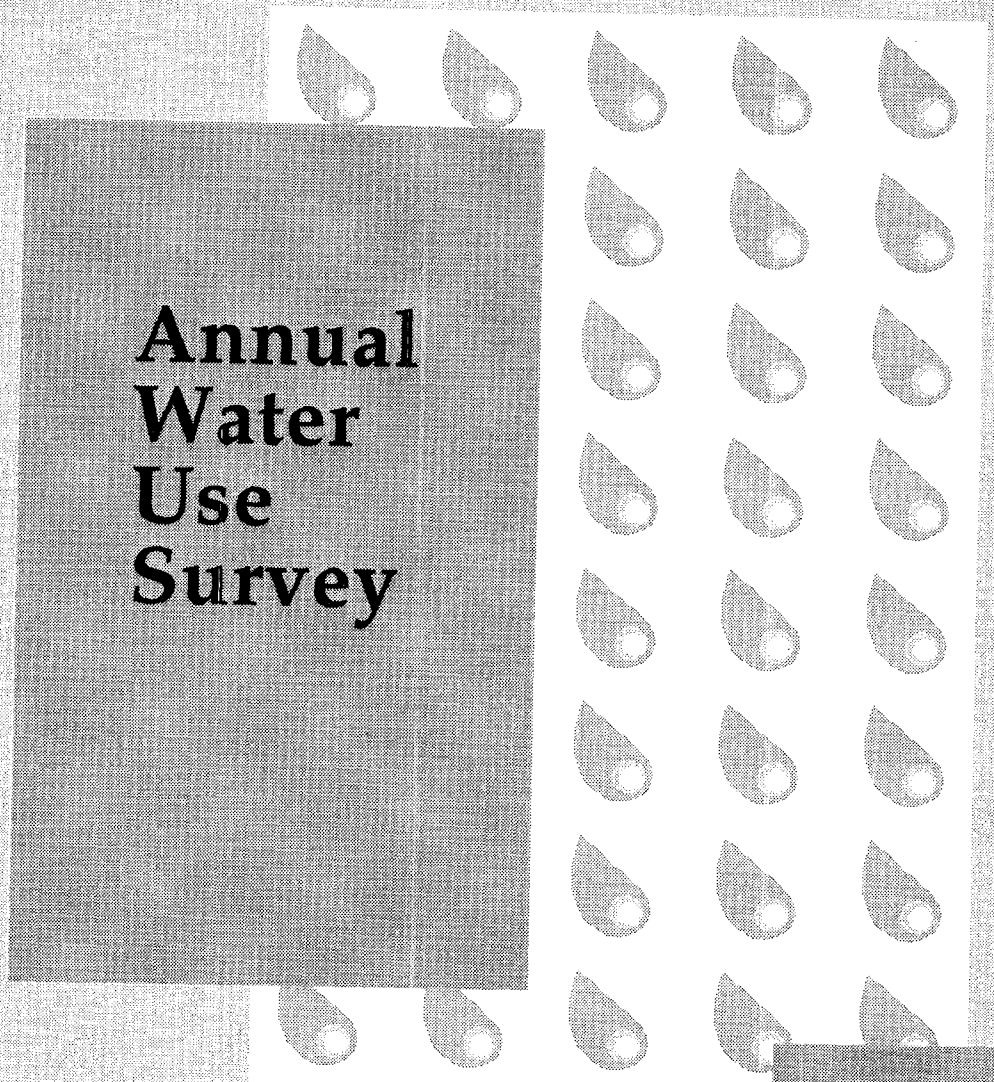
Technical Publication SJ 94-4



Annual Water Use Survey

1991

St. Johns River Water Management District

Technical Publication SJ94-4

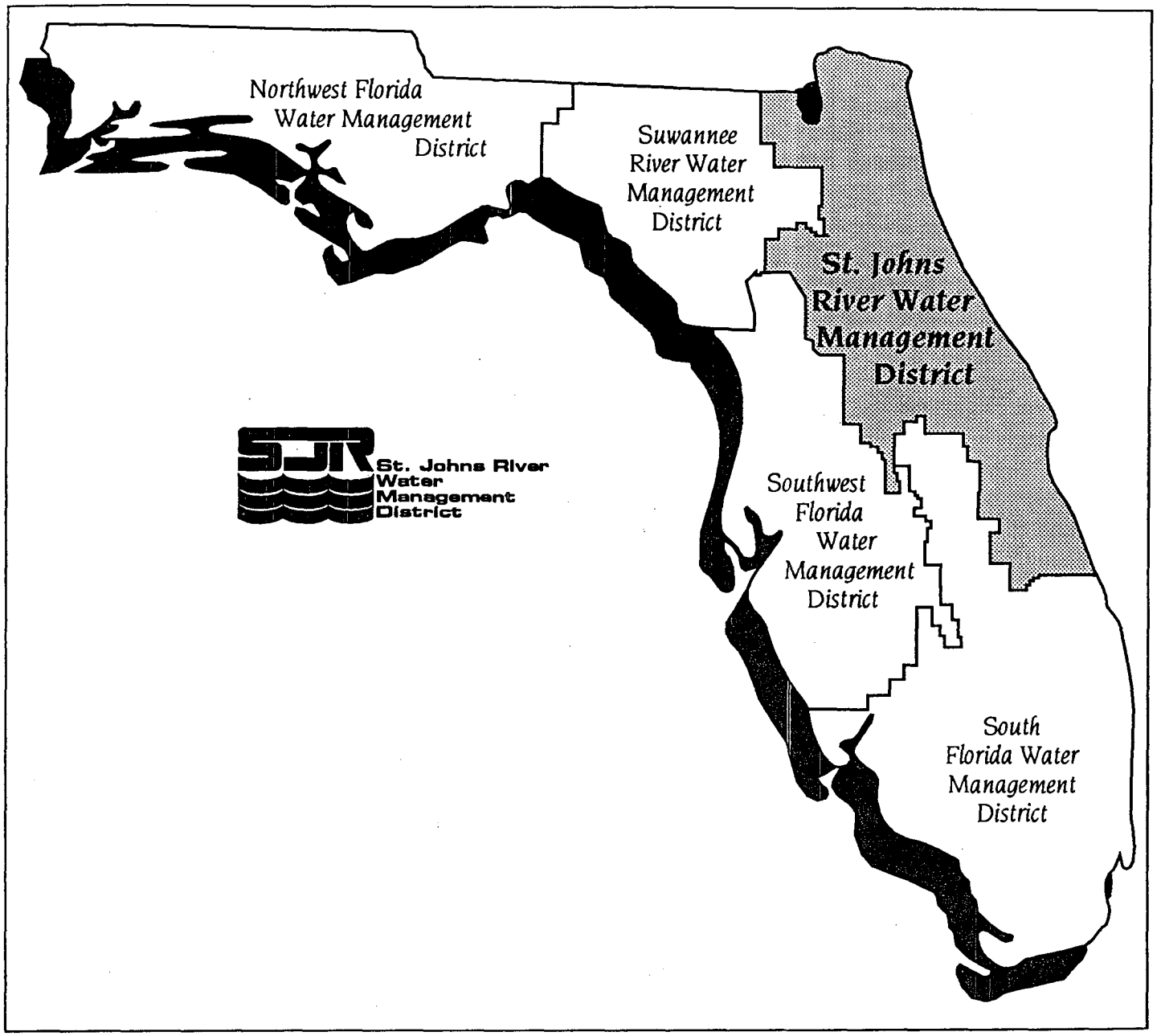
ANNUAL WATER USE SURVEY: 1991

by

Bruce L. Florence

St. Johns River Water Management District
Palatka, Florida

1994



The **St. Johns River Water Management District** (SJRWMD) was created by the Florida Legislature in 1972 to be one of five water management districts in Florida. It includes all or part of 19 counties in northeast Florida. The mission of SJRWMD is to manage water resources to ensure their continued availability while maximizing environmental and economic benefits. It accomplishes its mission through regulation; applied research; assistance to federal, state, and local governments; operation and maintenance of water control works; and land acquisition and management.

Technical reports are published to disseminate information collected by SJRWMD in pursuit of its mission. Copies of this report can be obtained from:

Library
St. Johns River Water Management District
P.O. Box 1429
Palatka, FL 32178-1429

Phone: (904) 329-4132

EXECUTIVE SUMMARY

Water use data have been published annually by the St. Johns River Water Management District (SJRWMD) since 1978. This report assesses water use in SJRWMD for 1991; it presents the total quantities of water used. The information is arranged by source (ground or surface), category of use, and county.

Water use covers all water uses from ground or surface water sources and is expressed in million gallons per day (mgd). Values are the average annual quantities withdrawn and are rounded to the nearest 10,000 gallons (0.01 mgd).

The total amount of water used in SJRWMD in 1991, including fresh and saline water, was 3,156.65 mgd. Of that total, 1,400.63 mgd, or 44 percent, was fresh water. The total surface water use for SJRWMD was 2,129.43 mgd, of which 1,756.02 mgd was saline and 373.41 mgd was fresh. The total amount of ground water withdrawn in SJRWMD was 1,027.22 mgd. Most ground water was fresh water.

The largest use of fresh ground water was for public supply—398.91 mgd, or 39 percent of the total fresh ground water use in SJRWMD, followed closely by agricultural irrigation—363.08 mgd, or 36 percent of the total.

The largest use of fresh surface water was for agriculture—198.04 mgd, or 53 percent of the total fresh surface water use in SJRWMD. Most surface water used was saline water, used for thermoelectric power generation (1,710.93 mgd).

Brevard County had the largest total water use, at 1,303.34 mgd, and the highest total freshwater withdrawal, at 214.14 mgd.

CONTENTS

FIGURES

TABLES

INTRODUCTION

Water use data have been published annually by the St. Johns River Water Management District (SJRWMD) since 1978. This report assesses water use in SJRWMD for 1991; it presents the total quantities of water used. The information is arranged by source (ground or surface), category of use, and county.

Water use covers all water uses from ground or surface water sources and is expressed in million gallons per day (mgd). Values are the average annual quantities withdrawn and are rounded to the nearest 10,000 gallons (0.01 mgd).

SJRWMD includes all or part of 19 counties in northeast Florida (Figure 1). The following counties are wholly or partly included in SJRWMD:

Alachua*	AL	Nassau	NS
Baker*	BK	Okeechobee*	OK
Bradford*	BF	Orange*	OR
Brevard	BV	Osceola*	OS
Clay	CL	Polk*	PK
Duval	DU	Putnam*	PT
Flagler	FL	St. Johns	SJ
Indian River	IR	Seminole	SM
Lake*	LK	Volusia	VL
Marion*	MR		

*Counties that are partly in SJRWMD

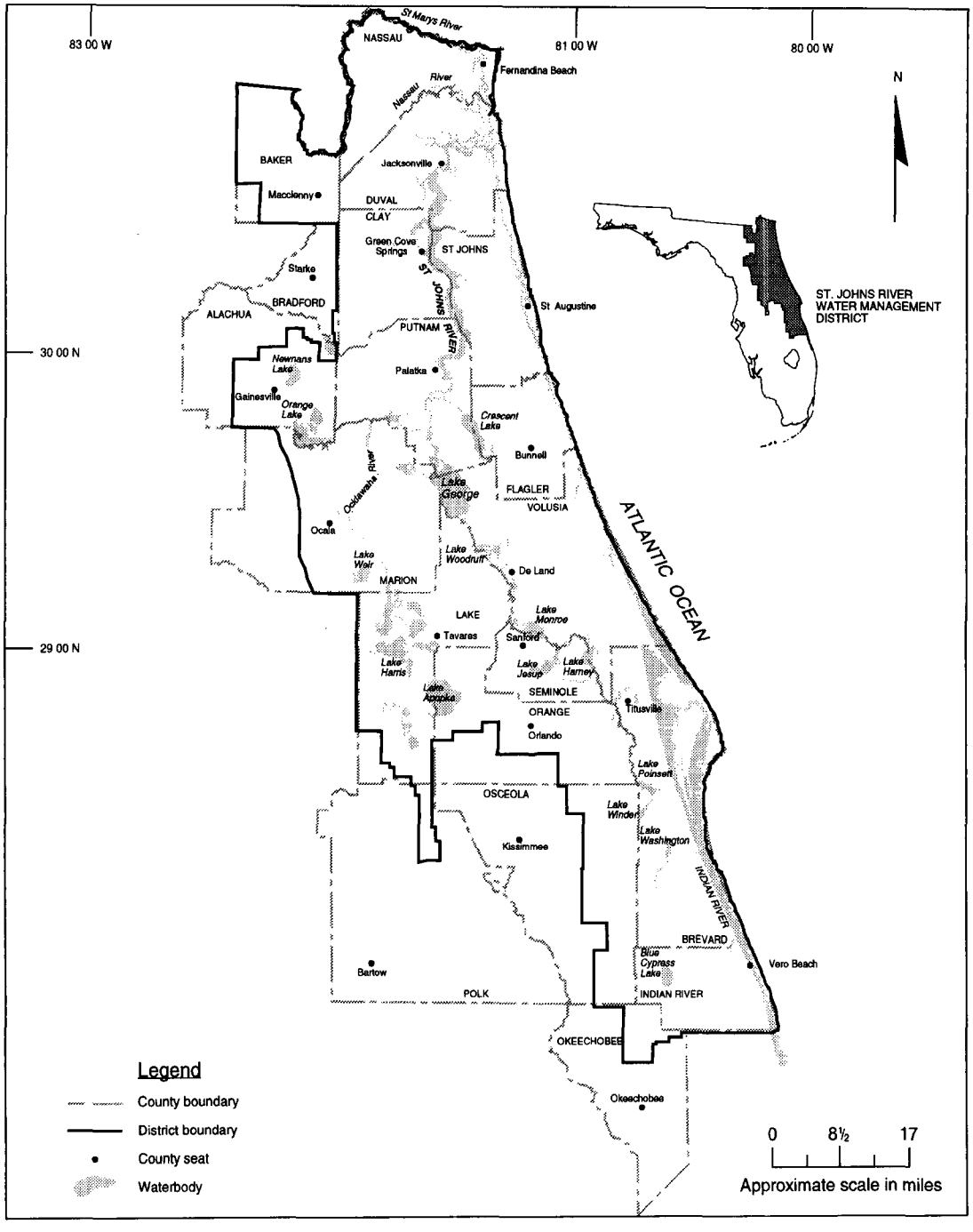


Figure 1. The St. Johns River Water Management Disrict

WATER USE CATEGORIES

Water use information is reported for six categories of use:

- Public supply
- Domestic self-supply
- Commercial/industrial self-supply
- Agricultural irrigation
- Thermoelectric power generation
- Miscellaneous (abandoned artesian wells)

PUBLIC SUPPLY

The public supply category consists of water supplied by utilities to homes and industries. The reported amounts are a minimum, because some utilities report water withdrawals taken into the supply plant and others report only deliveries, which can be less than withdrawals. Utilities that serve 400 or more people or that withdraw more than 0.01 mgd from ground or surface water sources are included in the public supply category. These data come from utility records and are estimated to the nearest 0.01 mgd.

The 197 public supply utilities included in this report served 2,700,294 people in 1991, or 83 percent of the total population in SJRWMD (Table 1). The rest of the population is assumed to use domestic self-supplied systems. County, city, and municipal population data are estimated from Florida Bureau of Economics and Business Research figures (Shoemyen et al. 1992; University of Florida 1992a). Public supply data are estimated from the average service connections reported in the utility records multiplied by the average number of people per household (University of Florida 1992b).

Table 1. Population in the St. Johns River Water Management District (SJRWMD) by county, 1991

County	County Population	SJRWMD Population	Percentage of County Population in SJRWMD*	Public Supply Population	Domestic Self-Supply Population
Alachua	183,773	149,214	81%	130,203	19,011
Baker	18,905	17,960	95%	4,127	13,833
Bradford	22,749	1,705	8%	358	1,347
Brevard	409,370	409,370	100%	371,422	37,948
Clay	108,191	108,191	100%	73,523	34,668
Duval	681,631	681,631	100%	630,195	51,436
Flagler	30,465	30,465	100%	19,423	11,042
Indian River	92,429	92,429	100%	56,553	35,876
Lake	157,061	155,490	99%	107,909	47,581
Marion	200,314	156,888	78%	70,835	86,053
Nassau	44,957	44,957	100%	22,727	22,230
Okeechobee	30,166	453	2%	0	453
Orange	701,292	561,034	80%	476,135	84,899
Osceola	114,411	2,574	2%	0	2,574
Polk	414,700	4,147	1%	1,128	3,019
Putnam	66,002	66,002	100%	22,963	43,039
St. Johns	86,118	86,118	100%	64,083	22,035
Seminole	298,057	298,057	100%	294,145	3,912
Volusia	376,695	376,695	100%	354,565	22,130
District Totals	4,037,286	3,243,380		2,700,294	543,086

*Percentages will be used to calculate population figures for future reports on annual water use.

Source: Shoemyen et al. 1992; Florence 1992

DOMESTIC SELF-SUPPLY

The domestic self-supply category includes water withdrawn by individual domestic wells or provided by utilities that serve fewer than 400 people. All domestic self-supplied water is assumed to be ground water, and it is assumed that individual wells are drilled into the easiest accessible aquifer that could produce the water. Small utilities and domestic wells are not inventoried, so water use in this category is estimated from population and per capita water use figures.

Populations are based initially on the 1990 census data. SJRWMD follows watershed boundaries and not county boundaries; therefore, some counties are only partially included in SJRWMD. SJRWMD population figures for these counties are based on estimated population percentages contained in Florence (1992).

Domestic self-supplied water use is derived by (1) subtracting the number of people served by public supply systems from the water use population of the county, to obtain a domestic self-supplied population, and (2) multiplying the result by the county per capita water use. Per capita water use is derived by dividing the public supply water use by the public supply population.

COMMERCIAL/INDUSTRIAL SELF-SUPPLY

The commercial/industrial self-supply category consists of the larger commercial and industrial users not covered by public supply utilities. The commercial category includes businesses and institutions, such as government facilities, military installations, schools, prisons, hospitals, and recreational facilities. The industrial category includes mining, processing, and manufacturing facilities; it does not include water used for power generation by thermoelectric power plants.

Only commercial/industrial self-supplied facilities that used more than 0.01 mgd of ground or surface water were inventoried. In 1991, 60 industrial users, 43 institutional users, and 2 commercial users were included in this survey. Water used in the mining

industry to transport materials from the mine pit to the plant and water pumped for dewatering mining pits is considered conveyance and was not included in estimates of water use.

The data for this category are based on reported water use or permitted allowances. The data were collected using information from the consumptive use permits (CUP) issued by SJRWMD to the facilities and information from monthly operating reports received by SJRWMD, the Florida Department of Environmental Protection (DEP), or the Florida Department of Health and Rehabilitative Services (HRS). Industries not reporting to DEP or SJRWMD were contacted by SJRWMD staff.

AGRICULTURAL IRRIGATION

The agricultural water use category consists of estimated water withdrawals from ground or surface sources for agricultural and recreational crop irrigation. Estimates of the acreage planted in various crops are multiplied by estimates of the water necessary to irrigate those crops per acre.

Water use for irrigation is assessed by crop, because different crops require different amounts of irrigation (USDA 1970). There are 33 categories assessed, and these are divided into five groups (Table 2):

- Vegetable crops
- Fruit crops
- Field crops
- Ornamentals and grasses
- Miscellaneous agricultural (includes livestock watering and lake augmentation for fish farming)

In this and previous reports, golf course irrigation water use has been treated as an agricultural crop (ornamental and grasses). In subsequent reports, it will be listed in a separate category for recreational crops.

Table 2. Crops included in estimates of water use for agricultural irrigation

Vegetable Crops	Fruit Crops	Field Crops	Ornamentals and Grasses
Cabbage	Blueberries	Field corn	Ferns
Carrots	Citrus	Peanuts	Flowers and foliage
Cucumbers	Grapes	Rice	Woody ornamentals
Peppers	Peaches	Sorghum	Improved pasture
Potatoes	Pecans	Soybeans	Sod
Tomatoes	Strawberries	Sugar cane	Turf grass (golf)
Sweet corn	Watermelons	Tobacco	Turf grass (other)
Watercress	Miscellaneous fruits	Wheat	
Miscellaneous vegetables		Miscellaneo us grains	

Note: Miscellaneous agricultural water uses include livestock watering and fish farming.

