

Figure 1.--Areal extent of principal aquifers in Florida
(modified from Franks, 1982)

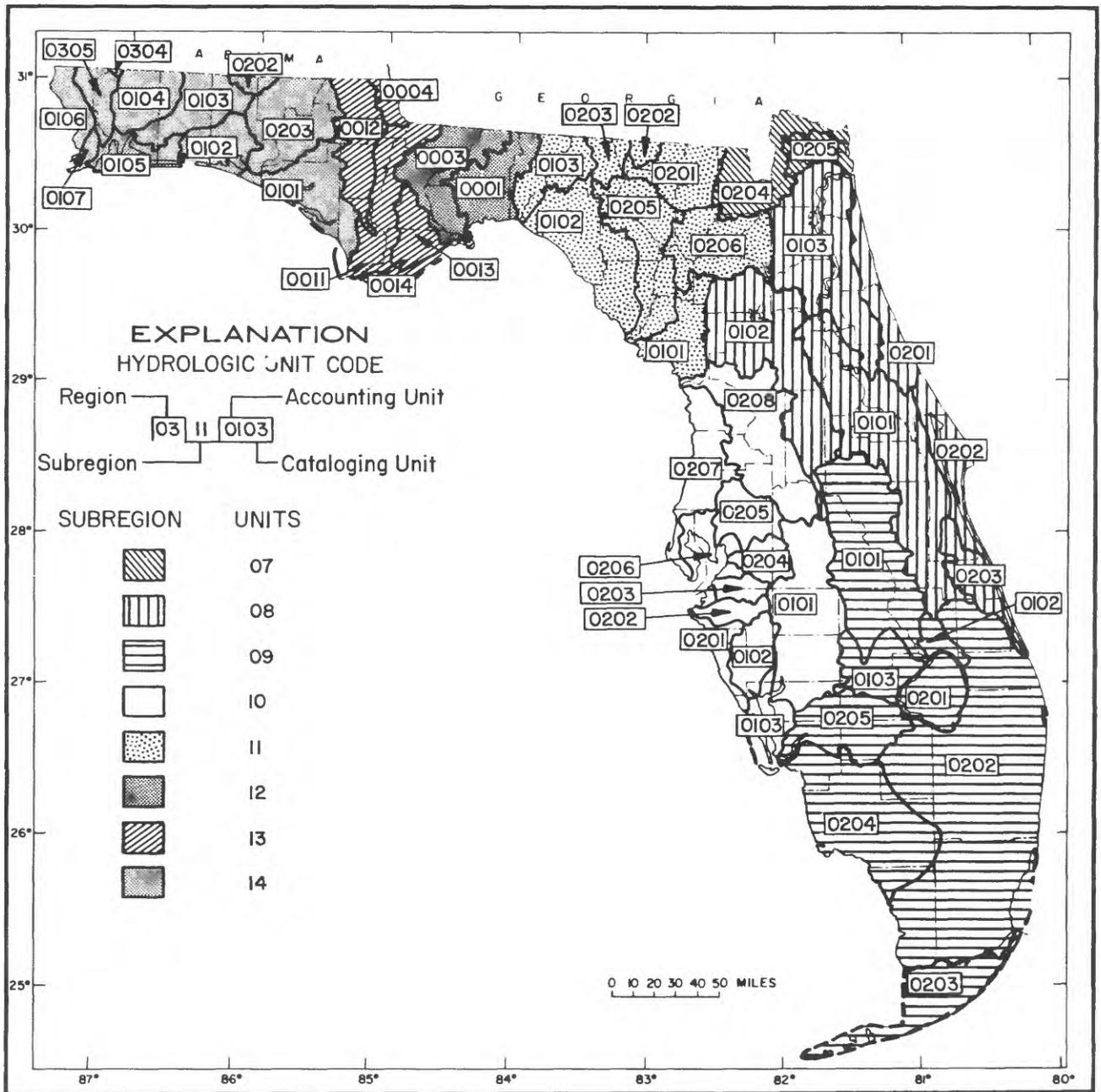


Figure 3.--Hydrologic unit map of Florida (modified from Heath and Conover, 1981).

Table 3.--Hydrologic unit codes, names, and drainage areas in Florida

[Modified from U.S. Geological Survey, 1982]

[Subregions are in Water Resources Region 03, South Atlantic-Gulf]

Subregion	Accounting unit Cataloging unit	Description	Drainage area (mi ²)
07		Altamaha-St. Marys: The coastal drainage and associated waters from and including the Altamaha River basin to the St. Johns River basin boundary. Florida, Georgia.	20,500
02		St. Marys-Satilla: The coastal drainage and associated waters from the Altamaha River basin boundary to the St. Johns River basin boundary. Florida, Georgia	6,220
04		St. Marys. Florida, Georgia	1,610
05		Nassau. Florida.	439
08		St. Johns: The coastal drainage and associated waters from and including the St. Johns River basin to St. Lucie inlet. Florida.	11,600
01		St. Johns: The St. Johns River basin. Florida.	9,360
01		Upper St. Johns. Florida	3,700
02		Oklawaha. Florida	2,860
03		Lower St. Johns. Florida.	2,800
02		East Florida Coastal: The coastal drainage and associated waters from the St. Johns River basin boundary to St. Lucie Inlet. Florida.	2,190
01		Daytona-St. Augustine. Florida	760
02		Cape Canaveral. Florida	760
03		Vero Beach. Florida.	670
09		Southern Florida: The coastal drainage and associated waters from St. Lucie Inlet to and including the Caloosahatchee River basin, and interior drainage south of the St. Johns and Peace River basins. Florida.	18,700
01		Kissimmee: The Kissimmee River basin and interior drainage into Lake Okeechobee from the north. Florida.	4,210
01		Kissimmee. Florida.	3,010
02		Northern Okeechobee inflow. Florida	282
03		Western Okeechobee inflow. Florida	918

