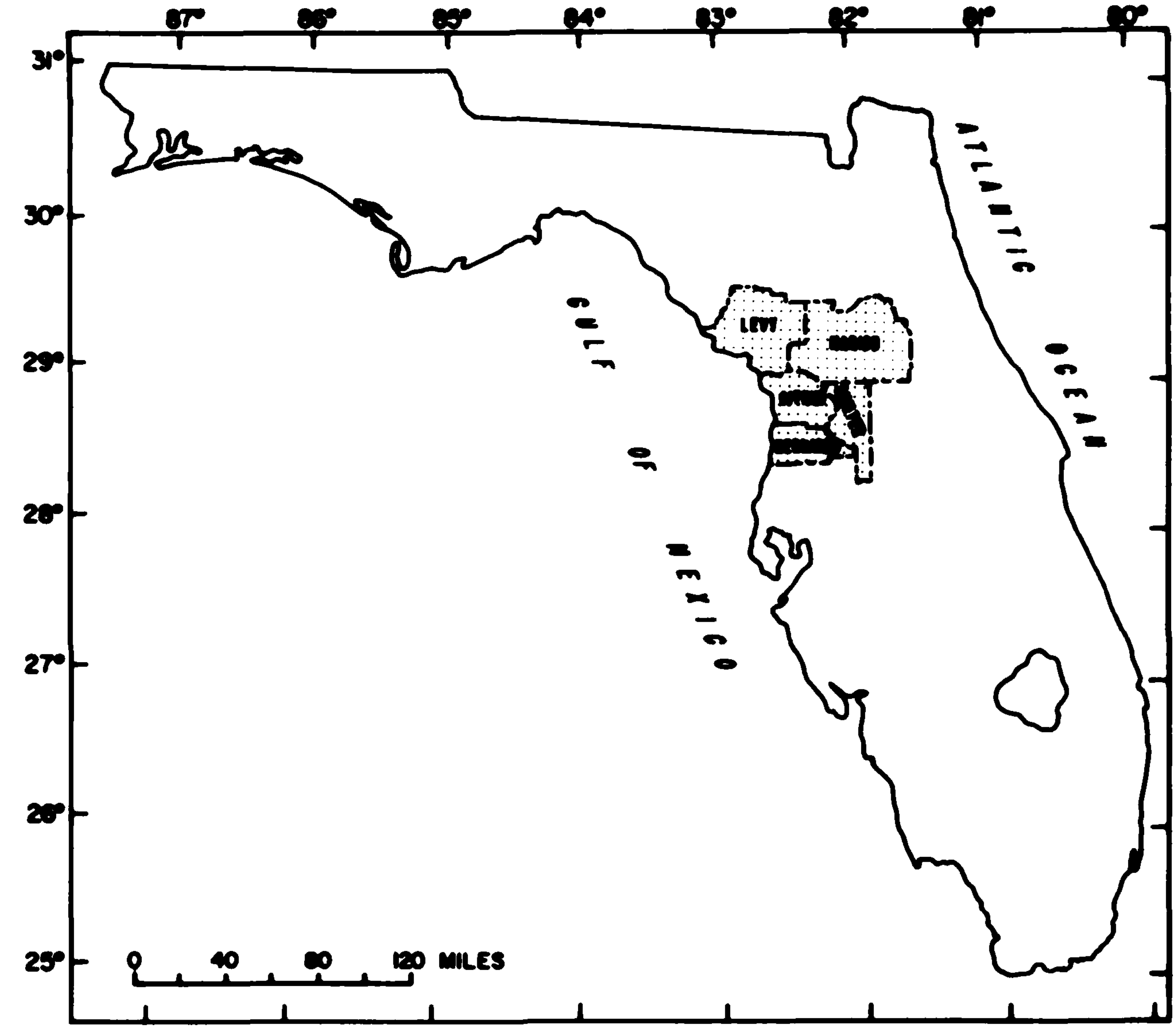



Figure 1.--Location of study area.

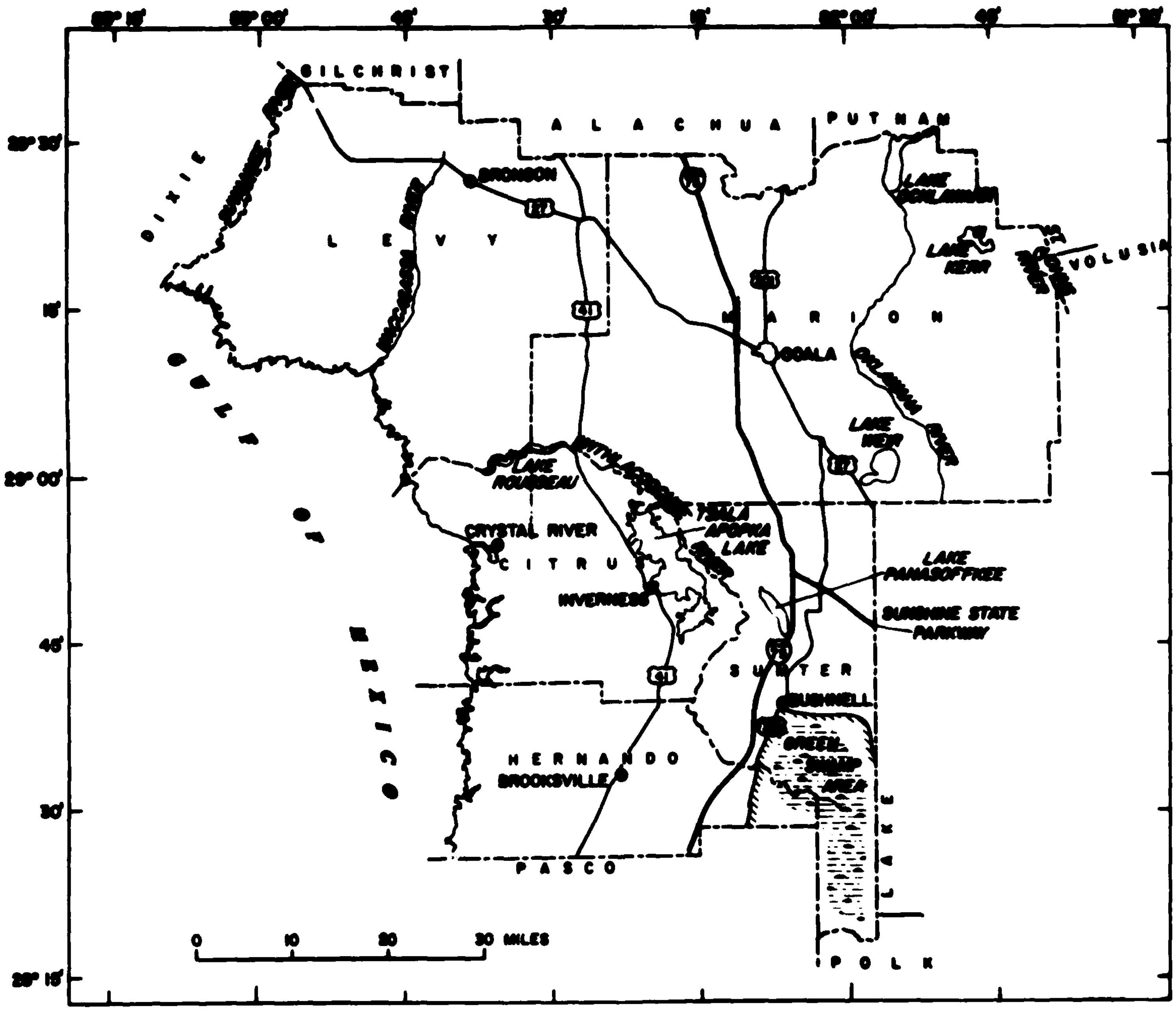



Figure 2.--Geographic features of the study area.

## 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]

| | Ocala | Inverness | Bushnell | Three-station average |
|---|---|---|---|---|
| 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 |

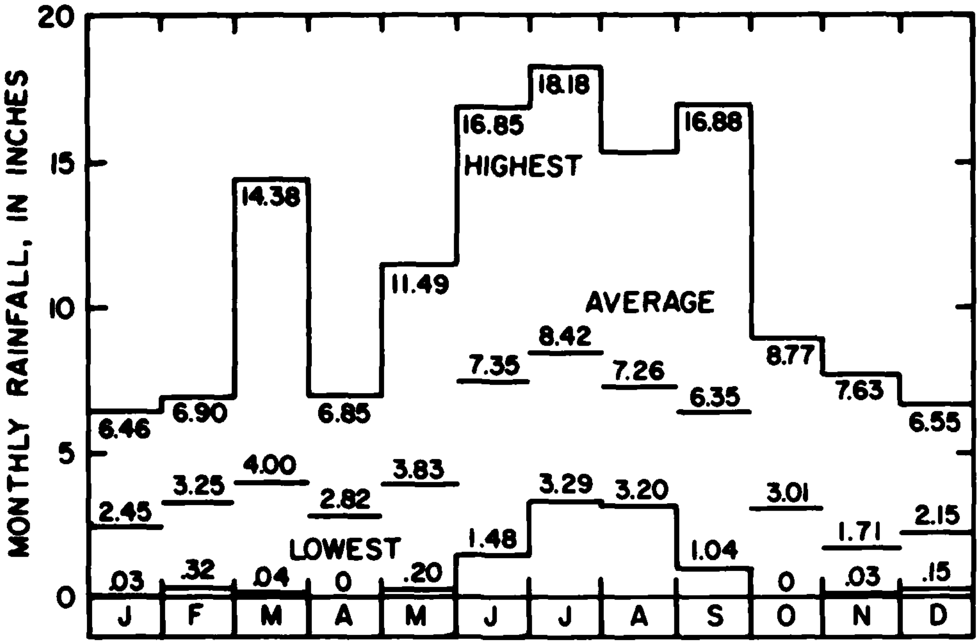



Figure 3.--Average and extreme monthly rainfall 2 miles east of Bushnell, 1937-76 (from Anderson, 1980).

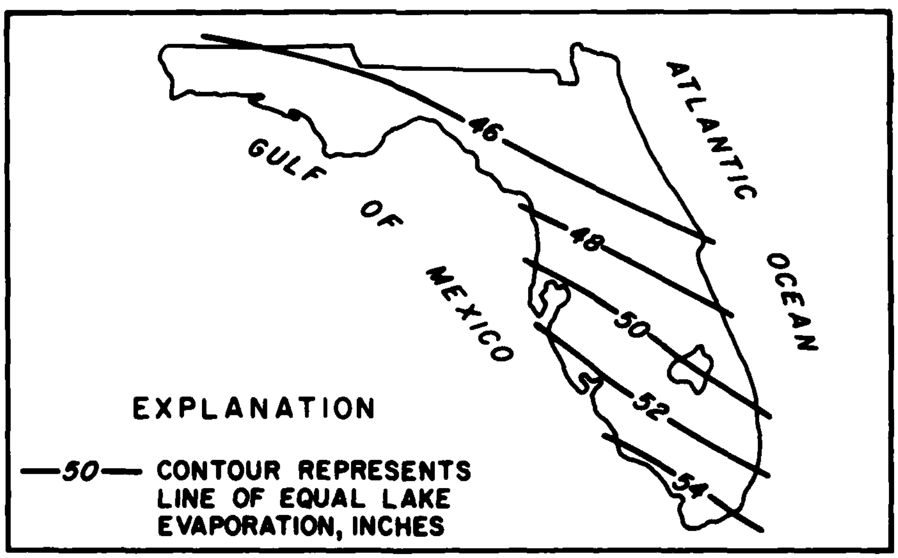



Figure 4.--Average annual lake evaporation (from Kohler and others, 1959).

## 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 | | | | | |
|---|---|---|---|---|---|---|
| | Citrus | Hernando | Levy | Marion | Sumter | Total |
| 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 conditioning | 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 freshwater 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: Citrus | Hernando | Levy | Marion | Sumter | Total |
|---|---|---|---|---|---|---|
| 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: Citrus | Hernando | Levy | Marion | Sumter | Total |
|---|---|---|---|---|---|---|
| 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

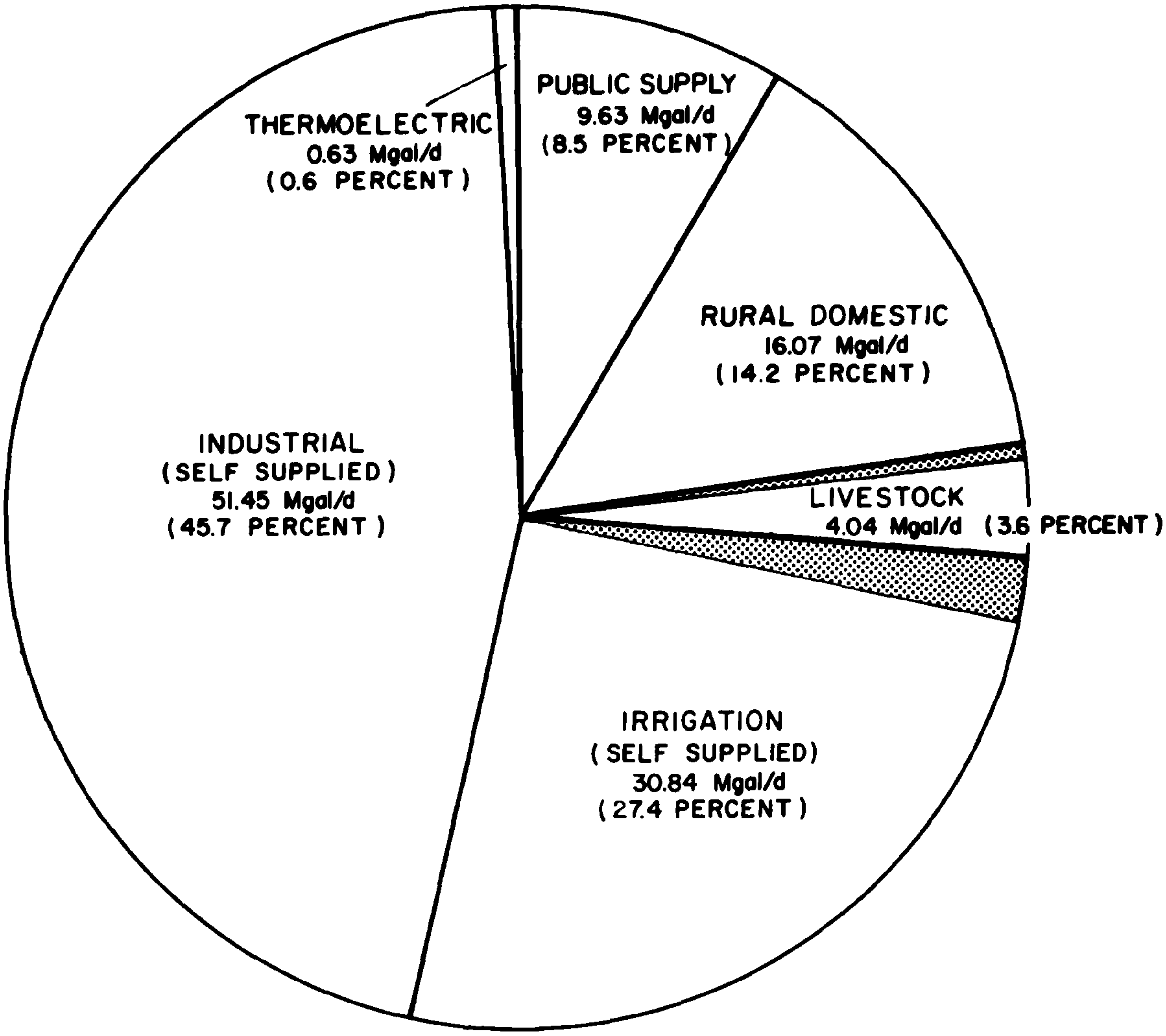
Land forms in the area can be grouped into highland and lowland areas. These areas have been named by White (1970) and are shown on figure 9.

### Highland Areas

Brooksville Ridge is the westernmost and the largest of the central Florida ridges. Its alinement 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).

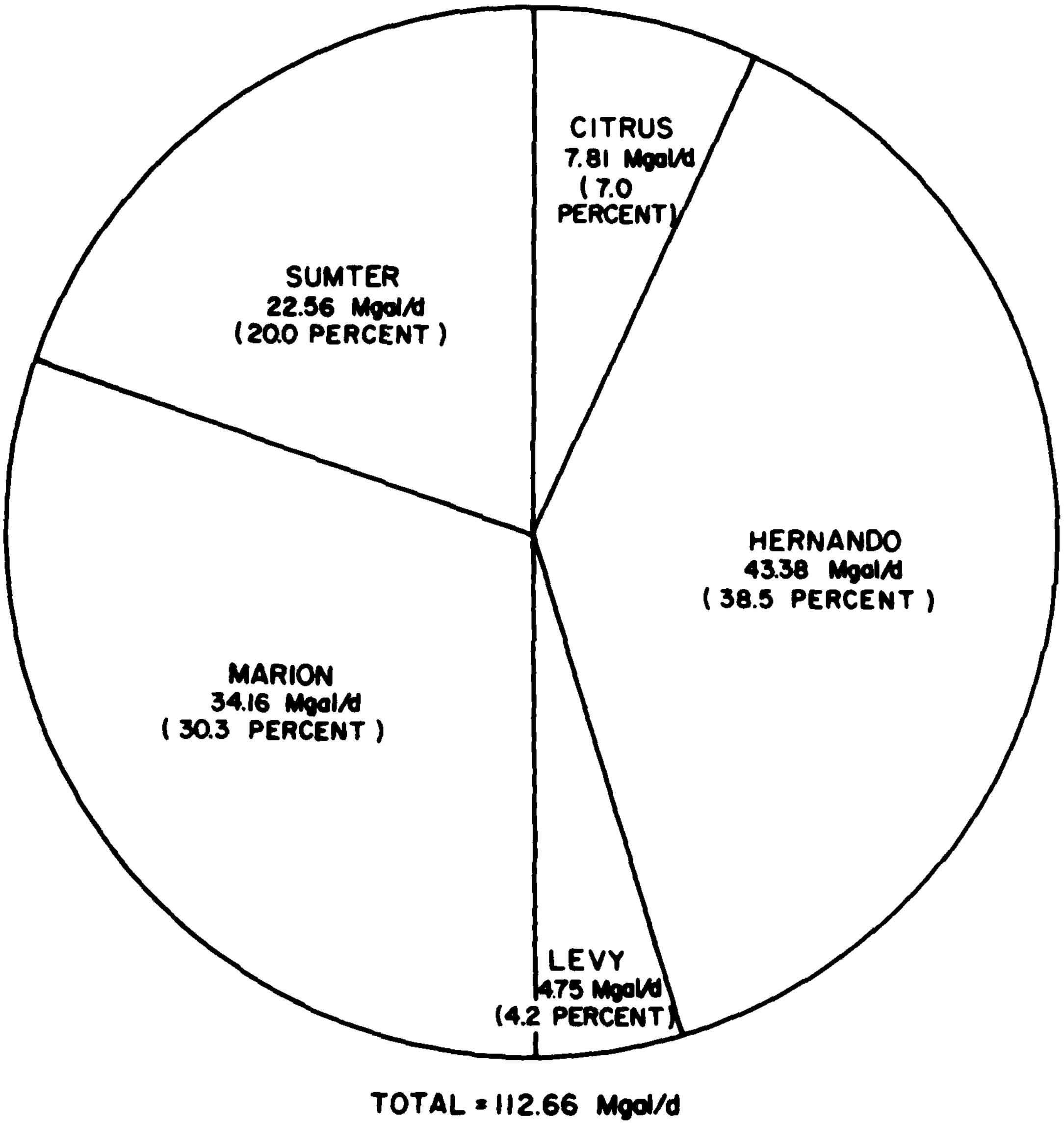



Figure 6.--Freshwater withdrawals by county, in million gallons per day (data from Leach and Healy, 1980).

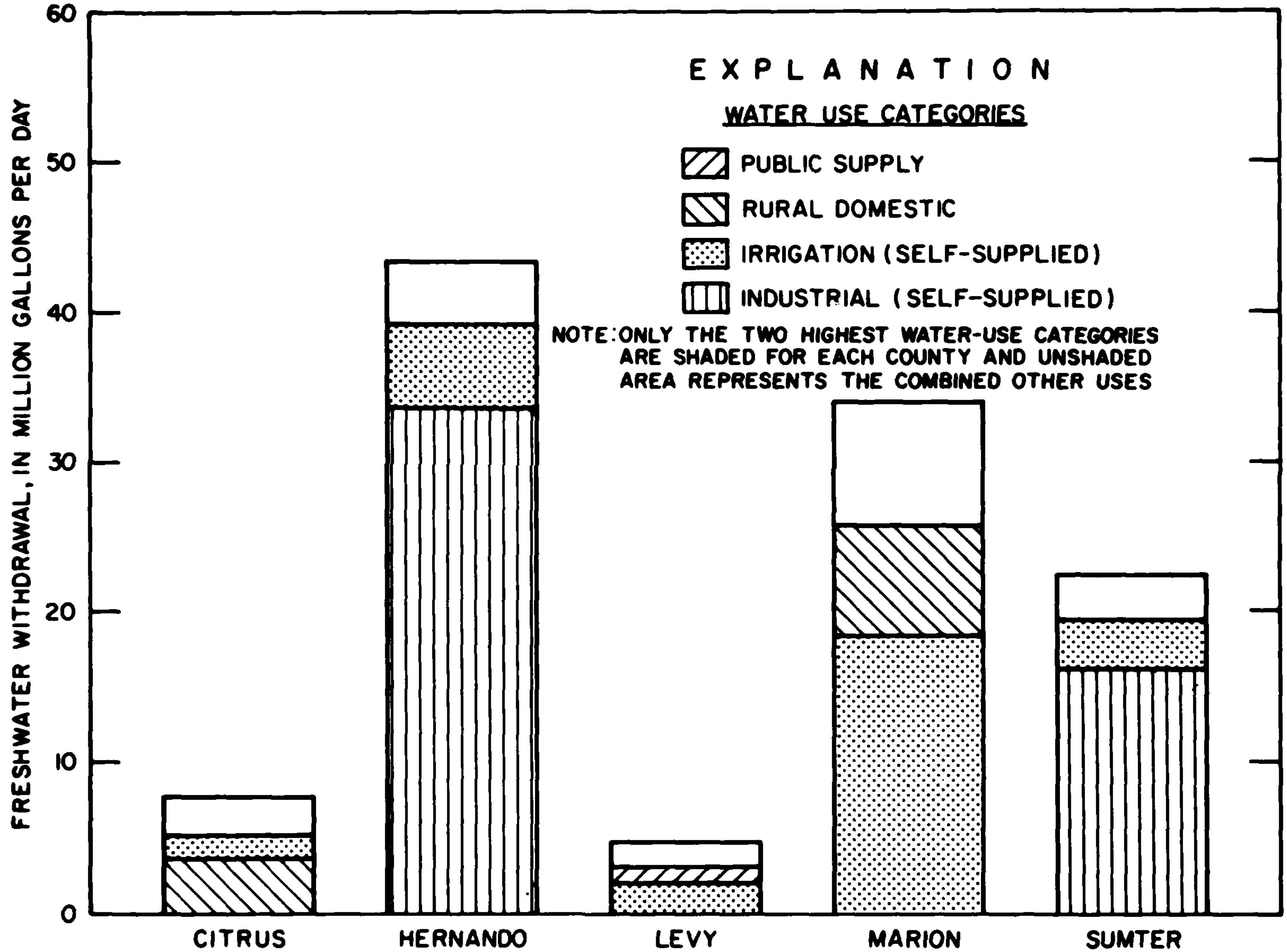



Figure 7.--Freshwater withdrawals in the Withlacoochee River region by county and major use category (data from Leach and Healy, 1980).

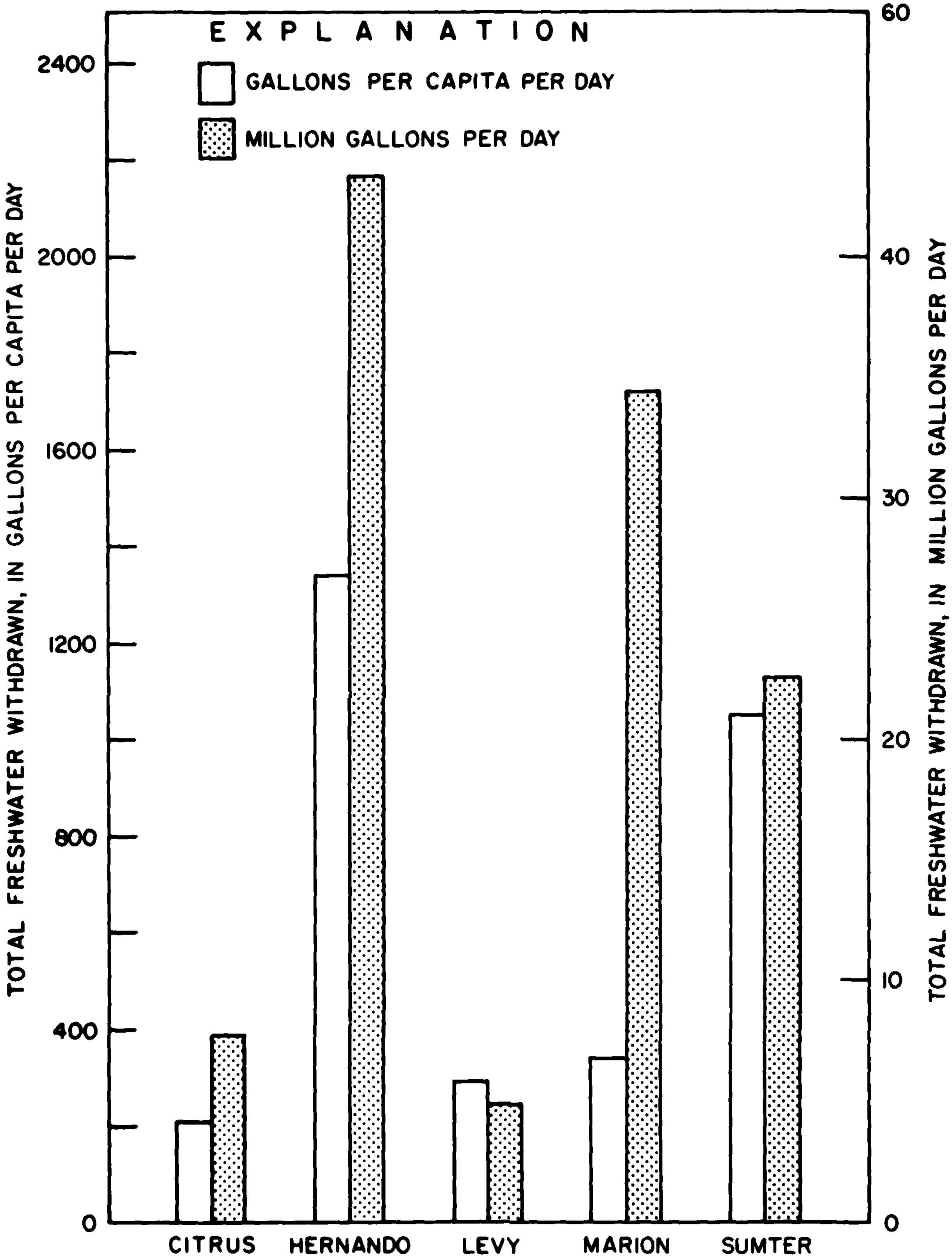



Figure 8.--Freshwater withdrawals by county (data from Leach and Healy, 1980).

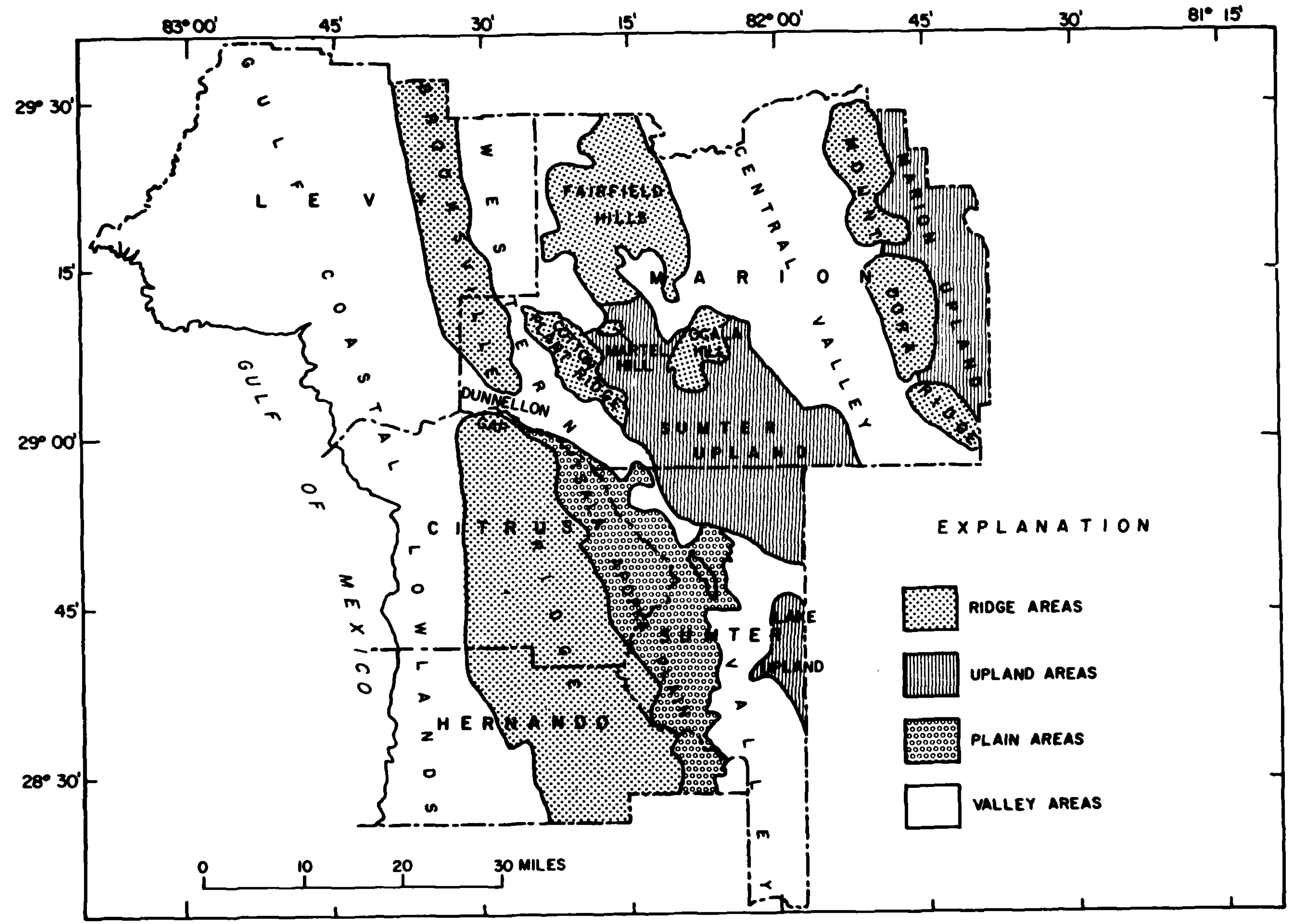



Figure 9.--Physiographic map (modified from White, 1970).

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.

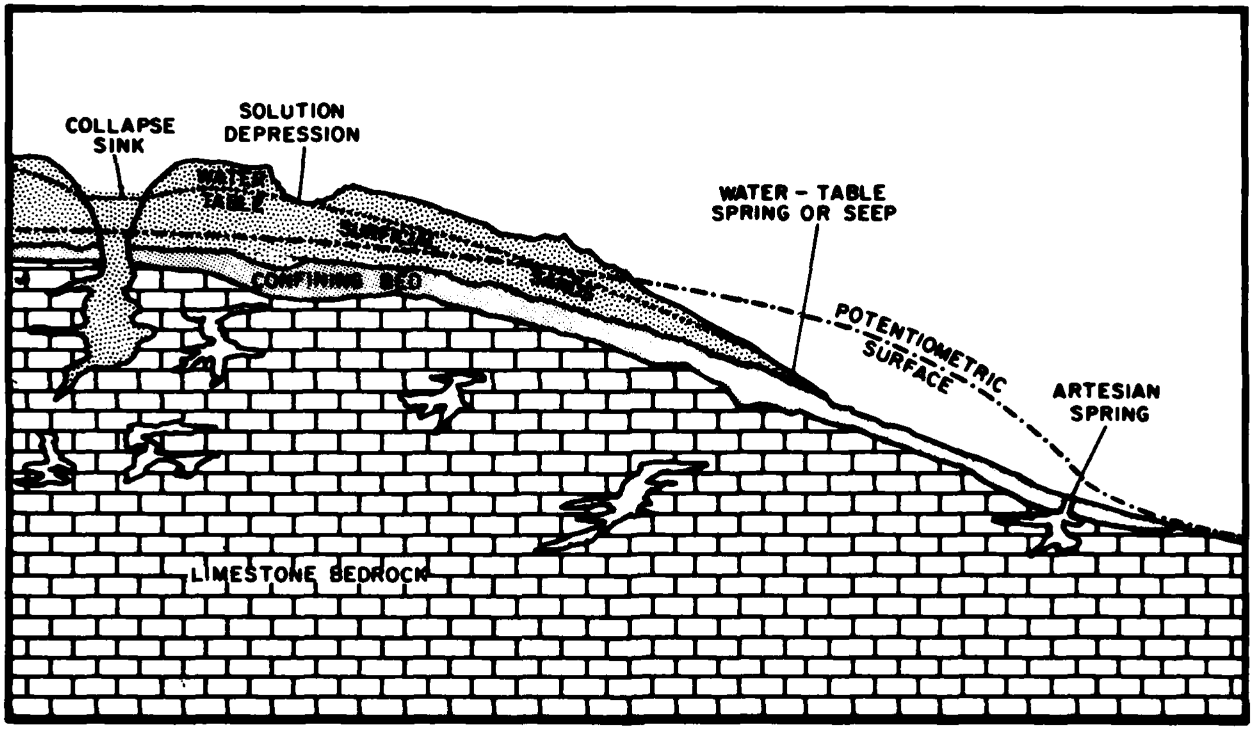



Figure 10.--Collapse sink, solution depression, water-table spring, artesian spring, and their relation to water table, potentiometric surface, and geology.