The acreage data are supplied primarily by the Cooperative Extension Service of the Institute of Food and Agricultural Sciences at the University of Florida, supplemented by information from SJRWMD CUP files and the Florida Department of Agriculture and Consumer Services (FDACS 1992a, 1992b, 1992c). The Florida Crop and Livestock Reporting Service provides counts of livestock, which are multiplied by a specified amount of water used per head (FDACS 1992d).

The estimates of irrigation necessary per acre for each crop are calculated using the modified Blaney-Criddle irrigation model (USDA 1970) and data from the SJRWMD Benchmark Farms irrigation monitoring program (Singleton 1992), supplemented by other information from the U.S. Department of Agriculture Soil

Conservation Service (USDA 1970, 1982) and the National Oceanographic and Atmospheric Administration (NOAA 1992).

THERMOELECTRIC POWER GENERATION

The thermoelectric power generation category of water use consists of water used by power plants primarily for cooling. These figures are derived from information in the SJRWMD CUP files or from data supplied by the power companies to SJRWMD, DEP, or HRS in monthly operating reports. In 1991, water use data were collected for 12 self-supplied thermoelectric power plants.

MISCELLANEOUS (ABANDONED ARTESIAN WELLS)

The miscellaneous category of water use includes only water flowing from abandoned artesian wells. According to available data, all abandoned artesian wells draw from the Floridan aquifer system. Water flowing from abandoned artesian wells is estimated based on an average of metered flow from monitored wells multiplied by an estimated number of wells. For counties where known flows exist, the average of the known flows in that county is used to estimate flow from the wells of unknown flow. For counties where no flows have been metered, the SJRWMD average for all wells of known flow is used. In 1991, the SJRWMD average for all wells of known flow was 0.108 mgd (Steele, pers. com. 1992).

In previous *Annual water use survey* reports, the miscellaneous category of water use included estimates of water use for heat pump, air-conditioning units, and small wells used in lawn irrigation, as well as for abandoned artesian wells. The data on heat pumps, air-conditioning units, and lawn irrigation were old and incomplete. As it was not possible to update this data accurately, this part of the miscellaneous water use estimate has been dropped.

Previous abandoned artesian well reports are dated by the year in which the fiscal year ends (e.g., October 1990 through September

1991 in the 1991 report). Comparisons between 1991 and other years will be made with the miscellaneous water use adjusted accordingly.

1991 WATER USE BY SOURCE

Water can be withdrawn from surface waterbodies or from the various aquifers within SJRWMD. There are three ground water aquifer systems in SJRWMD: the surficial, the intermediate, and the Floridan. Most ground water used in SJRWMD comes from the Floridan aquifer system.

For the purposes of this report, fresh water (ground or surface) is defined as any water containing 1,000 milligrams per liter (mg/L) or less of total dissolved solids (TDS) (see glossary). Fresh water includes both potable and nonpotable, but treatable, water. Section 17-3.091 *Florida Administrative Code* defines potable water as containing chlorides less than or equal to 250 mg/L and TDS less than or equal to 500 mg/L. Slightly saline water is defined as water with a chloride concentration between 250 and 1,000 mg/L or a TDS concentration between 500 and 3,000 mg/L. Small amounts of slightly saline ground water are either diluted with fresh water or treated by reverse osmosis to potable standards to be used for public supply. For other uses, slightly saline water is not treated. In this report, slightly saline water that has been treated is included in the reported quantities of fresh water. In reports published before 1987, slightly saline water was reported as saline.

Some of the surface water use recorded in this report is saline water. Saline water is defined as water with a TDS concentration of more than 3,000 mg/L.

TOTAL WATER USE

Total water use in SJRWMD in 1991 was 3,156.65 mgd, of which 1,756.02 mgd was saline surface water and 1,400.63 mgd was fresh water (Table 3). These figures do not include reused wastewater (see appendix).

Table 3. Total 1991 water use by county (in million gallons per day), St. Johns River Water Management District

County	Fresh Water			Saline Water	Totals
	Ground	Surface	Total	Surface	
Alachua	31.16	0.17	31.33	0.00	31.33
Baker	6.16	0.91	7.07	0.00	7.07
Bradford	0.37	0.00	0.37	0.00	0.37
Brevard	187.31	26.83	214.14	1,089.20	1,303.34
Clay	25.44	0.38	25.82	0.00	25.82
Duval	148.71	0.90	149.61	527.45	677.06
Flagler	11.39	1.08	12.47	0.00	12.47
Indian River	67.82	98.52	166.34	137.97	304.31
Lake	96.63	16.65	113.28	0.00	113.28
Marion	31.95	1.14	33.09	0.00	33.09
Nassau	43.37	0.23	43.60	1.40	45.00
Okeechobee	10.03	0.00	10.03	0.00	10.03
Orange	132.56	49.89	182.45	0.00	182.45
Osceola	7.40	9.70	17.10	0.00	17.10
Polk	6.21	0.56	6.77	0.00	6.77
Putnam	47.96	41.94	89.90	0.00	89.90
St. Johns	44.34	1.12	45.46	0.00	45.46
Seminole	61.15	1.16	62.31	0.00	62.31
Volusia	67.26	122.23	189.49	0.00	189.49
District Totals	1,027.22	373.41	1,400.63	1,756.02	3,156.65

Note: 0.00 value means pumpage was insignificant (<0.01 million gallons per day) or did not occur.

The largest use of fresh water was for agricultural irrigation—561.12 mgd (Table 4), or 40 percent of the total fresh water,

Table 4. Total 1991 water use by category (in million gallons per day), St. Johns River Water Management District

Category	Fresh Water			Saline Water*
	Ground	Surface	Total	Surface
Public supply	398.91	15.24	414.15	0.00
Domestic self-supply	84.51	0.00	84.51	0.00
Commercial/industrial self-supply	117.23	27.01	144.24	45.09
Agricultural irrigation	363.08	198.04	561.12	0.00
Thermoelectric power generation	6.87	133.12	139.99	1,710.93
Miscellaneous	56.62	0.00	56.62	0.00
Totals	1,027.22	373.41	1,400.63	1,756.02

*Saline water is all from surface water sources.

followed by public supply—414.15 mgd, or 30 percent of the total freshwater use in SJRWMD. The largest use of saline surface water was for thermoelectric power generation—1,710.93, or 97 percent of the total saline surface water use in SJRWMD.

SURFACE WATER

In 1991, surface water accounted for a total of 2,129.43 mgd of water use (Table 3). This included water from both fresh and saline surface water sources. Eighteen percent (373.41 mgd) of the total water used in SJRWMD came from fresh surface water sources. The remaining 82 percent of surface water came from saline sources. All of the saline water discussed in this report came from surface water sources.

Fresh Water

The county using the most fresh surface water (122.23 mgd) was Volusia County (Table 3). Most of this water was for thermoelectric power generation. Indian River County used 98.52 mgd of fresh surface water, all for agricultural irrigation. Water use in these two counties totaled 220.75 mgd, or 59 percent of the total fresh surface water use in SJRWMD in 1991.

The largest category of fresh surface water use was agricultural irrigation, which accounted for 198.04 mgd (Table 4), or 53 percent (Figure 2) of the total fresh surface water use in SJRWMD. The second largest category of fresh surface water use was thermoelectric power generation, which accounted for 133.12 mgd, or 36 percent of the total. Fresh surface water withdrawn for public supply accounted for 15.24 mgd, or 4 percent of the total fresh surface water used. Commercial/industrial water use accounted for 27.01 mgd, or 7 percent of the total fresh surface water use in SJRWMD.

Saline Water

Total saline water use in SJRWMD in 1991 was 1,756.02 mgd (Tables 3 and 4). Saline surface water is primarily used in SJRWMD for thermoelectric power generation or for commercial/industrial plant operation. Thermoelectric power plants use large amounts of saline water for cooling purposes. This is recorded as a water use in this report even though nearly all of the cooling water is returned to its original source.

Brevard County used the most saline surface water—1,089.20 mgd (Table 3), for thermoelectric power generation at two plants:

- Florida Power and Light (568.55 mgd)
- Orlando Utilities Commission (520.65 mgd)

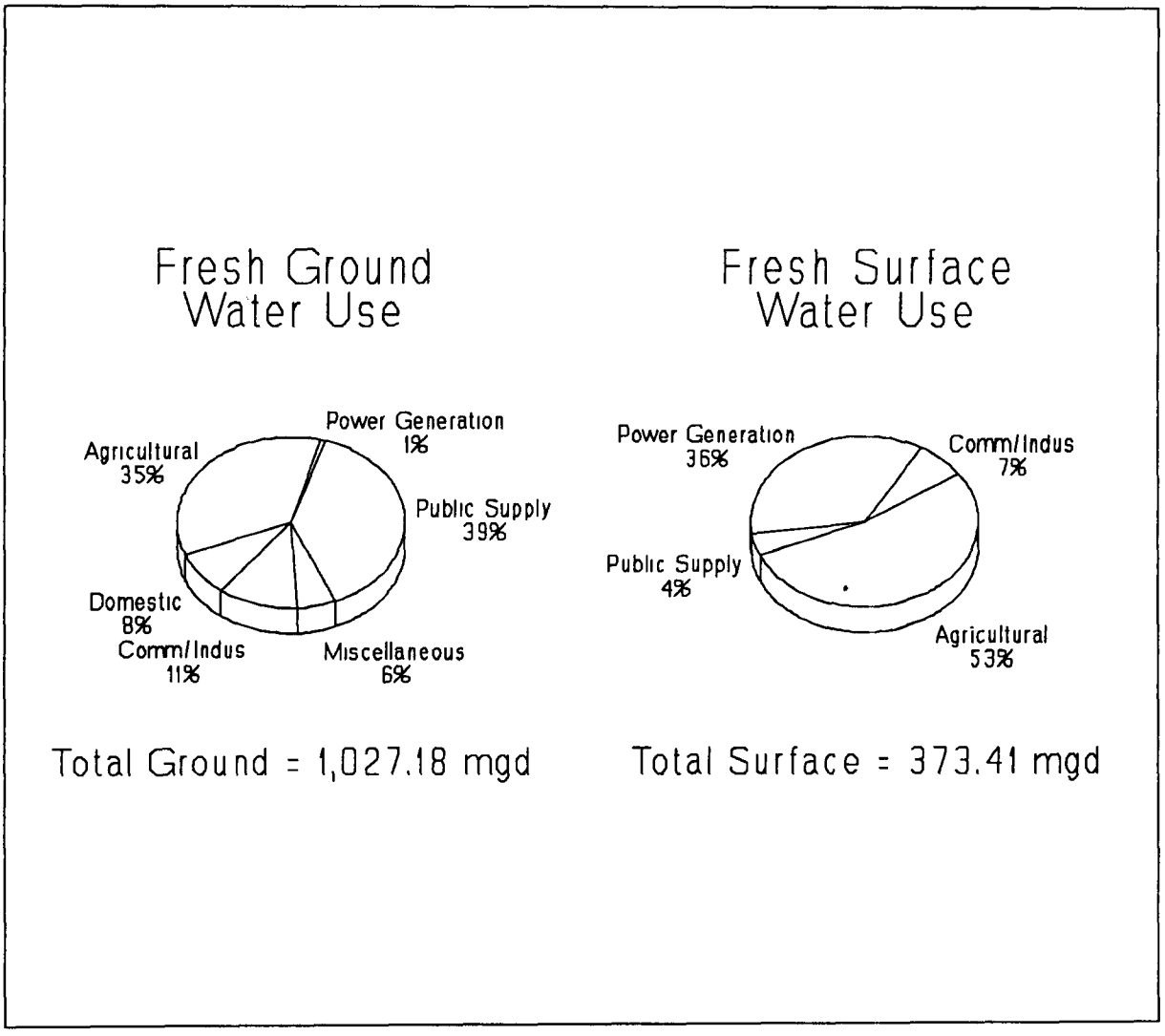


Figure 2. Total freshwater use, 1991. *Most of the fresh water used in the St. Johns River Water Management District came from ground water sources. Surface water is used primarily for agricultural irrigation and thermoelectric power generation.*

Duval County used 527.45 mgd (Table 3) of saline surface water for power generation and commercial purposes at four plants:

- Jacksonville Electric Authority (439.34 mgd)
- Eastport Power Plant (44.42 mgd)
- Seminole Kraft Corporation (41.39 mgd)
- Jacksonville Shipyard (2.30 mgd)

Indian River County used saline surface water at the Vero Beach Municipal Power Plant (137.97 mgd), and Nassau County used saline water at the ITT Rayonier paper mill (1.40 mgd).

GROUND WATER

In 1991, ground water accounted for a total of 1,027.22 mgd of water use (Table 3), or 73 percent of the total freshwater use in SJRWMD. Generally, all ground water withdrawals are from freshwater sources.

The counties in SJRWMD using the most ground water were Brevard, Duval, and Orange (Table 3). Each of these counties used more than 100 mgd of ground water, for a total of 468.58 mgd for the three counties, or 46 percent of the total ground water use in SJRWMD in 1991.

The largest category of ground water use in 1991 in SJRWMD was public supply, which accounted for about 398.91 mgd (Table 4), or 39 percent of the total ground water use (Figure 2). The second largest category of ground water use was agricultural irrigation, accounting for 363.08 mgd, or 35 percent of the total ground water use.

Commercial/industrial water use accounted for 117.23 mgd, or 11 percent of the total ground water use in SJRWMD in 1991; domestic self-supply for 84.51 mgd, or 8 percent of the total; miscellaneous uses for 56.62 mgd, or 6 percent of the total; and thermoelectric power generation for 6.87 mgd, or 1 percent of the total.

1991 Water Use by Category

In the following four categories of water use, most or all of the water used is fresh water:

- Public supply
- Domestic self-supply
- Agricultural irrigation
- Miscellaneous

In the following two categories of water use, both fresh and saline water are used:

- Thermoelectric power generation
- Commercial/industrial self-supply

Public Supply

The public supply category consists of water supplied by utilities to homes and industries. Total water use from ground and surface sources for public supply in 1991 was 414.15 mgd (Tables 4 and 5). All public supply water was fresh water, and most of the water supplied in 1991 (96 percent) was ground water (Table 4). Fresh surface water (15.24 mgd) was used for public supply in Brevard County. Ninety percent of the ground water used in SJRWMD for public supply was withdrawn from the Floridan aquifer system; the remaining 10 percent was withdrawn from the intermediate and surficial aquifer systems (SJRWMD 1991). The public supply category of ground water use accounted for 39 percent of the total ground water use in SJRWMD in 1991 (Figure 2).

The figures in this report for fresh ground water use include a small amount of slightly saline ground water (4.21 mgd) that was treated by reverse osmosis or blended with fresh water for use as potable water. In the SJRWMD *Annual water use survey* reports

Table 5. Public supply and domestic self-supply water use in the St. Johns River Water Management District (SJRWMD), 1991

County	Public Supply Population	Public Supply Water Use (mgd)	Per Capita (gallons per day)	Domestic Self-Supply Population	Domestic Self-Supply Water Use (mgd)
Alachua	130,203	19.73	152	19,011	2.89
Baker	4,127	0.76	184	13,833	2.55
Bradford	358	0.04	118[a]	1,347	0.16
Brevard	371,422	48.40[b]	130	37,948	4.93
Clay	73,523	10.61	144[a]	34,668	4.99
Duval	630,195	92.55	147	51,436	7.56
Flagler	19,423	3.79	195	11,042	2.15
Indian River	56,553	11.51	204	35,876	7.32
Lake	107,909	19.19	178	47,581	8.47
Marion	70,835	10.71	151	86,053	12.99
Nassau	22,727	4.04	178	22,230	3.96
Okeechobee	0	0.00	153[c]	453	0.07
Orange	476,135	92.91[d]	195	84,899	12.99
Osceola	0	0.00	153[c]	2,574	0.39
Polk	1,128	0.19	168	3,019	0.51
Putnam	22,963	3.59	156	43,039	6.71
St. Johns	64,083	7.63	119	22,035	2.62
Seminole	294,145	46.44	158	3,912	0.62
Volusia	354,565	42.06	119	22,130	2.63
District Totals	2,700,294	414.15	153[e]	543,086	84.51[f]

Note: mgd = million gallons per day
[a]See Bradford and Clay counties in the appendix.
[b]This includes 22.46 mgd withdrawn in Orange County.
[c]Districtwide per capita (see footnote[e]).
[d]This does not include 22.46 mgd withdrawn in Orange County for use in Brevard County.
[e]This total represents districtwide per capita based on counties for which per capita data were available.
[f]This is a total of the county domestic self-supply figures, not based on SJRWMD per capita.

published before 1987, this slightly saline ground water was reported as saline water.

Per Capita

The average per capita water use in SJRWMD in 1991, based on the population served by public supply, was 153 gallons per day (Table 5). This amount includes water used for residential as well as non-residential purposes.

Water Use by County

The counties with the largest populations in SJRWMD—and consequently the counties with the largest public supply water use—are Duval and Orange counties (Table 5 and Figure 3). Together, these counties represent 41 percent of the SJRWMD public supply water use population.

Water use for public supply in Orange (92.91 mgd) and Duval (92.55 mgd) counties was 185.46 mgd, or 45 percent of the public supply water use in SJRWMD in 1991. Orange County is split between two water management districts; 33.41 mgd of public supply water use in Orange County was used in the South Florida Water Management District and therefore is not included in the totals in this report (see appendix). Also, some of the water withdrawn in Orange County (22.46 mgd) was for the City of Cocoa public supply system in Brevard County (Table 5).

The City of Jacksonville Public Utilities, the largest public supply utility in SJRWMD, serves the City of Jacksonville in Duval County. This utility supplied its 447,200 customers with 67.74 mgd of fresh ground water in 1991 (see appendix).

DOMESTIC SELF-SUPPLY

In 1991, an estimated 543,086 people used 84.51 mgd of domestic self-supplied water (Table 5), or 8 percent of the total fresh ground water use in SJRWMD (Table 4). All of the domestic self-supplied water was assumed to be ground water.

