National Water Quality Assessment of the Georgia-Florida Coastal Plain Study Unit—Water Withdrawals and Treated Wastewater Discharges, 1990

By Richard L. Marella and Julia L. Fanning

U.S. GEOLOGICAL SURVEY
Water-Resources Investigations Report 95-4084

U.S. GEOLOGICAL SURVEY
NATIONAL WATER-QUALITY ASSESSMENT PROGRAM
GEORGIA-FLORIDA COASTAL PLAIN STUDY UNIT

Tallahassee, Florida
1996

U.S. DEPARTMENT OF THE INTERIOR
BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY
Gordon P. Eaton, Director

For additional information write to:

District Chief
U.S. Geological Survey
Suite 3015
227 North Bronough Street
Tallahassee, Florida 32301

Copies of this report can be purchased from:

U.S. Geological Survey
Earth Science Information Center
Open-File Reports Section
P.O. Box 25286, MS 517
Denver, CO 80225-0425

CONTENTS

ILLUSTRATIONS

TABLES

CONVERSION FACTORS

Multiply	By	To obtain
acres	4,047	square meters
acres	0.00156	square mile
square miles (mi^2)	2.59	square kilometer
gallons per day (gal/d)	3.785	liters per day
million gallons per day (Mgal/d)	0.003785	million cubic meters per day

ADDITIONAL ABBREVIATIONS

FDEP = Florida Department of Environmental Protection
mg/L = milligrams per liter
MSA = metropolitan statistical area
NAWQA = National Water Quality Assessment Program
USGS = U.S. Geological Survey

GLOSSARY

Aquifer.--A geologic formation, group of formations, or part of a formation that contains sufficient saturated material to yield significant quantities of water to wells and springs.

Agricultural water use.--Includes water used for irrigation and nonirrigation purposes. Irrigation water use includes the artificial application of water on lands to assist in the growing of crops and pasture grasses, or to maintain vegetative growth in recreational lands, parks, and golf courses. Nonirrigation water use includes water used for livestock, fish farming, and other farm needs. Livestock water use includes water used for stock watering, feedlots, and dairy operations.

Cesspool.--An underground catch basin for liquid waste, such as household sewage. See septic tank.

Commercial water use.--Water for motels, hotels, restaurants, office buildings, commercial facilities as well as civilian and military institutions. The water may be obtained from a public supply or may be self-supplied.

Consumptive use.--That part of water withdrawn that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate water environment. Sometimes called water consumed or water depleted. Additionally, any water withdrawn in the basin and transferred out of the basin for use is considered 100 percent consumptively used.

Cooling water.--Water used for cooling purposes by electric generators, steam condensers, large machinery or products at manufacturing facilities. Water used for cooling purposes can be either fresh or saline and may be obtained from a public supply water system or be self-supplied. Cooling water may be used only once or recirculated multiple times.

Desalination.--Refers to the removal of salts from water. Desalination is primarily used for public supply water to ensure that it meets Florida Department of Environmental Protection secondary drinking standards (see potable water). The primary types of desalination are: (1) distillation, (2) electrodialysis, and (3) reverse osmosis (Buros, 1989; South Florida Water Management District, 1990). Reverse osmosis is the most commonly used processes in Florida followed by electrodialysis (Dykes and Conlon, 1989). Additionally, many public suppliers also dilute or blend brackish or saline water with fresher water to produce potable water. Also see reverse osmosis.

Dewatering.--The deliberate attempt to lower the ground-water level for selected purposes such as agricultural, construction, mining or other activities. For mining operation, dewatering is usually accomplished by pumping the water out of the ground and discharging the water to a surface-water body. However, some dewatering involves gravity feeding water from the surficial aquifer into the deeper aquifer (usually the Floridan aquifer system) through recharge wells (Campbell, 1986, p. 36).

Disposal system or method.--Refers to injection wells, outfalls, drain fields, percolation ponds, spray fields, and other facilities utilized for the release of reclaimed or treated effluents to the environment.

Domestic wastewater facility.--Refers to those facilities that receive or dispose of wastewater principally derived from residential dwellings, business or commercial buildings, institutions, and the like; sanitary wastewater; sewage (Florida Department of Environmental Regulation, 1991). Can also include some wastewater derived from industrial facilities. May also be referred to as a municipal wastewater facility.

Domestic water use.--Water for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Also called residential water use. Water used for domestic purposes may be obtained from a public-supply system or it may be self-supplied from individual wells.

Drain field.--A network of buried piping or tubing where the fluid is discharged to the ground through seepage. Most common use is with septic tanks, but can also be used for domestic or industrial wastewater disposal after other treatment methods.

Effluent.--Refers to the water that flows out of a wastewater-treatment facility or other works used for the purpose of treating, stabilizing, or holding waste.

Flood irrigation.-- Irrigation systems that control the water table with lateral supply ditches. These include open field ditch systems (furrows), semi-closed conveyance systems, subsurface conduit systems, crown flood systems, and continuous flood systems. Also referred to as seepage or subsurface irrigation. The efficiencies of these flood irrigation systems range from 20 to 80 percent (Smajstrla and others, 1988), however, the average of 60 percent is commonly used for estimating water requirements.

Freshwater.--Water that contains less than 1,000 mg/L (milligrams per liter) of dissolved solids; generally, more than 500 mg/L dissolved solids is considered undesirable for drinking and many industrial uses. Generally, freshwater is considered potable.

Ground water.--Specifically, that part of the subsurface water that is in the saturated zone (a zone, in which all voids are filled with water.

Ground-water disposal.--Refers to wastewater that is disposed of through the ground by injection or seepage. This includes the following discharge methods: absorption beds, injection wells, drain fields, percolation ponds, rapid infiltration basins, and spray fields (land application). Land-application systems (reuse systems) are considered a ground-water disposal method, as the effluent used to irrigate turf or crops generally percolates down through the soil despite a percentage of the water that evaporates into the atmosphere or runs off.

Hydroelectric power water use.--Water used to generate electricity at plants where turbine generators are driven by falling water. Water used for hydroelectric purposes is considered an instream use of water and is generally a nonconsumptive use of water.

Industrial-wastewater facility.--Refers to those facilities that produce, treat, or dispose of wastewater not otherwise defined as domestic wastewater; includes water runoff and leachate from areas that receive pollutants associated with industrial or commercial storage, handling, or processing (Florida Department of Environmental Protection, 1991).

Industrial water use.--Water used for industrial purposes such as fabricating, processing, washing, and cooling, and includes such industries as steel, chemical and allied products, paper and allied products, mining, and petroleum refining. The water may be obtained from a public supply or may be self-supplied.

Injection well.--Refers to a well constructed for the purpose of injecting treated wastewater directly into the ground. Wastewater is generally forced (pumped) into the well for dispersal or storage into a designated aquifer. Injection wells are generally drilled into nonpotable aquifers, unused aquifers, or below freshwater levels in these aquifers.

Instream use.--Water use taking place within the stream channel for such purposes as hydroelectric power generation, navigation, water-quality improvement, fish and wildlife propagation, and recreation. Sometimes called nonwithdrawal use or in-channel use.

Land application.--The application of reclaimed water or effluents on, above, or into the ground by irrigation systems or other methods.

Low pressure/low volume irrigation.--Irrigation systems that apply water directly, or very near to the soil surface, either above the ground or into the air, in discrete drops, continuous drops, small streams, mist, or sprays. These include drip systems, spray systems, jet systems, and bubbler systems. Also referred to as micro or trickle irrigation. The efficiencies of these low pressure irrigation systems range from 75 to 95 percent (Smajstrla and others, 1988), however, the average of 80 percent is commonly used for estimating water requirements.

Navigational water use.--Water utilized as a means of commercial (and sometimes recreational) transportation. Includes water used to lift a vessel in a lock, or maintain a navigable channel level. Navigational water use is considered a nonconsumptive instream use of water and is generally not measured or accounted for.

Offstream use.--Water withdrawn or diverted from a ground- or surface-water source for public-water supply, industry, irrigation, livestock, thermoelectric power generation, and other uses. Sometimes called off-channel use or withdrawal use.

Once-Through cooling water.--Water (fresh or saline) that is withdrawn from a river, stream, or other water body (manmade or natural), or a well, that is passed through a condenser one time, and then returned to the source some distance from the intake (Hughs, 1975, p. 14). Once-through cooling water is used to exchange heat from the steam condenser to the cooling water. This method of cooling is commonly used in power production throughout the southeast, and usually has no consumption involved.

Other water use.--Water used for such purposes as heating and cooling, irrigation of common areas (public areas, highway medians, etc.), lake augmentation, and other nonspecific uses. The water can be obtained from a public supply or be self-supplied.

Outfall.--Refers to the outlet or structure through which reclaimed water or treated effluent is finally discharged to a receiving water body.

Per capita use.--The average amount of water used per person during a standard time period, generally per day. Public supply per capita use refers to the amount of water used (withdrawn) for public supply divided by the population served. Domestic per capita use refers to the amount of water used for domestic (residential) purposes divided by the population served.

Percolation pond.--Refers to a pond (usually manmade) designed to allow treated wastewater effluent to percolate slowly into the ground. The pond acts as a holding facility while gravity allows the water to seep through the soil or other unconsolidated material into the surficial aquifer.

Public supply.--Water withdrawn by public and private water suppliers and delivered to users who do not supply their own water. Water suppliers provide water for a variety of uses, such as domestic, commercial, thermoelectric power, industrial, and public-water use. See also commercial water use, domestic water use, industrial water use, public water use, and other water use.

Public-water use.--Water supplied from a public-water supply and used for such purposes as firefighting, street washing, municipal parks, and swimming pools. Public-water use also includes system water losses (water lost to leakage) and brine water discharged from desalination facilities. Can also be referred to as water-utility use.

Reclaimed wastewater.--Refers to water that has received at least secondary treatment and is reused after being released from a wastewater-treatment facility.

Resident population.--The number of persons who live in a State who consider it their permanent place of residence. College students, military personnel, and inmates of penal institutions are counted as permanent residents. According to this definition, tourist and seasonal or part-time residents are considered nonresident population.

Residential water use.--See domestic water use.

Reuse system.--Means the deliberate application of reclaimed water for a beneficial purpose. Reuse may encompass landscape irrigation (such as golf courses, cemeteries, highway medians, parks, playgrounds, school yards, nurseries, and residential properties), agricultural irrigation (such as food and fruit crops, wholesale nurseries, sod farms and pasture grass), aesthetic uses, ground-water recharge, environmental enhancement of surface water and wetland restoration, fire protection, and other useful purposes.

Return flow.--The water that reaches a ground- or surface-water source after release from the point of use and thus becomes available for further use.

Saline water.--Water that contains more than 1,000 mg/L of dissolved solids (Solley and others, 1993).

Self-supplied water.--Water withdrawn from a ground- or surface-water source by a user and not obtained from a public supply.

Septic tank.--Refers to a buried watertight receptacle constructed to promote the separation of solids, grease, and liquid components of wastewater in the absence of oxygen. The liquid fraction from the septic tank is released to a drain or absorption field for further treatment or disposal.

Silviculture.--The forested trees of a region or area. This includes timberland (areas capable of producing 20 cubic feet of industrial wood per acre per year) or woodland (areas incapable of producing 20 cubic feet of industrial wood per acre per year under natural conditions) (Thompson, 1988).

Spray field.--Refers to the land that is the recipient of reclaimed water or treated effluent released on the surface of the ground through a variety of sprinkler heads or nozzles (including overhead systems, center pivot systems, periodic moving systems, and portable or traveling gun systems). See land application.

Sprinkler irrigation.--A pressurized irrigation system where water is distributed through pipes to the field and applied through a variety of sprinkler heads or nozzles. Pressure is used to spread water droplets above the crop canopy to simulate rainfall (Izuno and Haman, 1987). These systems include portable and traveling guns, solid or permanent fixture (overhead or pop ups), center pivots, and periodic moving systems. Also referred as overhead irrigation. The efficiencies of these sprinkler irrigation systems range from 15 to 85 percent (Smajstrla and others, 1988), however, the average of 70 percent is commonly used when estimating water requirements.

Surface-water disposal.--Refers to the release of reclaimed water or treated effluent directly into a surface water body (including marshes or wetlands). This does not include water discharged into ponds for holding or percolation purposes.

Thermoelectric power.--Electrical power generated by using fossil-fuel (coal, oil, or natural gas), geothermal, or nuclear energy.

Thermoelectric power water use.--Water used in the process of the generation of electric power. The majority of water used for this category is for cooling purposes (much of which is used for once-through cooling). Water is also used for boiler makeup or domestic purposes throughout the plant. Boiler makeup water and water used for domestic purposes are generally obtained from a public supplier, however, for facilities located in remote areas, this water can be self-supplied (usually from a well). Cooling water is most often self-supplied, although some smaller facilities use public supplied water for cooling purposes. Water used for thermoelectric power generation purposes is considered an offstream use of water.

Treated (wastewater) effluent.--Refers to water that has received primary, secondary, or advanced treatment and is released from a wastewater facility after treatment.

Wastewater.--A combination of liquid or solid water-carried pollutants from residence, commercial buildings, industrial plants, and institutions needing treatment before reentering the hydrologic cycle. Wastewater may also include any ground or surface water that may have infiltrated or entered into the wastewater return system.

Water transfer.--Artificial conveyance of water from one area to another. This may be referred to as an import or export of water from one basin or county to another.

Withdrawal. Water removed from the ground or diverted from a surface-water source for use.

National Water Quality Assessment of the Georgia-Florida Coastal Plain Study Unit—Water Withdrawals and Treated Wastewater Discharges, 1990

By Richard L. Marella and Julia L. Fanning

Abstract

The Georgia-Florida Coastal Plain study unit covers nearly 62,600 square miles along the southeastern United States coast in Georgia and Florida. In 1990, the estimated population of the study unit was 9.3 million, and included all or part of the cities of Atlanta, Jacksonville, Orlando, Tampa, and St. Petersburg. Estimated freshwater withdrawn in the study unit in 1990 was nearly 5,075 million gallons per day. Ground-water accounted for more than 57 percent of the water withdrawn during 1990 and the Floridan aquifer system provided nearly 91 percent of the total ground-water withdrawn. Surface-water accounted for nearly 43 percent of the water withdrawn in the study unit in 1990 with large amounts of withdrawals from the Altamaha River, Hillsborough River, the Ocmulgee River, the Oconee River, the St. Johns River, and the Suwannee River.

Water withdrawn for public supply in the Georgia-Florida Coastal Plain study unit in 1990 totaled 1,139 million gallons per day, of which 83 percent was ground water and 17 percent was surface water. Self-supplied domestic withdrawals in the Georgia-Florida Coastal Plain study unit in 1990 totaled nearly 230 million gallons per day. Ground water supplied over 80 percent of the study units population for drinking water purposes; nearly 5.8 million people were served by public supply and 1.8 million people were served by self-supplied systems. Water withdrawn for self-supplied domestic use in Georgia and Florida is derived almost exclusively from ground water, primarily because this source can provide the quantity and quality of water needed for drinking purposes. Nearly 1.7 million people served by public supply utilized surface water for their drinking water needs.

Water withdrawn for self-supplied commercial-industrial uses in the study unit in 1990 totaled 862 million gallons per day, of which 93 percent was ground water and 7 percent was surface water. Water withdrawn for agriculture purposes in the study unit in 1990 totaled 1,293 million gallons per day, of which 69 percent was ground water and 31 percent was surface water. An estimated 1.254 million acres were irrigated within the study unit during 1990. Water withdrawn for thermoelectric power generation in the study unit in 1990 totaled 1,552 million gallons per day, of which 99 percent was surface water and 1 percent was ground water. An additional 6,919 million gallons per day of saline surface water were withdrawn for thermoelectric power generation in 1990, solely for cooling purposes.

Treated wastewater discharged within the Georgia-Florida Coastal Plain study unit totaled nearly 1,187 million gallons per day in 1990. Of the total water discharged, 58 percent was discharged directly into surface water and the remaining 42 percent was discharged to ground water (through drain fields, injection wells, percolation ponds or spray fields). Domestic wastewater facilities discharged in the study unit totaled nearly 789 million gallons per day, industrial wastewater facilities discharged 213 million gallons per day, and releases from septic tanks was estimated at 185 million gallons per day. More than 1.3 million septic tanks were estimated in use within the study unit in 1990.

INTRODUCTION

The Georgia-Florida Coastal Plain study unit covers nearly 62,600 square miles (mi^2) in the Southeastern United States (fig. 1). Located within the study unit are all or part of the following major river basins; Altamaha-St. Marys, Ochlockonee, Ogeechee, Peace-Tampa Bay, St. Johns, Southern Florida (including part of the Kissimmee River basin), and the

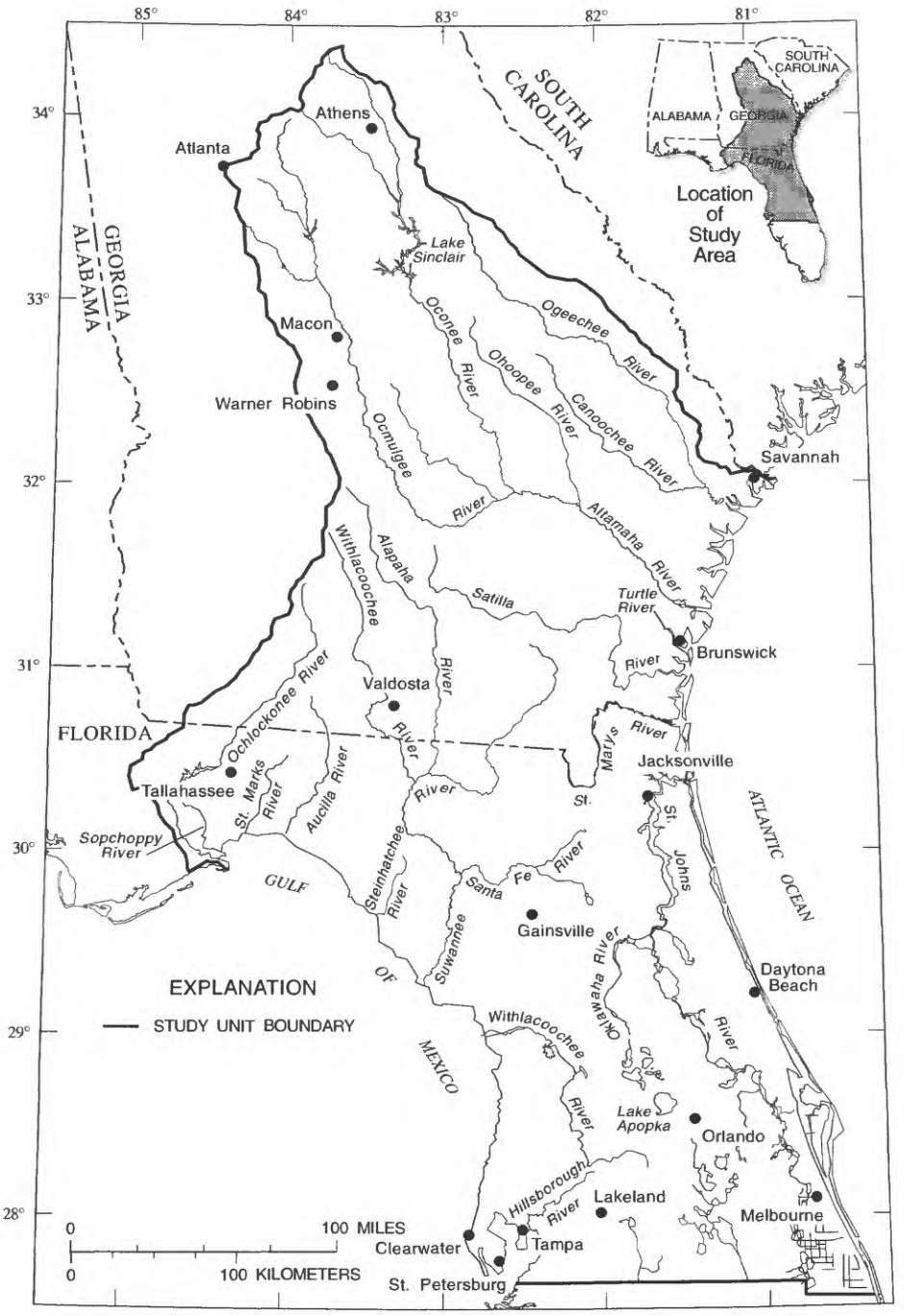

Figure 1. Location of the Georgia-Florida Coastal Plain study unit with major cities and rivers in the study unit.

Suwannee. The study unit is located in the Piedmont and Coastal Plain physiographic provinces, and about 90 percent of the unit is underlain by the Floridan aquifer system (fig. 2). Forest lands comprise the largest percentage of area covered (48 percent) in the study unit. A large percentage of forest lands are planted and harvested (silviculture) for pulp and paper production. Other land uses include agriculture

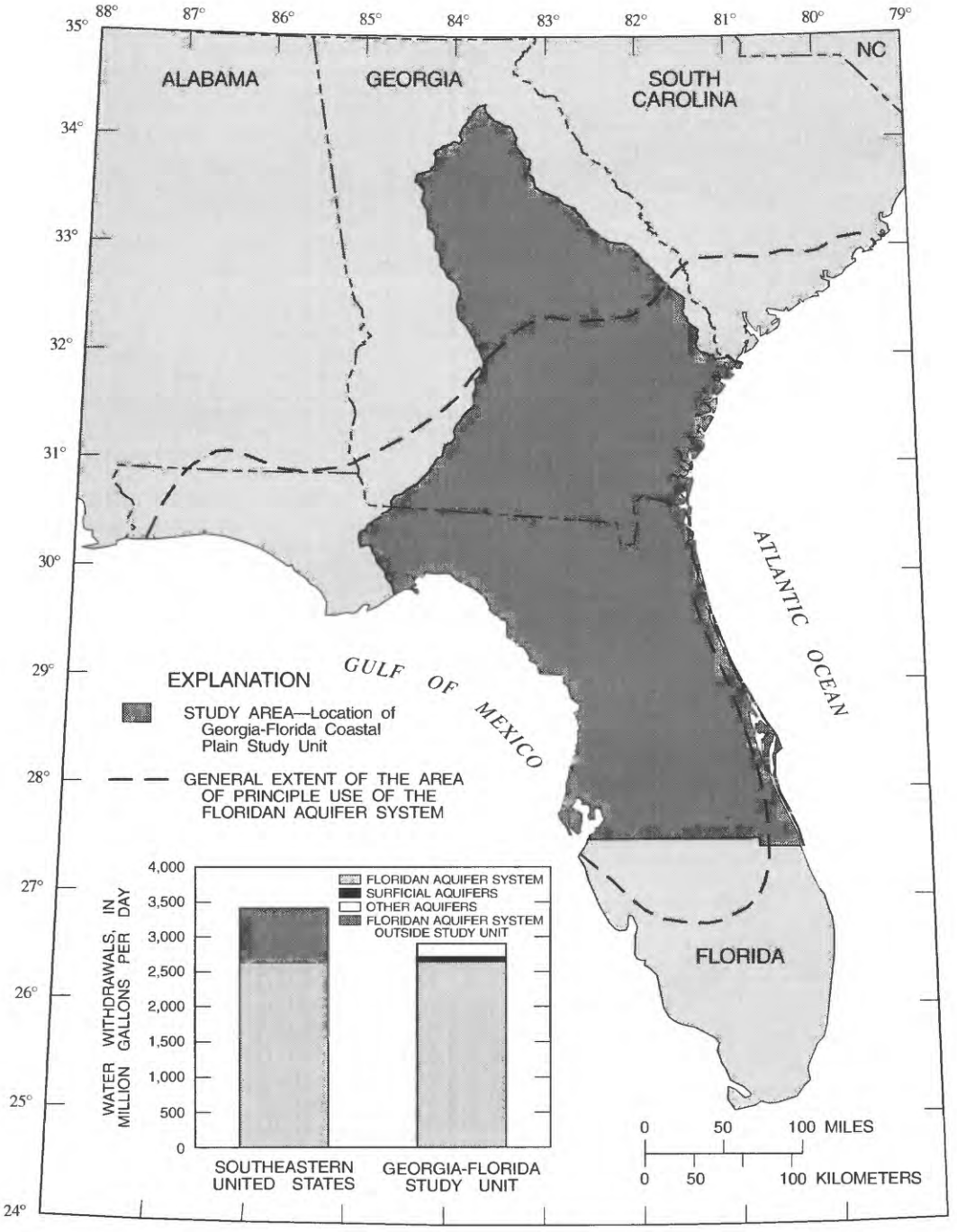

Figure 2. General location of and ground-water withdrawals from principal aquifers in the Georgia-Florida Coastal Plain study unit, 1990.

(25 percent), wetlands (16 percent), urban (4 percent), water areas (3 percent) and rangeland and barrenland comprise the remaining 4 percent. Citrus and vegetables (truck crops) were the major crops grown and irrigated within the study unit (Berndt and others, in press), with most of the acreage occurring in the extreme southern part of the study unit.

The total population in the Georgia-Florida Coastal Plain study unit for 1990 was estimated at 9.3 million. Located within the study unit are all or part of 4 of the 50 most populated metropolitan statistical accounting areas (MSA) in the nation in 1990. These include the Tampa-St. Petersburg-Clearwater MSA (2.068 million people), Orlando MSA (1.073 million people), the Jacksonville MSA (0.907 million people), and part of the Atlanta MSA (2.834 million) (U.S. Bureau of Census, 1991a, p. 33). Other population centers within the study unit include Daytona Beach, Gainesville, and Tallahassee in Florida and Macon, Savannah (partially) and Valdosta in Georgia. Economic activities include agriculture, commercial services, lumber and food processing, manufacturing (pulp and paper, textiles, electronics), mining (limerock and phosphate), transportation, and tourism.

The U.S. Geological Survey began implementation of a full-scale National Water-Quality Assessment (NAWQA) program in 1991. The overall goals of the program are to, (1) describe the status and trends in the quality of a large, representative part of the Nation's surface- and ground water resources, (2) define long-term trends in water quality, and (3) identify the natural and human factors that affect water quality (Hirsch and others, 1988). The program consist of 60 study units nationally that contain segments of most major river basins or aquifer systems. The study units were delineated to incorporate 60-70 percent of the water use and population served by public water supply in the nation. Because the Georgia-Florida Coastal Plain study unit is heavily dependent upon the water resources of the area, the collection and compilation of water-use data is important. Information provided in this report aid scientists to determine some of the factors and trends that affect the water quality in this part of the United States.

Purpose and Scope

The purpose of this report is to present the most recent (1990) water-use values for the Georgia-Florida Coastal Plain study unit. An inventory of the quantity of freshwater withdrawn (fresh), category of use, and the locations (State, river basin, and county) of water used in the Georgia-Florida Coastal Plain study unit during 1990 are provided. Primary sources of water are identified as well as baseline computations for future trends in water withdrawals within the study unit. Additional data are presented for wastewater discharge including the amount of wastewater discharged for 1990, along with the location and the type of discharge.

Data on freshwater withdrawals in the Georgia-Florida Coastal Plain study unit are presented for each of the following categories: public supply, self-supplied domestic, self-supplied commercial-industrial (including mining uses), agriculture (including irrigation, livestock and fish farming uses), and thermoelectric power generation. Water-use data for the study unit were compiled by county. For counties that are partially within the study unit, data are presented only for that part of the county that lies within the study unit. The water-use data presented in this report are predominantly for 1990, with some water-use data reported for 1980, 1985 and 1987. Information concerning instream (nonwithdrawal) water use, such as navigation, water-based recreation, propagation of fish and wildlife, dilution and conveyance of liquid or solid wastes, and hydroelectric power generation are not included.

Water-use estimates are expressed in million gallons per day (Mgal/d) and are the average daily quantities derived from annual data. The tables in this report show values in million gallons per day and are reported to two decimal places or to 10,000 gallons per day. Water-use values in the text, however, are rounded to whole numbers.

Previous Investigations

Because the Georgia-Florida Coastal Plain is a newly defined study area, no previous water-use reports have been completed; however, some water-use data for 1985 were reported for the study unit by Kantrowitz (1991). The totals compiled in the Kantrowitz report differ from those in this report because the study unit area was increased when the

boundaries were redefined in early 1993. Water-use reports for Florida (Leach, 1983; Marella, 1988) and Georgia (Pierce and others, 1982; Turlington and others, 1987) that detail water use on a county and category level were published for 1980 and 1985. Although these reports contain water-use data by category and county for their respective State, they do not specifically aggregate the water-use data for the Georgia-Florida Coastal Plain study unit for those years. Based on the redefined study unit boundaries, the data in these reports were used to recalculate the study unit totals for 1980 and 1985.

Data Sources and Reliability

As part of the U.S. Geological Survey (USGS) National Water-Use Information Program, water-use data are collected and compiled for each State every 5 years (Solley and others, 1988). Water-use values are reported in each State by category, county, hydrologic unit (surface-water basin), and aquifer. Data used for this report were compiled by each State as part of the 1990 National Water-Use Information Program. Water-use data for Florida in 1990 were collected through an ongoing cooperative effort between the Florida Department of Environmental Protection (FDEP) and the USGS and published by Marella (1992b). Most of the data for Florida were obtained from the FDEP and the five water management districts (Northwest Florida, St. Johns River, South Florida, Southwest Florida, and the Suwannee River). Water-use data for Georgia in 1990 were collected through an ongoing cooperative effort among the Georgia Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey and the USGS and published by Fanning and others (1992). The reports from these agencies provided the data necessary for compiling the water-use values for the Georgia-Florida Coastal Plain study unit.

The accuracy of the water-use data by category presented in this report varies. For example, withdrawal data for the categories of public-supply, commercial, industrial, mining, and power generation are considered more accurate because most systems or facilities in Georgia and Florida meter their usage. Data for the categories of agriculture and self-supplied domestic are less accurate because they are most often estimated. Agricultural withdrawals are estimated from information provided by the County Extension Office or other State agencies and multiplied by a crop coefficient which is based on rainfall and growing seasons. Self-supplied domestic withdrawals are estimated by multiplying the population not served from public supply by a calculated or estimated per capita value. Wastewater discharge values are considered accurate, as most facilities are required to record their untreated water inflows or treated water outflows.

Description of Study Unit

The Georgia-Florida Coastal Plain study unit covers a large part of two States and seven major river basins (hydrologic units) in central and southeastern Georgia and central and northern Florida The study unit includes all or part of 135 counties in Georgia (95) and Florida (40) (fig. 3). In Florida, the central, north-central, western, and northern Gulf Coast part of the study unit is rural and predominantly comprised of agricultural cropland (including pasture land) forest, and wetlands. Along the east coast, across central Florida, and around Tampa Bay on the west coast, the study unit is highly urbanized. In Georgia, the eastern part of the study unit is predominately forest and wetlands with a few urban areas along the coast whereas the northwestern part of the study unit is highly urbanized (Atlanta) and south-central Georgia is mostly agricultural cropland and forest. The total population in the study unit in 1990 was estimated at nearly 9.3 million. An estimated 81 percent of the population (7.5 million) relied on public-supply water systems for their drinking water needs. The remaining 19 percent (1.8 million) are served by small public suppliers not inventoried or are self-supplied by individual systems.

Georgia (31,860 mi^2) and Florida (29,700 mi^2) accounted for roughly equal amounts of land area in the study unit (52 percent and 48 percent, respectively). However, in 1990 more than 70 percent of the population lived in Florida (6.532 million), while the remaining 30 percent (2.735 million) lived in Georgia. In Florida, the more populated cities within the study unit for 1990 include Jacksonville (0.635 million), Tampa (0.280 million), St. Petersburg (0.239 million), Orlando (0.165 million), Tallahassee (0.125 million), Clearwater (0.099 million), Gainesville (0.085 million) and Lakeland (0.071 million) (University of Florida, 1991, p. 44) (fig. 1). In Georgia, some of the more populated cities within the study unit for 1990 include Macon (0.107 million), Athens (0.046 million), Warner Robins (0.044 million), and Valdosta (0.040 million) (Akioka, 1992, p. 12). Only parts of the cities of Atlanta and Savannah are within the study unit, and the exact population of these cities within the study unit in unknown.

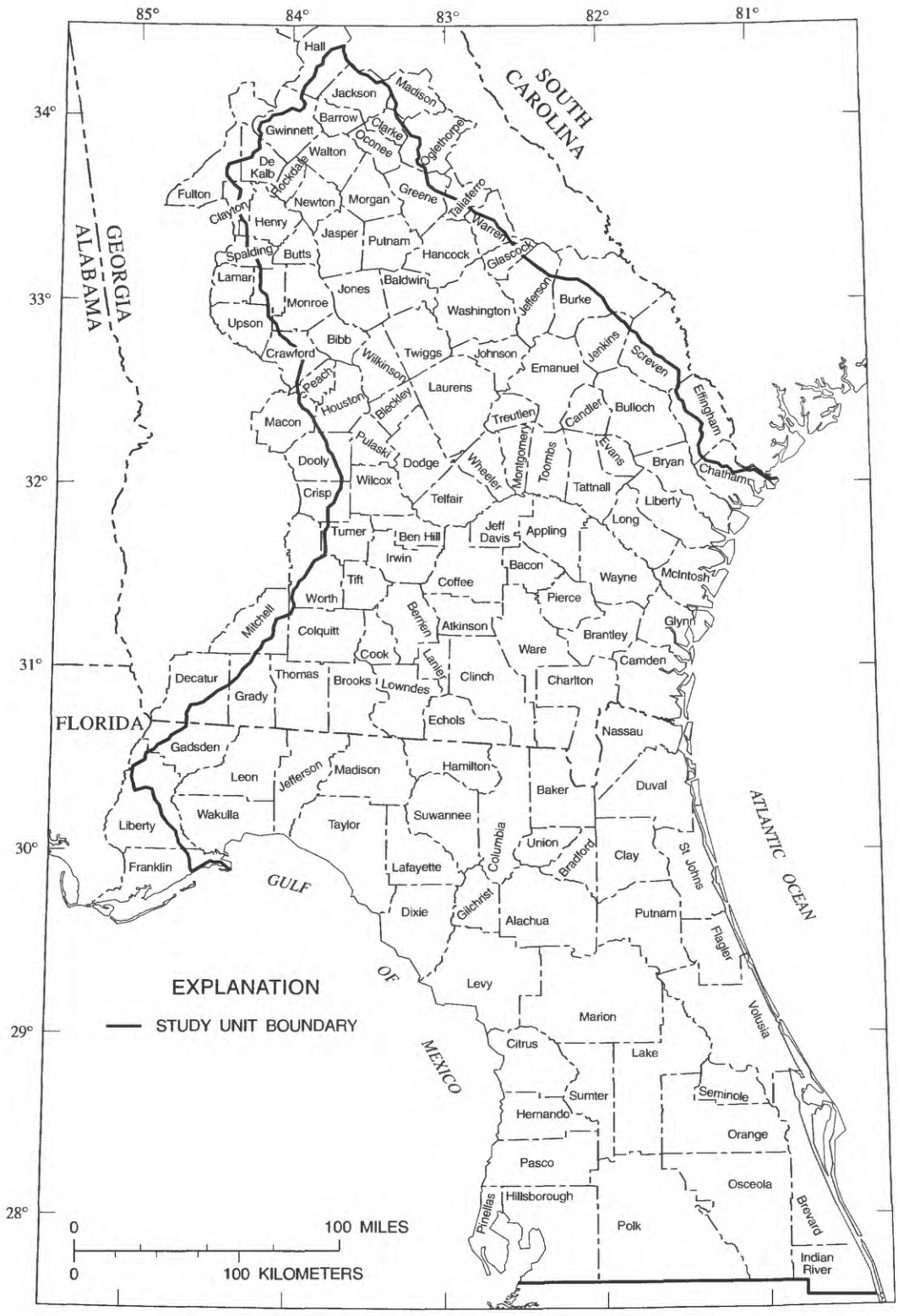

Figure 3. Locations of counties in the Georgia-Florida Coastal Plain study unit.

WATER WITHDRAWALS IN THE GEORGIA-FLORIDA COASTAL PLAIN STUDY UNIT

Estimated freshwater withdrawn in the Georgia-Florida Coastal Plain study unit in 1990 was nearly 5,075 Mgal/d. An additional 6,998 Mgal/d of saline water was withdrawn in the study unit in 1990. Florida accounted for 3,060 Mgal/d (60 percent) of the freshwater withdrawn and Georgia the remaining 2,015 Mgal/d (40 percent). The total freshwater withdrawn in the Florida part of the study unit accounted for nearly 41 percent of the State's 1990 freshwater use (7,532 Mgal/d) (Marella, 1992b, p. 6) The total freshwater withdrawn in the Georgia part of the study unit accounted for nearly 38 percent of the 1990 freshwater use (5,353 Mgal/d) (Fanning and others, 1992, p. 5) for the State. Freshwater withdrawn in the study unit increased 3 percent from 1985 to 1990, but decreased nearly 3 percent from 1980 to 1990. Of the freshwater withdrawn in 1990, approximately 28 percent (1,410 Mgal/d) was consumed and 72 percent was returned to ground- and surface-water sources for possible reuse. Less than 0.1 percent of the saline withdrawals were consumed in 1990.

Source of Withdrawals

Ground water is the primary source of freshwater in the study unit, accounting for more than 57 percent of the water withdrawn in 1990. Florida accounted for 2,292 Mgal/d (79 percent) of the ground-water withdrawn and Georgia 596 Mgal/d (21 percent). Surface water accounted for 43 percent of the freshwater withdrawn in 1990. Georgia accounted for 1,418 Mgal/d (65 percent) of the surface water withdrawn and Florida 769 Mgal/d (35 percent). Additionally, 115 Mgal/d of reclaimed wastewater water was used throughout the study unit during 1990.

Ground Water

In 1990, ground water withdrawn in the study unit totaled 2,888 Mgal/d (table 1). This represents an increase in ground water withdrawals of 4 percent and 13 percent since 1985 and 1980, respectively. Six counties within the study unit (Brevard, Duval, Hillsborough, Orange, Pasco, and Polk) withdrew more than 100 Mgal/d from ground water sources in 1990 (fig. 4) with the largest withdrawal in Polk County (354 Mgal/d). Ground water supplied drinking-water for nearly 77 percent (5.8 million) of the population served by public supply and 100 percent (1.8 million) of the self-supplied population.

The Florida aquifer system, which underlies about 90 percent of the study unit, provided nearly 91 percent (2,630 Mgal/d) of the ground-water withdrawn in the Georgia-Florida Coastal Plain study unit in 1990 (fig. 2). More than 77 percent of the total water withdrawn in 1990 from the Floridan aquifer system in the southeastern United States was withdrawn in the study unit in 1990. An estimated total of 3,415 Mgal/d of water was withdrawn from the Floridan aquifer system in 1990 in Alabama, Florida, Georgia, and South Carolina (Marilee Horn, U.S.