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 alined 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.±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 anyhydrite) 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 | | | | |

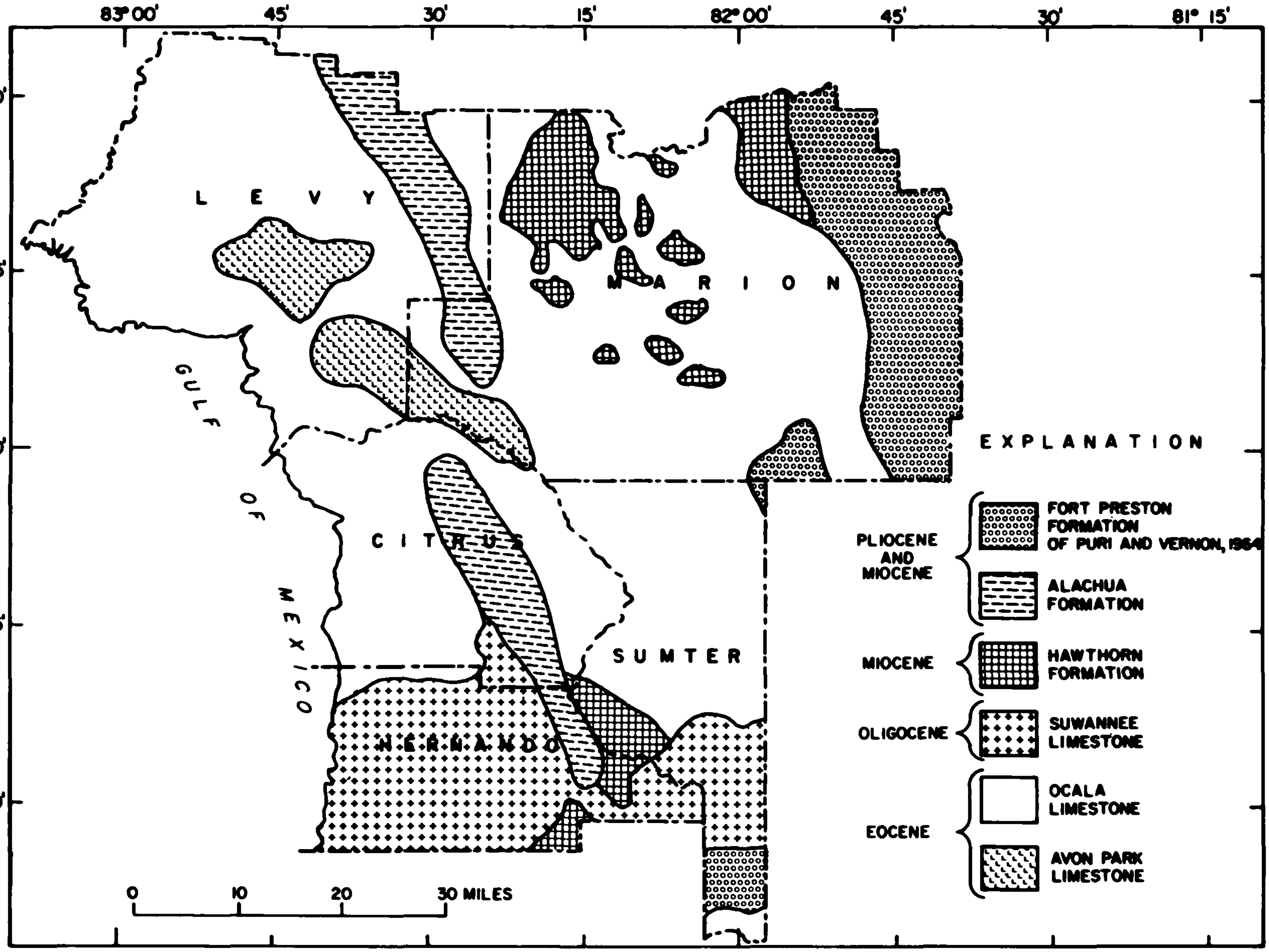



Figure 11.--Geologic map (modified from Puri and Vernon, 1964).

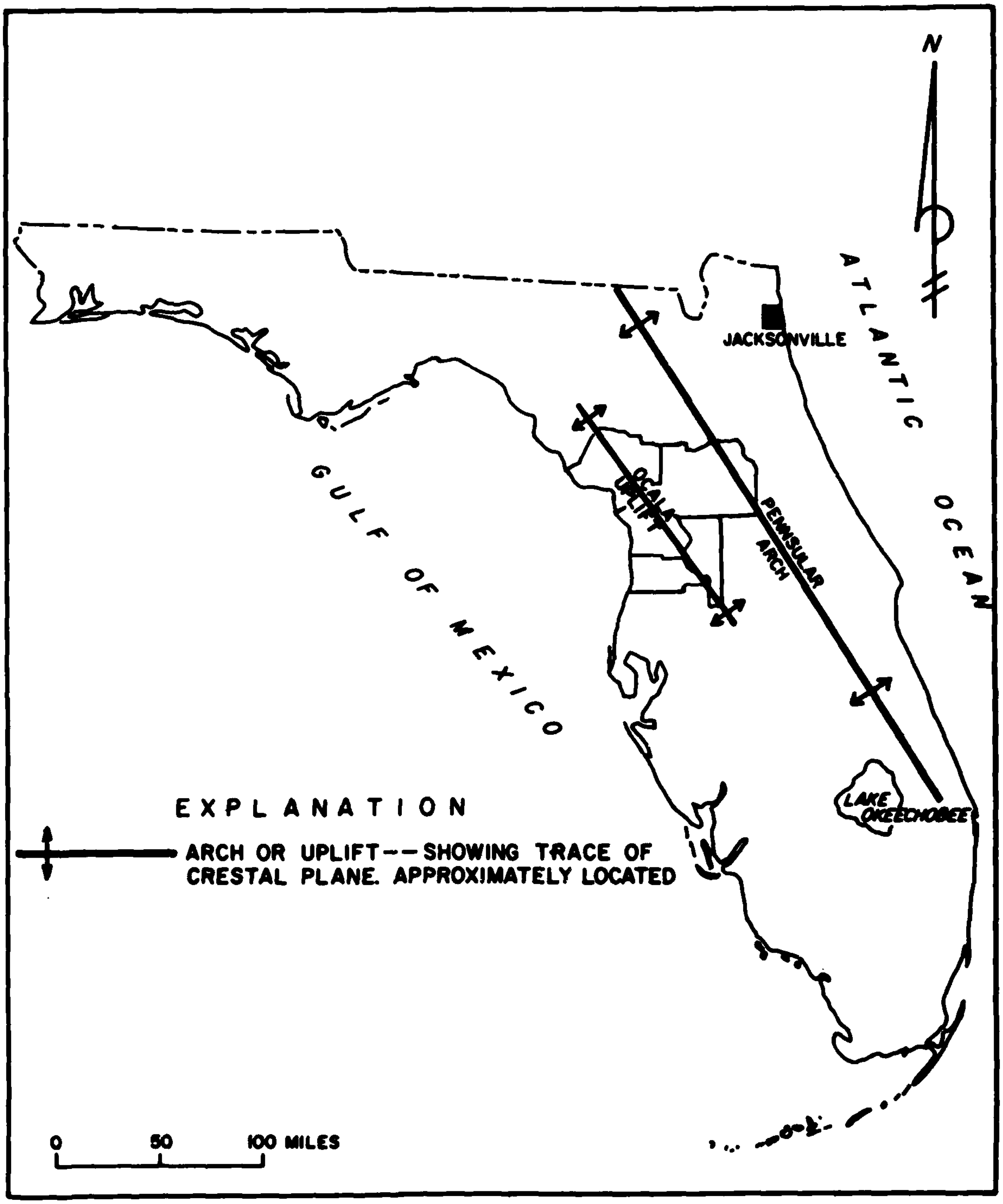



Figure 12.--Orientations of Peninsular Arch and Ocala Uplift (from Chen, 1965).

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 microcoquinoid, 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 classifi-cation | Oscillations of sea level |
|---|---|---|---|
| | | Nebraskan Glaciation | Emergence caused by the accumulation of continental ice. |
| Hazlehurst | 270 | Aftonian Interglacia-tion | 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 at an altitude of 150 feet. |
| Coharie<br>Sunderland<br>Okefenokee<br>Wicomico<br>Penholoway<br>Talbot | 215<br>170<br>150<br>100<br>70<br>42 | Yarmouth Interglacia-tion | 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 Interglacia-tion | 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. |

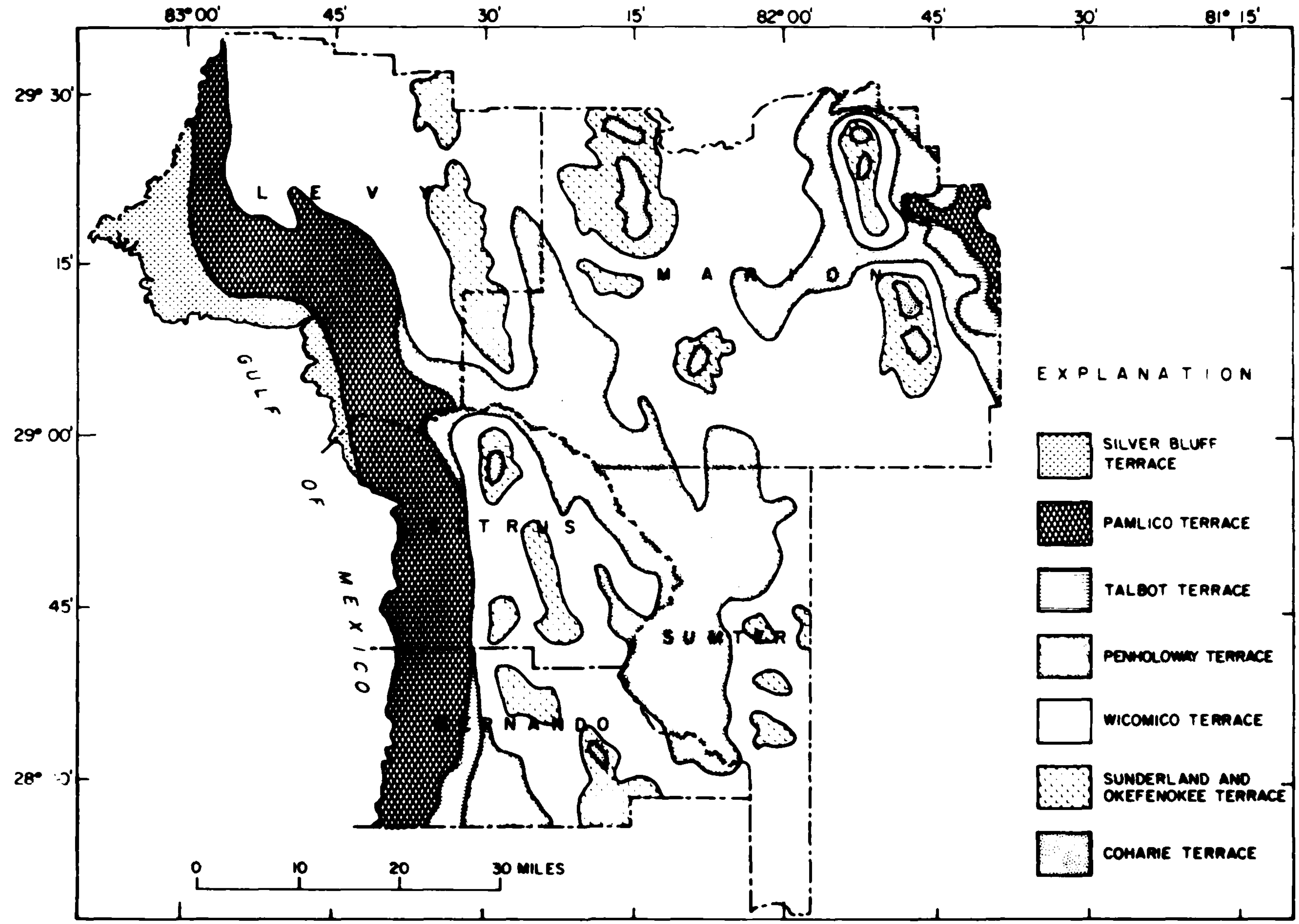



Figure 13.--Terrace map (from Healy, 1975).

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 $(gal/d)/ft^2$ (0.0001 ft/d), to 200 $(gal/day)/ft^2$ (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).

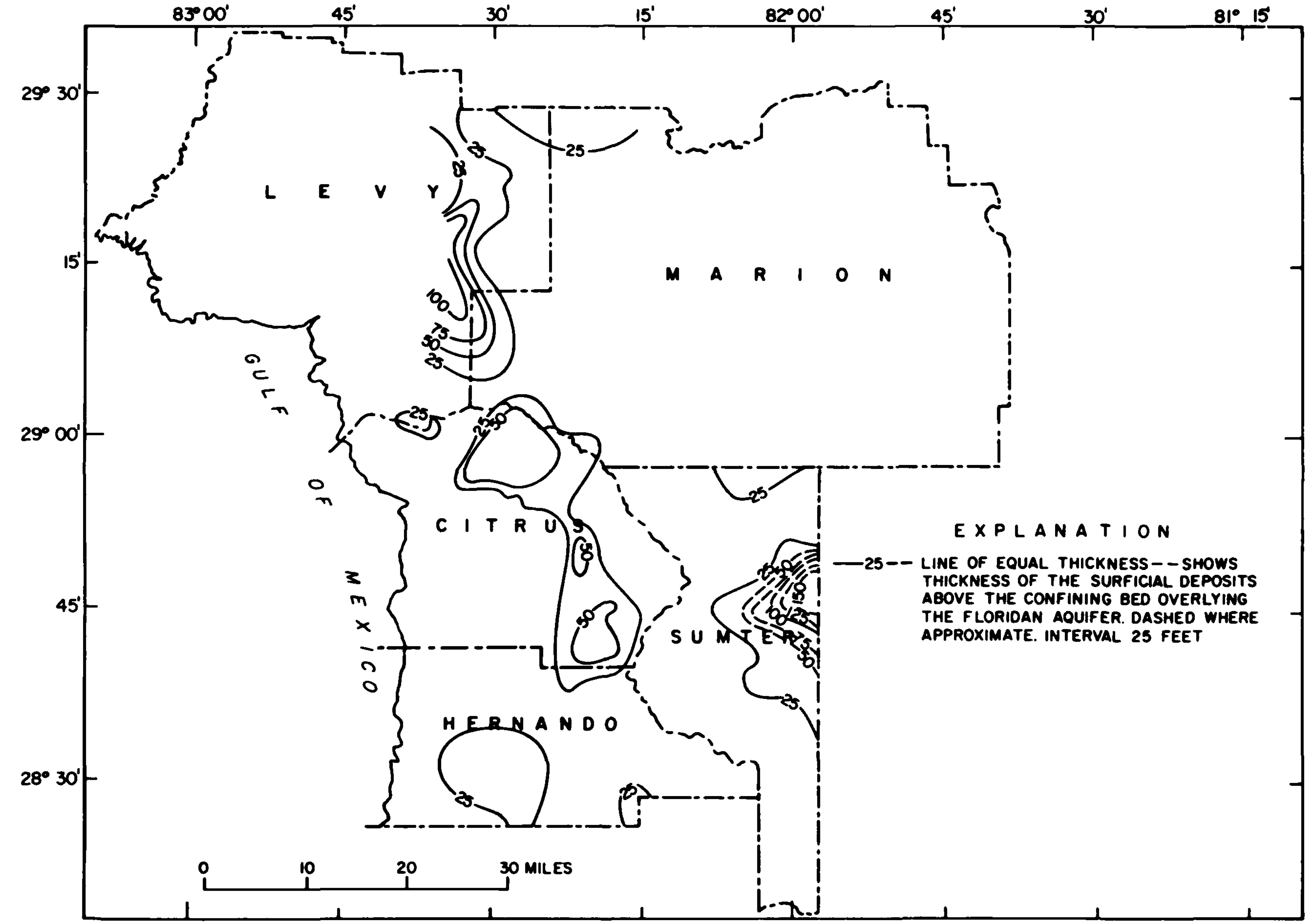



Figure 14.--Thickness of surficial deposits above confining beds for areas where such data have been published (from Wolansky, Spechler, and Buono, 1979).

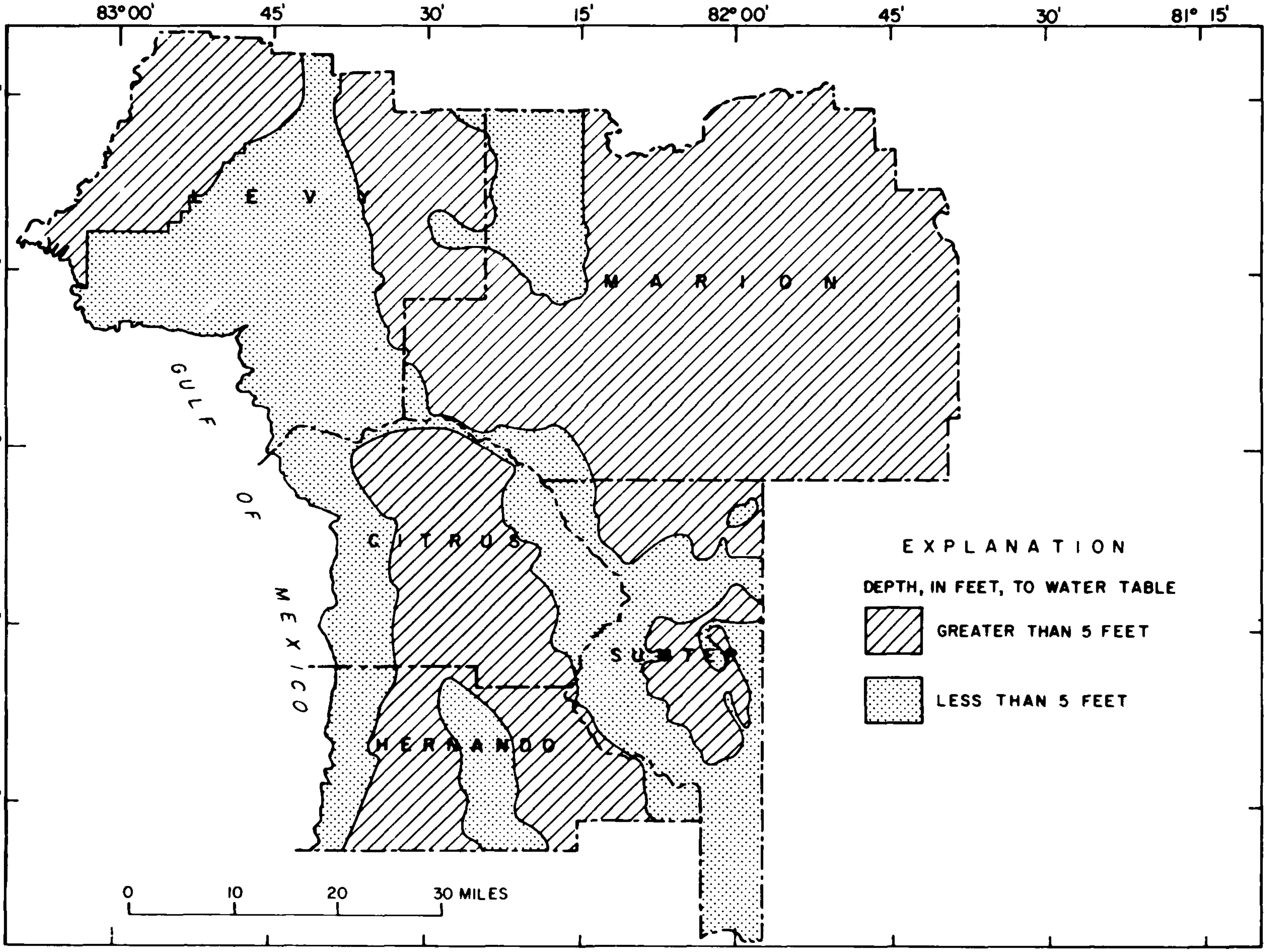



Figure 15.--Generalized depth to water table (from Ross, Saarinen, Bolton, and Wilder, 1978).

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.

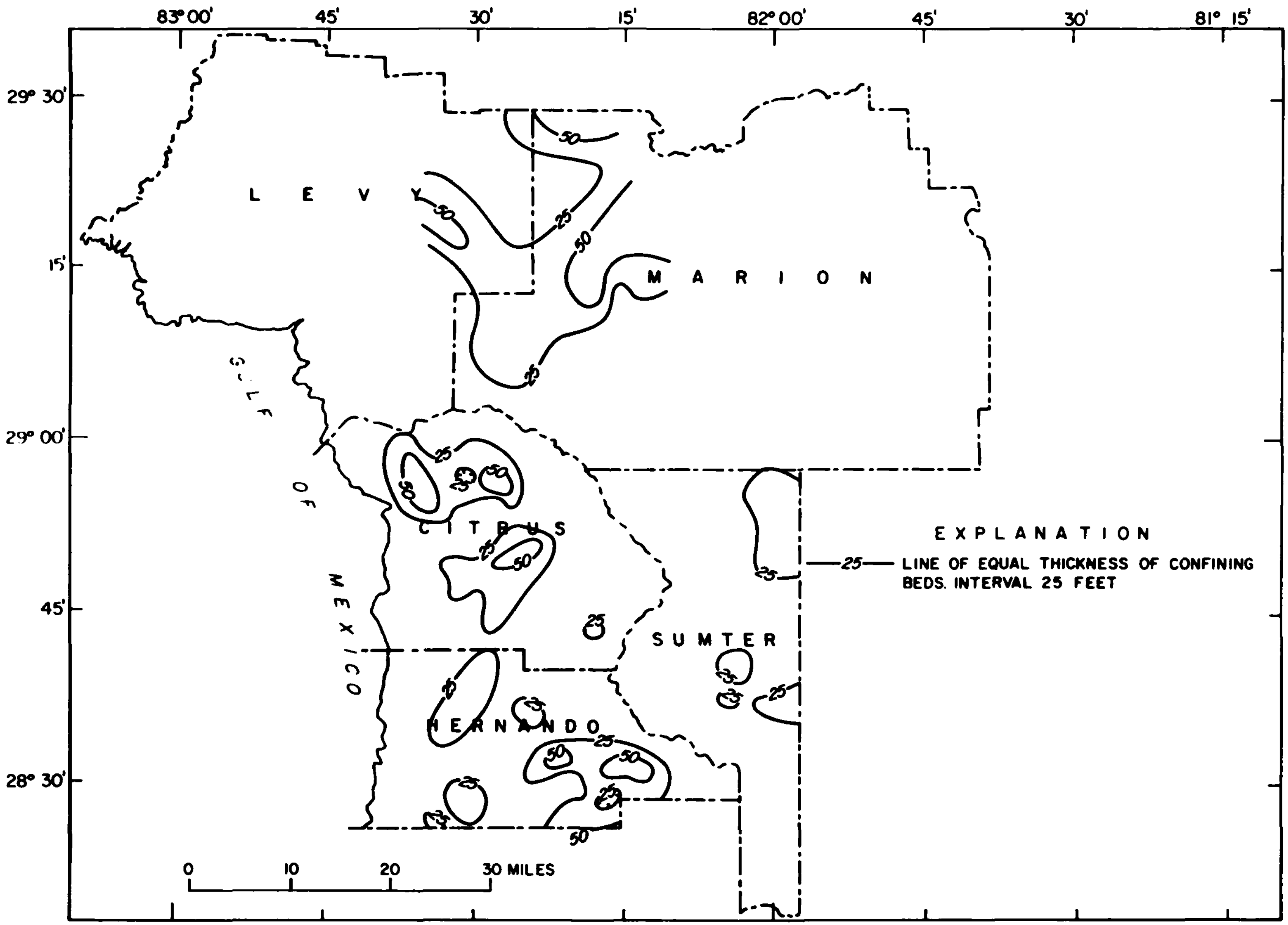



Figure 16.--Thickness of confining beds for areas where such data have been published (from Buono and others, 1979).

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 $2.1 \times 10^6$ ft$^2$/d and about 1 mile upgradient, $1.2 \times 10^6$ ft$^2$/d. Cherry and others (1970) calculated the transmissivity along a section from just north of Crystal River to the Citrus-Hernando line to be $2.0 \times 10^6$ ft$^2$/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 ($0.67 \times 10^6$ ft$^2$/d). Near Silver Springs, Faulkner (1973b) determined the transmissivity to range from 10,700 to $25.5 \times 10^6$ ft$^2$/d and to average about $2.0 \times 10^6$ ft$^2$/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 ($0.67 \times 10^5$ ft$^2$/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)/ft$^3$ or 1/d (a simplification of (ft$^3$/d)/ft$^3$). 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).

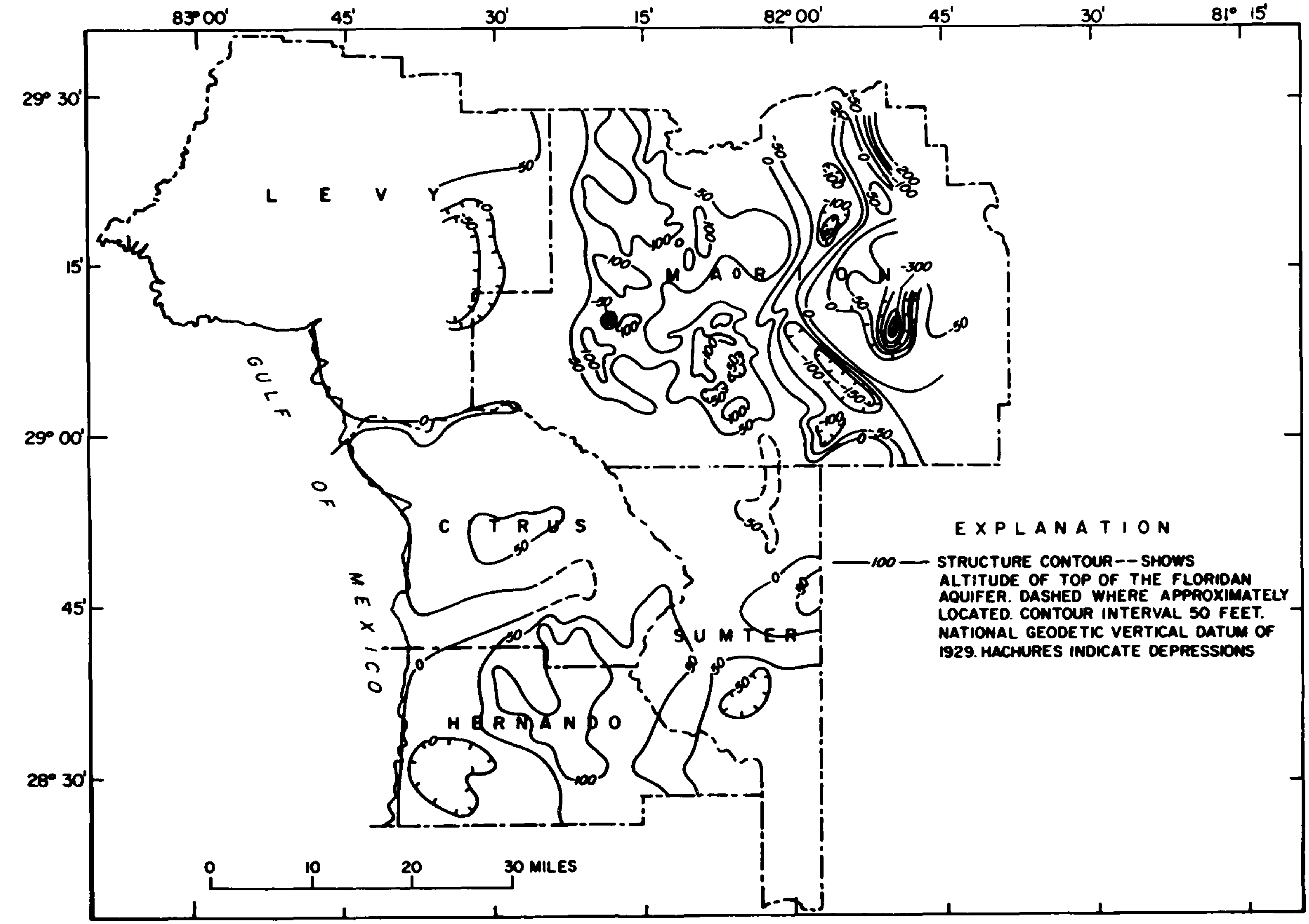



Figure 17.--Altitude of top of the Floridan aquifer for areas where such data have been published (from Buono and Rutledge, 1979).

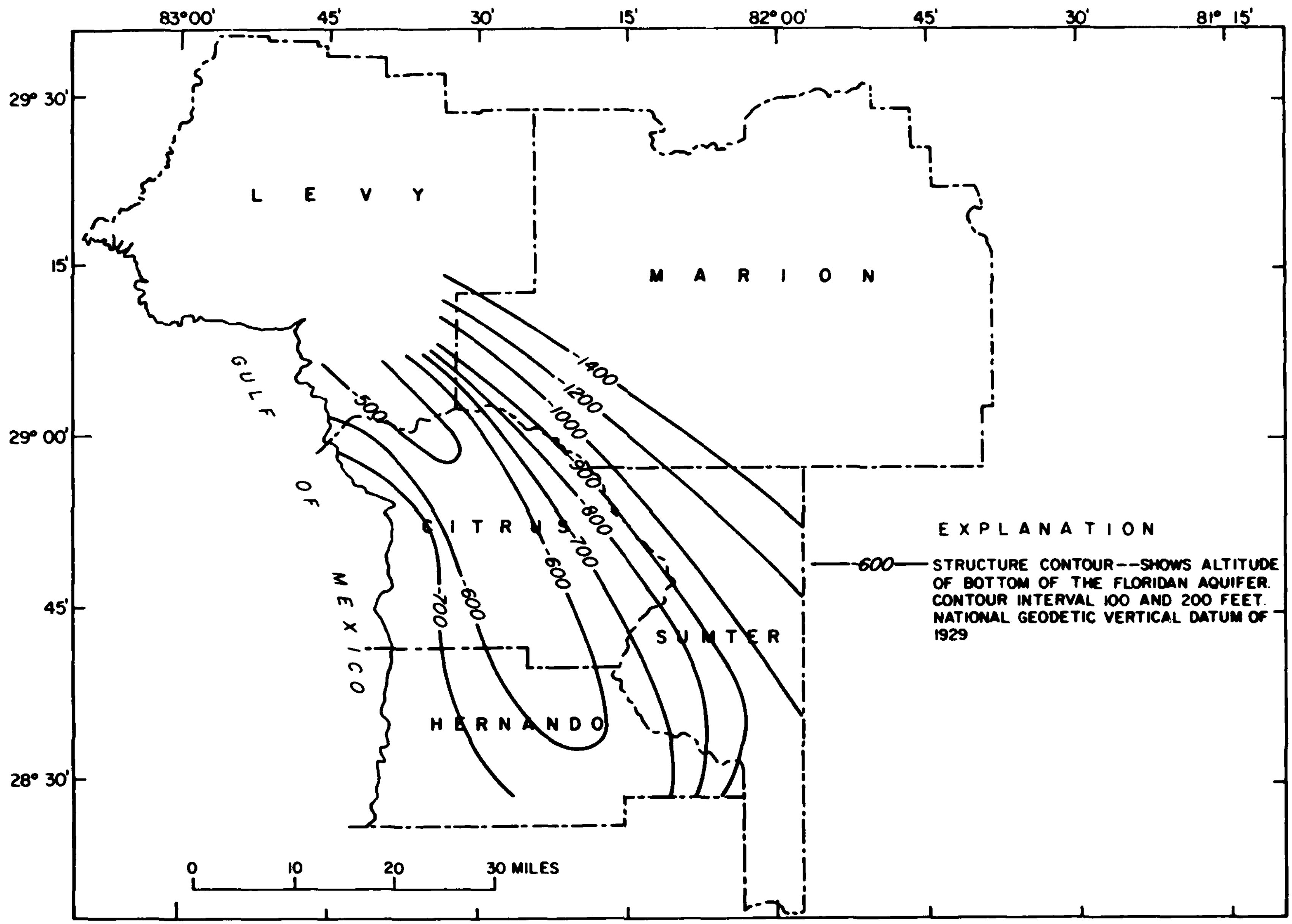



Figure 18.--Altitude of base of the Floridan aquifer for areas where such data have been published (*from* Wolansky, Barr, and Spechler, 1979).

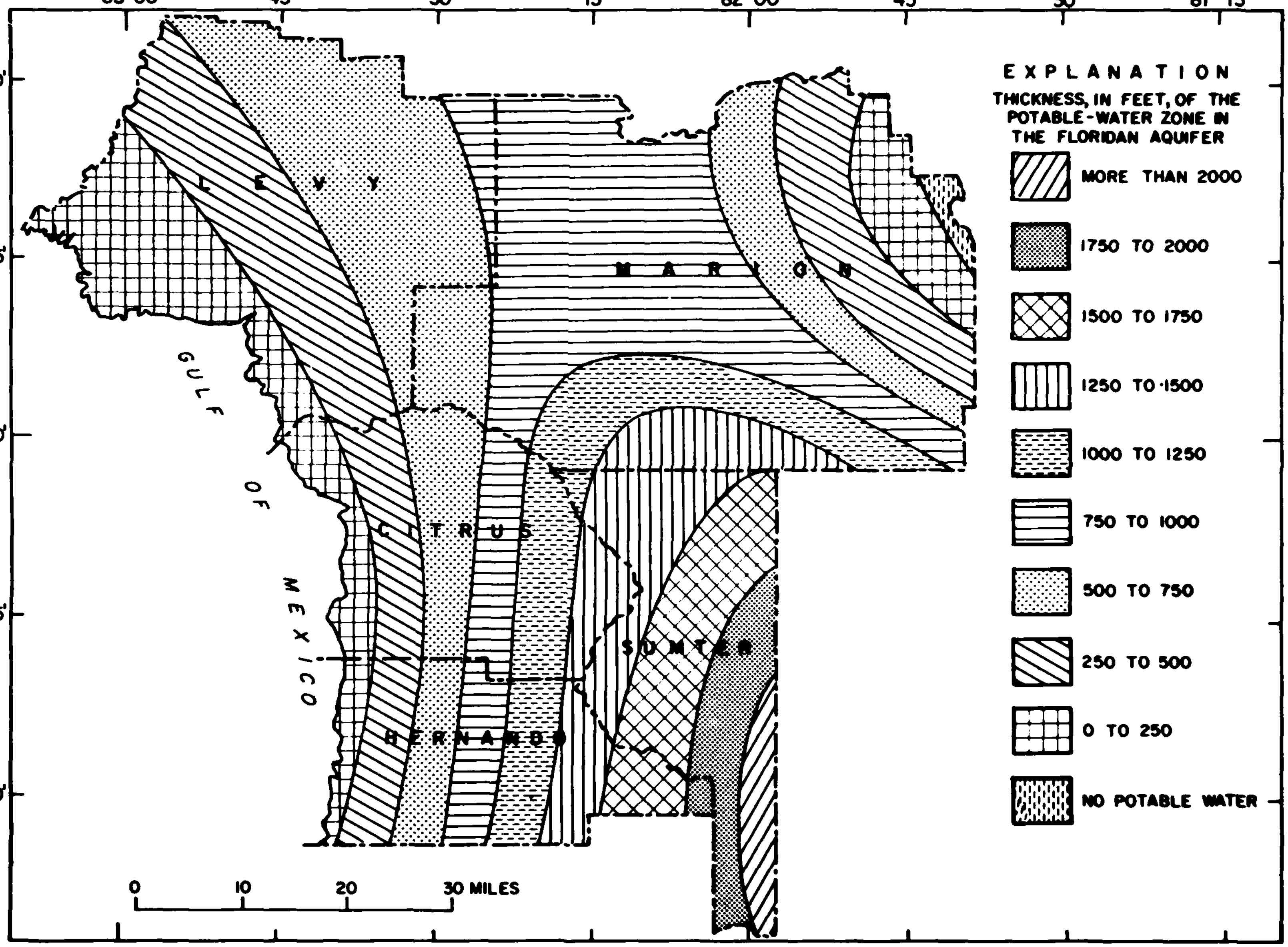



Figure 19.--Thickness of the potable-water zone in the Floridan aquifer (from Causey and Leve, 1976).