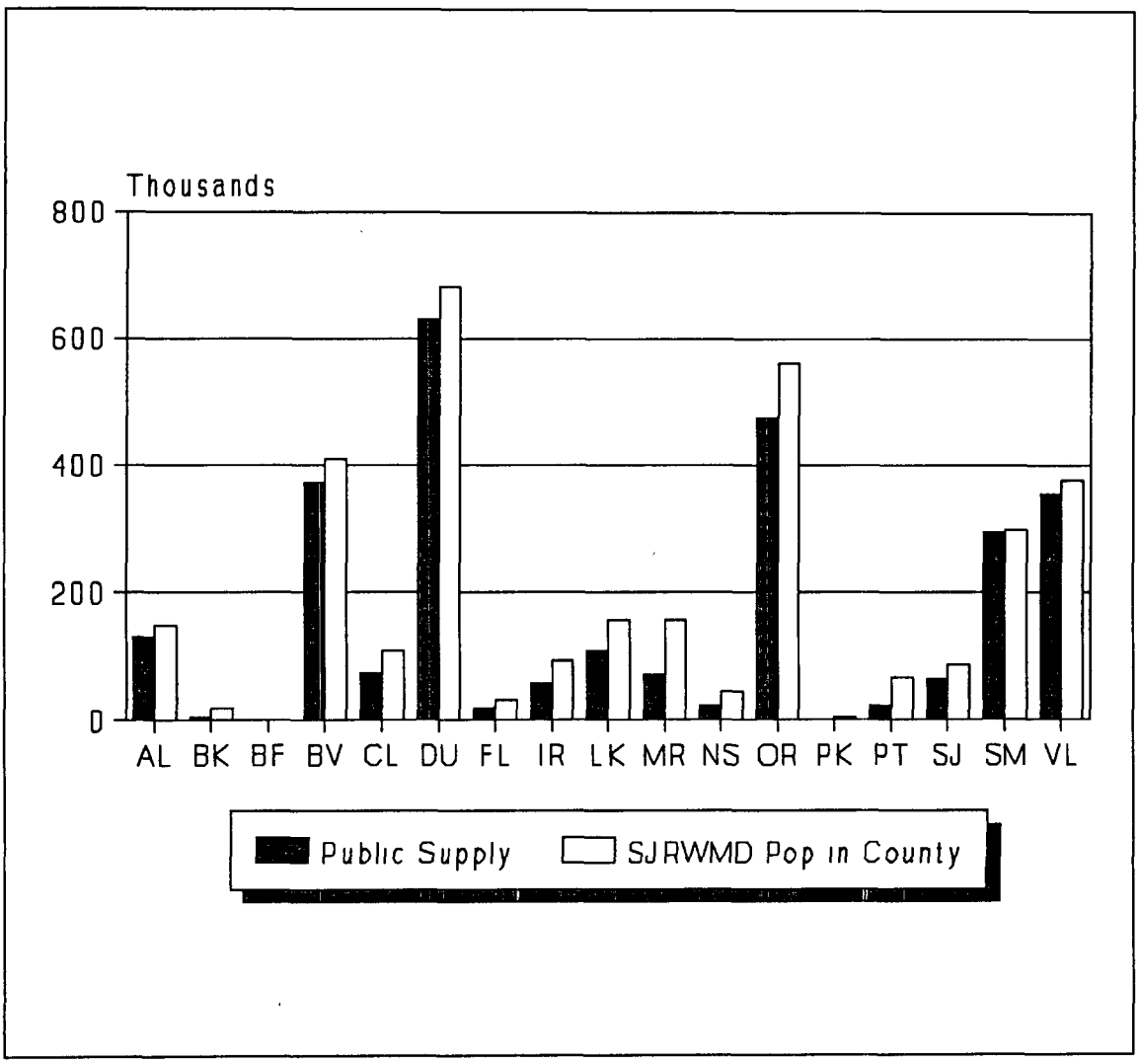


Figure 3. Population served by public supply in the St. Johns River Water Management District (SJRWMD), 1991. *The largest counties in population in SJRWMD are Duval, Orange, Brevard, and Volusia (county abbreviations are listed on p. 1). Okeechobee and Osceola counties do not have a public supply population in SJRWMD.*

Marion County had the largest self-supplied population—86,053 people (Table 5). Orange County had the second largest, with 84,899 people, followed by Duval County with 51,436 people.

COMMERCIAL/INDUSTRIAL SELF-SUPPLY

The total self-supplied freshwater use in the commercial/industrial category was 144.24 mgd (Tables 4 and 6), or 10 percent of the total freshwater use in SJRWMD. Of this total, 117.23 mgd was ground water and 27.01 mgd was fresh surface water. In addition, 45.09 mgd of saline water was used in this category.

Most of the water used in this category supplied the pulp and paper industries in Putnam, Nassau, and Duval counties. In 1991, water use for pulp and paper production included 72.51 mgd of fresh ground water, 21.49 mgd of fresh surface water, and 41.39 mgd of saline surface water (see appendix). The second largest water user in this category was the mining industry, which accounted for 25.22 mgd of fresh water. Together, pulp and paper production and mining accounted for 119.22 mgd of fresh water, or 83 percent of the commercial/industrial self-supply freshwater use in SJRWMD.

The largest amount of fresh water used for commercial/industrial self-supply (49.72 mgd) was in Putnam County (Table 6). Duval (35.69 mgd) and Nassau (32.71 mgd) counties also had significant amounts of freshwater use in this category. Eighty-two percent of the total fresh water used for commercial/industrial self-supply in SJRWMD, 118.12 mgd, was in these three counties.

AGRICULTURAL IRRIGATION

Almost all of the water used for agricultural irrigation in SJRWMD was fresh water. A small but undetermined amount of moderately saline water (TDS >1,000 but <3,000 mg/L) was used for agricultural irrigation in Indian River County. Total freshwater use for agricultural irrigation was estimated at

Table 6. Commercial/Industrial self-supply water use in the St. Johns River Water Management District, 1991 (in million gallons per day)

County	Fresh Water			Saline Water
	Ground	Surface*	Total	Surface
Alachua	1.94	0.00	1.94	0.00
Baker	0.32	0.00	0.32	0.00
Bradford	0.00	0.00	0.00	0.00
Brevard	0.13	0.00	0.13	0.00
Clay	7.28	0.00	7.28	80.00
Duval	35.69	0.00	35.69	43.69
Flagler	0.16	0.00	0.16	0.00
Indian River	0.29	0.00	0.29	0.00
Lake	8.66	0.64	9.30	0.00
Marion	1.51	0.00	1.51	0.00
Nassau	32.71	0.00	32.71	1.40
Okeechobee	0.10	0.00	0.10	0.00
Orange	3.46	0.00	3.46	0.00
Osceola	0.00	0.00	0.00	0.00
Polk	0.21	0.00	0.21	0.00
Putnam	23.35	26.37	49.72	0.00
St. Johns	0.07	0.00	0.07	0.00
Seminole	0.53	0.00	0.53	0.00
Volusia	0.82	0.00	0.82	0.00
District Totals	117.23	27.01	144.24	45.09

*Does not include water used in mining for dewatering and transport.

Note: 0.00 value means pumpage was insignificant (<0.01 million gallons per day) or did not occur.

561.12 mgd, or 40 percent of the total freshwater use in SJRWMD in 1991 (Tables 4 and 7). Of this total, 363.08 mgd, or 65 percent of the total water used for agriculture, was ground water. It was assumed that most ground water used for agricultural irrigation came from the Lower and Upper Floridan aquifers.

Water Use by Acreage and Crop

An estimated 927,664 acres were farmed in SJRWMD in 1991, of which 376,229 acres were irrigated (see appendix). Of the total acreage irrigated, 266,422 acres were irrigated by flood systems, 55,142 acres by sprinkler systems, and 54,665 acres by low pressure/low volume systems. The total amount of irrigated acres increased from 373,040 acres in 1990—a net increase of 3,189 acres (Florence 1992).

The group of crops with the largest water use in 1991 was ornamentals and grasses, accounting for 220.68 mgd, or 39 percent of the agricultural water use (Figure 4). The breakdown is as follows:

- Improved pasture—132.49 mgd
- Golf course irrigation—36.83 mgd
- Ferns—20.41 mgd
- Woody ornamentals—15.04 mgd
- Sod farms—8.03 mgd
- Other turf grass—4.92 mgd
- Flowers and foliage—2.96 mgd

The largest water use for a single crop type was for citrus irrigation, which accounted for 185.40 mgd, or 33 percent of the total agricultural water use in SJRWMD (see appendix). Irrigation of improved pasture land accounted for 132.49 mgd, or 24 percent of agricultural water use.

Water Use by County

The largest water use for agriculture occurred in Indian River County—141.44 mgd of fresh water (Table 7), or 25 percent of the

Table 7. Agricultural irrigation water use in the St. Johns River Water Management District, 1991 (in million gallons per day)

County	Fresh Water		Total
	Ground	Surface	
Alachua	6.31	0.17	6.48
Baker	2.53	0.91	3.44
Bradford	0.17	0.00	0.17
Brevard	112.76	11.59	124.35
Clay	2.56	0.38	2.94
Duval	6.84	0.90	7.74
Flagler	5.29	1.08	6.37
Indian River	42.92	98.52	141.44
Lake	59.45	16.01	75.46
Marion	5.44	1.14	6.58
Nassau	2.34	0.23	2.57
Okeechobee	9.86	0.00	9.86
Orange	19.95	49.89	69.84
Osceola	6.90	9.70	16.60
Polk	5.30	0.56	5.86
Putnam	13.41	0.64	14.05
St. Johns	30.56	1.12	31.68
Seminole	9.78	1.16	10.94
Volusia	20.71	4.04	24.75
District Totals	363.08	198.04	561.12

Note: 0.00 value means pumpage was insignificant (<0.01 million gallons per day) or did not occur.

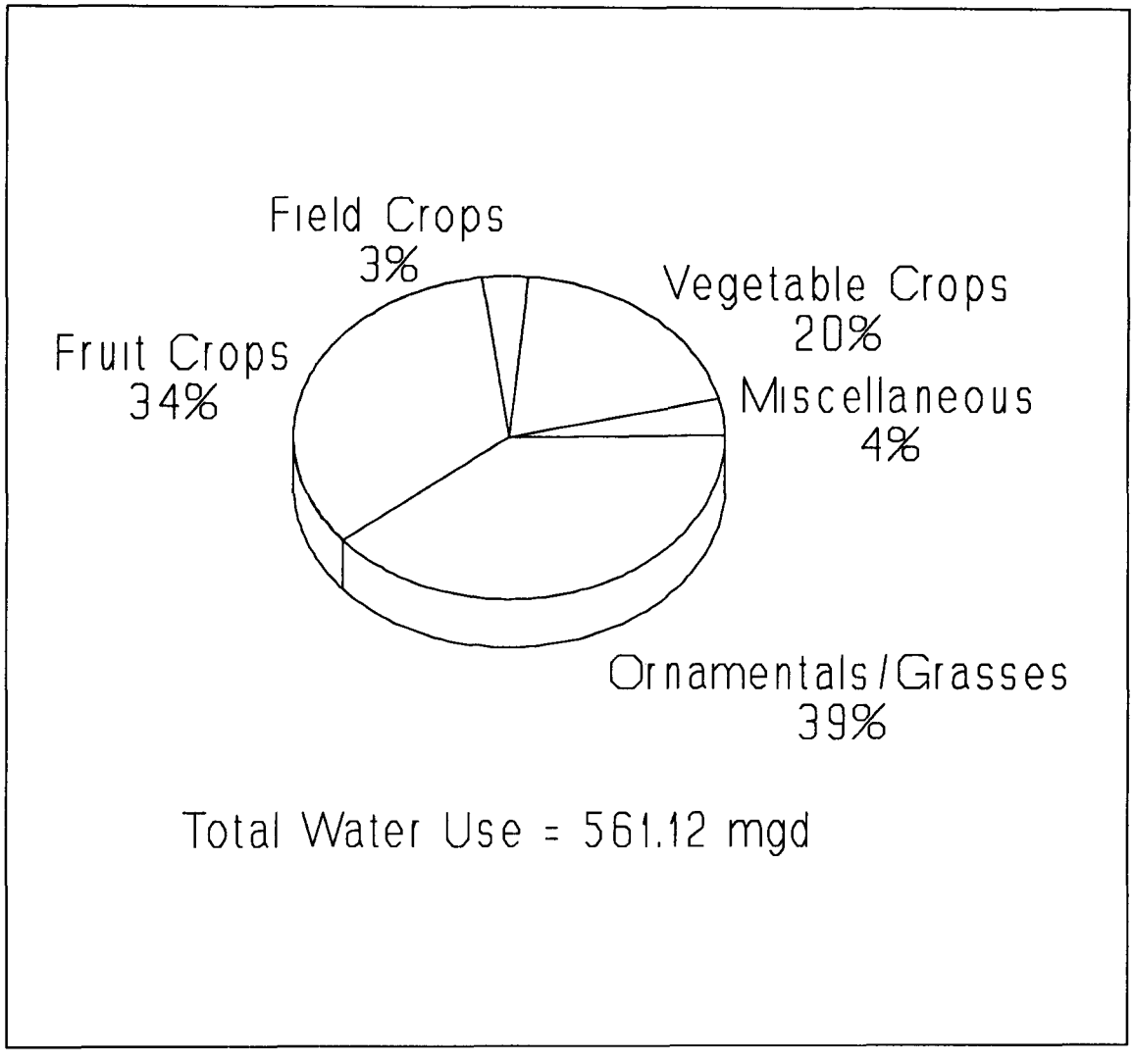


Figure 4. 1991 water use in the St. Johns River Water Management District for five crop types. *Ornamentals and grasses (which include improved pasture land) accounted for 39 percent of agricultural irrigation water use in 1991.*

total water use for irrigation in SJRWMD. Most of this amount, 98.52 mgd, was fresh surface water. The second largest water use for agriculture was in Brevard County—124.35 mgd, most of which was ground water. Lake and Orange counties each used more than 50 mgd of ground and surface water combined, predominantly for sweet corn, carrots, and citrus. These four counties together used 411.09 mgd, or 73 percent of the total agricultural irrigation water use in SJRWMD in 1991.

THERMOELECTRIC POWER GENERATION

Total water use for the 12 self-supplied power plants accounted for 1,710.93 mgd of saline surface water, 133.12 mgd of fresh surface water, and 6.87 mgd of fresh ground water (Tables 4 and 8). The largest amount of saline water used for thermoelectric power generation was in Brevard County—1,089.20 mgd. The largest amount of freshwater use was in Volusia County—118.70 mgd.

MISCELLANEOUS (ABANDONED ARTESIAN WELLS)

Miscellaneous water use, which includes only water flowing from 512 abandoned artesian wells, totaled an estimated 56.62 mgd in SJRWMD (Table 9). The total known flow for 74 wells was 8.01 mgd. The estimated flow from 438 wells was 48.61 mgd. All water was fresh ground water.

The estimated flows were calculated by county, then summed for a SJRWMD total. The calculation is performed as follows:

1. Determine county average of known flow.

2. Multiply result (average known flow) by the estimated number of wells of unknown flow.

3. Combine the estimated unknown flow with the known flow for a county total.

Table 8. Thermoelectric power generation water use in the St. Johns River Water Management District, 1991 (in million gallons per day)

County	Fresh Water			Saline Water
	Ground	Surface	Totals	Surface
Alachua	0.29	0.00	0.29	0.00
Baker	0.00	0.00	0.00	0.00
Bradford	0.00	0.00	0.00	0.00
Brevard	0.28	0.00	0.28	1,089.20
Clay	0.00	0.00	0.00	0.00
Duval	4.77	0.00	4.77	483.76
Flagler	0.00	0.00	0.00	0.00
Indian River	0.08	0.00	0.08	137.97
Lake	0.00	0.00	0.00	0.00
Marion	0.00	0.00	0.00	0.00
Nassau	0.00	0.00	0.00	0.00
Okeechobee	0.00	0.00	0.00	0.00
Orange	0.33	0.00	0.33	0.00
Osceola	0.00	0.00	0.00	0.00
Polk	0.00	0.00	0.00	0.00
Putnam	0.61	14.93	15.54	0.00
St. Johns	0.00	0.00	0.00	0.00
Seminole	0.00	0.00	0.00	0.00
Volusia	0.51	118.19	118.70	0.00
District Totals	6.87	133.12	139.99	1,710.93

Note: 0.00 value means pumpage was insignificant (<0.01 million gallons per day) or did not occur.

Table 9. Miscellaneous water use (abandoned artesian well inventory) in the St. Johns River Water Management District, 1991 (in million gallons per day)

County	Number of Known Wells	Known Flow (mgd)	Estimated Number of Wells of Unknown Flow	Estimated Flow (mgd)	Total Estimated Flow (mgd)
Alachua	0	0.00	0	0.00	0.00
Baker	0	0.00	0	0.00	0.00
Bradford	0	0.00	0	0.00	0.00
Brevard	232	6.37	191	29.68	36.05
Clay	0	0.00	0	0.00	0.00
Duval	12	NA	12	*1.30	1.30
Flagler	5	0.00	2	0.00	0.00
Indian River	25	0.68	22	5.02	5.70
Lake	8	NA	8	*0.86	0.86
Marion	12	NA	12	*1.30	1.30
Nassau	3	NA	3	*0.32	0.32
Okeechobee	0	0.00	0	0.00	0.00
Orange	27	NA	27	*2.92	2.92
Osceola	1	NA	1	*0.11	0.11
Polk	0	0.00	0	0.00	0.00
Putnam	24	0.04	21	0.25	0.29
St. Johns	16	0.22	15	*3.24	3.46
Seminole	133	0.51	115	3.27	3.78
Volusia	14	0.19	9	0.34	0.53
District Totals	512	8.01	438	48.61	56.62

Note: 0.00 value means pumpage was insignificant (<0.01 mgd) or did not occur.
*SJRWMD average (0.108 mgd) used for estimated flow.

Source: Steele, pers. com. 1992

For counties with no wells of known flow, the average of all known flows in SJRWMD (0.108 mgd) was used.

SJRWMD began its Abandoned Artesian Well Plugging Program in 1976. As of 1991, 1,625 abandoned artesian wells have been identified, of which 670 wells have been plugged or repaired by SJRWMD, 443 have been plugged or repaired by the well owners, and 512 are still flowing (Steele 1992). As of September 1991, an estimated 108 mgd of fresh water had been saved.

TRENDS

1980 TO 1991

Total freshwater use since 1980 has remained fairly constant (Figure 5 and Table 10). On the average, public supply water use has increased and agricultural irrigation water use has decreased, yielding a fairly constant total water use since 1980. In 1981, there was high freshwater use (1,697.30 mgd). In 1982, there was low freshwater use (1,258.97 mgd); an average of 58 inches of rain occurred in this year (SJRWMD 1992). Drought years were 1981 and 1990, with 41 inches and 39 inches, respectively, of average rainfall (SJRWMD 1992). An average of 63 inches of rain occurred in 1991, making it the wettest year during the period 1980–91. The arithmetic mean of total freshwater use for this 12-year period is 1,404 mgd. In 1991, freshwater use was 1,400.63 mgd, less than 1 percent below the mean.

The use of fresh water by source (ground or surface) has not followed overall trends as indicated above. The highest use of ground water was in 1981 (1,335.52 mgd), and the highest use of surface water was in 1990 (459.00 mgd). The lowest use of ground water was in 1980 (957.50 mgd), and the lowest use of surface water was in 1982 (273.70 mgd). The arithmetic mean of ground water and surface water usage for this 12-year period is 1,052.05 mgd and 351.95 mgd, respectively. In 1991, use of fresh surface water was 6 percent above the mean, and use of fresh ground water was 2 percent below the mean.

Estimated population figures indicate a steady climb from 1980 through 1991. The estimated population in 1991 was about 42 percent greater than in 1980, while total freshwater use increased by only 9 percent during this period.