Table 1. Freshwater withdrawals and reclaimed wastewater by principal water-use category in the Georgia-Florida Coastal Plain study unit, 1990

[Withdrawals are in million gallons per day; self-supplied commercial-industrial includes withdrawals for mining purposes; agriculture includes withdrawals for irrigation, livestock, and fish farming purposes]

Category	Freshwater withdrawals			Reclaimed wastewater
	Ground water	Surface water	Total	Total use
Public supply	947.41	191.39	1,138.80	0.00
Self-supplied domestic	229.51	0.00	229.51	0.00
Self-supplied commercial-industrial	801.94	60.39	862.33	0.00
Agriculture	892.48	400.95	1,293.43	111.18
Thermoelectric power generation	16.55	1,534.69	1,551.24	4.20
Totals	2,887.89	2,187.42	5,075.31	115.38

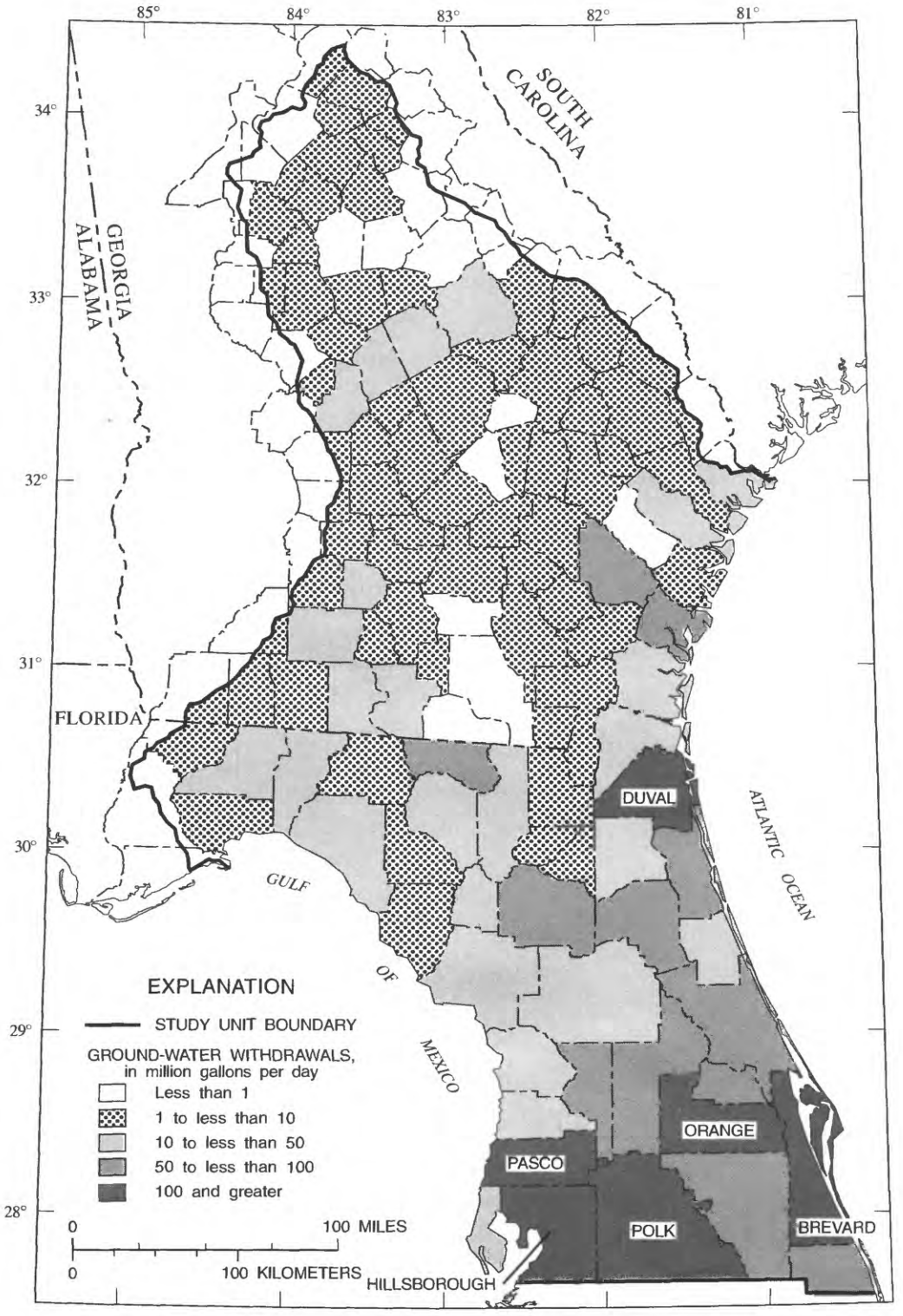

Figure 4. Ground-water withdrawals by county in the Georgia-Florida Coastal Plain study unit, 1990.

Geological Survey, written commun., March 1993). Within the study unit, the Floridan aquifer system supplied the majority of ground water for all water-use categories (public supply, self-supplied domestic, self-supplied commercial-industrial, agriculture and thermoelectric power generation) within the study unit (table 2).

Several other aquifers in the study unit are tapped for water supply needs. Surficial aquifers overlying the Floridan aquifer system in many parts of the study unit supplied about 3 percent (85 Mgal/d) of the ground-water withdrawn in 1990. These unnamed surficial aquifers are utilized for small self-supplied domestic wells in areas where the Floridan aquifer system is too deep to tap, or where the water of the Floridan aquifer system is nonpotable. The Intermediate aquifer system is present primarily in southwest Florida and along the eastern coast of Florida (Vecchioli and Foose, 1985). The intermediate aquifer system in Florida and the Upper and Lower Brunswick aquifers in Georgia are utilized in areas where the water quality of the Floridan aquifer system is nonpotable. The Claiborne, Cretaceous, and Crystalline Rock aquifers are located along the northern and western boundary of the study unit in Georgia (primarily where the Floridan aquifer system is not present), and are utilized to a small degree (Clarke and Pierce, 1985). Withdrawals from the Intermediate aquifer system, the Upper and Lower Brunswick aquifers, along with Claiborne, Cretaceous, and Crystalline Rock aquifers are combined as other aquifers (table 2). These aquifers combined supplied about 6 percent (173 Mgal/d) of the ground-water withdrawn in the study unit in 1990.

Surface Water

In 1990, surface water (fresh) withdrawn in the study unit totaled 2,187 Mgal/d (table 1). This represents a 2 percent increase from the surface water withdrawn in 1985, but an 18 percent decrease from the surface water withdrawn in 1980. Most of the decrease occurred in the usage for thermoelectric power generation, as several plants changed from once-through cooling to using cooling ponds or owers. Four counties within the study unit (Indian River, Suwannee, Putnam, and Volusia) withdrew more than 100 Mgal/d from surface water sources in 1990 (fig. 5) with the largest amount withdrawn in Putnam County Georgia (1,047 Mgal/d). Surface water supplied drinking water for 23 percent (1.7 million) of the population served by public-supply.

Large amounts of surface water were withdrawn from most rivers in the study unit during 1990. Withdrawals from the Altamaha, Hillsborough, Ocmulgee, Oconee, St. Johns, and Suwannee Rivers for public supply, commercial, industrial and thermoelectric power generation totaled about 1,630 Mgal/d in 1990. Nearly 100 percent of the surface water withdrawn from these rivers for thermoelectric power

Table 2. Ground-water withdrawals by principal aquifer in the Georgia-Florida Coastal Plain study unit, 1990

Category of use	Withdrawals by source (in million gallons per day)			
	Floridan aquifer system	Surficial aquifers	Other (1) aquifers	Total withdrawn
Public supply	893.85	19.70	33.86	947.41
Self-supplied domestic	150.71	47.25	31.55	229.51
Self-supplied commercial-industrial	742.15	1.46	58.33	801.94
Agriculture	826.83	16.64	49.01	892.48
Thermoelectric power generation	16.24	0.31	0.00	16.55
Totals	2,629.78	85.36	172.75	2,887.89

(1)Other aquifers include the Claiborne, Cretaceous, Intermediate, and the Upper and Lower Brunswick as defined in Clarke and Pierce, 1985, and Vecchioli and Foose, 1985.

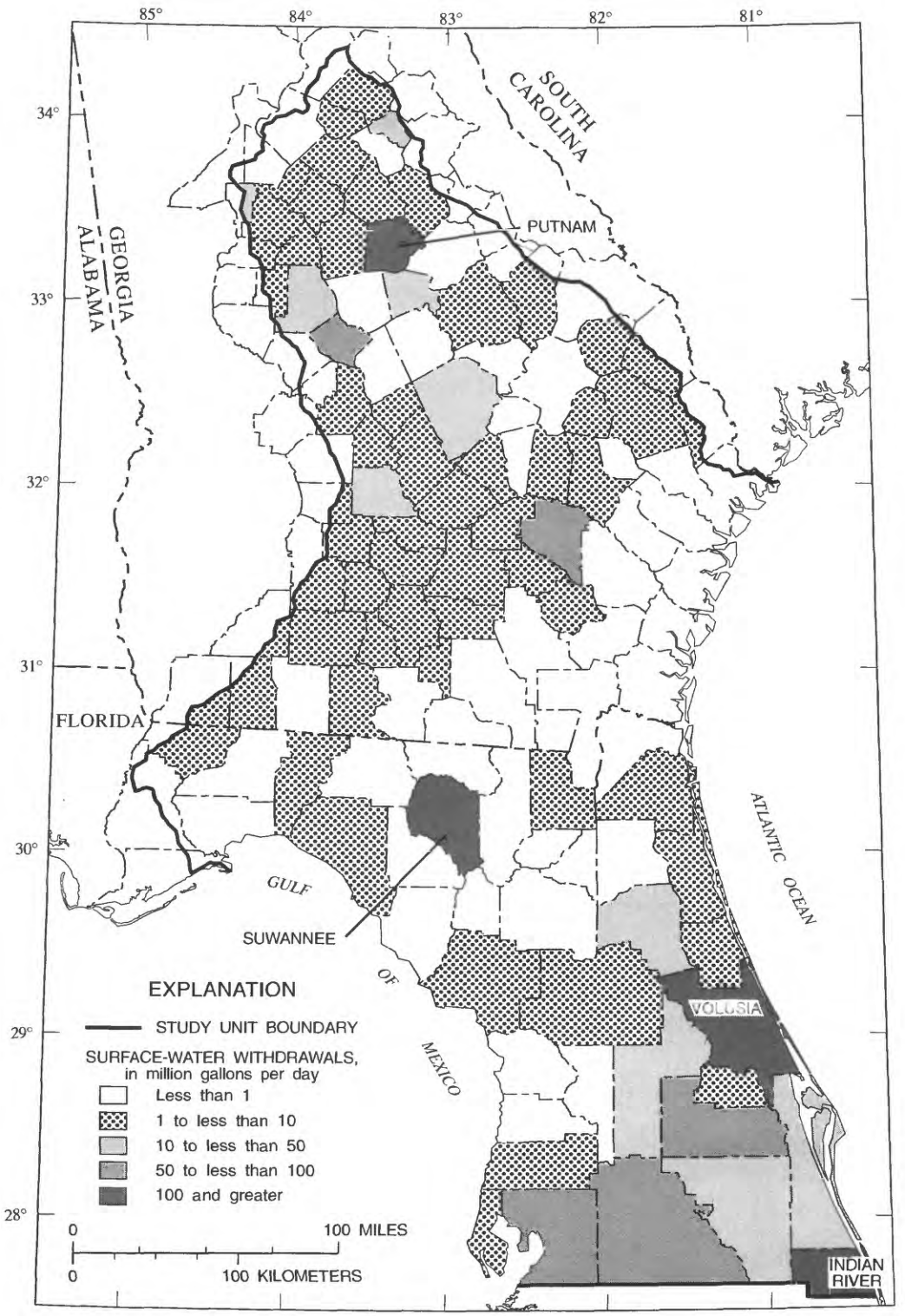

Figure 5. Surface-water withdrawals by county in the Georgia-Florida Coastal Plain study unit, 1990.

generation is returned. Withdrawals from these rivers specifically for agricultural needs was undetermined. Most of the withdrawals for agricultural needs as well as the remaining surface water withdrawn in the study unit for public supply, commercial, and industrial needs were obtained from other rivers, unnamed canals or ditches, local lakes or ponds, or small creeks or tributaries. The amount of water withdrawn from each major river basin are presented in a following section of this report.

Saline surface water withdrawn in the study unit during 1990 totaled 6,998 Mgal/d. A large percentage of the saline water was withdrawn from Tampa Bay (37 percent) and the Gulf of Mexico (20 percent). Other saline water sources include the Indian River, St. Johns River, St. Marks River, and the Turtle River, as well as other coastal water bodies. Most of these rivers are fresh water rivers, however in the areas were these rivers meet the coast, they are tidally influenced and are most often a mix of fresh and saline waters. Because the percentage of fresh and saline water changes often, but is predominately saline, the withdrawals in these areas are considered saline. All of the saline water withdrawn for once-through cooling is returned to the source.

Water Withdrawals by Category

Water-use data in 1990 were collected and compiled for the following categories: public supply, self-supplied domestic, self-supplied commercial-industrial, agriculture, and thermoelectric power generation. Thermoelectric power generation accounted for the largest amount of surface-water withdrawn in the Georgia-Florida Coastal Plain study unit in 1990 (70 percent) followed by agriculture (18 percent), public supply (9 percent), and self-supplied commercial-industrial (3 percent) (fig. 6). Public supply accounted for the largest amount (33 percent) of the ground-water withdrawn, followed by agriculture (31 percent), self-supplied commercial-industrial (28 percent), self-supplied domestic (7.5 percent), and thermoelectric power generation (0.5 percent) (fig. 6). Between 1985 and 1990, water withdrawals increased for public supply, self-supplied domestic use, and agriculture; withdrawals decreased for thermoelectric power generation, and self-supplied commercial-industrial purposes (fig. 7 and table 3).

Public Supply

Water withdrawn for public supply in the Georgia-Florida Coastal Plain study unit in 1990 totaled about 1,139 Mgal/d (table 1), of which 83 percent was ground water and 17 percent was surface water (fig. 6). Withdrawals for public supply within the study unit increased 18 percent from 1985 to 1990 and 49 percent from 1980 to 1990 (fig. 7). These increases are primarily the result of an increase in resident, tourist, and seasonal populations. The expansion of public-supply utilities into unserviced areas around larger cities and the conversion of several industrial facilities from self-supplied systems to

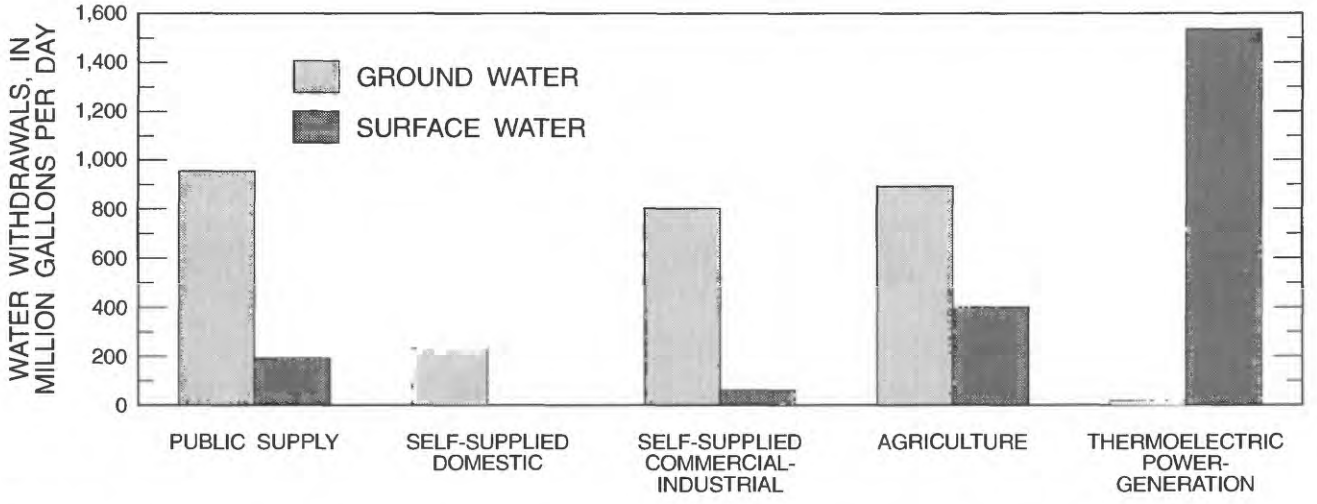

Figure 6. Ground- and surface-water withdrawals by water-use categories in the Georgia-Florida Coastal Plain study unit, 1990.

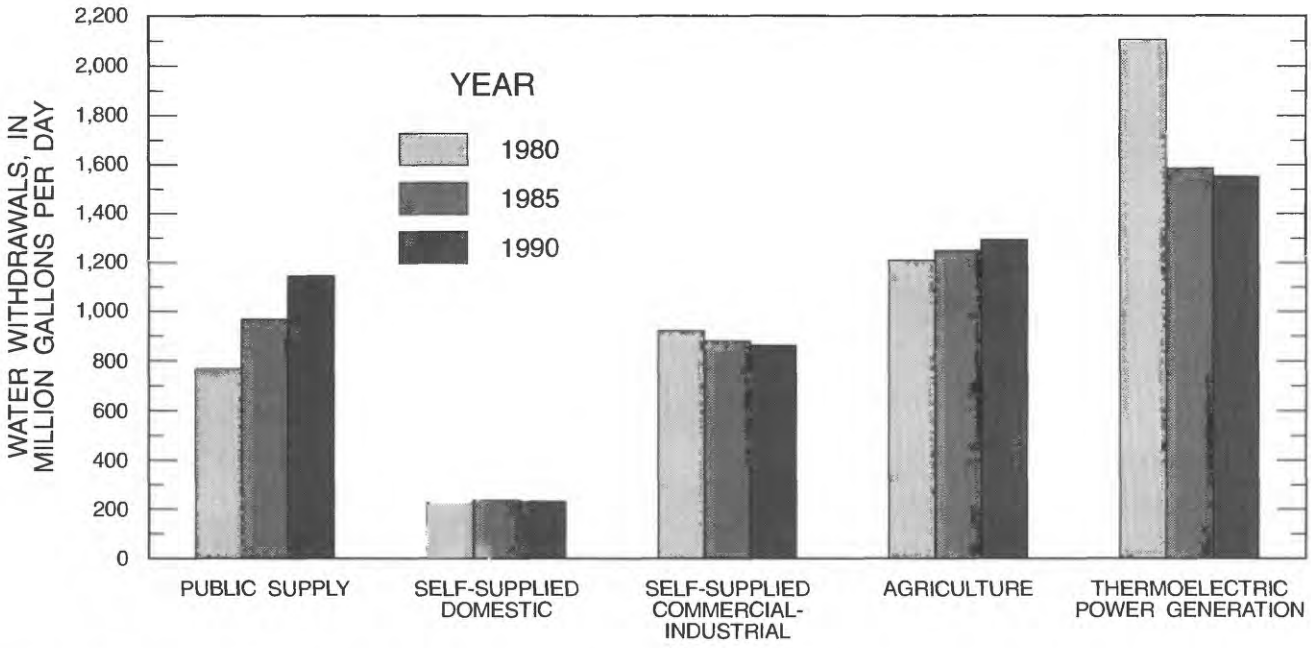

Figure 7. Freshwater withdrawals by water-use category in the Georgia-Florida Coastal Plain study unit for 1980, 1985, and 1990.

public supply purchasers have contributed to the increase in withdrawals (Marella, 1992a). Florida accounted for 79 percent and Georgia 21 percent of the water withdrawn for public supply in the study unit during 1990.

Nearly 740 public supply utilities were inventoried in the study area for 1990. Of this total, 476 were located in Florida (app. 1, table A) and 265 were located in Georgia (app. 1, table B). These systems include facilities that served 400 people or more or had a withdrawal of 0.01 Mgal/d or more during 1990. By far, the majority of these systems (85 percent) tap the Floridan aquifer system, while only 1 percent tap surficial aquifers, and 10 percent tap the other aquifers within the study unit. Most of these utilities or water systems have multiple well fields located throughout their service areas. The remaining 4 percent of the systems inventoried for 1990 withdrew surface water, and several of these supplement their surface-water withdrawals with ground water. The municipal water systems for the cities of Tampa (81 Mgal/d), Orlando (79 Mgal/d), and Jacksonville (70 Mgal/d) were the largest public suppliers in the study unit during 1990. Consequently, the counties associated with these cities (Hillsborough, Orange, and Duval, respectively) withdrew the largest amount of water during 1990 (table 4). The general location of the 23 public-supply utilities that withdrew more than 10 Mgal/d during 1990 is shown in figure 8.

Ground water is the primary source for public-supply water in central, northern, and western Florida as well as southeastern and south-central Georgia because it is readily available, is of good quality in most areas, usually requires very little treatment before distribution, and generally is cheaper to produce than surface water (Marella, 1992a). In 1990, ground water withdrawn for public supply in the study unit totaled 947 Mgal/d (table 1 and fig. 6) and was the source of water for most of the water suppliers. Nearly 94 percent (893 Mgal/d) of the ground-water withdrawn for public supply in the study unit in 1990 was supplied by the Floridan aquifer system (table 2). The remaining ground-water was withdrawn from surficial aquifers (20 Mgal/d), and other aquifers (34 Mgal/d) (table 2). Ground water accounted for 89 percent (150 Mgal/d) of the increase in public supply withdrawals between 1985 and 1990 and 97 percent (325 Mgal/d) of the increase between 1980 and 1990 (table 3).

A small amount of ground water withdrawn for public supply in the study unit for 1990 was too saline for immediate potable purposes and required treatment to meet drinking water standards (Florida Department of Environmental Regulation, 1990). These withdrawals occurred in Brevard, Indian River and Volusia

Table 3. Freshwater withdrawals by source and by water-use category in the Georgia-Florida Coastal Plain study unit, 1980-90

[All values are in million gallons per day; 0.00, no use occurred; ----, partial or no data were available or collected; N/A, totals could not be calculated]

Year	Public Supply		Self-supplied domestic		Self-supplied commercial-industrial (1)		Agriculture (2)		Thermoelectric power generation		Total freshwater withdrawals		
	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Total
1980 (3)	622.56	144.05	225.55	0.00	853.81	66.86	841.60	367.58	15.58	2,088.39	2,559.10	2,666.88	5,225.98
1981	----	----	----	----	----	----	----	----	----	----	----	----	----
1982	----	----	----	----	----	----	----	----	----	----	----	----	----
1983	----	----	----	----	----	----	----	----	----	----	----	----	----
1984	----	----	----	----	----	----	----	----	----	----	----	----	----
1985 (4)	797.23	170.70	236.88	0.00	801.45	77.70	921.03	326.70	14.22	1,571.40	2,770.81	2,146.50	4,917.31
1986	----	----	----	----	----	----	----	----	----	----	----	----	----
1987 (5)	848.24	164.95	----	----	----	----	----	----	----	----	N/A	N/A	N/A
1988	----	----	----	----	----	----	----	----	----	----	----	----	----
1989	----	----	----	----	----	----	----	----	----	----	----	----	----
1990 (6)	947.41	191.39	229.51	0.00	801.94	60.39	892.48	400.95	16.55	1,534.69	2,887.89	2,187.42	5,075.31

(1) Self-supplied commercial-industrial includes water withdrawn for mining purposes.

(2) Agriculture includes water withdrawn for irrigation, livestock, and fish farming.

(3) Modified from; U.S. Geological Survey Water-Resources Investigations Report 82-4090 (Leach, 1983), and Georgia Geologic Survey Information Circular 59 (Pierce and others, 1982).

(4) Modified from; U.S. Geological Survey Water-Resources Investigations Report 88-4103 (Marella, 1988), and Georgia Geologic Survey Information Circular 81 (Turlington and others, 1987).

(5) Modified from; U.S. Geological Survey Open-File Report 90-596 (Marella, 1990b), and Georgia Geologic Survey Information Circular 85 (Trent and others, 1990).

(6) Modified from; U.S. Geological Survey Water-Resources Investigations Report 92-4140 (Marella, 1992b), and Georgia Geologic Survey Information Circular 90 (Fanning and others, 1992).

Table 4. Freshwater withdrawals by source and by principal water-use category for the counties in the Georgia-Florida Coastal Plain study unit, 1990

[Modified from Fanning and others, 1992, and Marella, 1992b; withdrawals are in million gallons per day; 0.00, no withdrawals occurred; self-supplied commercial-industrial includes withdrawals for mining; agriculture includes withdrawals for irrigation, livestock, and fish farming; Fl, Florida; Ga, Georgia]

County	Public supply				Self-supplied domestic		Self-supplied commercial-industrial		Agriculture		Thermoelectric power generation		Total water withdrawals		
	Withdrawals		Transfers (a)												
	Ground water	Surface water	Imported water	Exported water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Total water
Alachua (Fl)	22.95	0.00	0.00	0.00	6.38	0.00	2.29	0.00	18.09	0.36	2.41	0.00	52.12	0.36	52.48
Appling (Ga)	0.51	0.00	0.00	0.00	0.73	0.00	0.32	0.00	0.45	1.51	0.23	56.83	2.24	58.34	60.58
Atkinson (Ga)	0.16	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.31	1.43	0.00	0.00	0.68	1.43	2.11
Bacon (Ga)	0.42	0.00	0.00	0.00	0.42	0.00	0.43	0.00	1.01	1.18	0.00	0.00	2.28	1.18	3.46
Baker (Fl)	0.81	0.00	0.00	0.00	2.84	0.00	0.92	0.00	3.30	2.20	0.00	0.00	7.87	2.20	10.07
Baldwin (Ga)	0.03	5.29	0.00	0.00	1.06	0.00	0.00	5.67	0.00	0.33	0.00	0.00	1.09	11.29	12.38
Barrow (Ga)	0.09	3.22	0.00	0.00	0.94	0.00	0.10	0.00	0.02	0.86	0.00	0.00	1.15	4.08	5.23
Ben Hill (Ga)	1.20	0.00	0.00	0.00	0.45	0.00	0.00	0.00	2.19	1.93	0.00	0.00	3.84	1.93	5.77
Berrien (Ga)	0.30	0.00	0.00	0.00	0.57	0.00	0.91	0.00	2.89	8.88	0.00	0.00	4.67	8.88	13.55
Bibb (Ga)	0.50	24.30	0.00	0.00	0.11	0.00	2.68	13.45	0.30	0.15	0.00	34.96	3.59	72.86	76.45
Bleckley (Ga)	0.97	0.00	0.00	0.00	0.33	0.00	0.07	0.00	2.46	2.63	0.00	0.00	3.83	2.63	6.46
Bradford (Fl)	1.61	0.00	0.00	0.00	3.33	0.00	2.99	0.00	1.03	0.06	0.00	0.00	8.96	0.06	9.02
Brantley (Ga)	0.39	0.00	0.00	0.00	0.68	0.00	0.98	0.00	0.13	0.15	0.00	0.00	2.18	0.15	2.33
Brevard (Fl)	11.55	16.24	0.00	0.00	5.08	0.00	0.19	0.00	100.78	10.40	0.25	0.00	117.85	26.64	144.49
Brooks (Ga)	1.27	0.00	0.00	0.00	0.67	0.00	0.01	0.00	16.45	7.76	0.00	0.00	18.40	7.76	26.16
Bryan (Ga)	0.76	0.00	0.00	0.00	0.69	0.00	0.02	0.00	0.00	0.01	0.00	0.00	1.47	0.01	1.48
Bulloch (Ga)	4.46	0.00	0.00	0.00	0.98	0.00	1.64	0.00	1.65	1.35	0.00	0.00	8.73	1.35	10.08
Burke (Ga)(b)	0.12	0.00	0.00	0.00	0.37	0.00	0.01	0.00	1.05	0.19	0.00	0.00	1.55	0.19	1.74
Butts (Ga)	0.18	1.03	0.00	0.00	0.61	0.00	0.23	0.00	0.00	0.32	0.00	0.00	1.02	1.35	2.37
Camden (Ga)	2.19	0.00	0.00	0.00	0.77	0.00	35.29	0.00	0.03	0.01	0.00	0.00	38.28	0.01	38.29
Candler (Ga)	0.69	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.88	2.64	0.00	0.00	1.86	2.64	4.50
Charlton (Ga)	0.67	0.00	0.00	0.00	0.41	0.00	0.43	0.00	0.03	0.13	0.00	0.00	1.54	0.13	1.67
Chatham (Ga)(b)	15.16	0.00	0.00	0.00	1.69	0.00	1.68	0.00	2.02	0.02	0.00	0.00	20.55	0.02	20.57
Citrus (Fl)	8.65	0.00	0.00	0.00	8.80	0.00	2.13	0.00	4.47	0.27	1.50	0.00	25.55	0.27	25.82
Clarke (Ga)(b)	0.30	15.13	0.00	0.00	1.04	0.00	0.01	0.00	0.00	0.48	0.00	0.00	1.35	15.61	16.96
Clay (Fl)	11.11	0.00	0.00	0.00	4.53	0.00	6.56	0.00	3.00	0.44	0.00	0.00	25.20	0.44	25.64
Clayton (Ga)(b)	0.20	20.13	0.00	11.88	0.00	0.00	0.01	0.00	0.04	0.02	0.00	0.00	0.25	20.15	20.40
Clinch (Ga)	0.32	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.17	0.08	0.00	0.00	0.69	0.08	0.77
Coffee (Ga)	4.20	0.00	0.00	0.00	0.88	0.00	0.08	0.00	0.73	2.47	0.00	0.00	5.89	2.47	8.36
Colquitt (Ga)(b)	3.70	0.00	0.00	0.00	0.51	0.00	1.32	0.00	6.28	5.18	0.00	0.00	11.81	5.18	16.99

Table 4. Freshwater withdrawals by source and by principal water-use category for the counties in the Georgia-Florida Coastal Plain study unit, 1990 —Continued

[Modified from Fanning and others, 1992, and Marella, 1992b; withdrawals are in million gallons per day; 0.00, no withdrawals occurred; self-supplied commercial-industrial includes withdrawals for mining; agriculture includes withdrawals for irrigation, livestock, and fish farming; Fl, Florida; Ga, Georgia]

County	Public supply				Self-supplied domestic		Self-supplied commercial-industrial		Agriculture		Thermoelectric power generation		Total water withdrawals		
	Withdrawals		Transfers (a)												
	Ground water	Surface water	Imported water	Exported water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Total water
Columbia (Fl)	2.93	0.00	0.00	0.00	5.21	0.00	0.03	0.00	2.98	0.23	0.00	0.00	11.15	0.23	11.38
Cook (Ga)	2.87	0.00	0.00	0.00	0.37	0.00	0.12	0.00	1.58	1.68	0.00	0.00	4.94	1.68	6.62
Crawford (Ga)(b)	0.01	0.00	0.00	0.00	0.25	0.00	0.08	0.00	0.58	0.43	0.00	0.00	0.92	0.43	1.35
Crisp (Ga)(b)	0.07	0.00	0.00	0.00	0.09	0.00	1.53	0.00	1.28	1.85	0.00	0.00	2.97	1.85	4.82
Decatur (Ga)(b)	0.13	0.00	0.00	0.00	0.24	0.00	0.09	1.50	6.85	0.91	0.00	0.00	7.31	2.41	9.72
De Kalb (Ga)(b)	0.05	0.00	38.79	0.00	0.55	0.00	0.00	0.00	0.01	0.85	0.00	0.00	0.61	0.85	1.46
Dixie (Fl)	0.66	0.00	0.00	0.00	0.87	0.00	0.90	0.00	3.44	0.00	0.00	0.00	5.87	0.00	5.87
Dodge (Ga)	0.86	0.00	0.00	0.00	0.76	0.00	0.01	0.00	0.81	2.22	0.00	0.00	2.44	2.22	4.66
Dooly (Ga)(b)	0.22	0.00	0.00	0.00	0.09	0.00	0.11	0.00	0.76	0.28	0.00	0.00	1.18	0.28	1.46
Duval (Fl)	96.32	0.00	0.00	0.00	8.37	0.00	33.93	0.00	9.53	1.40	4.83	0.00	152.98	1.40	154.38
Echols (Ga)	0.06	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.33	0.17	0.00	0.00	0.53	0.17	0.70
Effingham (Ga)(b)	0.29	0.00	0.00	0.00	0.45	0.00	3.17	8.29	0.08	0.10	0.00	0.00	3.99	8.39	12.38
Emanuel (Ga)	2.31	0.00	0.00	0.00	0.56	0.00	0.20	0.00	1.60	0.80	0.00	0.00	4.67	0.80	5.47
Evans (Ga)	0.48	0.00	0.00	0.00	0.33	0.00	0.87	0.00	0.24	0.85	0.00	0.00	1.92	0.85	2.77
Flagler (Fl)	3.85	0.00	0.00	0.00	1.87	0.00	0.25	0.00	7.50	1.20	0.00	0.00	13.47	1.20	14.67
Franklin (Fl)(b)	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04
Fulton (Ga)(b)	0.00	0.00	30.18	0.00	0.23	0.00	0.01	0.07	0.01	0.08	0.00	0.00	0.25	0.15	0.40
Gadsden (Fl)(b)	1.53	1.29	0.00	0.00	1.86	0.00	1.02	0.00	3.03	7.11	0.00	0.00	7.44	8.40	15.84
Gilchrist (Fl)	0.27	0.00	0.00	0.00	1.31	0.00	0.13	0.00	9.35	0.00	0.00	0.00	11.06	0.00	11.06
Glascock (Ga)(b)	0.12	0.00	0.00	0.00	0.11	0.00	0.02	0.00	0.01	0.05	0.00	0.00	0.26	0.05	0.31
Glynn (Ga)	13.40	0.00	0.00	0.00	0.61	0.00	68.42	0.00	2.43	0.58	0.03	0.00	84.89	0.58	85.47
Grady (Ga)(b)	1.59	0.00	0.00	0.00	0.68	0.00	0.01	0.00	2.61	4.61	0.00	0.00	4.89	4.61	9.50
Greene (Ga)(b)	0.15	0.76	0.00	0.00	0.32	0.00	0.00	0.10	0.00	0.45	0.00	0.00	0.47	1.31	1.78
Gwinnett (Ga)(b)	0.08	0.00	47.64	0.00	0.03	0.00	0.00	0.00	0.08	0.59	0.00	0.00	0.19	0.59	0.78
Hall (Ga)(b)	0.10	0.00	0.00	0.00	0.68	0.00	0.03	0.00	0.27	0.67	0.00	0.00	1.08	0.67	1.75
Hamilton (Fl)	0.97	0.00	0.00	0.00	1.11	0.00	44.08	0.00	4.44	0.00	0.00	0.00	50.60	0.00	50.60
Hancock (Ga)	0.03	0.39	0.00	0.00	0.40	0.00	0.01	0.00	0.19	0.05	0.00	0.00	0.63	0.44	1.07
Henry (Ga)(b)	0.27	5.01	0.00	0.00	1.99	0.00	0.04	0.00	0.29	0.32	0.00	0.00	2.59	5.33	7.92
Hernando (Fl)	14.97	0.00	0.00	0.00	1.77	0.00	23.31	0.00	5.43	0.35	0.00	0.00	45.48	0.35	45.83
Hillsborough (Fl)	61.79	76.05	0.00	0.00	2.68	0.00	25.82	4.21	89.44	8.68	0.00	0.00	179.73	88.94	268.67

Table 4. Freshwater withdrawals by source and by principal water-use category for the counties in the Georgia-Florida Coastal Plain study unit, 1990 —Continued

[Modified from Fanning and others, 1992, and Marella, 1992b; withdrawals are in million gallons per day; 0.00, no withdrawals occurred; self-supplied commercial-industrial includes withdrawals for mining; agriculture includes withdrawals for irrigation, livestock, and fish farming; Fl, Florida; Ga, Georgia]

County	Public supply				Self-supplied domestic		Self-supplied commercial-industrial		Agriculture		Thermoelectric power generation		Total water withdrawals		
	Withdrawals		Transfers (a)												
	Ground water	Surface water	Imported water	Exported water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Total water
Houston (Ga)(b)	13.44	0.00	0.00	0.00	0.73	0.00	5.23	0.00	3.27	1.14	0.00	0.00	22.67	1.14	23.81
Indian River (Fl)	13.17	0.00	0.00	0.00	8.94	0.00	0.29	0.00	50.37	117.53	0.08	0.00	72.85	117.53	190.38
Irwin (Ga)	0.69	0.00	0.00	0.00	0.35	0.00	0.01	0.00	1.45	1.39	0.00	0.00	2.50	1.39	3.89
Jackson (Ga)(b)	0.32	2.32	0.00	0.00	1.56	0.00	0.85	0.00	0.06	1.15	0.00	0.00	2.79	3.47	6.26
Jasper (Ga)	0.14	0.25	0.00	0.00	0.34	0.00	0.00	0.90	0.01	0.28	0.00	0.00	0.49	1.43	1.92
Jeff Davis (Ga)	1.00	0.00	0.00	0.00	0.52	0.00	0.72	0.00	3.41	1.16	0.00	0.00	5.65	1.16	6.81
Jefferson (Fl)	0.72	0.00	0.00	0.00	1.04	0.00	0.08	0.00	8.45	1.81	0.00	0.00	10.29	1.81	12.10
Jefferson (Ga)(b)	1.62	0.00	0.00	0.00	0.55	0.00	1.31	0.00	2.24	3.85	0.00	0.00	5.72	3.85	9.57
Jenkins (Ga)	0.58	0.00	0.00	0.00	0.32	0.00	0.11	0.00	1.88	1.23	0.00	0.00	2.89	1.23	4.12
Johnson (Ga)	0.27	0.00	0.00	0.00	0.39	0.00	0.01	0.00	0.41	0.87	0.00	0.00	1.08	0.87	1.95
Jones (Ga)(b)	0.86	0.00	0.00	0.00	0.73	0.00	0.03	0.11	0.02	0.22	0.00	0.00	1.64	0.33	1.97
Lafayette (Fl)	0.18	0.00	0.00	0.00	0.70	0.00	0.14	0.00	8.08	0.54	0.00	0.00	9.10	0.54	9.64
Lake (Fl)	20.67	0.00	0.00	0.00	9.56	0.00	9.51	0.00	44.61	12.68	0.00	0.00	84.35	12.68	97.03
Lamar (Ga)(b)	0.01	1.51	0.00	0.00	0.43	0.00	0.02	0.00	0.55	0.58	0.00	0.00	1.01	2.09	3.10
Lanier (Ga)	0.34	0.00	0.00	0.00	0.22	0.00	0.00	0.00	1.44	1.66	0.00	0.00	2.00	1.66	3.66
Laurens (Ga)	1.42	2.64	0.00	0.00	1.06	0.00	0.55	12.79	2.00	5.57	0.00	0.00	5.03	21.00	26.03
Leon (Fl)	25.02	0.00	0.00	0.00	5.74	0.00	0.26	0.00	3.87	0.49	4.11	0.00	39.00	0.49	39.49
Levy (Fl)	1.58	0.00	0.00	0.00	2.15	0.00	0.36	1.70	17.43	1.34	0.00	0.00	21.52	3.04	24.56
Liberty (Fl)(b)	0.07	0.00	0.00	0.00	0.12	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.87	0.00	0.87
Liberty (Ga)	6.48	0.00	0.00	0.00	0.83	0.00	13.12	0.00	0.09	0.07	0.00	0.00	20.52	0.07	20.59
Long (Ga)	0.22	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.01	0.07	0.00	0.00	0.46	0.07	0.53
Lowndes (Ga)	8.39	0.00	0.00	0.00	1.61	0.00	14.19	0.00	1.05	0.93	0.00	0.00	25.24	0.93	26.17
Macon (Ga)(b)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Madison (Fl)	1.43	0.00	0.00	0.00	2.56	0.00	0.23	0.00	2.97	0.27	0.00	0.00	7.19	0.27	7.46
Madison (Ga)(b)	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.07	0.10	0.00	0.00	0.14	0.10	0.24
Marion (Fl)	16.47	0.00	0.00	0.00	16.93	0.00	1.07	0.00	14.73	1.87	0.00	0.00	49.20	1.87	51.07
McIntosh (Ga)	0.21	0.00	0.00	0.00	0.33	0.00	0.56	0.00	0.00	0.00	0.00	0.00	1.10	0.00	1.10
Mitchell (Ga)(b)	0.76	0.00	0.00	0.00	0.13	0.00	0.01	0.00	4.44	1.01	0.00	0.00	5.34	1.01	6.35
Monroe (Ga)(b)	0.03	1.20	0.00	0.00	0.76	0.00	0.20	0.00	2.06	2.35	0.02	10.61	3.07	14.16	17.23
Montgomery (Ga)	0.33	0.00	0.00	0.00	0.29	0.00	0.03	0.00	0.36	0.70	0.00	0.00	1.01	0.70	1.71