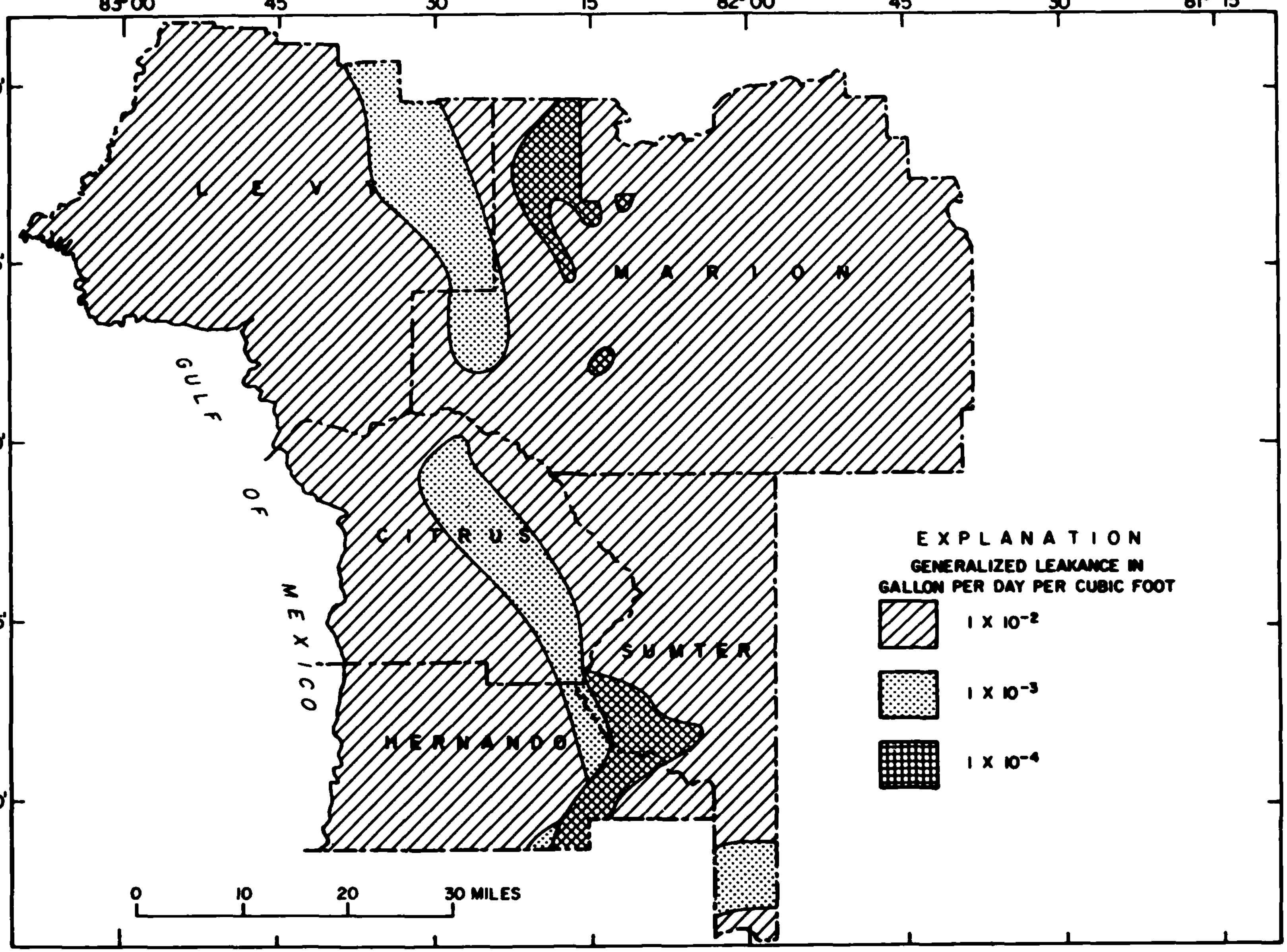



Figure 20.--Generalized leakance map (from Ross, Saarinen, Bolton, and Wilder, 1978).

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

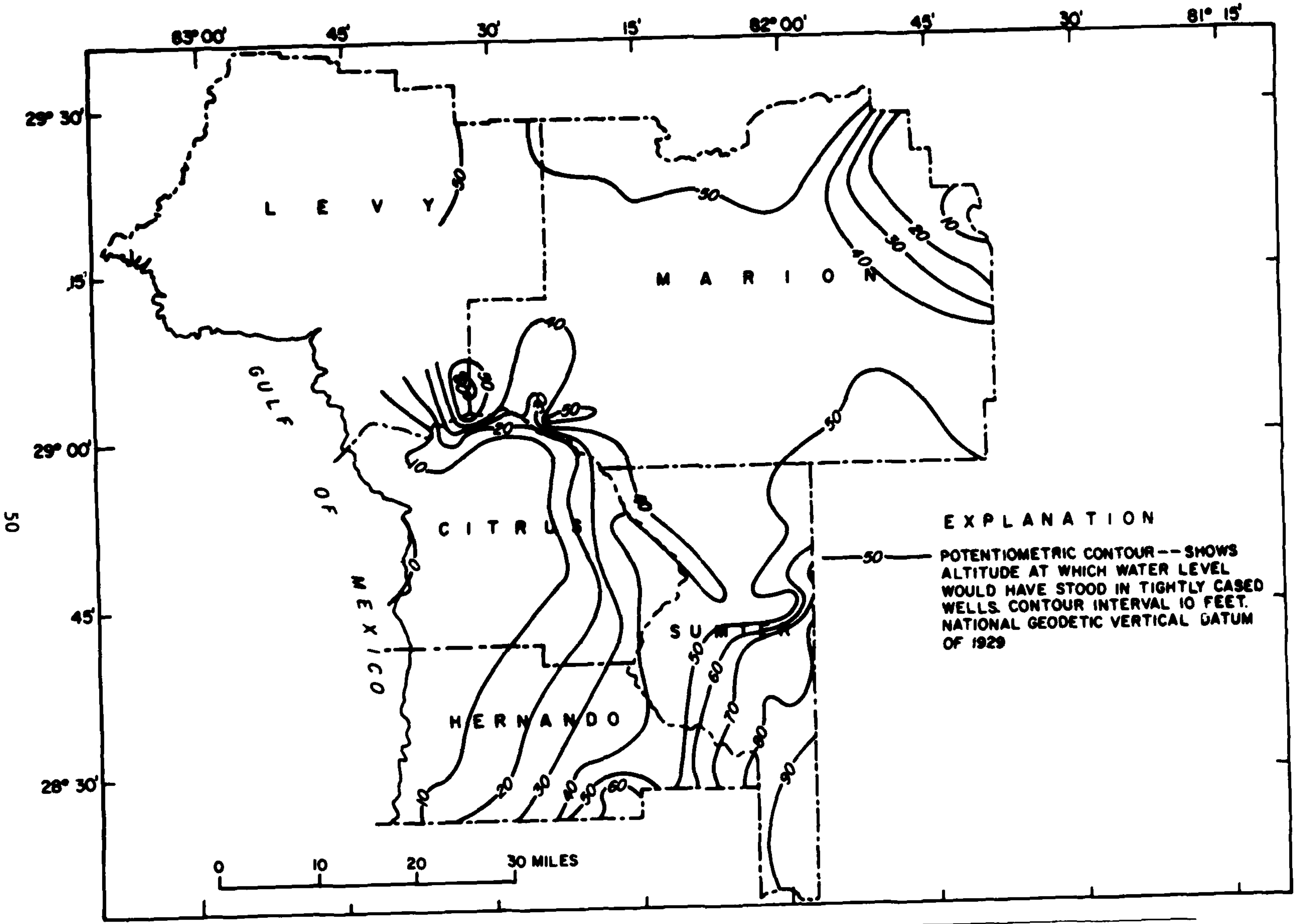



Figure 21.--Potentiometric surface of the Floridan aquifer, May 1979, for areas where such data have been published (from Laughlin and others, 1980; Wolansky, Mills, Woodham, and Laughlin, 1979).

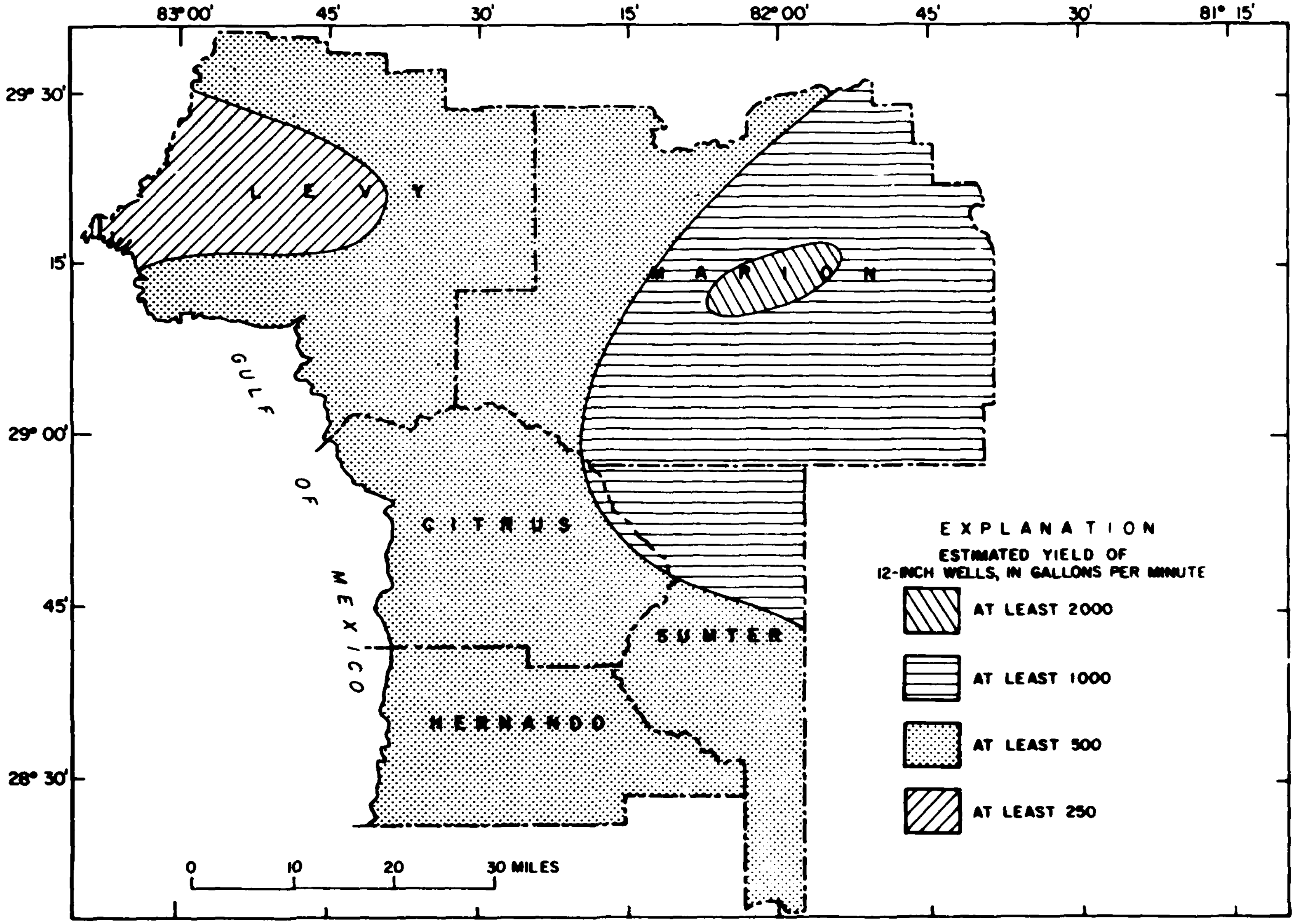



Figure 22.--Yields of 12-inch wells (from Pascale, 1975).

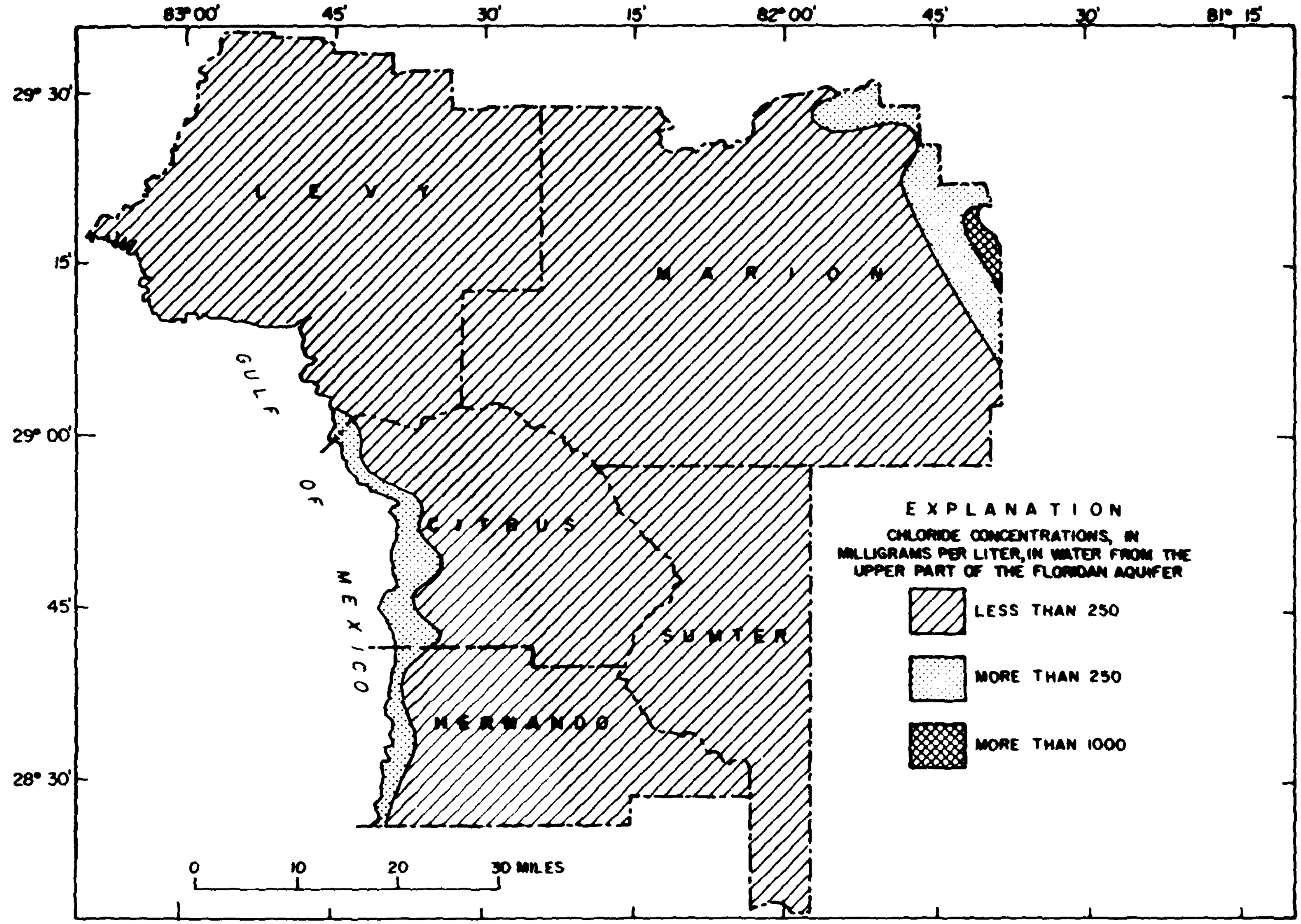



Figure 23.--Chloride concentrations in water from the upper part of the Floridan aquifer (from Mills and Ryder, 1977).

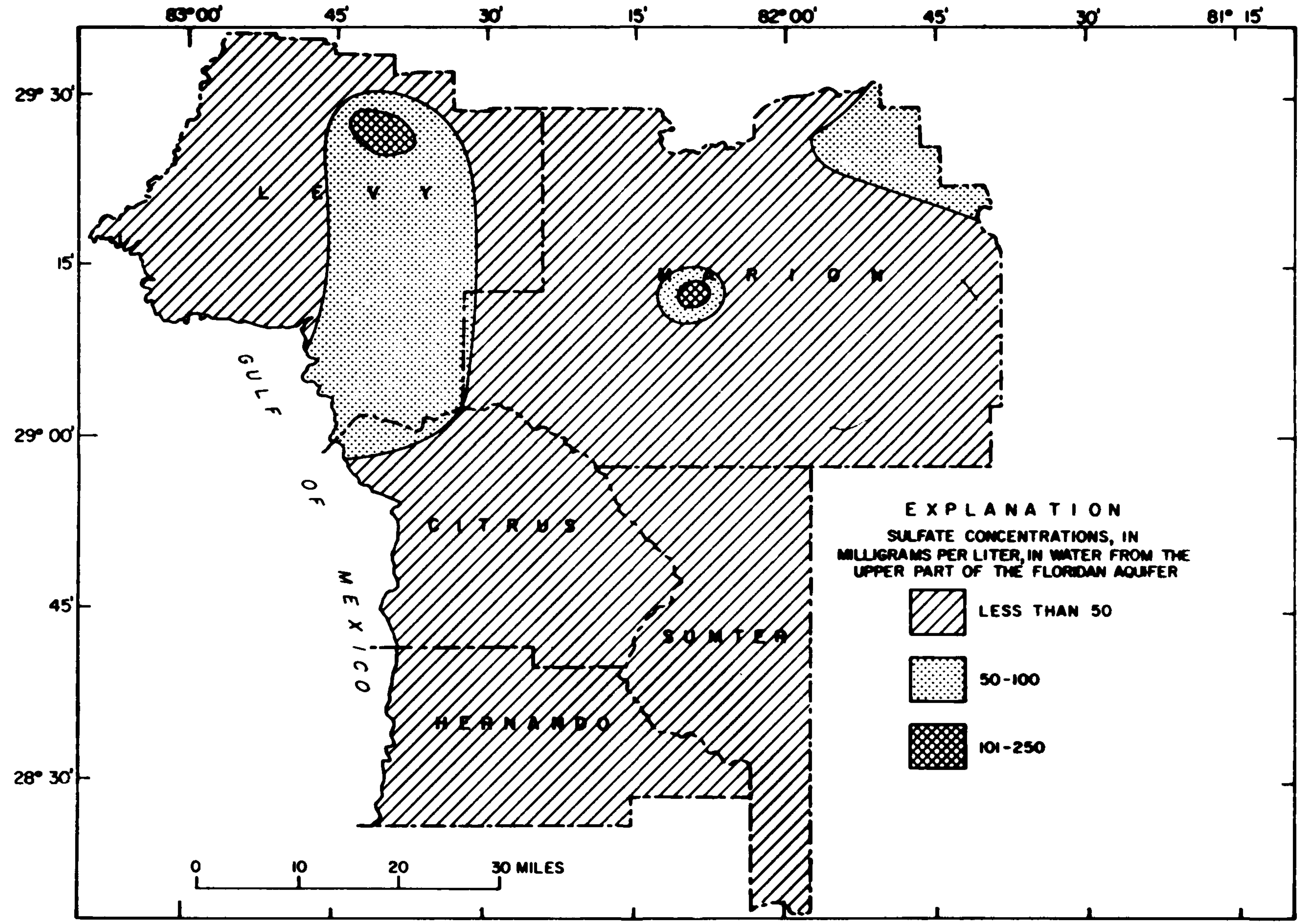



Figure 24.--Sulfate concentrations in water from the upper part of the Floridan aquifer (from Shampine, 1965a, revised 1975).

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.

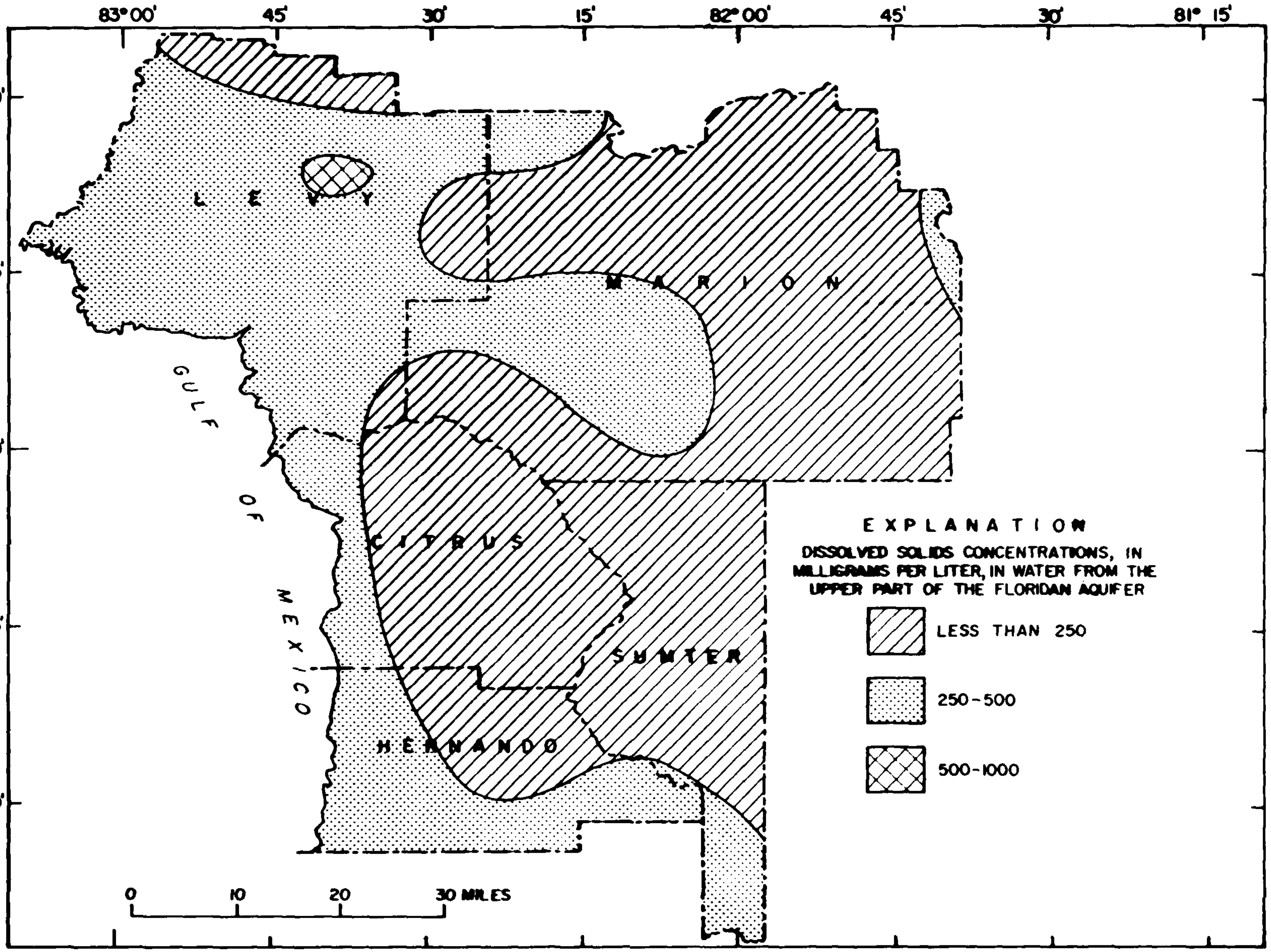



Figure 25.--Dissolved-solids concentrations in water from the upper part of the Floridan aquifer (from Shampine, 1965b, revised 1975).

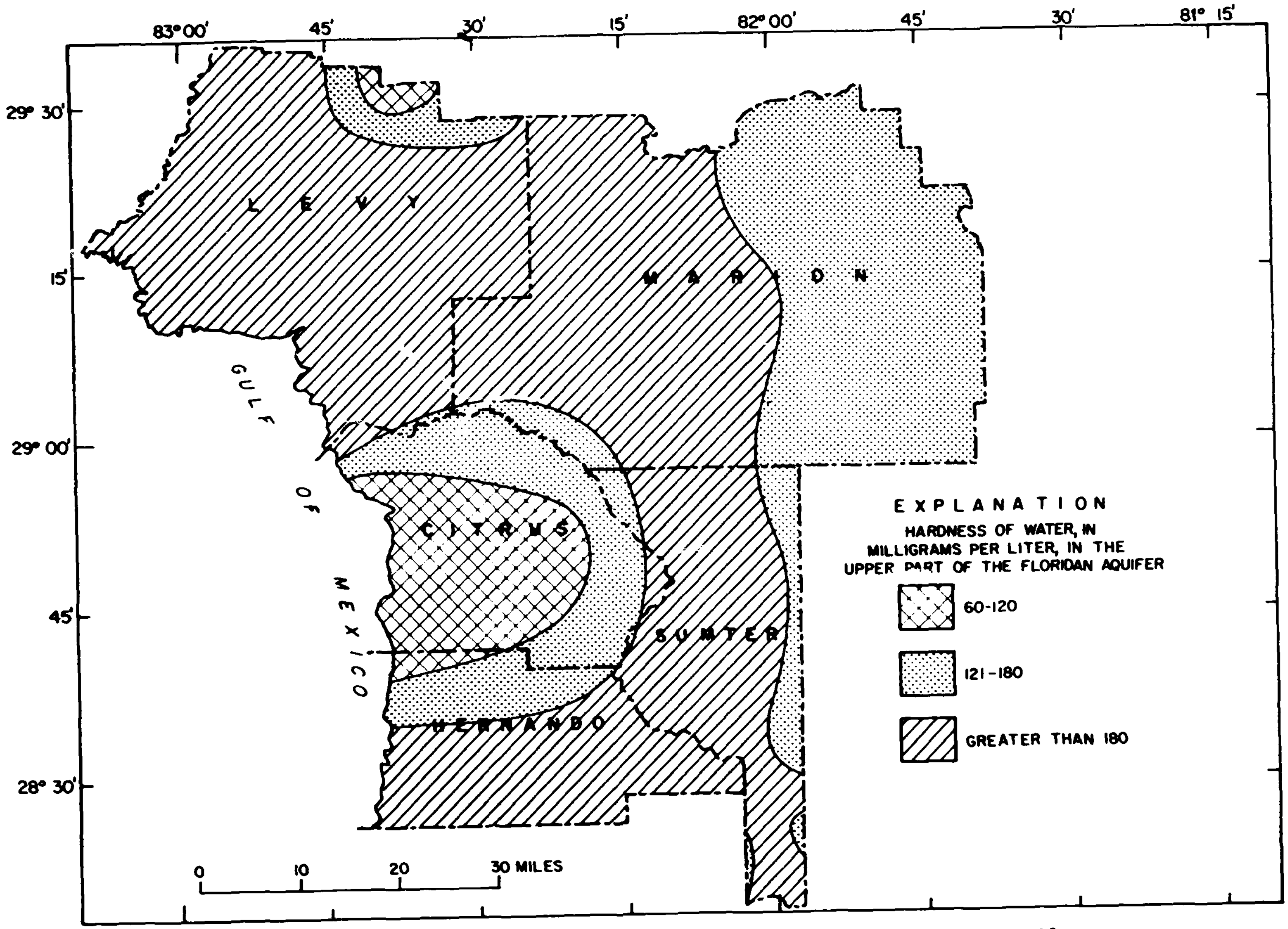



Figure 26.--Hardness of water in the upper part of the Floridan aquifer (from Shampine, 1965c, revised 1975).