Since 1980, some water use by category has fluctuated (Figure 6). Public supply water use has increased steadily, with some fluctuations. Water use for agricultural irrigation has declined

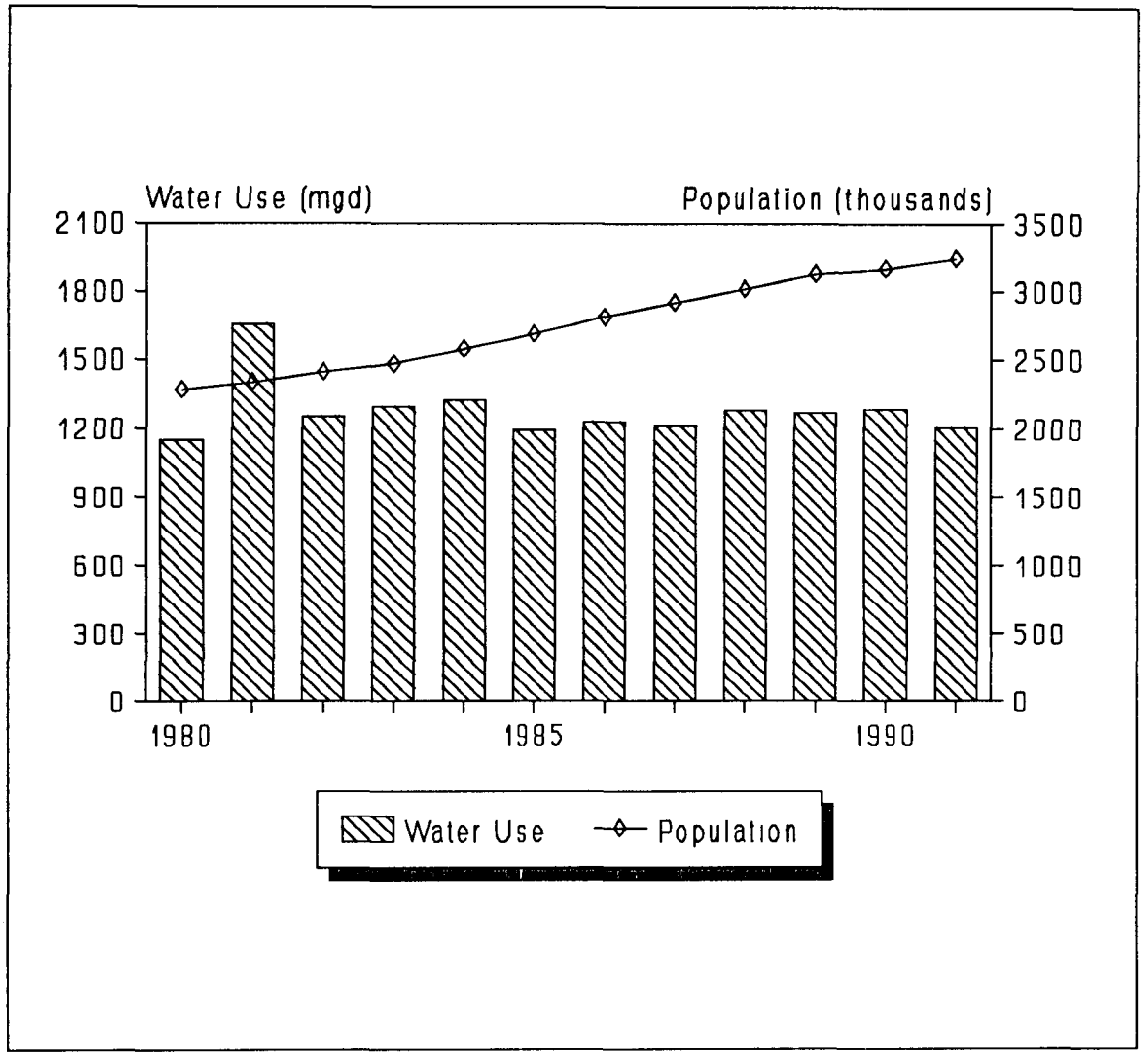


Figure 5. Freshwater use and population in the St. Johns River Water Management District from 1980 to 1991. *Except for very high water use in 1981 (a drought year), water use has remained constant, changing only slightly from year to year, while the population has increased gradually. Note: power generation and miscellaneous water uses are not included.*

Table 10. Comparisons of freshwater use (in million gallons per day) in the St. Johns River Water Management District (SJRWMD)

Category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989*	1990	1991
SJRWMD population	2,278,372	2,336,463	2,409,849	2,469,147	2,574,947	2,690,133	2,813,578	2,919,028	3,023,277	3,135,756	3,166,715	3,243,380
Water source**												
Fresh ground	957.50	1,335.52	985.27	986.85	1,066.24	991.04	1,003.12	1,012.03	1,054.55	1,119.32	1,085.97	1,027.22
Fresh surface	317.06	361.78	273.70	311.95	290.01	363.76	379.62	353.47	379.15	360.47	459.00	373.41
Total	1,274.56	1,697.30	1,258.97	1,298.80	1,356.25	1,354.80	1,382.74	1,365.50	1,433.70	1,479.79	1,544.97	1,400.63
Public supply	294.68	307.27	291.52	298.85	331.22	358.53	381.99	400.39	409.29	431.12	444.14	414.15
Domestic self-supply	85.37	89.80	88.20	80.99	87.72	81.76	82.33	85.71	86.73	90.24	83.86	84.51
Commercial/ industrial self-supply	163.36	160.01	169.69	163.67	150.24	172.34	148.46	145.67	150.11	148.66	137.65	144.24
Agricultural irrigation	607.68	1,099.81	698.77	748.45	753.90	584.68	617.97	581.24	630.92	600.09	605.31	561.12
Thermoelectric power generation	92.69	40.41	10.79	6.84	7.12	124.41	133.72	134.37	135.78	137.11	213.31	139.99
Abandoned artesian wells	30.78	0.00	0.00	0.00	26.05	33.08	18.27	18.12	20.87	56.60	60.70	56.62

* Abandoned artesian well data came from Steele (pers. com. 1992). As a result, the sum of water use by category will not match the total by water source.

**Excluding heat pump and air-conditioning.

Note: Over the years, some of the methods have changed. Check each source before making detailed comparisons.

Source: Marella 1983, 1984a, 1984b, 1985, 1986, 1987, 1988, 1990; Florence 1990, 1991, 1992; Steele 1992

Category	12-Year Average
Fresh ground	1,052.05
Fresh surface	351.95
Total	1,404.00
Public supply	363.60
Domestic self-supplied	85.60
Commercial/industrial	154.51
Agricultural irrigation	674.16
Thermoelectric power	98.05
Abandoned artesian wells	26.76

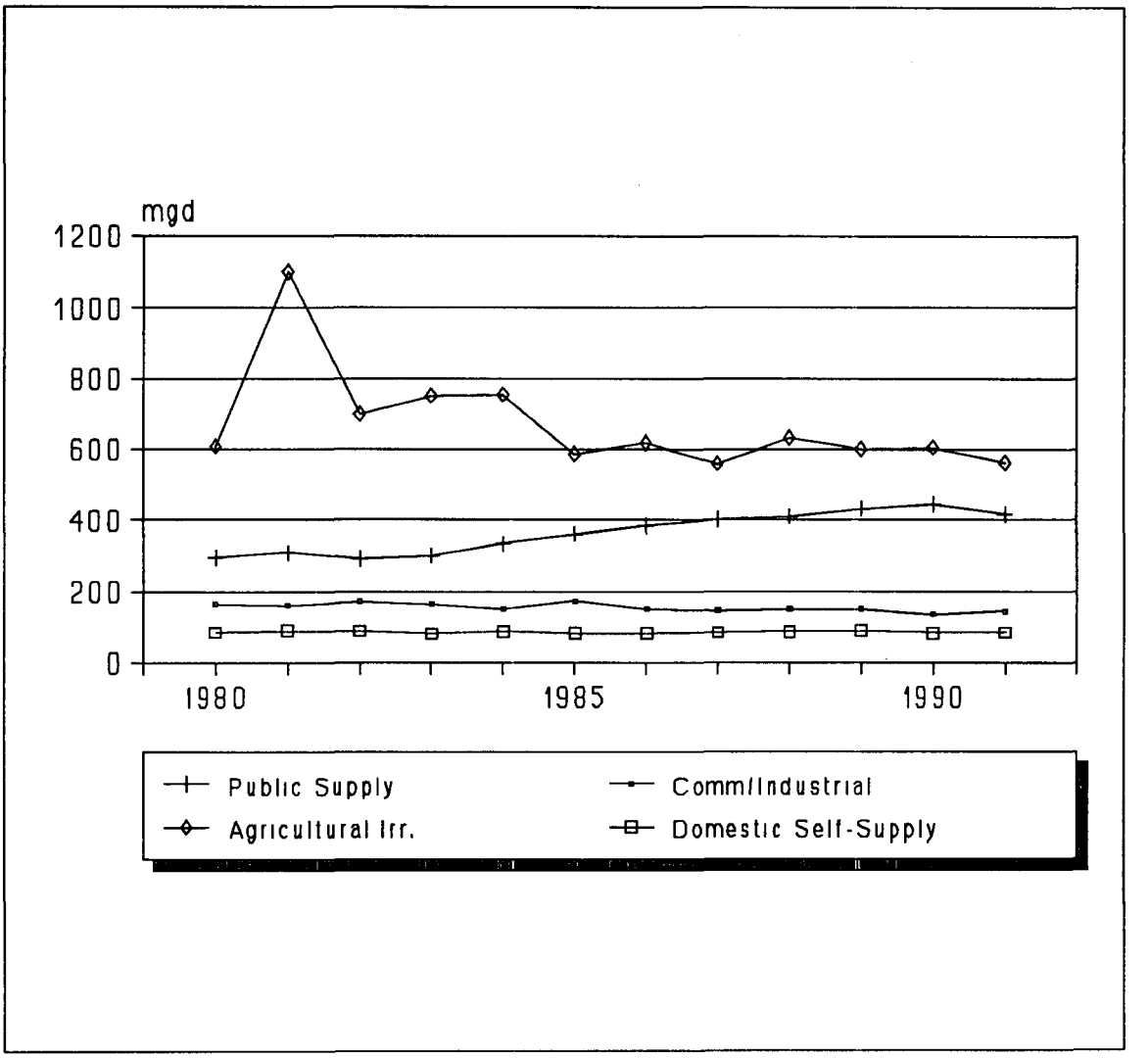


Figure 6. Freshwater use in the St. Johns River Water Management District by category from 1980 to 1991. *Water use for agricultural irrigation has fluctuated from year to year in response to rainfall. Water use for public supply has increased steadily with increasing population and tourism.*

due to improved irrigation and freeze protection methods and the conversion of agricultural lands to urban uses. However, water use for domestic self-supply and commercial/industrial self-supply has fluctuated little.

Water use for public supply was highest in 1990 (444.14 mgd) and lowest in 1982 (291.52 mgd). However, per capita use has remained consistently between 153 and 167 gallons per day. The arithmetic mean for this 12-year period is 363.60 mgd; water use in 1991 was 14 percent above the mean.

Water use for domestic self-supply was highest in 1989 (90.24 mgd) and lowest in 1985 (81.76 mgd). The arithmetic mean for this 12-year period was 85.60 mgd; in 1991, water use was 2 percent below the mean.

Water use for commercial/industrial self-supply was highest in 1985 (172.34 mgd) and lowest in 1990 (137.65 mgd). The arithmetic mean for this 12-year period is 154.51 mgd; in 1991, water use was 7 percent below the mean.

Water use for agricultural irrigation was highest in 1981 (1,099.81 mgd), a drought year, and lowest in 1991 (561.12 mgd), a rainy year. The arithmetic mean for this 12-year period is 674.16 mgd; in 1991, water use was 17 percent below the mean.

Thermoelectric power generation and abandoned artesian well data are either incomplete or the methods for determining water use have varied. Therefore, comparisons of data for these categories would be inappropriate.

1990 TO 1991

From 1990 to 1991, total freshwater use in SJRWMD decreased from 1,544.97 mgd to 1,400.63 mgd, or 9 percent. Fresh ground water use decreased from 1,085.97 mgd to 1,027.22 mgd, or 5 percent. Fresh surface water use decreased from 459.00 mgd to 373.41 mgd, or 19 percent. Saline surface water use increased from 1,548.86 mgd to 1,756.02 mgd, or 13 percent (Florence 1990).

The following four categories of fresh water use decreased from 1990 to 1991:

- Public supply freshwater use decreased 7 percent, from 444.14 mgd in 1990 to 414.15 mgd in 1991. This decrease in water use can be attributed to the high amount of rainfall during the year and conservation efforts.

- Agricultural irrigation freshwater use decreased 7 percent, from 605.31 mgd in 1990 to 561.12 mgd in 1991. This decrease can be attributed to the high amount of rainfall during the year. Also, improved irrigation methods and conservation efforts contributed to low water use.

- Thermoelectric power generation freshwater use decreased 34 percent, from 213.31 mgd in 1990 to 139.99 mgd in 1991. This decrease in freshwater use is attributed to the FPL-Sanford power generating plant in Volusia County, which dropped its fresh surface water withdrawals 95 percent from 1990.

- Miscellaneous (abandoned artesian well inventory) freshwater use decreased 7 percent, from 60.70 mgd in 1990 to 56.62 mgd in 1991.

Two categories of freshwater use increased slightly from 1990 to 1991:

- Commercial/industrial freshwater use increased 5 percent, from 137.65 mgd in 1990 to 144.24 mgd in 1991. Saline surface water withdrawals remained constant.

- Domestic self-supplied freshwater use increased less than 1 percent, from 83.86 mgd in 1990 to 84.51 mgd in 1991.

One category of saline surface water use increased for 1990 to 1991. Saline surface water used for thermoelectric power generation increased 14 percent, from 1,505.76 mgd in 1990 to 1,710.93 mgd in 1991. This increase in saline surface water

withdrawal is attributed to the Jacksonville Electric Authority power generating plant in Duval County, which increased its withdrawals 66 percent.

SEASONAL TRENDS

In 1991, total freshwater use was highest in May and June (Figure 7). Monthly trends in total water use follow the trends in agricultural water use, which depend on rainfall and growing season (Figure 7). March, April, and May tend to be both Florida's dry season and peak crop irrigation months, so irrigation demand usually increases during these months (Figure 8). Demand for residential lawn irrigation also tends to increase during these months, generating an increase in public supply water use.

Public Supply

Public supply water use in SJRWMD in 1991 fluctuated from a low of 393.83 mgd in January to a high of 441.78 mgd in September (Figures 7 and 9). However, the seasonal fluctuations usually observed in public supply water use were not nearly as pronounced as they have been in the past, largely due to high rainfall during the year. Typically, water use increases during the warm season (April through October), when outdoor residential use is at a high.

Commercial/Industrial Self-Supply

Commercial/industrial self-supply freshwater use in SJRWMD in 1991 varied little over the year—from a low of 137.87 mgd in May to a high of 155.22 mgd in October (Figure 10).

Agricultural Irrigation

Agricultural water use in SJRWMD in 1991 had a greater seasonal fluctuation than any other water use category—from a low of 135.12 mgd in January to a high of 1,346.41 mgd in May

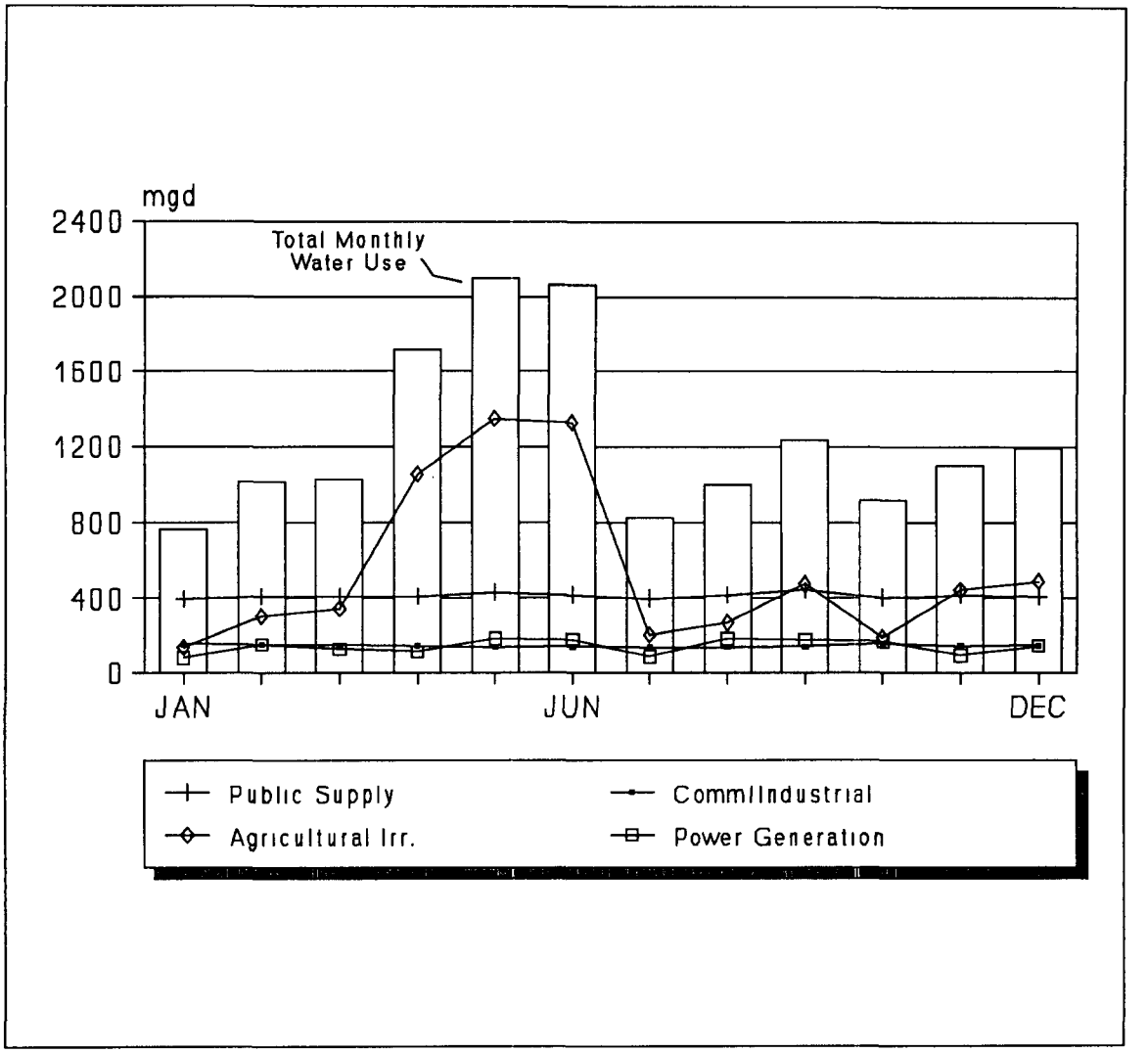


Figure 7. Total monthly freshwater use and freshwater use by category in the St. Johns River Water Management District, 1991. *Total monthly fluctuations in water use follow the fluctuations in agricultural irrigation.*

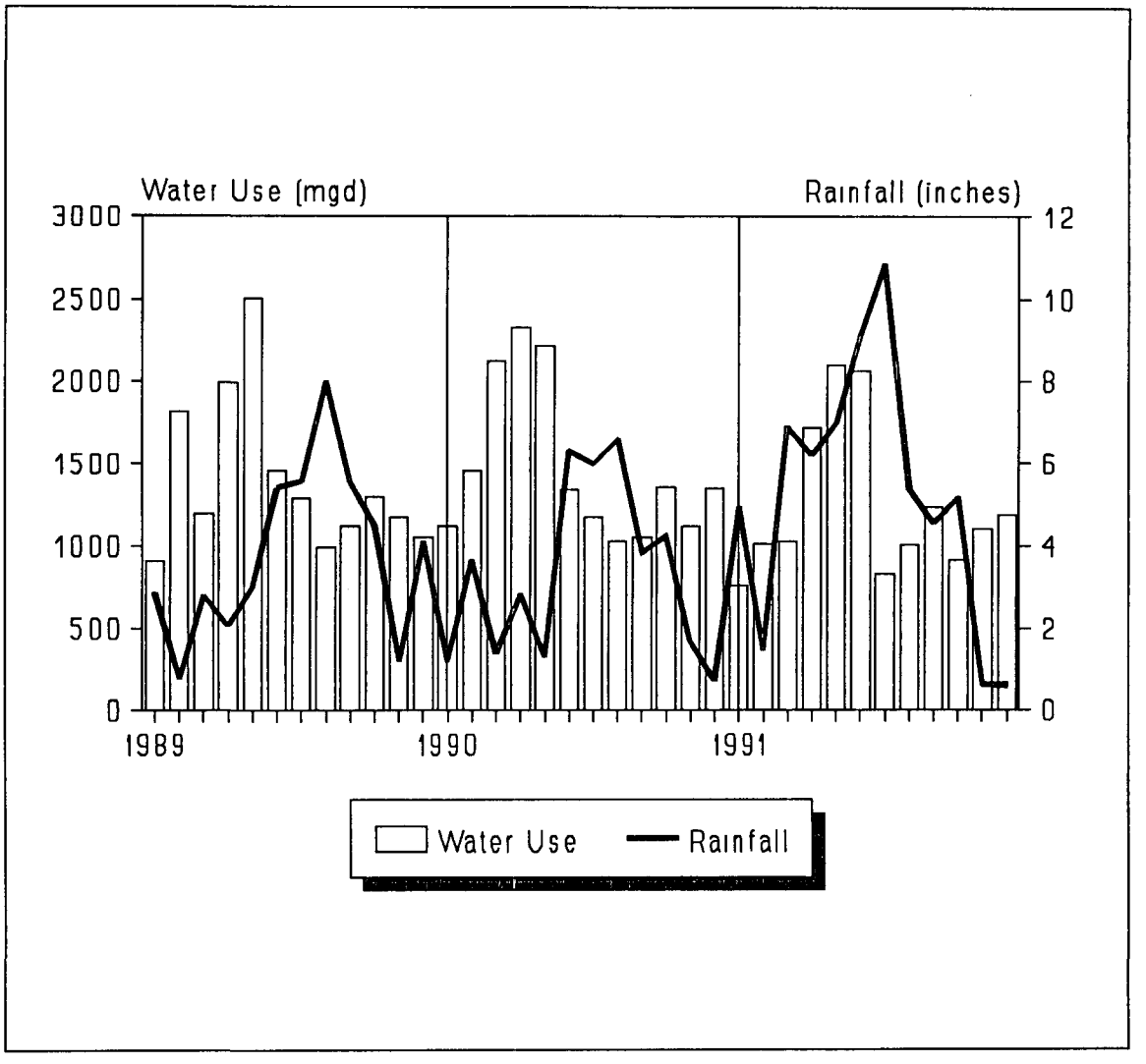


Figure 8. Total monthly freshwater use and rainfall in the St. Johns River Water Management District, 1989–91