Table 4. Freshwater withdrawals by source and by principal water-use category for the counties in the Georgia-Florida Coastal Plain study unit, 1990 —Continued

[Modified from Fanning and others, 1992, and Marella, 1992b; withdrawals are in million gallons per day; 0.00, no withdrawals occurred; self-supplied commercial-industrial includes withdrawals for mining; agriculture includes withdrawals for irrigation, livestock, and fish farming; Fl, Florida; Ga, Georgia]

County	Public supply				Self-supplied domestic		Self-supplied commercial-industrial		Agriculture		Thermoelectric power generation		Total water withdrawals		
	Withdrawals		Transfers (a)												
	Ground water	Surface water	Imported water	Exported water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Total water
Morgan (Ga)	0.20	0.94	0.00	0.00	0.79	0.00	0.06	0.00	0.01	0.59	0.00	0.00	1.06	1.53	2.59
Nassau (Fl)	3.85	0.00	0.00	0.00	3.83	0.00	32.69	0.00	2.40	0.60	0.00	0.00	42.77	0.60	43.37
Newton (Ga)	1.27	3.41	0.00	0.00	1.48	0.00	0.18	0.05	0.01	0.38	0.00	0.00	2.94	3.84	6.78
Oconee (Ga)	1.09	0.00	0.00	0.00	0.48	0.00	0.02	0.00	0.10	0.52	0.00	0.00	1.69	0.52	2.21
Oglethorpe (Ga)(b)	0.01	0.07	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.12	0.16	0.28
Orange (Fl)	161.29	0.00	0.00	0.00	5.01	0.00	18.88	0.00	35.36	61.47	0.33	0.00	220.87	61.47	282.34
Osceola (Fl)	12.08	0.00	0.00	0.00	4.31	0.00	2.33	0.00	44.72	13.40	0.00	0.00	63.44	13.40	76.84
Pasco (Fl)	90.65	0.00	0.00	0.00	10.33	0.00	18.68	0.07	19.05	2.31	0.00	0.00	138.71	2.38	141.09
Peach (Ga)(b)	2.40	0.00	0.00	0.00	0.61	0.00	0.02	0.00	2.85	0.76	0.00	0.00	5.88	0.76	6.64
Pierce (Ga)	0.54	0.00	0.00	0.00	0.64	0.00	0.53	0.00	0.38	1.86	0.00	0.00	2.09	1.86	3.95
Pinellas (Fl)	40.97	0.00	0.00	0.00	1.98	0.00	0.08	0.00	5.07	1.35	0.00	0.00	48.10	1.35	49.45
Polk (Fl)	65.52	0.00	0.00	0.00	23.26	0.00	143.35	0.00	120.13	13.21	1.41	70.62	353.67	83.83	437.50
Pulaski (Ga)	0.68	0.00	0.00	0.00	0.23	0.00	0.00	0.00	7.43	3.67	0.00	0.00	8.34	3.67	12.01
Putnam (Fl)	3.15	0.00	0.00	0.00	5.94	0.00	33.52	10.27	18.29	0.83	0.53	7.71	61.43	18.81	80.24
Putnam (Ga)	0.14	0.85	0.00	0.00	0.56	0.00	0.07	0.00	0.05	0.30	0.00	1,046.60	0.82	1,047.75	1,048.57
Rockdale (Ga)	4.80	1.66	0.00	0.00	0.04	0.00	0.01	0.00	0.12	0.14	0.00	0.00	4.97	1.80	6.77
St. Johns (Fl)	8.39	0.00	0.00	0.00	2.24	0.00	0.09	0.00	40.54	1.39	0.00	0.00	51.26	1.39	52.65
Screven (Ga)(b)	0.56	0.00	0.00	0.00	0.33	0.00	2.30	0.00	1.92	1.38	0.00	0.00	5.11	1.38	6.49
Seminole (Fl)	50.79	0.00	0.00	0.00	3.14	0.00	0.49	0.00	11.15	1.80	0.00	0.00	65.57	1.80	67.37
Spalding (Ga)(b)	0.02	4.18	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.50	4.53	5.03
Sumter (Fl)	1.90	0.00	0.00	0.00	3.00	0.00	60.02	0.00	8.21	0.47	0.00	0.00	73.13	0.47	73.60
Suwannee (Fl)	1.36	0.00	0.00	0.00	2.95	0.00	0.81	0.00	27.11	0.65	0.07	108.51	32.30	109.16	141.46
Taliaferro (Ga)(b)	0.03	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
Tattnall (Ga)	1.05	0.00	0.00	0.00	0.65	0.00	1.07	0.00	0.74	1.93	0.00	0.00	3.51	1.93	5.44
Taylor (Fl)	1.42	0.00	0.00	0.00	0.99	0.00	46.37	1.20	0.60	0.08	0.00	0.00	49.38	1.28	50.66
Telfair (Ga)	1.72	0.00	0.00	0.00	0.26	0.00	0.05	0.00	1.97	1.57	0.00	0.00	4.00	1.57	5.57
Thomas (Ga)	5.23	0.00	0.00	0.00	0.60	0.00	0.36	0.00	0.22	0.26	0.00	0.00	6.41	0.26	6.67
Tift (Ga)	6.20	0.00	0.00	0.00	0.12	0.00	0.04	0.00	6.08	9.77	0.00	0.00	12.44	9.77	22.21
Toombs (Ga)	2.50	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.83	2.27	0.00	0.00	3.89	2.27	6.16
Treutlen (Ga)	0.43	0.00	0.00	0.00	0.23	0.00	0.21	0.00	0.01	0.10	0.00	0.00	0.88	0.10	0.98

Table 4. Freshwater withdrawals by source and by principal water-use category for the counties in the Georgia-Florida Coastal Plain study unit, 1990 —Continued

[Modified from Fanning and others, 1992, and Marella, 1992b; withdrawals are in million gallons per day; 0.00, no withdrawals occurred; self-supplied commercial-industrial includes withdrawals for mining; agriculture includes withdrawals for irrigation, livestock, and fish farming; Fl, Florida; Ga, Georgia]

County	Public supply				Self-supplied domestic		Self-supplied commercial-industrial		Agriculture		Thermoelectric power generation		Total water withdrawals		
	Withdrawals		Transfers (a)												
	Ground water	Surface water	Imported water	Exported water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Total water
Turner (Ga) (b)	0.74	0.00	0.00	0.00	0.19	0.00	1.09	0.00	0.86	4.37	0.00	0.00	2.88	4.37	7.25
Twiggs (Ga)	0.26	0.00	0.00	0.00	0.58	0.00	17.89	0.00	0.03	0.06	0.00	0.00	18.76	0.06	18.82
Union (Fl)	0.63	0.00	0.00	0.00	2.42	0.00	0.00	0.00	1.32	0.68	0.00	0.00	4.37	0.68	5.05
Upson (Ga) (b)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volusia (Fl)	44.21	0.00	0.00	0.00	6.75	0.00	0.69	0.00	22.34	4.36	0.44	198.85	74.43	203.21	277.64
Wakulla (Fl)	0.77	0.00	0.00	0.00	0.71	0.00	0.79	0.00	0.11	0.00	0.31	0.00	2.69	0.00	2.69
Walton (Ga)	0.73	3.22	0.00	0.00	1.38	0.00	0.00	0.00	0.08	0.29	0.00	0.00	2.19	3.51	5.70
Ware (Ga)	4.65	0.00	0.00	0.00	0.74	0.00	0.47	0.00	0.53	0.43	0.00	0.00	6.39	0.43	6.82
Warren (Ga) (b)	0.01	0.30	0.00	0.00	0.13	0.00	0.00	0.01	0.03	0.07	0.00	0.00	0.17	0.38	0.55
Washington (Ga)	1.84	0.00	0.00	0.00	0.73	0.00	16.85	0.00	1.56	1.37	0.00	0.00	20.98	1.37	22.35
Wayne (Ga)	2.44	0.00	0.00	0.00	0.76	0.00	66.00	0.00	0.51	0.41	0.00	0.00	69.71	0.41	70.12
Wheeler (Ga)	0.27	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.25	1.55	0.00	0.00	0.69	1.55	2.24
Wilcox (Ga)	0.62	0.00	0.00	0.00	0.26	0.00	0.00	0.00	5.73	11.05	0.00	0.00	6.61	11.05	17.66
Wilkinson (Ga)	0.93	0.00	0.00	0.00	0.30	0.00	20.82	0.00	0.27	0.19	0.00	0.00	22.32	0.19	22.51
Worth (Ga) (b)	0.80	0.00	0.00	0.00	0.46	0.00	0.04	0.00	3.27	1.81	0.00	0.00	4.57	1.81	6.38
Totals	947.41	191.39	116.61	11.88	229.51	0.00	801.94	60.39	892.48	400.95	16.55	1,534.69	2,887.89	2,187.42	5,075.31

(a) Transfers include water that is exported out off or imported into the Georgia-Florida Coastal Plain study unit for public supply use.

(b) Indicates the county is partially in the study unit, and the data shown is for the part in the study unit only.

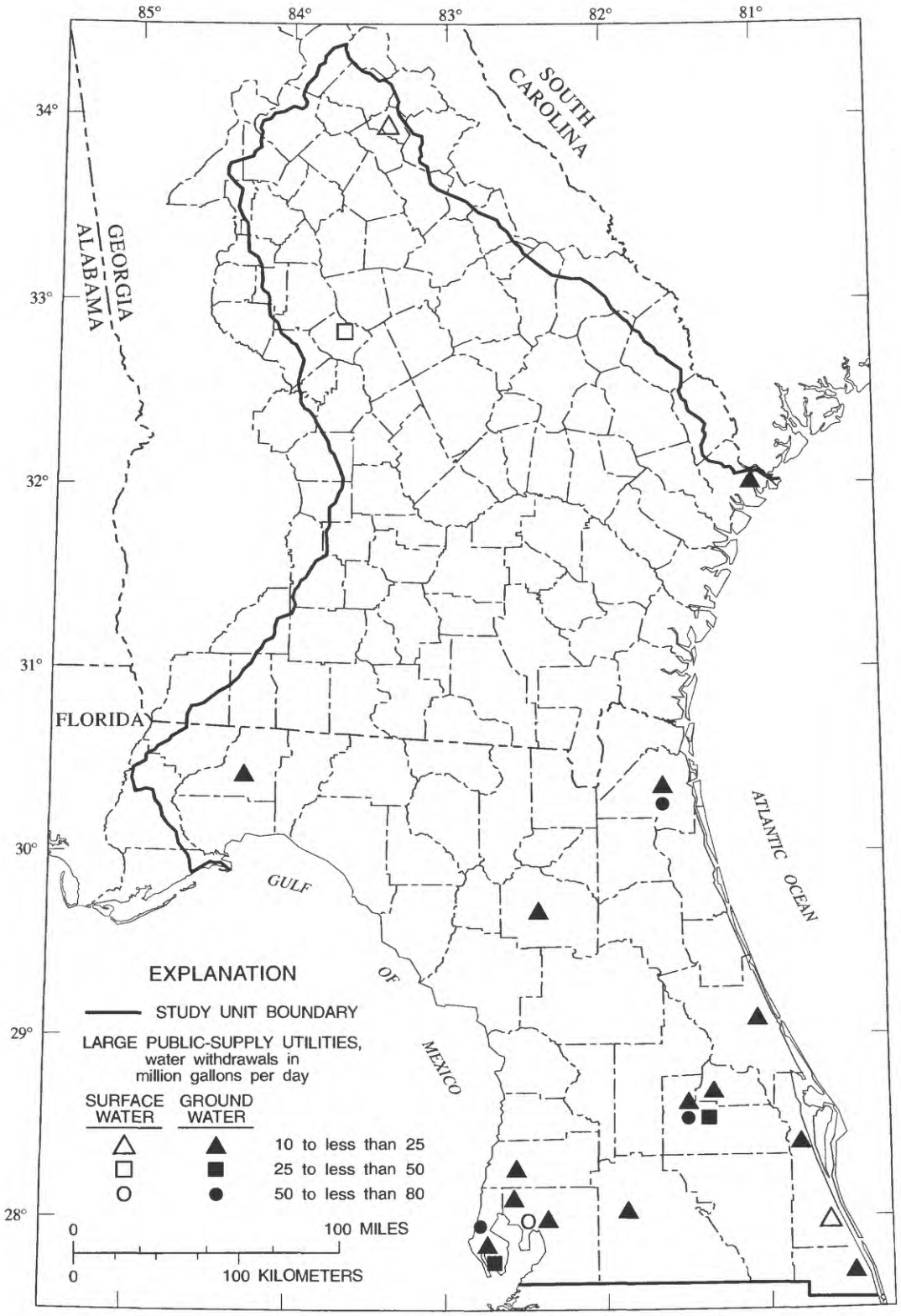

Figure 8. General locations of the largest public-supply utilities in the Georgia-Florida Coastal Plain study unit, 1990.

Counties on the east coast of Florida and were treated through a desalination process or diluted with fresher water. The use of nonpotable water for public supply has increased in this part of Florida from nearly 1 Mgal/d in 1985, to 5 Mgal/d in 1990 (in 1985, nonpotable water was originally referred to as saline ground water) (Marella, 1992b). Within the study unit, 10 public-supply systems treated or diluted nonpotable water in order to meet the drinking water standards.

Surface water is the primary source for public supply water in the extreme northwestern part of the study unit. Throughout the remaining areas of the study unit, surface water is only used by a handful of public suppliers. In 1990, surface water withdrawn for public supply in the study unit totaled 191 Mgal/d (table 1 and fig. 6). The Hillsborough River supplied 40 percent (76 Mgal/d) and the Ocmulgee and Oconee Rivers each supplied about 12 percent (47 Mgal/d combined) of the surface-water withdrawn (fig. 1). An additional 105 Mgal/d of surface water was imported into the study unit for public supply use (Marella and others, 1993). The water was imported from the Chattahoochee River (including Lake Sidney Lanier) in the metropolitan Atlanta area (primarily in DeKalb, Fulton, and Gwinnett Counties) (fig. 3) Some of this water was treated and discharged back into the Chattahoochee River after being used, but some water was discharged into the Altamaha-St. Marys River basin. The amount of water transferred between these basins varies from year to year.

Self-Supplied Domestic

Self-supplied domestic withdrawals in the Georgia-Florida Coastal Plain study unit in 1990 totaled nearly 230 Mgal/d (table 1). Withdrawals for self-supplied domestic use within the study unit decreased 2 percent from 1985 to 1990 but increased 2 percent from 1980 to 1990 (table 3 and fig. 7). Self-supplied water withdrawals remained about the same over this period primarily from an increase in rural population throughout the study unit and a decrease in self-supplied users around urban areas. The decrease occurred as many public-water supplies expanded their water systems into unincorporated areas. Most of this expansion is occurring in or around some large urban areas (Atlanta, Jacksonville, Orlando, and Tampa). In 1990, nearly 1.8 million people obtained drinking water from self-supplied systems or small public supply systems that were not inventoried. Because a large part of the study unit is rural, a significant percentage of the population within the study unit will always rely on self-supplied water systems. Florida accounted for nearly 78 percent and Georgia 22 percent of the water withdrawn for self-supplied domestic use during 1990.

Water withdrawn for self-supplied domestic use in Georgia and Florida is derived almost exclusively from ground water, primarily because this source can provide the quantity and quality of water needed for drinking purposes. Also, in most areas in the study unit, surface water does not meet drinking water standards without treatment. The Floridan aquifer system supplied 65 percent (151 Mgal/d) of the ground-water withdrawn for self-supplied domestic use in the study unit, followed by 21 percent (47 Mgal/d) from the surficial aquifers and 14 percent (32 Mgal/d) from the other aquifers (table 2). In many areas of the study unit, the surficial aquifers yield sufficient water for domestic purposes, precluding the need to tap the deeper Floridan aquifer system. The surficial and other aquifers are primarily used where the Floridan aquifer system is extremely deep below land surface (northeastern part of Florida and southeastern part of Georgia), or in other areas where the water from the Floridan aquifer system is nonpotable. In areas where the Floridan aquifer system is not present in north-central Georgia (fig. 2), the Claiborne, Cretaceous, and Crystalline Rock aquifers are used for self-supplied needs.

Polk and Marion Counties in Florida accounted for the largest amounts of water withdrawn for self-supplied domestic use in 1990, using 23 Mgal/d and 17 Mgal/d respectively (table 4). Most of the self-supplied water withdrawn in Polk (75 percent) and Marion (94 percent) is estimated to be from the Floridan aquifer system. In other counties with substantial withdrawals such as Brevard, Duval, Indian River, and Nassau Counties, more than 90 percent of the self-supplied water withdrawn is from the surficial aquifers.

Self-Supplied Commercial-Industrial

Water withdrawn for self-supplied commercial-industrial use (including mining needs) in the Georgia-Florida Coastal Plain study unit in 1990 totaled about 862 Mgal/d (table 1), of which 93 percent was ground water and 7 percent was surface water. Withdrawals for self-supplied commercial-industrial uses within the study unit decreased 2 percent from 1985 to 1990 and 6 percent from 1980 to 1990 (table 3 and fig. 7).

24 percent by flood irrigation systems. The general location of the more intensely irrigated areas within the Georgia-Florida Coastal Plain study unit are shown in figure 10. Citrus (30 percent) and vegetable (including truck farming) irrigation (20 percent) accounted for the largest amount of water withdrawn for irrigation in the study unit for 1990. About 0.251 million acres of citrus, grown mostly in 15 counties, was irrigated in the study unit during 1990. Polk, Indian River, and Hillsborough Counties accounted for 75 percent of the citrus acreage. Citrus in Hillsborough and Polk Counties is predominantly irrigated by ground water through sprinkler and low pressure systems. The water is pumped on an "as need" bases, and generally percolates quickly through the sandy soils. Citrus in Indian River County is predominantly irrigated by surface water through flood irrigation (primarily crown flood irrigation) with some ground water used for low pressure and sprinkler systems. Surface water is primarily obtained from a series of canals, and is gravity fed into the citrus groves, where the water floods the soil above the root zone of the tree. Once the water has saturated the soils, the excess water is then pumped out of the grove and back into the canal. Access to the canal water occurs on a predetermined time schedule (usually in days). In dry periods, many of the irrigators use ground water from free-flowing wells to augment the water levels in these canals or groves.

Vegetable irrigation occurs in several areas within the study unit (fig. 10) and generally runs from February through November. In Hillsborough County, ground water is withdrawn to irrigate tomatoes and strawberries through sprinklers, low pressure, or flood systems. In Flagler, Putnam, and St. Johns Counties, ground water is withdrawn to irrigate potatoes and cabbage through flood or sprinklers systems. In Lake and Orange Counties, surface water is used to irrigate a variety of vegetables (cabbage, carrots, celery, radishes, sweet corn, and others) through flood systems. This surface water is also supplemented by ground water from free-flowing wells during the irrigation seasons. Throughout northern Florida and southern Georgia, ground water is used by center pivots or traveling guns to irrigate crops such as corn, cotton, watermelons, and a variety of spring and summer vegetable crops. Brooks, Colquitt, Tift, and Worth Counties in Georgia and Alachua, Madison, Jefferson, and Suwannee Counties in Florida are some of the more intense areas involved in agricultural production in southern Georgia and northern Florida. Many dairy and poultry operations, along with several horse farming or breeding operations are located within the study unit (predominantly in the northern Florida and northern and southern Georgia areas). Most of the water withdrawn at these operations is used for animal and equipment washdown, animal drinking and cooling purposes, and augmenting farm ponds.

Ground water is the primary source of water for agricultural needs throughout the study unit because it is readily available and is highly dependable in both quantity and quality. In 1990, ground water withdrawn for agricultural purposes in the study unit totaled about 892 Mgal/d (table 1 and fig 7). The Floridan aquifer system supplied 93 percent (827 Mgal/d) of the ground-water withdrawn for agricultural purposes in the study unit for 1990 (table 2). The remaining water was withdrawn from surficial aquifers or other aquifers. Polk County withdrew the largest amount of ground water (120 Mgal/d) for agricultural purposes in 1990 (120 Mgal/d), followed by Brevard County (101 Mgal/d) and Hillsborough County (89 Mgal/d) (table 4).

The surface-water withdrawn in the study unit for agricultural irrigation was predominantly obtained from unnamed canals or ditches, local lakes or ponds, or small creeks or tributaries within the study unit. In 1990, surface water withdrawn for agricultural purposes in the study unit totaled about 401 Mgal/d (table 1 and fig. 7). Indian River County (118 Mgal/d) and Orange County (61 Mgal/d) withdrew the largest amount of surface water for agricultural purposes in 1990 (table 4). Most of the surface-water withdrawn in Indian River County is from the many canals associated with the St. Johns River marshlands while in Orange County the water is primarily from Lake Apopka (fig. 1). Excess or unused water from these flood irrigation operations in Indian River and Orange Counties is usually pumped back into the source on a regular bases.

More than 111 Mgal/d of reclaimed wastewater was used for irrigation purposes in the study unit during 1990. The city of St. Petersburg (Pinellas County) used nearly 28 Mgal/d of reclaimed wastewater in 1990 to irrigate commercial and residential lawns as well as golf courses within the county (Marella, 1994). Large reuse systems were also in operation in the Atlanta area (Clayton County), the Orlando area (Orange and Seminole Counties), and in Tallahassee

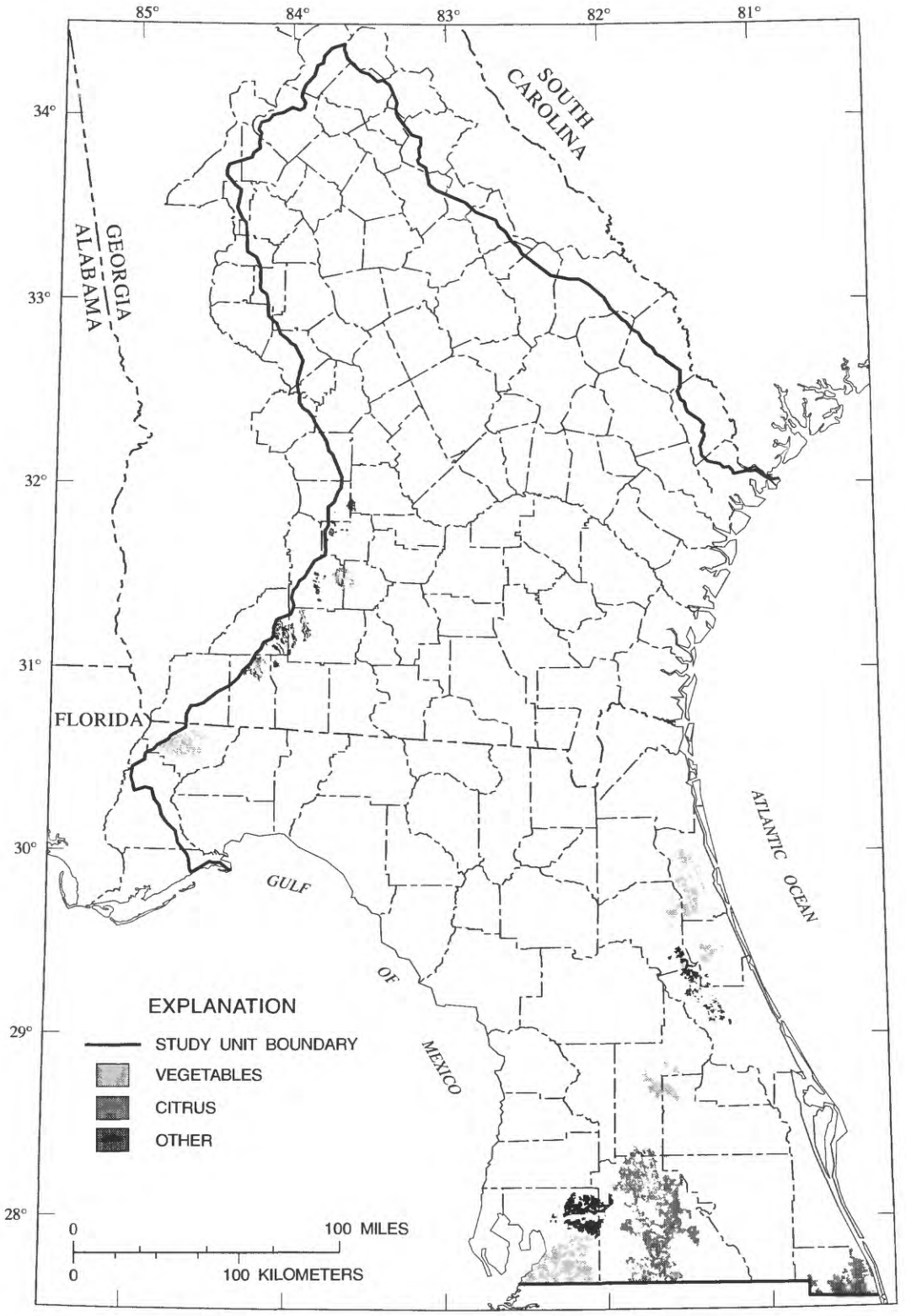

Figure 10. General locations of the more intensively irrigated agricultural areas in the Georgia-Florida Coastal Plain study unit, 1990.

The decrease is a result of many factors including a change by commercial and industrial users from self-supplied to obtaining water from public-supply systems, increases in water conservation practices and restrictions on withdrawals, and a change in the overall economic base throughout the area from manufacturing to services and tourism. Furthermore, because of the increasing cost of treating and discharging industrial wastewater coupled with the threat of saltwater intrusion in the coastal areas, many industries obtain water from a public supplier and/or reuse (recycle) as much water as possible. Florida accounted for nearly 62 percent and Georgia 38 percent of the water withdrawn for self-supplied commercial-industrial use in the study unit during 1990.

Nearly 63 percent of the water withdrawn for self-supplied commercial-industrial purposes was used for industrial manufacturing or processing, 31 percent for mining uses, and 6 percent for commercial needs. Large pulp and paper mills and related chemical processing facilities are primarily located in northern Florida (Duval, Nassau, Putnam, and Taylor Counties) and eastern Georgia (Camden, Chatham, Glynn, Liberty, Lowndes, and Wayne Counties). Limerock and phosphate mining operations and related chemical processing facilities are primarily located in southwestern Florida (Hernando, Hillsborough, Polk, and Sumter Counties) while other mining (sand, stone, or clay production) occurs in Johnson, Twiggs, and Washington Counties (Georgia) and Clay, Hamilton, and Putnam Counties (Florida). The general locations of the 20 self-supplied commercial-industrial facilities within the study unit that withdrew more than 10 Mgal/d during 1990 are shown in figure 9.

Ground water is the primary source for commercial-industrial self-supplied water throughout the study unit because it is readily available, is of good quality in most areas, and usually requires very little treatment before use. In 1990, ground water withdrawn for commercial-industrial self-supplied use in the study unit totaled about 802 Mgal/d (table 1 and fig 6). The Floridan aquifer system supplied 93 percent (742 Mgal/d) of the ground-water withdrawn for self-supplied commercial-industrial use in the study unit for 1990 (table 2). The remaining water was withdrawn from surficial aquifers or other aquifers. Polk County withdrew the largest amount of ground water (143 Mgal/d) for commercial-industrial purposes in 1990 (table 4). In eastern Georgia, Bryan, Camden, Chatham, Liberty, McIntosh, and Wayne Counties and in northeast Florida, Duval, Nassau, and Putnam Counties, more than 300 Mgal/d of ground water was withdrawn for pulp and paper production during 1990. All of this water was withdrawn from the Floridan aquifer system.

Surface water is the primary source for commercial-industrial self-supplied purposes in the extreme northwestern part of the study unit. Throughout the remaining areas of the study unit, surface water is only used by a handful of industries. In 1990, surface water withdrawn for commercial-industrial self-supplies in the study unit totaled 60 Mgal/d (table 1 and fig. 6). Bibb and Laurens Counties in Georgia accounted for more than 40 percent of the surface water withdrawn for commercial-industrial purposes in 1990 (table 4). Most surface water used for commercial-industrial purposes was withdrawn from rivers, streams, canals, or lakes within the study unit. Surface water withdrawn in the study unit was primarily used for cooling or washing purposes.

Agriculture

Water withdrawn for agricultural purposes (including water used for irrigation, livestock, fish farming, and frost or freeze protection) in the Georgia-Florida Coastal Plain study unit in 1990 totaled 1,293 Mgal/d (table 1), of which 69 percent was ground water and the 31 percent was surface water. Withdrawals for agricultural purposes within the study unit increased 3 percent from 1985 to 1990 and 7 percent from 1980 to 1990 (table 3 and fig. 7). Part of the increase was a result of an increase in water withdrawals for citrus, primarily due to an increase in acreage from replanting freeze-damaged groves in the extreme southern portions of the district (Hillsborough, Indian River, and Polk Counties). However, citrus acreage in the study unit decreased 6 percent (0.017 million acres) between 1985 and 1990, as losses occurred in Lake, Orange, Pasco, Seminole and Volusia Counties. Additionally, increases in vegetable (truck crops) and ornamentals (nursery) acreage occurred in several areas between 1980 and 1990, resulting in increased water usage. Florida accounted for 81 percent and Georgia 19 percent of the water withdrawn for agricultural purposes in the study unit during 1990.

An estimated 1.254 million acres were irrigated within the study unit during 1990, with 76 percent irrigated by sprinkler or low pressure systems and

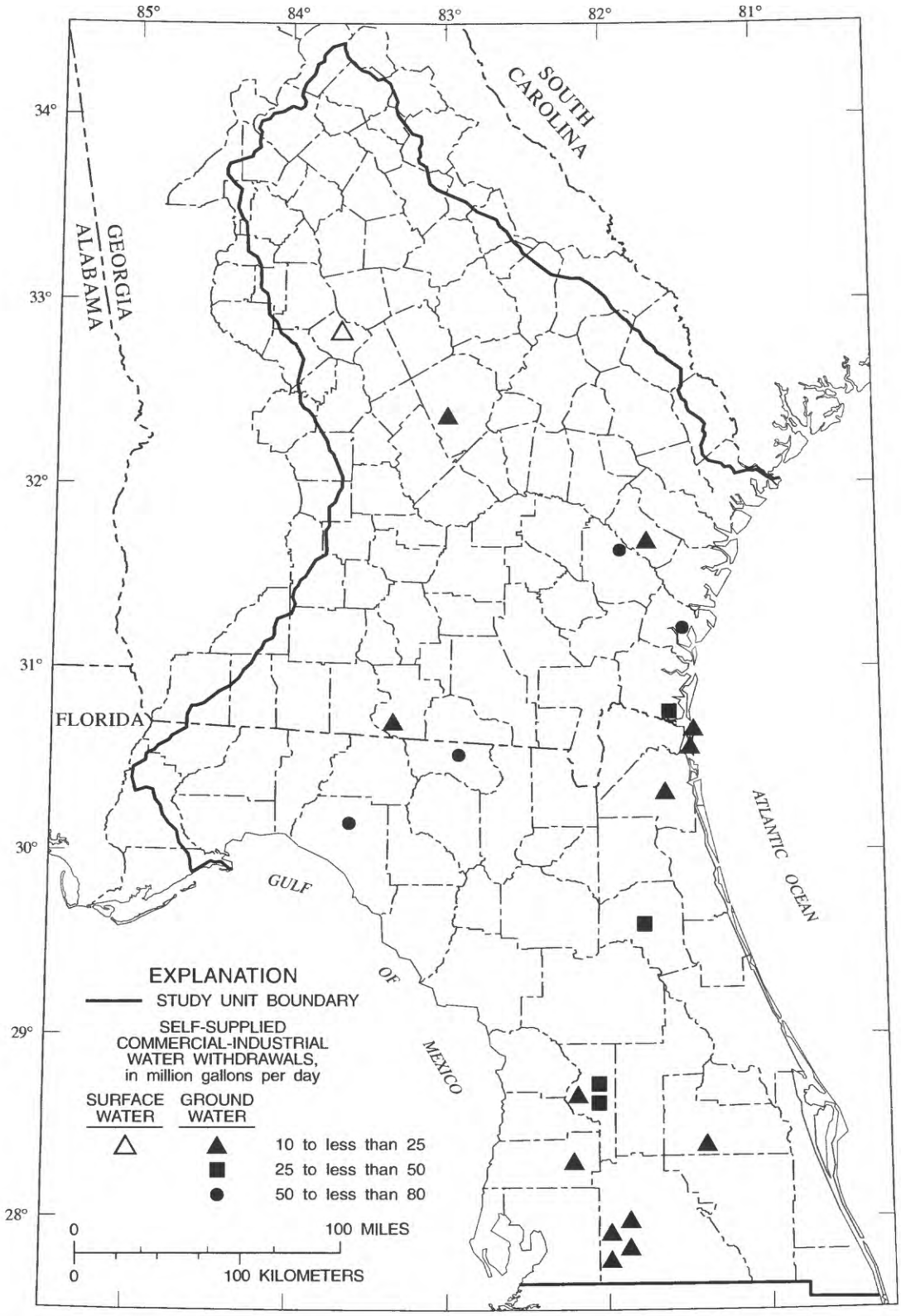

Figure 9. General locations of the largest self-supplied commercial-industrial facilities in the Georgia-Florida Coastal Plain study unit, 1990.

(Leon County). The use of reclaimed wastewater in the study unit has increased substantially over the past ten years due to the stress imposed on the resources caused by an increase in water demand along with the need to better dispose of treated wastewater.

Thermoelectric Power Generation

Freshwater withdrawn for thermoelectric power generation in the Georgia-Florida Coastal Plain study unit in 1990 totaled nearly 1,552 Mgal/d (table 1), of which 99 percent was surface water and only 1 percent was ground water. Freshwater withdrawn (fresh) for thermoelectric power generation within the study unit decreased 2 percent from 1985 to 1990 and 26 percent from 1980 to 1990 (table 3 and fig. 7). The decreases in water withdrawn for thermoelectric power generation is a result of the recirculation of cooling water and the building of newer, more efficient facilities. Since 1970, many powerplants in Florida and Georgia recycling their once-through cooling water through ponds and only withdrawal water to augment or supplement these ponds. Also, many of the powerplants built between 1970 and 1990 were built along the coast and use saline water for cooling purposes or were built with cooling towers for once-through cooling purposes (Marella, 1995). Furthermore, most of the older inefficient powerplants have been phased out or are used for stand-by purposes only, while the power generation capacities of the newer, more efficient facilities have increased substantially. Currently, most of the water withdrawn for thermoelectric power generation purposes within the study unit is from saline surface-water sources (6,919 Mgal/d) and is exclusively used for once-through cooling. Georgia accounted for 75 percent and Florida 25 percent of the freshwater withdrawn for thermoelectric power generation in the study unit during 1990. A total of 34 thermoelectric power facilities (fig. 11) and 7 hydroelectric powerplants were located and operated within the study unit in 1990. Power generated by these 41 facilities during 1990 totaled 119,860 gigawatthours.

Most of the water used for thermoelectric power generation within the study unit is surface water used for once-through cooling and is returned to the source with little or no consumption. Surface water is the primary source of water for cooling purposes because a high volume of water is needed and the quality of the water is not critical. In 1990, surface water withdrawn for thermoelectric purposes in the study unit totaled 1,535 Mgal/d (table 4). Nearly 68 percent of the surface water was withdrawn from the Oconee River in Putnam County Georgia, while the remaining surface water was withdrawn from the Ocmulgee, St. Johns, and Suwannee Rivers. Some of the saline sources include the Indian River, St. Johns River, St. Marks River, and the Turtle River, as well as other coastal water bodies. Most of these rivers are fresh water rivers, however in the areas were these rivers meet the coast, they are tidal influenced, and are most often a mix of fresh and saline waters. Because the percentage of fresh and saline water changes often, but is predominately saline, the withdrawals in these areas are considered saline. Several powerplants in Hillsborough, Orange, Osceola and Polk Counties used reclaimed wastewater directly or water from a wastewater-supplemented lake or reservoir for once-through cooling purposes.

Ground water withdrawn for thermoelectric power generation in the study unit totaled almost 17 Mgal/d in 1990. The majority of this water is used for boiler makeup or domestic purposes throughout the plant. Ground water is the primary source of water for boiler makeup and domestic purposes at facilities located in remote rural areas, while water from public supply is the primary source of water for these purposes at facilities in urban areas. The Floridan aquifer system supplied nearly all of the ground water for the powerplants in the study unit (table 2). Duval and Leon Counties accounted for the largest amount of ground-water withdrawn (5 Mgal/d and 4 Mgal/d respectively) (table 4).

Water Withdrawals by River Basin

Located within the Georgia-Florida Coastal Plain study unit are all or part of seven major river basins (fig. 12). These River basins include; the Ogeechee, Altamaha-St. Marys, St. Johns, Southern Florida, Peace-Tampa Bay, Suwannee, and the Ochlockonee (Seaber and others, 1987). Only the Altamaha-St. Marys, Suwannee, Ochlockonee and the Ogeechee basins are entirely within the study unit; the others are only partially in the study unit. The seven basins are also identified as subregions by the USGS. Within these major river basins are smaller divisions (cataloging units) which provide further detail on the each basin. The cataloging unit provides the greatest level of detail on each basin, as these units divide the river into smaller drainage sections or tributaries.