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 | . | . | | | | |
| 4 | 284151082215801 | 284151 | 822158 | 185 | . | . | TERTIARY FLORIDAN | IRRIGATION | R MONTAGUE | |
| 5 | 284247082343201 | 284247 | 823432 | . | . | . | | | | |
| 6 | 284254082343500 | 284254 | 823435 | . | . | . | TERTIARY FLORIDAN | DOMESTIC | FLORIDA | STATE OF |
| 7 | 284255082343200 | 284255 | 823432 | . | . | . | TERTIARY FLORIDAN | | | |
| 8 | 284300082334301 | 284300 | 823343 | 124 | . | . | | | | |
| 9 | 284302082330101 | 284302 | 823301 | 87 | . | . | | | | |
| 10 | 284302082330201 | 284302 | 823302 | 162 | . | . | | | | |
| 11 | 284304082333501 | 284304 | 823335 | 76 | . | . | | | | |
| 12 | 284311082332801 | 284311 | 823328 | . | . | . | | | | |
| 13 | 284311082332901 | 284311 | 823329 | 89 | . | . | | | | |
| 14 | 284317082330601 | 284317 | 823306 | 176 | . | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 15 | 284317082330602 | 284317 | 823306 | 46 | . | 4 | PLEISTOCENE NONARTESIAN SAND | UNUSED | USGS | |
| 16 | 284337082270601 | 284337 | 822706 | . | . | . | | | | |
| 17 | 284339082245401 | 284339 | 822454 | . | . | 4 | TERTIARY FLORIDAN | DOMESTIC | WITHLA ST FORES | |
| 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 | . | . | | | | |
| 21 | 284355082331701 | 284355 | 823317 | 47 | . | . | | | | |
| 22 | 284357082354800 | 284357 | 823548 | . | . | . | TERTIARY FLORIDAN | UNUSED | | |
| 23 | 284438082175501 | 284438 | 821755 | 193 | 135 | 8 | TERTIARY FLORIDAN | PUBLIC | FLORAL | CITY |
| 24 | 284438082175601 | 284438 | 821756 | 197 | . | 8 | TERTIARY FLORIDAN | PUBLIC | FLO CITY WAT AS | |
| 25 | 284440082191901 | 284440 | 821919 | 160 | 126 | 4 | TERTIARY FLORIDAN | | CAMP ENINI | HASSEE |
| 26 | 284442082331501 | 284442 | 823315 | 24 | . | . | HOLOCENE NONARTESIAN SAND | UNUSED | FLA STATE RD OF | |
| 27 | 284455082331601 | 284455 | 823316 | 138 | . | . | | DOMESTIC | US DEPT INT | |
| 28 | 284501082331301 | 284501 | 823313 | 140 | . | . | | DOMESTIC | U S DEPT INT | |
| 29 | 284508082174601 | 284508 | 821746 | 400 | 200 | 8 | TERTIARY FLORIDAN | INDUSTRY | FERRIS PACKING | |
| 30 | 284519082150701 | 284519 | 821507 | 60 | 40 | 6 | TERTIARY FLORIDAN | DOMESTIC | FISHER | HOMER |
| 31 | 284528082211801 | 284528 | 822118 | . | . | 4 | TERTIARY FLORIDAN | PUBLIC | WITHA ST | FOREST |
| 32 | 284531082371101 | 284531 | 823711 | 8 | . | . | | UNUSED | ROOKS BROTHERS | |
| 33 | 284532082371001 | 284532 | 823710 | 45 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 34 | 284537082331401 | 284537 | 823314 | 120 | . | . | | DOMESTIC | U S DEPT INT | |
| 35 | 284540082384901 | 284540 | 823849 | 7 | . | . | | UNUSED | ROOKS BROS | |
| 36 | 284547082361201 | 284547 | 823612 | 53 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 37 | 284551082345301 | 284551 | 823453 | 99 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 38 | 284607082300901 | 284607 | 823009 | 170 | . | 8 | | IRRIGATION | BRANTLEY | |
| 39 | 284614082293501 | 284614 | 822935 | 150 | . | . | | IRRIGATION | C A MERCER | |
| 40 | 284651082333601 | 284651 | 823336 | 111 | . | 2 | | IRRIGATION | C M JOHNSON | |
| 41 | 284653082365401 | 284653 | 823654 | 11 | . | 1 | | UNUSED | R ADKINS | |
| 42 | 284655082365401 | 284655 | 823654 | 16 | . | 2 | | PUBLIC | CITRUS COUNTY | |
| 43 | 284656082365601 | 284656 | 823656 | 9 | . | . | | UNUSED | CITRUS COUNTY | |
| 44 | 284702082264201 | 284702 | 822642 | 31 | . | . | | UNUSED | WITHL ST FOREST | |
| 45 | 284705082270101 | 284705 | 822701 | 63 | . | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 46 | 284720082345801 | 284720 | 823458 | 86 | . | . | | | ATER DISTRICT # 1 | |
| 47 | 284727082361401 | 284727 | 823614 | 20 | . | 4 | | DOMESTIC | WELTY MILLER | |
| 48 | 284752082202501 | 284752 | 822025 | 114 | 69 | 6 | TERTIARY FLORIDAN | FIRE | HIGHLAND | VFD |
| 49 | 284758082352000 | 284758 | 823520 | . | . | . | TERTIARY FLORIDAN | RECREATION | HOMOSASSA | |
| 50 | 284803082351701 | 284803 | 823517 | 50 | . | . | TERTIARY FLORIDAN | UNUSED | NATURE FISHBOWL | |
| 51 | 284805082225701 | 284805 | 822257 | 150 | . | . | TERTIARY FLORIDAN | PUBLIC | WITHLA ST FORST | |
| 52 | 284809082305501 | 284809 | 823055 | 330 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | RANDALL | |
| 53 | 284816082343801 | 284816 | 823438 | 180 | . | . | | PUBLIC | NORRIS CATTLE | |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CITRUS COUNTY | | | | | |
| 54 | 284844082282801 | 284844 | 822828 | . | . | 4 | TERTIARY FLORIDAN | PUBLIC | WITHLA | ST FORES |
| 55 | 284852082162301 | 284852 | 821623 | . | . | 4 | TERTIARY FLORIDAN | UNUSED | INFANTINO | T |
| 56 | 284857082334801 | 284857 | 823348 | 101 | . | . | | | | |
| 57 | 284907082311701 | 284907 | 823117 | 300 | . | . | TERTIARY FLORIDAN | IRRIGATION | CITGRO | |
| 58 | 284936082350401 | 284936 | 823504 | 94 | . | . | | | HEAD | |
| 59 | 284938082350301 | 284938 | 823503 | 48 | . | . | | | D | |
| 60 | 284939082344701 | 284939 | 823447 | 60 | . | . | | | ORIUM | |
| 61 | 284940082291901 | 284940 | 822919 | 71 | . | . | TERTIARY FLORIDAN | STOCK | LEN YOUNG | |
| 62 | 284944082311801 | 284944 | 823118 | 46 | . | 4 | | UNUSED | USGS | |
| 63 | 284947082311801 | 284947 | 823118 | . | . | . | TERTIARY FLORIDAN | | CANTO, FLA | |
| 64 | 284952082400301 | 284952 | 824003 | 47 | . | 3 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 65 | 284952082400302 | 284952 | 824003 | 38 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 66 | 284958082190401 | 284958 | 821904 | 48 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 67 | 285003082202001 | 285003 | 822020 | 130 | 78 | 6 | TERTIARY FLORIDAN | IRRIGATION | CITRUS | HIGH SCH |
| 68 | 285010082384001 | 285010 | 823840 | 55 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 69 | 285020082365301 | 285020 | 823653 | 41 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 70 | 285021082200601 | 285021 | 822006 | 450 | 400 | 12 | TERTIARY FLORIDAN | PUBLIC | INVERNESS | CITY OF |
| 71 | 285022082200601 | 285022 | 822006 | 400 | . | 10 | TERTIARY FLORIDAN | PUBLIC | CITY INVERNESS | |
| 72 | 285022082200701 | 285022 | 822007 | 200 | . | 10 | TERTIARY FLORIDAN | PUBLIC | INVERNESS | |
| 73 | 285026082174101 | 285026 | 821741 | 40 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 74 | 285037082213801 | 285037 | 822138 | . | . | . | TERTIARY FLORIDAN | PUBLIC | INVERNESS | VILLAGE |
| 75 | 285037082213802 | 285037 | 822138 | 195 | 175 | 6 | TERTIARY FLORIDAN | PUBLIC | INVERNESS | VILLAGE |
| 76 | 285056082163001 | 285056 | 821630 | 37 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 77 | 285057082291001 | 285057 | 822910 | 63 | . | . | TERTIARY FLORIDAN | DOMESTIC | JAMES GIBBS | |
| 78 | 285101082135802 | 285101 | 821358 | 31 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 79 | 285102082204001 | 285102 | 822040 | 450 | . | 18 | TERTIARY FLORIDAN | UNUSED | STATE ROAD DEPT | |
| 80 | 285102082361001 | 285102 | 823610 | 75 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 81 | 285104082134401 | 285104 | 821344 | 33 | 30 | 2 | TERTIARY FLORIDAN | UNUSED | WING | W |
| 82 | 285105082135801 | 285105 | 821358 | 31 | . | . | TERTIARY FLORIDAN | | CITRUS 11 U S G | EOL SURVEY |
| 83 | 285112082354401 | 285112 | 823544 | 111 | . | . | EOCENE AVON PARK LIMESTONE | | -2 NEAR HOMOSAS | SA SGS, FL |
| 84 | 285116082351401 | 285116 | 823514 | 100 | . | 6 | TERTIARY FLORIDAN | PUBLIC | OZELLO WATER CO | |
| 85 | 285116082351402 | 285116 | 823514 | 105 | . | 6 | TERTIARY FLORIDAN | PUBLIC | OZELLO WATER CO | |
| 86 | 285124082245601 | 285124 | 822456 | 150 | 52 | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 87 | 285128082194201 | 285128 | 821942 | 34 | . | 2 | TERTIARY FLORIDAN | UNUSED | G L HANDLEY | |
| 88 | 285130082195001 | 285130 | 821950 | 107 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | G L HANDLEY | |
| 89 | 285153082232601 | 285153 | 822326 | 143 | . | 6 | TERTIARY FLORIDAN | PUBLIC | W F ONIEL | |
| 90 | 285156082395701 | 285156 | 823957 | 965 | . | 4 | | UNUSED | LEE WADE | |
| 91 | 285158082245401 | 285158 | 822454 | 225 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | HOWARD FARMS | |
| 92 | 285205082352001 | 285205 | 823520 | 138 | . | . | | IRRIGATION | PARADISE PLANT | |
| 93 | 285220082354401 | 285220 | 823544 | 120 | . | . | | PUBLIC | CRYSTAL SHORES | |
| 94 | 285220082361001 | 285220 | 823610 | 85 | . | . | | PUBLIC | PALM SP WATER | |
| 95 | 285229082310501 | 285229 | 823105 | 483 | . | 4 | | UNUSED | ARTHUR LEWIS | |
| 96 | 285234082341901 | 285234 | 823419 | 252 | . | . | EOCENE AVON PARK LIMESTONE | | NEAR CRYSTAL R | IVER, FL |
| 97 | 285238082352001 | 285238 | 823520 | 119 | . | . | TERTIARY FLORIDAN | IRRIGATION | PARADISE HOTEL | |
| 98 | 285242082312801 | 285242 | 823128 | 418 | . | . | | | 852231231 | |
| 99 | 285242082370101 | 285242 | 823701 | 33 | . | 2 | | UNUSED | SUNCOAST DEV CO | |
| 100 | 285246082215601 | 285246 | 822156 | 84 | . | 2 | TERTIARY FLORIDAN | UNUSED | CITRUS CO PARK | |
| 101 | 285248082183201 | 285248 | 821832 | 53 | . | 2 | TERTIARY FLORIDAN | UNUSED | HEATH | ELMER |
| 102 | 285248082351801 | 285248 | 823518 | 123 | . | 4 | TERTIARY FLORIDAN | PUBLIC | PLANTATION PARA | |
| 103 | 285248082351802 | 285248 | 823518 | 128 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | PARADISE HOTEL | |
| 104 | 285254082323001 | 285254 | 823230 | 30 | . | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 105 | 285257082350301 | 285257 | 823503 | 95 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | PARADISE HOTEL | |
| 106 | 285311082345801 | 285311 | 823458 | 51 | . | . | | | ROCK PLANT PS W | ELL |
| 107 | 285313082191501 | 285313 | 821915 | 45 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | FRANK H LESLIE | |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CITRUS COUNTY | | | | | |
| 108 | 285313082345901 | 285313 | 823459 | 52 | . | 6 | TERTIARY FLORIDAN | PUBLIC | PARADISE GARDEN | |
| 109 | 285317082352100 | 285317 | 823521 | . | . | . | TERTIARY FLORIDAN | | | |
| 110 | 285325082353601 | 285325 | 823536 | 59 | . | . | | | CRYSTAL SPRING | WELL |
| 111 | 285329082293701 | 285329 | 822937 | 36 | . | . | TERTIARY FLORIDAN | UNUSED | HORACE ALLEN | |
| 112 | 285342082312801 | 285342 | 823128 | 418 | . | 3 | TERTIARY FLORIDAN | IRRIGATION | LEROY OLGLES | |
| 113 | 285346082252401 | 285346 | 822524 | 118 | 70 | 8 | TERTIARY FLORIDAN | IRRIGATION | BELLAMY | BURTON |
| 114 | 285348082330301 | 285348 | 823303 | 150 | . | . | | | 853233224 | |
| 115 | 285350082162801 | 285350 | 821628 | 44 | . | . | TERTIARY FLORIDAN | UNUSED | DONALD FELLS | |
| 116 | 285350082162802 | 285350 | 821628 | 65 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | FELLS | DONALD |
| 117 | 285352082350101 | 285352 | 823501 | 32 | . | 2 | TERTIARY FLORIDAN | IRRIGATION | O T BELCHER | |
| 118 | 285356082352801 | 285356 | 823528 | 152 | . | 10 | TERTIARY FLORIDAN | PUBLIC | CRYSTAL RIVER | |
| 119 | 285357082344001 | 285357 | 823440 | 40 | . | 2 | TERTIARY FLORIDAN | IRRIGATION | C WASHINGTON | |
| 120 | 285404082334201 | 285404 | 823342 | 80 | . | . | | | | |
| 121 | 285414082284201 | 285414 | 822842 | 335 | . | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 122 | 285414082284202 | 285414 | 822842 | 78 | . | 4 | MIOCENE HAWTHORN FORMATION | UNUSED | USGS | |
| 123 | 285417082180301 | 285417 | 821803 | 401 | 42 | 16 | TERTIARY FLORIDAN | IRRIGATION | DEE | J ROY |
| 124 | 285417082381300 | 285417 | 823813 | . | . | . | TERTIARY FLORIDAN | RECREATION | | |
| 125 | 285419082325601 | 285419 | 823256 | 21.5 | . | . | | | 854232313 | |
| 126 | 285420082360901 | 285420 | 823609 | . | . | . | | | AKINS MOTEL | |
| 127 | 285421082361601 | 285421 | 823616 | 53 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 128 | 285421082361602 | 285421 | 823616 | 176 | . | 5 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 129 | 285433082331701 | 285433 | 823317 | 34.5 | . | . | | | 854233234 | |
| 130 | 285436082344701 | 285436 | 823447 | 496 | . | . | | | S A BETZ RANCH | |
| 131 | 285441082165201 | 285441 | 821652 | 13 | . | 3 | TERTIARY FLORIDAN | UNUSED | DEE | J ROY |
| 132 | 285445082271201 | 285445 | 822712 | 200 | . | 10 | TERTIARY FLORIDAN | PUBLIC | ROLLING OAKS | |
| 133 | 285445082271202 | 285445 | 822712 | . | . | . | TERTIARY FLORIDAN | | BEVERLY HILLS W | ELL 5-T |
| 134 | 285454082275001 | 285454 | 822750 | 405 | 238 | 12 | TERTIARY FLORIDAN | PUBLIC | BEVERLY | HILLS |
| 135 | 285459082280801 | 285459 | 822808 | 240 | 149 | 12 | TERTIARY FLORIDAN | PUBLIC | BEVERLY | HILLS |
| 136 | 285459082354001 | 285459 | 823540 | 108 | . | . | | | SR 495 | |
| 137 | 285500082264401 | 285500 | 822644 | 190 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | BEVERLY HILLS | |
| 138 | 285505082353301 | 285505 | 823533 | 54 | . | . | | | CRYSTAL R | |
| 139 | 285508082365701 | 285508 | 823657 | 50 | . | 6 | TERTIARY FLORIDAN | PUBLIC | INDIAN WATERS | |
| 140 | 285511082364501 | 285511 | 823645 | . | . | . | | | INDIAN SPRINGS | SUBDIV |
| 141 | 285514082275401 | 285514 | 822754 | 260 | . | 10 | TERTIARY FLORIDAN | PUBLIC | ROLLING OAKS | |
| 142 | 285514082275402 | 285514 | 822754 | 176 | . | 4 | TERTIARY FLORIDAN | UNUSED | ROLLING OAKS 60 | |
| 143 | 285538082271001 | 285538 | 822710 | 295 | . | . | TERTIARY FLORIDAN | PUBLIC | BEVERLY HILLS | |
| 144 | 285538082271002 | 285538 | 822710 | 95 | . | . | TERTIARY FLORIDAN | PUBLIC | BEVERLY HILLS | |
| 145 | 285543082364401 | 285543 | 823644 | 92 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | S WOODEN | |
| 146 | 285548082313801 | 285548 | 823138 | [illegible] | 130 | 8 | TERTIARY FLORIDAN | PUBLIC | PINE | RIDGE |
| 147 | 285558082272401 | 285558 | 822724 | 180 | 137 | 8 | TERTIARY FLORIDAN | PUBLIC | PINE | RIDGE |
| 148 | 285608082233401 | 285608 | 822334 | 91 | . | . | TERTIARY FLORIDAN | UNUSED | CAMP MINING CO | |
| 149 | 285608082233402 | 285608 | 822334 | 91 | . | 14 | TERTIARY FLORIDAN | UNUSED | CAMP | MINING |
| 150 | 285612082294201 | 285612 | 822942 | 200 | 131 | 8 | TERTIARY FLORIDAN | PUBLIC | PINE | RIDGE |
| 151 | 285622082272301 | 285622 | 822723 | 94 | . | 4 | TERTIARY FLORIDAN | UNUSED | DELTONA | CORP |
| 152 | 285642082372100 | 285642 | 823721 | 68 | . | 2 | | IRRIGATION | L C COBURN | |
| 153 | 285651082301801 | 285651 | 823018 | 233 | 82 | 4 | TERTIARY FLORIDAN | UNUSED | DELTONA | |
| 154 | 285654082350101 | 285654 | 823501 | 109 | 102 | 8 | TERTIARY FLORIDAN | IRRIGATION | GERRITS | EDWARD |
| 155 | 285659082262701 | 285659 | 822627 | 280 | 160 | 8 | TERTIARY FLORIDAN | IRRIGATION | BEVERLY | HILLS |
| 156 | 285701082345201 | 285701 | 823452 | 31 | . | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 157 | 285714082285601 | 285714 | 822856 | . | . | 4 | TERTIARY FLORIDAN | UNUSED | DELTONA | CORP |
| 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 | WATER USE | NAME OF OWNER LAST NAME | FIRST NAME |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CITRUS COUNTY | | | | | |
| 162 | 285740082231901 | 285740 | 822319 | 34 | . | . | TERTIARY FLORIDAN | | MANKO CO | |
| 163 | 285744082415901 | 285744 | 824159 | 50 | . | 8 | TERTIARY FLORIDAN | INDUSTRY | 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 | |
| 166 | 285752082300601 | 285752 | 823006 | 243 | 110 | 4 | TERTIARY FLORIDAN | UNUSED | CROFT | J AND B |
| 167 | 285809082185200 | 285809 | 821852 | . | . | . | TERTIARY FLORIDAN | RECREATION | | |
| 168 | 285810082381001 | 285810 | 823810 | 60 | . | . | | | RED LEVEL BAPTI | ST CH |
| 169 | 285811082350901 | 285811 | 823509 | 300 | 156 | 10 | TERTIARY FLORIDAN | IRRIGATION | 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 NONARTESIAN SAND | UNUSED | U S GEOL SURVEY | |
| 181 | 290010082321601 | 290010 | 823216 | 128 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | DOLAN | G |
| 182 | 290023082393601 | 290023 | 823936 | 30 | . | 3 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 183 | 290027082370501 | 290027 | 823705 | 78 | . | . | TERTIARY FLORIDAN | DOMESTIC | P O NICHOLS | |
| 184 | 290027082370701 | 290027 | 823707 | 78 | . | . | TERTIARY FLORIDAN | DOMESTIC | P D NICHOLS | |
| 185 | 290033082272901 | 290033 | 822729 | 184 | 121 | 10 | TERTIARY FLORIDAN | PUBLIC | CITRUS | SPRINGS |
| 186 | 290034082411401 | 290034 | 824114 | 200 | 65 | 16 | TERTIARY FLORIDAN | INDUSTRY | FLA ST | ENGINEER |
| 187 | 290034082411402 | 290034 | 824114 | 405 | 53 | 16 | TERTIARY FLORIDAN | INDUSTRY | FLA ST | ENGINEER |
| 188 | 290041082265101 | 290041 | 822651 | 360 | 340 | 10 | TERTIARY FLORIDAN | UNUSED | DELTONA | CORA |
| 189 | 290045082272101 | 290045 | 822721 | 239 | 145 | 8 | TERTIARY FLORIDAN | PUBLIC | CITRUS | SPRINGS |
| 190 | 290047082414101 | 290047 | 824141 | 30 | . | 3 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 191 | 290057082304001 | 290057 | 823040 | 250 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | C W DIAZ | |
| 192 | 290107082400501 | 290107 | 824005 | 58 | . | 3 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 193 | 290113082400501 | 290113 | 824005 | 100 | 52 | 6 | TERTIARY FLORIDAN | PUBLIC | RIVER LODG | TRAIL PK |
| 194 | 290114082351501 | 290114 | 823515 | . | . | 2 | TERTIARY FLORIDAN | DOMESTIC | HAGENS | |
| 195 | 290114082420901 | 290114 | 824209 | 24 | . | 3 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 196 | 290115082401001 | 290115 | 824010 | 40 | . | 4 | TERTIARY FLORIDAN | COMMERCIAL | HAVEN MOTEL | |
| 197 | 290117082404501 | 290117 | 824045 | 150 | 43 | 6 | TERTIARY FLORIDAN | PUBLIC | COCKE | JOHN |
| 198 | 290117082404502 | 290117 | 824045 | 152 | 45 | 6 | TERTIARY FLORIDAN | PUBLIC | COCKE | JOHN |
| 199 | 290121082331001 | 290121 | 823310 | 246 | 121 | 12 | TERTIARY FLORIDAN | IRRIGATION | COWART | EMORY |
| 200 | 290132082324201 | 290132 | 823242 | 203 | 105 | 6 | TERTIARY FLORIDAN | DOMESTIC | COWART | EMORY |
| 201 | 290137082325501 | 290137 | 823255 | 1142 | 9 | 3 | TERTIARY FLORIDAN | UNUSED | COWART | EMORY |
| 202 | 290145082421901 | 290145 | 824219 | 61 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | HAROLD O LOGAN | |
| 203 | 290147082405501 | 290147 | 824055 | 50 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | S DORNBIRER | |
| 204 | 290152082312201 | 290152 | 823122 | 250 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | GLENN A BLAND | |
| 205 | 290154082301701 | 290154 | 823017 | 90 | . | . | TERTIARY FLORIDAN | DOMESTIC | ED SHIVELY | |
| 206 | 290154082324401 | 290154 | 823244 | 43 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | WEBB | |
| 207 | 290159082285101 | 290159 | 822851 | 440 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | CARL H REUMAN | |
| 208 | 290202082264801 | 290202 | 822648 | 105 | 60 | 6 | TERTIARY FLORIDAN | PUBLIC | CITRUS | SPRINGS |
| 209 | 290213082284101 | 290213 | 822841 | 78 | . | 3 | TERTIARY FLORIDAN | | CHARLES RUSH | |
| 210 | 290216082292001 | 290216 | 822920 | 190 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 211 | 290224082275001 | 290224 | 822750 | 124 | 106 | 12 | TERTIARY FLORIDAN | PUBLIC | S DUNN | WATER US |
| 212 | 290225082295301 | 290225 | 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 | NAME OF OWNER LAST NAME | FIRST NAME |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HERNANDO COUNTY | | | | | |
| 215 | 282601082395101 | 282601 | 823951 | 118 | . | . | | | | |
| 216 | 282605082345801 | 282605 | 823458 | 355 | . | . | EOCENE AVON PARK LIMESTONE | | PRING HILL, FL | |
| 217 | 282607082180901 | 282607 | 821809 | 304 | . | . | | DOMESTIC | CECIL ANSLEY | |
| 218 | 282607082383400 | 282607 | 823834 | . | . | . | TERTIARY FLORIDAN | RECREATION | | |
| 219 | 282613082175001 | 282613 | 821750 | 736 | . | 12 | | IRRIGATION | CECIL ANSLEY | |
| 220 | 282620082193801 | 282620 | 821938 | 209 | 104 | 4 | TERTIARY FLORIDAN | | LAKEWOOD | RETREAT |
| 221 | 282620082211801 | 282620 | 822118 | 197 | 91 | 6 | TERTIARY FLORIDAN | DOMESTIC | DUGGAN | JOHN |
| 222 | 282621082392900 | 282621 | 823929 | . | . | . | TERTIARY FLORIDAN | UNUSED | | |
| 223 | 282636082221401 | 282636 | 822214 | 69 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 224 | 282636082221402 | 282636 | 822214 | . | . | . | PLEISTOCENE NONARTESIAN SAND | | 11 NEAR MASARYK | TOWN,FL. |
| 225 | 282642082335101 | 282642 | 823351 | 481 | . | 12 | TERTIARY FLORIDAN | UNUSED | EL RICO RANCH | |
| 226 | 282652082363701 | 282652 | 823637 | 286 | . | 8 | TERTIARY FLORIDAN | RECREATION | DELTONA CORP | |
| 227 | 282657082382501 | 282657 | 823825 | 101 | . | 1 | | DOMESTIC | W RAULERSON | |
| 228 | 282704082394301 | 282704 | 823943 | 195 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 229 | 282708082390201 | 282708 | 823902 | 246 | . | 3 | | UNUSED | USGS | |
| 230 | 282723082202301 | 282723 | 822023 | 450 | . | 6 | | STOCK | L C HAWES | |
| 231 | 282726082311801 | 282726 | 823118 | 335 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | 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 | | | L C HAWES | |
| 236 | 282738082372501 | 282738 | 823725 | 95 | . | 6 | TERTIARY FLORIDAN | UNUSED | SPG HILL UTIL | |
| 237 | 282742082375901 | 282742 | 823759 | 880 | . | . | EOCENE OCALA LIMESTONE | | NR ARIPEKA, FL | . |
| 238 | 282742082380001 | 282742 | 823800 | 580 | . | . | EOCENE OCALA LIMESTONE | | 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 | . | . | . | | | | |
| 244 | 282839082190801 | 282839 | 821908 | 428 | 309 | 6 | TERTIARY FLORIDAN | DOMESTIC | BLACKETT | RUSSELL |
| 245 | 282842082042401 | 282842 | 820424 | 195 | 60 | 6 | TERTIARY FLORIDAN | IRRIGATION | BRINSON | J |
| 246 | 282847082042301 | 282847 | 820423 | 134 | . | 3 | TERTIARY FLORIDAN | UNUSED | BOYETT | MARGARET |
| 247 | 282847082103401 | 282847 | 821034 | . | . | 3 | TERTIARY FLORIDAN | UNUSED | TALLISMAN | ESTS |
| 248 | 282847082364101 | 282847 | 823641 | 250 | . | . | | | K | |
| 249 | 282851082035301 | 282851 | 820353 | 83 | . | 3 | TERTIARY FLORIDAN | UNUSED | BOYETTE | E |
| 250 | 282851082271601 | 282851 | 822716 | 251 | . | 8 | TERTIARY FLORIDAN | UNUSED | BROOKSVILLE | |
| 251 | 282851082360801 | 282851 | 823608 | . | . | . | TERTIARY FLORIDAN | | Y WELL | |
| 252 | 282857082212101 | 282857 | 822121 | 105 | 74 | 6 | TERTIARY FLORIDAN | DOMESTIC | PATE | HILTON |
| 253 | 282905082163401 | 282905 | 821634 | 456 | . | . | TERTIARY FLORIDAN | UNUSED | THOMAS | WAYNE |
| 254 | 282910082102601 | 282910 | 821026 | . | . | 4 | TERTIARY FLORIDAN | PUBLIC | FT DADE MHP | |
| 255 | 282911082101001 | 282911 | 821010 | 135 | 66 | 6 | TERTIARY FLORIDAN | PUBLIC | FT DADE MHP | |
| 256 | 282917082355701 | 282917 | 823557 | 170 | . | 8 | | PUBLIC | BARTLET BROS | |
| 257 | 282921082181101 | 282921 | 821811 | 260 | 143 | 6 | TERTIARY FLORIDAN | DOMESTIC | BROWN | GLADYS |
| 258 | 282923082355201 | 282923 | 823552 | . | . | . | | | NDS WELL NO 1 O | N REDWING |
| 259 | 282923082380301 | 282923 | 823803 | 180 | . | . | | | | |
| 260 | 282959082105201 | 282959 | 821052 | 300 | 50 | 6 | TERTIARY FLORIDAN | PUBLIC | HERNANDO | COUNTY |
| 261 | 283000082223000 | 283000 | 822230 | . | . | . | | | AD NE CORNER NO | T DATA SIT |
| 262 | 283000082300000 | 283000 | 823000 | . | . | . | | | AD NW CORNER NO | T DATA SIT |
| 263 | 283001082064701 | 283001 | 820647 | 97 | . | . | TERTIARY FLORIDAN | UNUSED | FLA FOREST SERV | |
| 264 | 283001082064702 | 283001 | 820647 | . | . | 6 | TERTIARY FLORIDAN | DOMESTIC | WITHLA | ST FORES |
| 265 | 283010082161701 | 283010 | 821617 | 210 | 62 | 6 | TERTIARY FLORIDAN | DOMESTIC | MINER | SHIRLES |
| 266 | 283022082160701 | 283022 | 821607 | 421 | . | . | TERTIARY FLORIDAN | DOMESTIC | HEDSTRAND | SUSAN |
| 267 | 283023082351001 | 283023 | 823510 | 84 | . | 4 | | DOMESTIC | 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 | NAME OF OWNER LAST NAME | FIRST NAME |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HERNANDO COUNTY | | | | | |
| 268 | 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 | OGNIBENE | SAMUEL |
| 271 | 283036082105501 | 283036 | 821055 | 1300 | . | . | TERTIARY FLORIDAN | | 830210133 RIDGE | MANOR NO |
| 272 | 283036082105502 | 283036 | 821055 | 3004 | . | 12 | TERTIARY FLORIDAN | PUBLIC | RIDGE MANOR EST | |
| 273 | 283041082154201 | 283041 | 821542 | 160 | 83 | 6 | TERTIARY FLORIDAN | DOMESTIC | OGNIBENE | SAMUEL |
| 274 | 283044082343401 | 283044 | 823434 | . | . | . | | IRRIGATION | FLINLANDTHEATRE | |
| 275 | 283049082345100 | 283049 | 823451 | . | . | . | TERTIARY FLORIDAN | UNUSED | | |
| 276 | 283050082105002 | 283050 | 821050 | 3008 | . | 12 | | PUBLIC | RIDGE MANOR EST | |
| 277 | 283057082342901 | 283057 | 823429 | 315 | . | . | TERTIARY FLORIDAN | PUBLIC | FLINLANDTHEATRE | |
| 278 | 283058082281001 | 283058 | 822810 | . | . | . | TERTIARY FLORIDAN | | L | |
| 279 | 283058082343601 | 283058 | 823436 | 64 | . | . | | STOCK | FLINLANDTHEATRE | |
| 280 | 283100082342500 | 283100 | 823425 | . | . | . | TERTIARY FLORIDAN | RECREATION | ST PETERSBURG | CITY OF |
| 281 | 283101082320601 | 283101 | 823206 | 60 | . | . | | STOCK | L DIEPOLDER | |
| 282 | 283103082341801 | 283103 | 823418 | 305 | . | . | | IRRIGATION | INLAND THEATRE | |
| 283 | 283103082350701 | 283103 | 823507 | . | . | . | | STOCK | INLAND THEATRE | |
| 284 | 283105082245001 | 283105 | 822445 | 140 | 88 | 8 | TERTIARY FLORIDAN | UNUSED | 41 TRAILER | VILLAGE |
| 285 | 283105082245002 | 283105 | 822450 | 242 | 85 | 8 | TERTIARY FLORIDAN | PUBLIC | 41 TRAILER | VILLAGE |
| 286 | 283105082380001 | 283105 | 823800 | 68 | . | . | | | | |
| 287 | 283108082123401 | 283108 | 821234 | . | . | 3 | TERTIARY FLORIDAN | UNUSED | LE COMPTE | |
| 288 | 283108082342301 | 283108 | 823423 | 321 | . | 6 | | INDUSTRY | ST PETERSBURG | |
| 289 | 283110082341501 | 283110 | 823415 | 91 | . | 4 | | UNUSED | U S GEOL SURVEY | |
| 290 | 283118082351301 | 283118 | 823513 | 117 | . | 4 | | IRRIGATION | INLAND THEATRE | |
| 291 | 283125082100501 | 283125 | 821005 | 95 | 48 | 4 | TERTIARY FLORIDAN | DOMESTIC | ASBEL | CARL |
| 292 | 283130082134901 | 283130 | 821349 | 5065 | . | 8 | TERTIARY FLORIDAN | DOMESTIC | GILBERT THAYER | |
| 293 | 283143082134901 | 283143 | 821349 | 2098 | . | 18 | TERTIARY FLORIDAN | UNUSED | THAYER DAVIS | |
| 294 | 283143082281801 | 283143 | 822818 | 116 | . | . | TERTIARY FLORIDAN | DOMESTIC | BURTON HANSON | |
| 295 | 283200082354101 | 283200 | 823541 | . | . | . | | | WELL NO 2 | |
| 296 | 283201082315601 | 283201 | 823156 | 259 | . | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 297 | 283201082354201 | 283201 | 823542 | . | . | . | | | WELL 1 | |
| 298 | 283203082370201 | 283203 | 823702 | 75 | . | . | TERTIARY FLORIDAN | UNUSED | PRESBYTER YOUTH | |
| 299 | 283213082212101 | 283213 | 822121 | 180 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | TALIS LEWIE | |
| 300 | 283223082335901 | 283223 | 823359 | . | . | . | | | FS OFFICE | |
| 301 | 283225082295701 | 283225 | 822957 | 500 | . | . | TERTIARY FLORIDAN | | ENT WELL | |
| 302 | 283227082335801 | 283227 | 823358 | 190 | . | . | | | 1 | |
| 303 | 283229082331901 | 283229 | 823319 | 62 | . | 2 | | DOMESTIC | SEDLEY COUCH | |
| 304 | 283231082115101 | 283231 | 821151 | 200 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | WATSON | M |
| 305 | 283233082364101 | 283233 | 823641 | 165 | . | 3 | | PUBLIC | A W CARE | |
| 306 | 283233082364102 | 283233 | 823641 | 155 | . | 3 | | PUBLIC | A W CARE | |
| 307 | 283233082364103 | 283233 | 823641 | 162 | . | 3 | | PUBLIC | A W CARE | |
| 308 | 283233082364104 | 283233 | 823641 | 166 | . | 3 | | PUBLIC | A W CARE | |
| 309 | 283233082364105 | 283233 | 823641 | 147 | . | . | | PUBLIC | WEEKIWACH R EST | |
| 310 | 283236082334901 | 283236 | 823349 | 212 | . | . | | | | |
| 311 | 283237082181901 | 283237 | 821819 | 259 | 117 | 8 | TERTIARY FLORIDAN | UNUSED | THOMAS | WAYNE |
| 312 | 283243082365701 | 283243 | 823651 | 302 | . | . | TERTIARY FLORIDAN | | NR BAYPORT, FLA | |
| 313 | 283245082371000 | 283245 | 823710 | . | . | . | TERTIARY FLORIDAN | UNUSED | | |
| 314 | 283250082302401 | 283250 | 823024 | 195 | . | . | | | | |
| 315 | 283251082304201 | 283251 | 823042 | 235 | . | . | | | | |
| 316 | 283253082383601 | 283253 | 823836 | 50 | . | 3 | | UNUSED | M L ABBOTT | |
| 317 | 283253082383701 | 283253 | 823837 | 54 | . | 3 | | UNUSED | M L ABBOTT | |
| 318 | 283254082335101 | 283254 | 823351 | . | . | . | TERTIARY FLORIDAN | | | |
| 319 | 283254082383601 | 283254 | 823836 | 39 | . | 4 | | UNUSED | COOGLER | |
| 320 | 283258082231901 | 283258 | 822319 | 602 | . | 15 | TERTIARY FLORIDAN | PUBLIC | CITYBROOKSVILLE | |
| 321 | 283258082232201 | 283258 | 822322 | 757 | . | . | TERTIARY FLORIDAN | PUBLIC | CITYBROOKSVILLE | |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HERNANDO COUNTY | | | | | |
| 322 | 283258082383101 | 283258 | 823831 | . | . | . | | | | |
| 323 | 283313082094601 | 283313 | 820946 | 26 | . | . | TERTIARY FLORIDAN | DOMESTIC | MRS MCCLINTOCK | |
| 324 | 283326082355201 | 283326 | 823552 | . | . | . | | | TSMAN CLUB NO 3 | |
| 325 | 283327082355001 | 283327 | 823550 | . | . | . | | | TSMANS CLUB NO 2 | |
| 326 | 283337082333701 | 283337 | 823337 | 56 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 327 | 283356082123301 | 283356 | 821233 | . | . | 4 | TERTIARY FLORIDAN | PUBLIC | WITHLA | ST FORES |
| 328 | 283408082123801 | 283408 | 821238 | . | . | . | TERTIARY FLORIDAN | | WITHLA | ST FORES |
| 329 | 283410082301301 | 283410 | 823013 | 225 | . | . | | UNUSED | FRAZIER HALL | |
| 330 | 283432082391401 | 283432 | 823914 | 180 | . | . | | UNUSED | J C PLUMMER | |
| 331 | 283433082303801 | 283433 | 823038 | 117 | . | . | | | | |
| 332 | 283433082391301 | 283433 | 823913 | 33 | . | . | | UNUSED | J C PLUMMER | |
| 333 | 283433082391302 | 283433 | 823913 | 15 | . | 2 | | DOMESTIC | J C PLUMMER | |
| 334 | 283443082223701 | 283443 | 822237 | 337 | . | 10 | TERTIARY FLORIDAN | PUBLIC | DA MAC UTIL | |
| 335 | 283443082223901 | 283443 | 822239 | 238 | . | . | TERTIARY FLORIDAN | | DA MAC UTIL | |
| 336 | 283446082210201 | 283446 | 822102 | 225 | 169 | 8 | TERTIARY FLORIDAN | PUBLIC | DOGWOOD | ESTATES |
| 337 | 283454082131301 | 283454 | 821313 | 65 | 42 | 4 | TERTIARY FLORIDAN | UNUSED | WITHLA ST | FOREST |
| 338 | 283508082215101 | 283508 | 822151 | 361 | 297 | 6 | TERTIARY FLORIDAN | DOMESTIC | SMITH | CLARENCE |
| 339 | 283516082302201 | 283516 | 823022 | 225 | . | 12 | TERTIARY FLORIDAN | IRRIGATION | FRAZIER HALL | |
| 340 | 283522082330701 | 283522 | 823307 | 65 | . | 2 | | DOMESTIC | FRED HAINES | |
| 341 | 283527082365701 | 283527 | 823657 | 125 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 342 | 283529082355801 | 283529 | 823558 | 140 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 343 | 283532082331201 | 283532 | 823312 | . | . | . | TERTIARY FLORIDAN | | | |
| 344 | 283537082151501 | 283537 | 821515 | 198 | 111 | 8 | TERTIARY FLORIDAN | UNUSED | SWFWMD | |
| 345 | 283546082261301 | 283546 | 822613 | 42 | . | . | TERTIARY FLORIDAN | UNUSED | CAMP CONC ROCK | |
| 346 | 283555082352901 | 283555 | 823529 | 110 | . | . | TERTIARY FLORIDAN | | KIWACHEE, FLA | |
| 347 | 283555082372901 | 283555 | 823729 | 110 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 348 | 283613082184301 | 283613 | 821843 | 219 | 200 | 4 | TERTIARY FLORIDAN | UNUSED | NIX | DELMAS |
| 349 | 283620082325801 | 283620 | 823258 | 10 | . | 2 | | DOMESTIC | PAUL HOLSTEIN | |
| 350 | 283632082245101 | 283632 | 822451 | 231 | . | 6 | TERTIARY FLORIDAN | DOMESTIC | SEABOARD R R | |
| 351 | 283648082275201 | 283648 | 822752 | . | . | . | | | LL | |
| 352 | 283652082324701 | 283652 | 823247 | 126 | . | . | | DOMESTIC | J GILPIN | |
| 353 | 283704082244201 | 283704 | 822442 | 40 | . | 1 | | UNUSED | U S GEOL SURVEY | |
| 354 | 283705082215701 | 283705 | 822157 | 804 | . | . | TERTIARY FLORIDAN | PUBLIC | U S D A | |
| 355 | 283724082320901 | 283724 | 823209 | 562 | . | . | | IRRIGATION | YOUNGBLOOD | |
| 356 | 283728082222801 | 283728 | 822228 | 360 | . | 12 | TERTIARY FLORIDAN | | U S D A | |
| 357 | 283729082323301 | 283729 | 823233 | 126 | . | . | TERTIARY FLORIDAN | UNUSED | UNKNOWN | |
| 358 | 283743082213801 | 283743 | 822138 | 149 | . | 3 | TERTIARY FLORIDAN | PUBLIC | JACK FRANKLIN | |
| 359 | 283759082214901 | 283759 | 822149 | 150 | . | . | TERTIARY FLORIDAN | PUBLIC | HERNANDO COUNTY | |
| 360 | 283803082323001 | 283803 | 823230 | 160 | . | . | | | | |
| 361 | 283806082214801 | 283806 | 822148 | 155 | . | 4 | TERTIARY FLORIDAN | PUBLIC | EDEN CHRS | SCHOOL |
| 362 | 283815082281701 | 283815 | 822817 | 600 | . | . | TERTIARY FLORIDAN | INDUSTRY | BRKSVIL ROCK CO | |
| 363 | 283815082281901 | 283815 | 822819 | 600 | . | . | TERTIARY FLORIDAN | INDUSTRY | BRKSVIL ROCK CO | |
| 364 | 283815082282201 | 283815 | 822822 | 899 | . | 18 | TERTIARY FLORIDAN | INDUSTRY | BRKSVIL ROCK CO | |
| 365 | 283816082281801 | 283816 | 822818 | 600 | . | . | TERTIARY FLORIDAN | INDUSTRY | BRKSVIL ROCK CO | |
| 366 | 283819082170801 | 283819 | 821708 | 205 | 110 | 5 | TERTIARY FLORIDAN | PUBLIC | USDA | |
| 367 | 283840082154801 | 283840 | 821548 | 140 | . | . | TERTIARY FLORIDAN | UNUSED | C C CHANDLER | |
| 368 | 283849082224801 | 283849 | 822248 | 315 | . | . | TERTIARY FLORIDAN | UNUSED | JORGENSON | |
| 369 | 283850082265501 | 283850 | 822655 | . | . | . | TERTIARY FLORIDAN | | NR BROOKSVILLE | |
| 370 | 283908082201301 | 283908 | 822013 | 143 | 125 | 6 | TERTIARY FLORIDAN | PUBLIC | WSF ENUIRO | CENTER |
| 371 | 283924082272301 | 283924 | 822723 | 240 | . | . | TERTIARY FLORIDAN | | NEAR BROOKSVILL | E. FLORIDA |
| 372 | 283926082175001 | 283926 | 821750 | 234 | 107 | 6 | TERTIARY FLORIDAN | DOMESTIC | HOOSER | GUY |
| 373 | 283941082164401 | 283941 | 821644 | 87 | 80 | 2 | TERTIARY FLORIDAN | UNUSED | COOK | BILL |
| 374 | 283944082290701 | 283944 | 822907 | 667 | . | . | | IRRIGATION | NORRIS CATTLE | |
| 375 | 283955082293501 | 283955 | 822935 | . | . | . | TERTIARY FLORIDAN | | NR BROOKSVILLE | |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HERNANDO COUNTY | | | | | |
| 376 | 283957082181001 | 283957 | 821810 | 140 | 95 | 4 | TERTIARY FLORIDAN | DOMESTIC | BLIZZARD | W |
| 377 | 284039082291801 | 284039 | 822918 | . | . | . | TERTIARY FLORIDAN | | | |
| 378 | 284040082342301 | 284040 | 823423 | . | . | . | | | NG CAMP | |
| 379 | 284317082330602 | 284317 | 823306 | . | . | . | | | 2 NR CHASSAHOW | ITZKA, FLA |
| 380 | 284339082270401 | 284339 | 822704 | . | . | . | | | HASSAHOWITZKA, | FLA |
| 381 | 284339082270402 | 284339 | 822704 | . | . | . | | | HASSAHOWITZKA, | FLA |