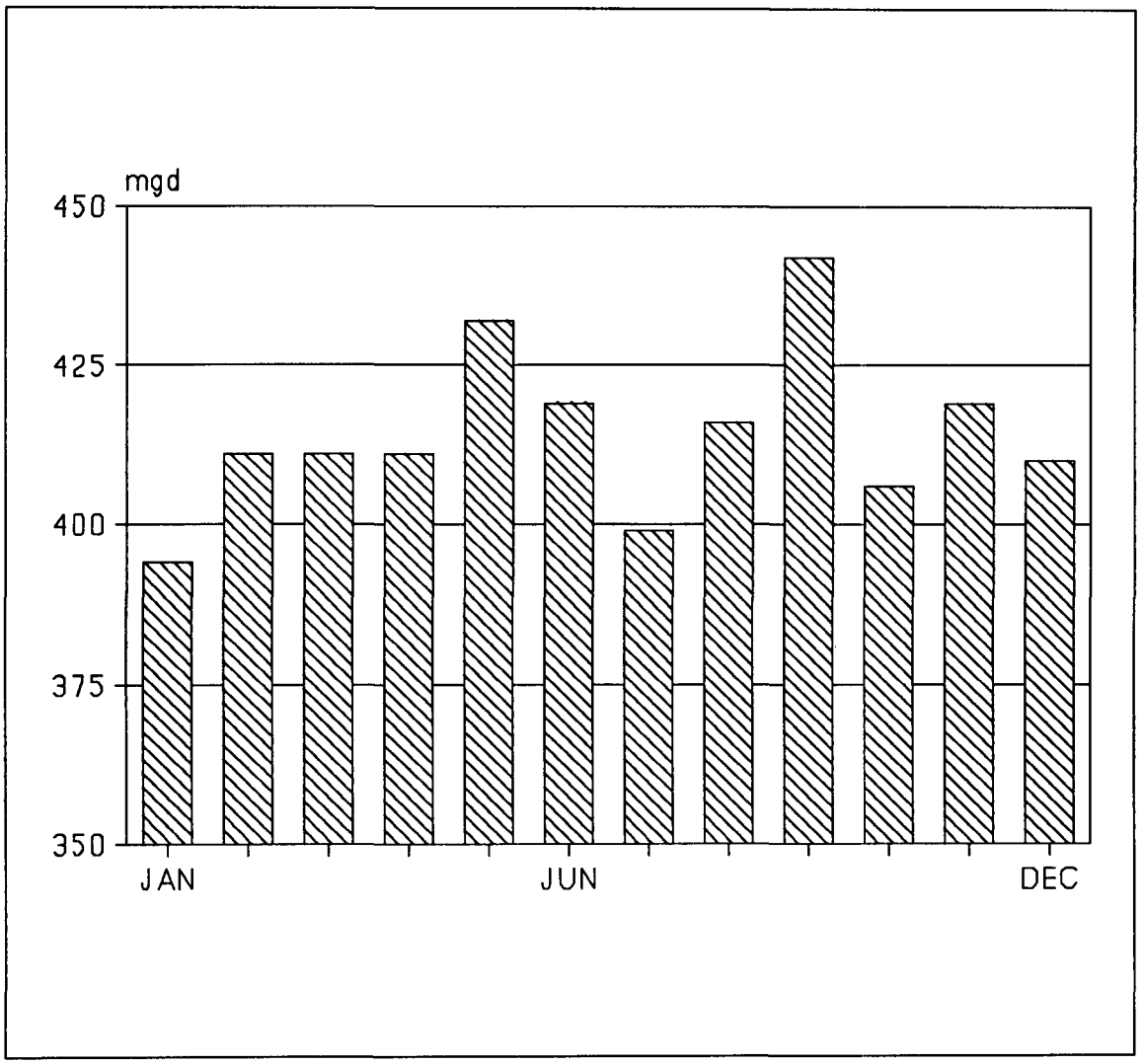


Figure 9. Monthly freshwater use for public supply in the St. Johns River Water Management District, 1991.

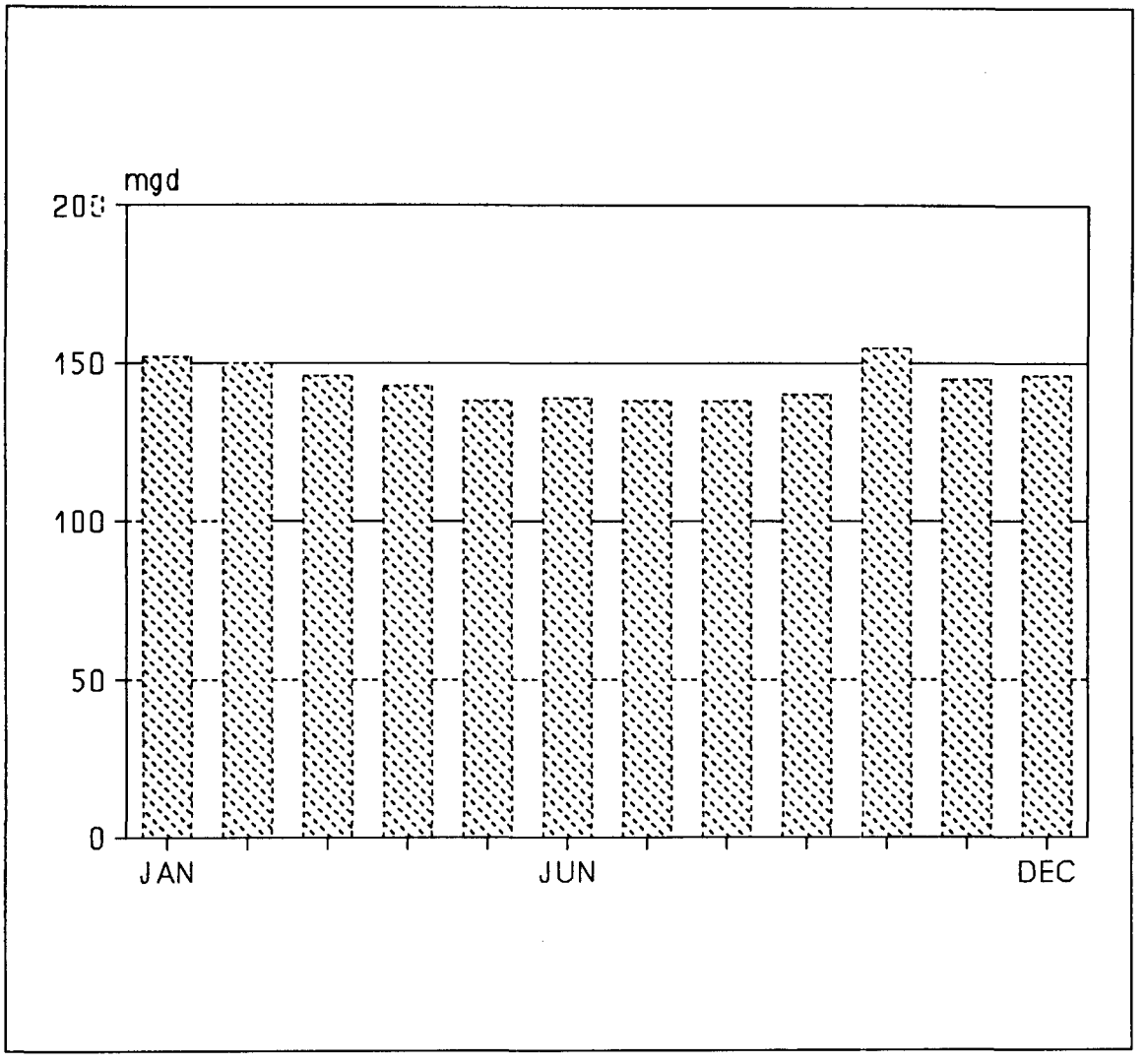


Figure 10. Monthly freshwater use for commercial/industrial self-supply in the St. Johns River Water Management District, 1991.
Commercial/industrial water use varies little over the year.

(Figure 11). These fluctuations are typical of agricultural water use and are inversely correlated to rainfall.

Thermoelectric Power Generation

Thermoelectric power generation freshwater use in SJRWMD in 1991 fluctuated from a low of 81.20 mgd in January to a high of 181.32 mgd in August (Figure 12). Fluctuations in water use are related to power plant shutdowns for maintenance or increased power demands during periods of extremely high or low temperature.

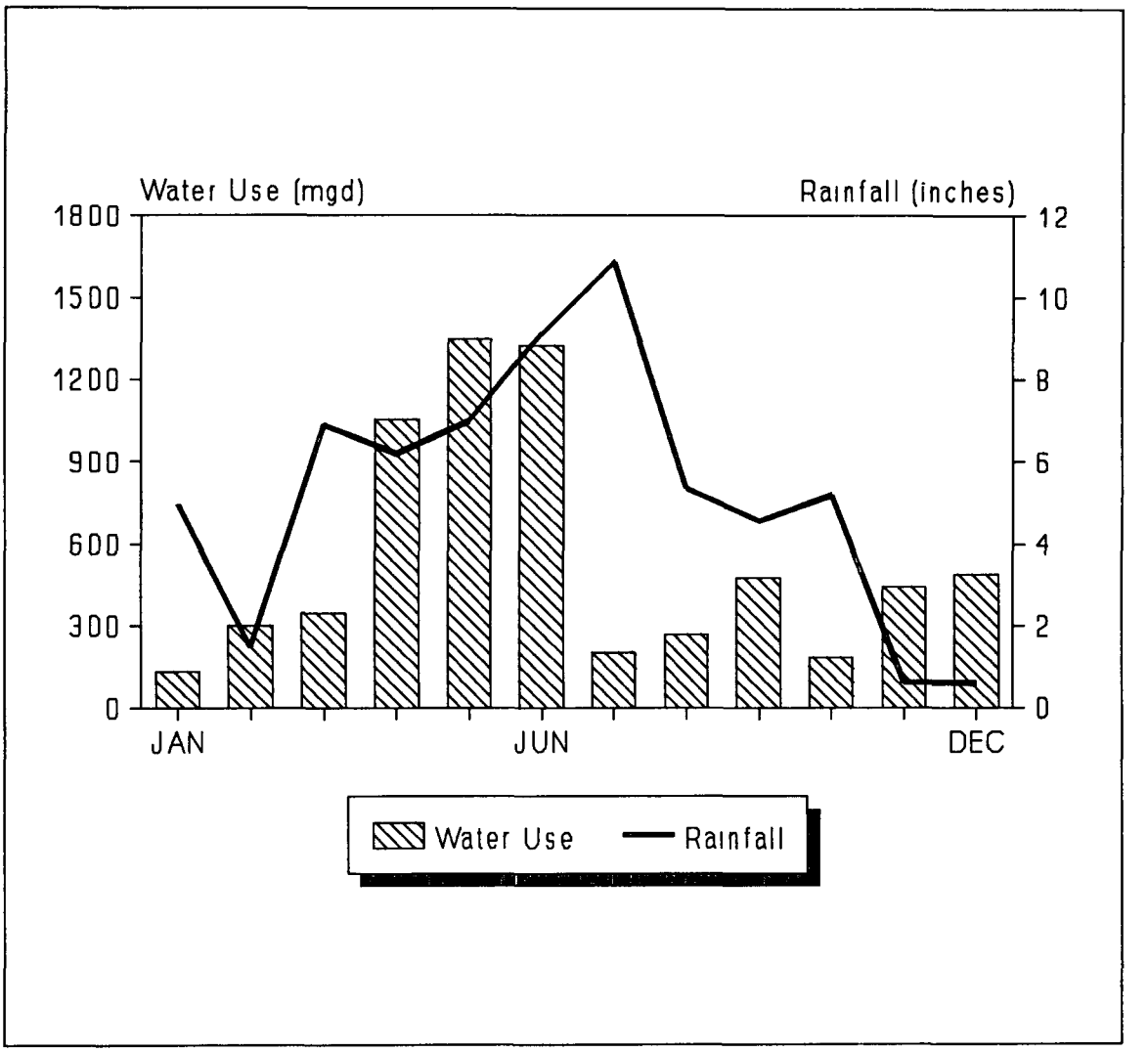


Figure 11. Monthly freshwater use for agricultural irrigation in the St. Johns River Water Management District, 1991. *Agricultural irrigation water use is inversely correlated to rainfall.*

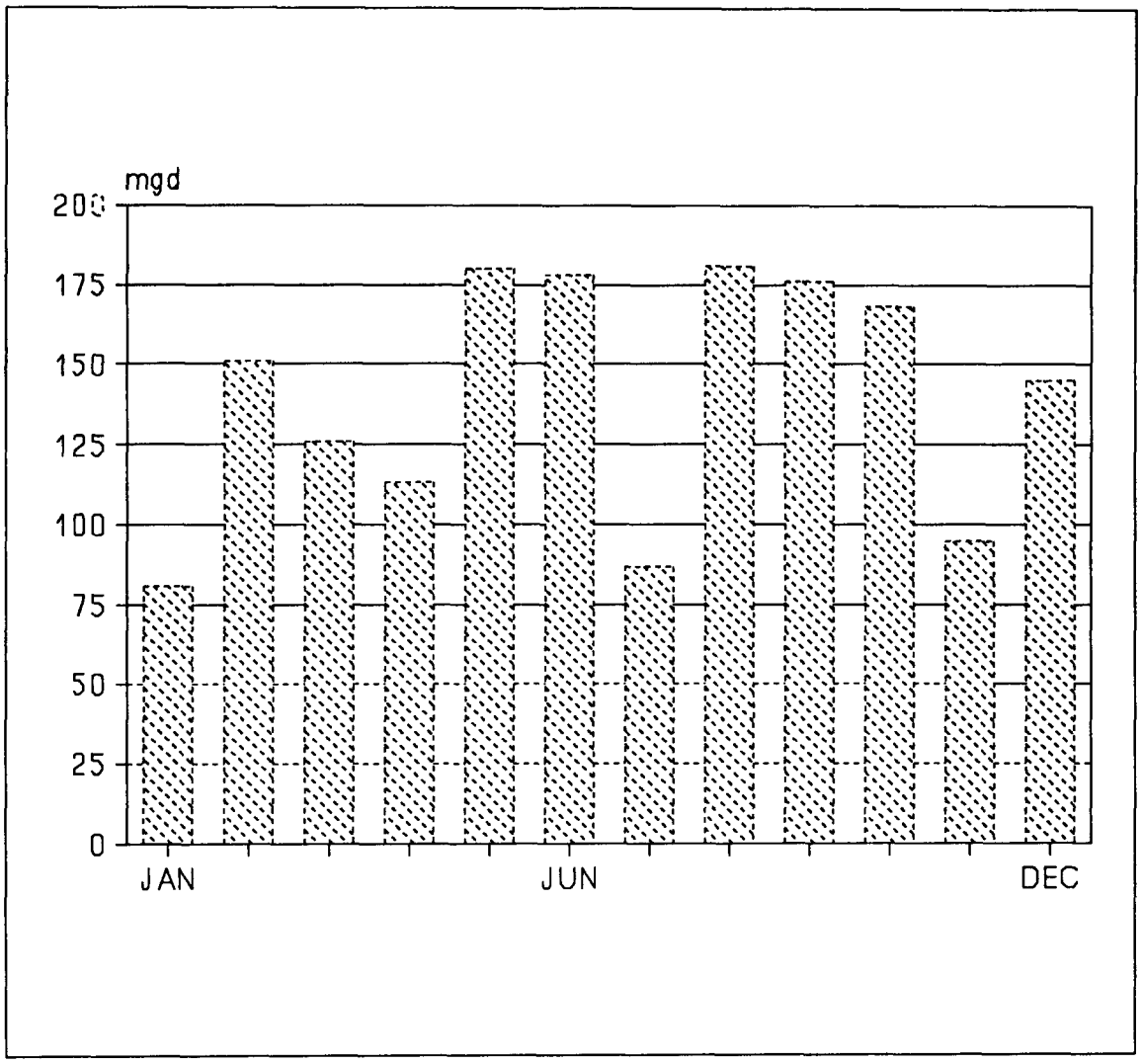


Figure 12. Monthly freshwater use for thermoelectric power generation in the St. Johns River Water Management District, 1991. *Monthly fluctuations in water use for power generation are due to increased seasonal power demands or plant shutdowns for maintenance.*

GLOSSARY

ABANDONED ARTESIAN WELL

An artesian well, with or without a mechanism for controlling discharge, that allows water to flow continuously at the land surface or into other aquifers through internal flow because of improper well construction or condition. Also called *wild flowing well, free-flowing well,* and *uncontrolled artesian well.*

AQUIFER

A reservoir of ground water. In SJRWMD, there are three major aquifer systems: the Floridan, the intermediate, and the surficial. In this report, data for the intermediate and surficial aquifers are combined.

AVERAGE ANNUAL WATER USE

The total quantity of water withdrawn during the year (in gallons) divided by 365 days except in a leap year. Reported in million gallons per day.

FRESH WATER

Water with a total dissolved solids concentration less than or equal to 1,000 mg/L. The freshwater category includes both potable and nonpotable water.

PER CAPITA USE (GROSS)

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 all uses by public supply water, divided by the population served.

POTABLE WATER

Water that meets the quality standards set by the Department of Environmental Protection. Potable water is considered safe for human consumption and is often referred to as drinking water. In Florida, chloride and total dissolved solids concentrations in potable water must be less than or equal to 250 mg/L and 500 mg/L, respectively.

REVERSE OSMOSIS

A process of desalination that removes chlorides or other dissolved solids from saline water to make it potable.

SALINE WATER

Water with a chloride concentration greater than 1,000 mg/L or a total dissolved solids concentration greater than 3,000 mg/L.

SELF-SUPPLIED WATER

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

SLIGHTLY SALINE WATER

Water with a chloride concentration between 250 and 1,000 mg/L or a total dissolved solids concentration between 500 and 3,000 mg/L. This water is nonpotable, but treatable. Slightly saline water is either diluted with fresh water or treated by reverse osmosis to potable standards for public supply. For other uses, this water is generally not treated. In this report, treated or diluted slightly saline water is included in the reported quantities of fresh water.

WATER USE

The quantity of water used and the way in which the water is used in SJRWMD. In most cases, water use equals withdrawals; however, in some cases, water is withdrawn in one county for use in another county. In the latter case, notations are made; otherwise, water use equals withdrawal.

WATER WITHDRAWALS

The amount of water withdrawn from a source (ground or surface, fresh or saline). Withdrawals are equivalent to *intake, water diversion,* or *pumpage,* terms commonly associated with industrial, agricultural irrigation, and public supply use, respectively. Water withdrawals are considered water use for this report.