Table 3.--Hydrologic unit codes, names, and drainage areas in Florida--Continued

[Modified from U.S. Geological Survey, 1982]

[Subregions are in Water Resources Region 03, South Atlantic-Gulf]

Subregion	Accounting unit Cataloging unit	Description	Drainage area (mi ²)
02		Southern Florida: The coastal drainage and associated waters from St. Lucie Inlet to and including the Caloosahatchee River basin, and interior drainage south of the St. Johns and Peace River basins, excluding the Kissimmee River basin and exterior drainage into Lake Okeechobee from the north. Florida.	14,500
	01	Lake Okeechobee. Florida.	727
	02	Everglades. Florida.	8,400
	03	Florida Bay-Florida Keys. Florida.	1,230
	04	Big Cypress Swamp. Florida	2,710
	05	Caloosahatchee. Florida.	1,420
10		Peace-Tampa Bay: The coastal drainage and associated waters from the Caloosahatchee River basin boundary to and including the Withlacoochee River basin. Florida.	10,000
	01	Peace: The coastal drainage and associated waters from the Caloosahatchee River basin boundary to Gasparilla Pass. Florida.	3,610
	01	Peace. Florida.	2,420
	02	Myakka. Florida	606
	03	Charlotte Harbor. Florida.	587
	02	Tampa Bay: The coastal drainage and associated waters from Gasparilla Pass to and including the Withlacoochee River basin. Florida.	6,410
	01	Sarasota Bay. Florida.	428
	02	Manatee. Florida	375
	03	Little Manatee. Florida	217
	04	Alafia. Florida.	434
	05	Hillsborough. Florida	678
	06	Tampa Bay. Florida.	894
	07	Crystal-Pithlachascotee. Florida	1,290
	08	Withlacoochee. Florida	2,090
11		Suwannee: The coastal drainage and associated waters from the Withlacoochee River basin boundary to and including the Aucilla River basin. Florida.	13,800

Table 3.--Hydrologic unit codes, names, and drainage areas in Florida--Continued

[Modified from U.S. Geological Survey, 1982]

[Subregions are in Water Resources Region 03, South Atlantic-Gulf]

Subregion	Accounting unit Cataloging unit	Description	Drainage area (mi ²)
01		Aucilla-Waccasassa: The coastal drainage and associated waters from the Withlacoochee River basin boundary to and including the Aucilla River basin, excluding the Suwannee River basin. Florida, Georgia.	3,870
	01	Waccasassa. Florida	936
	02	Econfina-Steinhatchee. Florida	1,930
	03	Aucilla. Florida, Georgia.	1,000
02		Suwannee: The Suwannee River basin. Florida, Georgia.	9,930
	01	Upper Suwannee. Florida, Georgia.	2,720
	02	Alapaha. Florida, Georgia	1,840
	03	Withlacoochee. Florida, Georgia	1,510
	05	Lower Suwannee. Florida.	1,590
	06	Santa Fe. Florida	1,390
12		Ochlockonee: The coastal drainage and associated waters from the Aucilla River basin boundary to and including the Ochlockonee River basin. Florida, Georgia.	3,650
	00	Ochlockonee. Florida, Georgia.	3,650
	01	Apalachee Bay-St. Marks. Florida, Georgia	1,180
	03	Lower Ochlockonee. Florida, Georgia	1,540
13		Apalachicola: The coastal drainage and associated waters from the Ochlockonee River basin boundary to and including the Apalachicola River basin and the drainage into Apalachicola Bay. Alabama, Florida, Georgia.	20,500
	00	Apalachicola. Alabama, Florida, Georgia.	20,500
	04	Lower Chattahoochee. Alabama, Florida, Georgia.	1,300
	11	Apalachicola, Florida, Georgia.	1,130
	12	Chipola. Alabama, Florida	1,270
	13	New. Florida.	569
	14	Apalachicola Bay. Florida.	266
14		Choctawhatchee-Escambia: The coastal drainage and associated waters from the Apalachicola Bay drainage boundary to the Mobile Bay drainage boundary. Alabama, Florida.	15,000

Table 3.--Hydrologic unit codes, names, and drainage areas in Florida--Continued

[Modified from U.S. Geological Survey, 1982]

[Subregions are in Water Resources Region 03, South Atlantic-Gulf]

Subregion Accounting unit Cataloging unit	Description	Drainage area (mi ²)
01	Florida Panhandle coastal: The coastal drainage and associated waters from the Apalachicola Bay drainage boundary to Mobile Bay drainage boundary, excluding the Choctawhatchee and Escambia River basins. Alabama, Florida, Georgia.	6,060
01	St. Andrews-St. Josephs Bays. Florida	1,350
02	Choctawhatchee Bay. Florida	699
03	Yellow. Alabama, Florida.	1,380
04	Blackwater. Alabama, Florida	860
05	Pensacola Bay. Florida.	543
06	Perdido. Alabama, Florida.	913
07	Perdido Bay. Alabama, Florida.	313
02	Choctawhatchee: The Choctawhatchee River basin. Alabama, Florida.	4,670
02	Pea. Alabama, Florida.	1,550
03	Lower Choctawhatchee. Alabama, Florida.	1,560
03	Escambia: The Escambia River basin. Alabama, Florida.	4,290
04	Lower Conecuh. Alabama, Florida.	1,010
05	Escambia. Alabama, Florida.	780

Agency site number.--The code assigned and used by the reporting agency to uniquely identify hydrologic data collection sites under its control.