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 | | | | | |
| 382 | 282310082275001 | 282310 | 822750 | 190 | . | 8 | TERTIARY FLORIDAN | PUBLIC | WILLISTON | |
| 383 | 290004082454101 | 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 | 2 | TERTIARY NONARTESIAN SAND | UNUSED | USGS | |
| 386 | 290118082364101 | 290118 | 823641 | 67 | 62 | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 387 | 290118082364102 | 290118 | 823641 | 21 | 18 | 2 | TERTIARY NONARTESIAN SAND | 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 NONARTESIAN SAND | UNUSED | USGS | |
| 391 | 290138082432001 | 290138 | 824320 | 30 | . | 2 | TERTIARY FLORIDAN | UNUSED | CHAS VORISEK | |
| 392 | 290151082401201 | 290151 | 824012 | 26 | . | 2 | TERTIARY FLORIDAN | UNUSED | DARRON | J |
| 393 | 290153082401601 | 290153 | 824016 | 57 | . | 2 | TERTIARY FLORIDAN | UNUSED | ALBERT JAMES | |
| 394 | 290155082415101 | 290155 | 824151 | 515 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | EUGENE KNOTTS | |
| 395 | 290156082415101 | 290156 | 824151 | 19 | . | 2 | TERTIARY FLORIDAN | STOCK | KNOTTS | TOM |
| 396 | 290200082425901 | 290200 | 824259 | 47 | . | 4 | TERTIARY FLORIDAN | UNUSED | SCHNEIDER | |
| 397 | 290200082431501 | 290200 | 824315 | 250 | . | . | TERTIARY FLORIDAN | | ROMP 124 D WELL | AT YANKEE |
| 398 | 290200082432301 | 290200 | 824323 | 250 | . | . | TERTIARY FLORIDAN | | 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 | | ROMP 125 DP AT | YANKEETOWN |
| 405 | 290301082335601 | 290301 | 823356 | 271 | . | 3 | TERTIARY FLORIDAN | UNUSED | WRIGHT | DEL |
| 406 | 290305082333701 | 290305 | 823337 | 16 | . | 1 | TERTIARY FLORIDAN | UNUSED | | |
| 407 | 290344082405601 | 290344 | 824056 | 10 | . | 2 | TERTIARY FLORIDAN | UNUSED | HUNT CAMP | |
| 408 | 290402082384901 | 290402 | 823849 | 37 | 25 | 2 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 409 | 290503082323101 | 290503 | 823231 | 115 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | T & J RANCH | |
| 410 | 290551082380901 | 290551 | 823809 | 32 | 14 | 2 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 411 | 290605082372601 | 290605 | 823726 | . | . | 2 | TERTIARY FLORIDAN | UNUSED | GEOTHE ROAD | |
| 412 | 290621082332901 | 290621 | 823329 | 30 | . | 3 | TERTIARY FLORIDAN | STOCK | J T GOETHE | |
| 413 | 290824083022101 | 290824 | 830221 | 29 | . | 1 | TERTIARY NONARTESIAN SAND | PUBLIC | LEVY COUNTY | |
| 414 | 291004082382901 | 291004 | 823829 | 110 | . | 4 | TERTIARY FLORIDAN | INDUSTRY | DIXIE LIME | |
| 415 | 291048083011801 | 291048 | 830118 | 106 | . | 8 | TERTIARY FLORIDAN | PUBLIC | CEDAR KEY | |
| 416 | 291055083011901 | 291055 | 830119 | 106 | . | 8 | TERTIARY FLORIDAN | UNUSED | DR ANDREWS | |
| 417 | 291118083010601 | 291118 | 830106 | 98 | . | 8 | TERTIARY FLORIDAN | PUBLIC | TOWN CEDAR KEYS | |
| 418 | 291208082592601 | 291208 | 825926 | 91 | . | 12 | TERTIARY FLORIDAN | PUBLIC | CEDAR KEYS | |
| 419 | 291250082341901 | 291250 | 823419 | . | . | 4 | TERTIARY FLORIDAN | DOMESTIC | CARVER | NORMA |
| 420 | 291310082464501 | 291310 | 824645 | 10038 | . | 8 | | OTHER | SUN OIL COMPANY | |
| 421 | 291436082291001 | 291436 | 822910 | 100 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | MERRILL | S |
| 422 | 291437082291001 | 291437 | 822910 | 109 | . | 2 | TERTIARY FLORIDAN | UNUSED | MERRILL | S |
| 423 | 291508082432901 | 291508 | 824329 | 300 | . | . | TERTIARY FLORIDAN | PUBLIC | GULF HAMMOCK | |
| 424 | 291516082241601 | 291516 | 822416 | 120 | 84 | 4 | TERTIARY FLORIDAN | STOCK | PRETTYMAN | DONALD |
| 425 | 291620082255101 | 291620 | 822551 | . | . | 4 | TERTIARY FLORIDAN | DOMESTIC | BLITCH | JAMES |
| 426 | 291649082392300 | 291649 | 823923 | . | . | . | TERTIARY FLORIDAN | | PARKS | JAMES |
| 427 | 291654082263101 | 291654 | 822631 | 296 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | MASONIC | LODGE |
| 428 | 291712082351801 | 291712 | 823518 | 154 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | ROBINSON | |
| 429 | 291719082352001 | 291719 | 823520 | 68 | . | 2 | TERTIARY FLORIDAN | UNUSED | | |
| 430 | 291723082344501 | 291723 | 823445 | 100 | . | 2 | TERTIARY FLORIDAN | UNUSED | GULLETTE | JOHN |
| 431 | 291806082545601 | 291806 | 825456 | 72 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 432 | 291807082545001 | 291807 | 825450 | 73 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 433 | 291910082341101 | 291910 | 823411 | 91 | 68 | 4 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 434 | 291917082455701 | 291917 | 824557 | 96 | . | . | TERTIARY FLORIDAN | DOMESTIC | OWENS ILLINOIS | |

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 | 292109082422901 | 292109 | 824229 | 679 | . | 18 | TERTIARY FLORIDAN | UNUSED | THOMPSON ESTATE | |
| 440 | 292143082282201 | 292143 | 822822 | 135 | . | 6 | TERTIARY FLORIDAN | PUBLIC | WILLISTOWN | 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 | 822836 | 20 | . | . | TERTIARY FLORIDAN | UNUSED | BARTON | |
| 446 | 292500082555001 | 292500 | 825550 | 40 | . | 24 | TERTIARY FLORIDAN | IRRIGATION | ALBERT J MIMS | |
| 447 | 292638082380801 | 292638 | 823808 | 267 | . | 2 | | PUBLIC | C. M. GRIFFIN | |
| 448 | 292640082381201 | 292640 | 823812 | 270 | . | 4 | TERTIARY FLORIDAN | PUBLIC | H E HARDEE | |
| 449 | 292702082415700 | 292702 | 824157 | . | . | . | TERTIARY FLORIDAN | RECREATION | | |
| 450 | 292711082312301 | 292711 | 823123 | 18 | . | 2 | TERTIARY FLORIDAN | UNUSED | MATHEWS | |
| 451 | 292843082514201 | 292843 | 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 | MELODY MOTEL | |
| 454 | 292922082583700 | 292922 | 825837 | . | . | . | TERTIARY FLORIDAN | RECREATION | FLORIDA | STATE OF |
| 455 | 293125082443501 | 293125 | 824435 | 40 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | H L GLEASON | |
| 456 | 293127082443701 | 293127 | 824437 | 31 | . | . | TERTIARY FLORIDAN | UNUSED | DODGE | |
| 457 | 293511082560700 | 293511 | 825607 | . | . | . | TERTIARY FLORIDAN | RECREATION | | |
| 458 | 293515082560800 | 293515 | 825608 | . | . | . | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MARION COUNTY | | | | | |
| 459 | 285739081470901 | 285739 | 814709 | 114 | . | . | TERTIARY FLORIDAN | | | |
| 460 | 285840082190800 | 285840 | 821908 | . | . | . | TERTIARY FLORIDAN | STOCK | DRAKE | T |
| 461 | 285841081421201 | 285841 | 814212 | 245 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | C M THOMAS | |
| 462 | 285850082033001 | 285850 | 820330 | 157 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | LEONARD GWYNN | |
| 463 | 285856082021901 | 285856 | 820219 | 95 | . | . | TERTIARY FLORIDAN | | GORDON HUNT AT | DALLAS FLA |
| 464 | 285900082072001 | 285900 | 820720 | 66 | . | 6 | TERTIARY FLORIDAN | UNUSED | LAZY K RANCH | |
| 465 | 285908082080401 | 285908 | 820904 | 111 | . | . | TERTIARY FLORIDAN | | SCE 141 LAZY K | RANCH |
| 466 | 285908082090401 | 285908 | 820904 | 111 | . | . | TERTIARY FLORIDAN | UNUSED | LAZY K RANCH | |
| 467 | 285920081490501 | 285928 | 815005 | 152 | . | 6 | TERTIARY FLORIDAN | DOMESTIC | NELSON | E |
| 468 | 285920082205801 | 285920 | 822058 | . | . | . | TERTIARY FLORIDAN | | STOKES FERRY FI | SH CAMP |
| 469 | 285930082022001 | 285930 | 820220 | 134 | . | . | TERTIARY FLORIDAN | DOMESTIC | W SWEETZ | |
| 470 | 285933082192501 | 285933 | 821925 | 45 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 471 | 285940081522001 | 285940 | 815220 | 500 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | KEY SCALES JR | |
| 472 | 285947082144201 | 285947 | 821442 | 43 | . | . | TERTIARY FLORIDAN | DOMESTIC | K JOHNSTON | |
| 473 | 285958082103801 | 285958 | 821038 | 110 | . | . | TERTIARY FLORIDAN | | MARION OAKS NO | 1 |
| 474 | 285958082103901 | 285958 | 821039 | 170 | . | . | TERTIARY FLORIDAN | | MARIOW OAKS NO | 3 |
| 475 | 290006082191501 | 290006 | 821915 | 27.29 | . | . | TERTIARY FLORIDAN | | FLORIDA HIGHLAN | DS |
| 476 | 290006082191502 | 290006 | 821915 | 51 | . | . | TERTIARY FLORIDAN | | FLORIDA HIGHLAN | DS |
| 477 | 290006082195001 | 290006 | 821950 | 51 | . | . | TERTIARY FLORIDAN | | FLORIDA HIGHLAN | DS |
| 478 | 290029082202101 | 290029 | 822021 | 36 | . | . | TERTIARY FLORIDAN | | | |
| 479 | 290052082191401 | 290052 | 821914 | 90 | . | . | TERTIARY FLORIDAN | | L R PEACOCK FLA | HIGHLANDS |
| 480 | 290057082064401 | 290057 | 820644 | 132 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | LLOYD MONROE | |
| 481 | 290101082194801 | 290101 | 821948 | 46 | . | . | TERTIARY FLORIDAN | | H L STANSEL NR | ROSS PRAIR |
| 482 | 290103082104501 | 290103 | 821045 | . | . | . | TERTIARY FLORIDAN | | MARION OAKS NO | 2 |
| 483 | 290106082191001 | 290106 | 821910 | 45 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 484 | 290108082191801 | 290108 | 821918 | 75.5 | . | . | TERTIARY FLORIDAN | | H L STANSEL NR | ROSS PRAIR |
| 485 | 290130082082001 | 290130 | 820820 | 70 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 486 | 290132082133001 | 290132 | 821330 | 82 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 487 | 290156082092301 | 290156 | 820923 | 187 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | W L DEVEL | |
| 488 | 290213082142001 | 290213 | 821420 | 192 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | SYD HERLONG | |
| 489 | 290215082023301 | 290215 | 820233 | 258 | . | . | TERTIARY FLORIDAN | | | |
| 490 | 290215082152401 | 290215 | 821524 | 51 | . | . | TERTIARY FLORIDAN | UNUSED | U S CORPS ENG | |
| 491 | 290216082023201 | 290216 | 820232 | 44.5 | . | . | TERTIARY FLORIDAN | | OTTOMED AT +26 | FT MSL |
| 492 | 290220081485001 | 290220 | 814850 | . | . | . | TERTIARY FLORIDAN | PUBLIC | U S FOREST SERV | |
| 493 | 290220081562001 | 290220 | 815620 | 179 | . | 6 | TERTIARY FLORIDAN | PUBLIC | PRATT & CUFFMAN | |
| 494 | 290227082250801 | 290227 | 822508 | 82 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 495 | 290237082251001 | 290237 | 822510 | 38 | . | 24 | TERTIARY FLORIDAN | UNUSED | NED H FOLKS | |
| 496 | 290238082120901 | 290238 | 821209 | 65 | . | 3 | TERTIARY FLORIDAN | UNUSED | CORPS OF ENGRS | |
| 497 | 290238082131101 | 290238 | 821311 | 238 | . | . | TERTIARY FLORIDAN | | CPTI PILOT HOLE | |
| 498 | 290238082131102 | 290238 | 821311 | 47.59 | . | . | TERTIARY FLORIDAN | | CPTI BOTTOM AT | 28+MSL |
| 499 | 290238082131103 | 290238 | 821311 | 67 | . | . | TERTIARY FLORIDAN | | CPTI BOTTOM AT | [illegible]+MSL |
| 500 | 290238082141801 | 290238 | 821418 | 73 | . | 3 | TERTIARY FLORIDAN | STOCK | CORPS OF ENGRS | |
| 501 | 290239082231301 | 290239 | 822313 | 68 | . | 3 | TERTIARY FLORIDAN | UNUSED | CORPS OF ENGRS | |
| 502 | 290247082264301 | 290247 | 822643 | . | . | . | TERTIARY FLORIDAN | | DUNNELLON SEWAGE | PLANT |
| 503 | 290250082091001 | 290250 | [illegible] | 83 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 504 | 290250082091002 | 290250 | [illegible] | 29 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | U S GEOL SURVEY | |
| 505 | 290255082273601 | 290255 | 822736 | 88 | . | 8 | TERTIARY FLORIDAN | PUBLIC | DUNNELLON FLA | |
| 506 | 290258082273601 | 290258 | [illegible] | 266 | . | 8 | TERTIARY FLORIDAN | PUBLIC | DUNNELLON FLA | |
| 507 | 290300081452001 | 290300 | 814520 | . | . | . | TERTIARY FLORIDAN | PUBLIC | U S FOREST SERV | |
| 508 | 290306082232801 | 290306 | 822328 | 10 | . | . | PLEISTOCENE NONARTESIAN SAND | | U S GEOL SURVEY | SH WELL |
| 509 | 290306082232802 | 290306 | 822328 | 36 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 510 | 290306082232903 | 290306 | 822329 | 10 | . | 6 | | UNUSED | USGS | |
| 511 | 290312082190601 | 29031[illegible] | [illegible] | 60 | . | 4 | 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 | 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 | . | 6 | 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 | . | . | . | TERTIARY FLORIDAN | | DUNNELLON FIRE TOWER |
| 516 | 290325082283701 | 290325 | 822837 | 115 | . | . | TERTIARY FLORIDAN | | AK:54 WELL NEAR VOGT SPRI |
| 517 | 290333082292401 | 290333 | 822924 | 200 | . | . | TERTIARY FLORIDAN | UNUSED | A C WRIGHT |
| 518 | 290339082032001 | 290339 | 820320 | 300 | . | . | TERTIARY FLORIDAN | PUBLIC | CITY BELLEVIEW |
| 519 | 290340082032201 | 290340 | 820322 | 300 | . | . | TERTIARY FLORIDAN | PUBLIC | CITY BELLEVIEW |
| 520 | 290340082131001 | 290340 | 821310 | 77 | . | . | TERTIARY FLORIDAN | UNUSED | R F CRANE |
| 521 | 290340082151001 | 290340 | 821510 | 68 | . | . | TERTIARY FLORIDAN | UNUSED | R F CRANE |
| 522 | 290359082281201 | 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 | . | . | TERTIARY FLORIDAN | | TENN VALLEY AUT HORITY |
| 525 | 290405082270701 | 290405 | 822707 | 175 | . | 2 | TERTIARY FLORIDAN | PUBLIC | J T GOETHE CO |
| 526 | 290406082270501 | 290406 | 822705 | 175 | . | 6 | TERTIARY FLORIDAN | FIRE | J T GOETHE CO |
| 527 | 290409082270601 | 290409 | 822706 | 175 | . | 4 | TERTIARY FLORIDAN | INDUSTRY | J T GOETHE CO |
| 528 | 290420081482001 | 290420 | 814820 | 97 | . | . | TERTIARY FLORIDAN | COMMERCIAL | U S FOREST SERV |
| 529 | 290421082190801 | 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 | 290455081530401 | 290455 | 815304 | 225 | . | . | TERTIARY FLORIDAN | | USGS OB WELL AT MOSS BLUF |
| 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 | 290530081543001 | 290530 | 815430 | 110 | . | 4 | TERTIARY FLORIDAN | UNUSED | NORRIS CTTLE CO |
| 537 | 290550081393001 | 290550 | 813930 | 175 | . | 4 | TERTIARY FLORIDAN | PUBLIC | U S FOREST SERV |
| 538 | 290552082044701 | 290552 | 820447 | 40 | . | . | TERTIARY FLORIDAN | IRRIGATION | MORRIS BURRELL |
| 539 | 290608082261600 | 290608 | 822616 | . | . | . | TERTIARY FLORIDAN | RECREATION | |
| 540 | 290614082274801 | 290614 | 822748 | 180 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | RAINBOW SPRINGS |
| 541 | 290620082080001 | 290620 | 820800 | 30 | . | . | TERTIARY FLORIDAN | DOMESTIC | JUNNIF COUNTS |
| 542 | 290623082180701 | 290623 | 821807 | 60 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 543 | 290623082180702 | 290623 | 821807 | 23 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | U S GEOL SURVEY |
| 544 | 290643082045001 | 290643 | 820450 | 78 | . | 3 | TERTIARY FLORIDAN | UNUSED | GEORGE PERRY |
| 545 | 290650082053001 | 290650 | 820530 | 110 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | VERNON D LOWDER |
| 546 | 290650082053002 | 290650 | 820530 | 62 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | VERNON D LOWDER |
| 547 | 290700082015001 | 290700 | 820150 | 157 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 548 | 290730081544001 | 290730 | 815440 | 30 | . | 2 | TERTIARY NONARTESIAN SAND | DOMESTIC | W E KENNER |
| 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 | 290740082100001 | 290740 | 821000 | 82 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 552 | 290745082153501 | 290745 | 821535 | 78 | . | . | TERTIARY FLORIDAN | UNUSED | NORRIS CATTLE |
| 553 | 290749082304701 | 290749 | 823047 | 250 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | MR SANDERS |
| 554 | 290750081570001 | 290750 | 815700 | 120 | . | 4 | TERTIARY FLORIDAN | UNUSED | NORRIS CTTLE CO |
| 555 | 290750082035001 | 290750 | 820350 | 37 | . | . | TERTIARY FLORIDAN | UNUSED | MARION COUNTY |
| 556 | 290751082311701 | 290751 | 823117 | 303 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | MR KISHLER |
| 557 | 290752082271101 | 290752 | 822711 | 78 | . | . | TERTIARY FLORIDAN | UNUSED | RAINBOW ACRES |
| 558 | 290752082312801 | 290752 | 823128 | 336 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | MR CLARK |
| 559 | 290758082294301 | 290758 | 822943 | 170 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | MR THEIR |
| 560 | 290800082115001 | 290800 | 821150 | 133 | . | 4 | TERTIARY FLORIDAN | UNUSED | BONNIE HEATH FR |
| 561 | 290810082025001 | 290810 | 820250 | 110 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 562 | 290810082063001 | 290810 | 820630 | 75 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | ELLIS SAVAGE |
| 563 | 290810082063002 | 290810 | 820630 | 75 | . | . | TERTIARY FLORIDAN | COMMERCIAL | REID MANOR MOTL |
| 564 | 290810082275401 | 290810 | 822754 | 150 | . | . | TERTIARY FLORIDAN | DOMESTIC | MR SIMMS |
| 565 | 290820082031301 | 290820 | 820313 | 87 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | TILTON BOUTWELL |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MARION COUNTY | | | | | |
| 566 | 290820082032001 | 290820 | 820320 | 72 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 567 | 290822082310101 | 290822 | 823101 | 749 | . | 12 | TERTIARY FLORIDAN | RECREATION | RAINBOW LAKES | |
| 568 | 290825082264801 | 290825 | 822648 | 130 | . | . | TERTIARY FLORIDAN | DOMESTIC | MR FOLKERSON | |
| 569 | 290830081584001 | 290830 | 815840 | 219 | . | 2 | 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 | | | |
| 572 | 290838082030601 | 290838 | 820306 | 62 | . | . | TERTIARY FLORIDAN | | | |
| 573 | 290838082030602 | 290838 | 820306 | 82 | . | . | TERTIARY FLORIDAN | | CORPS OF ENGRS | |
| 574 | 290840082265901 | 290840 | 822659 | 141 | . | . | TERTIARY FLORIDAN | DOMESTIC | MR KAISER | |
| 575 | 290841082285001 | 290841 | 822850 | 541 | . | 6 | TERTIARY FLORIDAN | PUBLIC | 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 | BERT WISE | |
| 583 | 290900082175701 | 290900 | 821757 | 125 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | LEO E LEWIS | |
| 584 | 290910082045001 | 290910 | 820450 | 45 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 585 | 290910082315001 | 290910 | 823150 | . | . | . | TERTIARY FLORIDAN | | SCE 138 LITTLE | LAKE BONAR |
| 586 | 290913082245601 | 290913 | 822456 | 205 | . | 6 | TERTIARY FLORIDAN | RECREATION | 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 | | CRPT 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 | DOMESTIC | 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 | 820030 | 183 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 603 | 291030082035001 | 291030 | 820350 | 210 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | M M BRINSON | |
| 604 | 291034082073701 | 291034 | 820737 | . | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA | |
| 605 | 291038082075601 | 291038 | 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 | 291049082081101 | 291049 | 820811 | 385 | . | 20 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 609 | 291050082142301 | 291050 | 821423 | 100 | . | . | TERTIARY FLORIDAN | | ARTHOPOD 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 | UNUSED | CITY OF OCALA | |
| 614 | 291056082080501 | 291056 | 820805 | 381 | . | 10 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 615 | 291057082033401 | 291057 | 820334 | 115 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | ROGER PARKER | |
| 616 | 291057082080401 | 291057 | 820804 | 350 | . | 12 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 617 | 291059082065201 | 291059 | 820652 | 440 | . | 14 | TERTIARY FLORIDAN | UNUSED | FOREST HS | |
| 618 | 291100081422900 | 291100 | 814229 | . | . | . | | RECREATION | US GOV'T | |
| 619 | 291100081502001 | 291100 | 815020 | 288 | . | 6 | TERTIARY FLORIDAN | PUBLIC | U S FOREST SERV | |

Table 13.--Record of wells--Continued

| | [illegible] | LAT-ITUDE | LONG-ITUDE | WELL DEPTH (FT) | CASING DEPTH (FT) | DIA-METER (IN) | AQUIFER | WATER USE | NAME OF OWNER LAST NAME FIRST NAME |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | MARION COUNTY | | | | |
| [illegible] | [illegible] | 291100 | 820100 | 177 | . | 4 | TERTIARY FLORIDAN | PUBLIC | CORPS OF ENGRS |
| [illegible] | 291100082010002 | 291100 | 820100 | 92 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | CORPS OF ENGRS |
| [illegible] | 291100082010003 | 291100 | 820100 | 153 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| [illegible] | 291100082080601 | 291100 | 820806 | 455 | . | 20 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA |
| 624 | 291101081424600 | 291101 | 814246 | . | . | . | TERTIARY FLORIDAN | RECREATION | US GOV'T |
| 625 | 291102082084501 | 291102 | 820845 | 129 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 626 | 291103082080501 | 291103 | 820805 | 70 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 627 | 291106082040401 | 291106 | 820404 | 90 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | M F THRIFT |
| 628 | 291109082133501 | 291109 | 821335 | 266 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | ALL FARM INC |
| 629 | 291110082052001 | 291110 | 820520 | 166 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 630 | 291110082060001 | 291110 | 820600 | 91 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 631 | 291110082082901 | 291110 | 820829 | 65 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 632 | 291110082084601 | 291110 | 820846 | 112 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 633 | 291111082080501 | 291111 | 820805 | . | . | 10 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 634 | 291112082210701 | 291112 | 822107 | 40 | . | . | TERTIARY FLORIDAN | UNUSED | RAINBOW PARK ES |
| 635 | 291115081592501 | 291115 | 815925 | 135 | . | . | TERTIARY FLORIDAN | UNUSED | STATE ROAD DEPT |
| 636 | 291117082063301 | 291117 | 820633 | 500 | . | 18 | TERTIARY FLORIDAN | UNUSED | |
| 637 | 291117082063302 | 291117 | 820633 | 185 | . | 18 | TERTIARY FLORIDAN | UNUSED | DEPT OF TRANS |
| 638 | 291117082063303 | 291117 | 820633 | 47 | . | 4 | TERTIARY FLORIDAN | UNUSED | DEPT OF TRANS |
| 639 | 291117082063304 | 291117 | 820633 | 47 | . | 4 | TERTIARY FLORIDAN | UNUSED | DEPT OF TRANS |
| 640 | 291120082060001 | 291120 | 820600 | 140 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | FLA FOREST SERV |
| 641 | 291120082064001 | 291120 | 820640 | 154 | . | 18 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 642 | 291120082074201 | 291120 | 820742 | 80 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 643 | 291120082074202 | 291120 | 820742 | . | . | 10 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 644 | 291120082102501 | 291120 | 821025 | 106 | . | . | TERTIARY FLORIDAN | UNUSED | D P SAWYER |
| 645 | 291121082044001 | 291121 | 820440 | 117 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | B FORREST |
| 646 | 291121082044002 | 291121 | 820440 | 240 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | R FORREST |
| 647 | 291122082090001 | 291122 | 820900 | . | . | 10 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 648 | 291125082075201 | 291125 | 820752 | . | . | 18 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 649 | 291125082075301 | 291125 | 820753 | 49 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 650 | 291125082075302 | 291125 | 820753 | . | . | 8 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 651 | 291125082075701 | 291125 | 820757 | . | . | 16 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 652 | 291126082065801 | 291126 | 820658 | . | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 653 | 291126082083501 | 291126 | 820835 | 58 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 654 | 291126082083502 | 291126 | 820835 | 73 | . | 8 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 655 | 291129082081501 | 291129 | 820815 | 95 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 656 | 291129082081502 | 291129 | 820815 | 88 | . | 8 | TERTIARY FLORIDAN | | CITY OF OCALA |
| 657 | 291130082015001 | 291130 | 820150 | 192 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 658 | 291130082015002 | 291130 | 820150 | 21 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | U S GEOL SURVEY |
| 659 | 291131082075501 | 291131 | 820755 | . | . | 12 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 660 | 291136082075201 | 291136 | 820752 | 111 | . | 8 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 661 | 291136082075202 | 291136 | 820752 | . | . | 10 | TERTIARY FLORIDAN | | CITY OF OCALA |
| 662 | 291136082075203 | 291136 | 820752 | . | . | 10 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 663 | 291138082081001 | 291138 | 820810 | 129 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 664 | 291139082073601 | 291139 | 820736 | 220 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 665 | 291139082073602 | 291139 | 820736 | . | . | 12 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 666 | 291140081545001 | 291140 | 815450 | 127 | . | 6 | TERTIARY FLORIDAN | DOMESTIC | MARY HIGGINS |
| 667 | 291140082052701 | 291140 | 820527 | 90 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 668 | 291141082091001 | 291141 | 820910 | . | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 669 | 291149082071201 | 291149 | 820712 | 208 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 670 | 291150082082301 | 291150 | 820823 | 123 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 671 | 291150082082302 | 291150 | 820823 | 121 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 672 | 291151082072501 | 291151 | 820725 | 243 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |
| 673 | 291152082080601 | 291152 | 820806 | 125 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA |