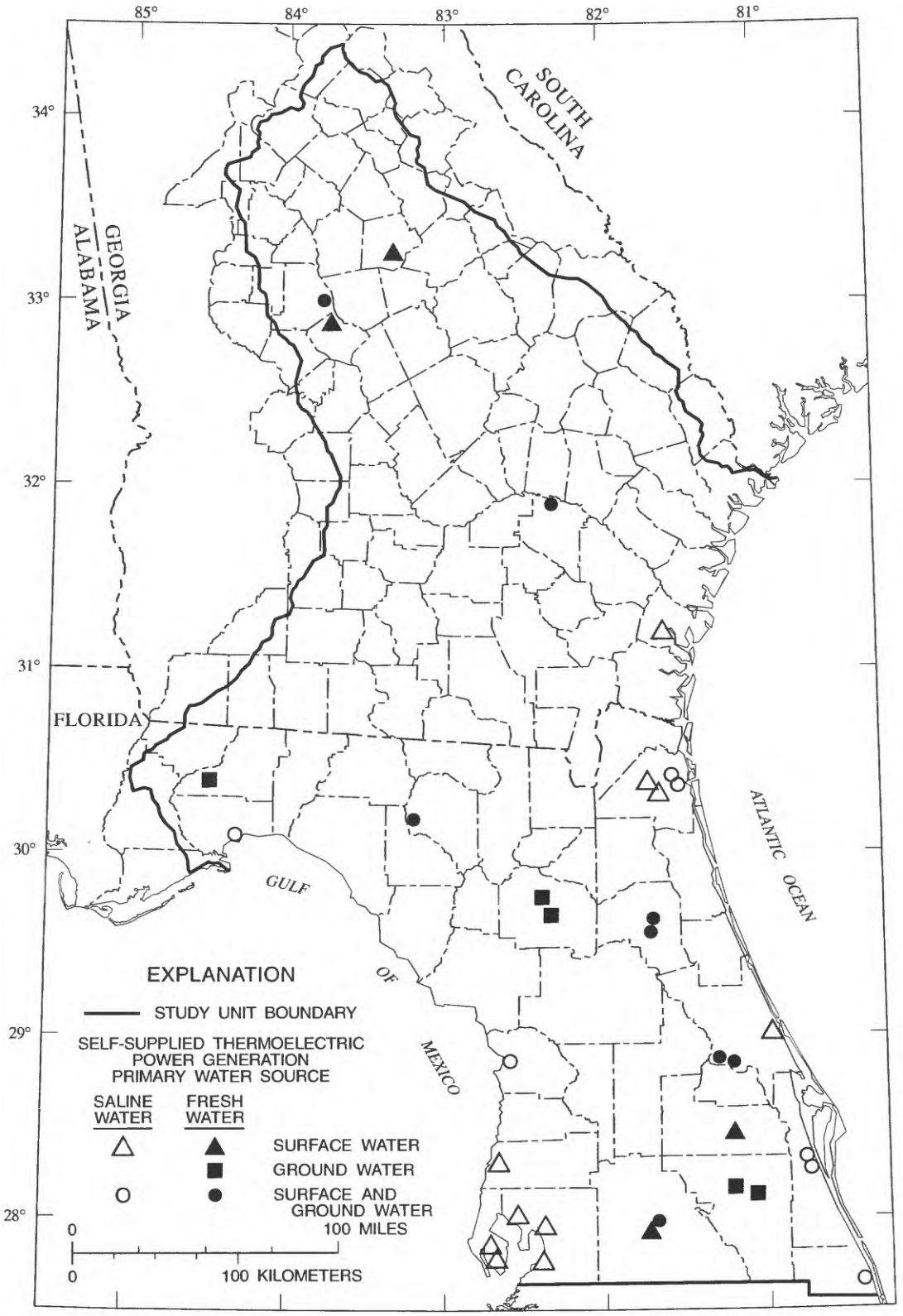

Figure 11. General locations of the self-supplied thermoelectric power generation facilities in the Georgia-Florida Coastal Plain study unit, 1990.

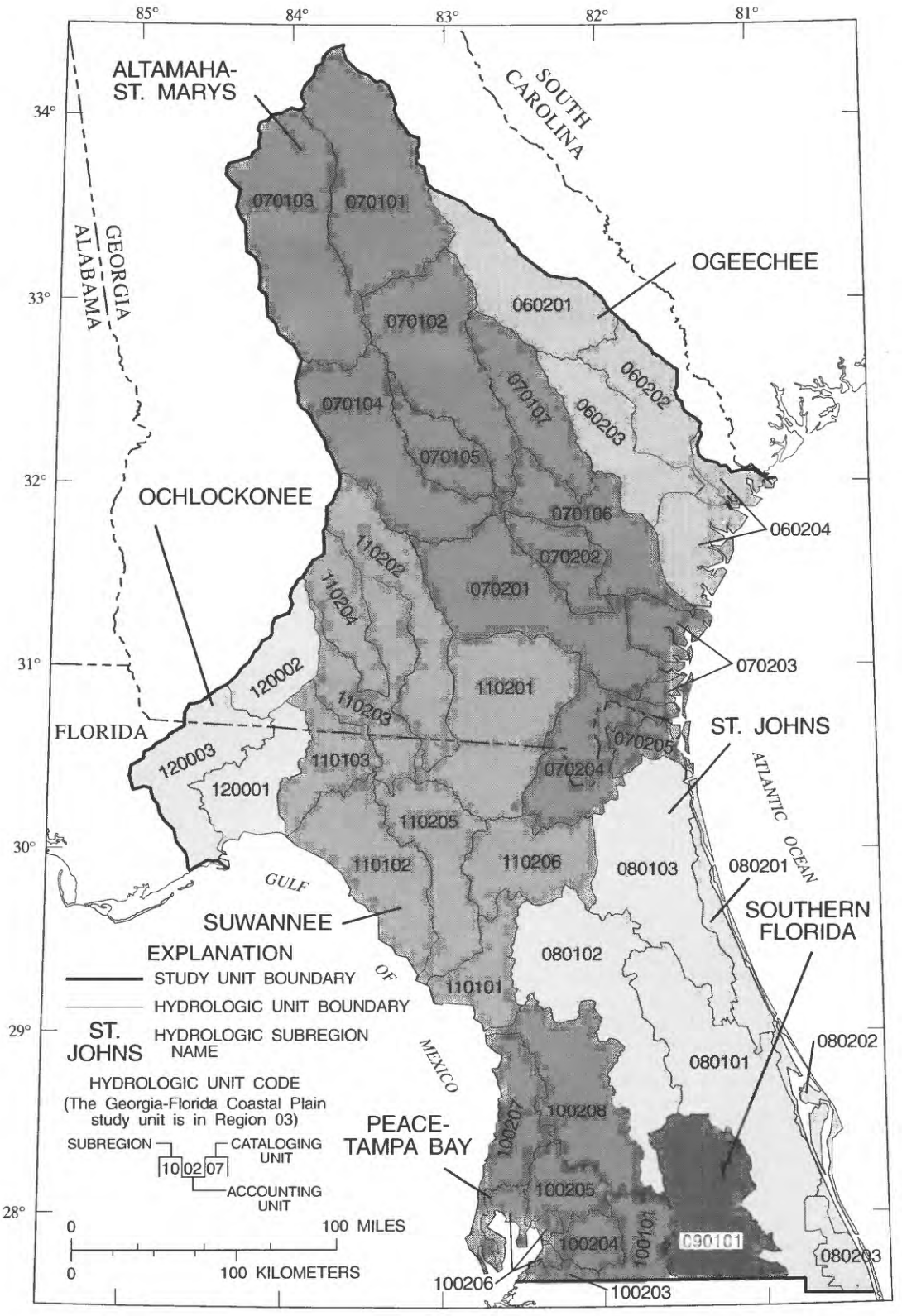

Figure 12. Locations of major river basins in the Georgia-Florida Coastal Plain study unit.

For example, within the Ochlockonee River basin are the following cataloging units; Apalachee Bay-St. Marks, Upper Ochlockonee River, and the Lower Ochlockonee River. Located within the seven major river basins (subregions) are all or part of 42 cataloging units (fig 12). The names and cataloging unit numbers of each major river basin are as follows:

Ogeechee (4 units)	
Upper Ogeechee River	03060201
Lower Ogeechee River	03060202
Canoochee River	03060203
Ogeechee Coastal	03060204
Altamaha-St. Marys (12 units)	
Upper Oconee River	03070101
Lower Oconee River	03070102
Upper Ocmulgee River	03070103
Lower Ocmulgee River	03070104
Little Ocmulgee River	03070105
Altamaha River	03070106
Ohoopee River	03070107
Satilla River	03070201
Little Satilla River	03070202
Cumberland - St. Simons Coastal	03070203
St. Marys River	03070204
Nassau River	03070205
St. Johns (6 units)	
Upper St. Johns River	03080101
Oklawaha River	03080102
Lower St. Johns River	03080103
Daytona - St. Augustine Coastal	03080201
Cape Canaveral Coastal	03080202
Vero Beach Coastal	03080203
Southern Florida (1 unit)	
Kissimmee River	03090101
Peace-Tampa Bay (7 units)	
Peace River	03100101
Little Manatee River	03100203
Alafia River	03100204
Hillsborough River	03100205
Tampa Bay	03100206
Crystal - Pithlachascotee	03100207
Withlacoochee River	03100208
Suwannee (9 units)	
Waccasassa River	03110101
Econfina - Steinhatchee	03110102
Aucilla River	03110103
Upper Suwannee River	03110201
Alapaha River	03110202
Withlacoochee River	03110203
Little River	03110204
Suwannee--Continued	
Lower Suwannee River	03110205
Santa Fe River	03110206
Ochlockonee (3 units)	
Apalachee River	03120001
Upper Ochlockonee River	03120002
Lower Ochlockonee River	03120003

Of the 42 cataloging units, 36 are entirely within the study unit, and 6 are partially within the study unit (Upper St. Johns River, Vero Beach Coastal, Kissimmee River, Peace River, Little Manatee River, and Tampa Bay). These cataloging units are shown on the USGS Hydrologic Unit Map, 1:500,000 scale (1974, 1975) for the State's of Florida and Georgia (USGS, 1975) and detailed in Seaber and others (1987).

The Suwannee River basin covers the largest land area of the major river basins in the study unit (26 percent), followed by the Altamaha-St. Marys River basin (23 percent), and the St. Johns River basin (22 percent). The Altamaha-St. Marys and the Suwannee river basins are entirely within the study unit, whereas a small part of the St. Johns River basin (2 percent) is not within the study unit. The Altamaha-St. Marys and the Suwannee river basin drain a part of both Georgia and Florida. The St. Johns River basin was the most populated basin in the study unit in 1990 (3.087 million), followed by the Peace-Tampa Bay River basin (2.644 million), and the Altamaha-St. Marys River basin (2.130 million) (table 5). Within the St. Johns River basin is the part of Orlando (Orange County) MSA as well as metropolitan areas that run along the east coast of Florida from Jacksonville (Duval County) to Melbourne (Brevard County) (fig 1. and fig. 12). Within the Peace-Tampa Bay River basin is the Tampa-St. Petersburg-Clearwater MSA, and within the Altamaha-St. Marys River basin is a large part of the Atlanta MSA.

The most populated cataloging unit in the study unit in 1990 was the Upper Ocmulgee River (1.188 million), followed by the Upper St. Johns River (0.961 million), and the Lower St. Johns River (0.873 million) (app. 2, table A). The Upper Ocmulgee River cataloging unit includes a large part of the metropolitan Atlanta area, the Upper St. Johns River includes a large part of the Orlando area, and the Lower St. Johns River includes most of the Jacksonville area. The Upper Ocmulgee River cataloging unit had the most people served by surface water for public supply (0.980 million) and the Upper St. Johns River had the most people served by ground water for public supply (0.876 million) in 1990 (app. 2, table A).

Table 5. Population and freshwater withdrawals by major river basin (subregion) in the Georgia-Florida Coastal Plain study unit, 1990

Hydrological unit Major river basin - subregions[1]			Withdrawals, in million gallons per day		
Subregion name	unit number	Population	Ground water	Surface water	Total water
Ogeechee	0306	352,130	78.74	22.08	100.82
Altamaha-St. Marys	0307	2,130,390	445.84	1,338.25	1,784.09
St. Johns[(2)]	0308	3,087,259	970.50	457.88	1,428.38
Southern Florida[(2)]	0309	255,660	163.16	10.23	173.39
Peace-Tampa Bay[(2)]	0310	2,643,527	830.28	177.05	1,007.33
Suwannee	0311	486,370	318.97	161.84	480.81
Ochlockonee	0312	312,050	80.40	20.09	100.49
Totals		9,267,386	2,887.89	2,187.42	5,075.31

[(1)] Refer to figure 12 for the location of subregion (Seaber and others, 1987).

[(2)] Indicates the subregion is partially in the study unit, and the data shown is for the part withinthe study unit only.

The Altamaha-St. Marys River basin accounted for the largest amount of water withdrawn in the Georgia-Florida Coastal Plain study unit during 1990 (1,784 Mgal/d), followed by the St. Johns River basin (1,428 Mgal/d) and the Peace-Tampa Bay River basin (1,007 Mgal/d) (table 5). The Altamaha-St. Marys River basin accounted for the largest amount of surface water withdrawn in 1990 (61 percent), followed by the St. Johns River basin (21 percent) (fig. 13). The St. Johns River basin accounted for the largest amount of ground water withdrawn in 1990 (34 percent), followed by the Peace-Tampa Bay basin (29 percent) (fig. 13).

The most surface water withdrawn in the study unit during 1990 (1,077 Mgal/d) occurred in the Upper Oconee River cataloging unit (03070101). The majority (97 percent) of the surface water in this cataloging unit was withdrawn for thermoelectric power generation purposes (app. 2, table B). The most ground water withdrawn in the study unit during 1990 (331 Mgal/d) occurred in the Upper St. Johns River cataloging unit (03080101). The majority (57 percent) of the ground water in this cataloging unit was withdrawn for public-supply purposes. The following cataloging units accounted for the largest amount of

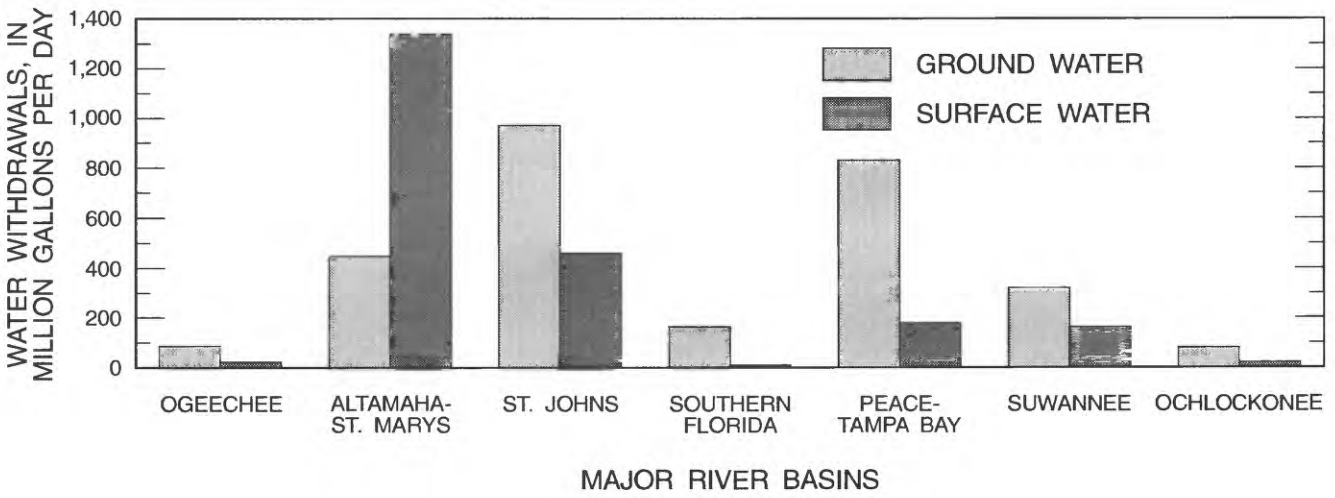

Figure 13. Ground- and surface-water withdrawals by major river basin in the Georgia-Florida Coastal Plain study unit, 1990.

water withdrawn for the following categories: public supply, Upper St. Johns River (206 Mgal/d); self-supplied domestic, Oklawaha River (23 Mgal/d); self-supplied commercial-industrial, Peace River (96 Mgal/d); agriculture, Vero Beach Coastal (184 Mgal/d); thermoelectric power generation, Upper Oconee River (1,047 Mgal/d) (app. 2, table B). The Upper Ocmulgee River cataloging unit withdrew more than 74 Mgal/d for public supply, but imported an additional 104 Mgal/d from the Chattahoochee River.

TREATED WASTEWATER DISCHARGE IN THE GEORGIA-FLORIDA COASTAL PLAIN STUDY UNIT

Once water is withdrawn and used it either evaporates, transpires, is incorporated into products or crops, consumed by humans or livestock, or runs off as surface water or percolates into the ground. After being used, some water is collected and treated before being released. Treatment can be as simple as a settling process or as complete as advanced treatment. Treated wastewater discharged within the Georgia-Florida Coastal Plain study unit was estimated at nearly 1,187 Mgal/d in 1990. This includes wastewater discharged by domestic (municipal) and industrial facilities, as well as releases from septic tanks. Of the total water treated, 58 percent was discharged as effluent directly into surface water and 42 percent was discharged to ground water. Surface-water disposal includes effluent outfalls into bays, rivers, streams, ditches, and wetlands. Ground-water disposal includes effluent discharges or releases through drain fields, injection wells, land application systems (spray fields and reuse systems), and percolation ponds. Pinellas and Orange Counties each discharged more than 100 Mgal/d of treated wastewater during 1990 (fig. 14). Discharge from powerplants, mining dewatering, or stormwater retention are not included in these wastewater discharge totals, primarily because this water is generally not treated and accurate or measured values are difficult to obtain.

Domestic Discharges

Domestic wastewater facilities are those systems that receive or dispose of municipal wastewater derived principally from residential dwellings, business or commercial buildings, institutions, and some industrial facilities (Florida Department of Environmental Regulation, 1991). For this report, 744 domestic wastewater facilities were inventoried and and these served an estimated 5.1 million people (table 6). Pinellas, Hillsborough, Orange, and Duval Counties had the greatest number of people served by domestic wastewater facilities in the study unit. These four counties accounted for 60 percent of the population served by domestic wastewater facilities. Of the total number of systems inventoried, 571 systems were in Florida (app. 3, table A), and 223 systems were in Georgia (app. 3, table B). Most of these systems had a capacity of more than 0.04 Mgal/d or an actual discharge of more than 0.01 Mgal/d during 1990. Tables list design or permitted capacity and actual discharge as well as discharge method.

Domestic wastewater discharged in the Georgia-Florida Coastal Plain study unit totaled nearly 789 Mgal/d. Approximately 61 percent (484 Mgal/d) of the water was discharged to surface water and 39 percent (305 Mgal/d) was discharged to ground water. Land application systems (drain fields, percolation ponds, spray fields, and reuse irrigation systems) accounted for 75 percent of the water released to the ground while 25 percent was discharged directly through injection wells. Overall, 16 domestic wastewater facilities within the study unit discharged more than 10 Mgal/d during 1990 (fig. 15). Several large land application systems are located within the study unit. These include the Clayton County (Georgia) Water Authority, E.L. Huie Jr., Land Application Facility, and the City of Tallahassee, Southeast Spray Irrigation Field. The E.L Huie facility discharged about 14 Mgal/d of treated effluent in 1990 on 3,700 acres of pine forest (Clayton County Water Authority, undated) in southeastern Clayton County. The City of Tallahassee discharged about 12 Mgal/d of treated effluent in 1990 (Marella, 1994, p. 35) on 1,840 acres of cover crops including corn, sorghum, soybeans, and rye (Pruitt and others, 1988, p. 2). Two large reuse systems are also located within the study unit. These include the city of St. Petersburg, which used about 21 Mgal/d of treated wastewater effluent for irrigation (residential and commercial lawns, and parks and golf courses) throughout Pinellas County in 1990, and the city of Orlando, which used about 20 Mgal/d of treated wastewater effluent for the irrigation of citrus throughout Lake and Orange Counties in 1990. The City of St. Petersburg along with Pinellas County Water and Sewer each discharged about 20 Mgal/d of treated wastewater effluent in 1990 through injection

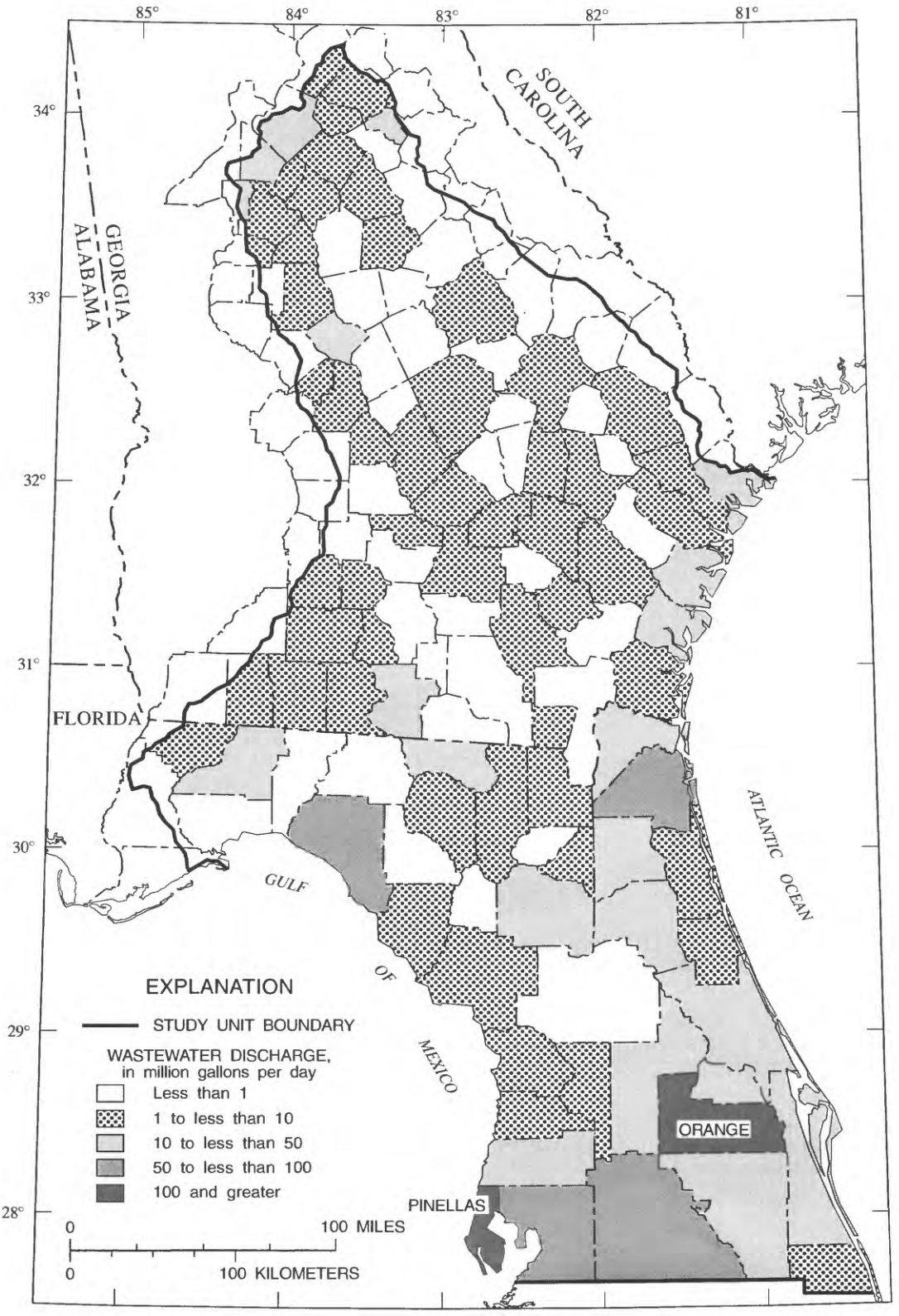

Figure 14. Treated wastewater discharge by county in the Georgia-Florida Coastal Plain study unit, 1990.

Table 6. Estimated wastewater discharge, population served, and number of septic tanks by county in the Georgia-Florida study unit, 1990

[Modified from Marella, 1994, U.S. Bureau of Census, 1993a and 1993b; Mgal/d, million gallons per day; Fl, Florida; Ga, Georgia; Industrial wastewater data was unavailable for the counties in Georgia for 1990]

County	Domestic wastewater		Industrial wastewater		Septic tanks	
	Number of facilities	Discharge in Mgal/d	Number of facilities	Discharge in Mgal/d	Number of septic tanks	Releases in Mgal/d
Alachua (Fl)	10	14.83	1	0.60	21,074	2.95
Appling (Ga)	0	0.00	0	0.00	4,613	0.65
Atkinson (Ga)	1	0.24	0	0.00	1,407	0.20
Bacon (Ga)	1	0.33	0	0.00	2,226	0.31
Baker (Fl)	3	0.81	0	0.00	4,474	0.63
Baldwin (Ga)	1	4.84	0	0.00	5,753	0.81
Barrow (Ga)	2	0.52	0	0.00	7,903	1.11
Ben Hill (Ga)	1	3.09	0	0.00	2,557	0.36
Berrien (Ga)	3	0.29	0	0.00	3,004	0.42
Bibb (Ga)	3	27.27	0	0.00	9,077	1.27
Bleckley (Ga)	1	0.39	0	0.00	2,358	0.33
Bradford (Fl)	3	2.02	1	6.80	5,953	0.83
Brantley (Ga)	1	0.01	0	0.00	3,904	0.55
Brevard (Fl)	33	42.78	0	0.00	44,874	6.28
Brooks (Ga)	0	0.00	0	0.00	3,858	0.54
Bryan (Ga)	2	0.65	0	0.00	3,843	0.54
Bulloch (Ga)	1	4.02	0	0.00	8,873	1.24
Burke (Ga) (b)	1	0.17	0	0.00	1,243	0.17
Butts (Ga)	3	0.63	0	0.00	3,740	0.52
Camden (Ga)	3	1.56	0	0.00	4,586	0.64
Candler (Ga)	0	0.00	0	0.00	1,768	0.25
Charlton (Ga)	1	0.22	0	0.00	2,013	0.28
Chatham (Ga) (b)	3	2.72	0	0.00	7,430	1.04
Citrus (Fl)	16	2.57	0	0.00	35,490	4.97
Clarke (Ga) (b)	3	10.72	0	0.00	7,183	1.01
Clay (Fl)	13	6.94	2	6.01	17,704	2.48
Clayton (Ga) (b)	4	30.11	0	0.00	3,638	0.51
Clinch (Ga)	1	0.67	0	0.00	1,100	0.15
Coffee (Ga)	0	0.00	0	0.00	6,871	0.96
Colquitt (Ga) (b)	4	2.96	0	0.00	7,359	1.03
Columbia (Fl)	1	1.69	0	0.00	12,743	1.78
Cook (Ga)	3	1.58	0	0.00	2,424	0.34
Crawford (Ga) (b)	0	0.00	0	0.00	1,630	0.23
Crisp (Ga) (b)	0	0.00	0	0.00	450	0.06
Decatur (Ga) (b)	0	0.00	0	0.00	1,210	0.17
De Kalb (Ga) (b)	3	29.74	0	0.00	11,850	1.66
Dixie (Fl)	2	0.26	0	0.00	5,622	0.79
Dodge (Ga)	3	0.91	0	0.00	4,517	0.63
Dooly (Ga) (b)	0	0.00	0	0.00	690	0.10
Duval (Fl)	22	68.03	5	9.77	65,114	9.12
Echols (Ga)	0	0.00	0	0.00	881	0.12
Effingham (Ga) (b)	0	0.00	0	0.00	1,890	0.26

Table 6. Estimated wastewater discharge, population served, and number of septic tanks by county in the Georgia-Florida study unit, 1990 —Continued

[Modified from Marella, 1994, U.S. Bureau of Census, 1993a and 1993b; Mgal/d, million gallons per day; Fl, Florida; Ga, Georgia; Industrial wastewater data was unavailable for the counties in Georgia for 1990]

County	Domestic wastewater		Industrial wastewater		Septic tanks	
	Number of facilities	Discharge in Mgal/d	Number of facilities	Discharge in Mgal/d	Number of septic tanks	Releases in Mgal/d
Emanuel (Ga)	2	1.38	0	0.00	4,672	0.65
Evans (Ga)	0	0.00	0	0.00	2,065	0.29
Flagler (Fl)	8	2.57	0	0.00	2,768	0.39
Franklin (Fl) (b)	0	0.00	0	0.00	100	0.01
Fulton (Ga) (b)	0	0.00	0	0.00	3,655	0.51
Gadsden (Fl) (b)	5	1.09	1	3.07	6,800	0.95
Gilchrist (Fl)	2	0.23	0	0.00	3,532	0.49
Glascock (Ga) (b)	1	0.04	0	0.00	708	0.10
Glynn (Ga)	3	8.10	0	0.00	9,897	1.39
Grady (Ga) (b)	1	0.95	0	0.00	4,399	0.62
Greene (Ga) (b)	3	0.63	0	0.00	2,480	0.35
Gwinnett (Ga) (b)	8	14.71	0	0.00	45,400	6.36
Hall (Ga) (b)	0	0.00	0	0.00	7,700	1.08
Hamilton (Fl)	3	0.68	1	16.65	2,198	0.31
Hancock (Ga)	1	0.09	0	0.00	2,488	0.35
Henry (Ga) (b)	10	1.82	0	0.00	13,860	1.94
Hernando (Fl)	16	4.71	0	0.00	28,943	4.05
Hillsborough (Fl)	49	79.43	8	5.46	78,911	11.05
Houston (Ga) (b)	3	8.03	0	0.00	9,058	1.27
Indian River (Fl)	16	4.55	1	0.25	19,360	2.71
Irwin (Ga)	0	0.00	0	0.00	2,097	0.29
Jackson (Ga) (b)	4	1.09	0	0.00	8,505	1.19
Jasper (Ga)	2	0.14	0	0.00	2,571	0.36
Jeff Davis (Ga)	3	0.87	0	0.00	2,898	0.41
Jefferson (Fl)	2	0.55	0	0.00	3,151	0.44
Jefferson (Ga) (b)	3	0.34	0	0.00	2,662	0.37
Jenkins (Ga) (b)	1	0.43	0	0.00	1,715	0.24
Johnson (Ga)	1	0.36	0	0.00	2,344	0.33
Jones (Ga)	1	0.16	0	0.00	5,791	0.81
Lafayette (Fl)	2	0.12	0	0.00	1,849	0.26
Lake (Fl)	32	7.99	3	0.56	36,188	5.07
Lamar (Ga) (b)	1	0.63	0	0.00	2,040	0.29
Lanier (Ga)	1	0.18	0	0.00	1,260	0.18
Laurens (Ga)	3	2.98	0	0.00	8,322	1.17
Leon (Fl)	7	16.37	0	0.00	22,090	3.09
Levy (Fl)	7	0.54	0	0.00	9,823	1.38
Liberty (Fl) (b)	1	0.11	0	0.00	920	0.13
Liberty (Ga)	0	0.00	0	0.00	5,507	0.77
Long (Ga)	1	0.02	0	0.00	2,021	0.28
Lowndes (Ga)	5	7.11	0	0.00	9,723	1.36
Mc Intosh (Ga)	0.23	0	0.00	3,279	0.46	
Macon (Ga) (b)	0	0.00	0	0.00	130	0.02
Madison (Fl)	1	0.63	0	0.00	4,528	0.63
Madison (Ga) (b)	0	0.00	0	0.00	0	0.00

Table 6. Estimated wastewater discharge, population served, and number of septic tanks by county in the Georgia-Florida study unit, 1990 —Continued

[Modified from Marella, 1994, U.S. Bureau of Census, 1993a and 1993b; Mgal/d, million gallons per day; Fl, Florida; Ga, Georgia; Industrial wastewater data was unavailable for the counties in Georgia for 1990]

County	Domestic wastewater		Industrial wastewater		Septic tanks	
	Number of facilities	Discharge in Mgal/d	Number of facilities	Discharge in Mgal/d	Number of septic tanks	Releases in Mgal/d
Marion (Fl)	30	6.83	0	0.00	59,532	8.33
Mitchell (Ga) (b)	1	0.76	0	0.00	655	0.09
Monroe (Ga) (b)	2	0.68	0	0.00	4,240	0.59
Montgomery (Ga)	2	0.21	0	0.00	1,629	0.23
Morgan (Ga)	3	0.58	0	0.00	3,076	0.43
Nassau (Fl)	6	2.37	2	29.90	11,125	1.56
Newton (Ga)	1	2.99	0	0.00	9,491	1.33
Oconee (Ga)	0	0.00	0	0.00	5,591	0.78
Oglethorpe (Ga)(b)	0	0.00	0	0.00	345	0.05
Orange (Fl)	46	91.67	0	0.00	69,892	9.78
Osceola (Fl)	19	10.22	0	0.00	13,903	1.95
Pasco (Fl)	38	15.88	1	10.17	56,330	7.89
Peach (Ga) (b)	2	0.39	0	0.00	3,268	0.46
Pierce (Ga)	0	0.00	0	0.00	3,422	0.48
Pinellas (Fl)	26	104.24	0	0.00	13,317	1.86
Polk (Fl)	70	25.23	15	31.70	80,238	11.23
Pulaski (Ga)	2	1.16	0	0.00	1,696	0.24
Putnam (Fl)	4	2.47	1	37.22	24,850	3.48
Putnam (Ga)	2	0.61	0	0.00	4,974	0.70
Rockdale (Ga)	7	3.32	0	0.00	10,455	1.46
St. Johns (Fl)	17	5.07	0	0.00	17,939	2.51
Screven (Ga) (b)	1	0.02	0	0.00	2,000	0.28
Seminole (Fl)	18	26.07	0	0.00	26,284	3.68
Spalding (Ga) (b)	1	1.12	0	0.00	4,815	0.67
Sumter (Fl)	8	0.84	0	0.00	11,638	1.63
Suwannee (Fl)	4	0.78	1	1.00	8,792	1.23
Taliaferro (Ga)(b)	1	0.01	0	0.00	0	0.00
Tattnall (Ga)	3	0.65	0	0.00	3,926	0.55
Taylor (Fl)	1	0.79	1	53.90	5,780	0.81
Telfair (Ga)	5	0.87	0	0.00	2,056	0.29
Thomas (Ga)	4	3.47	0	0.00	6,977	0.98
Tift (Ga)	2	4.37	0	0.00	5,032	0.70
Toombs (Ga)	4	2.25	0	0.00	3,878	0.54
Treutlen (Ga)	1	0.30	0	0.00	1,286	0.18
Turner (Ga) (b)	2	0.04	0	0.00	1,558	0.22
Twiggs (Ga)	1	0.14	0	0.00	2,946	0.41
Union (Fl)	2	0.43	0	0.00	1,899	0.27
Upson (Ga) (b)	0	0.00	0	0.00	0	0.00
Volusia (Fl)	25	29.82	2	0.06	60,843	8.52
Wakulla (Fl)	3	0.10	0	0.00	5,645	0.79
Walton (Ga)	5	2.14	0	0.00	7,931	1.11
Ware (Ga)	1	2.81	0	0.00	6,529	0.91
Warren (Ga) (b)	3	0.33	0	0.00	920	0.13
Washington (Ga)	2	1.11	0	0.00	4,065	0.57

Table 6. Estimated wastewater discharge, population served, and number of septic tanks by county in the Georgia-Florida study unit, 1990 —Continued

[Modified from Marella, 1994, U.S. Bureau of Census, 1993a and 1993b; Mgal/d, million gallons per day; Fl, Florida; Ga, Georgia; Industrial wastewater data was unavailable for the counties in Georgia for 1990]

County	Domestic wastewater		Industrial wastewater		Septic tanks	
	Number of facilities	Discharge in Mgal/d	Number of facilities	Discharge in Mgal/d	Number of septic tanks	Releases in Mgal/d
Wayne (Ga)	1	1.53	0	0.00	5,117	0.72
Wheeler (Ga)	2	0.21	0	0.00	1,389	0.19
Wilcox (Ga)	3	0.61	0	0.00	1,944	0.27
Wilkinson (Ga)	1	0.27	0	0.00	3,008	0.42
Worth (Ga) (b)	0	0.00	0	0.00	3,230	0.45
Totals	744	789.19	46	213.12	1,318,761	184.63

wells into an unused part of a deep aquifer (Marella, 1994, p. 44). Pinellas, Hillsborough, Orange, and Duval Counties discharged the most treated effluent from domestic wastewater facilities (table 6) which accounted for 42 percent of the total discharged effluent in the study unit during 1990.

Industrial Discharges

Industrial wastewater facilities are those that produce, treat or dispose of wastewater not otherwise defined primarily as domestic wastewater; including the runoff and leachate from areas that receive contaminants associated with industrial or commercial storage, handling, or processing (Florida Department of Environmental Regulation, 1991). For this report, only industrial wastewater systems in Florida were inventoried because data for the systems in Georgia were not readily available at the time of this publication. Nearly all of these systems had a capacity of more than 0.04 Mgal/d. In Florida, many of the industrial wastewater systems are permitted for large amounts of effluent discharge, but often discharge well below permitted capacities, discharge only seasonally, or do not discharge at all during a given year. This inventory did not include the discharge from the permitted thermoelectric power plants in Georgia or Florida that discharged water used for once-through cooling because it did not require treatment. Discharge from the dewatering and stormwater retention at the many mining operations in both States were also not included because much of this water does not require treatment and is most often unmeasured.

Industrial wastewater discharged in the Florida part of the Georgia-Florida Coastal Plain study unit totaled 213 Mgal/d. Nearly all (99.9 percent) of the wastewater was discharged to surface water. In Florida, Nassau, Polk, Putnam, and Taylor Counties each discharged 30 Mgal/d or more of industrial wastewater during 1990. The industrial wastewater discharged in Nassau, Putnam, and Taylor Counties is associated with the major pulp and paper manufacturing facilities, while the industrial wastewater discharged in Polk County is associated with food-processing facilities or chemical plants.

Septic Tanks

The use of septic tanks is common throughout the study unit, especially in rural areas. Septic tanks are mostly used for individual residents or small commercial establishments (churches, convenience stores, small motels, restaurants, and trailer parks, etc.) that are in rural or remote areas, or in urban areas that are not served by a domestic (municipal) wastewater facility. Water from septic tanks is generally released to the ground through a subsurface drain field (sometimes referred to as an absorption field) after natural biological treatment. In 1990, more than 1.3 million septic tanks were estimated in use within the study unit (U.S. Bureau of Census, 1993a and 1993b). These systems served nearly 4.2 million people in 1990. However, concentrations of septic tanks are common in highly urbanized counties, as housing growth often occurs in unincorporated areas surrounding larger cities (Marella, 1994 and Ayres Associates, 1987). Sometimes, these areas are not served by domestic wastewater (sewer) facilities. Of the four counties that had the most number of septic tanks in the study unit for 1990 (table 6), Polk, Hillsborough,

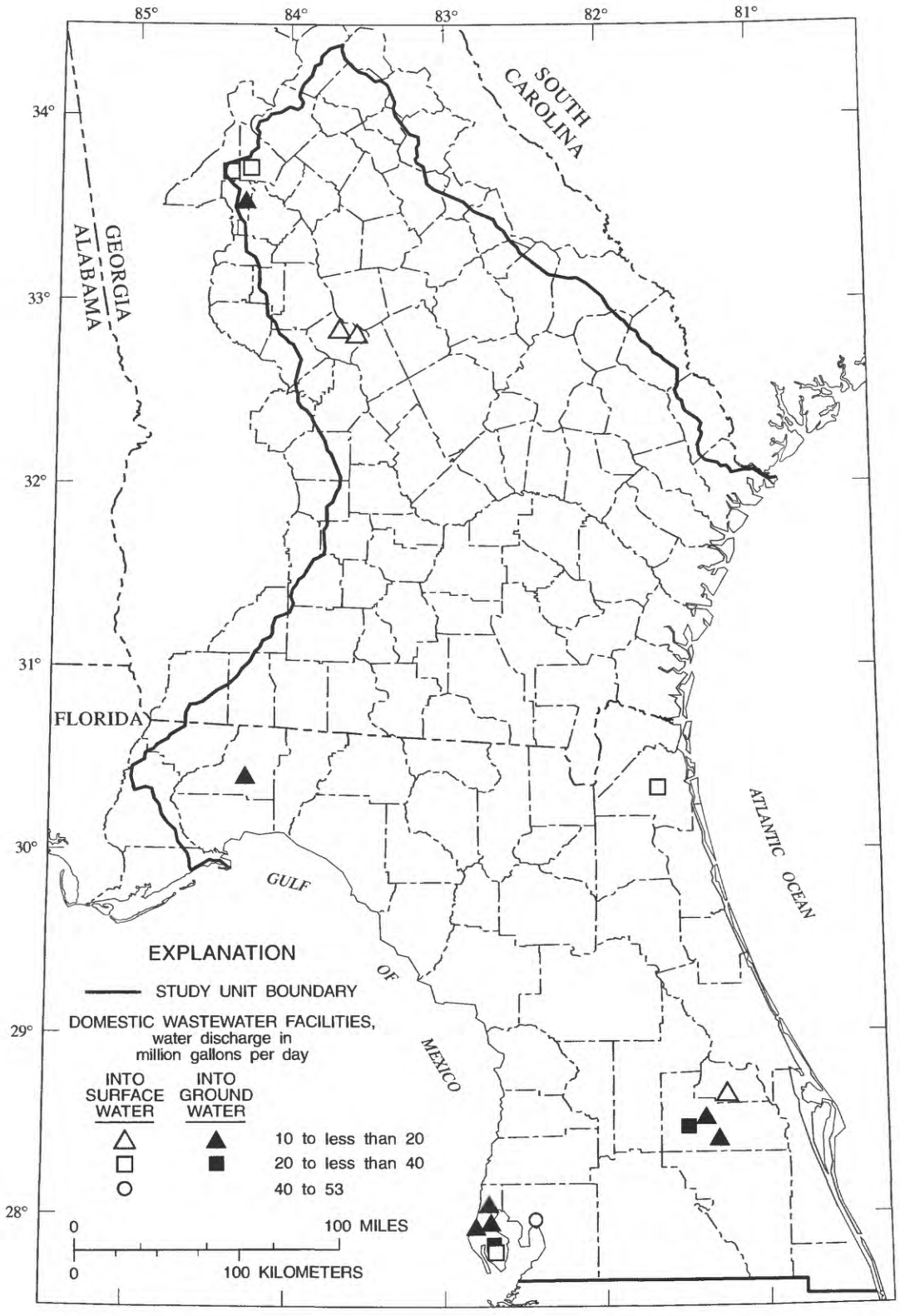

Figure 15. General locations of the largest domestic wastewater facilities in the Georgia-Florida Coastal Plain study unit, 1990.