Latitude-longitude.--The latitude and longitude are provided by the reporting agency.

Principal aquifer.--An aquifer is a formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs. If a well taps only one aquifer, that is the principal aquifer. If a well taps more than one aquifer, the principal aquifer will be the one that yields the greatest amount of water.

The principal aquifer codes and associated geologic names in Florida are presented in table 4. The table listing is by "principal aquifers" (Franks, 1982) as shown in figure 1. The principal aquifer component contains a geologic unit code (up to eight alpha-numeric characters) for the aquifer or rock unit supplying water to the well. The numeric codes relate to the geologic age of the aquifer as follows: 110-Quaternary, 111-Holocene, 112-Pleistocene, 120-Tertiary, 121-Pliocene, 122-Miocene, 123-Oligocene, and 124-Eocene. The alphabetic code relates to the name of the geologic unit. The geologic unit codes for Florida are explained in Hutchinson, 1975.

Well depth.--The greatest depth in feet below land surface at which water can enter the well. For screened or perforated wells, the depth to the bottom of the screen or to the lowest perforation is reported. For open-hole or open-end wells, the total depth is reported.

Period of record.--The calendar year in which water-quality data was first collected for the site and the calendar year when collection of water-quality data was discontinued. If the discontinued column is blank, the site is active.

Interrupted record.--The presence of a value of "Y" indicates one or more interruptions in the period of record of water-quality data acquisition during the period beginning with the first year of data collection through the present (if currently active), or ending with the last year of data collection.

Site type.--A two-character code describes the type of water body subject to hydrologic data-collection activities performed at the site. Two codes are contained in this report: GW and SP. GW designates a well, defined as an artificial excavation that derives some water from the interstices of rocks or soil which it penetrates and from which water can be withdrawn. SP designates a spring, defined as a place where water flows from a rock or soil upon the land surface or into a body of water.

Types of Data

The water-quality data available at each site are categorized as physical, chemical, and other characteristics. All data are called parameters in conformance with NAWDEX usage. A one-character alphabetic code is used to indicate the frequency with which a particular parameter was recorded or measured. The codes used to denote collection frequency are explained at the bottom of each page of tables 11 and 12. The absence of a frequency code indicates information was not collected for that parameter.

Physical

Physical water-quality parameters are those which pertain to the measurements of the physical characteristics (temperature, specific conductance, pH, and suspended solids) of water, as distinguished from the concentrations of chemicals present in water.

Temperature.--The measure of the intensity aspect of heat energy present in a water body. Temperatures may be recorded as either Fahrenheit or Celsius (Centigrade).

Table 4.--Principal aquifer codes and geologic names for Florida

[From Franks, 1982, for "Principal aquifers" and from Hutchinson, 1975, for "Codes" and "Geologic names"]

Principal aquifers	Codes ¹	Geologic names ²
Surficial	110NRSD	Nonartesian sand aquifer
	111HCPC	Holocene-Pleistocene series
	111NRSD	Nonartesian sand aquifer
	112CLSC	Caloosahatchee aquifer
	112LMSN	Limestone aquifer
	112NRSD	Nonartesian sand aquifer
	112PLSC	Pleistocene series
	112SNDS	Sandstone aquifer
	112SDGV	Sand-and-gravel aquifer
	120NRSD	Nonartesian sand aquifer
	121PCPC	Pleistocene-Pliocene series
	Biscayne	112BSCN
112KLRG		Key Largo aquifer
Sand-and-gravel	120NFSG	Northwestern Florida sand-and-gravel aquifer
	122SDGV	Sand-and-gravel aquifer
Intermediate	122ECMB	Escambia sand member of Pensacola clay
	122HTRN	Hawthorn Formation
	122LMSN	Limestone aquifer
	122SLML	Shell-marl aquifer
	122TMIN	Tamiami Formation
Floridan	120FLRD	Floridan aquifer
	123LMSN	Limestone aquifer
	123SWNN	Suwannee Limestone
	124AVPK	Avon Park aquifer

¹Geologic ages: 110, Quaternary; 111, Holocene; 112, Pleistocene; 120, Tertiary; 121, Pliocene; 122, Miocene; 123, Oligocene; and 124, Eocene.

²Names used by agencies to identify geological formations tapped for water; not necessarily formal names recognized by the U.S. Geological Survey Geologic Names Committee.

Specific conductance.--A measure of the ability of water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C.

pH.--To express the intensity of the acid or alkaline condition of a solution, pH stands for "parts hydrogen." It is the logarithm of the reciprocal of hydrogen-ion concentration, or more precisely, the hydrogen-ion activity expressed in moles per liter. The practical pH scale (in standard units) ranges from 0 to 14. A pH of 7.0 indicates that the water sample solution is neutral while readings progressively lower than 7.0 denote increasing acidity and those progressively higher than 7.0 denote increasing alkalinity.