REFERENCES

FDACS. 1992a. *Citrus summary 1991.* Florida Agricultural Statistics Service. Orlando, Fla.: Florida Department of Agriculture and Consumer Services.

———. 1992b. *Vegetable summary 1991.* Florida Agricultural Statistics Service. Orlando, Fla.: Florida Department of Agriculture and Consumer Services.

———. 1992c. *Special tree census survey for Polk, Lake and Orange counties.* Florida Agricultural Statistics Service. Orlando, Fla.: Florida Department of Agriculture and Consumer Services.

———. 1992d. *Livestock summary 1991.* Florida Agricultural Statistics Service. Orlando, Fla.: Florida Department of Agriculture and Consumer Services.

Florence, B.L. 1990. *Annual water use survey: 1988.* Technical Publication SJ90-12. Palatka, Fla.: St. Johns River Water Management District.

———. 1991. *Annual water use survey: 1989.* Technical Publication SJ91-6. Palatka, Fla.: St. Johns River Water Management District.

———. 1992. *Annual water use survey: 1990.* Technical Publication SJ92-4. Palatka, Fla.: St. Johns River Water Management District.

Marella, R. 1983. *Annual water use survey: 1981.* Technical Publication SJ83-9. Palatka, Fla.: St. Johns River Water Management District.

———. 1984a. *Annual water use survey: 1982.* Technical Publication SJ84-2. Palatka, Fla.: St. Johns River Water Management District.

———. 1984b. *Annual water use survey: 1983.* A supplement to Technical Publication SJ84-5. Palatka, Fla.: St. Johns River Water Management District.

———. 1985. *Annual water use survey: 1984.* Technical Publication SJ85-7. Palatka, Fla.: St. Johns River Water Management District.

———. 1986. *Annual water use survey: 1985.* Technical Publication SJ86-5. Palatka, Fla.: St. Johns River Water Management District.

———. 1987. *Annual water use survey: 1980.* Revised Edition. Technical Publication SJ82-5 (revised). Palatka, Fla.: St. Johns River Water Management District.

———. 1988. *Water withdrawals, use and trends in the St. Johns River Water Management District: 1986.* Technical Publication SJ88-7. Palatka, Fla.: St. Johns River Water Management District.

———. 1990. *Annual water use survey: 1987.* Technical Publication SJ90-4. Palatka, Fla.: St. Johns River Water Management District.

———. 1993. Glossary of water use terms commonly used in Florida-1993. U.S. Geologic Survey. Tallahassee, Fla.

Moore, C. 1992. Memorandum to author, 28 September 1992. Water Use Data Manager, St. Johns River Water Management District. Palatka, Fla.

NOAA. 1992. *Climatological data annual summary, Florida 1991.* Asheville, N.C.: National Oceanographic and Atmospheric Administration.

Shoemyen, A.H., L.L. Drexel, and S.S. Floyd. 1992. *Florida statistical abstract.* Bureau of Economic and Business Research. Gainesville, Fla.: University of Florida.

Singleton, V. 1992. *Agricultural pumpage data for various crops for the Benchmark Farms program.* Unpublished data. St. Johns River Water Management District. Palatka, Fla.

SJRWMD. 1991. *Consumptive use permit database.* Computer printout of unpublished data. Palatka, Fla.

———. 1992. *Summary of rainfall for January 1980 to December 1990.* Computer printout of unpublished data. Palatka, Fla.: St. Johns River Water Management District.

Steele, C. 1992. *Annual report on abandoned artesian wells: 1991.* Technical Publication SJ92-5. Palatka, Fla.: St. Johns River Water Management District.

University of Florida. 1992a. *Florida estimates of population by county and municipality in Florida, April 1, 1991.* Bureau of Economic and Business Research. Gainesville, Fla.

———. 1992b. *Number of households and average household size in Florida: 1970, 1980, 1990.* Bureau of Economic and Business Research. Gainesville, Fla.

USDA. 1970. *Irrigation water requirements* (revised). Soil Conservation Service. Technical Release No. 21. Gainesville, Fla.: U.S. Department of Agriculture.

———. 1982. *Florida irrigation guide.* Gainesville, Fla.: U.S. Department of Agriculture.

APPENDIX: 1991 WATER USE BY COUNTY

This appendix presents the detailed water use data from which this report is constructed. SJRWMD totals are first presented for population, land area, water withdrawals by category, agricultural acreage, and water use by crop.

Then, for each county, tables present population and land area totals, with water withdrawals by category; the reported water use of large, individual water users; and agricultural acreage and water use by crop. On the county water user tables, the withdrawal source is fresh water unless designated (by footnote) as saline water. Monthly freshwater use is graphed for public supply water use except for counties which have only a small area in SJRWMD (such as Okeechobee and Osceola), where the numbers are very small. Some totals may not equal 100 percent because of rounding.

CONTENTS

STATE OF FLORIDA

Total Population 13,195,952
Total Land Area 58,560 mi^2

St. Johns River Water Management District

Population	
Total	3,243,380
Public supply	2,700,294
Self-supplied	543,086
Per capita	153

Land Area (acres)	
Total area	7,788,460 (12,170 mi^2)
Farmed	927,664
Irrigated	376,229

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply (1)	398.91	15.24	414.15	0.00
Domestic self-supply	84.51	0.00	84.51	0.00
Com/ind. self-supply	117.23	27.01	144.24	45.09
Agricultural irr.	363.08	198.04	561.12	0.00
Power generation s-s	6.87	133.12	139.99	1,710.93
Miscellaneous (2)	56.62	0.00	56.62	0.00
Totals	1,027.22	373.41	1,400.63	1,756.02

Total Ground	1,027.22
Total Surface	2,129.43
District Total	3,156.65

(1) Includes 4.21 mgd of slightly saline water withdrawn for public supply (250 to 1,000 mg/L chlorides), of which 3.11 mgd is treated through reverse osmosis and 1.10 mgd is diluted with fresh water. Prior to 1986, this water was included under saline ground water.
(2) Miscellaneous water use includes only the abandoned artesian well inventory.

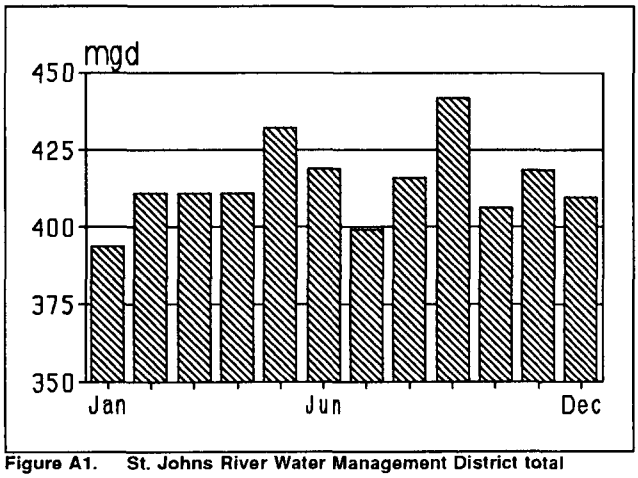


Figure A1. St. Johns River Water Management District total monthly public supply water use, 1991

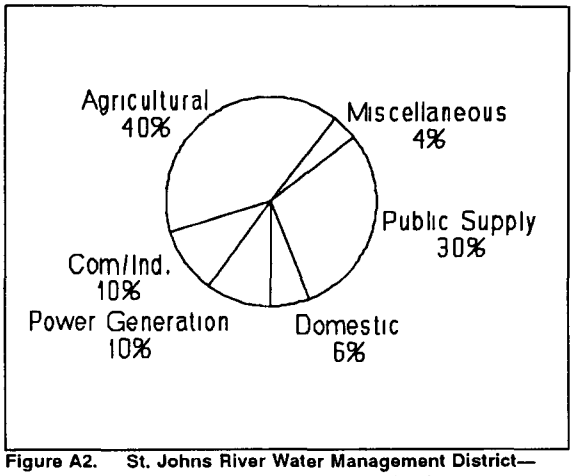


Figure A2. St. Johns River Water Management District—percentages, by category, of freshwater use, 1991

TOTAL ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	6,195	5,745	5.71	0.08	5.79
Carrots	15,550	13,650	5.16	25.70	30.86
Cucumbers	2,300	2,140	1.07	0.03	1.09
Peppers	330	330	0.19	0.00	0.19
Potatoes	30,550	30,550	27.71	0.00	27.71
Tomatoes	90	90	0.12	0.00	0.12
Sweet corn	19,625	19,225	10.42	25.11	35.53
Watercress	150	150	0.35	0.00	0.35
Misc. vegetables	24,362	22,250	2.59	6.00	8.59
Fruit Crops					
Blueberries	749	682	1.19	0.00	1.19
Citrus	110,420	102,325	93.55	91.85	185.40
Grapes	148	145	0.15	0.00	0.15
Peaches	102	102	0.15	0.00	0.15
Pecans	2,865	390	0.63	0.00	0.63
Strawberries	80	80	0.07	0.00	0.07
Watermelons	4,040	3,630	1.75	0.02	1.77
Misc. fruit	415	305	1.00	0.03	1.03
Field Crops					
Field corn	18,840	9,140	8.72	3.81	12.53
Peanuts	2,250	209	0.29	0.00	0.29
Rice	50	50	0.08	0.00	0.08
Sorghum	5,500	2,150	1.50	0.17	1.67
Soybeans	4,800	2,700	1.96	0.10	2.05
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	168	120	0.02	0.04	0.06
Wheat	1,350	1,000	2.18	0.00	2.18
Misc. grains	10,394	510	0.24	0.09	0.33
Ornamentals and Grasses					
Ferns	7,791	7,191	16.99	3.42	20.41
Flowers and foliage	1,976	1,976	2.78	0.18	2.96
Woody ornamentals	3,239	2,893	12.98	2.06	15.04
Improved pasture	623,580	124,960	108.06	24.43	132.49
Sod	6,886	6,786	5.21	2.82	8.03
Turf grass (golf)	20,349	12,273	25.22	11.61	36.83
Turf grass (other)	2,520	2,482	4.43	0.49	4.92
Misc. Agricultural					
Livestock	0	0	11.60	0.00	11.60
Fish farming	0	0	9.03	0.00	9.03
Totals	927,664	376,229	363.08	198.04	561.12

Sprinkler Acreage	55,142
Low Pressure Acreage	54,665
Flood Acreage	266,422
Total Irrigated Acreage	376,229

ALACHUA COUNTY

Total Population 183,773
Total Land Area 961 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	149,214	Total area	308,480 (482 mi^2)
Public supply	130,203	Farmed	40,880
Self-supplied	19,011	*Irrigated*	5,623
Per capita	152		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	19.73	0.00	19.73	0.00
Domestic self-supply	2.89	0.00	2.89	0.00
Com/ind. self-supply	1.94	0.00	1.94	0.00
Agricultural irr.	6.31	0.17	6.48	0.00
Power generation s-s	0.29	0.00	0.29	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Totals	31.16	0.17	31.33	0.00

Total Ground	31.16
Total Surface	0.17
County Total	31.33

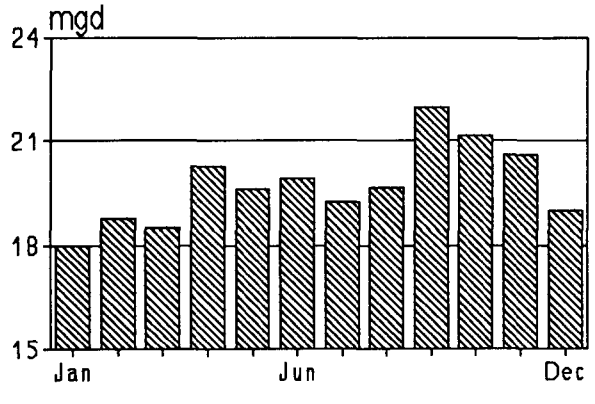


Figure A3. Alachua County monthly public supply water use, 1991

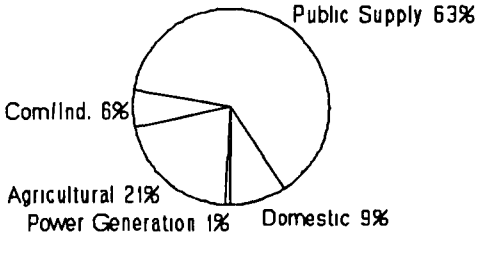


Figure A4. Alachua County—percentages, by category, of freshwater use, 1991

1991 WATER USERS IN ALACHUA COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Arredondo Village/Estates	Public supply	1,345	0.11	Floridan aquifer	0.00	
Gainesville Regional Utilities	Public supply	125,000	19.13	Floridan aquifer	0.00	
Hawthorne - City of	Public supply	1,307	0.20	Floridan aquifer	0.00	
Kincaid Hills S/D	Public supply	1,000	0.12	Floridan aquifer	0.00	
Micanopy - Town of	Public supply	606	0.08	Floridan aquifer	0.00	
Oak Park MHP	Public supply	620	0.07	Floridan aquifer	0.00	
West Gate MHP	Public supply	325	0.02	Floridan aquifer	0.00	
Total Public Supply		130,203	19.73		0.00	
Sunland Center	Institutional		0.23	Floridan aquifer	0.00	
University of Florida	Institutional		1.71	Floridan aquifer	0.00	
Total Com/ind.			1.94		0.00	
Gainesville Regional Utilities	Power generation		0.29	Floridan aquifer	0.00	
Total Power Generation			0.29		0.00	

ALACHUA COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	300	300	0.17	0.00	0.17
Peppers	200	200	0.13	0.00	0.13
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	200	200	0.27	0.00	0.27
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	1,300	1,300	0.45	0.00	0.45
Fruit Crops					
Blueberries	450	450	0.81	0.00	0.81
Citrus	0	0	0.00	0.00	0.00
Grapes	30	30	0.05	0.00	0.05
Peaches	15	15	0.02	0.00	0.02
Pecans	2,600	300	0.44	0.00	0.44
Strawberries	5	5	0.00	0.00	0.00
Watermelons	1,000	1,000	0.55	0.00	0.55
Misc. fruit	90	80	0.23	0.00	0.23
Field Crops					
Field corn	1,200	100	0.09	0.00	0.09
Peanuts	200	75	0.09	0.00	0.09
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	2,000	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	200	0	0.00	0.00	0.00
Misc. grains	1,500	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	4	4	0.01	0.00	0.01
Woody ornamentals	100	100	0.44	0.08	0.52
Improved pasture	28,500	680	0.57	0.00	0.57
Sod	100	50	0.06	0.00	0.06
Turf grass (golf)	480	328	0.89	0.09	0.98
Turf grass (other)	406	406	0.86	0.00	0.86
Misc. Agricultural					
Livestock	0	0	0.16	0.00	0.16
Fish farming	0	0	0.02	0.00	0.02
Totals	40,880	5,623	6.31	0.17	6.48

Sprinkler Acreage	5,218
Low Pressure Acreage	405
Flood Acreage	0
Total Irrigated Acreage	5,623

BAKER COUNTY

Total Population 18,905
Total Land Area 588 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	17,960	Total area	343,040 (536 mi^2)
Public supply	4,127	Farmed	14,921
Self-supplied	13,833	Irrigated	765
Per capita	184		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	0.76	0.00	0.76	0.00
Domestic self-supply	2.55	0.00	2.55	0.00
Com/ind. self-supply	0.32	0.00	0.32	0.00
Agricultural irr.	2.53	0.91	3.44	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Totals	6.16	0.91	7.07	0.00

Total Ground	6.16
Total Surface	0.91
County Total	7.07

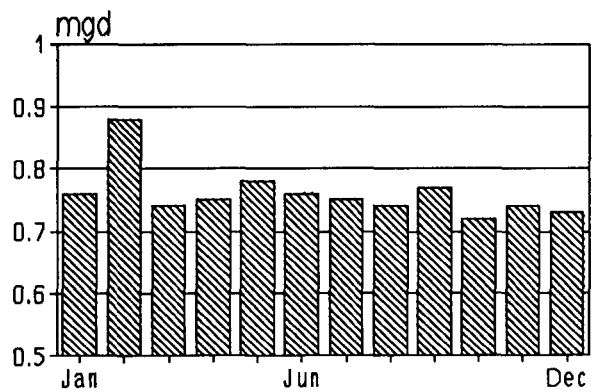


Figure A5. Baker County monthly public supply water use, 1991

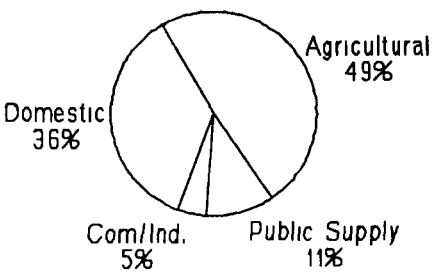


Figure A6. Baker County—percentages, by category, of freshwater use, 1991

1991 WATER USERS IN BAKER COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
MacClenny - City of	Public supply	4,007	0.74	Floridan aquifer	0.00	
MacClenny S/D	Public supply	120	0.02	Floridan aquifer	0.00	
Total Public Supply		4,127	0.76		0.00	
Wiremill Inc.	Industrial		0.14	Floridan aquifer	0.00	
Northeast Fla. State Hospital	Institutional		0.18	Floridan aquifer	0.00	
Total Com/ind.			0.32		0.00	

BAKER COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	100	20	0.01	0.00	0.01
Peppers	25	25	0.01	0.00	0.01
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	100	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	522	100	0.01	0.00	0.01
Fruit Crops					
Blueberries	25	0	0.00	0.00	0.00
Citrus	0	0	0.00	0.00	0.00
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	50	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	400	60	0.01	0.00	0.01
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	800	0	0.00	0.00	0.00
Peanuts	50	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	100	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	128	80	0.00	0.04	0.04
Wheat	150	0	0.00	0.00	0.00
Misc. grains	1,584	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	0	0	0.00	0.00	0.00
Woody ornamentals	763	420	1.31	0.87	2.18
Improved pasture	10,000	0	0.00	0.00	0.00
Sod	0	0	0.00	0.00	0.00
Turf grass (golf)	124	60	0.18	0.00	0.18
Turf grass (other)	0	0	0.00	0.00	0.00
Misc. Agricultural					
Livestock	0	0	1.00	0.00	1.00
Fish farming	0	0	0.00	0.00	0.00
Totals	14,921	765	2.53	0.91	3.44

Sprinkler Acreage	660
Low Pressure Acreage	105
Flood Acreage	0
Total Irrigated Acreage	765

BRADFORD COUNTY

St. Johns River Water Management District

Total Population 22,749
Total Land Area 305 mi^2

Population		Land Area (acres)	
Total	1,705	Total area	3,840 (6 mi^2)
Public supply	358	Farmed	200
Self-supplied	1,347	Irrigated	190
Per capita	118		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply (1)	0.04	0.00	0.04	0.00
Domestic self-supply	0.16	0.00	0.16	0.00
Com/ind. self-supply	0.00	0.00	0.00	0.00
Agricultural irr.	0.17	0.00	0.17	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Totals	0.37	0.00	0.37	0.00
Total Ground	0.37			
Total Surface	0.00			
County Total	0.37			

(1) Does not include 0.07 mgd withdrawn in Bradford County for public supply use in Clay County (Moore 1992).