Orange and Duval Counties all were located in the same county with a major city Lakeland, Tampa, Orlando, and Jacksonville, respectively. The density of the septic tanks in three of these areas are among the highest in Florida in 1990. The density of septic tanks in Duval County was 84 per mi^2 , Hillsborough County was about 75 per mi^2, and Orange County was 77 per mi^2 (Marella, 1994, p. 15). In Georgia, the counties with the highest density of septic tanks are also those that are in the Atlanta area. The density of septic tanks was highest in Gwinnett (140 per mi^2), Fulton (122 per mi^2), Rockdale (79 per mi^2), and DeKalb (69 per mi^2) Counties for 1990. However, because a large part of each of these counties is served by domestic wastewater facilities, the actual density of the septic tanks in the areas not served by domestic wastewater factilities is even greater. For those counties that were not entirely within the study unit, estimates of the number of septic tanks were based on the percentage of population in the county within the study unit.

Based on an average discharge of 55 gal/d (gallons per day) per person and 2.5 people per household, estimated water released from each septic tank would be about 140 gal/d (Tchobanoglous, 1991). Discharge from the 1.3 million septic tanks in the study unit for 1990 was approximately 185 Mgal/d. Most of the effluent is released to the soils through on-site subsurface drain fields that allow the water from the tank to percolate into the ground (usually into the surficial aquifers) or transpire to the atmosphere through surface vegetation. Polk and Hillsborough Counties had releases of treated effluent from septic tanks of more than 10 Mgal/d in 1990 (table 6).

SUMMARY

The Georgia-Florida Coastal Plain study unit covers approximately 62,000 square miles in the Southeastern United States. Located within the Georgia-Florida Coastal Plain study unit are all or part of 7 major river basins; the Ogeechee, Altamaha-St. Marys, St. Johns, Southern Florida, Peace-Tampa Bay, Suwannee, and the Ochlockonee. Only the Altamaha-St. Marys, Ochlockonee, Ogeechee, and the Suwannee basin's are entirely within the study unit, as the other 3 (St. Johns, Southern Florida, and Peace-Tampa Bay) are only partially in the study unit. The total population in the study unit for 1990 was estimated at 9.3 million. Located within the study unit are all or part of 4 of the Nation's top 50 most populated metropolitan statistical areas in 1990; Atlanta, Jacksonville, Orlando, and Tampa-St. Petersburg-Clearwater. Economic activities in the study unit include agriculture, commercial services, lumber and food processing, manufacturing (pulp and paper, textiles, electronics), mining (limerock and phosphate), transportation, and tourism.

Estimated freshwater withdrawn in the Georgia-Florida Coastal Plain study unit during 1990 was nearly 5,075 Mgal/d. Throughout this area of Georgia and Florida, ground water is the primary source of water. Ground water accounted for more than 57 percent (2,888 Mgal/d) of the water withdrawn in 1990. The Floridan aquifer system provided nearly 91 percent (2,630 Mgal/d) of the ground water withdrawn in the study unit during 1990. Several other aquifers in the study unit are tapped for ground water. Surficial aquifers throughout the study unit supplied about 3 percent of the ground water withdrawn. The other aquifers include the Intermediate aquifer system in Florida, the Upper and Lower Brunswick aquifers and the Claiborne, Cretaceous, and Crystalline Rock aquifers in Georgia accounted for the remaining 6 percent. The St. Johns River basin accounted for the largest amount of ground water withdrawn in 1990 (34 percent), followed by the Peace-Tampa Bay basin (29 percent).

Surface water accounted for nearly 43 percent (2,187 Mgal/d) of the water withdrawn in the study unit during 1990. Nearly 49 percent of the surface water used in the study unit was withdrawn from the Oconee River, primarily for thermoelectric power generation. Significant amounts of surface water were also withdrawn from the Altamaha, Hillsborough, Ocmulgee, St. Johns, and Suwannee Rivers during 1990. Surface water supplied 33 percent (1.7 million) of the study units population served by public supply in 1990. The Altamaha-St. Marys River basin accounted for the largest amount of surface water withdrawn in 1990 (61 percent), followed by the St. Johns River basin (21 percent).

Water withdrawn for public supply in the study unit in 1990 totaled about 1,139 Mgal/d, of which 83 percent (954 Mgal/d) was ground water and 17 percent (191 Mgal/d) was surface water. Ground water is the primary source for public-supply water in central and northern Florida as well as southeastern Georgia. The Floridan aquifer system supplied 94 percent (893 Mgal/d) of the ground water withdrawn for

public supply in the study unit. The Hillsborough River supplied 40 percent (76 Mgal/d) and the Ocmulgee and Oconee Rivers each supplied about 12 percent of the surface water withdrawn for public supply in the study unit. Water withdrawn for self-supplied domestic use in the study unit in totaled 230 Mgal/d in 1990. This water is derived almost exclusively from ground water. The Floridan aquifer system supplied 65 percent (151 Mgal/d) of the ground water withdrawn for self-supplied domestic use in the study unit, the surficial aquifers 21 percent, and other aquifers 14 percent. Ground water supplied drinking water to 77 percent (5.8 million) of the study unit's population served by public supply and 100 percent (1.8 million) of the study unit's self-supplied population.

Water withdrawn for self-supplied commercial-industrial use (including mining) in the study unit in 1990 totaled about 862 Mgal/d, of which 93 percent was ground water and 7 percent was surface water. The majority of the water withdrawn for self-supplied commercial-industrial use (63 percent) was for industrial manufacturing or processing, 31 percent for mining uses, and 6 percent for commercial needs. Water withdrawn for agriculture use (including water used for irrigation, livestock, fish farming, and frost or freeze protection) in the study unit in 1990 totaled 1,293 Mgal/d. Ground water is the primary source of water for agricultural needs (69 percent) throughout the study unit and the surface water withdrawn (31 percent) was predominately obtained from unnamed canals or ditches, local lakes or ponds, or small creeks or tributaries. An estimated 1.25 million acres were irrigated within the study unit, 76 percent by low pressure and sprinkler irrigation systems, and 24 percent by flood irrigation systems. Water withdrawn for thermoelectric power generation in the study unit in 1990 totaled nearly 1,552 Mgal/d, of which 99 percent was surface water and 1 percent was ground water. An additional 6,919 Mgal/d of saline surface water was withdrawn in the study unit for thermoelectric power generation during 1990, and was exclusively used for once-through cooling purposes.

Treated wastewater discharged within the Georgia-Florida Coastal Plain study unit was estimated at nearly 1,187 Mgal/d. Of the total water treated, 58 percent was discharged directly to surface water and 42 percent was discharged to ground water. Surface-water disposal includes effluent outfalls into bays, rivers, streams, ditches, and wetlands. Groundwater disposal includes effluent discharges or releases through drain fields, injection wells, land application systems (spray fields and reuse systems), and percolation ponds. Domestic wastewater discharged in the study unit totaled nearly 789 Mgal/d, industrial wastewater discharge totaled 213 Mgal/d, and releases from septic tanks totaled nearly 185 Mgal/d. An estimated 1.3 million septic tanks were in use within the study unit during 1990, and these systems served nearly 4.2 million people. Based on an average discharge of 55 gal/d per person per day and 2.5 people per household, water released from each septic tank would be about 140 gal/d.

SELECTED REFERENCES

Akioka, L. M., 1990, Georgia statistical abstract, 1990-91: Athens, University of Georgia, College of Business Administration, 483 p.

——— 1992, Georgia statistical abstract, 1992-93: Athens, University of Georgia, College of Business Administration, 535 p.

Atlanta Regional Commission, 1992, Water resources of the Atlanta region: Atlanta, April 1992, 1 sheet.

Ayres Associates, 1987, The impact of Florida's growth on the use of onsite sewage disposal systems: Tampa, Report to the Florida Department of Health and Rehabilitative Services, October, 1987, p. 59

Bachtel, D.C., and Boatright, S.R., 1994, The Georgia County Guide, tenth edition: Athens, Univeristy of Georiga, Department of Housing and Consumer Economics, Collegue of Family and Consumer Services, 200 p.

Berndt, M.P., Oaksford, E.T., Darst, M.R., and Marella, R.L., in press, Environmental setting and factors that affect water quality in the Georgia-Florida Coastal Plain study unit: U.S. Geological Survey Water-Resources Investigations Report 95-4268.

Buros, O.K., 1989, Desalting practices in the United States: American Water Works Association Journal, v. 18, no. 11, November, p. 38-42.

Campbell, K.M., 1986, The industrial minerals of Florida: Tallahassee, Florida Bureau of Geology Information Circular No. 102, 94 p.

Clarke, J.S., and Pierce, R.R., 1985, Georgia ground-water resources, *in* Moody, D.W., and others, compilers,National Water Summary 1984--Hydrologic events, selected water-quality trends, and ground-water resources: U.S. Geological Survey Water-Supply Paper 2275, p. 179-184.

Clayton County Water Authority, undated, E.L. Huie, Jr., Land Application Facility: Marrow, Ga., Clayton County Water Authority, 14 p.

Dietrich, T.S., 1978, The urbanization of Florida's population: An historical perspective of county growth 1830-1970: Gainesville, University of Florida, Bureau of Economic and Business Research, 211 p.

Dykes, G.M., and Conlon, W.J., 1989, Use of membrane technology in Florida: American Water Works Association Journal, v. 18, no. 11, November, p. 43-46.

Fanning, J.L., Doonan, G.A., and Montgomery, L.T., 1992, Water use in Georgia by county for 1990: Atlanta, Georgia Geologic Survey Information Circular 90, 116 p.

Fanning, J.L., Doonan, G.A., Trent, V.P., and McFarlane, R.D., 1991, Power generation and related water use in Georgia: Atlanta, Georgia Geologic Survey Information Circular 87, 112 p.

Fernald, E.A., and Patton, D.J., 1984, Water resources atlas of Florida: Tallahassee, Florida State University, 291 p.

Florida Department of Environmental Regulation, 1990, Drinking water standards, monitoring, and reporting: Chap. 17-550, 48 p.

——— 1991, Domestic wastewater facilities: Chap. 17-600, 70 p.

Georgia Department of Natural Resources, 1984, Water availability and use, Altamaha-St. Marys River basin Georgia, 1984: Atlanta, Georgia Environmental Protection Division, 99 p.

——— 1986, Water availability and use, Savannah River basin, Georgia, 1986: Atlanta, Georgia Environmental Protection Division, 95 p.

Hayes, L.R., Maslia, M.L., and Meeks, W.C., 1983, Hydrology and model evaluation of the principal artesian aquifer, Dougherty Plain, Southwest Georgia: Atlanta, Georgia Geologic Survey Bulletin 97, 93 p.

Hirsch, R.M., Alley, W.M., and Wilber, W.G., 1988, Concepts for a national water-quality assessment program: U.S. Geological Survey Circular 1021, 42 p.

Holder, W.H., and Schretter, H.A., 1986, The atlas of Georgia: Athens, University of Georgia, Institute of Community and Area Development, 273 p.

Holland, T.W., 1992, Water-use data collection techniques in the southeastern United States, Puerto Rico, and the U.S. Virgin Islands: Little Rock, Ark., U.S. Geological Survey Water-Resources Investigations Report 92-4028, 76 p.

Hughes, G.H., 1975, Perspective on use of fresh water for cooling systems of thermoelectric powerplants in Florida: U.S. Geological Survey Water-Resources Investigations 43-75, 30 p.

Izuno, F.T., and Haman, D.Z., 1987, Basic irrigation terminology: Gainesville, University of Florida, Institute of Food and Agricultural Sciences, Agricultural Engineering Fact Sheet AE-66, 4 p.

Kantrowitz, I.H., 1991, National Water-Quality Assessment Program - The Georgia-Florida Coastal Plain: U.S. Geological Survey Open-File Report 91-152, 2 p.

Leach, S.D., 1983, Source, use, and disposition of water in Florida, 1980: U.S. Geological Survey Water-Resources Investigations Report 82-4090, 337 p.

Libbey, M.M., 1991, Another road story: net migration in Georgia: *in* Georgia Business and Economic Conditions: Athens, University of Georgia, Selig Center for Economic Growth, vol. 51, no. 5, 16 p.

Marella, R.L., 1988, Water withdrawals, use and trends in Florida, 1985: U.S. Geological Survey Water-Resources Investigations Report 88-4103. 43 p.

——— 1990a, Florida water-supply and use: *in* Carr, J.E., and others, compilers, National water summary 1987--Hydrologic events and water supply and use: U.S. Geological Survey Water-Supply Paper 2350, p. 207-214.

——— 1990b, Public-supply water use in Florida, 1987: U.S. Geological Survey Open-File Report 90-596, 39 p.

——— 1992a, Factors that affect public-supply water use in Florida with a section on projected water use to the year 2020: U.S. Geological Survey Water-Resources Investigations Report 91-4123, 35 p.

——— 1992b, Water withdrawals, use and trends in Florida, 1990: U.S. Geological Survey Water-Resources Investigations Report 92-4140, 38 p.

——— 1993, Public-supply water use in Florida, 1990: U.S. Geological Survey Open-File Report 93-134, 46 p.

——— 1994, Estimated discharge of treated wastewater in Florida, 1990: U.S. Geological Survey Open-File Report 93-364, 53 p.

——— 1995, Water-use data by category, county, and water management district in Florida, 1950-90: U.S. Geological Survey Water-Resources Investigations Report 94-521, 88 p.

Marella, R.L., Fanning, J.L., and Mooty, W.S., 1993, Estimated use of water in the Apalachicola-Chattahoochee-Flint River basin during 1990, and trends in water use from 1970 to 1990: U.S. Geological Survey Water-Resources Investigations Report 93-4084, 45 p.

Pierce, R.R., 1990, Georgia water-supply and use: *in* Carr, J.E., and others, compilers, National water summary 1987--Hydrologic events and water supply and use: U.S. Geological Survey Water-Supply Paper 2350, p. 215-222.

Pierce, R.R., Barber, N.L., and Stiles, H.R., 1982, Water use in Georgia by county for 1980: Atlanta, Georgia Geologic Survey Information Circular 59, 180 p.

——— 1984, Georgia irrigation, 1970-80: A decade of growth: U.S. Geological Survey Water-Resources Investigations Report 83-4177, 29 p.

Pruitt, J.B., Elder, J.F., Johnson, I.K., 1988, Effects of treated municipal effluent irrigation on ground water beneath sprayfields, Tallahassee, Florida: U.S. Geological Survey Water-Resources Investigations Report 88-4092, 35 p.

Purdom, E.D., and Anderson, J.R., Jr., 1988, Florida County atlas and municipal fact book: Tallahassee, Florida State University, Institute of Science and Public Affairs, 145 p.

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1987, Hydrologic unit maps: U.S. Geological Survey Water-Supply Paper 2294, 63 p.

Smajstrla, A.G., Boman, B.J., Clark, G.A., Haman, D.Z., Harrison, D.S., Izuno, F.T., Zazueta, F.S., 1988, Efficiencies of Florida agricultural irrigation systems: Gainesville, University of Florida, Institute of Food and Agricultural Sciences, Bulletin 247, 15 p.

Solley, W.B., Chase, E.B., and Mann, W.B., 1983, Estimated use of water in the United States in 1980: U.S. Geological Survey Circular 1001, 56 p.

Solley, W.B., Merk, C.F., and Pierce, R.R., 1988, Estimated use of water in the United States in 1985: U.S. Geological Survey Circular 1004, 82 p.

Solley, W.B., Pierce, R.R., and Perlman, H.A., 1993, Estimated use of water in the United States in 1990: U.S. Geological Survey Circular 1081, 76 p.

South Florida Water Management District, 1990, Desalination: An additional water source for South Florida: West Palm Beach, The Office of Communications, (PIO 276 290 5M), 4 p.

Tchobanoglous, George, 1991, Wastewater engineering, treatments, disposal, and reuse (3rd ed.): New York, Metcalf and Eddy, Inc. 2010 p.

Thompson, M.T., 1988, Forest statistics for southwest Georgia, 1988: Asheville, N.C., U.S. Department of Agricultural, Forest Service, Resource Bulletin SE-102, 53 p.

Trent, V.P., Fanning, J.L., and Doonan, G.A., 1990, Water use in Georgia by county for 1987: Atlanta, Georgia Geologic Survey Information Circular 85, 112 p.

Turlington, M.C., Fanning, J.L., and Doonan, G.A., 1987, Water use in Georgia by county for 1985: Atlanta, Georgia Geologic Survey Information Circular 81, 109 p.

U.S. Bureau of Census, 1991a, Statistical abstract of the United States, 1991 (111th ed.): Washington D.C., United States Department of Commerce, Bureau of the Census, 986 p.

——— 1991b, Census of population and housing, 1990: PUBLIC LAW (P.L.) 94-171. Data (State of Florida) [machine-readable data files], prepared by the United States Department of Commerce, Bureau of the Census, Washington, D.C.

——— 1991c, Census of population and housing, 1990: PUBLIC LAW (P.L.) 94-171. Data (State of Georgia) [machine-readable data files], prepared by the United States Department of Commerce, Bureau of the Census, Washington, D.C.

——— 1993a, 1990 Census of housing, detailed housing characteristics; Florida: Washington D.C., United States Department of Commerce, Bureau of the Census, CH-2-11, 793 p.

——— 1993b, 1990 Census of housing, detailed housing characteristics; Georgia: Washington D.C., United States Department of Commerce, Bureau of the Census, CH-2-12, 506 p.

U. S. Geological Survey, 1975, Hydrologic unit map-1974, State of Florida: United States Geological Survey, 1:500,000 scale.

——— 1975, Hydrologic unit map-1974, State of Georgia: United States Geological Survey, 1:500,000 scale.

University of Florida, 1991, Florida population: Census summary 1990: Gainesville, University of Florida, Bureau of Economic and Business Research, 55 p.

Vecchioli, John and Foose, D.W., 1985, Florida groundwater resrouces, *in* Moody, D.W., and others, compilers, National Water Summary 1984--Hydrologic events, selected water-quality trends, and groundwater resources: U.S. Geological Survey Water-Supply Paper 2275, p. 173-178.

APPENDIXES

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System: PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Alachua, city of	Alachua	Santa Fe River	FAS	100	0.64	4,962
Archer, town of	Alachua	Oklawaha River	FAS	100	0.19	1,372
Arredondo Utilities	Alachua	Oklawaha River	FAS	100	0.11	1,675
Gainesville Regional Ut.	Alachua	Oklawaha River	FAS	100	20.32	123,790
Hawthorne, city of	Alachua	Oklawaha River	FAS	100	0.24	1,305
High Springs, city of	Alachua	Santa Fe River	FAS	100	0.38	3,144
Kincaid Hills Utilities	Alachua	Oklawaha River	FAS	100	0.10	1,000
Micanopy, town of	Alachua	Oklawaha River	FAS	100	0.08	612
Newberry, city of	Alachua	Waccasassa River	FAS	100	0.26	1,644
Oak Park MHP	Alachua	Oklawaha River	FAS	100	0.09	620
Turkey Creek Utilities	Alachua	Santa Fe River	FAS	100	0.41	688
Waldo, city of	Alachua	Santa Fe River	FAS	100	0.10	962
West Gate MHP	Alachua	Santa Fe River	FAS	100	0.03	330
Macclenny, city of	Baker	St. Marys River	FAS	100	0.79	3,966
Macclenny S/D	Baker	St. Marys River	FAS	100	0.02	136
Brooker, town of	Bradford	Santa Fe River	FAS	100	0.04	355
Geneva Lake Estates	Bradford	Santa Fe River	FAS	100	0.04	300
Hampton, town of	Bradford	Santa Fe River	FAS	100	0.06	351
Keystone Club Estates	Bradford	Santa Fe River	FAS	100	0.16	362
Lawtey, city of	Bradford	Santa Fe River	FAS	100	0.18	739
Starke, city of	Bradford	Santa Fe River	FAS	100	1.13	5,226
Aquarina Utilities	Brevard	Cape Canaveral Coastal	FAS	100	0.08	170
Avatar Utilities	Brevard	Cape Canaveral Coastal	USA	100	0.76	6,340
Cocoa Water Department	Brevard	Upper St. Johns River	FAS	100	23.52	139,672
Melbourne, city of	Brevard	Upper St. Johns River	Lake Washington	100	16.24	136,490
North Brevard Utilities	Brevard	Cape Canaveral Coastal	FAS	100	0.65	7,000
GDU - Palm Bay	Brevard	Cape Canaveral Coastal	USA and FAS	98/2	4.38	33,500
South Brevard Utilities	Brevard	Cape Canaveral Coastal	FAS	100	0.06	500
Titusville, city of	Brevard	Cape Canaveral Coastal	FAS	100	5.62	39,394
Cinnamon Ridge Utility	Citrus	Crystal - Pithlachasotte	FAS	100	0.04	390
Connell Lake Estates	Citrus	Crystal - Pithlachasotte	FAS	100	0.14	150
Crystal River, city of	Citrus	Crystal - Pithlachasotte	FAS	100	0.74	4,307
Floral City W/A	Citrus	Withlacoochee River	FAS	100	0.23	2,638
Greenbrair Condo W/A	Citrus	Crystal - Pithlachasotte	FAS	100	0.07	295
Homosassa Water District	Citrus	Crystal - Pithlachasotte	FAS	100	0.77	3,659
Inverness, city of	Citrus	Withlacoochee River	FAS	100	1.03	7,078
Marion Utilities	Citrus	Withlacoochee River	FAS	100	0.01	25
Ozello W/A	Citrus	Withlacoochee River	FAS	100	0.27	2,919
P.P.F. Incorporated	Citrus	Withlacoochee River	FAS	100	0.04	272
Rolling Oaks Utilities	Citrus	Withlacoochee River	FAS	100	2.80	11,493
Royal Oaks at Inverness	Citrus	Withlacoochee River	FAS	100	0.02	106
SSU: Apache Shores	Citrus	Withlacoochee River	FAS	100	0.01	738
SSU: Citrus Springs	Citrus	Withlacoochee River	FAS	100	0.52	3,550
SSU: Golden Terrace	Citrus	Withlacoochee River	FAS	100	0.02	268

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
SSU: Oak Forest	Citrus	Crystal - Pithlachasotte	FAS	100	0.07	318
SSU: Point-O-Woods	Citrus	Crystal - Pithlachasotte	FAS	100	0.06	740
SSU: Rolling Green	Citrus	Crystal - Pithlachasotte	FAS	100	0.04	306
SSU: Rosemont	Citrus	Crystal - Pithlachasotte	FAS	100	0.01	136
SSU: Sugar Mill/Suntaac	Citrus	Crystal - Pithlachasotte	FAS	100	0.54	3,668
WRWSA: Meadowcreast	Citrus	Crystal - Pithlachasotte	FAS	100	1.22	4,400
Clay Utility Company	Clay	Lower St. Johns River	FAS	100	0.90	7,914
Duval Utility Company	Clay	Lower St. Johns River	FAS	100	0.03	243
Green Cove Springs,city of	Clay	Lower St. Johns River	FAS	100	0.83	4,497
Keystone Heights,city of	Clay	Lower St. Johns River	FAS	100	0.22	2,774
Kingsley Ser. Company	Clay	Lower St. Johns River	FAS	100	7.14	46,515
Lake Asbury Utilities	Clay	Lower St. Johns River	FAS	100	0.23	1,673
Magnolia Springs Utility	Clay	Lower St. Johns River	FAS	100	0.16	858
Orange Park, town of	Clay	Lower St. Johns River	FAS	100	1.43	9,488
Penny Retirement W/S	Clay	Lower St. Johns River	FAS	100	0.06	226
Penny Farms, town of	Clay	Lower St. Johns River	FAS	100	0.04	609
Ravines Village/Resort	Clay	Lower St. Johns River	FAS	100	0.07	500
Azalea Park S/D	Columbia	Santa Fe River	FAS	100	0.03	258
Belaire W/S	Columbia	Santa Fe River	FAS	100	0.03	264
Clayton Smith S/D	Columbia	Santa Fe River	FAS	100	0.06	486
Gatortown Utilities	Columbia	Santa Fe River	FAS	100	0.05	374
Lake City, city of	Columbia	Santa Fe River	FAS	100	2.61	12,616
Melton Bishop S/D	Columbia	Santa Fe River	FAS	100	0.13	1,188
Woodgate Village W/S	Columbia	Santa Fe River	FAS	100	0.02	150
Cross City W/S	Dixie	Econfina - Steinhatchee	FAS	100	0.51	3,010
Horseshoe Beach W/A	Dixie	Econfina - Steinhatchee	FAS	100	0.05	375
Shady Oaks Trailer Park	Dixie	Econfina - Steinhatchee	FAS	100	0.01	220
Suwannee W/A	Dixie	Econfina - Steinhatchee	FAS	100	0.09	950
Atlantic Beach, city of	Duval	Lower St. Johns River	FAS	100	2.65	13,747
Baldwin, city of	Duval	St. Marys River	FAS	100	0.21	1,450
Beauclerc Utilities	Duval	Lower St. Johns River	FAS	100	0.65	6,670
Canal Utilities	Duval	Lower St. Johns River	FAS	100	2.08	7,734
Colony MHP	Duval	Lower St. Johns River	FAS	100	0.06	962
Commercial Utilities	Duval	Lower St. Johns River	FAS	100	0.11	1,200
Duval Utilities	Duval	Lower St. Johns River	FAS	100	0.05	252
Harbor View S/D	Duval	Lower St. Johns River	FAS	100	0.19	2,100
Jacksonville Beach,city of	Duval	Lower St. Johns River	FAS	100	2.84	17,839
Jacksonville, city of	Duval	Lower St. Johns River	FAS	100	70.49	441,515
Jacksonville Suburban Ut.	Duval	Lower St. Johns River	FAS	100	9.93	78,158
Lamplighter MHP	Duval	Lower St. Johns River	FAS	100	0.15	892
Londontown Apartments	Duval	Lower St. Johns River	FAS	100	0.23	1,125
Neighborhood Utilities	Duval	Lower St. Johns River	FAS	100	0.04	543
Neptune Beach, city of	Duval	Lower St. Johns River	FAS	100	1.21	6,816
Normandy Estates W/S	Duval	Lower St. Johns River	FAS	100	0.12	500

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Normandy Village Utility	Duval	Lower St. Johns River	FAS	100	0.44	3,266
Oaks of Atlantic Beach	Duval	Lower St. Johns River	FAS	100	0.10	825
Ortega Utilities	Duval	Lower St. Johns River	FAS	100	1.02	4,423
Regency Utilities	Duval	Lower St. Johns River	FAS	100	0.80	4,900
Shadowrock Utilities	Duval	Lower St. Johns River	FAS	100	0.24	1,250
Southern Gulf Utilities	Duval	Lower St. Johns River	FAS	100	0.24	2,900
SSU - Duval Co. totals	Duval	Lower St. Johns River	FAS	100	1.31	11,524
Southside Utilities	Duval	Lower St. Johns River	FAS	100	1.16	8,605
Beverly Beach Utility	Flagler	Daytona - St. Augustine	FAS	100	0.03	312
Bunnell, city of	Flagler	Lower St. Johns River	FAS	100	0.33	1,873
Flagler Beach, city of	Flagler	Daytona - St. Augustine	FAS	100	0.57	3,820
Plantation Bay	Flagler	Daytona - St. Augustine	FAS	100	0.05	324
Palm Coast Utilities	Flagler	Daytona - St. Augustine	USA	100	2.87	13,000
Greensboro, town of	Gadsden	Lower Ochlockonee River	FAS	100	0.07	586
Gretna, town of	Gadsden	Lower Ochlockonee River	FAS	100	0.21	1,981
Havana, city of	Gadsden	Lower Ochlockonee River	FAS	100	0.61	3,994
Joyland S/D	Gadsden	Lower Ochlockonee River	FAS	100	0.01	133
Rentz's MHP	Gadsden	Lower Ochlockonee River	FAS	100	0.03	144
Quincy, city of	Gadsden	Lower Ochlockonee River	Quincy Creek/FAS	97/3	1.33	8,420
Talquin Electric	Gadsden	Lower Ochlockonee River	FAS	100	0.56	6,495
Trenton, town of	Gilchrist	Lower Suwannee River	FAS	100	0.27	1,656
Jasper, city of	Hamilton	Upper Suwannee River	FAS	100	0.69	3,372
Jennings, town of	Hamilton	Alapaha River	FAS	100	0.11	781
White Springs, city of	Hamilton	Upper Suwannee River	FAS	100	0.17	948
Brooksville, city of	Hernando	Crystal - Pithlachasotte	FAS	100	1.58	10,852
Hernando Co.: Brookridge	Hernando	Crystal - Pithlachasotte	FAS	100	3.79	23,098
Hernando Co.: Cedar Lane	Hernando	Withlacoochee River	FAS	100	0.03	293
Hernando Co.: Lakeside	Hernando	Withlacoochee River	FAS	100	0.03	322
Hernando Co.: Number 1	Hernando	Crystal - Pithlachasotte	FAS	100	0.45	3,292
Hernando Co.: Number 2	Hernando	Crystal - Pithlachasotte	FAS	100	0.07	466
Hernando Co.: Number 3	Hernando	Withlacoochee River	FAS	100	0.14	1,199
Hernando Co.: Number 5	Hernando	Withlacoochee River	FAS	100	0.02	156
Hernando Co.: Number 6	Hernando	Withlacoochee River	FAS	100	0.01	201
Hernando Co.: Springwood	Hernando	Crystal - Pithlachasotte	FAS	100	0.07	254
Spring Hill Utilities	Hernando	Crystal - Pithlachasotte	FAS	100	8.78	52,187
Allied/USA Utilities	Hillsborough	Tampa Bay	FAS	100	0.25	2,239
Charles Springer	Hillsborough	Tampa Bay	FAS	100	0.11	1,004
Country Meadows Estates	Hillsborough	Tampa Bay	FAS	100	0.35	1,400
Eagles Utility Company	Hillsborough	Tampa Bay	FAS	100	0.05	109
Featherock MHP	Hillsborough	Tampa Bay	FAS	100	0.11	771
Florida Cities Water	Hillsborough	Tampa Bay	FAS	100	0.80	2,796
Hillsborough County Ut.	Hillsborough	Alafia River	FAS	100	0.16	420
Lake Highlands/Moorings	Hillsborough	Tampa Bay	FAS	100	0.03	180
Little Manatee Isle MHP	Hillsborough	Little Manatee River	FAS	100	0.01	75

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Paradise Village	Hillsborough	Tampa Bay	FAS	100	0.12	1,242
Pebble Creek Ser. Area	Hillsborough	Alifia River	FAS	100	0.32	2,067
Plant City, city of	Hillsborough	Hillsborough River	FAS	100	4.87	23,177
Scarecrow Ut.: San Remo	Hillsborough	Tampa Bay	FAS	100	0.02	138
SSU: Hershel Heights	Hillsborough	Hillsborough River	FAS	100	0.10	843
SSU: Seaboard	Hillsborough	Alifia River	FAS	100	0.89	7,111
SSU: Valrico Hills	Hillsborough	Hillsborough River	FAS	100	0.10	894
Tampa, city of	Hillsborough	Hillsborough River	Hillsborough River/FAS	93/7	81.44	468,458
Temple Terrace, city of	Hillsborough	Hillsborough River	FAS	100	3.36	26,513
Village Green MHP	Hillsborough	Tampa Bay	FAS	100	0.02	100
WCRWSA: Northwest Hills.	Hillsborough	Hillsborough River	FAS	100	13.08	119,000
WCRWSA: South-Central	Hillsborough	Little Manatee River	FAS	100	18.92	171,700
Wilder/Hawaiian Isles	Hillsborough	Tampa Bay	FAS	100	0.06	789
Wilder/Southern Aire MHP	Hillsborough	Tampa Bay	FAS	100	0.02	315
Aspen-Whispering Palms	Indian River	Vero Beach Coastal	FAS	100	0.08	1,334
GDU-Sebastian Highlands	Indian River	Vero Beach Coastal	FAS	100	0.31	2,502
Heritage Village W/S	Indian River	Vero Beach Coastal	FAS	100	0.06	654
Heron Cay	Indian River	Vero Beach Coastal	FAS	100	0.04	588
Indian River County Ut.	Indian River	Vero Beach Coastal	FAS	100	2.36	19,465
Lakewood Village W/S	Indian River	Vero Beach Coastal	FAS	100	0.07	1,095
Marsh Island Utilities	Indian River	Vero Beach Coastal	FAS	100	0.02	382
North Beach Utilities	Indian River	Vero Beach Coastal	FAS	100	0.32	1,890
Pelican Pointe Utilities	Indian River	Vero Beach Coastal	FAS	100	0.03	325
Vero Beach, city of	Indian River	Vero Beach Coastal	USA and FAS	84/16	9.79	24,067
Village Green W/S	Indian River	Vero Beach Coastal	FAS	100	0.09	1,432
Monticello, city of	Jefferson	Apalachee Bay - St. Markss	FAS	100	0.72	4,620
Mayo, city of	Lafayette	Econfina - Steinhatchee	FAS	100	0.18	1,140
Astor Park W/A	Lake	Upper St. Johns River	FAS	100	0.27	3,000
Brittany Estates	Lake	Oklawaha River	FAS	100	0.07	315
Clermont, city of	Lake	Oklawaha River	FAS	100	1.52	6,910
Deanza W/S	Lake	Oklawaha River	FAS	100	0.68	2,698
Eustis, city of	Lake	Oklawaha River	FAS	100	2.82	18,105
Fruitland Park, city of	Lake	Oklawaha River	FAS	100	0.42	2,754
Groveland, city of	Lake	Oklawaha River	FAS	100	0.29	2,300
Hawthorne S/D	Lake	Oklawaha River	FAS	100	0.49	2,885
Howey-In-The-Hills W/S	Lake	Oklawaha River	FAS	100	0.24	724
Lakeview Terrace Center	Lake	Oklawaha River	FAS	100	0.04	300
Leesburg, city of	Lake	Oklawaha River	FAS	100	4.17	19,897
Mascotte, town of	Lake	Oklawaha River	FAS	100	0.20	1,764
Minneola, city of	Lake	Oklawaha River	FAS	100	0.22	1,528
Molakai Park W/S	Lake	Oklawaha River	FAS	100	0.04	550
Montverde, town of	Lake	Oklawaha River	FAS	100	0.12	667
Mt. Dora, city of	Lake	Oklawaha River	FAS	100	2.82	12,347
Orange Blossom Gardens	Lake	Oklawaha River	FAS	100	2.52	9,714

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Silver Lake Estates Ut.	Lake	Oklawaha River	FAS	100	0.83	2,020
South Umatilla W/A	Lake	Oklawaha River	FAS	100	0.06	375
SSU - Lake Co. totals	Lake	Oklawaha River	FAS	100	0.22	2,646
Sunlake Estates	Lake	Oklawaha River	FAS	100	0.31	576
Tavares, city of	Lake	Oklawaha River	FAS	100	1.40	7,383
Umatilla, city of	Lake	Oklawaha River	FAS	100	0.49	2,559
UIF - Lake Co. totals	Lake	Oklawaha River	FAS	100	0.16	558
Water Oak Estates	Lake	Oklawaha River	FAS	100	0.27	1,210
Deer Tree Hills S/D	Leon	Apalachee Bay - St.Marks	FAS	100	0.02	194
Greenwood MHP	Leon	Apalachee Bay - St.Marks	FAS	100	0.03	255
Lake Bradford MHP	Leon	Apalachee Bay - St.Marks	FAS	100	0.03	175
Rowe Drilling and Ut.	Leon	Apalachee Bay - St.Marks	FAS	100	0.17	1,430
Spencers S/D	Leon	Apalachee Bay - St.Marks	FAS	100	0.02	141
Southern Bell MHP	Leon	Apalachee Bay - St.Marks	FAS	100	0.03	200
Tallahassee, city of	Leon	Apalachee Bay - St.Marks	FAS	100	22.41	138,989
Talquin Electric	Leon	Lower Ochlockonee River	FAS	100	2.31	15,197
Bronson, town of	Levy	Waccasassa River	FAS	100	0.15	1.109
Cedar Key, town of	Levy	Waccasassa River	FAS	100	0.17	935
Chiefland, town of	Levy	Lower Suwannee River	FAS	100	0.47	1,917
Fanning Springs, town of	Levy	Lower Suwannee River	FAS	100	0.06	489
Fowlers Bluff W/A	Levy	Waccasassa River	FAS	100	0.02	350
Hide-A-Way MHP	Levy	Waccasassa River	FAS	100	0.03	204
Otter Creek, town of	Levy	Waccasassa River	FAS	100	0.01	227
Inglis, town of	Levy	Withlacoochee River	FAS	100	0.15	1,798
Williston, city of	Levy	Oklawaha River	FAS	100	0.41	2,421
Yankeetown, town of	Levy	Waccasassa River	FAS	100	0.11	1,023
Hosford/Telogia W/S	Liberty	Lower Ochlockonee River	FAS	100	0.06	485
Talquin Electric	Liberty	Lower Ochlockonee River	FAS	100	0.01	67
Cherry Lake Utilities	Madison	Withlacoochee River	FAS	100	0.05	620
Greenville, city of	Madison	Aucilla River	FAS	100	0.20	1,061
Madison, city of	Madison	Aucilla River	FAS	100	1.18	4,262
Amaroc/Edison/Foxwood	Marion	Withlacoochee River	FAS	100	0.06	586
Belleview, city of	Marion	Withlacoochee River	FAS	100	0.53	4,802
CHC II/Saddlebrook MHP	Marion	Oklawaha River	FAS	100	0.17	400
Decca Utilities: Oak Run	Marion	Oklawaha River	FAS	100	0.97	2,928
Decca Utilities:Pine Run	Marion	Oklawaha River	FAS	100	0.62	2,023
Dunnellon, city of	Marion	Oklawaha River	FAS	100	0.28	1,735
GDU-Silver Springs Shore	Marion	Oklawaha River	FAS	100	1.12	10,579
Living Development Co.	Marion	Oklawaha River	FAS	100	0.02	38
Maco Development Co.	Marion	Oklawaha River	FAS	100	0.11	530
Marion Utilities	Marion	Oklawaha River	FAS	100	0.46	4,231
McIntosh, city of	Marion	Oklawaha River	FAS	100	0.09	411
Ocala East Utilities	Marion	Oklawaha River	FAS	100	0.13	593
Ocala Housing Corporation	Marion	Oklawaha River	FAS	100	0.09	140