Suspended solids.--Colloidal and particulate matter such as sand, clay, finely divided organic material, bacteria, and plankton that are suspended in the water body.

The term suspended solids is synonymous with suspended sediment concentration. Suspended solids is the term generally used by sanitary engineers in connection with water-treatment facilities; suspended sediment is generally used by civil or hydraulic engineers in connection with sediment transport studies.

Chemical

Chemical water-quality parameters are those which pertain to the chemical constituents and properties of substances present in water.

Dissolved solids.--Consists mainly of inorganic salts and small amounts of organic matter. A general working definition of "dissolved" (as compared to suspended) solids is anything which will pass through a 0.45-micron filter.

Major ions.--Consists of ions usually found in relatively high concentrations in most natural waters. Major cations are calcium, magnesium, sodium, and potassium, and the anions are bicarbonate, carbonate, sulfate, and chloride.

Hardness.--Historically defined as a measure of the ability of water to precipitate soap. Hardness in natural waters is primarily a function of the presence of calcium and magnesium ions. Other constituents, such as iron, manganese, aluminum, strontium, zinc, and free acid also cause hardness but they are not usually present in quantities large enough to have any objectionable effect.

Hardness is normally expressed in terms of calcium carbonate (CaCO_3) and is often reported as "carbonate hardness," "noncarbonate hardness," and "total hardness."

Silica.--The compound (SiO_2) is widely used in referring to the presence of silicon, in soluble and colloidal forms, in natural waters. Amounts of silica are commonly reported as milligrams per liter of SiO_2 .

Phosphorus.--The gross measurement (total) of the element phosphorus without regard to individual species. The measurement is usually expressed in milligrams per liter.

Phosphorus species.--Pertains to the measurement of any compound containing the element phosphorus commonly found in water, for example, organic phosphate, or orthophosphate.

Nitrogen.--The gross measurement (total) of the element nitrogen without regard to individual species. The measurement is usually expressed in milligrams per liter. Nitrogen in water in the form of nitrogen gas is reported under column heading "Other dissolved gases."

Nitrogen species.--The measurement of any compounds containing the element nitrogen commonly found in water, for example, nitrate, nitrite, or ammonia.

Detergents.--Applied to a wide variety of cleansing agents. Generally, detergents are organic materials. Detergents are reported in terms of milligrams per liter or as visual observations (suds on water) in terms of severity values.

Other minor elements.--Those inorganic constituents not included in any of the other components of the 700 series in figure 2, such as the halides (fluoride, bromide, iodide), the rare earths, and the transition metals (iron, manganese, etc.).

Radioactivity.--The gross measurement of radioactivity (alpha, beta, gamma) without regard to the radiochemical species that produces the radiation.

Radiochemical species.--The individual radioactive elements that produce radioactivity such as: radium-226, cobalt-60, strontium-90, and tritium.

Carbon.--The gross measurement of all of the carbon present without regard to groups or species.

Organic groups.--The presence of groups such as the phenols or the menthols, rather than of specific organic molecules, such as chloroform or DDT. Such results are obtained from the application of analytic techniques such as mass spectrometry, nuclear magnetic resonance, and infrared spectroscopy.

Pesticide species.--Includes insecticides, herbicides, fungicides, rodenticides, etc. Examples are: chlordane; DDT; 2,4,5-T; and silvex.

Other organic species.--The presence of specific organic compounds, other than pesticides, such as chloroform, PCB (polychlorinated biphenyls), and formaldehyde.

Dissolved oxygen.--Expressed in milligrams per liter which reflects chemical, physical, and biological activities in the water.

Other dissolved gases.--Includes all gases except oxygen. Examples are: nitrogen, hydrogen sulfide, and methane.

Other

The column heading "Other" indicates information on parameters other than physical or chemical characteristics. This column is subdivided into "Biological Activity" and "Data Bank Source."

Biological activity.--Any or all of the following organisms: enteric bacteria, native bacteria, phytoplankton, zooplankton, periphyton, macrophyton, microinvertebrates, macroinvertebrates, vertebrates, fungi, and viruses. "Y" indicates that one or more biological parameters are actively being collected. An "N" means that one or more parameters have been collected in the past. The absence of a "Y" or "N" indicates that biological data have not been collected at the site.

Data bank source.--A code identifying the data base in which some or all of the data for the indexed site is stored. An "S" indicates the U.S. Environmental Protection Agency's STORET system and a "W" indicates the U.S. Geological Survey's WATSTORE system.

SUMMARY OF THE FLORIDA GROUND-WATER QUALITY DATA INDEX

A total of 2,180 well sites and 39 spring sites are active and 11,559 well and 147 spring sites are inactive, for a total of 13,925 sites at which ground-water quality data have been collected for wells and springs in the State and for which a record is available according to the MWDI.