Table 13.--Record of wells--Continued

| OBS. NO. | STATION NUMBER | LATITUDE | LONGITUDE | WELL DEPTH (FT) | CASING DEPTH (FT) | DIAMETER (IN) | AQUIFER | WATER USE | NAME OF OWNER LAST NAME | FIRST NAME |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MARION COUNTY | | | | | |
| 674 | 291154082081101 | 291154 | 820811 | 78 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA | |
| 675 | 291155082052001 | 291155 | 820521 | 68 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | B F JOYNER | |
| 676 | 291156082080001 | 291156 | 820808 | 181 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA | |
| 677 | 291158082073501 | 291158 | 820735 | 76 | . | 8 | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA | |
| 678 | 291200082072001 | 291200 | 820720 | 105 | . | . | TERTIARY FLORIDAN | UNUSED | CITY OF OCALA | |
| 679 | 291201082075501 | 291201 | 820755 | 935 | . | 26 | TERTIARY FLORIDAN | INDUSTRY | LIBBY MCNEIL | |
| 680 | 291207082261601 | 291207 | 822616 | 52 | . | 2 | TERTIARY FLORIDAN | IRRIGATION | E J HARRINGTON | |
| 681 | 291215082051401 | 291215 | 820514 | 265 | . | 24 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 682 | 291215082052701 | 291215 | 820527 | 187 | . | 24 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 683 | 291220082080001 | 291220 | 820800 | 62 | . | . | TERTIARY FLORIDAN | COMMERCIAL | J A LEAPTROT | |
| 684 | 291221082051401 | 291221 | 820514 | 240 | . | 24 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 685 | 291227082052101 | 291227 | 820521 | 230 | . | 24 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 686 | 291227082052701 | 291227 | 820527 | 198 | . | 24 | TERTIARY FLORIDAN | PUBLIC | CITY OF OCALA | |
| 687 | 291230081594001 | 291230 | 815940 | . | . | 3 | TERTIARY FLORIDAN | UNUSED | CORPS OF ENGRS | |
| 688 | 291233082082201 | 291233 | 820822 | 90 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | V W FABELLA | |
| 689 | 291240082034001 | 291240 | 820340 | 104 | . | . | TERTIARY FLORIDAN | UNUSED | CORPS OF ENGRS | |
| 690 | 291250081582001 | 291250 | 815820 | 65 | . | 4 | TERTIARY FLORIDAN | UNUSED | NUBY SHEALY | |
| 691 | 291257082031100 | 291257 | 820311 | . | . | . | TERTIARY FLORIDAN | RECREATION | | |
| 692 | 291307081393600 | 291307 | 813936 | . | . | . | | | | |
| 693 | 291310081521001 | 291310 | 815210 | 78 | . | . | TERTIARY FLORIDAN | UNUSED | WILBUR GRIGGS | |
| 694 | 291310082022001 | 291310 | 820220 | 100 | . | . | TERTIARY FLORIDAN | UNUSED | CORPS OF ENGRS | |
| 695 | 291310082045001 | 291310 | 820450 | 40 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 696 | 291320082090001 | 291320 | 820900 | 81 | . | 4 | TERTIARY FLORIDAN | UNUSED | IMP FLA OIL CO | |
| 697 | 291330082004001 | 291330 | 820040 | 150 | . | . | TERTIARY FLORIDAN | DOMESTIC | OCALA ICE & MFG | |
| 698 | 291340082145001 | 291340 | 821450 | 175 | . | 6 | TERTIARY FLORIDAN | DOMESTIC | CASTRO FARMS | |
| 699 | 291354082160801 | 291354 | 821608 | 171 | . | . | TERTIARY FLORIDAN | STOCK | P W REED | |
| 700 | 291400082070001 | 291400 | 820700 | 70 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | IDA LUFFMAN | |
| 701 | 291440082200501 | 291440 | 822005 | 76 | . | . | TERTIARY FLORIDAN | STOCK | C L DRESSEL | |
| 702 | 291441082070501 | 291441 | 820705 | 44 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | SARA JONES | |
| 703 | 291443081383700 | 291443 | 813837 | . | . | . | TERTIARY FLORIDAN | | DUPONT CO | TRUSTEES |
| 704 | 291445082071201 | 291445 | 820712 | 75 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | MARVIN SPINKS | |
| 705 | 291450081520001 | 291450 | 815200 | 179 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S FOREST SERV | |
| 706 | 291510082082001 | 291510 | 820820 | 69 | . | 4 | TERTIARY FLORIDAN | UNUSED | VERNON PRIEST | |
| 707 | 291520082052001 | 291520 | 820520 | 80 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | OLIVE S SMITH | |
| 708 | 291600081550001 | 291600 | 815500 | 165 | . | 4 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 709 | 291600081550002 | 291600 | 815500 | 43 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | U S GEOL SURVEY | |
| 710 | 291610082195001 | 291610 | 821950 | 124 | . | 4 | TERTIARY FLORIDAN | UNUSED | FLA FOREST SERV | |
| 711 | 291620081415001 | 291620 | 814150 | 215 | . | . | TERTIARY FLORIDAN | PUBLIC | U S FOREST SER | |
| 712 | 291650082223001 | 291650 | 822230 | 120 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | JOHN J HILL | |
| 713 | 291700081522001 | 291700 | 815220 | 156 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S FOREST SERV | |
| 714 | 291728081390501 | 291728 | 813905 | . | . | . | TERTIARY FLORIDAN | UNUSED | | |
| 715 | 291728081390502 | 291728 | 813905 | . | . | . | TERTIARY FLORIDAN | UNUSED | | |
| 716 | 291729082080001 | 291729 | 820800 | 80 | . | 4 | TERTIARY FLORIDAN | STOCK | E R SCHARPS | |
| 717 | 291730081390001 | 291730 | 813900 | 110 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | C E BOX | |
| 718 | 291730082001001 | 291730 | 820010 | 23 | . | 1 | TERTIARY FLORIDAN | UNUSED | M G BYERS | |
| 719 | 291730082051001 | 291730 | 820510 | 95 | . | . | TERTIARY FLORIDAN | DOMESTIC | W K PRIEST | |
| 720 | 291730082115001 | 291730 | 821150 | 68 | . | . | TERTIARY FLORIDAN | DOMESTIC | N J TOWNSEND | |
| 721 | 291738082115301 | 291738 | 821153 | 89 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | H H CARR | |
| 722 | 291740081562001 | 291740 | 815620 | 280 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 723 | 291740081562002 | 291740 | 815620 | 25 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | U S GEOL SURVEY | |
| 724 | 291743081392201 | 291743 | 813922 | 140 | 140 | 6 | TERTIARY FLORIDAN | RECREATION | MOODY | |
| 725 | 291750081494001 | 291750 | 814940 | 184 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S A CORPS ENG | |
| 726 | 291810081570001 | 291810 | 815700 | 200 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 727 | 291810081570002 | 291810 | 815700 | 18 | . | 2 | TERTIARY NONARTESIAN SAND | 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 | NAME OF OWNER LAST NAME | 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 | 292017082232201 | 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 | . | . | . | | STOCK | BO BETT FARMS | |
| 740 | 292110081510001 | 292110 | 815100 | 300 | . | 6 | TERTIARY FLORIDAN | DOMESTIC | U S DEPT AGR | |
| 741 | 292119082135601 | 292119 | 821356 | . | . | . | | STOCK | BO BETT FARMS | |
| 742 | 292127082134601 | 292127 | 821346 | . | . | . | | DOMESTIC | BO BETT FARMS | |
| 743 | 292130082003001 | 292130 | 820030 | 117 | . | . | TERTIARY FLORIDAN | STOCK | HUDSON PAPER CO | |
| 744 | 292134082144001 | 292134 | 821440 | 170 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | ROOSEVELT BLUNT | |
| 745 | 292135082145301 | 292135 | 821453 | . | . | . | | DOMESTIC | EMMA LOU CARTER | |
| 746 | 292138082141501 | 292138 | 821415 | . | . | . | | STOCK | BO BETT FARMS | |
| 747 | 292139082152501 | 292139 | 821525 | 120 | . | . | | DOMESTIC | RUBY REYNOLDS | |
| 748 | 292140082150501 | 292140 | 821505 | 182 | . | . | | DOMESTIC | DWIGHT JAMES | |
| 749 | 292140082153401 | 292140 | 821534 | 154 | . | 2 | | DOMESTIC | J W REYNOLDS | |
| 750 | 292140082160301 | 292140 | 821603 | 275 | . | . | | DOMESTIC | G THOMPSON | |
| 751 | 292140082160501 | 292140 | 821605 | 250 | . | . | | DOMESTIC | G THOMPSON | |
| 752 | 292143082145001 | 292143 | 821450 | 195 | . | 4 | | DOMESTIC | ROSALIEROBINSON | |
| 753 | 292149082144601 | 292149 | 821446 | 165 | . | 4 | | DOMESTIC | WILLIE SAVAGE | |
| 754 | 292150081484001 | 292150 | 814840 | 22 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | U S GEOL SURVEY | |
| 755 | 292150081491001 | 292150 | 814910 | 500 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | U S FOREST SERV | |
| 756 | 292151082140901 | 292151 | 821409 | . | . | . | | STOCK | BO BETT FARMS | |
| 757 | 292151082145401 | 292151 | 821454 | 148 | . | 4 | | DOMESTIC | B L MCLAUCHLIN | |
| 758 | 292151082163201 | 292151 | 821632 | 161 | . | 4 | | DOMESTIC | STARLITE FARMS | |
| 759 | 292152082152601 | 292152 | 821526 | 185 | . | 2 | | DOMESTIC | ROY RIGGSBY | |
| 760 | 292153082152601 | 292153 | 821526 | . | . | 2 | | | BRUCE REED | |
| 761 | 292155082150401 | 292155 | 821504 | 193 | . | 2 | | DOMESTIC | M M MACK | |
| 762 | 292156082155201 | 292156 | 821552 | 21 | . | . | | DOMESTIC | M R BAILEY | |
| 763 | 292156082155301 | 292156 | 821553 | . | . | . | | UNUSED | M R BAILEY | |
| 764 | 292157082143001 | 292157 | 821430 | 200 | . | 6 | | DOMESTIC | BO BETT FARMS | |
| 765 | 292159082034501 | 292159 | 820345 | 107 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | TRE ORIPE | |
| 766 | 292159082150801 | 292159 | 821508 | 165 | . | 2 | | DOMESTIC | A J MCLAUCHLIN | |
| 767 | 292200081510001 | 292200 | 815100 | 90 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURV | |
| 768 | 292200081574001 | 292200 | 815740 | 108 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | J R LONGMIRE | |
| 769 | 292205082151401 | 292205 | 821514 | 103 | . | 2 | | DOMESTIC | J E THIGPIN | |
| 770 | 292207082150701 | 292207 | 821507 | . | . | . | | STOCK | | |
| 771 | 292210081524001 | 292210 | 815240 | 69 | . | 2 | TERTIARY NONARTESIAN SAND | UNUSED | U S GEOL SURVEY | |
| 772 | 292215082141001 | 292215 | 821410 | . | . | 6 | | DOMESTIC | CHAS DESTELLE | |
| 773 | 292218082142301 | 292218 | 821423 | . | . | . | | DOMESTIC | | |
| 774 | 292220082141001 | 292220 | 821410 | 215 | . | . | | DOMESTIC | T E REYNOLDS | |
| 775 | 292220082151201 | 292220 | 821512 | 417 | . | . | TERTIARY FLORIDAN | PUBLIC | FAIRFIELD P S | |
| 776 | 292222082142201 | 292222 | 821422 | 175 | . | . | | DOMESTIC | CARL LEVERETT | |
| 777 | 292222082142401 | 292222 | 821424 | 200 | . | 4 | | DOMESTIC | F W REYNOLDS | |
| 778 | 292222082144501 | 292222 | 821445 | 190 | . | . | | DOMESTIC | A E DODSON | |
| 779 | 292224082140301 | 292224 | 821403 | 184 | . | 4 | | DOMESTIC | BLOOMER TYRE | |
| 780 | 292224082141201 | 292224 | 821412 | 180 | . | 4 | | DOMESTIC | A G YONGUE | |
| 781 | 292224082142601 | 292224 | 821426 | 190 | . | . | | DOMESTIC | E L DEAN | |

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 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | MARION COUNTY | | | | |
| 782 | 292224082154001 | 292224 | 821540 | . | . | . | | STOCK | L K EDWARDS |
| 783 | 292225082151901 | 292225 | 821519 | 90 | . | 2 | | 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 | TERTIARY FLORIDAN | COMMERCIAL | STD OIL OF KY |
| 793 | 292450081581001 | 292450 | 815810 | 112 | . | . | TERTIARY FLORIDAN | STOCK | O C BRYAN |
| 794 | 292500082063801 | 292500 | 820638 | 94 | . | 3 | TERTIARY FLORIDAN | COMMERCIAL | RAYMOND BOYT |
| 795 | 292500082125001 | 292500 | 821250 | 100 | . | 4 | TERTIARY FLORIDAN | COMMERCIAL | LARRY WILLIAMS |
| 796 | 292501082064001 | 292501 | 820640 | 26 | . | . | TERTIARY FLORIDAN | DOMESTIC | HARRY SMITH |
| 797 | 292530081454001 | 292530 | 814540 | 80 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | KARL NEWBERN |
| 798 | 292546081513301 | 292546 | 815133 | 340 | . | 6 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY |
| 799 | 292610081550001 | 292610 | 815500 | 254 | . | 6 | TERTIARY FLORIDAN | UNUSED | 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 NONARTESIAN SAND | PUBLIC | U S FOREST SERV |
| 812 | 293020081532001 | 293020 | 815320 | 125 | . | 6 | TERTIARY FLORIDAN | UNUSED | US 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 | SWFWMD | |
| 815 | 281849081575601 | 281849 | 815756 | . | . | . | | UNUSED | SWFWMD | |
| 816 | 281927082005001 | 281927 | 820050 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 817 | 281929081575901 | 281929 | 815759 | . | . | . | | UNUSED | SWFWMD | |
| 818 | 281929081595401 | 281929 | 815954 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 819 | 281933081584701 | 281933 | 815847 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 820 | 281951082012001 | 281951 | 820120 | 49 | . | . | TERTIARY FLORIDAN | | L 11 MD SWFMD | |
| 821 | 281951082012002 | 281951 | 820120 | 18 | . | . | TERTIARY FLORIDAN | | L 11 MM SWFWMD | |
| 822 | 281951082012003 | 281951 | 820120 | 9 | . | . | TERTIARY FLORIDAN | | L 11 MS SWFWMD | |
| 823 | 282010081590501 | 282010 | 815905 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 824 | 282016081575201 | 282016 | 815752 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 825 | 282018081595201 | 282018 | 815952 | . | . | . | | UNUSED | SWFWMD | |
| 826 | 282020082005101 | 282020 | 820051 | . | . | . | | UNUSED | SWFWMD | |
| 827 | 282109082001201 | 282109 | 820012 | . | . | . | | UNUSED | SWFWMD | |
| 828 | 282111081585401 | 282111 | 815854 | . | . | . | | UNUSED | SWFWMD | |
| 829 | 282113081575701 | 282113 | 815757 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 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 | | L 11 KD SWFWMD | |
| 833 | 282152082011202 | 282152 | 820112 | 17 | . | . | PLEISTOCENE NONARTESIAN SAND | | L 11 KS SWFWMD | |
| 834 | 282154082002701 | 282154 | 820027 | . | . | . | | UNUSED | SWFWMD | |
| 835 | 282201081575501 | 282201 | 815755 | . | . | . | | UNUSED | SWFWMD | |
| 836 | 282204081585701 | 282204 | 815857 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 837 | 282208082010701 | 282208 | 820107 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 838 | 282258081585501 | 282258 | 815855 | . | . | . | | UNUSED | SWFWMD | |
| 839 | 282259082004701 | 282259 | 820047 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 840 | 282303081575403 | 282303 | 815754 | . | . | . | | UNUSED | SWFWMD | |
| 841 | 282307081593901 | 282307 | 815939 | . | . | . | | UNUSED | SWFWMD | |
| 842 | 282350081575201 | 282350 | 815752 | . | . | . | | UNUSED | SWFWMD | |
| 843 | 282351082100301 | 282351 | 821003 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 844 | 282353081585301 | 282353 | 815853 | . | . | . | | UNUSED | SWFWMD | |
| 845 | 282357081595201 | 282357 | 815952 | . | . | . | | UNUSED | SWFWMD | |
| 846 | 282430081595801 | 282430 | 815958 | 21 | . | . | PLEISTOCENE-PLIOCENE SERIES | UNUSED | USGS | |
| 847 | 282430081595802 | 282430 | 815958 | 102 | 33 | 2 | | UNUSED | SWFWMD | |
| 848 | 282434082002401 | 282434 | 820024 | . | . | . | | UNUSED | SWFWMD | |
| 849 | 282441081585001 | 282441 | 815850 | . | . | . | | UNUSED | SWFWMD | |
| 850 | 282443081575101 | 282443 | 815751 | . | . | . | | UNUSED | SWFWMD | |
| 851 | 282509082010801 | 282509 | 820108 | 40 | . | . | PLEISTOCENE-PLIOCENE SERIES | UNUSED | USGS | |
| 852 | 282522082010901 | 282522 | 820109 | 96.89 | . | . | MIOCENE SERIES | UNUSED | USGS | |
| 853 | 282616081592101 | 282616 | 815921 | 24 | . | . | MIOCENE SERIES | UNUSED | USGS | |
| 854 | 282631082030301 | 282631 | 820303 | 98.89 | . | . | PLEISTOCENE-PLIOCENE SERIES | UNUSED | USGS | |
| 855 | 282632082004801 | 282632 | 820048 | . | . | . | | UNUSED | SWFWMD | |
| 856 | 282719081594101 | 282719 | 815941 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 857 | 282721082004401 | 282721 | 820044 | . | . | . | | UNUSED | SWFWMD | |
| 858 | 282722081584701 | 282722 | 815847 | . | . | . | | UNUSED | SWFWMD | |
| 859 | 282740082012101 | 282740 | 820121 | 30 | . | . | TERTIARY FLORIDAN | | L 12 RD SWFWMD | |
| 860 | 282740082012102 | 282740 | 820121 | 10 | . | . | PLEISTOCENE NONARTESIAN SAND | | L 12 BS SWFWMD | |
| 861 | 282741081585701 | 282741 | 815857 | 175 | . | 3 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 862 | 282816081585101 | 282816 | 815851 | . | . | . | | UNUSED | SWFWMD | |
| 863 | 282816081594901 | 282816 | 815949 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 864 | 282816082004501 | 282816 | 820045 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 865 | 282840081583501 | 282840 | 815835 | 40.09 | . | . | PLEISTOCENE-PLIOCENE SERIES | UNUSED | USGS | |
| 866 | 282905081584801 | 282905 | 815848 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |

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 | | | | | |
| 867 | 282906082005101 | 282906 | 820051 | . | . | . | | UNUSED | SWFWMD | |
| 868 | 282908081594501 | 282908 | 815945 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 869 | 282957081585301 | 282957 | 815853 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 870 | 282957081594201 | 282957 | 815942 | . | . | . | | UNUSED | SWFWMD | |
| 871 | 283007081575901 | 283007 | 815759 | 166 | . | . | TERTIARY FLORIDAN | UNUSED | FLA FOREST SERV | |
| 872 | 283053081575201 | 283053 | 815752 | . | . | . | | UNUSED | SWFWMD | |
| 873 | 283055081505001 | 283055 | 815850 | . | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 874 | 283055081585001 | 283055 | 815850 | 30 | . | . | MIOCENE SERIES | UNUSED | SWFWMD | |
| 875 | 283252082043201 | 283252 | 820432 | 30 | . | . | TERTIARY FLORIDAN | DOMESTIC | J KNOX | |
| 876 | 283318082041001 | 283318 | 820410 | 95 | . | . | TERTIARY FLORIDAN | | FULTON FRANKLIN | |
| 877 | 283324082050601 | 283324 | 820506 | . | . | . | TERTIARY FLORIDAN | | WILSON IRR WELL | AT WILSON |
| 878 | 283432081592401 | 283432 | 815924 | 166 | . | . | TERTIARY FLORIDAN | IRRIGATION | HUGH IVEY | |
| 879 | 283433082020901 | 283433 | 820209 | 210 | . | . | TERTIARY FLORIDAN | UNUSED | BOB MCELYEA | |
| 880 | 283445081573201 | 283445 | 815732 | 81 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | E G ODOM JR | |
| 881 | 283458082003601 | 283458 | 820036 | 28 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | MORRIS ILEY | |
| 882 | 283519081591601 | 283519 | 815916 | 47 | . | . | TERTIARY FLORIDAN | | JC 68 FLA ROCK | IND NO 3 |
| 883 | 283539082000301 | 283539 | 820003 | 48 | . | . | TERTIARY FLORIDAN | | JC 67 FLA ROCK | IND NO 2 |
| 884 | 283630082001001 | 283630 | 820010 | 21 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | E LANCASTER | |
| 885 | 283632082031201 | 283632 | 820312 | 372 | . | 6 | TERTIARY FLORIDAN | PUBLIC | CITY WEBSTER | |
| 886 | 283634082080501 | 283634 | 820805 | 59 | . | . | TERTIARY FLORIDAN | DOMESTIC | D H WILKERSON | |
| 887 | 283634082080502 | 283634 | 820805 | 21 | . | . | TERTIARY FLORIDAN | | JC 48A D H WILK | ERSON HOUS |
| 888 | 283637082024501 | 283637 | 820245 | 75 | . | 3 | TERTIARY FLORIDAN | DOMESTIC | M HIGGINS | |
| 889 | 283637082081501 | 283637 | 820815 | 253 | . | . | TERTIARY FLORIDAN | | SCL RR USED 155 | |
| 890 | 283638082025701 | 283638 | 820257 | 423 | . | 12 | TERTIARY FLORIDAN | PUBLIC | CITY OF WEBSTER | |
| 891 | 283638082025702 | 283638 | 820257 | 430 | . | . | TERTIARY FLORIDAN | | TOWN OF WEBSTER | RECORDER |
| 892 | 283643082020101 | 283643 | 820201 | 45 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | GRADY D COLEMAN | |
| 893 | 283643082024001 | 283643 | 820240 | 187 | . | . | TERTIARY FLORIDAN | | WEBSTER SUPPLY | NO 4 |
| 894 | 283645082111901 | 283645 | 821119 | 78 | . | . | TERTIARY FLORIDAN | | 836211232 R C S | TRONG |
| 895 | 283654082080501 | 283654 | 820805 | 28 | . | 2 | TERTIARY FLORIDAN | DOMESTIC | T J TOMBERLIN | |
| 896 | 283757082003201 | 283757 | 820032 | 631 | . | . | TERTIARY FLORIDAN | | CENTRAL PACKING CO | |
| 897 | 283829082123701 | 283829 | 821237 | 90 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 47 N R DOKE | |
| 898 | 283838082040401 | 283838 | 820404 | 926 | . | . | TERTIARY FLORIDAN | UNUSED | DUNDEE PETRO CO | |
| 899 | 283842081594801 | 283842 | 815948 | 62 | . | . | TERTIARY FLORIDAN | | CREWS WILSON | |
| 900 | 283848082121901 | 283848 | 821219 | 100 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | FRANK WADE | |
| 901 | 283855082003301 | 283855 | 820033 | 81 | . | 4 | TERTIARY FLORIDAN | INDUSTRY | CENT PACKING CO | |
| 902 | 283856082003201 | 283856 | 820032 | 300 | . | . | TERTIARY FLORIDAN | | CENTRAL PACKING | 4 INCH |
| 903 | 283857082003201 | 283857 | 820032 | 631 | . | . | TERTIARY FLORIDAN | INDUSTRY | CENTRAL PACKING | |
| 904 | 283858081592501 | 283858 | 815925 | 108 | . | 3 | TERTIARY FLORIDAN | IRRIGATION | R J FOSTER | |
| 905 | 283900082073401 | 283900 | 820734 | 82 | . | . | TERTIARY FLORIDAN | | DADE BATTLEGROU | ND STATE P |
| 906 | 283904082001601 | 283904 | 820016 | 48 | 40 | 2 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 907 | 283904082005301 | 283904 | 820053 | 57 | . | . | TERTIARY FLORIDAN | | JC 69 FLA CRUSH | ED STONE N |
| 908 | 283919082031901 | 283919 | 820319 | 320 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | DAVID WEINBERG | |
| 909 | 283937082123401 | 283937 | 821234 | 111 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | FRANK WADE | |
| 910 | 283952082022001 | 283952 | 820220 | 300 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | JC 42 PARROT RA | NCH |
| 911 | 283953082051401 | 283953 | 820514 | 36 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 36 | |
| 912 | 283956082045501 | 283956 | 820455 | 44 | . | 4 | TERTIARY FLORIDAN | | JC 35 A BEVILLE | |
| 913 | 284002082064201 | 284002 | 820642 | 693 | . | 10 | TERTIARY FLORIDAN | PUBLIC | BUSHNELL | |
| 914 | 284002082064202 | 284002 | 820642 | 85 | . | 4 | TERTIARY FLORIDAN | UNUSED | CITY BUSHNELL | |
| 915 | 284017082033701 | 284017 | 820337 | 91 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 38 | |
| 916 | 284021082032301 | 284021 | 820323 | 47 | . | 3 | TERTIARY FLORIDAN | UNUSED | JC 37 | |
| 917 | 284022082033001 | 284022 | 820330 | 115 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | GEORGE ALTMAN | |
| 918 | 284100082055801 | 284100 | 820558 | 98 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 29 | |
| 919 | 284101082060601 | 284101 | 820606 | 25 | . | 5 | TERTIARY FLORIDAN | IRRIGATION | JC 28 | |
| 920 | 284102082033401 | 284102 | 820334 | 119 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 41 PARROT RA | NCH |

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 | | | | |
| 921 | 284104082055801 | 284104 | 820558 | 92 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 30 |
| 922 | 284113082080701 | 284115 | 820807 | 23 | . | 2 | TERTIARY FLORIDAN | UNUSED | JC 07 C H BEVIL LE |
| 923 | 284115082062601 | 284115 | 820626 | 75 | . | 3 | TERTIARY FLORIDAN | UNUSED | JC 27A |
| 924 | 284119082034501 | 284119 | 820345 | 22 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 44 PARROT RA NCH |
| 925 | 284120082061301 | 284120 | 820613 | 32 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | WITHLACOOCHEE P ROJECT 31 |
| 926 | 284126082034501 | 284126 | 820345 | 100 | . | 1 | TERTIARY FLORIDAN | IRRIGATION | JC 45 PARROT RA NCH |
| 927 | 284127082033901 | 284127 | 820339 | 500 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | JC 46 PARROT RA NCH |
| 928 | 284132082092801 | 284132 | 820928 | 261 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | JC 05 C H BEVIL LE |
| 929 | 284137082032801 | 284137 | 820328 | 100 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 40 PARROT RA NCH |
| 930 | 284139082045601 | 284139 | 820456 | 75 | . | . | TERTIARY FLORIDAN | IRRIGATION | C H BEVILLE |
| 931 | 284139082082501 | 284139 | 820825 | 40 | . | 2 | TERTIARY FLORIDAN | UNUSED | JC 06 C H BEVIL LE |
| 932 | 284143082032901 | 284143 | 820329 | 41 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 39 PARROT RA NCH |
| 933 | 284143082050801 | 284143 | 820508 | 82 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 23 C H BEVIL LE |
| 934 | 284143082051401 | 284143 | 820514 | 75 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 22 C H BEVIL LE |
| 935 | 284146082045901 | 284146 | 820459 | 65 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 24 C H BEVIL LE |
| 936 | 284146082060901 | 284146 | 820609 | 190 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | WITHLACOOCHEE P ROJECT 32 |
| 937 | 284146082061401 | 284146 | 820614 | 190 | . | . | TERTIARY FLORIDAN | | JC 32 |
| 938 | 284147082051301 | 284147 | 820513 | 82 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 21 C H BEVIL LE |
| 939 | 284147082052801 | 284147 | 820528 | 50 | . | 1 | TERTIARY FLORIDAN | IRRIGATION | JC 34 |
| 940 | 284148082064301 | 284148 | 820643 | 27 | . | 2 | TERTIARY FLORIDAN | IRRIGATION | JC 33 C H BEVIL LE |
| 941 | 284155082043901 | 284155 | 820439 | 68 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 25 C H BEVIL LE |
| 942 | 284155082051401 | 284155 | 820514 | 400 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | JC 17 C H BEVIL LE |
| 943 | 284157082051701 | 284157 | 820517 | . | . | . | TERTIARY FLORIDAN | | ALTMAN NO 2 |
| 944 | 284158082043301 | 284158 | 820433 | 23 | . | . | TERTIARY FLORIDAN | | JC 26 C H BEVIL LE |
| 945 | 284158082045101 | 284158 | 820451 | 48 | 40 | 2 | TERTIARY FLORIDAN | UNUSED | USGS |
| 946 | 284159082043301 | 284159 | 820433 | 25 | . | 4 | TERTIARY FLORIDAN | UNUSED | |
| 947 | 284159082081601 | 284159 | 820816 | 50 | 40 | 2 | TERTIARY FLORIDAN | UNUSED | JC 62 U S GEOL SURVEY |
| 948 | 284208082051701 | 284208 | 820517 | 490 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | JC 18 C H BEVIL LE |
| 949 | 284208082054601 | 284208 | 820546 | 199 | . | 2 | TERTIARY FLORIDAN | IRRIGATION | JC 19 C H BEVIL LE |
| 950 | 284209082060101 | 284209 | 820601 | 234 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | JC 20 C H BEVIL LE |
| 951 | 284212082044301 | 284212 | 820443 | 54 | . | 2 | TERTIARY FLORIDAN | | JC 16 C H BEVIL LE |
| 952 | 284212082071701 | 284212 | 820717 | 48 | 40 | 2 | TERTIARY FLORIDAN | UNUSED | USGS |
| 953 | 284215082092301 | 284215 | 820923 | 43 | 40 | 2 | TERTIARY FLORIDAN | UNUSED | JC 61 U S GEOL SURVEY |
| 954 | 284225082072101 | 284225 | 820721 | 48 | . | 4 | TERTIARY FLORIDAN | IRRIGATION | WALTER G WYNN |
| 955 | 284237082044401 | 284237 | 820444 | 500 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | JC 13 C H BEVIL LE |
| 956 | 284241082034201 | 284241 | 820342 | 37 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | JC 14 C H BEVIL LE |
| 957 | 284242082054401 | 284242 | 820544 | 500 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | JC 09 C H BEVIL LE |
| 958 | 284249082053101 | 284249 | 820531 | 400 | . | . | TERTIARY FLORIDAN | | JC 10 C H BEVIL LE |
| 959 | 284252082045201 | 284255 | 820452 | 342 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | JC 12 C H BEVIL LE |
| 960 | 284258082072101 | 284258 | 820721 | . | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 08 C H BEVIL LE |
| 961 | 284259082052101 | 284259 | 820521 | . | . | 4 | TERTIARY FLORIDAN | IRRIGATION | JC 11 C H BEVIL LE |
| 962 | 284259082053101 | 284259 | 820531 | 400 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | |
| 963 | 284259082081601 | 284259 | 820816 | 50 | . | . | TERTIARY FLORIDAN | | JC 62 U S GEOL SURVEY |
| 964 | 284309082090401 | 284309 | 820904 | 489 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | JC 3 C H BEVI LLE |
| 965 | 284310082091001 | 284310 | 820910 | 68 | . | . | TERTIARY FLORIDAN | IRRIGATION | C H BEVILLE |
| 966 | 284311082081801 | 284311 | 820818 | 25 | . | 1 | TERTIARY FLORIDAN | UNUSED | JC 01 C H BEVIL LE |
| 967 | 284312081574701 | 284312 | 815747 | . | . | . | TERTIARY FLORIDAN | | HI ACRES EAST O F CENTER H |
| 968 | 284317082142601 | 284317 | 821426 | . | . | . | TERTIARY FLORIDAN | | TRAILER PARK NW OF WAHOO |
| 969 | 284323082083601 | 284323 | 820836 | 27 | . | 1 | TERTIARY FLORIDAN | UNUSED | JC 02 C H BEVIL LE |
| 970 | 284340082042701 | 284340 | 820427 | 83 | . | . | TERTIARY FLORIDAN | | JC 66 SANDPIT W ELL |
| 971 | 284406082084001 | 284406 | 820840 | 285 | . | . | TERTIARY FLORIDAN | | JC 04 C H BEVIL LE |
| 972 | 284430082063001 | 284430 | 820630 | . | . | . | TERTIARY FLORIDAN | | JC 72 GEO ALTMA N IRR |
| 973 | 284440082032201 | 284440 | 820322 | 174 | . | 6 | TERTIARY FLORIDAN | UNUSED | L G GODWIN |
| 974 | 284449082055201 | 284449 | 820552 | 130 | . | . | TERTIARY FLORIDAN | | WOODWARD RESIDE NCE |

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 | | | | | |
| 975 | 284456082035901 | 284456 | 820359 | 41 | . | . | TERTIARY FLORIDAN | | | |
| 976 | 284515082061301 | 284515 | 820613 | 65 | . | 2 | TERTIARY FLORIDAN | COMMERCIAL | STD OIL CO KY | |
| 977 | 284520082081301 | 284520 | 820813 | 28 | . | 2 | TERTIARY FLORIDAN | UNUSED | JC 54 | |
| 978 | 284521082014901 | 284521 | 820149 | 137 | . | . | TERTIARY FLORIDAN | UNUSED | DIXIE LIME | |
| 979 | 284541082080701 | 284541 | 820807 | 104 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | M L MARSH | |
| 980 | 284548082073601 | 284548 | 820736 | . | . | . | TERTIARY FLORIDAN | | JC 70 | |
| 981 | 284558082073601 | 284558 | 820736 | . | . | . | TERTIARY FLORIDAN | | WHITES ALUMINUM | |
| 982 | 284609082073901 | | . | 19 | . | . | TERTIARY FLORIDAN | | | |
| 983 | 284612082071301 | 284612 | 820713 | 170 | . | . | TERTIARY FLORIDAN | | LK PANASOFFEE W ATER ASSOC | |
| 984 | 284619082035101 | 284619 | 820351 | 180 | 62 | 8 | TERTIARY FLORIDAN | UNUSED | SWFWMD | |
| 985 | 284628082074501 | 284628 | 820745 | 267 | . | . | TERTIARY FLORIDAN | IRRIGATION | W N BURKETT | |
| 986 | 284712082072601 | 284712 | 820726 | 50 | . | 2 | TERTIARY FLORIDAN | UNUSED | L J REINHOLZ | |
| 987 | 284742082021900 | 284742 | 820219 | . | . | . | TERTIARY FLORIDAN | STOCK | BIGHAM | P |
| 988 | 284746082081001 | 284746 | 820810 | 150 | . | 2 | TERTIARY FLORIDAN | UNUSED | DORIS BAUGHMAN | |
| 989 | 284748082080401 | 284748 | 820804 | 65 | . | 2 | TERTIARY FLORIDAN | RECREATION | JAMES PINSON | |
| 990 | 284754082084501 | 284754 | 820845 | . | . | . | TERTIARY FLORIDAN | | | |
| 991 | 284804082020901 | 284804 | 820209 | 62.5 | . | . | TERTIARY FLORIDAN | | | |
| 992 | 284807082040301 | 284807 | 820403 | . | . | . | TERTIARY FLORIDAN | | | |
| 993 | 284809082080701 | 284809 | 820807 | 150 | . | . | TERTIARY FLORIDAN | DOMESTIC | HOWARD KENT | |
| 994 | 284925082105501 | 284925 | 821055 | . | . | . | TERTIARY FLORIDAN | | GATOR LODGE | |
| 995 | 285059081593001 | 285059 | 815930 | 220 | . | . | TERTIARY FLORIDAN | | L NR WILDWOOD,F LA. | |
| 996 | 285110082015701 | 285110 | 820157 | . | . | . | | | | |
| 997 | 285110082515901 | 285110 | 825159 | . | . | . | | | | |
| 998 | 285112082124001 | 285112 | 821240 | 22 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 999 | 285121082112201 | 285121 | 821122 | 31 | . | 6 | TERTIARY FLORIDAN | UNUSED | USGS | |
| 1000 | 285124082104901 | 285124 | 821049 | 66 | . | 4 | TERTIARY FLORIDAN | DOMESTIC | LESTER KING | |
| 1001 | 285133082014201 | 285133 | 820142 | 155 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | J T LIPHAM | |
| 1002 | 285141082015501 | 285141 | 820155 | 700 | . | 10 | TERTIARY FLORIDAN | PUBLIC | CITY WILDWOOD | |
| 1003 | 285150082044001 | 285150 | 820440 | 38 | . | 2 | TERTIARY FLORIDAN | UNUSED | U S GEOL SURVEY | |
| 1004 | 285203082100001 | 285203 | 821000 | 38 | . | . | TERTIARY FLORIDAN | | | |
| 1005 | 285207082014501 | 285207 | 820145 | 125 | . | 12 | TERTIARY FLORIDAN | PUBLIC | CITY WILDWOOD | |
| 1006 | 285209082090201 | 285209 | 820902 | 155 | . | . | TERTIARY FLORIDAN | IRRIGATION | A W LEE JR | |
| 1007 | 285224082054201 | 285224 | 820542 | . | . | . | TERTIARY FLORIDAN | | HORNES WELL W O F WILDWOOD | |
| 1008 | 285240082012001 | 285240 | 820120 | 100 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | J T LIPHAM | |
| 1009 | 285244082005401 | 285244 | 820054 | 135 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | W L DEUEL | |
| 1010 | 285329082140201 | 285329 | 821402 | 93 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | MAJOR BELLAMY | |
| 1011 | 285343082085001 | 285343 | 820850 | 125 | . | . | TERTIARY FLORIDAN | IRRIGATION | C DAVIS | |
| 1012 | 285414082074501 | 285414 | 820745 | . | . | . | | | J H NICHOLS | |
| 1013 | 285440082052901 | 285440 | 820529 | 150 | . | 10 | TERTIARY FLORIDAN | IRRIGATION | C & L FARMS | |
| 1014 | 285453082110901 | 285453 | 821109 | 62 | . | 4 | TERTIARY FLORIDAN | UNUSED | M A DAVIS | |
| 1015 | 285456082114701 | 285456 | 821147 | 90 | . | . | TERTIARY FLORIDAN | IRRIGATION | M A DAVIS | |
| 1016 | 285502082022001 | 285502 | 820220 | 150 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | GEORGE FUSSELL | |
| 1017 | 285536082044001 | 285536 | 820440 | 130 | . | 6 | TERTIARY FLORIDAN | OTHER | G N SMITH | |
| 1018 | 285538082021301 | 285538 | 820213 | 110 | . | . | TERTIARY FLORIDAN | | | |
| 1019 | 285606082081001 | 285606 | 820810 | 63 | . | 8 | TERTIARY FLORIDAN | IRRIGATION | L H NICHOLS | |
| 1020 | 285703082065701 | 285703 | 820657 | 125 | . | 6 | TERTIARY FLORIDAN | IRRIGATION | R H NICHOLS | |
| 1021 | 285731082135400 | 285731 | 821354 | . | . | . | TERTIARY FLORIDAN | RECREATION | SMITH | MCGREGOR |

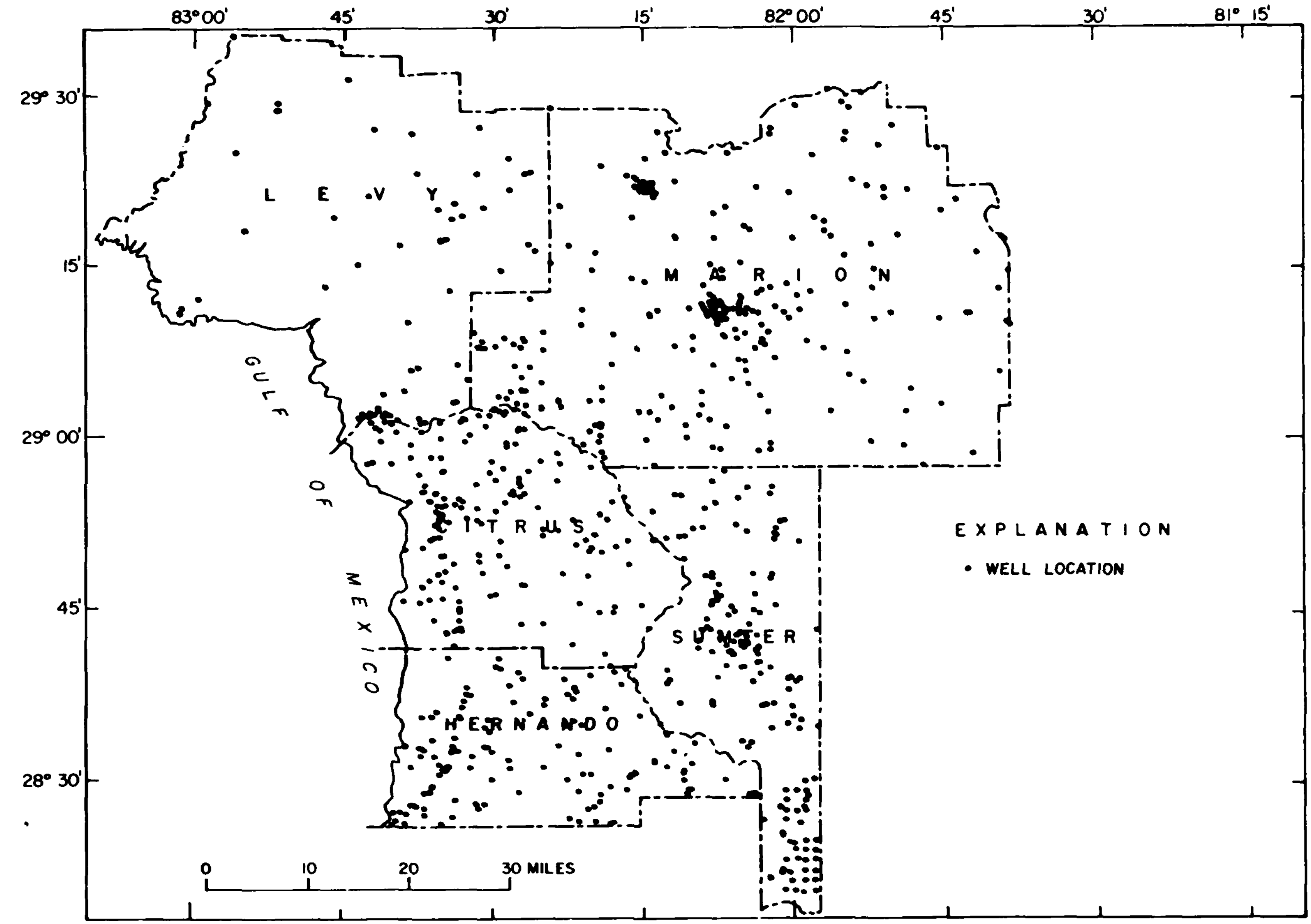



Figure 27.--Locations of wells listed in table 13.