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Ocala Oaks Utilities	Marion	Oklawaha River	FAS	100	0.26	1,981
Ocala, city of	Marion	Oklawaha River	FAS	100	8.24	42,045
Quail Hollow	Marion	Oklawaha River	FAS	100	0.02	163
Rainbow Springs Utility	Marion	Oklawaha River	FAS	100	0.56	383
SSU: Citrus Park	Marion	Oklawaha River	FAS	100	0.10	780
SSU: Marion Oaks	Marion	Oklawaha River	FAS	100	0.77	5,195
SSU: Salt Springs Vil.	Marion	Upper St. Johns River	FAS	100	0.06	459
Sunshine Utilities	Marion	Oklawaha River	FAS	100	0.43	3,711
Sweetwater Oaks	Marion	Oklawaha River	FAS	100	0.01	15
Top of the World W/S	Marion	Oklawaha River	FAS	100	0.87	2,772
Tradewinds Utilities	Marion	Oklawaha River	FAS	100	0.09	850
UIF: Golden Hills	Marion	Oklawaha River	FAS	100	0.15	900
Venture Associates	Marion	Oklawaha River	FAS	100	0.22	1,154
Windstream Utilities	Marion	Oklawaha River	FAS	100	0.01	162
Woods and Lakes S/D	Marion	Oklawaha River	FAS	100	0.03	283
Callahan, town of	Nassau	Nassau River	FAS	100	0.15	1,295
Eastwood Oaks W/S	Nassau	Nassau River	FAS	100	0.03	365
Florida Public Ut.	Nassau	St. Marys River	FAS	100	2.65	12,738
Hillard, town of	Nassau	St. Marys River	FAS	100	0.25	2,082
Marsh Cove W/S	Nassau	St. Marys River	FAS	100	0.04	268
SSU: Amelia Island	Nassau	Nassau River	FAS	100	0.73	5,266
Apopka, city of	Orange	Upper St. Johns River	FAS	100	5.29	23,250
Eatonville, town of	Orange	Upper St. Johns River	FAS	100	0.69	2,170
Econ Ut./Wedgefield S/D	Orange	Upper St. Johns River	FAS	100	0.16	1,229
Maitland, city of	Orange	Upper St. Johns River	FAS	100	3.16	9,110
Oakland, town of	Orange	Oklawaha River	FAS	100	0.11	700
Ocoee, city of	Orange	Oklawaha River	FAS	100	2.69	12,778
Orange County Utilities	Orange	Upper St. Johns River	FAS	100	27.76	96,089
Orlando Utilities Comm.	Orange	Upper St. Johns River	FAS	100	79.28	399,720
Rock Springs MHP	Orange	Upper St. Johns River	FAS	100	0.24	1,240
SSU - Orange Co. totals	Orange	Upper St. Johns River	FAS	100	1.00	6,631
Starlight Ranch MHP	Orange	Upper St. Johns River	FAS	100	0.18	1,560
Tangerine, town of	Orange	Oklawaha River	FAS	100	0.14	428
Taft, city of	Orange	Kissimmee River	FAS	100	0.28	2,145
UIF - Orange Co. totals	Orange	Upper St. Johns River	FAS	100	0.10	1,103
Winter Garden, city of	Orange	Oklawaha River	FAS	100	1.78	12,140
Winter Park, city of	Orange	Upper St. Johns River	FAS	100	13.62	80,214
Zellwood Station Ut.	Orange	Oklawaha River	FAS	100	0.96	2,332
Zellwood W/A	Orange	Oklawaha River	FAS	100	0.33	900
Harbour Oaks Utilities	Osceola	Kissimmee River	FAS	100	0.12	831
Kissimmee, city of	Osceola	Kissimmee River	FAS	100	7.33	31,878
Kissimmee Good Samaratin	Osceola	Kissimmee River	FAS	100	0.22	1,924
Majestic Oaks	Osceola	Kissimmee River	FAS	100	0.02	187
Morningside Utilities	Osceola	Kissimmee River	FAS	100	0.03	250

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises: PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Oak Forrest S/D	Osceola	Kissimmee River	FAS	100	0.01	100
Poinciana Utilities	Osceola	Kissimmee River	FAS	100	0.76	5,663
Orange/Osceola Utilities	Osceola	Kissimmee River	FAS	100	1.39	17,985
St. Cloud, city of	Osceola	Kissimmee River	FAS	100	1.89	17,696
SSU - Osceola Co. totals	Osceola	Kissimmee River	FAS	100	0.31	3,111
Aloha Utilities	Pasco	Crystal - Pithlachasotte	FAS	100	2.12	18,755
Barrington Hills	Pasco	Withlacoochee River	FAS	100	0.03	100
Betmar Utilities	Pasco	Hillsborough River	FAS	100	0.13	2,577
Crystal Springs W/S	Pasco	Hillsborough River	FAS	100	0.05	592
Dade City, city of	Pasco	Withlacoochee River	FAS	100	1.32	9,014
Dixie Grove Estates	Pasco	Crystal - Pithlachasotte	FAS	100	0.11	723
Floralino Properties	Pasco	Crystal - Pithlachasotte	FAS	100	0.16	2,000
Forest Hills Utilities	Pasco	Crystal - Pithlachasotte	FAS	100	0.46	6,100
Forrest Lake Estates	Pasco	Hillsborough River	FAS	100	0.03	904
Hacienda Village	Pasco	Crystal - Pithlachasotte	FAS	100	0.06	556
Holiday Utility	Pasco	Crystal - Pithlachasotte	FAS	100	0.05	570
Hudson Water Works	Pasco	Crystal - Pithlachasotte	FAS	100	0.60	4,324
Jasmine Lakes Ser. Area	Pasco	Crystal - Pithlachasotte	FAS	100	0.35	3,693
L.W.V. Ut. Corporation	Pasco	Crystal - Pithlachasotte	FAS	100	0.04	814
Lindrick Ser. Corporation	Pasco	Crystal - Pithlachasotte	FAS	100	0.83	6,884
Magnolia Valley W/S	Pasco	Crystal - Pithlachasotte	FAS	100	0.33	3,578
MHU: Carpenters Run	Pasco	Hillsborough River	FAS	100	0.14	623
MHU: Foxwood/C. Cove	Pasco	Hillsborough River	FAS	100	0.15	899
MHU: Turtle Lakes	Pasco	Hillsborough River	FAS	100	0.26	791
New Port Richey, city of	Pasco	Crystal - Pithlachasotte	FAS	100	2.67	18,201
Orangewood Lakes MHP	Pasco	Crystal - Pithlachasotte	FAS	100	0.12	850
Pasco Utilities	Pasco	Hillsborough River	FAS	100	0.09	1,173
PCU: Hickory Hill	Pasco	Withlacoochee River	FAS	100	0.05	350
PCU: Hillcrest/Lacoochee	Pasco	Withlacoochee River	FAS	100	0.12	380
PCU: Joyland	Pasco	Withlacoochee River	FAS	100	0.02	80
PCU: New River Acres	Pasco	Hillsborough River	FAS	100	0.38	1,290
PCU: Pasadena	Pasco	Withlacoochee River	FAS	100	0.01	98
PCU: Sunburst Hills	Pasco	Withlacoochee River	FAS	100	0.03	250
PCU: West Pasco System	Pasco	Crystal - Pithlachasotte	FAS	100	11.15	98,300
PCU: Z-Groves	Pasco	Hillsborough River	FAS	100	0.03	317
Port Richey, city of	Pasco	Crystal - Pithlachasotte	FAS	100	0.87	8,137
Shamerock Heights Ut.	Pasco	Crystal - Pithlachasotte	FAS	100	0.04	452
San Antonio, city of	Pasco	Hillsborough River	FAS	100	0.15	760
SSU: Palm Terrace	Pasco	Hillsborough River	FAS	100	0.20	2,978
SSU: Zephyrhills MHP	Pasco	Hillsborough River	FAS	100	0.06	1,367
T.V. Home Owners Assoc.	Pasco	Hillsborough River	FAS	100	0.04	479
Travelers Rest MHP	Pasco	Hillsborough River	FAS	100	0.05	501
UIF: Orangewood	Pasco	Crystal - Pithlachasotte	FAS	100	0.12	1,320
UIF: Paradise Point	Pasco	Crystal - Pithlachasotte	FAS	100	0.17	850

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Virginia City Inc.	Pasco	Crystal - Pithlachasotte	FAS	100	0.07	660
WCRWSA	Pasco	Crystal - Pithlachasotte	FAS	100	0.68	N/A
Wray Ent.: Bartelt	Pasco	Crystal - Pithlachasotte	FAS	100	0.15	2,755
Wray Ent.: Crestridge	Pasco	Crystal - Pithlachasotte	FAS	100	0.11	1,385
Wray Ent.: Holiday Gardens	Pasco	Crystal - Pithlachasotte	FAS	100	0.10	922
Zephyrhills, city of	Pasco	Hillsborough River	FAS	100	1.46	9,042
Belleair, town of	Pinellas	Crystal - Pithlachasotte	FAS	100	1.16	5,734
Clearwater, city of	Pinellas	Tampa Bay	Purchased and FAS	80/20	15.88	118,133
Dunedin, city of	Pinellas	Tampa Bay	FAS and Purchased	99/1	4.77	36,465
Oldsmar	Pinellas	Tampa Bay	Purchased	100	1.11	8,334
PCWS	Pinellas	Tampa Bay	Purchased and FAS	100	50.58	319,269
Pinellas Park	Pinellas	Tampa Bay	Purchased	100	5.14	54,431
Safety Harbor	Pinellas	Tampa Bay	Purchased	100	2.06	13,765
St. Petersburg, city of	Pinellas	Tampa Bay	FAS	100	34.35	306,366
Tarpon Springs, city of	Pinellas	Crystal - Pithlachasotte	Purchased and FAS	86/14	3.15	23,981
Breeze Hill MHP	Polk	Kissimmee River	FAS	100	0.06	400
Indian Lake Estates	Polk	Kissimmee River	FAS	100	0.07	450
Lake Wales Utilities	Polk	Kissimmee River	FAS	100	0.16	2,244
PCBoCC: Sunair	Polk	Kissimmee River	FAS	100	0.22	1,520
PCBoCC: Timber Lake Road	Polk	Kissimmee River	FAS	100	0.17	1,600
PCBoCC: Walk-in Water	Polk	Kissimmee River	FAS	100	0.04	666
Poinciana Village	Polk	Kissimmee River	FAS	100	0.68	4,589
Rosalie Oaks	Polk	Kissimmee River	FAS	100	0.01	190
Emerald Acres	Polk	Oklawaha River	FAS	100	0.01	80
PCBoCC: Polo/Davenport	Polk	Oklawaha River	FAS	100	0.05	465
Alturas Water Works	Polk	Peace River	FAS	100	0.02	137
Bartow, city of	Polk	Peace River	FAS	100	2.66	16,260
Bartow, city of; Airbase	Polk	Peace River	FAS	100	0.57	2,287
Carefree RV Country Club	Polk	Peace River	FAS	100	0.21	660
CHC VII/Swiss Golf	Polk	Peace River	FAS	100	0.67	1,550
Crooked Lake Water	Polk	Peace River	FAS	100	0.20	1,657
Cypress Lakes Venture	Polk	Peace River	FAS	100	0.19	33
Davenport, city of	Polk	Kissimmee River	FAS	100	0.50	2,182
Dundee, town of	Polk	Peace River	FAS	100	0.58	2,667
Eagle Lake, city of	Polk	Peace River	FAS	100	0.29	2,401
Fort Meade, city of	Polk	Peace River	FAS	100	0.98	5,800
Frostproof, city of	Polk	Kissimmee River	FAS	100	1.52	3,266
Garden Grove W/S	Polk	Peace River	FAS	100	3.30	20,598
Garden Grove/Kinsmen	Polk	Peace River	FAS	100	0.02	410
Garden Grove/Towerwood	Polk	Peace River	FAS	100	0.10	329
Grenelefe Corporation	Polk	Peace River	FAS	100	3.05	3,820
Haines City, city of	Polk	Peace River	FAS	100	2.27	11,340
Lake Alfred, city of	Polk	Peace River	FAS	100	0.59	3,641
Lake Hamilton, town of	Polk	Peace River	FAS	100	0.32	1,958

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Lake Region MHP	Polk	Peace River	FAS	100	0.21	701
Lake Wales, city of	Polk	Peace River	FAS	100	3.97	12,696
Lakeland, city of	Polk	Peace River	FAS	100	24.37	114,988
Mulberry, city of	Polk	Alafia River	FAS	100	0.57	3,500
Orchid Springs W/S	Polk	Peace River	FAS	100	0.14	976
PCBoCC: Aurburndale	Polk	Peace River	FAS	100	2.28	13,118
PCBoCC: Green Acres	Polk	Peace River	FAS	100	0.07	546
PCBoCC: Lake Pierce	Polk	Kissimmee River	FAS	100	1.52	8,125
PCBoCC: Unnamed number 1	Polk	Peace River	FAS	100	1.37	8,335
PCBoCC: Unnamed number 2	Polk	Peace River	FAS	100	1.17	4,418
PCBoCC: Unnamed number 3	Polk	Peace River	FAS	100	0.86	4,158
PCBoCC: Unnamed number 4	Polk	Peace River	FAS	100	0.51	1,018
PCBoCC: Oak Acres	Polk	Peace River	FAS	100	0.01	146
PCBoCC: Rainbow Ridge	Polk	Peace River	FAS	100	0.02	184
PCBoCC: Sunray	Polk	Peace River	FAS	100	0.10	1,302
PCBoCC: Tanamora	Polk	Peace River	FAS	100	0.01	370
PCBoCC: Willowwoods	Polk	Peace River	FAS	100	0.07	535
PCBoCC: Wolf Run	Polk	Peace River	FAS	100	0.02	208
Plantation Landings LTD.	Polk	Peace River	FAS	100	0.07	182
Ridge Utilities	Polk	Peace River	FAS	100	0.10	822
Saddlebag Lake W/A	Polk	Peace River	FAS	100	0.11	1,051
SSU: Gibsonia	Polk	Peace River	FAS	100	0.05	407
SSU: Lake Gibson	Polk	Peace River	FAS	100	0.29	1,918
SSU: Orange Hill	Polk	Peace River	FAS	100	0.04	592
Sunlake Terrace	Polk	Peace River	FAS	100	0.05	342
Swiss Village	Polk	Peace River	FAS	100	0.39	1,416
Village of Highland Park	Polk	Peace River	FAS	100	0.16	195
WFC: Sweetwater East	Polk	Peace River	FAS	100	0.01	51
WFC: Sweetwater West	Polk	Peace River	FAS	100	0.09	633
Winter Haven, city of	Polk	Peace River	FAS	100	7.35	30,011
Winter Paradise/Rollar	Polk	Peace River	FAS	100	0.03	197
Crescent, city of	Putnam	Lower St. Johns River	FAS	100	0.34	2,485
Interlachen, town of	Putnam	Oklawaha River	FAS	100	0.08	1,160
Lake Como W/A	Putnam	Lower St. Johns River	FAS	100	0.02	322
Melrose W/A	Putnam	Santa Fe River	FAS	100	0.09	893
Palatka, city of	Putnam	Lower St. Johns River	FAS	100	2.42	14,460
SSU - Putnam Co. totals	Putnam	Lower St. Johns River	FAS	100	0.20	3,223
Anastasia/Mainland W/S	St. Johns	Daytona - St. Augustine	USA and FAS	75/25	2.17	17,949
Fountain Condominums	St. Johns	Daytona - St. Augustine	FAS	100	0.04	392
Fruit Cove Oaks S/D	St. Johns	Lower St. Johns River	FAS	100	0.06	450
GDU-Julington Creek S/D	St. Johns	Lower St. Johns River	FAS	100	0.04	276
Hastings, city of	St. Johns	Lower St. Johns River	USA and FAS	80/20	0.11	595
Intercoastal Utilities	St. Johns	Lower St. Johns River	FAS	100	0.72	3,755
North Beach W/S	St. Johns	Daytona - St. Augustine	FAS	100	0.21	1,244

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Palm Valley W/S	St. Johns	Lower St. Johns River	FAS	100	0.12	459
Ponce DeLeon Utilities	St. Johns	Daytona - St. Augustine	FAS	100	0.05	360
Ponte Vedra Utilities	St. Johns	Daytona - St. Augustine	FAS	100	0.84	4,263
South Ponte Vedra Beach	St. Johns	Daytona - St. Augustine	FAS	100	0.08	718
SSU - Remington Forest	St. Johns	Lower St. Johns River	FAS	100	0.02	98
St. Augustine, city of	St. Johns	Daytona - St. Augustine	USA and FAS	80/20	1.83	18,457
St. Augustine Shores	St. Johns	Daytona - St. Augustine	USA	100	0.38	5,463
St. Johns North Utility	St. Johns	Lower St. Johns River	FAS	100	0.08	381
St. Johns Ser. Company	St. Johns	Daytona - St. Augustine	FAS	100	1.55	10,878
Wesley Manor W/S	St. Johns	Lower St. Johns River	FAS	100	0.08	400
Altamonte Springs,city of	Seminole	Upper St. Johns River	FAS	100	8.00	34,879
Casselberry, city of	Seminole	Upper St. Johns River	FAS	100	5.98	46,464
Indian Creek Utilities	Seminole	Upper St. Johns River	FAS	100	0.06	277
Lake Harney W/A	Seminole	Upper St. Johns River	FAS	100	0.03	449
Lake Mary, city of	Seminole	Upper St. Johns River	FAS	100	1.14	5,929
Longwood, city of	Seminole	Upper St. Johns River	FAS	100	2.21	13,316
Luthern Haven W/S	Seminole	Upper St. Johns River	FAS	100	0.04	435
Mullet Lake W/A	Seminole	Upper St. Johns River	FAS	100	0.04	550
Oviedo, city of	Seminole	Upper St. Johns River	FAS	100	1.99	11,114
Palm Ventures MHP	Seminole	Upper St. Johns River	FAS	100	0.16	687
Sanford, city of	Seminole	Upper St. Johns River	FAS	100	5.63	32,063
Sanlando Utilities	Seminole	Upper St. Johns River	FAS	100	10.43	39,113
Seminole County Water	Seminole	Upper St. Johns River	FAS	100	9.15	41,754
SSU - Seminole Co. totals	Seminole	Upper St. Johns River	FAS	100	1.43	9,615
UIF - Seminole Co. totals	Seminole	Upper St. Johns River	FAS	100	0.90	10,905
Winter Springs, city of	Seminole	Upper St. Johns River	FAS	100	3.60	23,241
Bushnell, city of	Sumter	Withlacoochee River	FAS	100	0.30	746
Center Hill, city of	Sumter	Withlacoochee River	FAS	100	0.08	809
Lake Panasoffkee W/A	Sumter	Withlacoochee River	FAS	100	0.21	3,444
Continental Country Club	Sumter	Withlacoochee River	FAS	100	0.46	2,303
Gordon, Nathan	Sumter	Withlacoochee River	FAS	100	0.02	107
Red Barn MHP	Sumter	Withlacoochee River	FAS	100	0.04	350
Webster, city of	Sumter	Withlacoochee River	FAS	100	0.11	746
Wildwood, city of	Sumter	Withlacoochee River	FAS	100	0.68	3,747
Dowling Park W/S	Suwannee	Lower Suwannee River	FAS	100	0.11	350
Branford, town of	Suwannee	Lower Suwannee River	FAS	100	0.11	945
Friars Trailer Park	Suwannee	Lower Suwannee River	FAS	100	0.04	275
Live Oak, city of	Suwannee	Lower Suwannee River	FAS	100	1.05	6,332
Welborn W/A	Suwannee	Lower Suwannee River	FAS	100	0.05	543
Keaton Beach W/A	Taylor	Econfina - Steinhatchee	FAS	100	0.02	210
Cedar Island W/A	Taylor	Econfina - Steinhatchee	FAS	100	0.01	100
Perry, city of	Taylor	Econfina - Steinhatchee	FAS	100	1.20	7,062
Stienhatchee W/A	Taylor	Econfina - Steinhatchee	FAS	100	0.16	2,248
Taylor Beach W/A	Taylor	Econfina - Steinhatchee	FAS	100	0.03	480

Appendix 1. Public-supply water use by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. Within Florida. B. Within Georgia.

[A. Florida. [Modified from Marella, 1993; Mgal/d, million gallons per day; FAS, Floridan aquifer system; Ut., utility; MHP, mobile home park; S/D, sub division; USA, unnamed surficial aquifers; GDU, General Developement Utilities; W/A, water association; SSU, Southern States Utilities; WRWSA, Withlacoochee Regional Water Supply Authority; Ser., service; W/S, water system; Co., county; WCRWSA, West Coast Regional Water Supply Authority; UIF, Utilities Incorporated of Florida; Vil., village; Comm., commission; MHU, Mad Hatter Utilities; PCU, Pasco County Utilities; N/A, not available; WF, wellfield; Ent., enterprises; PCWS, Pinellas County Water System; PCBoCC, Polk County Board of County Commissioners; WFC, West Florida Community; Bch., Beach; Riv., River]

Utility/Owner	County	Cataloging unit	Water source		1990 Mgal/d	1990 Population served
			Name	Percent		
Lake Butler, city of	Union	Santa Fe River	FAS	100	0.63	2,116
Cassadaga W/A	Volusia	Upper St. Johns River	FAS	100	0.02	273
Daytona Beach, city of	Volusia	Daytona - St. Augustine	FAS	100	12.11	80,003
Deland, city of	Volusia	Upper St. Johns River	FAS	100	3.70	32,966
Edgewater, city of	Volusia	Cape Canaveral Coastal	FAS	100	1.65	15,337
Hacienda Del Rio W/A	Volusia	Upper St. Johns River	FAS	100	0.06	606
Halifax Plantation	Volusia	Daytona - St. Augustine	FAS	100	0.04	210
Highland Country Estates	Volusia	Upper St. Johns River	FAS	100	0.26	671
Holly Hill, city of	Volusia	Daytona - St. Augustine	FAS	100	1.07	11,141
John Knox Village	Volusia	Upper St. Johns River	FAS	100	0.07	700
Kingston Shores W/A	Volusia	Daytona - St. Augustine	FAS	100	0.02	250
Lake Beresford W/A	Volusia	Upper St. Johns River	FAS	100	0.18	986
Lake Helen, city of	Volusia	Upper St. Johns River	FAS	100	0.23	2,344
New Smyrna Beach,city of	Volusia	Daytona - St. Augustine	FAS	100	4.12	27,751
Orange City Country Vil.	Volusia	Upper St. Johns River	FAS	100	0.20	1,340
Orange City, city of	Volusia	Upper St. Johns River	FAS	100	0.64	5,347
Ormond Beach, city of	Volusia	Daytona - St. Augustine	FAS	100	4.76	45,678
Pierson, town of	Volusia	Upper St. Johns River	FAS	100	0.04	650
Port Orange, city of	Volusia	Daytona - St. Augustine	FAS	100	4.81	42,802
South Water Front Park	Volusia	Daytona - St. Augustine	FAS	100	0.02	610
SSU - Deltona Utilities	Volusia	Upper St. Johns River	FAS	100	8.95	42,416
SSU - Sugar Mill	Volusia	Daytona - St. Augustine	FAS	100	0.12	1,347
Terra Marie Village W/S	Volusia	Upper St. Johns River	FAS	100	0.02	200
Tomoka View W/A	Volusia	Daytona - St. Augustine	FAS	100	0.05	387
Tymber Creek Utilities	Volusia	Daytona - St. Augustine	FAS	100	0.10	792
Volusia County Water	Volusia	Upper St. Johns River	FAS	100	0.97	6,828
Panacea Area W/S	Wakulla	Apalachee Bay - St.Marks	FAS	100	0.21	2,160
St. Marks, town of	Wakulla	Apalachee Bay - St.Marks	FAS	100	0.07	486
Sopchoppy, city of	Wakulla	Lower Ochlockonee River	FAS	100	0.25	2,340
Talquin Electric	Wakulla	Apalachee Bay - St.Marks	FAS	100	0.22	2,244
Wakulla W/S	Wakulla	Apalachee Bay - St.Marks	FAS	100	0.02	165

Appendix 1. Public supply water-use by by utility in the Georgia-Florida Coastal Plain study unit, 1990
B. Georgia.

[Modified from Fanning and others, 1992; Mgal/d, million gallons per day; FAS, Floridan aquifer system; CST, Crystaline Rock aquifer; W/S, Water and Sewer; CLB, Claiborne aquifer; Assoc., Association; N/A, data not available; Auth., Authority; CRE, Cretaceous aquifer]

Utility/Owner	County	Cataloging unit	Water source		Water use in Mgal/d	Population served
			Name	Percent		
Baxley, city of	Appling	Little Satilla River	FAS	100	0.44	5,349
Surrency, town of	Appling	Little Satilla River	FAS	100	0.04	244
Pearson, city of	Atkinson	Satilla River	FAS	100	0.06	1,850
Willacoochee, town of	Atkinson	Satilla River	FAS	100	0.11	1,635
Alma, city of	Bacon	Satilla River	FAS	100	0.41	3,819
Milledgeville, city of	Baldwin	Lower Oconee River	Oconee River	100	4.75	25,000
Auburn, town of	Barrow	Upper Oconee River	CST	100	0.06	657
Statham, city of	Barrow	Upper Oconee River	Cedar Creek	100	0.04	2,086
Winder, city of	Barrow	Upper Oconee River	Mulberry River	100	3.18	14,000
Fitzgerald, city of	Ben Hill	Alapaha River	FAS	100	1.18	10,000
Alapaha, town of	Berrien	Alapaha River	FAS	100	0.02	672
Enigma, town of	Berrien	Withlacoochee River	FAS	100	0.03	600
Nashville, city of	Berrien	Withlacoochee River	FAS	100	0.20	4,718
Ray City, city of	Berrien	Withlacoochee River	FAS	100	0.05	475
Macon-Bibb County W/S	Bibb	Upper Ocmulgee River	Ocmulgee River	100	24.30	143,262
Cochran, city of	Bleckley	Lower Ocmulgee River	FAS and CLB	60/40	0.96	6,000
Hoboken, city of	Brantley	Satilla River	FAS	100	0.21	435
Nahunta, city of	Brantley	Satilla River	FAS	100	0.14	1,106
Barwick, town of	Brooks	Withlacoochee River	FAS	100	0.07	450
Morven, city of	Brooks	Little River	FAS	100	0.08	461
Quitman, city of	Brooks	Withlacoochee River	FAS	100	1.07	5,400
Pembroke, city of	Bryan	Canoochee Creek	FAS	100	0.11	1,555
Richmond Hill, city of	Bryan	Lower Ogeechee River	FAS	100	0.41	1,500
Brooklet, town of	Bulloch	Lower Ogeechee River	FAS	100	0.10	1,200
Nevils Water Assoc.	Bulloch	Canoochee Creek	FAS	100	0.02	180
Portal, town of	Bulloch	Lower Ogeechee River	FAS	100	1.30	519
Register, town of	Bulloch	Canoochee Creek	FAS	100	0.01	280
Statesboro, city of	Bulloch	Canoochee Creek	FAS	100	2.62	23,400
Midville, city of	Burke	Upper Ogeechee River	CLB	100	0.11	840
Vidette, city of	Burke	Upper Ogeechee River	CLB	100	0.01	90
Flovilla, city of	Butts	Upper Ocmulgee River	CST	100	0.09	1,030
Jackson, city of	Butts	Upper Ocmulgee River	Yellow Creek	100	1.03	5,418
Jenkinsburg, town of	Butts	Upper Ocmulgee River	CST	100	0.06	203
Kingsland, city of	Camden	St. Marys River	FAS	100	0.48	6,500
St. Marys, city of	Camden	St. Marys River	FAS	100	1.11	6,000
Woodbine, city of	Camden	Satilla River	FAS	100	0.14	1,200
Metter, city of	Candler	Canoochee Creek	FAS	100	0.66	3,531
Pulaski, town of	Candler	Canoochee Creek	FAS	100	0.03	263
Folkston, city of	Charlton	St. Marys River	FAS	100	0.67	3,700
Savannah, city of	Chatham	Ogeechee Coastal	FAS	100	22.41	123,542
Skidway Island Utilities	Chatham	Ogeechee Coastal	FAS	100	0.41	1,264
Thunderbolt, town of	Chatham	Ogeechee Coastal	FAS	100	0.43	3,915
Tybee Island, city of	Chatham	Ogeechee Coastal	FAS	100	0.25	2,700
Athens, city of	Clarke	Upper Oconee River	Middle Oconee River	100	15.13	69,779
Clayton County Water Auth.	Clayton	Upper Ocmulgee River	Little Cotton Indian Creek	N/A	N/A	N/A
Dupont, town of	Clinch	Upper Suwannee River	FAS	100	0.01	111
Homerville, city of	Clinch	Upper Suwannee River	FAS	100	0.32	3,400

Appendix 1. Public supply water-use by by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
B. Georgia.

[Modified from Fanning and others, 1992; Mgal/d, million gallons per day; FAS, Floridan aquifer system; CST, Crystaline Rock aquifer; W/S, Water and Sewer; CLB, Claiborne aquifer; Assoc., Association; N/A, data not available; Auth., Authority; CRE, Cretaceous aquifer]

Utility/Owner	County	Cataloging unit	Water source		Water use in Mgal/d	Population served
			Name	Percent		
Ambrose, city of	Coffee	Satilla River	FAS	100	0.04	410
Broxton, city of	Coffee	Satilla River	FAS	100	0.15	1,117
Douglas, City of	Coffee	Satilla River	FAS	100	3.77	13,500
Nicholls, city of	Coffee	Satilla River	FAS	100	0.13	1,300
Berlin, town of	Colquitt	Withlacoochee River	FAS	100	0.02	500
Doerun, city of	Colquitt	Upper Ochlockonee River	FAS	100	0.09	1,046
Ellenton, town of	Colquitt	Little River	FAS	100	0.01	345
Funston, town of	Colquitt	Upper Ochlockonee River	FAS	100	0.03	249
Moultrie, city of	Colquitt	Upper Ochlockonee River	FAS	100	3.22	25,000
Norman Park, town of	Colquitt	Little River	FAS	100	0.15	709
Riverside, town of	Colquitt	Withlacoochee River	FAS	100	0.04	69
Adel, city of	Cook	Withlacoochee River	FAS	100	2.51	5,500
Cecil, town of	Cook	Withlacoochee River	FAS	100	0.10	359
Lenox, town of	Cook	Withlacoochee River	FAS	100	0.09	1,100
Sparks, town of	Cook	Withlacoochee River	FAS	100	0.16	1,500
Arabi, town of	Crisp	Alapaha River	FAS	100	0.07	413
Attapulgus, town of	Decatur	Lower Ochlockonee River	FAS	100	0.10	380
Climax, town of	Decatur	Lower Ochlockonee River	FAS	100	0.02	107
Chauncey, town of	Dodge	Little Ocmulgee River	FAS	100	0.03	312
Chester, town of	Dodge	Little Ocmulgee River	FAS	100	0.04	886
Eastman, city of	Dodge	Little Ocmulgee River	FAS and CLB	80/20	0.72	6,000
Rhine, town of	Dodge	Lower Ocmulgee River	FAS	100	0.07	465
Pinehurst, city of	Dooly	Lower Ocmulgee River	CLB	100	0.03	143
Unadilla, city of	Dooly	Lower Ocmulgee River	CLB	100	0.19	2,100
Echols County Water Assoc.	Echols	Alapaha River	FAS	100	0.06	450
Guyton, city of	Effingham	Lower Ogeechee River	FAS	100	0.17	800
Adrian, city of	Emanuel	Ohoopee River	FAS	100	0.10	750
Garfield, town of	Emanuel	Canoochee Creek	FAS	100	0.03	226
Nunez, town of	Emanuel	Ohoopee River	FAS	100	0.01	135
Oak Park, town of	Emanuel	Ohoopee River	FAS	100	0.03	266
Stillmore, town of	Emanuel	Ohoopee River	FAS	100	0.04	610
Summertown, town of	Emanuel	Upper Ogeechee River	FAS	100	0.01	151
Swainsboro, town of	Emanuel	Ohoopee River	FAS	100	1.94	8,100
Twin City, city of	Emanuel	Canoochee Creek	FAS	100	0.13	2,500
Bellville, city of	Evans	Canoochee Creek	FAS	100	0.04	300
Claxton, city of	Evans	Canoochee Creek	FAS	100	0.33	3,000
Daisy, city of	Evans	Canoochee Creek	FAS	100	0.02	138
Hagan, city of	Evans	Canoochee Creek	FAS	100	0.09	900
Hapeville, city of	Fulton	Upper Ocmulgee River	Purchased	100	N/A	4,800
Gibson, city of	Glascock	Upper Ogeechee River	CLB	100	0.10	679
Mitchell, city of	Glascock	Upper Ogeechee River	CST	100	0.02	188
Brunswick, city of	Glynn	Cumberland - St. Simons	FAS	100	6.34	25,480
Brunswick-Glynco W/S	Glynn	Cumberland - St. Simons	FAS	100	0.33	11,605
Brunswick-Interchange Water	Glynn	Cumberland - St. Simons	FAS	100	0.47	300
Sea Palms Development Water	Glynn	Cumberland - St. Simons	FAS	100	0.46	N/A
Jekyll Island Water System	Glynn	Cumberland - St. Simons	FAS	100	1.40	2,500
St. Simons Island W/S	Glynn	Cumberland - St. Simons	FAS	100	2.48	6,904
Sea Island Services	Glynn	Cumberland - St. Simons	FAS	100	1.43	1,000

Appendix 1. Public supply water-use by by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
B. Georgia.

[Modified from Fanning and others, 1992; Mgal/d, million gallons per day; FAS, Floridan aquifer system; CST, Crystaline Rock aquifer; W/S, Water and Sewer; CLB, Claiborne aquifer; Assoc., Association; N/A, data not available; Auth., Authority; CRE, Cretaceous aquifer]

Utility/Owner	County	Cataloging unit	Water source		Water use in Mgal/d	Population served
			Name	Percent		
Cairo, city of	Grady	Upper Ochlockonee River	FAS	100	1.46	9,035
Whigham, city of	Grady	Upper Ochlockonee River	FAS	100	0.09	604
Greensboro, city of	Greene	Upper Oconee River	Lake Oconee	100	0.53	2,930
Siloam, town of	Greene	Upper Oconee River	CST	100	0.02	161
Union Point, city of	Greene	Upper Ogeechee River	Sherrill Creek	100	0.23	2,010
White Plains, town of	Greene	Upper Oconee River	CST	100	0.02	283
Woodville	Greene	Upper Oconee River	CST	100	0.01	204
Dacula, city of	Gwinnett	Upper Oconee River	CST	100	0.16	2,080
Grayson, city of	Gwinnett	Upper Ocmulgee River	CST	100	0.03	527
Devereux Water System	Hancock	Upper Oconee River	CST	100	0.02	267
Sparta, city of	Hancock	Lower Oconee River	Ford Creek	100	0.39	3,110
Hampton, city of	Henry	Upper Ocmulgee River	CST	100	0.08	1,800
Henry County Water Auth.	Henry	Upper Ocmulgee River	Towaliga River	100	4.38	20,100
Locust Grove, city of	Henry	Upper Ocmulgee River	Indian Creek	100	0.05	1,545
McDonough, city of	Henry	Upper Ocmulgee River	Walnut Creek and CST	88/12	0.76	3,740
Centerville, city of	Houston	Lower Ocmulgee River	CRE	100	0.77	5,606
Elberta, city of	Houston	Lower Ocmulgee River	CRE	100	0.11	1,559
Houston County W/S	Houston	Lower Ocmulgee River	CRE	100	3.19	3,540
Perry, city of	Houston	Lower Ocmulgee River	CRE	100	1.58	11,612
Warner Robins, city of	Houston	Lower Ocmulgee River	CRE	100	6.51	51,000
Irwinville Water Works	Irwin	Alapaha River	FAS	100	0.03	300
Mystic, city of	Irwin	Alapaha River	FAS	100	0.03	300
Ocilla, city of	Irwin	Alapaha River	FAS	100	0.62	3,200
Braselton, town of	Jackson	Upper Oconee River	CST	100	0.05	650
Commerce, city of	Jackson	Upper Oconee River	Grove Creek	100	1.26	5,000
Hoschton, city of	Jackson	Upper Oconee River	CST	100	0.04	590
Jefferson, city of	Jackson	Upper Oconee River	Big Curry Creek	100	1.06	3,000
Nicholson Water Assoc.	Jackson	Upper Oconee River	CST	100	0.12	536
Monticello, city of	Jasper	Upper Oconee River	Popes Branch	100	0.24	3,080
Shady Dale, town of	Jasper	Upper Oconee River	CST	100	0.10	320
Denton, city of	Jeff Davis	Satilla River	FAS	100	0.04	700
Hazelhurst, city of	Jeff Davis	Altamaha River	FAS	100	0.95	4,298
Avera, town of	Jefferson	Upper Ogeechee River	CLB	100	0.02	248
Bartow, town of	Jefferson	Upper Ogeechee River	CLB	100	0.01	427
Louisville, city of	Jefferson	Upper Ogeechee River	CLB and CRE	100	1.37	2,823
Stapleton, town of	Jefferson	Upper Ogeechee River	CLB and CRE	90/10	0.05	390
Wadley, city of	Jefferson	Upper Ogeechee River	CLB and FAS	100	0.16	2,475
Millen, city of	Jenkins	Upper Ogeechee River	FAS and CLB	100	0.57	3,900
Perkins Water Auth.	Jenkins	Upper Ogeechee River	CLB	100	0.01	76
Kite, town of	Johnson	Ohoopee River	FAS	100	0.03	296
Scott W/S Auth.	Johnson	Ohoopee River	FAS	100	0.02	250
Wrightsville, city of	Johnson	Ohoopee River	FAS and CLB	100	0.22	2,540
Gray, city of	Jones	Upper Ocmuglee River	CST	100	0.03	3,000
Haddock Water Commission	Jones	Lower Oconee River	CST	100	0.06	800
Jones County Water Auth.	Jones	Upper Ocmuglee River	CRE	100	0.70	6,300
Barnesville, city of	Lamar	Upper Ocmuglee River	Edie Creek and Big Towaliga Creek	N/A	1.51	5,600
Lakeland, city of	Lanier	Alapaha River	FAS	100	0.34	2,647

Appendix 1. Public supply water-use by by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
B. Georgia.