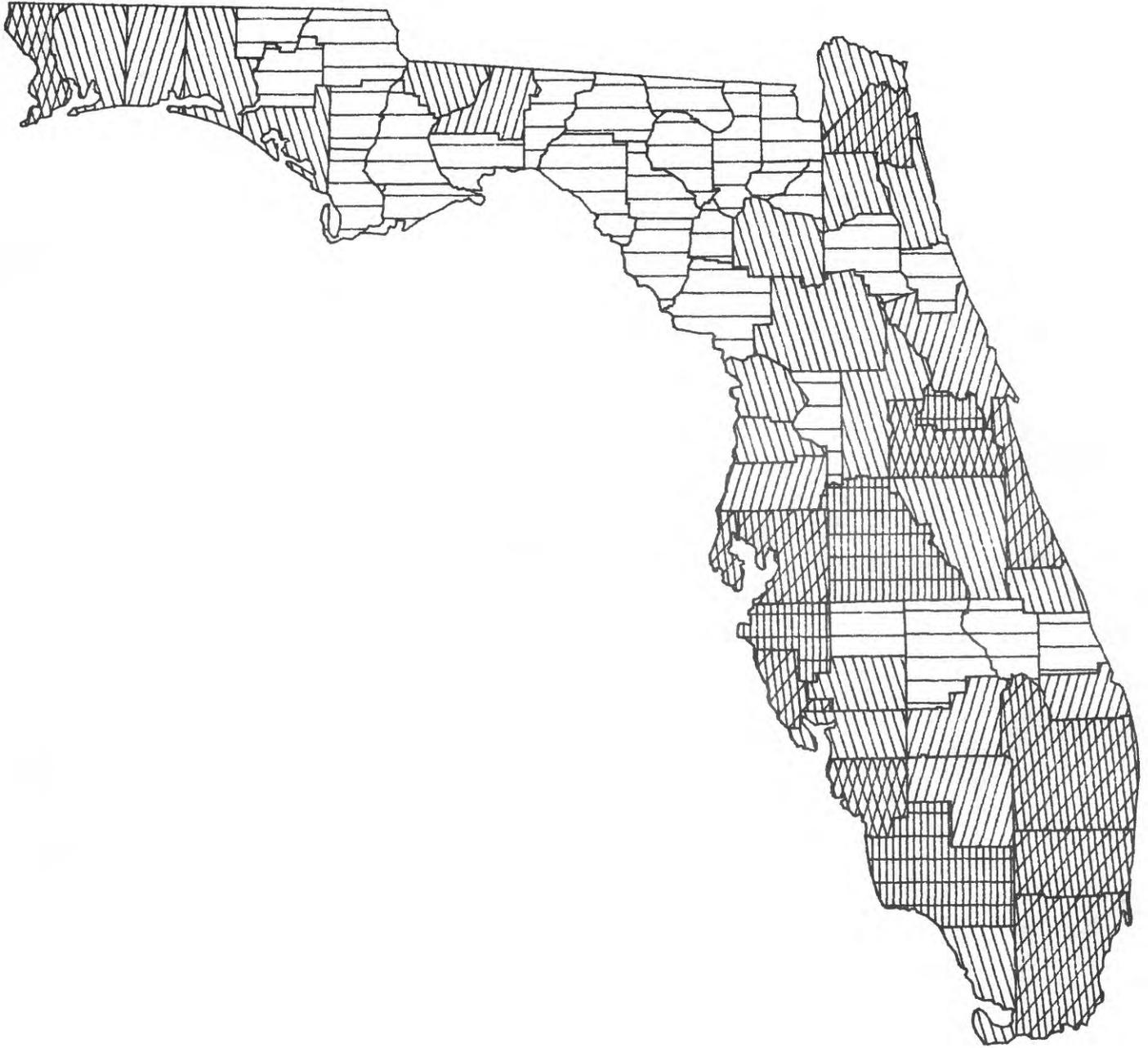
Active and inactive hydrologic data-collection sites at which surface-water, ground-water, and quality-of-water data have been indexed in the MWDI for the State of Florida are summarized in table 5. This table shows that quality-of-water data, particularly water-quality data for well water, are the most widespread data collected. Active sites are those which are currently (1984) scheduled to be sampled by the operating agency, although this does not necessarily mean that a sample has been collected at the station within the past year--merely that data collection at the station has not ended or that data are planned to be collected there.

The surface-water category includes stream-gage data, streamflow data, and data on lake and reservoir elevations and volumes. The ground-water category includes water-level data and well and spring discharge data. The quality-of-water category includes the subcategories of physical, chemical, and biological analyses for both surface water and ground water. These numbers are given for comparison of the relative hydrologic data collection network effort in Florida.

This report is concerned only with ground-water quality from wells and springs, and summaries of tables 11 and 12 are given in figures 4 through 9 and in tables 6 through 10. The ground-water quality well site density, by county, for all aquifers is shown in figure 4. The ground-water quality spring site density, by county, for all aquifers is shown in figure 5. A site density map by county for wells identified in the MWDI as tapping only the Floridan is shown in figure 6. A pie diagram (figure 7) and bar graph (figure 8) show the number of sites for which ground-water quality is available in Florida by aquifer if the aquifer has been identified in the MWDI.