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 $ft^2/d$. Initial estimates of transmissivity for the simulation ranged from 26,750 to 160,430 $ft^2/d$. Initial upper confining bed vertical hydraulic conductivity ranged from $8.6x10^{-6}$ to $4.3x10^{-3}$ 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 $mi^2$ 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 $mi^2$ 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 $mi^2$ 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.

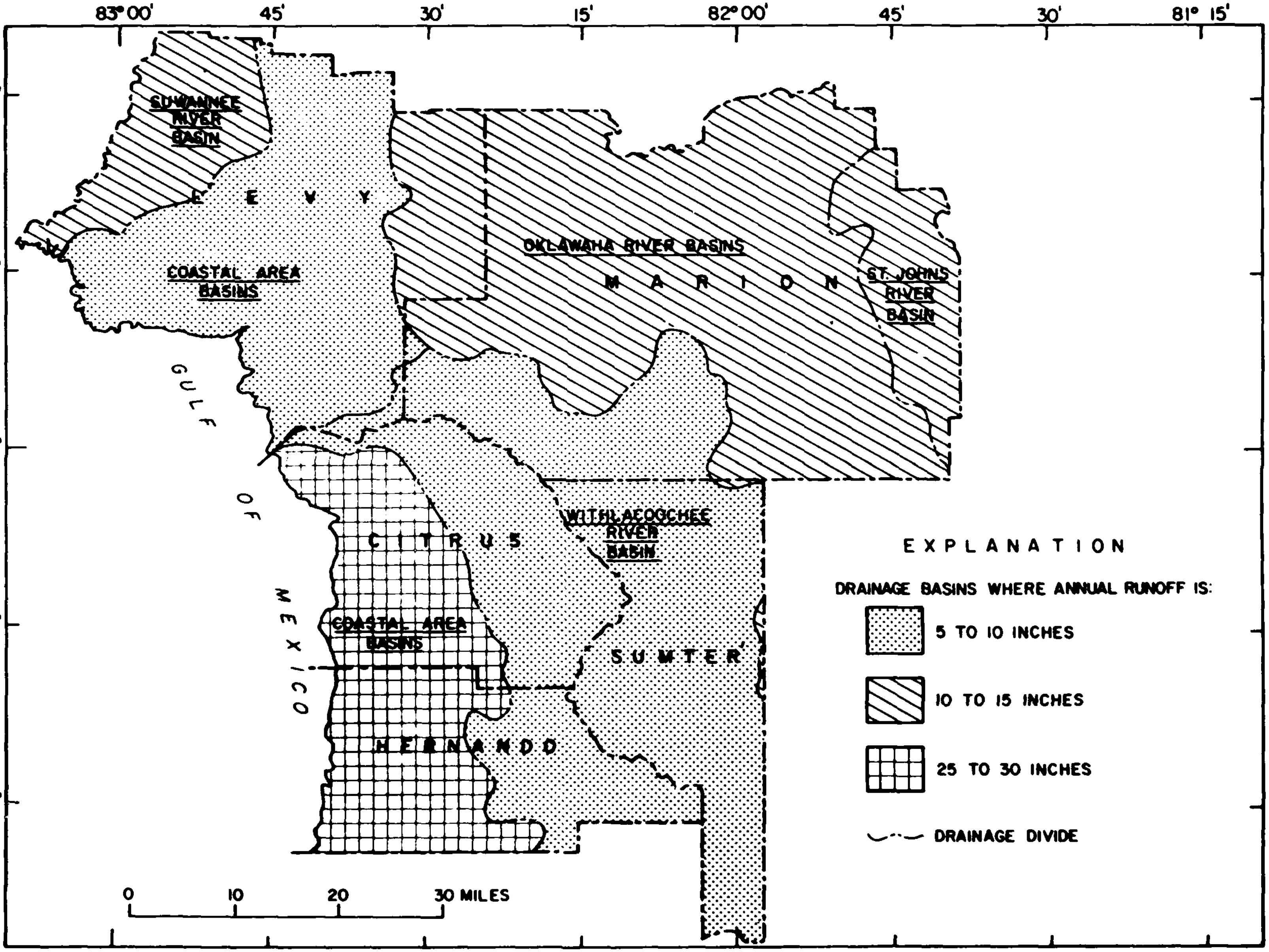



Figure 28.--Drainage basins (from Kenner and others, 1967) and average annual basin runoff (from Hughes, 1978).

## 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 attentuate 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

| Station name: Number | Station name: Latitude | Station name: Longitude | Drainage area, square miles | Altitude of gage datum, feet | Daily stage, feet: min | Daily stage, feet: mean | Daily stage, feet: max | Daily discharge, cubic feet per second: min | Daily discharge, cubic feet per second: mean | Daily discharge, cubic feet per second: max |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Oklawaha River above Moss Bluff Dam at Moss Bluff 02238499 | 29°04'52" | 81°52'51" | 879. | 0.00 | 45.47 | 58.02 | 59.53 | - | - | - |
| 2. Oklawaha River at Moss Bluff 02238500 | 29°04'52" | 81°52'51" | 879. | 0.00 | 34.05 | 37.61 | 49.93 | 0.00 | - | 1,960. |
| 3. Oklawaha River near Ocala 02239000 | 29°11' | 82°00' | 1,020. | 36.52 | - | - | - | 4.19 | 410. | 2,190. |
| 4. Silver Springs near Ocala 02239500 | 29°13' | 82°03' | - | 38.96 | -0.77 | 0.88 | 3.25 | 539. | 810. | 1,290. |
| 5. Silver River near Ocala 02239501 | 29°12'53" | 82°02'29" | - | 0.00 | 38.72 | 40.00 | 41.78 | - | - | - |
| 6. Oklawaha River near Conner 02240000 | 29°12'52" | 81°59'10" | 1,200. | 31.79 | 2.27 | 4.34 | 7.73 | 631. | - | 3,610. |
| 7. Oklawaha River at Eureka 02240500 | 29°22' | 81°54' | 1,370. | 15.44 | - | - | - | 634. | - | 6,060. |
| 8. Orange Creek at Orange Springs 02243000 | 29°30'34" | 81°56'47" | 1,070 | 19.81 | 1.07 | - | 7.89 | 2.00 | - | 1,940. |
| 9. Oklawaha River near Orange Springs 02243500 | 29°30'15" | 81°54'45" | 2,750. | 7.12 | - | - | - | 741. | 1,690. | 9,490. |
| 10. Weekiwachee River near Bayport 02310550 | 28°31'56" | 82°37'33" | - | - | - | - | - | 205. | 264. | 430. |
| [illegible] Chassahowitzka River near Homosassa 02310650 | 23°42'54" | 82°34'38" | - | 0.00 | -0.05* | - | 13.60* | - | - | - |
| [illegible] Homosassa River at Homosassa [illegible] | 28°47'06" | 82°37'05" | - | 0.00 | -1.73* | - | 14.04* | - | - | - |
| [illegible] Crystal River near Crystal River [illegible] | 28°54'17" | 82°38'13" | - | 0.00 | -2.72* | - | 14.90* | -1,520. | 970. | 4,340. |
| [illegible] [illegible]oochee River at Trilby [illegible] | 28°28'47" | 82°10'40" | 570. | 49.27 | 0.54 | [illegible] | 15.80 | [illegible] | [illegible] | [illegible],840. |
| [illegible] Withlacoochee River near Terrytown [illegible] | 28°31'17" | 82°03'18" | 85. | 80.00 | 1.39 | [illegible] | [illegible] | [illegible] | [illegible] | 1,110. |

AD-A106 929 GEOLOGICAL SURVEY TALLAHASSEE FLA WATER RESOURCES DIV F/G 8/8
WATER-RESOURCES INFORMATION FOR THE WITHLACOOCHEE RIVER REGION,--ETC(U)
AUG 81 R A MILLER, W ANDERSON, A S NAVOY
UNCLASSIFIED USGS/WRI-81-11 NL

2 of 2

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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 min | Daily stage, feet mean | Daily stage, feet max | Daily discharge, cubic feet per second min | Daily discharge, cubic feet per second mean | Daily discharge, cubic feet per second max |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16. 02312194 | Big Gant Canal at S-11 near Webster | 28°34'47" | 82°05'45" | 18. | 0.00 | 72.12 | - | 76.58 | - | - | - |
| 17. 02312197 | Big Gant Canal at Structure WC-2 at Berdell | 28°34'16" | 82°08'52" | 30. | 0.00 | 65.00 | 65.75 | 70.00 | - | - | - |
| 18. 02312198 | Big Gant Canal below Structure WC-2 at Berdell | 28°34'16" | 82°08'54" | 30. | 0.00 | 62.10 | 64.05 | 70.30 | - | - | - |
| 19. 02312200 | Little Withlacoochee River at Berdell | 28°34'21" | 82°09'20" | 145. | 59.02 | 0.93 | 3.51 | 12.30 | 0.00 | [illegible] | 3,380. |
| 20. 02312500 | Withlacoochee River at Croom | 28°35'33" | 82°13'20" | 810. | 38.94 | 1.43 | - | 11.15 | 16.0 | 476. | 8,630. |
| 21. 02312600 | Withlacoochee River near Floral City | 28°44'36" | 82°13'13" | 995. | 0.00 | 38.80 | 40.67 | 43.78 | - | - | - |
| 22. 02312625 | Jumper Creek Canal near Center Hill | 28°37'03" | 81°59'39" | 6.72 | 78.89 | 5.55 | 6.38 | 7.07 | - | - | - |
| 23. 02312630 | Jumper Creek Canal at Center Hill | 28°38'58" | 82°00'19" | 13.6 | 77.32 | 3.88 | 5.35 | 6.17 | - | - | - |
| 24. 02312635 | Jumper Creek Canal near Sumterville | 28°41'46" | 82°03'18" | 28.6 | 68.04 | 4.10 | - | 7.27 | 1.10 | - | 68.0 |
| 25. 02312640 | Jumper Creek Canal near Bushnell | 28°41'45" | 82°06'34" | 40.0 | 55.00 | 1.56 | 2.67 | 5.68 | 5.10 | 26.7 | 203. |
| 26. 02312645 | Jumper Creek Canal near Wahoo | 28°42'15" | 82°09'26" | 50.6 | 0.00 | 46.30 | 46.84 | 47.82 | 11.0 | 37.3 | 155. |
| 27. 02312690 | Chitty Chatty Creek near Wildwood | 28°48'33" | 81°58'59" | 38.0 | 52.70 | 3.83 | 5.28 | 7.41 | 0.00 | - | 171. |
| 28. 02312700 | Outlet River at Panacoochee Retreats | 28°49'01" | 82°08'40" | 420. | 0.00 | 38.83 | - | 42.47 | 0.00 | 191. | 538. |
| 29. 02312719 | Withlacoochee River above Wysong Dam, at Carlson | 28°49'22" | 82°10'58" | 1,520. | 0.00 | 37.05 | 38.78 | 40.65 | - | - | - |
| 30. 02312720 | Withlacoochee River at Wysong Dam, at Carlson | 28°49'23" | 82°11'00" | 1,520. | 0.00 | 36.36 | 37.94 | 40.59 | 85.0 | 666. | 2,790. |

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

| Number | Station name Latitude | Longitude | Drainage area, square miles | Altitude of gage datum, feet | Daily stage, feet min | mean | max | Daily discharge, cubic feet per second min | mean | max |
|---|---|---|---|---|---|---|---|---|---|---|
| 31. Taala Apopka Outfall Canal at S-353, near Hernando 02312975 | 28°57'19" | 82°20'13" | - | 0.00 | 36.40 | 38.01 | 39.98 | 0.00 | 20.0 | 410. |
| 32. Taala Apopka Outfall Canal below S-353, near Hernando 02312976 | 28°57'19" | 82°20'13" | - | 0.00 | 27.78 | 30.33 | 37.01 | - | - | - |
| 33. Withlacoochee River near Holder 02313000 | 28°59'19" | 82°20'59" | 1,820 | 27.52 | 0.35 | 2.87 | 9.42 | 113. | 1,100. | 6,660. |
| 34. Rainbow Springs near Dunnellon 02313100 | 29°06'08" | 82°26'16" | - | 28.34 | 2.19 | 3.08 | 3.51 | 538. | 738. | 1,060. |
| 35. Withlacoochee River at Inglis Dam, near Dunnellon 02313230 | 29°00'35" | 82°37'01" | 2,020 | 0.00 | - | - | - | 70.0 | 364. | 4,500. |
| 36. Withlacoochee River below Inglis Dam, near Dunnellon 023113231 | 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 | 138. |
| 38. Withlacoochee River Bypass Channel near Inglish 02313250 | 29°01'15" | 82°38'17" | - | 0.00 | 21.72 | 26.80 | 27.85 | 53.0 | 1,130. | 1,760. |
| 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 | - | 1,170. |
| 42. Waccasassa River near Gulf Hammock 02313700 | 29°12'14" | 82°46'09" | 480. | -0.51 | -2.67* | - | 6.96* | -1,810. | 309. | 11,400 |
| 43. Otter Creek at Otter Creek 02314000 | 29°19'08" | 82°47'03" | 300. | - | - | - | - | 0.00 | 58.1 | 2,980 |
| 44. Tenmile Creek at Lebanon Station 02314200 | 29°09'39" | 82°38'21" | 26. | 15.00 | 2.89 | 4.56 | 10.40 | 0.00 | 39.0 | 3,440. |
| 45. Suwannee River near Wilcox 02323500 | 29°35'22" | 82°56'12" | 9,640 | -0.53 | 1.39 | 5.12 | 18.55 | 3,270 | 10,630 | 84,700 |

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

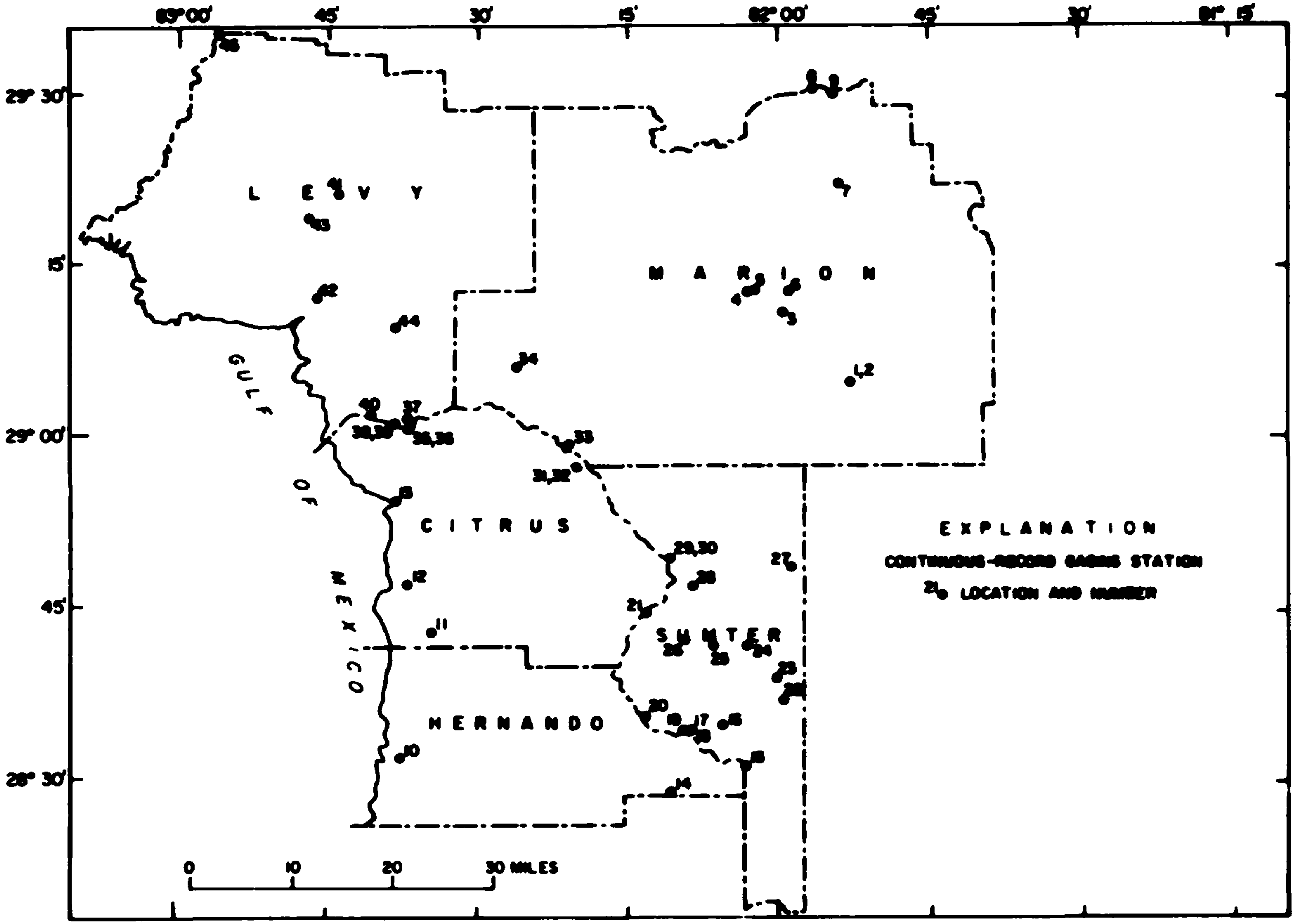


Figure 29.--Locations of continuous-record gaging stations listed in table 14.

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

| | Station number | Station name | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean monthly discharge, in cubic feet per second | | | | | | | | | | | |
| 2. | 02238500 | Oklawaha River at Moss Bluff | 318 | 283 | 274 | 309 | 385 | 360 | 326 | 241 | 244 | 269 | 309 | 346 |
| 3. | 02239000 | Oklawaha River near Ocala | 479 | 374 | 359 | 386 | 411 | 451 | 415 | 317 | 325 | 385 | 474 | 540 |
| 4. | 02239500 | Silver Springs near Ocala | 873 | 857 | 826 | 802 | 789 | 792 | 797 | 781 | 766 | 773 | 805 | 854 |
| 6. | 02240000 | Oklawaha River near Conner | 1,284 | 1,157 | 1,133 | 1,153 | 1,135 | 1,197 | 1,156 | 1,071 | 1,108 | 1,170 | 1,264 | 1,403 |
| 7. | 02240500 | Oklawaha River at Eureka | 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. | 02243000 | 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. | 02312180 | 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 Rerdell | 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 Croom | 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 Wysong Dam at Carlson | 842 | 542 | 488 | 593 | 696 | 767 | 606 | 403 | 390 | 611 | 854 | 1,088 |
| 31. | 02312975 | Tsala Apopka 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 Holder | 1,870 | 1,173 | 868 | 858 | 905 | 1,035 | 1,016 | 685 | 615 | 957 | 1,464 | 1,912 |
| 35. | 02313230 | Withlacoochee River at Inglis Dam, near Dunnellon | 780 | 436 | 325 | 321 | 400 | 453 | 260 | 117 | 108 | 173 | 432 | 525 |
| 42. | 02313700 | Waccasassa River near Gulf Hammock | 258 | 123 | 209 | 325 | 487 | 403 | 224 | 135 | 151 | 279 | 636 | 479 |
| 44. | 02314200 | Tenmile 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 Rerdell | .70 | 2.1 | 6.7 | 8.7 | 23 | 82 | 250 |
| 20. | 02312500 | Withlacoochee River at Croom | 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 Wysong Dam at Carlson | 180 | 220 | 330 | 370 | 500 | 780 | 1,400 |
| 31. | 02312975 | Tsala 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 | Tenmile Creek at Lebanon Station | .07 | .10 | .40 | .70 | 6.0 | 29 | 100 |
| 45. | 02323500 | Suwannee 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

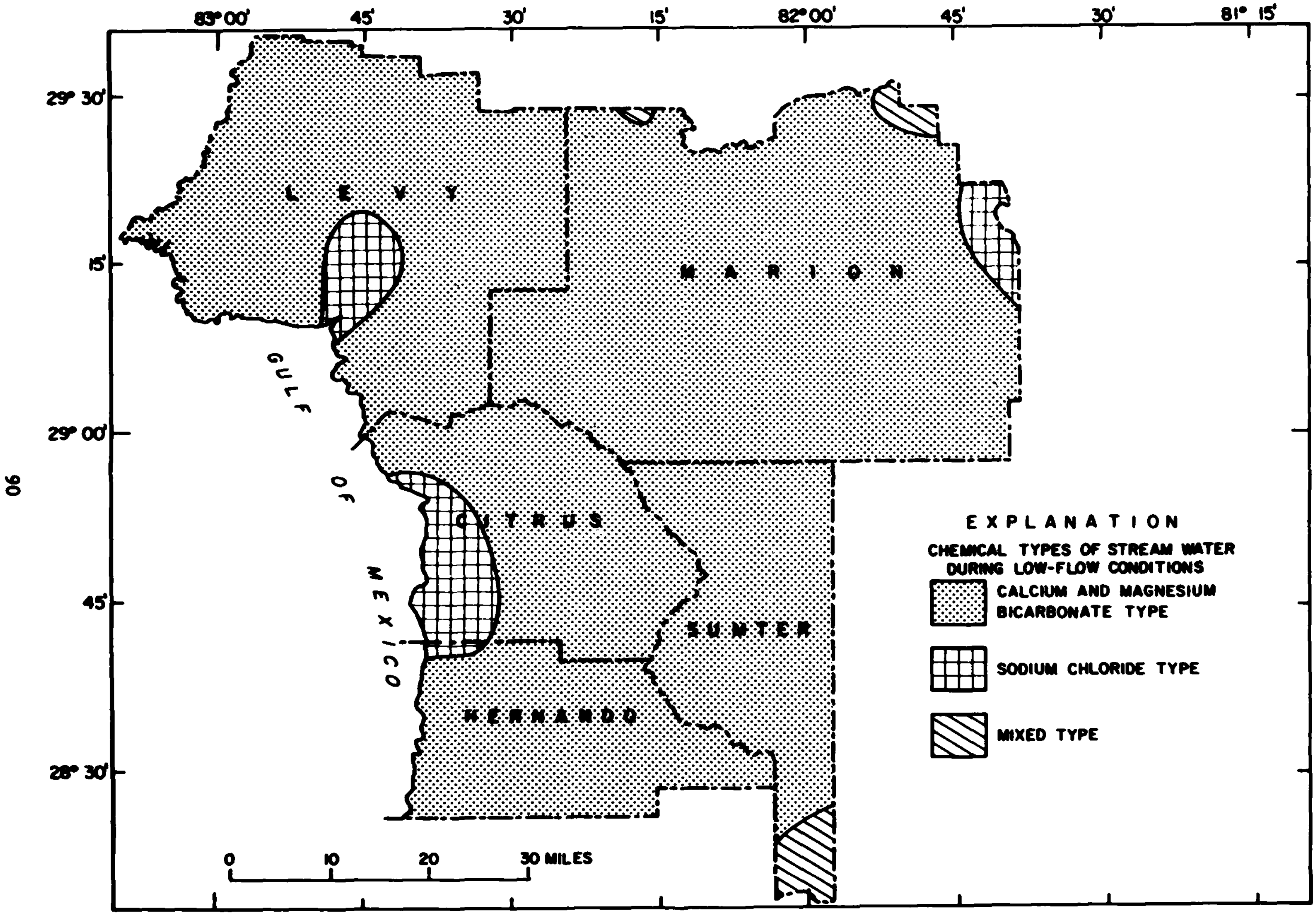


Figure 30.--Chemical types of streams during low-flow conditions (from Kaufman, 1972).

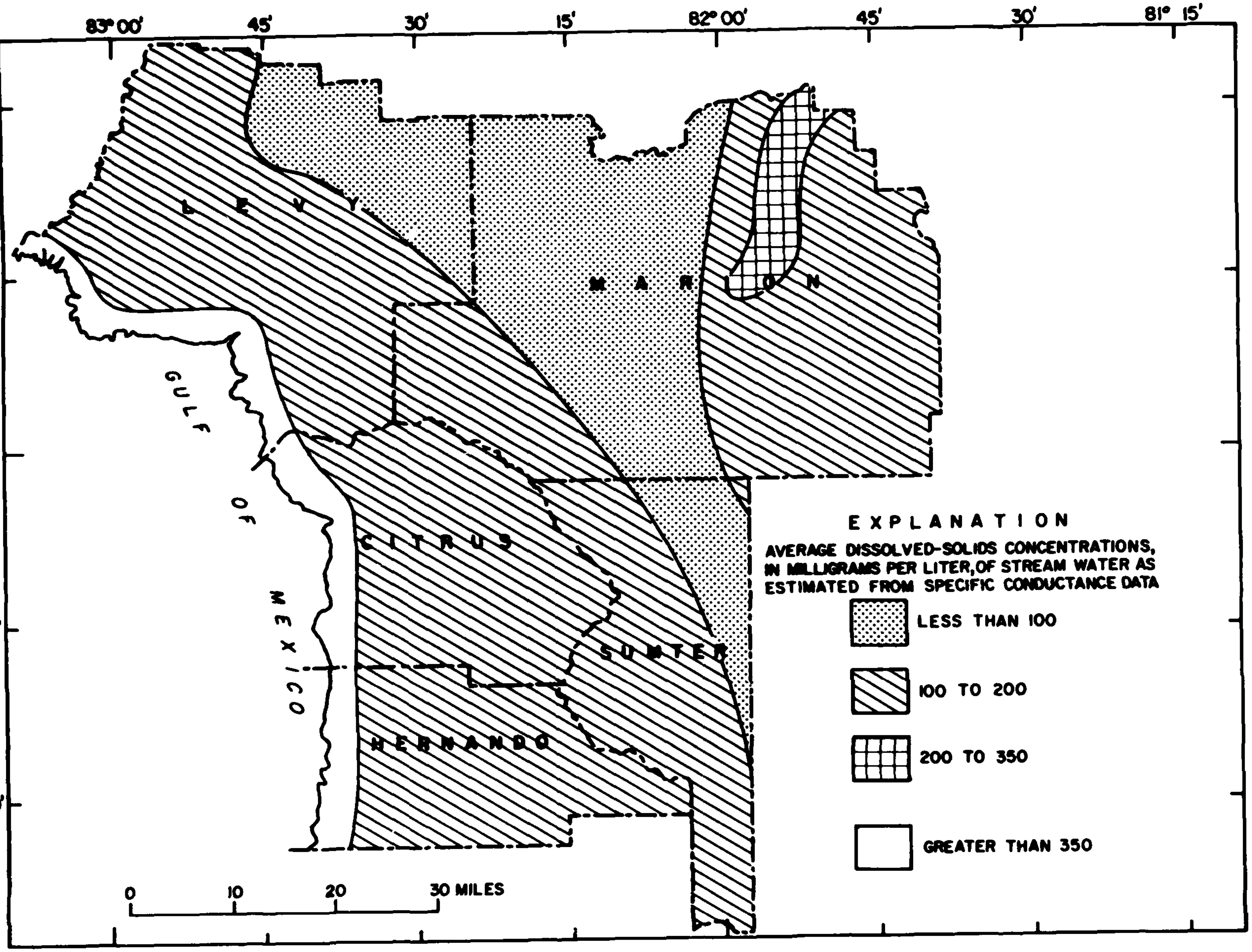


Figure 31.--Dissolved-solids concentrations in streams (from Dysart and Goolsby, 1977).

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):

| River | Dissolved-solids load, in tons per square mile per year |
|---|---|
| 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:

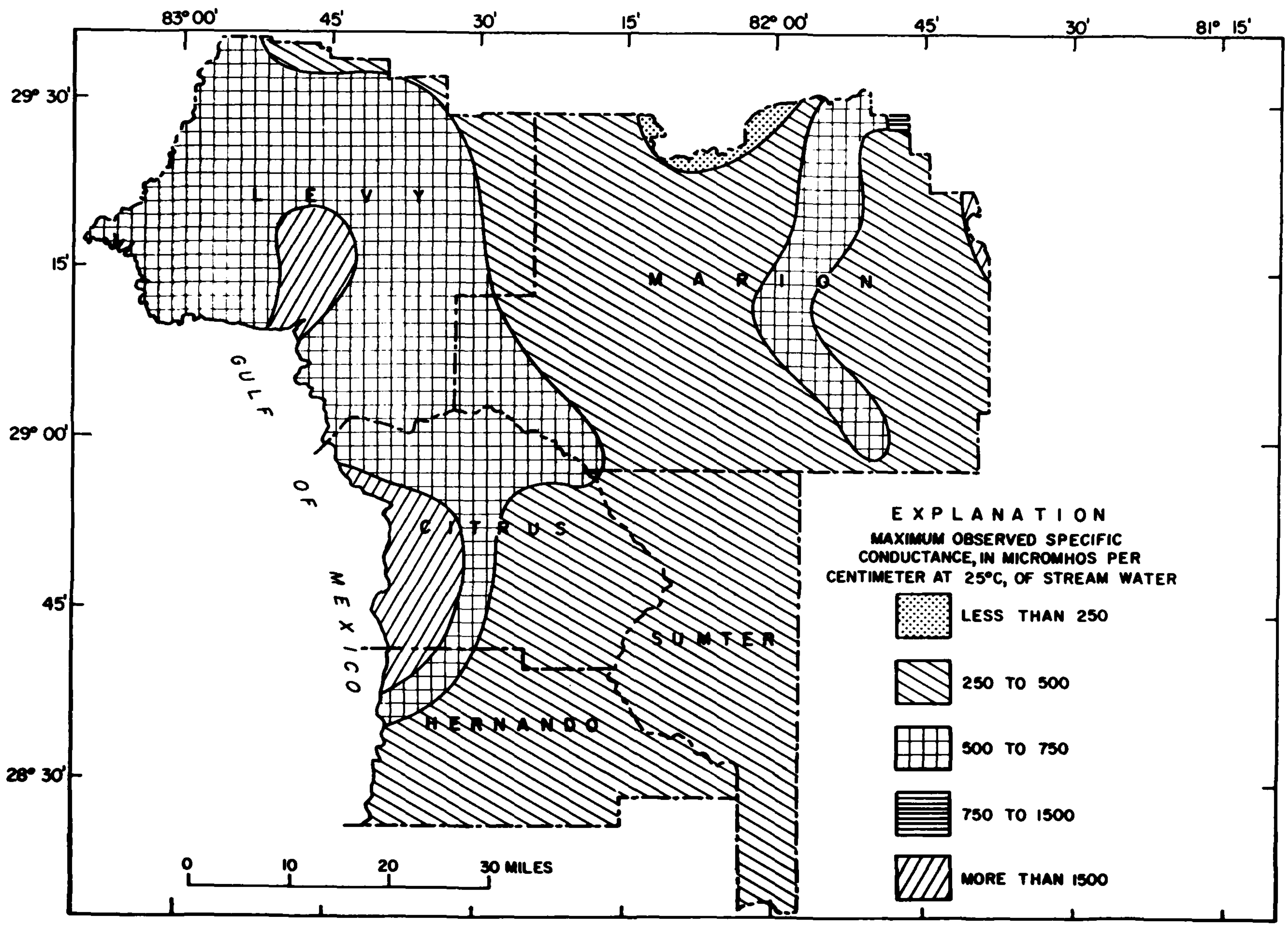


Figure 32.--Maximum-observed specific conductance of streams (from Slack and Kaufman, 1973).