[Modified from Fanning and others, 1992; Mgal/d, million gallons per day; FAS, Floridan aquifer system; CST, Crystaline Rock aquifer; W/S, Water and Sewer; CLB, Claiborne aquifer; Assoc., Association; N/A, data not available; Auth., Authority; CRE, Cretaceous aquifer]

Utility/Owner	County	Cataloging unit	Water source		Water use in Mgal/d	Population served
			Name	Percent		
Cadwell, town of	Laurens	Little Ocmulgee River	FAS	100	0.06	464
Dexter, town of	Laurens	Lower Oconee River	FAS	100	0.03	465
Dublin, city of	Laurens	Lower Oconee River	Oconee River and FAS	80/20	3.34	19,099
Dudley, city of	Laurens	Lower Oconee River	CLB	100	0.06	403
East Dublin, town of	Laurens	Lower Oconee River	CLB	100	0.38	3,200
Montrose, town of	Laurens	Lower Oconee River	FAS and CLB	50/50	0.02	117
Rentz, town of	Laurens	Lower Oconee River	FAS	100	0.04	364
Hinesville, city of	Liberty	Ogeechee Coastal	FAS	100	2.14	21,000
Midway, city of	Liberty	Ogeechee Coastal	FAS	100	0.02	800
Walthourville, city of	Liberty	Ogeechee Coastal	FAS	100	0.23	15,000
Ludowici, city of	Long	Altamaha River	FAS	100	0.14	2,000
Clyattville, town of	Lowndes	Withlachoochee River	FAS	100	0.03	300
Hahira, city of	Lowndes	Little River	FAS	100	0.03	1,800
Lake Park, town of	Lowndes	Alapaha River	FAS	100	0.04	433
Lowndes County Water System	Lowndes	Alapaha River	FAS	100	0.18	1,364
Remerton, city of	Lowndes	Withlachoochee River	FAS	100	0.04	443
Valdosta, city of	Lowndes	Alapaha River	FAS	100	7.47	43,000
Darien, city of	McIntosh	Ogeechee Coastal	FAS	100	0.11	3,000
Hog Hammock Community	McIntosh	Ogeechee Coastal	FAS	100	0.02	170
Hinsonton Water Assoc.	Mitchell	Upper Ochlockonee River	FAS	100	0.01	60
Pelham, city of	Mitchell	Upper Ochlockonee River	FAS	100	0.69	4,300
Sale City, town of	Mitchell	Upper Ochlockonee River	FAS	100	0.05	322
Culloden, city of	Monroe	Upper Ocmulgee River	CST	100	0.02	121
Forsyth, city of	Monroe	Upper Ocmulgee River	CST	100	1.20	6,000
Ailey, town of	Montgomery	Lower Oconee River	FAS	100	0.04	555
Alston, town of	Montgomery	Altamaha River	FAS	100	0.01	160
Charlotte Water Assoc.	Montgomery	Altamaha River	FAS	100	0.01	60
Mt. Vernon, city of	Montgomery	Lower Oconee River	FAS	100	0.19	1,737
Tarrytown, village of	Montgomery	Ohoopee River	FAS	100	0.01	130
Uvalda, town of	Montgomery	Altamaha River	FAS	100	0.05	563
Bostwick, town of	Morgan	Upper Oconee River	CST	100	0.01	307
Buckhead, town of	Morgan	Upper Oconee River	CST	100	0.02	174
Madison, city of	Morgan	Upper Oconee River	CST/Hard Labor Creek	92/8	1.02	984
Rutledge, city of	Morgan	Upper Oconee River	CST	100	0.07	659
Almon Community Water	Newton	Upper Ocmulgee River	CST	100	0.04	350
Covington, city of	Newton	Upper Ocmulgee River	Alcovy Creek	100	3.37	12,000
Mansfield, town of	Newton	Upper Oconee River	CST	100	0.02	337
Newborn, town of	Newton	Upper Oconee River	CST	100	0.04	388
Porterdale, town of	Newton	Upper Ocmulgee River	CST	100	0.04	1,430
Oconee County Water Auth.	Oconee	Upper Oconee River	Calls Creek	100	0.32	6,400
Watkinsville, city of	Oconee	Upper Oconee River	CST	100	0.51	1,240
Byron, city of	Peach	Lower Ocmulgee River	CRE	100	0.30	1,960
Fort Valley, city of	Peach	Lower Ocmulgee River	CRE	100	2.07	10,000
Blackshear, city of	Pierce	Little Satilla River	FAS	100	0.47	3,465
Patterson, city of	Pierce	Little Satilla River	FAS	100	0.03	750
Hartford Water Auth.	Pulaski	Lower Ocmulgee River	CLB	100	0.05	650
Hawkinsville, city of	Pulaski	Lower Ocmulgee River	CLB and FAS	90/10	0.62	4,400
Eatonton, city of	Putnam	Upper Oconee River	Little River	100	0.85	4,832

Appendix 1. Public supply water-use by by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
B. Georgia.

[Modified from Fanning and others, 1992; Mgal/d, million gallons per day; FAS, Floridan aquifer system; CST, Crystaline Rock aquifer; W/S. Water and Sewer; CLB, Claiborne aquifer; Assoc., Association; N/A. data not available; Auth., Authority; CRE, Cretaceous aquifer]

Utility/Owner	County	Cataloging unit	Water source		Water use in Mgal/d	Population served
			Name	Percent		
Conyers, city of	Rockdale	Upper Ocmulgee River	CST and Yellow River	73/27	6.14	43,214
Milstead Water System	Rockdale	Upper Ocmulgee River	CST	100	0.11	1,000
Newington, town of	Screven	Lower Ogeechee River	FAS	100	0.05	317
Oliver, city of	Screven	Lower Ogeechee River	FAS	100	0.03	214
Sylvania, city of	Screven	Lower Ogeechee River	FAS	100	0.47	2,420
Crawfordville, city of	Taliaferro	Upper Ogeechee River	FAS	100	0.03	234
Cobbtown, city of	Tattnail	Canoochee Creek	FAS	100	0.07	341
Collins, city of	Tattnail	Ohoopee River	FAS	100	0.06	750
Glennville, city of	Tattnail	Altamaha River	FAS	100	0.49	4,500
Manassas, city of	Tattnail	Canoochee Creek	FAS	100	0.02	200
Reidsville, city of	Tattnail	Ohoopee River	FAS	100	0.40	3,150
Jacksonville, town of	Telfair	Lower Ocmulgee River	FAS	100	0.03	127
Lumber City, city of	Telfair	Little Ocmulgee River	FAS	100	0.90	1,500
McRae, city of	Telfair	Little Ocmulgee River	FAS	100	0.20	3,409
Milan, town of	Telfair	Little Ocmulgee River	FAS	100	0.41	900
Scotland, city of	Telfair	Little Ocmulgee River	FAS	100	0.18	236
Boston, city of	Thomas	Aucilla River	FAS	100	0.11	1,500
Barwick, town of	Thomas	Withlacoochee River	FAS	100	0.06	413
Coolidge, city of	Thomas	Upper Ochlockonee River	FAS	100	0.11	610
Meigs, city of	Thomas	Upper Ochlockonee River	FAS	100	0.16	1,300
Ochlocknee, town of	Thomas	Upper Ochlockonee River	FAS	100	0.07	650
Pavo, city of	Thomas	Withlacoochee River	FAS	100	0.08	1,000
Thomasville, city of	Thomas	Aucilla River	FAS	100	3.99	24,000
Omega, city of	Tift	Little River	FAS	100	0.07	1,058
Tift County Water System	Tift	Withlacoochee River	FAS	100	0.22	2,500
Tifton, city of	Tift	Withlacoochee River	FAS	100	5.73	28,000
Ty Ty, town of	Tift	Little River	FAS	100	0.08	565
Lyons, city of	Toombs	Ohoopee River	FAS	100	0.56	4,203
Santa Claus, city of	Toombs	Ohoopee River	FAS	100	0.01	164
Vidalia, city of	Toombs	Ohoopee River	FAS	100	1.87	11,500
Soperton, city of	Treutlen	Lower Oconee River	FAS	100	0.43	3,000
Ashburn, city of	Turner	Little River	FAS	100	0.61	4,670
Rebecca, town of	Turner	Alapaha River	FAS	100	0.02	390
Sycamore, city of	Turner	Little River	FAS	100	0.10	650
Danville, town of	Twiggs	Lower Oconee River	CRE	100	0.03	482
Jeffersonville, city of	Twiggs	Lower Oconee River	CRE	100	0.23	1,474
Jersey, town of	Walton	Upper Ocmulgee River	CST	100	0.03	342
Monroe, city of	Walton	Upper Ocmulgee River	Alcovy River	100	2.77	14,866
Social Circle, city of	Walton	Upper Ocmulgee River	Alcovy River	100	0.45	2,700
Walton County Water System	Walton	Upper Ocmulgee River	CST	100	0.64	N/A
Manor Water System	Ware	Upper Suwannee River	FAS	100	0.37	500
Ware County Water System	Ware	Satilla River	FAS	100	1.27	9,000
Waycross, city of	Ware	Satilla River	FAS	100	2.82	16,100
Norwood, town of	Warren	Upper Ogeechee River	CST	100	0.01	188
Warrenton, city of	Warren	Upper Ogeechee River	Rocky Comfort Creek	100	0.30	2,525
Davisboro, city of	Washington	Upper Ogeechee River	CLB and CRE	67/33	0.03	382
Deepstep, town of	Washington	Lower Oconee River	CRE	100	0.01	86
Harrison, town of	Washington	Ohoopee River	FAS	100	0.02	411

Appendix 1. Public supply water-use by by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
B. Georgia.

[Modified from Fanning and others, 1992; Mgal/d, million gallons per day; FAS, Floridan aquifer system: CST, Crystaline Rock aquifer: W/S, Water and Sewer; CLB, Claiborne aquifer; Assoc., Association; N/A, data not available; Auth., Authority; CRE, Cretaceous aquifer]

Utility/Owner	County	Cataloging unit	Water source		Water use in Mgal/d	Population served
			Name	Percent		
Oconee, town of	Washington	Lower Oconee River	CRE	100	0.03	221
Riddleville, town of	Washington	Ohoopee River	CLB	100	0.11	79
Sandersville, city of	Washington	Lower Oconee River	CRE and CLB	70/30	1.44	6,148
Tennille, city of	Washington	Ohoopee River	FAS	100	0.19	1,717
Warthen Water Auth.	Washington	Upper Ogeechee River	CRE	100	0.01	240
Jesup, city of	Wayne	Altamaha River	FAS	100	1.62	10,000
Odum, town of	Wayne	Little Satilla River	FAS	100	0.02	388
Screven, city of	Wayne	Little Satilla River	FAS	100	0.73	872
Alamo, city of	Wheeler	Little Ocmulgee River	FAS	100	0.21	1,035
Glenwood, city of	Wheeler	Lower Oconee River	FAS	100	0.06	1,610
Abbeville, city of	Wilcox	Lower Ocmulgee River	FAS	100	0.08	998
Pineview, town of	Wilcox	Lower Ocmulgee River	FAS	100	0.10	564
Pitts, city of	Wilcox	Alapaha River	FAS	100	0.02	218
Rochelle, city of	Wilcox	Alapaha River	FAS	100	0.40	1,642
Seville, town of	Wilcox	Alapaha River	FAS	100	0.01	150
Allentown, town of	Wilkinson	Lower Oconee River	CRE	100	0.02	241
Gordon, town of	Wilkinson	Lower Oconee River	CRE	100	0.38	2,873
Irwinton, town of	Wilkinson	Lower Oconee River	CRE	100	0.20	1,250
Ivey, town of	Wilkinson	Lower Oconee River	CRE	100	0.11	650
Mcintyre, town of	Wilkinson	Lower Oconee River	CRE	100	0.10	571
Toomsboro, town of	Wilkinson	Lower Oconee River	CRE	100	0.12	652
Poulan, city of	Worth	Little River	FAS	100	0.05	800
Sumner, town of	Worth	Little River	FAS	100	0.03	190
Sylvester, city of	Worth	Little River	FAS	100	0.69	5,900

Appendix 2. Population and water-use by hydrologic cataloging unit in the Georgia-Florida Coastal Plain study unit, 1990. This appendix is divided into the following sections:
A. Population characteristics. B. Water-use by principal category.

A. Population charactertistics.

[cataloging units are shown on figure 12 and are identified in Seaber and others, 1987]

Cataloging units			Served by public supply		
Name	Unit number	Population	Total	Ground water	Surface water
Upper Ogeechee River	03060201	43,010	18,900	13,810	5,090
Lower Ogeechee River	03060202	43,770	22,880	22,880	0
Canoochee Creek	03060203	64,620	36,510	36,510	0
Ogeechee Coastal	03060204	200,730	152,630	144,630	8,000
Upper Oconee River	03070101	265,340	154,180	30,710	123,470
Lower Oconee River	03070102	116,650	75,750	30,690	45,060
Upper Ocmulgee River	03070103	1,188,200	1,037,610	57,790	979,820
Lower Ocmulgee River	03070104	128,870	104,880	104,880	0
Little Ocmulgee River	03070105	31,160	17,140	17,140	0
Altamaha River	03070106	50,970	21,670	21,670	0
Ohoopee River	03070107	54,010	31,870	31,870	0
Satilla River	03070201	103,550	57,570	57,570	0
Little Satilla River	03070202	21,000	9,330	9,330	0
Cumberland - St. Simons	03070203	72,340	54,620	54,620	0
St. Marys River	03070204	73,510	42,020	42,020	0
Nassau River	03070205	24,790	7,650	7,650	0
Upper St. Johns River (1)	03080101	961,276	876,630	876,630	0
Oklawaha River	03080102	446,040	328,260	328,260	0
Lower St. Johns River	03080103	873,250	731,700	731,700	0
Daytona - St. Augustine	03080201	275,030	250,510	250,510	0
Cape Canaveral Coastal	03080202	440,070	406,150	269,660	136,490
Vero Beach Coastal (1)	03080203	91,593	53,734	53,734	0
Kissimmee River (1)	03090101	255,660	221,373	221,373	0
Peace River (1)	03100101	276,534	228,598	228,598	0
Little Manatee River (1)	03100203	21,000	19,500	19,500	0
Alafia River	03100204	59,430	21,780	21,780	0
Hillsborough River	03100205	623,800	590,370	205,200	385,170
Tampa Bay (1)	03100206	624,263	610,786	567,990	42,796
Crystal - Pithlachascotee	03100207	843,160	757,390	757,390	0
Withlacoochee River	03100208	195,340	80,960	80,960	0
Waccasassa River	03110101	13,660	3,910	3,910	0
Econfina - Steinhatchee	03110102	25,940	14,650	14,650	0
Aucilla River	03110103	33,510	19,080	19,080	0
Upper Suwannee River	03110201	25,520	10,230	10,230	0
Alapaha River	03110202	84,960	49,350	49,350	0
Withlacoochee River	03110203	113,020	93,630	93,630	0
Little River	03110204	41,580	19,250	19,250	0
Lower Suwannee River	03110205	42,820	13,660	13,660	0
Santa Fe River	03110206	105,360	35,470	35,470	0
Apalachee Bay - St. Marks	03120001	193,960	155,260	155,260	0
Upper Ochlockonee River	03120002	53,510	45,300	45,300	0
Lower Ochlockonee River	03120003	64,580	28,020	19,600	8,420
Totals		9,267,386	7,510,761	5,776,445	1,734,316

(1)Indicates the cataloging unit is partially in the study unit, and the data shown is for the part within the study unit only.

Appendix 2. Population and water-use by hydrologic cataloging unit in the Georgia-Florida Coastal Plain study unit, 1990
B. Freshwater withdrawals by principal water-use category.

[Cataloging units are shown on figure 12 and are identified in Seaber and others, 1987; withdrawals are in million gallons per day; 0.00, no withdrawals occurred; self-supplied commercial-industrial includes withdrawals for mining; agriculture includes withdrawals for irrigation, livestock, and fish farming]

Cataloging units		Public supply		Self-supplied domestic		Self-supplied commercial-industrial		Agriculture		Thermoelectric power generation		Total water withdrawals		
Name	Unit number	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Totals
Upper Ogeechee River	03060201	2.65	0.92	1.96	0.00	1.47	0.01	5.27	5.62	0.00	0.00	11.35	6.55	17.90
Lower Ogeechee River	03060202	4.16	0.00	1.92	0.00	2.83	0.00	4.08	2.86	0.00	0.00	12.99	2.86	15.85
Canoochee Creek	03060203	5.17	0.00	1.95	0.00	3.69	0.00	2.52	4.57	0.00	0.00	13.33	4.57	17.90
Ogeechee Coastal	03060204	20.77	0.00	2.96	0.00	16.60	8.00	0.74	0.10	0.00	0.00	41.07	8.10	49.17
Upper Oconee River	03070101	3.52	23.54	8.34	0.00	1.17	1.46	0.71	5.85	0.00	1,046.60	13.74	1,077.45	1,091.19
Lower Oconee River	03070102	4.78	8.12	3.09	0.00	43.08	18.15	3.16	7.06	0.00	0.00	54.11	33.33	87.44
Upper Ocmulgee River	03070103	9.06	65.23	8.03	0.00	17.31	13.59	4.26	6.79	0.02	45.57	38.68	131.18	169.86
Lower Ocmulgee River	03070104	17.39	0.00	3.14	0.00	5.22	0.00	22.73	15.44	0.00	0.00	48.48	15.44	63.92
Little Ocmulgee River	03070105	2.43	0.00	1.03	0.00	0.09	0.00	2.58	4.68	0.00	0.00	6.13	4.68	10.81
Altamaha River	03070106	2.96	0.00	1.88	0.00	66.98	0.00	2.47	3.21	0.23	56.83	74.52	60.04	134.56
Ohoopee River	03070107	4.77	0.00	1.43	0.00	0.62	0.00	2.25	3.76	0.00	0.00	9.07	3.76	12.83
Satilla River	03070201	10.19	0.00	3.14	0.00	4.95	0.00	4.23	6.62	0.00	0.00	22.51	6.62	29.13
Little Satilla River	03070202	1.54	0.00	1.16	0.00	0.34	0.00	1.36	2.29	0.00	0.00	4.40	2.29	6.69
Cumberland - St. Simons	03070203	13.42	0.00	0.93	0.00	69.07	0.00	2.03	0.53	0.03	0.00	85.48	0.53	86.01
St. Marys River	03070204	6.68	0.00	6.36	0.00	65.78	0.00	4.80	2.50	0.00	0.00	83.62	2.50	86.12
Nassau River	03070205	0.88	0.00	2.77	0.00	0.05	0.00	1.40	0.43	0.00	0.00	5.10	0.43	5.53
Upper St. Johns River (1)	03080101	190.14	16.24	11.43	0.00	2.04	0.00	126.33	23.49	0.77	198.85	330.71	238.58	569.29
Oklawaha River	03080102	60.34	0.00	22.63	0.00	21.84	7.97	94.77	74.36	0.29	0.00	199.87	82.33	282.20
Lower St. Johns River	03080103	113.12	0.00	21.10	0.00	68.26	4.00	74.98	3.44	5.36	7.71	282.82	15.15	297.97
Daytona - St. Augustine	03080201	32.55	0.00	3.31	0.00	0.72	0.00	5.34	2.69	0.00	0.00	41.92	2.69	44.61
Cape Canaveral Coastal	03080202	17.32	0.00	4.81	0.00	0.19	0.00	3.59	1.89	0.25	0.00	26.16	1.89	28.05
Vero Beach Coastal (1)	03080203	13.17	0.00	8.73	0.00	0.29	0.00	66.75	117.24	0.08	0.00	89.02	117.24	206.26
Kissimmee River (1)	03090101	47.49	0.00	5.59	0.00	29.72	0.00	80.36	10.23	0.00	0.00	163.16	10.23	173.39
Peace River (1)	03100101	51.63	0.00	11.81	0.00	95.51	0.00	68.36	7.58	1.41	70.62	228.72	78.20	306.92
Little Manatee River (1)	03100203	3.10	0.00	0.20	0.00	0.00	0.00	17.03	1.67	0.00	0.00	20.33	1.67	22.00
Alafia River	03100204	3.34	0.00	7.43	0.00	52.28	4.21	28.95	2.85	0.00	0.00	92.00	7.06	99.06
Hillsborough River	03100205	35.75	76.05	5.01	0.00	14.42	0.00	32.00	3.38	0.00	0.00	87.18	79.43	166.61
Tampa Bay (1)	03100206	37.05	0.00	2.28	0.00	0.41	0.00	28.03	5.41	0.00	0.00	67.77	5.41	73.18
Crystal - Pithlachascotee	03100207	140.85	0.00	12.84	0.00	18.60	0.00	12.57	1.69	1.50	0.00	186.36	1.69	188.05
Withlacoochee River	03100208	13.24	0.00	17.37	0.00	79.18	0.00	38.13	3.59	0.00	0.00	147.92	3.59	151.51

Appendix 2. Population and water-use by hydrologic cataloging unit in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
B. Freshwater withdrawals by principal water-use category.

[Cataloging units are shown on figure 12 and are identified in Seaber and others, 1987; withdrawals are in million gallons per day; 0.00, no withdrawals occurred; self-supplied commercial-industrial includes withdrawals for mining; agriculture includes withdrawals for irrigation, livestock, and fish farming]

Cataloging units		Public supply		Self-supplied domestic		Self-supplied commercial-industrial		Agriculture		Thermoelectric power generation		Total water withdrawals		
Name	Unit number	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Ground water	Surface water	Totals
Waccasassa River	03110101	0.59	0.00	2.61	0.00	0.00	0.00	1.15	0.00	0.00	0.00	4.35	0.00	4.35
Econfina - Steinhatchee	03110102	2.08	0.00	1.78	0.00	47.27	1.20	0.60	0.08	0.00	0.00	51.73	1.28	53.01
Aucilla River	03110103	3.50	0.00	2.75	0.00	0.25	0.00	9.99	3.04	0.00	0.00	16.49	3.04	19.53
Upper Suwannee River	03110201	1.79	0.00	2.49	0.00	44.16	0.00	3.48	0.47	0.00	0.00	51.92	0.47	52.39
Alapaha River	03110202	7.32	0.00	2.23	0.00	14.14	0.00	10.81	16.69	0.00	0.00	34.50	16.69	51.19
Withlacoochee River	03110203	16.80	0.00	2.57	0.00	3.69	0.00	21.18	16.24	0.00	0.00	44.24	16.24	60.48
Little River	03110204	1.95	0.00	0.95	0.00	1.45	0.00	11.14	12.94	0.00	0.00	15.49	12.94	28.43
Lower Suwannee River	03110205	2.34	0.00	4.76	0.00	1.02	0.30	45.65	1.20	0.07	108.51	53.84	110.01	163.85
Santa Fe River	03110206	6.73	0.00	14.00	0.00	3.96	0.00	19.60	1.17	2.12	0.00	46.41	1.17	47.58
Apalachee Bay - St. Marks	03120001	24.59	0.00	5.73	0.00	1.09	0.00	6.55	0.90	0.31	0.00	38.27	0.90	39.17
Upper Ochlockonee River	03120002	6.60	0.00	1.21	0.00	0.38	0.00	9.77	7.10	0.00	0.00	17.96	7.10	25.06
Lower Ochlockonee River	03120003	3.66	1.29	3.80	0.00	1.82	1.50	10.78	9.30	4.11	0.00	24.17	12.09	36.26
Totals		947.41	191.39	229.51	0.00	801.94	60.39	892.48	400.95	16.55	1,534.69	2,887.89	2,187.42	5,075.31

(1)Indicates the cataloging unit is partially in the study unit, and the data shown is for the part within the study unit only.

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990
This appendix is divided into the following sections: A. In Florida. B. In Georgia.
A. Florida.

[Modified from Marella. 1994: capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St.. street: N. north: So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district; Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			
			Design capacity	1990 discharge	Disposal source	Disposal system method or receiving water body
Alachua, city of	Alachua	Santa Fe River	0.40	0.34	G	Spray field
Gainesville Regional STP 1	Alachua	Oklawaha River	7.50	4.74	S	Sweetwater Creek
Gainesville Regional STP 5	Alachua	Oklawaha River	10.00	7.92	G	Injection well
Newberry, city of	Alachua	Waccasassa River	0.40	0.21	G	Spray field
University of Florida	Alachua	Oklawaha River	3.10	1.44	S	Lake Alice
FDOC: Baker Correctional	Baker	Santa Fe River	0.19	0.16	G	Percolation pond
Macclenny, city of	Baker	St. Marys River	0.64	0.51	S	Overland flow/Turkey Creek
Florida State Hospital	Baker	St. Marys River	0.30	0.14	S	Little St. Marys River
Florida State Prison	Bradford	Santa Fe River	1.30	0.98	S	New River
Starke, city of	Bradford	Santa Fe River	1.20	0.97	S	Alligator Crek
Barefoot Bay	Brevard	Cape Canaveral Coastal	0.90	0.81	G	Percolation pond/spray field
Brevard Co.: Indian Harbor	Brevard	Cape Canaveral Coastal	2.50	2.18	G	N/A
Brevard Co.: Merritt Island	Brevard	Cape Canaveral Coastal	6.00	2.42	G	Injection well
Brevard Co.: N. Brevard	Brevard	Cape Canaveral Coastal	1.00	0.23	G	Percolation pond
Brevard Co.: Port St. John	Brevard	Cape Canaveral Coastal	0.25	0.16	G	Percolation pond/spray field
Brevard Co.: So. Beaches	Brevard	Cape Canaveral Coastal	6.00	5.53	G	Injection well
				0.45	G	Reuse system
Brevard Co.: So. Central	Brevard	Cape Canaveral Coastal	3.00	2.87	G	Spray field
Brevard Co.: Suntree	Brevard	Cape Canaveral Coastal	0.50	0.48	G	Percolation pond
Brevard Co.: So. Patrick	Brevard	Cape Canaveral Coastal	2.00	1.70	G	Percolation pond
Cape Canaveral, city of	Brevard	Cape Canaveral Coastal	1.80	0.90	G	Percolation pond
Cocoa, city of	Brevard	Cape Canaveral Coastal	4.50	2.47	S	Indian River
Cocoa Beach, city of	Brevard	Cape Canaveral Coastal	6.00	1.54	S	Banana River
				1.59	G	Reuse system
Kennedy Space Center #1	Brevard	Cape Canaveral Coastal	0.38	0.12	G	Percolation pond
Melbourne: D.B. Lee WWTP	Brevard	Cape Canaveral Coastal	7.50	3.70	G	Injection well
Melbourne: Grant St. WWTP	Brevard	Cape Canaveral Coastal	5.80	2.70	G	Injection well
				0.18	G	Reuse system
Palm Bay, city of	Brevard	Cape Canaveral Coastal	0.50	0.37	G	Reuse system
Port Malabar	Brevard	Cape Canaveral Coastal	4.00	2.79	G	Injection well
Rockledge, city of	Brevard	Cape Canaveral Coastal	2.30	1.68	G	Injection well
Titusville, city of (N.)	Brevard	Cape Canaveral Coastal	2.80	2.24	S	Indian River
Titusville, city of (So.)	Brevard	Cape Canaveral Coastal	2.00	1.59	S	Indian River
U.S. Air Force: Capehart	Brevard	Cape Canaveral Coastal	1.00	0.59	S	Banana River
				0.15	G	Reuse system
U.S. Air Force: Patrick N.	Brevard	Cape Canaveral Coastal	1.00	0.60	S	Banana River
U.S. Air Force: Canaveral	Brevard	Cape Canaveral Coastal	0.50	0.38	S	Banana River
West Melbourne, city of	Brevard	Cape Canaveral Coastal	1.90	1.82	G	Injection well
Beverly Hills Rolling Oaks	Citrus	Withlacoochee River	1.00	0.48	G	Percolation pond

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. In Florida. B. In Georgia.

A. Florida.

[Modified from Marella, 1994; capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St., street; N, north; So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district; Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Design capacity	1990 discharge	Disposal source	
Crystal River, city of	Citrus	Crystal - Pithlachasotte	0.75	0.72	S	Crystal River
Inverness, city of	Citrus	Withlacoochee River	1.50	0.58	G	Spray field
Sugar Mill Woods	Citrus	Crystal - Pithlachasotte	0.50	0.25	G	Spray field
Green Cove Springs, city of	Clay	Lower St. Johns River	1.20	0.78	S	St. Johns River
Kingsley: Fleming Island	Clay	Lower St. Johns River	0.72	0.32	S	St. Johns River
Kingsley: Orange Park	Clay	Lower St. Johns River	4.00	3.55	S	St. Johns River
Orange Park, town of	Clay	Lower St. Johns River	2.50	1.15	S	St. Johns River
Clay Utility: Ridaught Land.	Clay	Lower St. Johns River	1.00	0.57	S	Little Black Creek
U.S. Army: Camp Blanding	Clay	Lower St. Johns River	0.90	0.34	S	Black Creek
Lake City, city of	Columbia	Santa Fe River	3.00	1.69	G	Spray field
Cross City: WWTP #1	Dixie	Econfina - Steinhatchee	0.15	0.11	S	Unnamed creek
Cross City: WWTP #2	Dixie	Econfina - Steinhatchee	0.25	0.15	S	Unnamed swamp
Atlantic Beach, city of	Duval	Lower St. Johns River	2.00	1.20	S	Intercoastal waterway
Baldwin, city of	Duval	St. Marys River	0.20	0.13	S	St. Marys River tributary
Beauclerc Utilities	Duval	Lower St. Johns River	0.78	0.48	S	Goodby's Lake
Buccaneer STP	Duval	Lower St. Johns River	1.00	0.77	S	St. Johns River
Holiday Harbour	Duval	Lower St. Johns River	1.20	0.79	S	Hog Pen Creek
Jacksonville Beach,city of	Duval	Lower St. Johns River	3.00	2.77	S	Pablo Creek
Jacksonville: Arlington	Duval	Lower St. Johns River	10.00	4.72	S	St. Johns River
Jacksonville: Buckman St.	Duval	Lower St. Johns River	52.50	30.76	S	St. Johns River
Jacksonville: District II	Duval	Lower St. Johns River	10.00	2.70	S	St. Johns River
Jacksonville: Mandarin	Duval	Lower St. Johns River	4.00	3.48	S	St. Johns River
Jacksonville: Southwest	Duval	Lower St. Johns River	10.00	5.48	S	St. Johns River
JSU: Holly Oaks WWTP	Duval	Lower St. Johns River	1.00	0.42	S	Cow Head Creek
JSU: Jacksonville Heights	Duval	Lower St. Johns River	2.50	1.29	S	Fishing Creek
JSU: Monterey STP	Duval	Lower St. Johns River	3.00	2.20	S	St. Johns River
JSU: Royal Lakes STP	Duval	Lower St. Johns River	2.40	1.90	S	Pottsburg Creek
JSU: San Jose STP	Duval	Lower St. Johns River	2.20	1.57	S	St. Johns River
Neptune Beach, city of	Duval	Lower St. Johns River	0.75	0.86	S	Intercoastal waterway
Ortega Utilities: Blanding	Duval	Lower St. Johns River	0.35	0.50	S	Ortega Creek
Riverside Plaza	Duval	Lower St. Johns River	N/A	0.67	S	St. Johns River
Southern States: Beacon Hills	Duval	Lower St. Johns River	1.80	0.77	S	St. Johns River
Southern States: Woodmere	Duval	Lower St. Johns River	0.50	0.43	S	Fairfield Branch
U.S. Navy: Cecil Field	Duval	Lower St. Johns River	1.20	0.62	S	Rowell Creek/Sal Taylor Creek
U.S. Navy: Jacksonville NAS	Duval	Lower St. Johns River	3.00	2.19	S	St. Johns River
U.S. Navy: Mayport NAS	Duval	Lower St. Johns River	1.80	1.29	S	St. Johns River
Bunnell, city of	Flagler	Lower St. Johns River	0.30	0.22	S	Haw Creek
Flagler Beach, city of	Flagler	Daytona - St. Augustine	1.00	0.56	S	Intercoastal waterway
Palm Coast Utilities	Flagler	Daytona - St. Augustine	1.60	1.62	G	Percolation pond/spray field

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. In Florida. B. In Georgia.
A. Florida.

[Modified from Marella, 1994; capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St., street; N, north; So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district; Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Design capacity	1990 discharge	Disposal source	
Havana, city of	Gadsden	Lower Ochlockonee River	0.30	0.26	S	Womack Creek/Lake Talquin
Quincy, city of	Gadsden	Lower Ochlockonee River	1.50	0.83	S	Quincy Creek
Trenton, town of	Gilchrist	Lower Suwannee River	0.20	0.18	G	Percolation pond
Jasper, city of	Hamilton	Lower Suwannee River	0.40	0.49	S	Bells Creek
White Springs, city of	Hamilton	Lower Suwannee River	0.15	0.10	S	Suwannee River
Berkeley Manor S/D	Hernando	Crystal - Pithlachasotte	0.75	0.20	G	Spray field/percolation pond
Brookridge S/D	Hernando	Crystal - Pithlachasotte	0.25	0.20	G	Percolation pond
Brooksville: Croom Road	Hernando	Crystal - Pithlachasotte	0.38	0.21	G	Percolation pond
Brooksville: School St.	Hernando	Crystal - Pithlachasotte	0.84	0.52	G	Percolation pond
High Point S/D	Hernando	Withlacoochee River	0.30	0.22	G	Percolation pond
Hill-N-Dale S/D	Hernando	Withlacoochee River	0.15	0.10	G	Percolation pond
Spring Hill Utilities	Hernando	Crystal - Pithlachasotte	2.00	0.84	G	Spray field/percolation pond
W. Hernando: Hernando Beach	Hernando	Crystal - Pithlachasotte	0.20	0.13	G	Spray field/percolation pond
W. Hernando: Weeki Wachee	Hernando	Crystal - Pithlachasotte	0.25	0.12	G	Percolation pond
Apollo Beach, WWTP 1 and 2	Hillsborough	Tampa Bay	1.50	0.42	G	Spray field
Boyette Springs	Hillsborough	Tampa Bay	0.13	0.10	G	Drain field
Carrolwood S/D	Hillsborough	Tampa Bay	0.45	0.37	S	Canal A/Sweetwater Creek
Country Meadows Estates	Hillsborough	Tampa Bay	0.17	0.11	G	Spray field/percolation pond
Groves North	Hillsborough	Tampa Bay	0.22	0.16	G	Spray field
Heather Lakes	Hillsborough	Tampa Bay	0.10	0.10	G	Percolation pond
Hillsborough Co.: Dale Mabry	Hillsborough	Tampa Bay	6.00	5.38	S	Brushy Crek
Hillsborough Co.: Falkenburg	Hillsborough	Tampa Bay	3.00	2.89	S	Palm River/Tampa Bypass Canal
Hillsborough Co.: Progress	Hillsborough	Tampa Bay	0.75	0.23	S	Archie Creek
Hillsborough Co.: River Oaks	Hillsborough	Tampa Bay	10.00	7.06	S	Canal A
Hillsborough Co.: South Reg.	Hillsborough	Hillsborough River	3.00	1.21	G	Spray field
Hillsborough Co.: Valrico	Hillsborough	Hillsborough River	3.00	1.21	S	Turkey Crek
Pebble Creek	Hillsborough	Hillsborough River	0.54	0.17	G	Spray field
Plant City, city of	Hillsborough	Hillsborough River	8.00	3.34	S	Baker/Mill/Pemberton Creeks
Rice Creek Utility	Hillsborough	Tampa Bay	0.30	0.22	G	Percolation pond
Scarecrow Utility: Windemere	Hillsborough	Tampa Bay	0.26	0.12	G	Percolation pond
Seaboard Utilities	Hillsborough	Alifia River	0.82	0.92	G	Spray field/percolation pond
Summerfield subregional	Hillsborough	Hillsborough River	0.75	0.11	G	Spray field
Tampa: Hookers Point	Hillsborough	Tampa Bay	70.00	52.52	S	Hillsborough Bay
Tampa: Suburban	Hillsborough	Hillsborough River	1.00	0.52	G	Spray field/percolation pond
U.S. Air Force: Macdill AFB	Hillsborough	Tampa Bay	1.20	0.80	S	Hillsborough Bay
Van Dyke Resource Venture	Hillsborough	Tampa Bay	1.50	0.39	G	Percolation pond
Countryside of Vero Beach	Indian River	Vero Beach Coastal	0.12	0.10	G	Percolation pond
Indian River Co.: Gifford	Indian River	Vero Beach Coastal	2.00	0.41	G	Percolation pond/spray field
Indain River Co.: V. Royale	Indian River	Vero Beach Coastal	0.50	0.17	G	Percolation pond

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. In Florida. B. In Georgia.
A. Florida.

[Modified from Marella, 1994; capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St., street; N. north; So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district; Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Design capacity	1990 discharge	Disposal source	
Indian River Co.: W. Region	Indian River	Vero Beach Coastal	2.00	0.43	G	Percolation pond/spray field
Sebastian Highlands	Indian River	Vero Beach Coastal	0.30	0.10	G	Percolation pond
Vero Beach, city of	Indian River	Vero Beach Coastal	4.50	2.72	S	Indian River
Vero Beach Highlands	Indian River	Vero Beach Coastal	0.45	0.28	G	Percolation pond
Monticello, city of	Jefferson	Apalachee Bay - St. Mark	0.30	0.53	S	Unnamed swamp/wetlands
Clermont, city of	Lake	Oklawaha River	0.95	0.72	G	Percolation pond
Deanza-Mid Florida Lakes	Lake	Oklawaha River	0.18	0.10	G	Percolation pond
Eustis, city of	Lake	Oklawaha River	1.80	1.11	G	Percolation pond/spray field
Leesburg, city of	Lake	Oklawaha River	3.50	2.44	G	Percolation pond/reuse system
Mt. Dora, city of	Lake	Oklawaha River	1.50	0.83	G	Spray field/reuse system
Orange Blossom Gardens	Lake	Oklawaha River	0.95	0.34	G	Reuse system
Tavares: Main	Lake	Oklawaha River	0.75	0.55	G	Percolation pond
Tavares: Woodlea Road	Lake	Oklawaha River	1.00	0.31	G	Percolation pond
Umatilla, city of	Lake	Oklawaha River	0.30	0.18	G	Percolation pond/spray field
Tallahassee: Lake Bradford	Leon	Apalachee Bay - St.Marks	4.50	4.19	G	Spray field
Tallahassee: T.P. Smith	Leon	Apalachee Bay - St.Marks	20.00	11.79	G	Reuse system
Talquin Electric: Lakewood	Leon	Lower Ochlockonee River	0.30	0.19	G	Percolation pond
Chiefland, town of	Levy	Lower Suwannee River	0.30	0.17	G	Percolation pond
Williston, city of	Levy	Oklawaha River	0.45	0.30	G	Percolation pond
FDOC: Liberty Correctional	Liberty	Lower Ochlockonee River	0.20	0.11	G	N/A
Madison, city of	Madison	Aucilla River	0.75	0.63	S	Dry Drainage Ditch
Belleview, city of	Marion	Withlacoochee River	0.35	0.31	G	Percolation pond
Dunnellon, city of	Marion	Oklawaha River	0.25	0.13	S	Rainbow River
FDOC: Marion Correctional	Marion	Oklawaha River	0.44	0.30	G	Spray field
Marion Oaks	Marion	Oklawaha River	0.20	0.11	G	Percolation pond
Oak Run S/D	Marion	Oklawaha River	0.50	0.16	G	Percolation pond
Ocala: WWTP #1	Marion	Oklawaha River	2.40	1.25	G	Reuse sytem
Ocala: WWTP #2	Marion	Oklawaha River	3.50	3.03	G	Spray field
On Top of the World W/S	Marion	Oklawaha River	0.75	0.19	G	Percolation pond
Rolling Green	Marion	Oklawaha River	0.25	0.10	G	Percolation pond
Silver Springs Shores	Marion	Oklawaha River	0.80	0.61	G	Percolation pond/spray field
Amelia Island Plantation	Nassau	Nassau River	0.60	0.35	G	Spray field/reuse system
Callahan, town of	Nassau	Nassau River	0.30	0.16	S	Alligator Creek
Fernandina Beach	Nassau	St. Marys River	1.70	1.62	S	Amelia River
Hillard, town of	Nassau	St. Marys River	0.16	0.18	G	Spray field
Apopka, city of	Orange	Upper St. Johns River	4.00	1.11	G	Spray field/reuse system
Camino Real STP	Orange	Kissimmee River	0.35	0.26	G	Percolation pond
Fairway MHP	Orange	Upper St. Johns River	0.15	0.13	G	Percolation pond/reuse system
Marriott Hotel STP	Orange	Kissimmee River	0.45	0.22	G	Reuse system

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. In Florida. B. In Georgia.
A. Florida.