Table 5.--Hydrologic data-collection sites in Florida by type of site and type of data

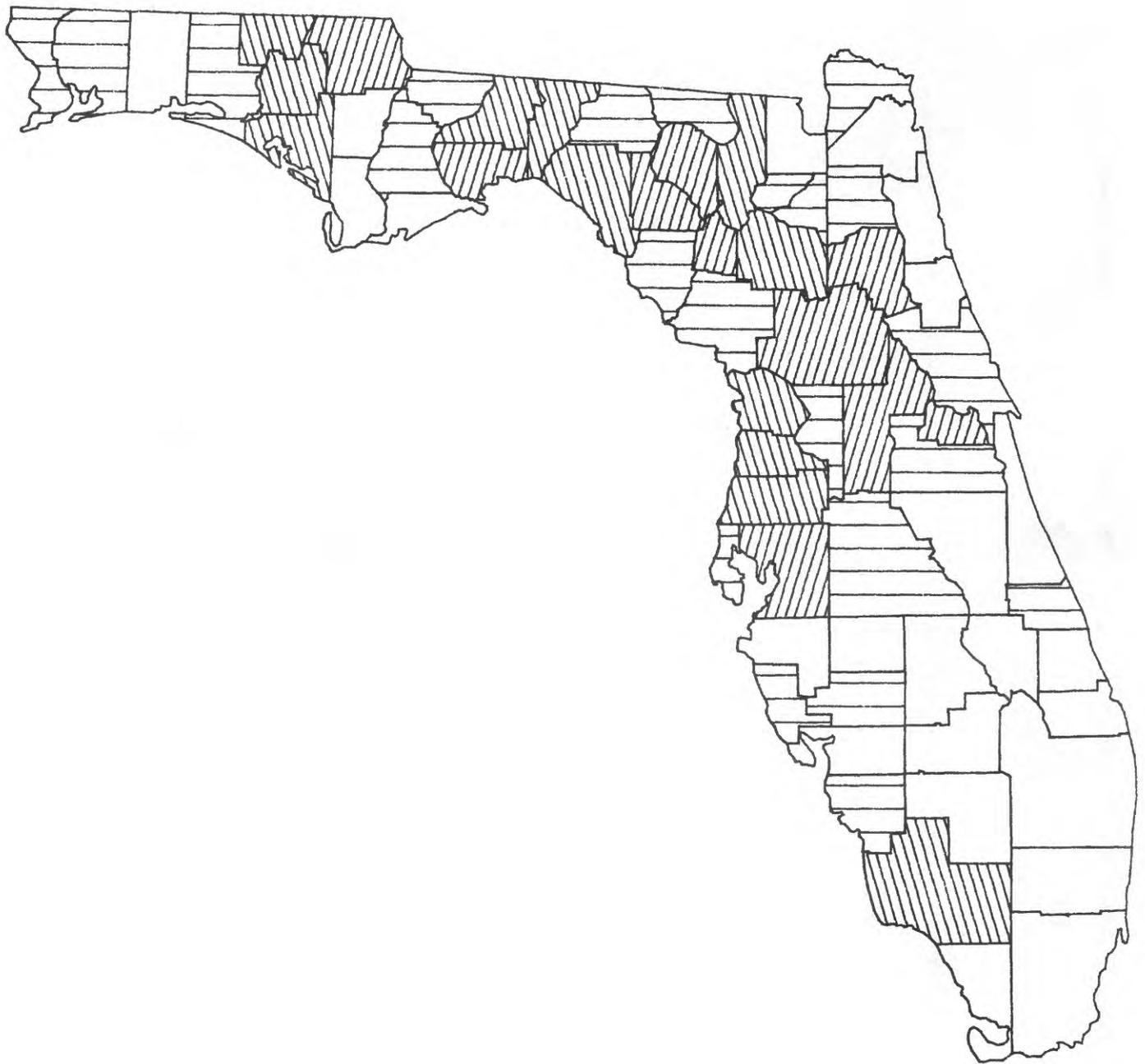
Type of site	Total sites	Surface water			Ground water			Quality of water		
		Ac-tive	Inac-tive	Total	Ac-tive	Inac-tive	Total	Ac-tive	Inac-tive	Total
Stream	4,539	506	547	1,053	0	0	0	804	2,682	3,486
Lake/reservoir	3,199	263	116	379	0	0	0	474	2,346	2,820
Canal	180	64	97	161	0	0	0	17	2	19
Drain	1	0	0	0	0	0	0	1	0	1
Estuary	836	17	34	51	0	0	0	400	385	785
Meteorological	70	0	3	3	0	0	0	12	55	67
Specific source	1,027	1	0	1	0	0	0	249	777	1,026
Ocean	1,364	0	0	0	0	0	0	81	1,283	1,364
Well	16,870	0	0	0	2,906	225	3,131	2,180	11,559	13,739
Spring	210	15	9	24	0	0	0	39	147	186
Other	22	6	13	19	0	0	0	2	1	3
Total	28,318	872	819	1,691	2,906	225	3,131	4,259	19,237	23,496



SITES	 1-50	 51-100	 101-200
	 201-300	 301-400	 OVER 400

INDEXED IN THE MWDI
AS OF MARCH 1984

Figure 4.--Density map, by county, for ground-water quality well sites in Florida.