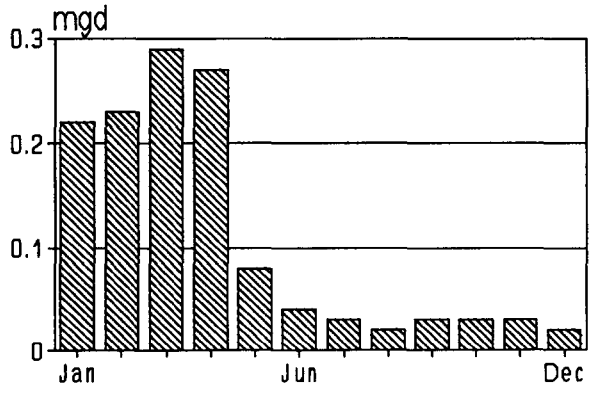


Figure A7. Bradford County monthly public supply water use, 1991

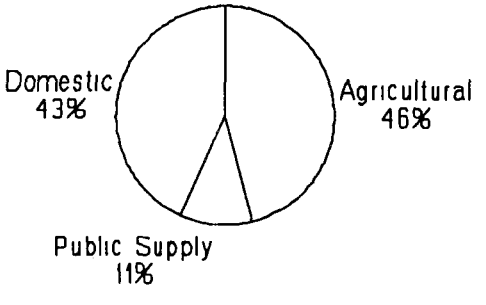


Figure A8. Bradford County—percentages, by category, of freshwater use, 1991

1991 Water Users in Bradford County

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Southern States Utilities[a]	Public supply	358	0.04	Floridan aquifer	0.00	

[a]Does not include 0.07 mgd withdrawn in Bradford County for public supply use in Clay County (Moore 1992)

BRADFORD COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	50	50	0.01	0.00	0.01
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	50	50	0.01	0.00	0.01
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	0	0	0.00	0.00	0.00
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	50	50	0.04	0.00	0.04
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	0	0	0.00	0.00	0.00
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	0	0	0.00	0.00	0.00
Woody ornamentals	0	0	0.00	0.00	0.00
Improved pasture	0	0	0.00	0.00	0.00
Sod	0	0	0.00	0.00	0.00
Turf grass (golf)	40	30	0.09	0.00	0.09
Turf grass (other)	10	10	0.02	0.00	0.02
Misc. Agricultural					
Livestock	0	0	0.00	0.00	0.00
Fish farming	0	0	0.00	0.00	0.00
Totals	200	190	0.17	0.00	0.17

Sprinkler Acreage	190
Low Pressure Acreage	0
Flood Acreage	0
Total Irrigated Acreage	190

BREVARD COUNTY

Total Population 409,370
Total Land Area 995 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	409,370	Total area	636,800 (995 mi^2)
Public supply	371,422	Farmed	145,315
Self-supplied	37,948	Irrigated	100,337
Per capita	130		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply (1)(2)	33.16	15.24	48.40	0.00
Domestic self-supply	4.93	0.00	4.93	0.00
Com/ind. self-supply	0.13	0.00	0.13	0.00
Agricultural irr.	112.76	11.59	124.35	0.00
Power generation s-s	0.28	0.00	0.28	1,089.20
Miscellaneous	36.05	0.00	36.05	0.00
Totals	187.31	26.83	214.14	1,089.20
Total Ground	187.31			
Total Surface	1,116.03			
County Total	1,303.34			

(1) Includes 0.10 mgd of slightly saline water withdrawn for public supply (250 to 1,000 mg/L chlorides), of which 0.08 mgd is treated through reverse osmosis and 0.02 mgd is diluted with fresh water.
(2) Includes 22.46 mgd of water withdrawn in Orange County for public supply use in Brevard County.

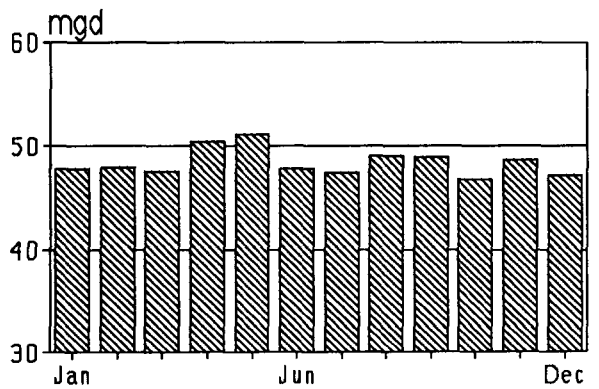


Figure A9. Brevard County monthly public supply water use, 1991

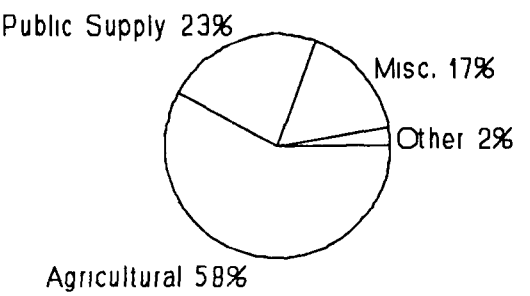


Figure A10. Brevard County—percentages, by category, of freshwater use, 1991. *Other* includes power generation, commercial/industrial, and domestic self-supplied water use.

1991 WATER USERS IN BREVARD COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Aquarina Utilities	Public supply	177	0.02	Floridan aquifer and reverse osmosis (R/O)	0.00	
Avatar (Barefoot Bay) Utility	Public supply	6,340	0.58	Surficial aquifer	0.00	
Cocoa Water Utility	Public supply	143,300	22.46	Floridan aquifer	0.00	
GDU - Palm Bay	Public supply	34,705	4.23	Surficial and Floridan aquifers	0.00	
Melbourne - City of	Public supply	140,000	0.00		15.24	Lake Washington
N. Brevard Utilities (Mims)	Public supply	6,391	0.55	Surficial aquifer	0.00	
S. Brevard Utilities (Sunnyland)	Public supply	726	0.06	Floridan aquifer and R/O	0.00	
Titusville - City of	Public supply	39,783	5.26	Floridan aquifer	0.00	
Total Public Supply		371,422	33.16[a]		15.24	
Harris Corp.	Industrial		0.03	Surficial aquifer	0.00	
Union Carbide Inc.	Industrial		0.09	Surficial aquifer	0.00	
Florida DOT - I-95 rest fac.	Institutional		0.01	Surficial aquifer	0.00	
			0.13		0.00	
Florida Power & Light	Power generation		0.16	Surficial aquifer	568.55	Indian River*
Orlando Utilities	Power generation		0.12	Surficial aquifer	520.65	Indian River*
Total Power Generation			0.28		1,089.20	

[a]Includes water withdrawn from Orange County for public supply use in Brevard County
*Saline water

BREVARD COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	1,300	1,300	1.47	0.00	1.47
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	0	0	0.00	0.00	0.00
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	10,519	5,750	8.21	3.20	11.41
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	200	200	0.12	0.02	0.14
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	2,500	2,500	4.52	0.00	4.52
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	1,800	1,800	1.31	0.00	1.31
Soybeans	2,500	2,500	1.86	0.00	1.86
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	1,000	1,000	2.18	0.00	2.18
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	1	1	0.00	0.00	0.00
Flowers and foliage	10	10	0.02	0.00	0.02
Woody ornamentals	190	190	0.99	0.00	0.99
Improved pasture	121,700	81,860	87.30	4.59	91.89
Sod	1,300	1,300	0.86	1.29	2.15
Turf grass (golf)	1,692	1,323	1.50	2.47	3.97
Turf grass (other)	603	603	1.31	0.02	1.33
Misc. Agricultural					
Livestock	0	0	1.09	0.00	1.09
Fish farming	0	0	0.02	0.00	0.02
Totals	145,315	100,337	112.76	11.59	124.35

Sprinkler Acreage	3,677
Low Pressure Acreage	3,500
Flood Acreage	93,160
Total Irrigated Acreage	100,337

CLAY COUNTY

Total Population 108,191
Total Land Area 643 mi^2

St. Johns River Water Management District

Population	
Total	108,191
Public supply	73,523
Self-supplied	34,668
Per capita	144

Land Area (acres)	
Total area	411,520 (643 mi^2)
Farmed	44,241
Irrigated	749

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply (1)	10.61	0.00	10.61	0.00
Domestic self-supply	4.99	0.00	4.99	0.00
Com/ind. self-supply	7.28	0.00	7.28	0.00
Agricultural irr.	2.56	0.38	2.94	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Totals	25.44	0.38	25.82	0.00
Total Ground	25.44			
Total Surface	0.38			
County Total	25.82			

(1) Includes 0.07 mgd withdrawn in Bradford County for public supply use in Clay County (Moore 1992).

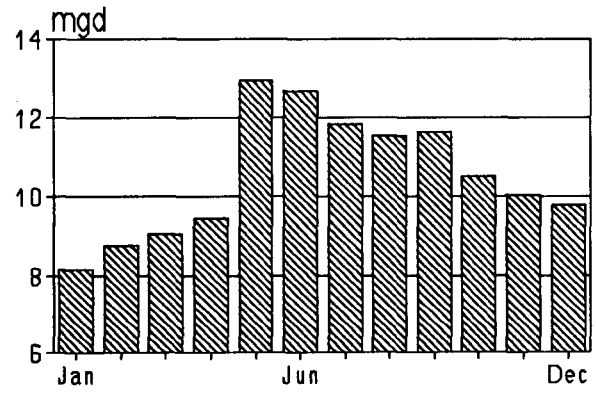


Figure A11. Clay County monthly public supply water use, 1991

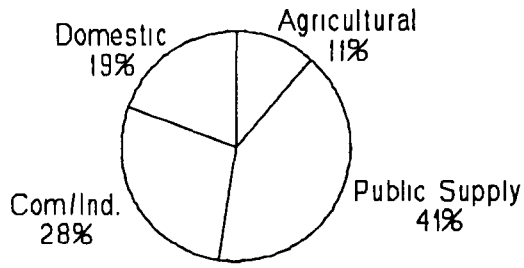


Figure A12. Clay County—percentages, by category, of freshwater use, 1991

1991 Water Users in Clay County

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Clay Utility Co.	Public supply	8,242	0.78	Floridan aquifer	0.00	
McRae Landing (Duval Utility)	Public supply	257	0.03	Floridan aquifer	0.00	
Green Cove Springs - City of	Public supply	4,593	0.76	Floridan aquifer	0.00	
Keystone Heights - City of[a]	Public supply	2,796	0.34	Floridan aquifer	0.00	
Kingsley Service Co.	Public supply	44,320	6.95	Floridan aquifer	0.00	
Lake Asbury Utilities	Public supply	1,667	0.19	Floridan aquifer	0.00	
Magnolia Springs Utilities	Public supply	858	0.10	Floridan aquifer	0.00	
Orange Park - Town of	Public supply	9,445	1.32	Floridan aquifer	0.00	
Penny Retirement Community	Public supply	226	0.05	Floridan aquifer	0.00	
Penny Farms - Town of	Public supply	619	0.03	Floridan aquifer	0.00	
The Ravines Village & Resort	Public supply	500	0.06	Floridan aquifer	0.00	
Total Public Supply		73,523	10.61		0.00	
El DuPont De Nemours Minerals	Industrial*		3.12	Floridan aquifer	0.00	
Florida Rock - Keystone mine	Industrial*		2.17	Floridan aquifer	0.00	
J-M Manufacturing Co.	Industrial		0.13	Floridan aquifer	0.00	
Reynolds Industrial Park	Industrial		0.42	Floridan aquifer	0.00	
Paramount Poultry	Industrial		0.02	Floridan aquifer	0.00	
RGC (USA) Mineral Sands	Industrial*		1.09	Floridan aquifer	0.00	
Camp Blanding Military Base	Institutional		0.33	Floridan aquifer	0.00	
Total Com/ind.			7.28		0.00	

[a]Includes 0.07 mgd withdrawn in Bradford County for public supply use in Clay County (Moore 1992)
*Mining industry

CLAY COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	200	60	0.01	0.00	0.01
Fruit Crops					
Blueberries	15	13	0.02	0.00	0.02
Citrus	0	0	0.00	0.00	0.00
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	500	0	0.00	0.00	0.00
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	2,800	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	50	50	0.07	0.00	0.07
Woody ornamentals	0	0	0.00	0.00	0.00
Improved pasture	40,000	100	0.08	0.00	0.08
Sod	0	0	0.00	0.00	0.00
Turf grass (golf)	530	380	0.76	0.38	1.14
Turf grass (other)	146	146	0.24	0.00	0.24
Misc. Agricultural					
Livestock	0	0	1.38	0.00	1.38
Fish farming	0	0	0.00	0.00	0.00
Totals	44,241	749	2.56	0.38	2.94

Sprinkler Acreage	636
Low Pressure Acreage	3
Flood Acreage	110
Total Irrigated Acreage	749

DUVAL COUNTY

Total Population 681,631
Total Land Area 840 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	681,631	Total area	537,600 (840 mi^2)
Public supply	630,195	Farmed	16,442
Self-supplied	51,436	Irrigated	2,965
Per capita	147		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	92.55	0.00	92.55	0.00
Domestic self-supply	7.56	0.00	7.56	0.00
Com/ind. self-supply	35.69	0.00	35.69	43.69
Agricultural irr.	6.84	0.90	7.74	0.00
Power generation s-s	4.77	0.00	4.77	483.76
Miscellaneous	1.30	0.00	1.30	0.00
Totals	148.71	0.90	149.61	527.45
Total Ground	148.71			
Total Surface	528.35			
County Total	677.06			

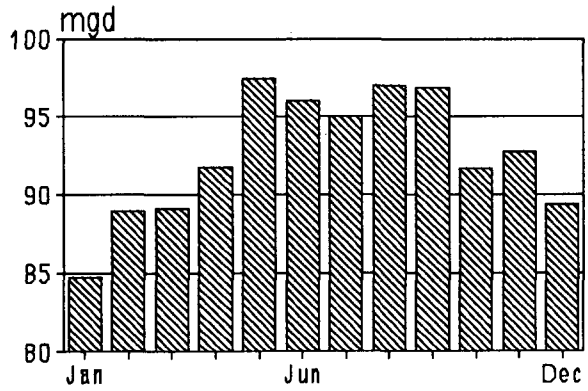


Figure A13. Duval County monthly public supply water use, 1991.

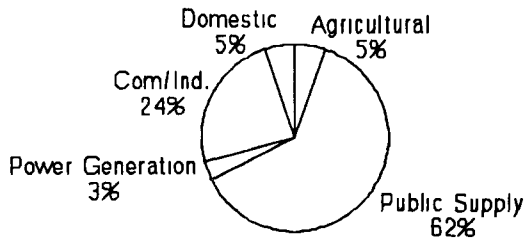


Figure A14. Duval County—percentages, by category, of freshwater use, 1991. Miscellaneous water use accounted for less than 1%.

1991 WATER USERS IN DUVAL COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Atlantic Beach - City of	Public supply	14,186	2.83	Floridan aquifer	0.00	
Baldwin - City of	Public supply	1,481	0.19	Floridan aquifer	0.00	
Beauclerc Utilities	Public supply	7,210	0.59	Floridan aquifer	0.00	
Canal Utilities	Public supply	8,070	1.73	Floridan aquifer	0.00	
Duval Utility Co.	Public supply	250	0.05	Floridan aquifer	0.00	
Harbor View S/D	Public supply	2,100	0.16	Floridan aquifer	0.00	
Jacksonville Beach - City of	Public supply	18,588	2.32	Floridan aquifer	0.00	
Jacksonville - City of	Public supply	447,200	67.74	Floridan aquifer	0.00	
Jacksonville Suburban Utilities	Public supply	79,170	9.74	Floridan aquifer	0.00	
Lamplighter MHP	Public supply	888	0.13	Floridan aquifer	0.00	
Londontowne Apartments	Public supply	1,125	0.16	Floridan aquifer	0.00	
Neighborhood Utilities	Public supply	543	0.04	Floridan aquifer	0.00	
Neptune Beach - City of	Public supply	6,956	1.17	Floridan aquifer	0.00	
Normandy Estates MHP	Public supply	500	0.12	Floridan aquifer	0.00	
Normandy Village Utilities	Public supply	3,246	0.47	Floridan aquifer	0.00	
Oaks of Atlantic Beach	Public supply	825	0.10	Floridan aquifer	0.00	
Ortega Utilities	Public supply	4,423	0.98	Floridan aquifer	0.00	
Regency Utilities	Public supply	4,900	0.79	Floridan aquifer	0.00	
Springtree (Shadowrock Util.)	Public supply	1,250	0.20	Floridan aquifer	0.00	
Southern Gulf Utilities	Public supply	2,900	0.21	Floridan aquifer	0.00	
Southern States Utilities	Public supply	15,664	1.81	Floridan aquifer	0.00	
Southside Utilities	Public supply	8,720	1.02	Floridan aquifer	0.00	
Total Public Supply		630,195	92.55		0.00	
Castleton Beverage Co.	Industrial		0.09	Floridan aquifer	0.00	
Celotex Gypsum Co.	Industrial		0.12	Floridan aquifer	0.00	
Florida Wire & Cable co.	Industrial		0.02	Floridan aquifer	0.00	
Seminole Kraft Paper Co.	Industrial*		17.09	Floridan aquifer	41.39	St. Johns River**
Jacksonville Port Authority	Industrial		0.06	Floridan aquifer	0.00	
Jacksonville Shipyard	Industrial		0.20	Floridan aquifer	2.30	St. Johns River**

1991 WATER USERS—*Continued*

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Jefferson-Smurfit Inc. (Alton)	Industrial*		7.21	Floridan aquifer	0.00	
Reichold Chemical Co.	Industrial		0.19	Floridan aquifer	0.00	
SCM Organic Chemical Co.	Industrial		1.95	Floridan aquifer	0.00	
Simplex Man. Co.	Industrial		0.06	Floridan aquifer	0.00	
Swisher & Son Man. Co.	Industrial		0.07	Floridan aquifer	0.00	
Union Camp, Inc.	Industrial		2.84	Floridan aquifer	0.00	
U.S. Gypsum	Industrial		0.65	Floridan aquifer	0.00	
Cecil Field NAS	Institutional		0.61	Floridan aquifer	0.00	
Duval Correctional Fac.	Institutional		0.01	Floridan aquifer	0.00	
Florida DOT - I-10 rest fac.	Institutional		0.01	Floridan aquifer	0.00	
Jacksonville Int. Airport	Institutional		0.20	Floridan aquifer	0.00	
Jacksonville NAS	Institutional		1.21	Floridan aquifer	0.00	
Jacksonville University	Institutional		0.45	Floridan aquifer	0.00	
Jacksonville Zoo	Institutional		0.81	Floridan aquifer	0.00	
Mayport NAS	Institutional		1.84	Floridan aquifer	0.00	
Total Com/ind.			35.69		43.69	
Jacksonville Electric Authority	Power generation		1.47	Floridan aquifer	439.34	St. Johns River**
SJR Power Park (Eastport)	Power generation		3.29	Floridan aquifer	44.42	St. Johns River**
Total Power Generation			4.77		483.76	

*Pulp and paper industry
**Saline water

DUVAL COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	200	10	0.00	0.00	0.00
Fruit Crops					
Blueberries	18	13	0.02	0.00	0.02
Citrus	0	0	0.00	0.00	0.00
Grapes	10	7	0.01	0.00	0.01
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	200	0	0.00	0.00	0.00
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	200	200	0.14	0.00	0.14
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	12	12	0.01	0.00	0.01
Woody ornamentals	60	60	0.31	0.00	0.31
Improved pasture	12,000	500	0.21	0.00	0.21
Sod	600	600	0.38	0.07	0.45
Turf grass (golf)	2,992	1,413	3.41	0.83	4.24
Turf grass (other)	150	150	0.21	0.00	0.21
Misc. Agricultural					
Livestock	0	0	0.64	0.00	0.64
Fish farming	0	0	1.50	0.00	1.50
Totals	16,442	2,965	6.84	0.90	7.74

Sprinkler Acreage	2,891
Low Pressure Acreage	34
Flood Acreage	40
Total Irrigated Acreage	2,965

FLAGLER COUNTY

Total Population 30,465
Total Land Area 504 mi²

St. Johns River Water Management District

Population	
Total	30,465
Public supply	19,423
Self-supplied	11,042
Per capita	195

Land Area (acres)	
Total area	322,560 (504 mi²)
Farmed	24,420
Irrigated	6,985

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	3.79	0.00	3.79	0.00
Domestic self-supply	2.15	0.00	2.15	0.00
Com/ind. self-supply	0.16	0.00	0.16	0.00
Agricultural irr.	5.29	1.08	6.37	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Totals	11.39	1.08	12.47	0.00
Total Ground	11.39			
Total Surface	1.08			
County Total	12.47			