[Modified from Marella, 1994; capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St., street; N, north; So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district; Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Design capacity	1990 discharge	Disposal source	
Ocoee, city of	Orange	Oklawaha River	1.60	0.73	G	Percolation pond
Orange Co.: Cypress Walk	Orange	Kissimmee River	1.00	0.53	G	Reuse system
Orange Co.: Easterly	Orange	Upper St. Johns River	19.00	5.64	S	Wetland/Econlockhatchee River
Orange Co.: Meadow Woods	Orange	Kissimmee River	0.50	0.28	G	Spray field/reuse system
Orange Co.: Northwest	Orange	Oklawaha River	3.00	2.16	G	Percolation pond
Orange Co.: Pepper Mill	Orange	Kissimmee River	1.80	0.50	G	Percolation pond
Orange Co.: Sand Lake Road	Orange	Kissimmee River	30.00	12.52	G	Reuse system
Orange Co.: Vistana	Orange	Kissimmee River	0.33	0.22	G	Percolation pond
Orlando: Conserv I	Orange	Upper St. Johns River	7.50	3.63	G	Percolation pond
Orlando: Conserv II	Orange	Upper St. Johns River	44.00	21.34	G	Reuse system
Orlando: Iron Bridge WWTP	Orange	Upper St. Johns River	20.00	13.28	S	Wetland/Econlockhatchee River
Orlando: McLeod Road	Orange	Kissimmee River	25.00	12.50	G	Reuse system
Park Manor STP	Orange	Oklawaha River	0.35	0.26	G	Percolation pond
Reedy Creek Improvement Dist.	Orange	Kissimmee River	15.00	7.40	G	Percolation pond
Rock Springs MHP	Orange	Upper St. Johns River	0.15	0.10	G	Percolation pond
Starlight Ranch MHP	Orange	Upper St. Johns River	0.12	0.13	G	Percolation pond
University of Central Fla.	Orange	Upper St. Johns River	0.50	0.19	G	Reuse system
University Shores #1	Orange	Oklawaha River	0.28	0.12	S	Little Econlockhatchee River
University Shores #2	Orange	Oklawaha River	1.00	0.51	G	Percolation pond
Winter Garden, city of	Orange	Oklawaha River	2.00	1.08	G	Percolation pond
Winter Park, city of	Orange	Upper St. Johns River	7.50	5.39	G	Reuse system
Buenaventure Lakes STP	Osceola	Kissimmee River	1.50	1.30	G	Spray field/reuse system
Kissimmee Good Samaratin	Osceola	Kissimmee River	0.21	0.14	G	Spray field/reuse system
Kissimmee: Camelot STP	Osceola	Kissimmee River	3.00	0.45	G	Percolation pond/spray field
Kissimmee: Parkway STP	Osceola	Kissimmee River	1.50	0.30	G	Spray field/reuse system
Kissimmee: South Bermuda STP	Osceola	Kissimmee River	7.00	3.76	G	Percolation pond/spray field
Kissimmee: Western STP	Osceola	Kissimmee River	1.20	1.35	G	Percolation pond
Orlando Hyatt House Hotel	Osceola	Kissimmee River	0.40	0.20	G	Spray field
Poinciana Utilities STP #2	Osceola	Kissimmee River	0.50	0.49	G	Spray field
Poinciana Utilities STP #5	Osceola	Kissimmee River	0.66	0.50	G	Percolation pond
St. Cloud, city of	Osceola	Kissimmee River	2.20	1.29	G	Spray field
Aloha Utility: Aloha Gardens	Pasco	Crystal - Pithlachasotte	0.85	0.38	G	Percolation pond
Aloha Utility: Seven Springs	Pasco	Crystal - Pithlachasotte	1.20	0.55	G	Percolation pond
Dade City, city of	Pasco	Withlacoochee River	1.50	0.74	S	Withlacoochee River
Deer Park STP	Pasco	Crystal - Pithlachasotte	1.20	0.63	G	Percolation pond
Forest Hills Utilities	Pasco	Crystal - Pithlachasotte	0.30	0.17	G	Percolation pond/spray field
Jasmine Lakes Ser. Area	Pasco	Crystal - Pithlachasotte	0.37	0.21	G	Percolation pond
Lindrick Ser. Corporation	Pasco	Crystal - Pithlachasotte	1.00	0.49	S	Cross Bayou
Mad Hatter: Carpenters Run	Pasco	Hillsborough River	N/A	0.15	G	Percolation pond

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. In Florida. B. In Georgia.
A. Florida.

[Modified from Marella, 1994; capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St., street; N, north; So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district; Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Design capacity	1990 discharge	Disposal source	
Magnolia Valley	Pasco	Crystal - Pithlachasotte	0.40	0.29	G	Reuse system
New Port Richey, city of	Pasco	Crystal - Pithlachasotte	4.50	3.56	S	Cross Bayou
Palm Terrace STP	Pasco	Hillsborough River	0.13	0.11	G	Percolation pond
Pasco Co.: Hudson	Pasco	Crystal - Pithlachasotte	3.00	1.48	G	Percolation pond
Pasco Co.: Embassy Hills	Pasco	Hillsborough River	3.50	3.03	G	Percolation pond/spray field
Pasco Co.: Land-O-Lakes	Pasco	Hillsborough River	0.40	0.22	G	Percolation pond/spray field
Pasco Co.: River Ridge	Pasco	Crystal - Pithlachasotte	0.30	0.10	G	Percolation pond
Pasco Co.: Southeast	Pasco	Crystal - Pithlachasotte	0.56	0.15	G	Percolation pond
Pasco Co.: Wesley Chapel	Pasco	Crystal - Pithlachasotte	0.75	0.11	G	Reuse system
Saddlebrook STP	Pasco	Hillsborough River	0.25	0.20	G	Percolation pond
Sea Pines STP	Pasco	Crystal - Pithlachasotte	N/A	0.14	G	Percolation pond
Shadow Ridge	Pasco	Hillsborough River	0.20	0.16	G	Percolation pond
Tampa Downs-Quail Hollow	Pasco	Withlacoochee River	0.10	0.13	G	Percolation pond
Zephyrhills, city of	Pasco	Hillsborough River	2.20	0.96	G	Spray field
Belleair, town of	Pinellas	Crystal - Pithlachasotte	0.90	0.49	G	Spray field
				0.15	S	Clearwater Bay
Clearwater: East WWTP	Pinellas	Tampa Bay	5.00	3.60	S	Tampa Bay
Clearwater: Marshall St.	Pinellas	Tampa Bay	10.00	6.40	S	Stevenson Creek
Clearwater: Northeast WWTP	Pinellas	Tampa Bay	8.00	5.21	G	Reuse system
Dunedin, city of	Pinellas	Tampa Bay	6.00	4.05	S	St. Joseph Sound
Dyna-Flo Service Company	Pinellas	Tampa Bay	1.00	0.64	G	N/A
Largo, city of	Pinellas	Tampa Bay	15.00	8.01	S	Tampa Bay
				2.00	G	Spray field
Oldsmar	Pinellas	Tampa Bay	2.20	1.08	S	Old Tampa Bay
On Top of the World STP	Pinellas	Tampa Bay	0.60	0.36	G	N/A
Pinellas Co.: Eastlake	Pinellas	Tampa Bay	0.40	0.29	G	Reuse system
Pinellas Co.: Mckay Creek	Pinellas	Tampa Bay	6.00	4.30	G	Injection well
				0.00	S	Boca Ciega Bay
Pinellas Co.: N. Pinellas	Pinellas	Tampa Bay	9.00	3.59	G	Reuse system
Pinellas Co.: Pine Ridge	Pinellas	Tampa Bay	0.60	0.15	G	Reuse system
Pinellas Co.: So. Cross Bayou	Pinellas	Tampa Bay	24.50	20.03	G	Injection well
				0.00	S	Joe's Creek
Safety Harbor	Pinellas	Tampa Bay	0.20	0.10	G	Percolation pond
St. Petersburg: A. Whited	Pinellas	Tampa Bay	12.40	3.64	G	Injection well
				4.42	G	Reuse system
St. Petersburg: Northeast	Pinellas	Tampa Bay	16.00	5.71	G	Injection well
				4.67	G	Reuse system
St. Petersburg: Northwest	Pinellas	Tampa Bay	20.00	4.46	G	Injection well
				7.36	G	Reuse system

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. In Florida. B. In Georgia.
A. Florida.

[Modified from Marella, 1994; capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St., street; N, north; So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district: Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			
			Design capacity	1990 discharge	Disposal source	Disposal system method or receiving water body
St. Petersburg: Southwest	Pinellas	Tampa Bay	20.00	6.64	G	Injection well
				4.82	G	Reuse system
Tarpon Lake Village	Pinellas	Tampa Bay	0.80	0.15	G	N/A
Tarpon Springs, city of	Pinellas	Crystal - Pithlachasotte	4.00	1.00	S	Anclotte River
				0.45	G	Reuse system
Tarpon Woods STP	Pinellas	Crystal - Pithlachasotte	0.25	0.23	G	Injection well
Aurburndale, city of	Polk	Peace River	1.40	0.96	S	Lake Lena Run
Bartow, city of	Polk	Peace River	2.70	2.40	G	Reuse system
FDOC: Avon Park Correctional	Polk	Kissimmee River	0.48	0.43	S	Arbuckle Creek
FDOC: Polk Correctional	Polk	Peace River	0.25	0.26	G	Percolation pond
Fort Meade, city of	Polk	Peace River	1.00	0.41	G	Percolation pond
Garden Grove: Cypresswood	Polk	Kissimmee River	0.72	0.45	G	Percolation pond
Grenelefe Corporation	Polk	Peace River	0.30	0.32	G	Reuse system
Haines City, city of	Polk	Peace River	1.40	0.96	G	Spray field/reuse system
Lake Alfred, city of	Polk	Peace River	0.30	0.26	S	Lake Haines
Lake Wales, city of	Polk	Peace River	1.90	1.14	S	Lake Effie
Lake Wales Utilities	Polk	Kissimmee River	0.50	0.12	S	Lake Weopakapka
Lakeland: Main WWTP	Polk	Peace River	10.80	8.20	S	Wetlands
Lakeland: Northside STP	Polk	Peace River	4.00	1.58	G	Percolation pond
Mulberry, city of	Polk	Alafia River	0.50	0.31	S	Alaphia River
Poinciana Utilities STP # 3	Polk	Kissimmee River	0.30	0.25	S	Wetlands/Cypress Bayhead
Polk Co.: I-4 and US 27 So.	Polk	Peace River	0.20	0.14	G	Percolation pond
Polk Co.: Central Regional	Polk	Peace River	0.20	0.25	G	Percolation pond
Polk Co.: Foxwood Lake	Polk	Peace River	0.10	0.10	G	Percolation pond
Polk Co.: Imperial Lake	Polk	Peace River	0.90	0.66	G	Percolation pond
Polk Co.: Jan Phyl Village	Polk	Peace River	0.20	0.20	G	Percolation pond
Skyview Utilities	Polk	Peace River	0.40	0.18	G	Spray field/percolation pond
Winter Haven: Lake Conine	Polk	Peace River	1.70	0.81	S	Lake Conine
Winter Haven: Wahneta WWTP	Polk	Peace River	5.00	3.05	S	Peace Creek drainage canal
Crescent, city of	Putnam	Lower St. Johns River	0.25	0.14	S	Crescent Lake
Palatka, city of	Putnam	Lower St. Johns River	3.00	2.27	S	St. Johns River
Anastasia/Mainland W/S	St. Johns	Daytona - St. Augustine	2.00	1.09	S	Matanzas River
Hastings, city of	St. Johns	Lower St. Johns River	0.10	0.11	S	Cracker Creek
Ponte Vedra Utilities	St. Johns	Daytona - St. Augustine	0.50	0.28	G	Spray field
Sawgrass Utilities	St. Johns	Lower St. Johns River	0.70	0.33	G	Spray field
St. Augustine: STP #1	St. Johns	Daytona - St. Augustine	5.00	1.56	S	Matanzas River
St. Augustine: STP #2	St. Johns	Daytona - St. Augustine	1.50	0.44	S	Matanzas River
St. Augustine Shores	St. Johns	Daytona - St. Augustine	0.50	0.26	G	Spray field
St. Johns Ser.: Inlet Beach	St. Johns	Daytona - St. Augustine	0.50	0.23	G	Spray field

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit, 1990 —Continued
This appendix is divided into the following sections: A. In Florida. B. In Georgia.
A. Florida.

[Modified from Marella, 1994; capacity and discharge values are in million gallons per day; G. Ground; S. Surface; STP, sewage treatment plant; FDOC, Florida Department of Corrections; Co., County; N/A, data not available; WWTP, wastewater treatment plant; St., street; N, north; So, south; JSU, Jacksonville Suburban Utilities; NAS, Naval Air Station; S/D, subdivision; W. west; AFB, Air Force Base; W/S, water system; Reg., regional; Ser., service; V., vista; Land., landing; Dist., district; Fla., Florida; MHP, mobile home park]

Owner/Facility	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Design capacity	1990 discharge	Disposal source	
St. Johns Ser.: Marsh Land.	St. Johns	Lower St. Johns River	0.50	0.31	G	Spray field
St. Johns Ser.: Players Club	St. Johns	Lower St. Johns River	0.90	0.25	G	Spray field
Alfaya Utilities	Seminole	Upper St. Johns River	2.40	0.41	G	Percolation pond
Altamonte Springs, city of	Seminole	Upper St. Johns River	12.50	4.68	S	Wekiva River
				0.97	G	Reuse system
Casselberry, city of	Seminole	Upper St. Johns River	0.64	0.47	G	Reuse system
Longwood Utilities	Seminole	Upper St. Johns River	0.50	0.40	G	Percolation pond
Orlando: Iron Bridge WWTP	Seminole	Upper St. Johns River	40.00	8.84	S	Wetlands/Econlockhatchee River
Sanford, city of	Seminole	Upper St. Johns River	6.00	4.63	S	Lake Monroe/St. Johns River
Sanlando: Wekiva Hunt Club	Seminole	Upper St. Johns River	2.90	1.88	S	Sweetwater Creek/Wekiva River
Sanlando: Woodlands/Des Pinar	Seminole	Upper St. Johns River	0.50	0.43	G	Percolation pond/spray field
Seminole Co.: I-4 Industrial	Seminole	Upper St. Johns River	0.10	0.12	S	Smith Canal/St. Johns River
Seminole Co.: Greenwood	Seminole	Upper St. Johns River	3.50	1.17	G	Percolation pond/reuse system
Seminole Co.: Heathrow	Seminole	Upper St. Johns River	0.20	0.10	G	N/A
Weathersfield S/D	Seminole	Upper St. Johns River	0.36	0.23	S	Little Wekiva River
Winter Springs: Main WWTP	Seminole	Upper St. Johns River	1.50	0.83	G	Reuse system
Winter Springs: Tuscawilla	Seminole	Upper St. Johns River	2.20	0.72	G	Reuse system
Continental Country Club	Sumter	Withlacoochee River	0.40	0.11	S	Chitty Chatty Marsh
FDOC: Sumter Correctional	Sumter	Withlacoochee River	0.21	0.25	G	Spray field
Wildwood, city of	Sumter	Withlacoochee River	0.50	0.37	S	Wetlands
Live Oak, city of	Suwannee	Lower Suwannee River	0.75	0.65	G	Spray field
Perry, city of	Taylor	Econfina - Steinhatchee	1.20	0.79	S	Spring Creek
Lake Butler, city of	Union	Santa Fe River	0.50	0.39	S	Silver Run Creek
Daytona Beach: Bethune Point	Volusia	Daytona - St. Augustine	12.00	8.78	S	Halifax River
Daytona Beach: Westside	Volusia	Daytona - St. Augustine	10.00	4.50	S	Halifax River
Deland: Brandy Trails	Volusia	Upper St. Johns River	0.63	0.10	G	Reuse system
Deland: Regional	Volusia	Upper St. Johns River	4.00	2.22	S	St. Johns River
Deltona Utilities	Volusia	Upper St. Johns River	0.90	0.78	G	Reuse system
Edgewater, city of	Volusia	Cape Canaveral Coastal	2.25	0.55	S	North Indian River
Holly Hill, city of	Volusia	Daytona - St. Augustine	2.40	1.30	S	11th Street Canal
New Smyrna Beach, city of	Volusia	Daytona - St. Augustine	4.00	2.38	S	North Indian River
Ormond Beach, city of	Volusia	Daytona - St. Augustine	6.00	2.77	S	Halifax River
Port Orange, city of	Volusia	Daytona - St. Augustine	12.00	5.28	S	Rose Bay/Halifax River
Sugar Mill STP	Volusia	Daytona - St. Augustine	0.27	0.14	G	Percolation pond
Volusia Co.: Four Townes	Volusia	Upper St. Johns River	0.60	0.29	G	Percolation pond
Volusia Co.: Spruce Creek	Volusia	Upper St. Johns River	0.35	0.20	G	Percolation pond

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit
B. Georgia.

[From the USGS water-use data files, Atlanta; capacity and discharge values are in million gallons per day; S. Surface; G. Ground; WPCP, Water pollution control plant; WWTP, Wastewater treatment plant; STP, Sewage treatment plant; N/A, data not available]

Facility/Owner	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Permitted amount	1990 discharge	Disposal source	
Pearson, city of	Atkinson	Satilla River	0.36	0.24	S	Little Red Bluff Creek
Alma, city of	Bacon	Satilla River	0.75	0.33	S	Hurricane Creek/Satilla River
Milledgeville, city of	Baldwin	Lower Oconee River	7.00	4.84	S	Oconee River
Statham, city of	Barrow	Upper Oconee River	0.15	0.05	S	Barber Creek
Winder, city of	Barrow	Upper Oconee River	0.60	0.47	S	Marburg Creek
Fitzgerald, city of	Ben Hill	Alapaha River	6.00	3.09	S	Turkey Creek
Alapaha, town of	Berrien	Alapaha River	0.10	0.03	S	Alapaha River
Nashville, city of	Berrien	Withlacoochee River	0.63	0.23	S	Reedy Creek
Ray City, city of	Berrien	Withlacoochee River	0.10	0.03	S	Cat Creek
Macon-Bibb County Water and Sewer						
Rocky Creek WPCP	Bibb	Upper Ocmulgee River	21.00	14.79	S	Rocky Creek
L.B. Wilson Airport WPCP	Bibb	Upper Ocmulgee River	0.70	0.37	S	Echeconne Creek
Lower Popular Street WPCP	Bibb	Upper Ocmulgee River	18.00	12.11	S	Ocmulgee River
Cochran, city of	Bleckley	Lower Ocmulgee River	0.60	0.39	S	Jordan Creek
Nahunta, city of	Brantley	Satilla River	0.12	0.00(1)	S	Buffalo Creek
Pembroke, city of	Bryan	Canoochee Creek	0.15	0.10	S	Mill Creek
Richmond Hill, city of	Bryan	Lower Ogeechee River	0.50	0.55	S	Ogeechee River
Statesboro, city of	Bulloch	Canoochee Creek	5.00	4.02	S	Little Lotts Creek
Midville, city of	Burke	Upper Ogeechee River	0.17	0.00(1)	S	Ogeechee River
Jackson, city of						
Northside WPCP	Butts	Upper Ocmulgee River	0.14	0.13	S	Yellow Water Creek
Southside WPCP	Butts	Upper Ocmulgee River	0.04	0.28	S	Town Branch Tributary
Yellow Water Creek WWTP	Butts	Upper Ocmulgee River	0.20	0.22	S	Yellow Water Creek
Kingsland, city of	Camden	St. Marys River	1.60	1.15	S	Little Catfish Creek
St. Marys, city of	Camden	St. Marys River	0.70	0.26(2)	S	St. Marys River
Woodbine, city of	Camden	Satilla River	0.37	0.15	S	Satilla River
Folkston, city of	Charlton	St. Marys River	0.28	0.22	S	Clay Branch
Savannah, city of						
Wilshire/Windsor WPCP	Chatham	Ogeechee Coastal	4.50	2.66	S	Vernon River
Gateway/Georgetown WWTP	Chatham	Ogeechee Coastal	0.19	0.06	S	Ogeechee River
Larchmont WPCP	Chatham	Ogeechee Coastal	N/A	N/A	S	N/A
Skidway Island Utilities	Chatham	Ogeechee Coastal	N/A	N/A	S	N/A
Athens, city of						
North Oconee WPCP	Clarke	Upper Oconee River	10.72	6.53	S	North Oconee River
Mid Oconee WPCP	Clarke	Upper Oconee River	4.00	3.58	S	Middle Oconee River
Cedar Creek WPCP	Clarke	Upper Oconee River	2.00	0.61	S	Oconee River
Clayton County Water Authority						
Northeast WPCP	Clayton	Upper Ocmulgee River	4.00	2.78	S	Panther Creek
W.B. Casey WPCP	Clayton	Upper Ocmulgee River	15.00	10.40	G	Spray field
R.E. Jackson WPCP	Clayton	Upper Ocmulgee River	4.50	2.95	G	Spray field
E.L. Huie WPCP	Clayton	Upper Ocmulgee River	15.00	13.98	G	Spray field
Homerville, city of	Clinch	Upper Suwannee River	0.50	0.67	S	Gallows Branch

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit —Continued
B. Georgia.

[From the USGS water-use data files, Atlanta; capacity and discharge values are in million gallons per day; S. Surface; G. Ground; WPCP, Water pollution control plant; WWTP, Wastewater treatment plant: STP, Sewage treatment plant; N/A, data not available]

Facility/Owner	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Permitted amount	1990 discharge	Disposal source	
Doerun, city of	Colquitt	Upper Ochlockonee River	0.15	0.04	S	Bridge Creek
Moultrie, city of						
Moultrie main WPCP	Colquitt	Upper Ochlockonee River	4.00	2.69	S	Ocklocknee River
Spence Field WPCP	Colquitt	Upper Ochlockonee River	0.20	0.09	S	Little Indian Creek
Norman Park, town of	Colquitt	Little River	0.20	0.09	S	Reddy Creek
Adel, city of	Cook	Withlacoochee River	0.95	1.43	S	Bear Creek
Lenox, town of	Cook	Withlacoochee River	0.17	0.04	S	Little River
Sparks, town of	Cook	Withlacoochee River	0.23	0.11	S	Bear Creek
Atlanta, city of						
Entrenchment Creek WPCP (3)	Dekalb	Upper Ocmulgee River	N/A	(4)	S	Entrenchment Creek
DeKalb County Water System						
Pole Bridge Creek WPCP	DeKalb	Upper Ocmulgee River	5.00	5.16	S	South River
Snapfinger Creek WPCP	DeKalb	Upper Ocmulgee River	36.00	24.45	S	South River
Chester, town of	Dodge	Little Ocmulgee River	0.10	0.13	S	Flat Creek
Eastman, city of						
Roach Branch WPCP	Dodge	Little Ocmulgee River	0.90	0.46	S	Roach Branch
South WPCP	Dodge	Lower Ocmulgee River	0.90	0.32	S	Sugar Creek
Swainsboro, town of	Emanuel	Ohoopee River	3.00	1.26	S	Crooked Creek Tributary
Twin City, city of	Emanuel	Canoochee Creek	0.20	0.12	S	Thick Creek
Gibson, city of	Glascock	Upper Ogeechee River	0.21	0.04	S	Rocky Comfort Creek
Brunswick, city of	Glynn	Cumberland - St. Simons	13.50	5.78	S	Academy Creek
Jekyll Island Water System	Glynn	Cumberland - St. Simons	1.00	0.55	S	Jekyll River
St. Simons Island Water	Glynn	Cumberland - St. Simons	2.50	1.77	S	Dunbar Creek Tributary
Cairo, city of	Grady	Upper Ochlockonee River	2.00	0.95	S	Parkers Mill Creek
Greensboro, city of						
North WPCP	Greene	Upper Oconee River	0.10	0.05	S	Richland Creek
South WPCP	Greene	Upper Oconee River	0.45	0.27	S	Town Creek
Union Point, city of	Greene	Upper Ogeechee River	0.45	0.31	S	North Fork Ogeechee River
Gwinnett County Water and Sewer						
Beaver Run-Sweetwater WPCP	Gwinnett	Upper Ocmulgee River	4.50	3.83	S	Sweetwater Creek
Big Haynes Creek WPCP	Gwinnett	Upper Ocmulgee River	0.50	0.34	S	Big Haynes Creek
Camp Creek WPCP	Gwinnett	Upper Ocmulgee River	0.06	0.02	S	Hale Creek
Castle Wood WPCP	Gwinnett	Upper Ocmulgee River	0.07	0.00(1)	S	Yellow River Tributary
Jacks Creek WPCP	Gwinnett	Upper Ocmulgee River	1.00	0.91	S	Jacks Creek
Jackson Creek WPCP	Gwinnett	Upper Ocmulgee River	3.00	2.63	S	Jackson Creek Tributary
No Business Creek WPCP	Gwinnett	Upper Ocmulgee River	1.00	0.88	S	No Business Creek
Yellow River WPCP	Gwinnett	Upper Ocmulgee River	8.00	6.30	S	Yellow River
Sparta, city of	Hancock	Lower Oconee River	0.08	0.09	S	Buffalo Creek Tributary
Henry County Water Auth.						
Camp Creek WPCP	Henry	Upper Ocmulgee River	1.50	0.74	S	Camp Creek
Hudson Bridge Road WPCP	Henry	Upper Ocmulgee River	0.40	0.12	S	Walnut Creek Tributary
Meadow Creek WPCP	Henry	Upper Ocmulgee River	0.11	0.00(1)	S	Kalves Creek/South River

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit —Continued
B. Georgia.

[From the USGS water-use data files, Atlanta; capacity and discharge values are in million gallons per day; S. Surface; G. Ground; WPCP, Water pollution control plant; WWTP, Wastewater treatment plant; STP, Sewage treatment plant; N/A, data not available]

Facility/Owner	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Permitted amount	1990 discharge	Disposal source	
Panola Woods WPCP	Henry	Upper Ocmulgee River	0.12	0.10	S	Clark Creek Tributary
Skyland WPCP	Henry	Upper Ocmulgee River	0.20	0.11	S	Bear Creek Tributary
Locust Grove, city of (East)	Henry	Upper Ocmulgee River	0.05	0.03	S	Wolf Creek/Tussaha Creek
Locust Grove, city of (West)	Henry	Upper Ocmulgee River	0.05	0.03	S	Indian Creek Tributary
McDonough, city of						
McDonough Main WPCP	Henry	Upper Ocmulgee River	0.11	0.00(1)	S	Tussaham Creek Tributary
Camp Creek WPCP	Henry	Upper Ocmulgee River	0.50	0.36	S	Walnut Creek Tributary
Stockbridge, city of	Henry	Upper Ocmulgee River	0.50	0.33	S	Brush Creek
Perry, city of	Houston	Lower Ocmulgee River	3.00	1.76	S	Big Indian Creek
Warner Robins, city of						
Sandy Run WPCP	Houston	Lower Ocmulgee River	6.00	4.31	S	Sandy Run Creek
Horse Creek WPCP	Houston	Lower Ocmulgee River	3.00	1.96	S	Horse Creek Tributary
Maysville, city of	Jackson	Upper Oconee River	N/A	0.04	S	Buckhead Creek
Commerce, city of	Jackson	Upper Oconee River	N/A	0.73	S	North Oconee River
Hoschton, city of	Jackson	Upper Oconee River	0.10	0.03	S	Middle Oconee Tributary
Jefferson, city of	Jackson	Upper Oconee River	N/A	0.29	S	Big Curry Creek
Monticello, city of						
Pearson Creek Pond	Jasper	Upper Oconee River	0.17	0.08	S	Pearson Creek
White Oak Creek Pond	Jasper	Upper Oconee River	0.11	0.06	S	White Oak Creek
Hazelhurst, city of						
Pond 1	Jeff Davis	Lower Ocmulgee River	0.64	0.24	S	Gully Creek
Pond 2	Jeff Davis	Lower Ocmulgee River	0.24	0.22	S	Gully Creek
Hazelhurst	Jeff Davis	Lower Ocmulgee River	1.50	0.41	S	Big Satilla River
Louisville, city of						
Pond 1	Jefferson	Upper Ogeechee River	0.56	0.24	S	Ogeechee River
Pond 2	Jefferson	Upper Ogeechee River	0.06	0.02	S	Rocky Comfort Creek
Wadley, city of	Jefferson	Upper Ogeechee River	0.21	0.08	S	Williamson Swamp Creek
Millen, city of	Jenkins	Upper Ogeechee River	0.45	0.43	S	Buckhead Creek
Wrightsville, city of	Johnson	Ohoopee River	0.75	0.36	S	Big Cedar Creek
Gray, city of	Jones	Lower Oconee River	0.40	0.16	S	Wolf Creek Tributary
Barnesville, city of	Lamar	Upper Ocmulgee River	1.20	0.63	S	Tobesofkee Creek
Lakeland, city of	Lanier	Alapaha River	0.20	0.18	S	Big Creek
Cadwell, town of	Laurens	Little Ocmulgee River	0.05	0.04	S	Big Creek
Dublin, city of	Laurens	Lower Oconee River	4.00	2.89	S	Oconee River
Dudley, city of	Laurens	Lower Oconee River	0.12	0.05	S	Turkey Creek Tributary
Ludowici, city of	Long	Altamaha River	0.24	0.02	S	Jones Creek Tributary
Hahira, city of	Lowndes	Little River	0.13	0.26	S	Franks Creek
Lowndes County Water System						
Twin Lakes WPCP	Lowndes	Alapaha River	0.15	0.10	S	Caney Branch
Foxboro WPCP	Lowndes	Withlachoochee River	0.15	0.05	S	Withlachoochee River Tributary
Valdosta, city of						
Mud Creek WPCP	Lowndes	Alapaha River	3.22	1.53	S	Mud Creek Tributary
Withlacoochee WPCP	Lowndes	Withlachoochee River	12.00	5.17	S	Withlachoochee River

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit —Continued
B. Georgia.

[From the USGS water-use data files, Atlanta; capacity and discharge values are in million gallons per day; S. Surface; G. Ground; WPCP, Water pollution control plant; WWTP, Wastewater treatment plant; STP, Sewage treatment plant; N/A, data not available]

Facility/Owner	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Permitted amount	1990 discharge	Disposal source	
Darien, city of	McIntosh	Ogeechee Coastal	0.60	0.23	S	Cathead Creek
Pelham, city of	Mitchell	Upper Ochlockonee River	0.75	0.76	S	Big Creek
Forsyth, city of						
Northeast WPCP	Monroe	Upper Ocmulgee River	0.75	0.40	S	Town Creek Tributary
South WPCP	Monroe	Upper Ocmulgee River	0.60	0.28	S	Mill Branch Tributary
Ailey, town of	Montgomery	Lower Oconee River	0.08	0.03	S	Firat Creek
Mt. Vernon, city of	Montgomery	Lower Oconee River	0.27	0.18	S	Limestone Creek
Madison, city of						
Northside WPCP	Morgan	Upper Oconee River	0.14	0.09	S	Mill Branch Tributary
Southside WPCP	Morgan	Upper Oconee River	0.66	0.49	S	Little Sugar Creek
Rutledge, city of	Morgan	Upper Oconee River	0.05	0.03	S	Big Indian Creek
Covington, city of	Newton	Upper Ocmulgee River	4.80	2.99(5)	G	Spray field
Byron, city of	Peach	Lower Ocmulgee River	0.44	0.30	S	Echeconnee Creek
Fort Valley, city of	Peach	Lower Ocmulgee River	2.20	0.09	S	Bay Creek
Hawkinsville, city of						
Hawkinsville Main WPCP	Pulaski	Lower Ocmulgee River	1.30	1.16	S	Ocmulgee River
Hawkinsville North WPCP	Pulaski	Lower Ocmulgee River	1.00	0.00(1)	S	Ocmulgee River
Eatonton, city of						
Eatonton East WPCP	Putnam	Upper Oconee River	0.28	0.32	S	Grady Creek Tributary
Eatonton West WPCP	Putnam	Upper Oconee River	0.39	0.29	S	Root Creek Tributary
Conyers, city of						
Almand Branch WPCP	Rockdale	Upper Ocmulgee River	1.25	1.11	S	Almand Branch
Honey Creek WPCP	Rockdale	Upper Ocmulgee River	0.30	0.25	S	McLain Branch Tributary
Lakeridge Estates WPCP	Rockdale	Upper Ocmulgee River	0.09	0.06	S	Almand Branch/Snapping Creek
Quiggs Branch WPCP	Rockdale	Upper Ocmulgee River	2.00	1.52	S	Quiggs Branch
Scott Creek WPCP	Rockdale	Upper Ocmulgee River	0.30	0.08	S	Scott Creek Tributary
Stanton Woods WPCP	Rockdale	Upper Ocmulgee River	0.15	0.07	S	Almand Branch/Snapping Creek
Atlanta suburbia WPCP	Rockdale	Upper Ocmulgee River	0.45	0.21	S	Snapping Shoals Creek
Newington, town of	Screven	Lower Ogeechee River	0.04	0.02	S	Ogeechee Creek
Griffin, city of						
Griffin Shoal Creek STP	Spalding	Upper Ocmulgee River	1.50	1.12	S	Shoal Creek
Crawfordville, city of	Taliaferro	Upper Ogeechee River	0.05	0.01	S	North Fork Ogeechee River
Collins, city of	Tattnall	Ohoopee River	0.06	0.05	S	Cypress Flat Creek
Glennville, city of	Tattnall	Altamaha River	0.88	0.48	S	Brick Yard Branch
Reidsville, city of	Tattnall	Ohoopee River	0.18	0.12	S	Brazells Creek
Helena, city of	Telfair	Little Ocmulgee River	0.20	0.07	S	Little Ocmulgee River
Lumber City, city of	Telfair	Little Ocmulgee River	0.22	0.28	S	Ocmulgee River
McRae, city of						
Sugar Creek WPCP	Telfair	Little Ocmulgee River	0.60	0.36	S	Sugar Creek
Gum Swamp WPCP	Telfair	Little Ocmulgee River	0.20	0.12	S	Gum Swamp Creek
Scotland, city of	Telfair	Little Ocmulgee River	0.18	0.01	S	Little Ocmulgee River
Boston, city of	Thomas	Aucilla River	0.21	0.14	S	Aucilla Creek
Meigs, city of	Thomas	Upper Ochlockonee River	0.15	0.14	S	Ochlocknee River Tributary

Appendix 3. Domestic wastewater discharge by utility in the Georgia-Florida Coastal Plain study unit —Continued
B. Georgia.

[From the USGS water-use data files, Atlanta; capacity and discharge values are in million gallons per day; S. Surface; G. Ground; WPCP, Water pollution control plant; WWTP, Wastewater treatment plant; STP, Sewage treatment plant; N/A, data not available]

Facility/Owner	County	Cataloging unit	Facility discharge information			Disposal system method or receiving water body
			Permitted amount	1990 discharge	Disposal source	
Ochlocknee, town of	Thomas	Upper Ochlockonee River	0.01	0.00(1)	S	Ochlocknee River Tributary
Thomasville, city of	Thomas	Aucilla River	6.50	3.19	S	Oquina Creek
Tifton, city of	Tift	Withlacoochee River	8.00	4.34	S	New River
Ty Ty, town of	Tift	Little River	0.07	0.03	S	Ty Ty Creek
Lyons, city of						
Lyons North WPCP	Toombs	Ohoopee River	0.48	0.21	S	Swift Creek
Lyons Swift Creek WPCP	Toombs	Ohoopee River	0.55	0.26	S	Swift Creek Tributary
Santa Claus, city of	Toombs	Ohoopee River	0.01	0.01	S	Rocky Creek Tributary
Vidalia, city of	Toombs	Ohoopee River	1.88	1.77	S	Swift Creek
Soperton, city of	Treutlen	Lower Oconee River	0.40	0.30	S	Little Red Bluff Creek
Ashburn, city of	Turner	Little River	1.16	0.03	S	Hat Creek
Sycamore, city of	Turner	Little River	0.01	0.01	S	Little River Tributary
Jeffersonville, city of	Twiggs	Lower Oconee River	0.25	0.14	S	Turkey Creek
Loganville, city of	Walton	Upper Ocmulgee River	0.57	0.29	S	Big Flat Creek
Monroe, city of	Walton	Upper Ocmulgee River	1.86	1.48	S	Jacks Creek
Social Circle, city of						
Little River WPCP	Walton	Upper Ocmulgee River	0.69	0.34	S	Little River
Spearman Pond	Walton	Upper Ocmulgee River	0.05	0.03	S	Spearman Pond
Waycross, city of	Ware	Satilla River	6.70	2.81	S	Satilla River
Warrenton, city of						
Garland Street Pond	Warren	Upper Ogeechee River	0.02	0.01	S	Golden Creek Tributary
Northside Pond	Warren	Upper Ogeechee River	0.05	0.03	S	Golden Creek Tributary
Southside Pond	Warren	Upper Ogeechee River	0.30	0.29	S	Golden Creek Tributary
Sandersville, city of	Washington	Lower Oconee River	1.70	0.91	S	Tanyard Branch
Tennille, city of	Washington	Ohoopee River	0.29	0.20	S	Dyers Creek
Jesup, city of	Wayne	Altamaha River	2.50	1.53	S	Altamaha River
Alamo, city of	Wheeler	Little Ocmulgee River	0.07	0.05	S	Alligator Creek
Glenwood, city of	Wheeler	Lower Oconee River	0.11	0.16	S	Peterson Creek
Abbeville, city of	Wilcox	Lower Ocmulgee River	0.15	0.06	S	Ocmulgee River
Rochelle, city of						
Rochelle Northwest WPCP	Wilcox	Alapaha River	1.10	0.50	S	Mill Creek
Rochelle Southeast WPCP	Wilcox	Alapaha River	0.04	0.05	S	Mill Creek
Gordon, town of	Wilkinson	Lower Oconee River	0.40	0.27	S	Little Commissioners Creek

(1)Discharge from this facility did not occur during 1990.
(2)Discharge data is for 1991.
(3)This plant is located in the Upper Ocmulgee River basin, hovever, effluent can be discharged to either the Chattahoochee River basin or the Ocmulgee River basin.
(4)The amount of water discharged during 1990 into the Upper Ocmulgee River basin was unknown.
(5)Includes the Newton County STP totals.