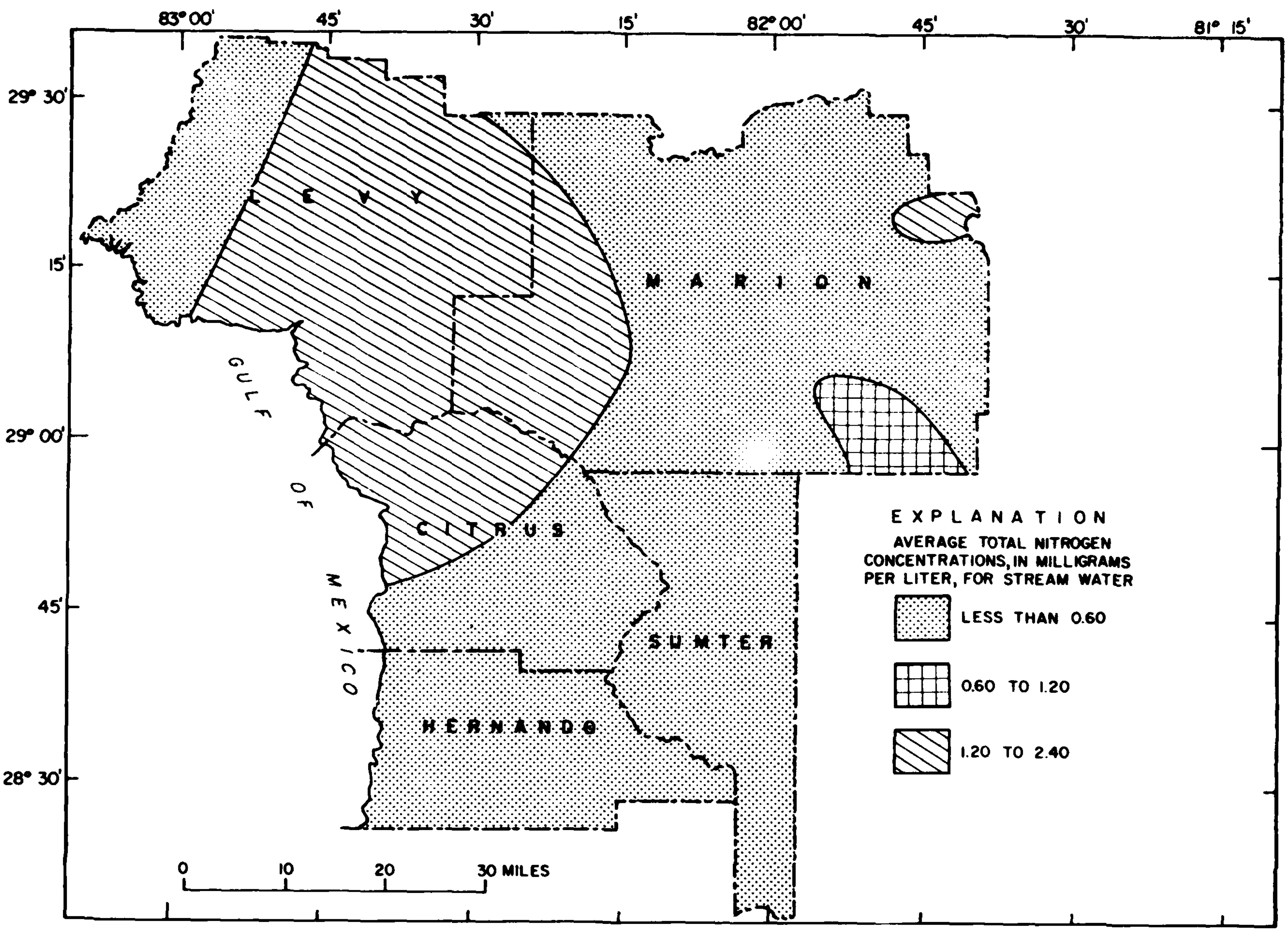


Figure 33.--Average total nitrogen concentrations in streams (from Slack and Goolsby, 1976)

| River | Nitrogen load, in tons per square mile per year |
|---|---|
| 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,

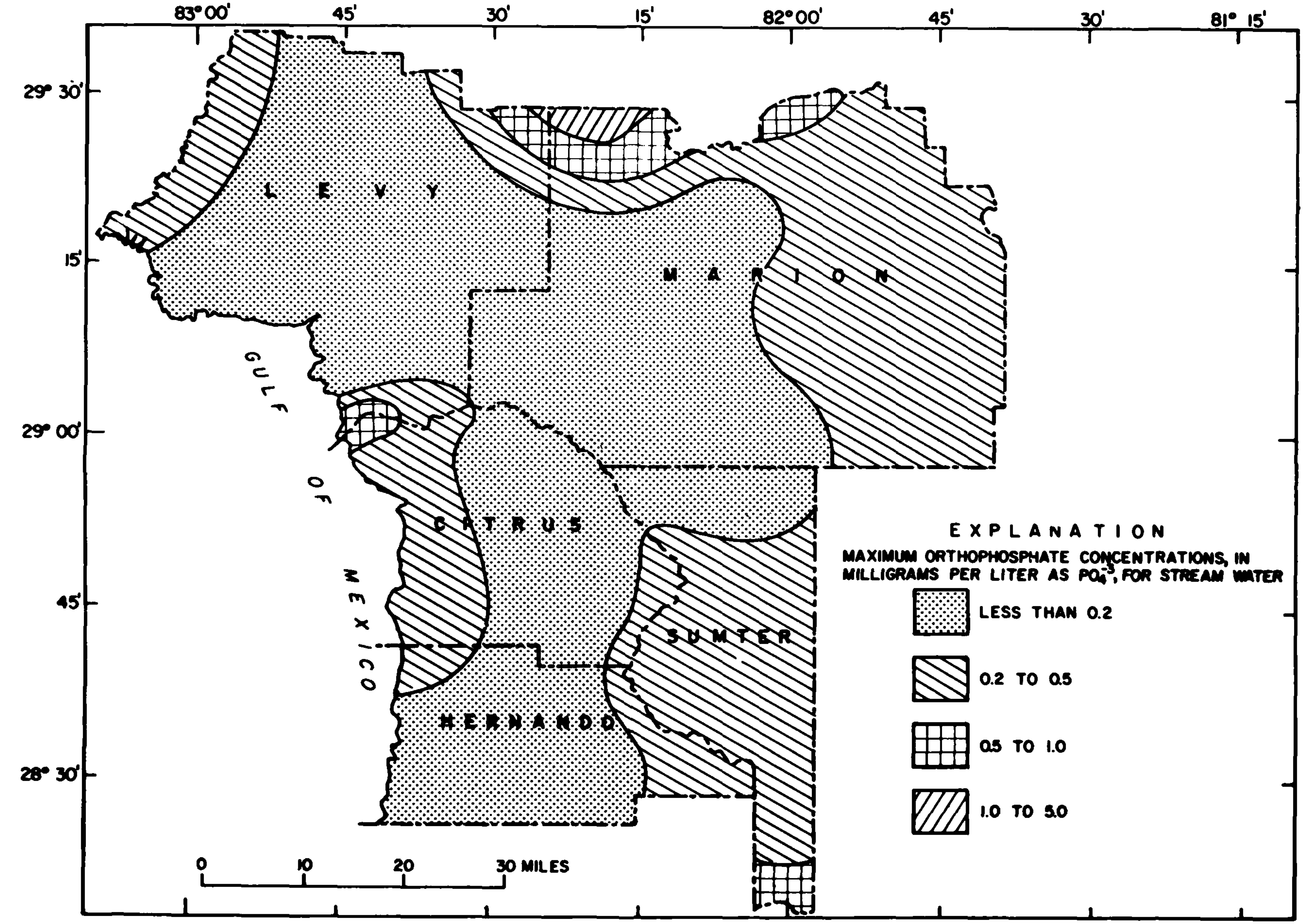


Figure 34.--Maximum orthophosphate concentrations in streams (from Kaufman, 1969b).

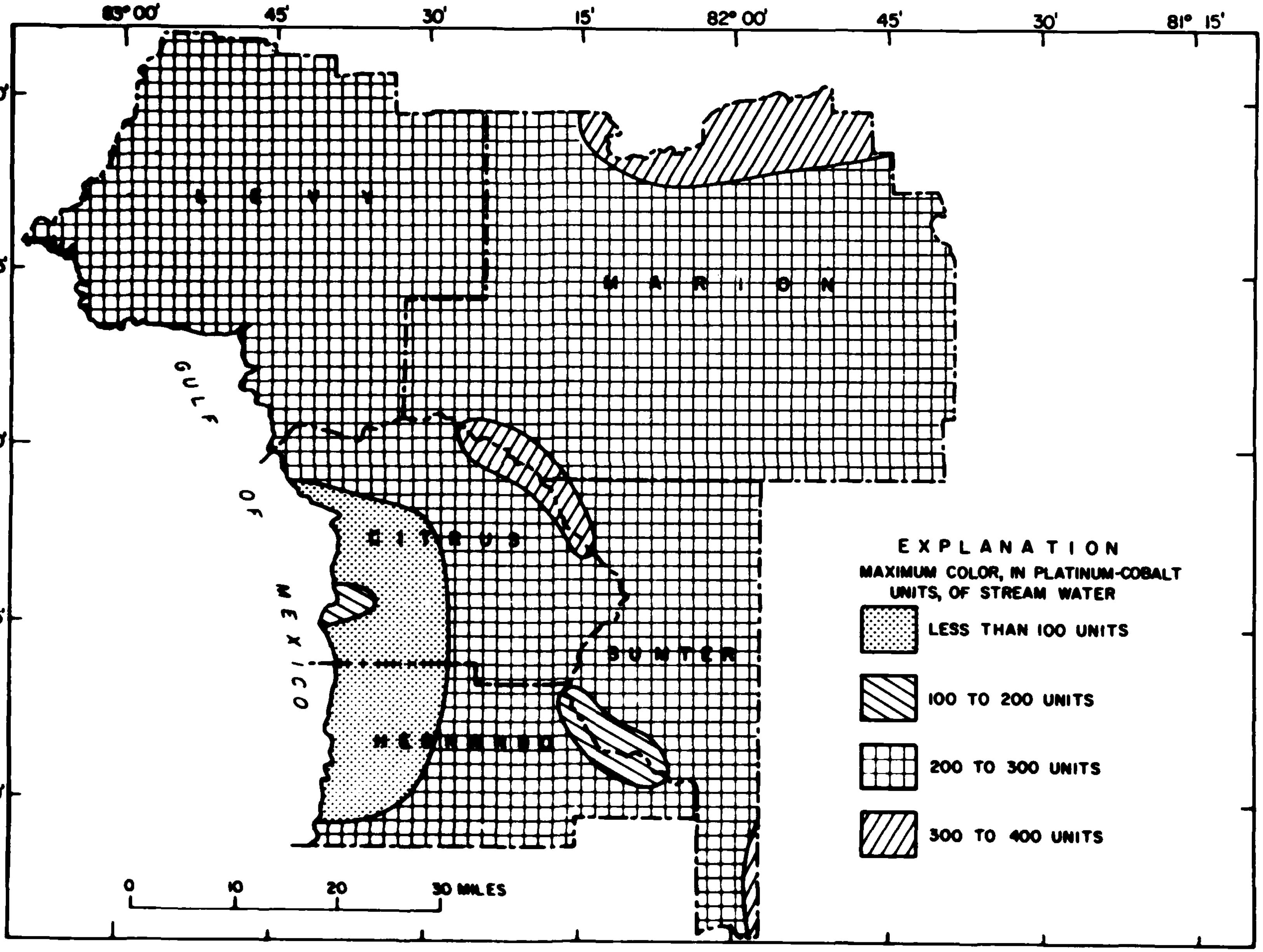


Figure 35.--Maximum color of water in streams (from Kaufman, 1969a).

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 Tsala 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

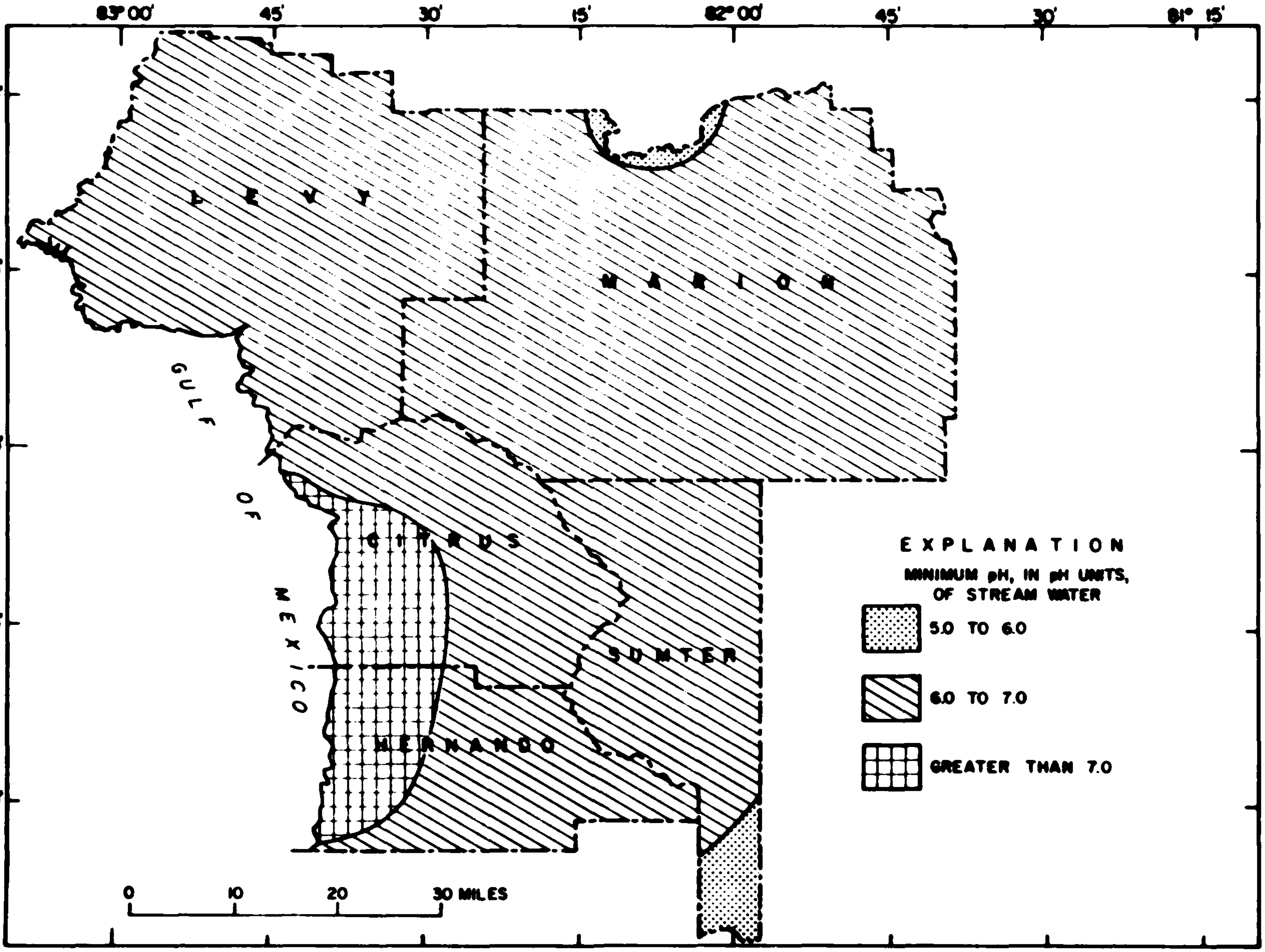


Figure 36.--Minimum pH of water in streams (from Kaufman, 1970).

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

| | Station name / Station number | 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 name<br>Station number | Latitude | Longitude | Length of record (years) | Daily stage, in feet above NGVD of 1929<br>minimum | mean | maximum |
|---|---|---|---|---|---|---|---|
| 11. | Lake Oklahumpka near Wildwood<br>02312691 | 28°49'45" | 82°00'06" | 3 | 55.91 | - | 58.12 |
| 12. | Lake Miona near Oxford<br>02312696 | 28°54'21" | 82°00'19" | 2 | 49.74 | - | 51.82 |
| 13. | Lake Panasoffkee near Lake Panasoffkee<br>02312698 | 28°49'01" | 82°08'40" | 18 | 15.66 | 40.41 | 42.47 |
| 14. | Little Lake at Floral City<br>02312794 | 28°44'51" | 82°17'17" | 5 | 37.41 | 39.98 | 42.16 |
| 15. | Tsala Apopka Lake at Floral City<br>02312800 | 28°45'03" | 82°16'49" | 21 | 35.24 | 40.46 | 44.21 |
| 16. | Tsala Apopka Lake at Moccasin Slough near Inverness<br>02312829 | 28°49'30" | 82°14'40" | 1 | 39.20 | - | 41.65 |
| 17. | Tsala Apopka Lake at Spivey Lake near Inverness<br>02312877 | 28°49'50" | 82°17'30" | 1 | 38.45 | - | 40.67 |
| 18. | Tsala Apopka Lake at Inverness<br>02312900 | 28°50'39" | 82°19'21" | 22 | 36.13 | 39.17 | 49.93 |
| 19. | Tsala Apopka Lake at Hernando<br>02312950 | 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 name<br>Station number | Latitude | Longitude | Length of record (years) | Daily stage, in feet above NGVD of 1929 minimum | mean | maximum |
|---|---|---|---|---|---|---|---|
| 20. | Lake Rousseau near Dunnellon<br>02313229 | 29°00'36" | 82°37'00" | 17 | 21.69 | 27.20 | 28.00 |
| 21. | Chunky Pond near Bronson<br>02313510 | 29°23'36" | 82°37'19" | 11 | 45.80 | - | 56.00 |

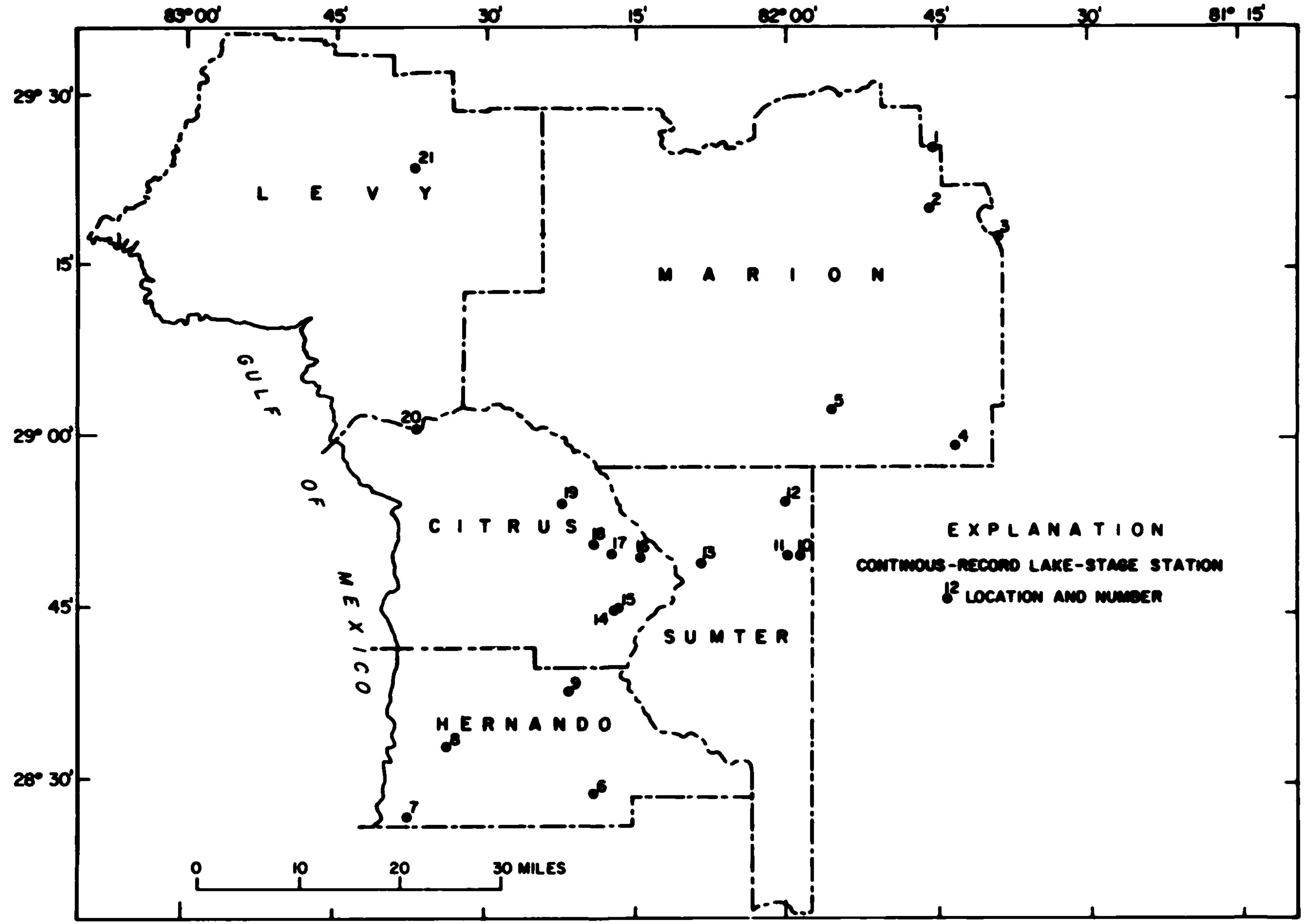


Figure 37.--Locations of lakes having continuous stage data.

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:

| | Feet |
|---|---|
| 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 |
| 023113229 | 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 (µmho/cm at 25°C) | Minimum dissolved oxygen (mg/L) | Maximum concentrations (mg/L): Biochemical oxygen demand 5-day | Total nitrogen 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 |
| 02238330 | Big Bass Lake near Starkes Ferry | 30.0 | 54 | 5.3 | 2.3 | - | - | - |
| 02238800 | 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 | Neff Lake near Brooksville | 34.0 | 640 | 0 | - | - | - | - |
| 02312520 | Lake Lindsey near Brooksville | 32.0 | 58 | - | - | - | - | - |
| 02312698 | Lake Panasoffkee near Lake Panasoffkee | 32.5 | 400 | - | - | - | - | - |
| 02312800 | Tsala 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 |
| 02238330 | Big Bass Lake near Starkes Ferry | 30.0 | 54 | 5.3 | 2.3 | - | - | - |
| 02238800 | 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 | Neff Lake near Brooksville | 34.0 | 640 | 0 | - | - | - | - |
| 02312520 | Lake Lindsey near Brooksville | 32.0 | 58 | - | - | - | - | - |
| 02312698 | Lake Panasoffkee near Lake Panasoffkee | 32.5 | 400 | - | - | - | - | - |
| 02312800 | Tsala Apopka Lake at Floral City | 34.0 | 310 | - | - | - | - | - |
| 02312900 | Tsala Apopka Lake at Inverness | 34.0 | 420 | - | - | - | - | - |
| 02312950 | Tsala Apopka Lake at Hernando | 33.0 | 305 | - | - | - | - | - |
| 02313510 | Chunky Pond near Bronson | 36.5 | 360 | 2.1 | - | - | - | - |
| 284535082054701 | Lake Panasoffkee at I-74 Crossing | 27.5 | 418 | 2.0 | 4.2 | 1.13 | .12 | 22 |
| 284753082070401 | Lake Panasoffkee near Coleman Landing | 32.- | 350 | 6.9 | 2.- | 1.- | .00 | 20 |
| 290146082353600 | 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 |
| 292502082551000 | Lake Ocklawaha 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 Oklawaha 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 $mi^2$. 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 $ft^3/s$.

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:

| | Nitrogen, in tons | Phosphorus, in tons |
|---|---|---|
| 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

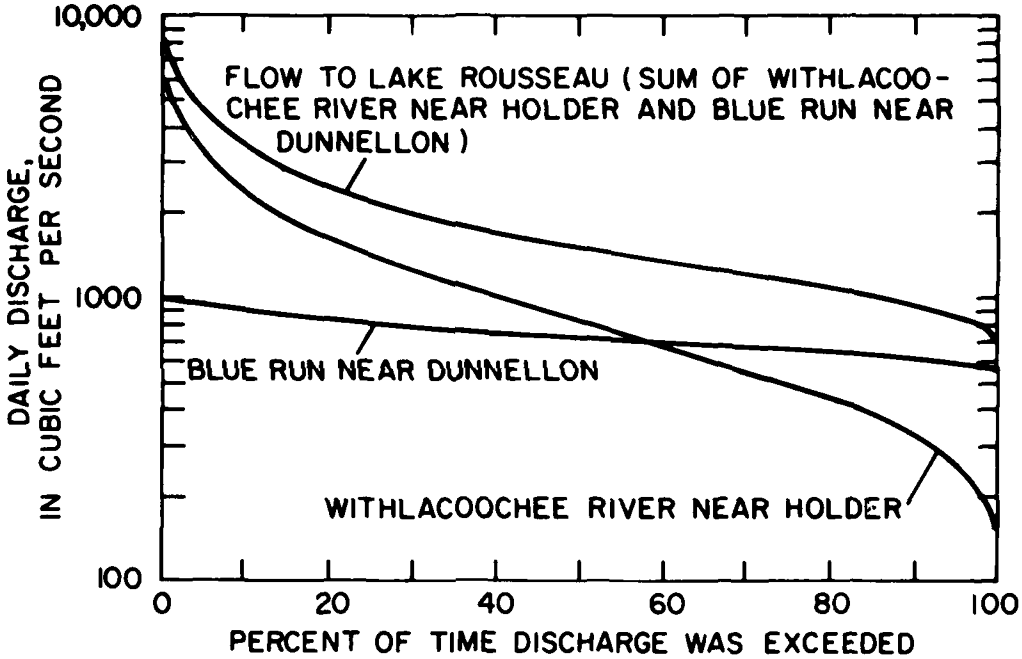


Figure 38.--Flow-duration curves for Lake Rousseau, Blue Run, and Withlacoochee River, 1966-76 (from German, 1978).

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 μmho/cm at 25°C at Floral City, 150 μmho/cm at 25°C at Inverness, and 139 μmho/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:

| | Cubic feet per second |
|---|---|
| Rainfall onto the lake | 29 |
| Surface-water inflow | 44 |
| Net ground-water inflow | 160 |
| Total | 233 |
| Surface-water outflow | 207 |
| Evaporation from lake | 26 |
| 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 Oklawaha 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 $mi^2$ and a drainage area of about 60 $mi^2$. 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 $ft^3/s$. 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 $ft^3/s$ 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 $ft^3/s$--Silver Springs with a maximum of 1,290 $ft^3/s$ and Rainbow Springs with a maximum of 1,230 $ft^3/s$. Both are located in Marion County. Ten springs have had a maximum discharge between 100 and 1,000 $ft^3/s$, 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 $ft^3/s$ for

Table 20.—Record of selected springs

| Spring No. | Spring name | Latitude | Longitude | Period of record | Discharge ($ft^3/s$) | Temperature (°C) | Dissolved solids (mg/L) | Specific conductance (µmho/cm) | Hardness as $CaCO_3$ (mg/L) | Chloride (mg/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum and maximum of variable | | | | | |
| **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 | Chassahowitzka 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'- | 82°35'- | 1975 | - | 25.0/- | 460/- | 555/- | 160/- | 180/- |
| 5 | Homosassa 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 Spring | - | - | 1961 | - | 23.9/- | - | 6,500/- | - | 1,900/- |
| 9 | Unnamed Springs | - | - | 1961 | 20/- | - | - | - | - | - |
| **Hernando County** | | | | | | | | | | |
| 1 | Blind Springs | 28°39'- | 82°38'- | 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'- | 82°37'- | 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'- | 82°39'- | 1962 | 5*/- | - | - | - | - | - |
| 8 | Unnamed Spring 2 | 28°27'- | 82°38'- | 1960 | 1*/- | 24.0/- | - | 176/- | 90/- | 5.0/- |
| 9 | Unnamed Spring 3 | 28°31'- | 82°37'- | 1962 | 1.5*/- | - | - | - | - | - |
| 10 | Unnamed Spring 4 | 28°31'- | 82°37'- | 1962 | 10*/- | - | - | 5,500/- | - | 1,600*/- |
| 11 | Unnamed Spring 5 | 28°31'- | 82°37'- | 1962 | 12*/- | - | - | 5,000/- | - | 1,500*/- |
| 12 | Unnamed Spring 6 | 28°32'- | 82°37'- | 1960 | 5*/- | - | - | 8,500/- | - | 2,700*/- |
| 13 | Unnamed Spring 7 | 28°39'- | 82°38'- | 1961 | 50*/- | - | - | - | - | - |
| 14 | Unnamed Spring 8 | 28°40'- | 82°38'- | 1961 | 40*/- | 24.0/- | - | 19,000/- | - | 6,400*/- |
| 15 | Unnamed Spring 9 | 28°41'- | 82°35'- | 1961 | 30.1/- | 23.5/- | - | 650/- | - | 110*/ |
| 16 | Unnamed Spring 10 | 28°41'- | 82°36'- | 1961 | 5*/- | 23.5/- | - | 12,900/- | 1,550/- | 4,300/- |
| 17 | Unnamed Spring 11 | 28°41'- | 82°36'- | 1961 | 5*/- | 22.0/- | - | 11,400/- | 1,360/- | 3,700/- |
| 18 | Unnamed Spring 12 | 28°41'- | 82°36'- | 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 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|
| **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 | Fannin 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 | Wekiva 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 | Fern 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 | 539/1,290 | 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 | Fenney Springs | 28°47'42" | 82°02'19" | 1947-72 | 4.66/95.5 | 20.0/- | 175/- | 230/- | 120/- | 1.2/0 |
| 2 | Gum 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.

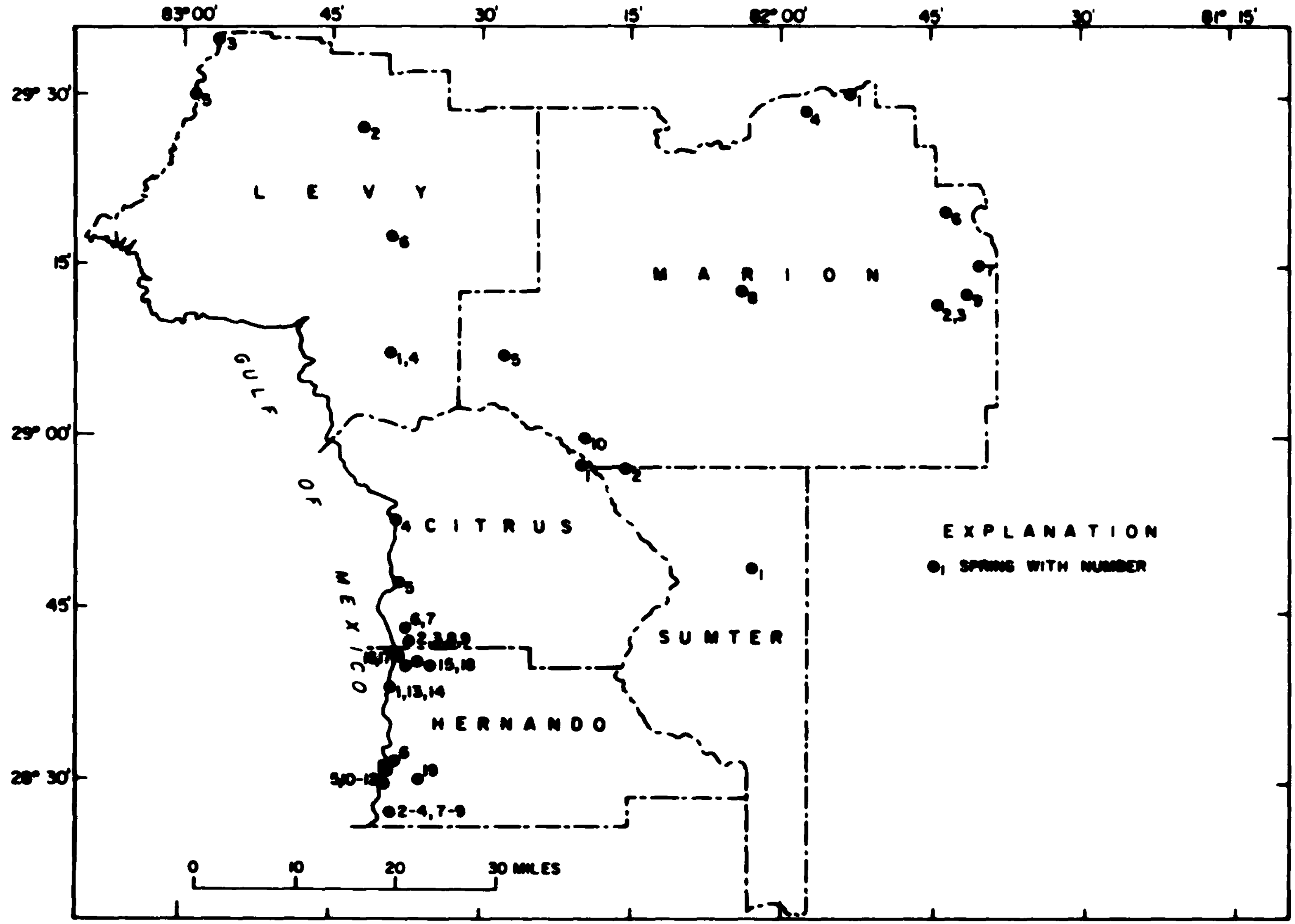


Figure 39.--Locations of springs with discharge greater than 1 cubic foot per second.

Silver Springs and 487 to 1,230 $ft^3/s$ 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 $ft^3/s$. For Rainbow Springs the difference is 280 $ft^3/s$. The median discharge for Silver Springs is 790 $ft^3/s$, and for Rainbow Springs, 700 $ft^3/s$.

### 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 Kejldahl 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 frequences 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 $ft^2/d$. 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 µmho/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 $ft^3/s$ 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 $ft^3/s$ for Silver Springs, and only 280 $ft^3/s$ 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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