SITES

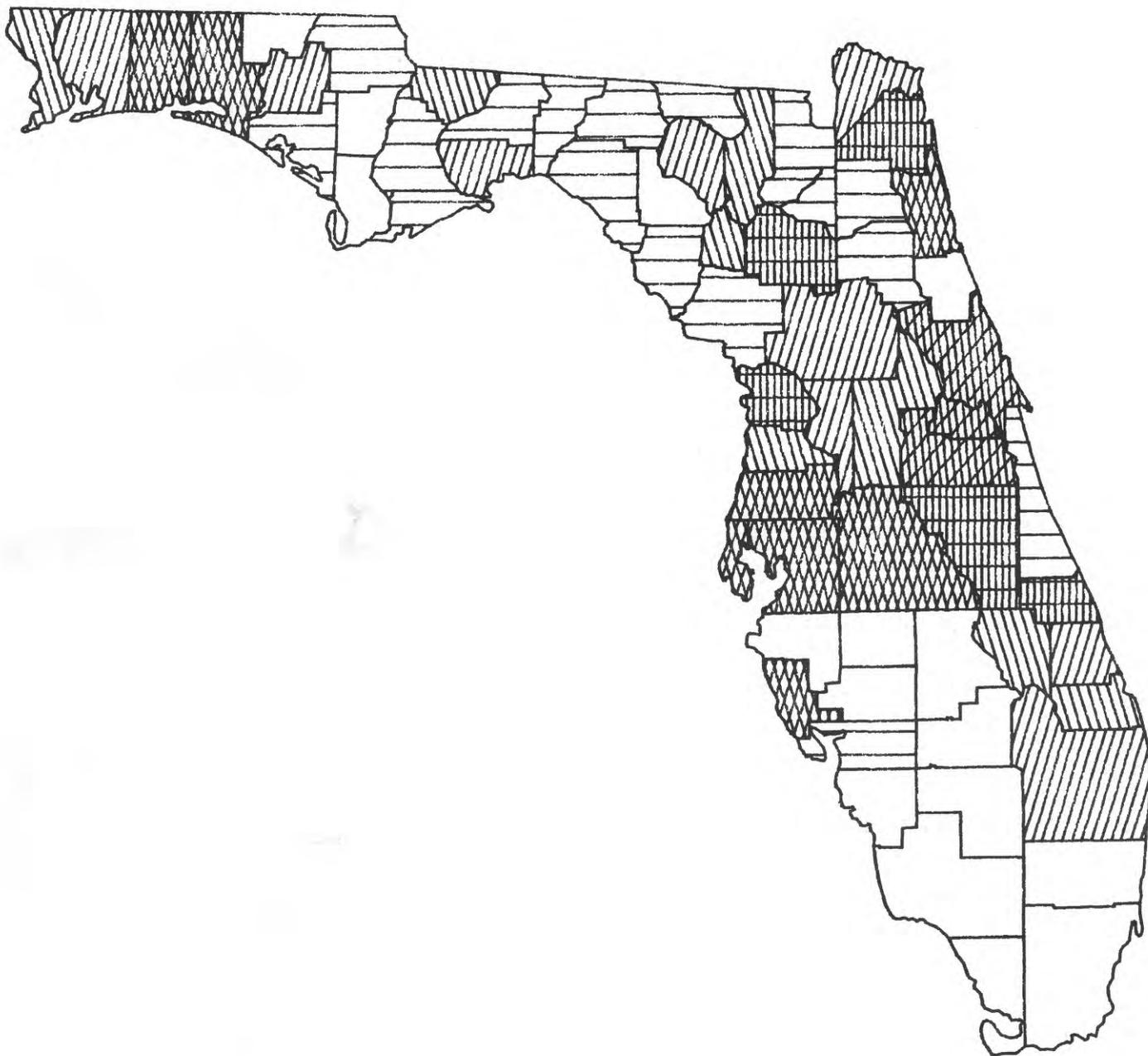
1-2

3-6

7-10

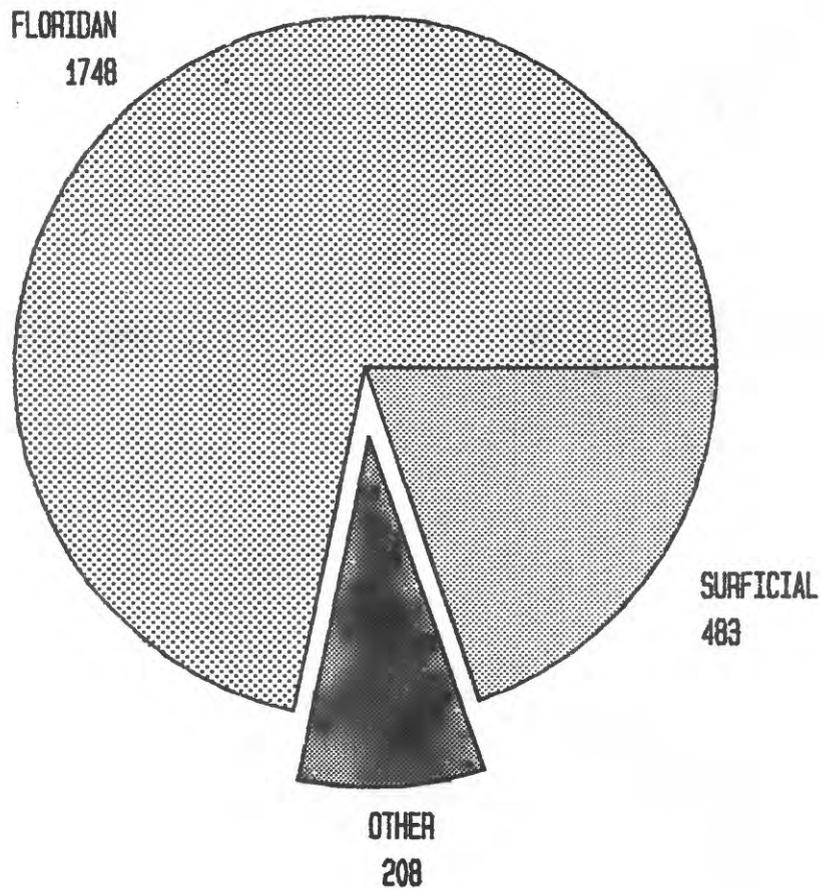
INDEXED IN THE MWDI
AS OF MARCH 1984

Figure 5.--Density map, by county, for ground-water quality spring sites in Florida.



INDEXED IN THE MWDI
AS OF MARCH 1984

Figure 6.--Density map, by county, for Floridan aquifer system ground-water quality sites in Florida.

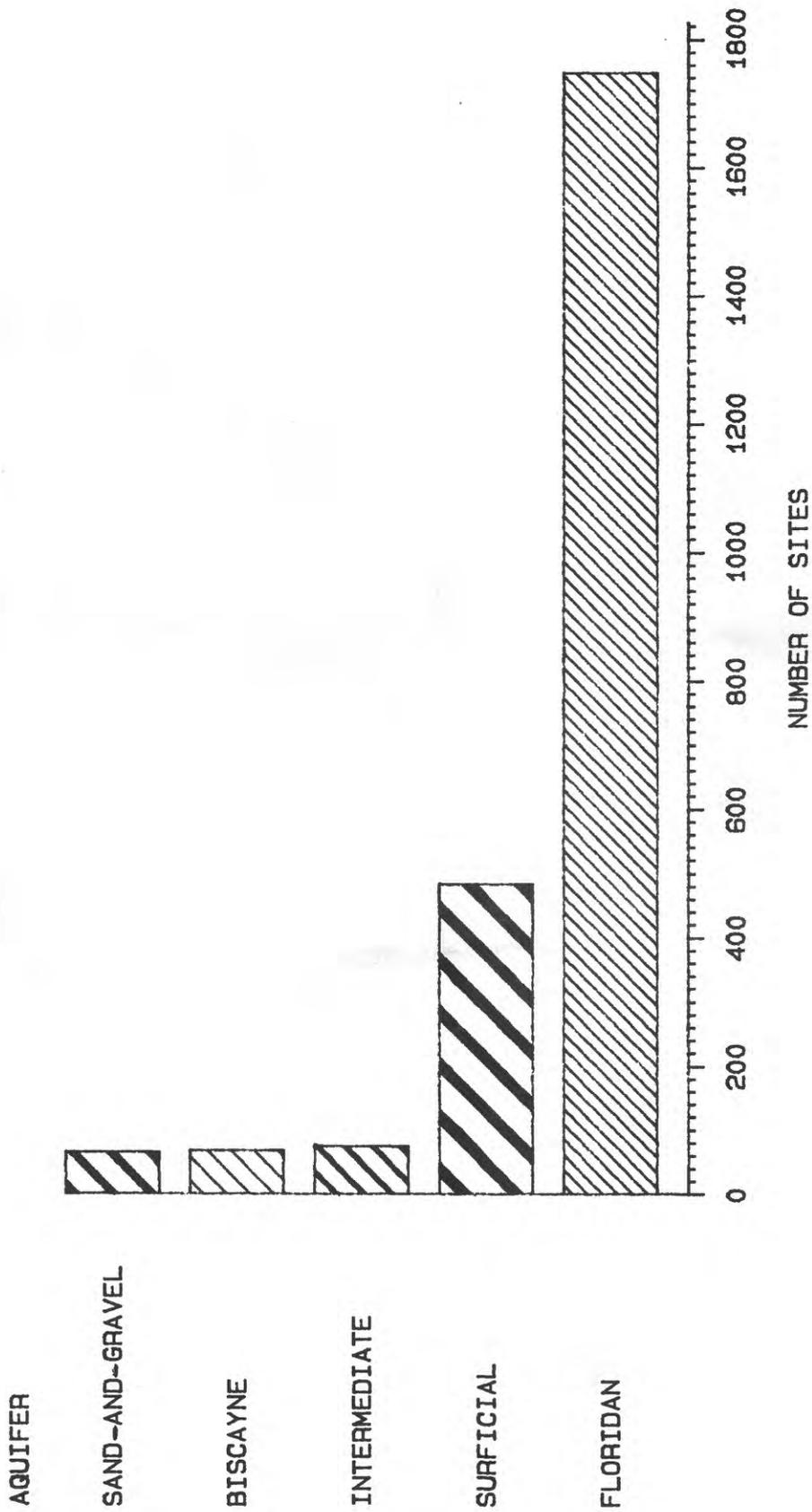


OTHER INCLUDES:

INTERMEDIATE 75 SITES
 SAND AND GRAVEL 65 SITES
 BISCAYNE 68 SITES

INDEXED IN THE MMDI
 AS OF MARCH 1984

Figure 7.--Pie diagram of number of ground-water quality sites, by aquifer, in Florida.



INDEXED IN THE MWDI
AS OF MARCH 1984

Figure 8.---Bar graph of number of ground-water quality sites, by aquifer, in Florida.