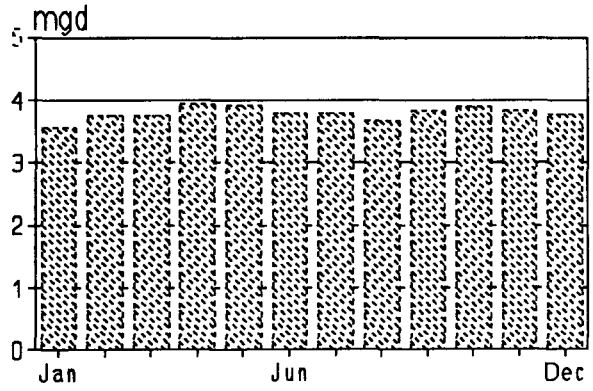


Figure A15. Flagler County monthly public supply water use, 1991

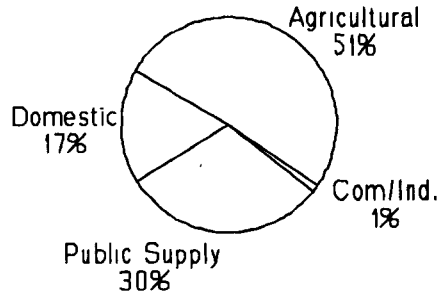


Figure A16. Flagler County—percentages, by category, of freshwater use, 1991

1991 Water Users in Flagler County

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Beverly Beach Utility	Public supply	314	0.03	Floridan aquifer	0.00	
Bunnell - City of	Public supply	1,873	0.34	Floridan aquifer	0.00	
Flagler Beach - City of	Public supply	3,912	0.50	Floridan aquifer	0.00	
Palm Coast Utilities	Public supply	13,000	2.87	Floridan aquifer	0.00	
Plantation Bay	Public supply	324	0.05	Floridan aquifer	0.00	
Total Public Supply		19,423	3.79		0.00	
Rinker Cement	Industrial		0.03	Floridan aquifer	0.00	
Bulow KOA	Institutional		0.07	Floridan aquifer	0.00	
Holiday Travel Park	Institutional		0.01	Floridan aquifer	0.00	
Marineland	Institutional		0.05	Floridan aquifer	0.00	
Total Com/Ind.			0.16		0.00	

FLAGLER COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	2,000	2,000	1.82	0.00	1.82
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	2,200	2,200	2.04	0.00	2.04
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	1,000	1,000	0.14	0.00	0.14
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	0	0	0.00	0.00	0.00
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	100	100	0.03	0.00	0.03
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	400	400	0.40	0.00	0.40
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	1,500	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	0	0	0.00	0.00	0.00
Woody ornamentals	5	5	0.03	0.00	0.03
Improved pasture	16,580	695	0.52	0.00	0.52
Sod	200	150	0.16	0.00	0.16
Turf grass (golf)	362	362	0.13	0.96	1.09
Turf grass (other)	73	73	0.01	0.12	0.13
Misc. Agricultural					
Livestock	0	0	0.01	0.00	0.01
Fish farming	0	0	0.00	0.00	0.00
Totals	24,420	6,985	5.29	1.08	6.37

Sprinkler Acreage	1,485
Low Pressure Acreage	0
Flood Acreage	5,500
Total Irrigated Acreage	6,985

INDIAN RIVER COUNTY

Total Population 92,429
Total Land Area 549 mi^2

St. Johns River Water Management District

Population	
Total	92,429
Public supply	56,553
Self-supplied	35,876
Per capita	204

Land Area (acres)	
Total area	351,360 (549 mi^2)
Farmed	136,680
Irrigated	96,308

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply (1)	11.51	0.00	11.51	0.00
Domestic self-supply	7.32	0.00	7.32	0.00
Com/ind. self-supply	0.29	0.00	0.29	0.00
Agricultural irr.	42.92	98.52	141.44	0.00
Power generation s-s	0.08	0.00	0.08	137.97
Miscellaneous	5.70	0.00	5.70	0.00
Totals	67.82	98.52	166.34	137.97
Total Ground	67.82			
Total Surface	236.49			
County Total	304.31			

(1) Includes 4.06 mgd of slightly saline water withdrawn for public supply (250 to 1,000 mg/L chlorides), of which 2.98 mgd is treated through reverse osmosis and 1.08 mgd is diluted with fresh water.

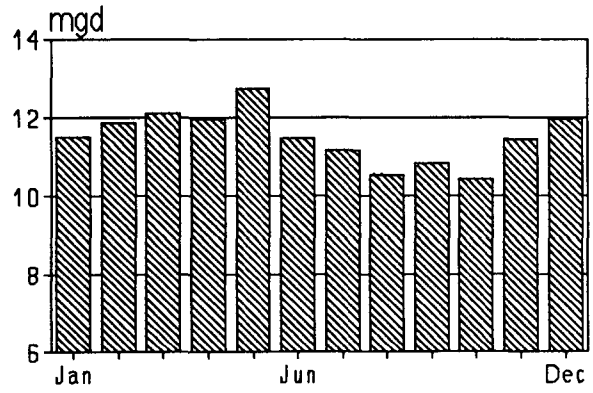


Figure A17. Indian River County monthly public supply water use, 1991

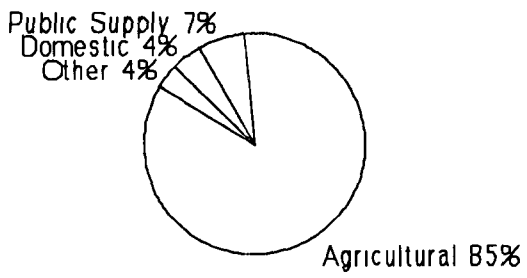


Figure A18. Indian River County—percentages, by category, of freshwater use, 1991. *Other* includes power generation, commercial/industrial, and miscellaneous water use.

1991 WATER USERS IN INDIAN RIVER COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Aspen/Whispering Palms MHP	Public supply	1,000	0.04	Floridan aquifer and reverse osmosis (R/O)	0.00	
GDU - Sebastian Highlands	Public supply	2,656	0.29	Floridan aquifer	0.00	
Heritage Village	Public supply	800	0.05	Floridan aquifer and R/O	0.00	
Heron Cay	Public supply	588	0.04	Floridan aquifer and R/O	0.00	
Indian River County Utilities	Public supply	20,335	2.47	Floridan aquifer and R/O	0.00	
Lakewood Village	Public supply	531	0.05	Surficial aquifer	0.00	
Marsh Island Utilities	Public supply	325	0.01	Floridan aquifer and R/O	0.00	
North Beach Utilities	Public supply	1,705	0.28	Floridan aquifer and R/O	0.00	
Pelican Pointe Utilities	Public supply	325	0.02	Floridan aquifer	0.00	
Vero Beach - City of	Public supply	26,856	8.17	Surficial and Floridan aquifers	0.00	
Village Green W/S	Public supply	1,432	0.09	Floridan aquifer and R/O	0.00	
Total Public Supply		56,553	11.51		0.00	
Fellsmere Packing House	Industrial		0.03	Surficial aquifer	0.00	
Hercules Inc.	Industrial		0.07	Surficial aquifer	0.00	
Ocean Spray processing plant	Industrial		0.13	Surficial and Floridan aquifers	0.00	
Indian River Correctional Fac.	Institutional		0.03	Surficial aquifer	0.00	
Sebastian Medical Center	Institutional		0.03	Surficial aquifer	0.00	
Total Com/ind.			0.29		0.00	
Vero Beach mun. power plant	Power generation		0.08	Floridan aquifer	137.97	Indian River*
Total Power Generation			0.08		137.97	

*Saline water

INDIAN RIVER COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	150	150	0.11	0.00	0.11
Carrots	50	50	0.08	0.00	0.08
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	100	100	0.06	0.00	0.06
Tomatoes	10	10	0.01	0.00	0.01
Sweet corn	700	700	0.72	0.72	1.43
Watercress	150	150	0.35	0.00	0.35
Misc. vegetables	2,020	2,020	0.64	0.64	1.27
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	65,446	65,446	27.28	81.84	109.12
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	20	20	0.02	0.00	0.02
Watermelons	100	50	0.03	0.00	0.03
Misc. fruit	100	100	0.37	0.00	0.37
Field Crops					
Field corn	2,500	2,000	0.00	3.26	3.26
Peanuts	0	0	0.00	0.00	0.00
Rice	50	50	0.08	0.00	0.08
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	300	300	0.09	0.09	0.18
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	25	25	0.03	0.00	0.03
Woody ornamentals	60	60	0.00	0.31	0.31
Improved pasture	62,208	22,747	9.73	9.73	19.46
Sod	1,000	1,000	0.45	0.68	1.13
Turf grass (golf)	1,637	1,276	2.57	1.26	3.83
Turf grass (other)	54	54	0.08	0.01	0.09
Misc. Agricultural					
Livestock	0	0	0.22	0.00	0.22
Fish farming	0	0	0.00	0.00	0.00
Totals	136,680	96,308	42.92	98.52	141.44

Sprinkler Acreage	2,040
Low Pressure Acreage	26,723
Flood Acreage	67,545
Total Irrigated Acreage	96,308

LAKE COUNTY

Total Population 157,061
Total Land Area 1,163 mi²

St. Johns River Water Management District

Population		Land Area (acres)	
Total	155,490	Total area	677,760 (1,059 mi²)
Public supply	107,909	Farmed	83,582
Self-supplied	47,581	Irrigated	32,046
Per capita	178		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	19.19	0.00	19.19	0.00
Domestic self-supply	8.47	0.00	8.47	0.00
Com/ind. self-supply	8.66	0.64	9.30	0.00
Agricultural irr.	59.45	16.01	75.46	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.86	0.00	0.86	0.00
Totals	96.63	16.65	113.28	0.00

Total Ground	96.63
Total Surface	16.65
County Total	113.28

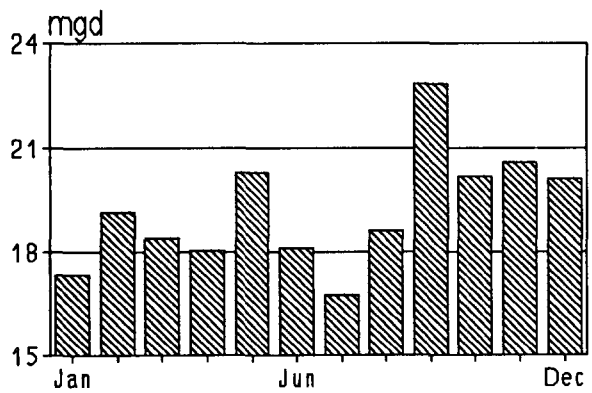


Figure A19. Lake County monthly public supply water use, 1991

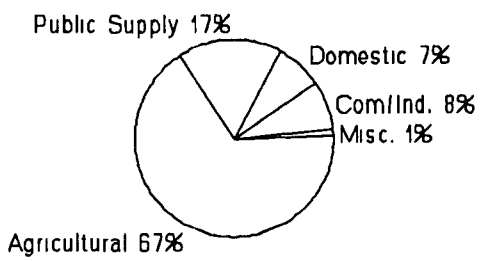


Figure A20. Lake County—percentages, by category, of freshwater use, 1991

1991 WATER USERS IN LAKE COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Astor/Astor Park Water Assoc.	Public supply	3,000	0.27	Floridan aquifer	0.00	
Brittany Estates	Public supply	337	0.06	Floridan aquifer	0.00	
Clermont - City of	Public supply	6,930	1.50	Floridan aquifer	0.00	
Deanza - Mid Florida Lakes	Public supply	2,686	0.42	Floridan aquifer	0.00	
Eustis - City of	Public supply	18,455	2.50	Floridan aquifer	0.00	
Fruitland Park - City of	Public supply	2,805	0.39	Floridan aquifer	0.00	
Groveland - City of	Public supply	2,316	0.27	Floridan aquifer	0.00	
Hawthorne S/D	Public supply	2,742	0.46	Floridan aquifer	0.00	
Howey-in-the-Hills - Town of	Public supply	724	0.21	Floridan aquifer	0.00	
Lady Lake	Public supply	3,325	0.25	Floridan aquifer	0.00	
Lakeview Terrace Center	Public supply	300	0.04	Floridan aquifer	0.00	
Leesburg - City of	Public supply	19,434	3.85	Floridan aquifer	0.00	
Mascotte - Town of	Public supply	1,811	0.18	Floridan aquifer	0.00	
Minneola - City of	Public supply	1,588	0.28	Floridan aquifer	0.00	
Milakai Park water system	Public supply	629	0.03	Floridan aquifer	0.00	
Montverde - Town of	Public supply	930	0.12	Floridan aquifer	0.00	
Mount Dora - City of	Public supply	12,304	2.49	Floridan aquifer	0.00	
Orange Blossom Gardens MHP	Public supply	9,716	2.31	Floridan aquifer	0.00	
Silver Lake Estates[a]	Public supply	2,193	0.85	Floridan aquifer	0.00	
South Umatilla W.A.	Public supply	375	0.04	Floridan aquifer	0.00	
Southern States Utilities	Public supply	2,728	0.22	Floridan aquifer	0.00	
Sunlake Estates	Public supply	1,000	0.34	Floridan aquifer	0.00	
Tavares - City of	Public supply	7,498	1.28	Floridan aquifer	0.00	
Umatilla - City of	Public supply	2,342	0.44	Floridan aquifer	0.00	
Utilities Inc. of Florida	Public supply	470	0.14	Floridan aquifer	0.00	
Water Oak Estates	Public supply	1,271	0.26	Floridan aquifer	0.00	
Total Public Supply		107,909	19.19		0.00	
B & W Canning - Groveland plant	Industrial		0.05	Floridan aquifer	0.00	
Coca Cola - Leesburg plant	Industrial		1.59	Floridan aquifer	0.00	
Eustis Sand Co.	Industrial*		0.19	Floridan aquifer	0.64	Unknown
Florida Crushed Stone - Tulley[b]	Industrial*		2.19	Floridan aquifer	0.00	

1991 WATER USERS—*Continued*

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Florida Rock - Lake Co. mine[c]	Industrial*		0.00	Floridan aquifer	0.00	
Golden Gem - Umatilla plant	Industrial		2.88	Floridan aquifer	0.00	
Silver Sand Co. - Clermont mine	Industrial*		1.06	Floridan aquifer	0.00	
Silver Springs citrus plant	Industrial		0.57	Floridan aquifer	0.00	
Sundor Brands Proc. Co.	Industrial		0.02	Floridan aquifer	0.00	
Lake County Util. (Sunshine Park)	Commercial		0.04	Floridan aquifer	0.00	
Groveland Academy	Institutional		0.01	Floridan aquifer	0.00	
Lake Correction Fac.	Institutional		0.06	Floridan aquifer	0.00	
Total Com/Ind.			8.66		0.64	

[a]Silver Lake Estates operated by Southern States Utilities
[b]Data estimated using 1990 values
[c]Florida Rock only uses water to prime the lines of the plant water system
*Mining industry

LAKE COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	150	150	0.08	0.08	0.16
Carrots	2,000	2,000	2.50	2.50	4.99
Cucumbers	60	60	0.03	0.03	0.05
Peppers	25	25	0.02	0.00	0.02
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	5,000	5,000	7.24	4.82	12.06
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	1,250	1,250	0.40	0.27	0.67
Fruit Crops					
Blueberries	61	61	0.16	0.00	0.16
Citrus	18,604	17,674	37.67	5.64	43.31
Grapes	54	54	0.02	0.00	0.02
Peaches	7	7	0.02	0.00	0.02
Pecans	80	80	0.18	0.00	0.18
Strawberries	5	5	0.01	0.00	0.01
Watermelons	400	380	0.27	0.00	0.27
Misc. fruit	25	25	0.07	0.03	0.10
Field Crops					
Field corn	2,000	500	0.38	0.38	0.75
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	300	150	0.10	0.08	0.18
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	550	550	1.40	0.16	1.56
Flowers and foliage	100	100	0.23	0.00	0.23
Woody ornamentals	950	950	4.69	0.25	4.94
Improved pasture	50,000	1,886	1.88	0.08	1.96
Sod	250	250	0.09	0.61	0.70
Turf grass (golf)	1,591	769	1.27	1.04	2.31
Turf grass (other)	120	120	0.30	0.06	0.36
Misc. Agricultural					
Livestock	0	0	0.45	0.00	0.45
Fish farming	0	0	0.00	0.00	0.00
Totals	83,582	32,046	59.45	16.01	75.46

Sprinkler Acreage	7,907
Low Pressure Acreage	15,789
Flood Acreage	8,350
Total Irrigated Acreage	32,046

MARION COUNTY

Total Population 200,314
Total Land Area 1,652 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	156,888	Total area	764,160 (1,194 mi^2)
Public supply	70,835	Farmed	72,544
Self-supplied	86,053	Irrigated	5,668
Per capita	151		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	10.71	0.00	10.71	0.00
Domestic self-supply	12.99	0.00	12.99	0.00
Com/ind. self-supply	1.51	0.00	1.51	0.00
Agricultural irr.	5.44	1.14	6.58	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	1.30	0.00	1.30	0.00
Totals	31.95	1.14	33.09	0.00

Total Ground	31.95
Total Surface	1.14
County Total	33.09

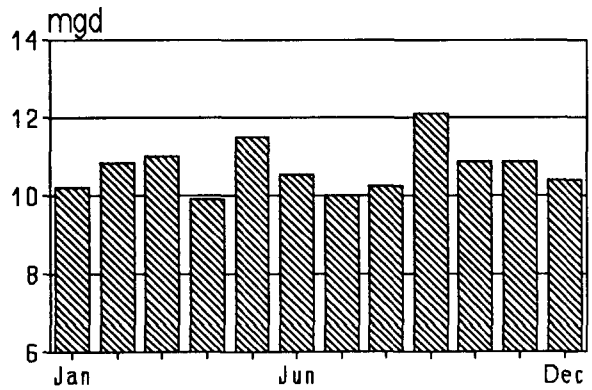


Figure A21. Marion County monthly public supply water use, 1991

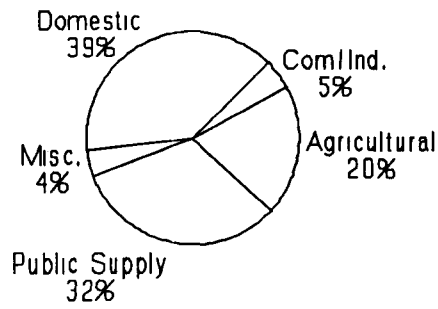


Figure A22. Marion County—percentages, by category, of freshwater use, 1991

1991 WATER USERS IN MARION COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Belleview - City of	Public supply	4,860	0.56	Floridan aquifer	0.00	
GDU - Silver Springs Shores	Public supply	10,986	1.01	Floridan aquifer	0.00	
Maco Development Co.	Public supply	751	0.11	Floridan aquifer	0.00	
Marion Utilities	Public supply	3,295	0.37	Floridan aquifer	0.00	
McIntosh - City of	Public supply	404	0.08	Floridan aquifer	0.00	
Ocala - City of	Public supply	41,918	7.52	Floridan aquifer	0.00	
Ocala East Villas	Public supply	547	0.10	Floridan aquifer	0.00	
Ocala Oaks Utilities	Public supply	2,048	0.23	Floridan aquifer	0.00	
Sunshine Utilities	Public supply	3,769	0.47	Floridan aquifer	0.00	
Southern States Utilities	Public supply	1,166	0.15	Floridan aquifer	0.00	
Tradewinds Utilities	Public supply	850	0.08	Floridan aquifer	0.00	
Woods & Lakes	Public supply	241	0.03	Floridan aquifer	0.00	
Total Public Supply		70,835	10.71		0.00	
Certified Grocers Inc.	Industrial		0.03	Floridan aquifer	0.00	
Florida Rock - Marion mine	Industrial*		0.73	Floridan aquifer	0.00	
Golden Flake Inc - Ocala plant	Industrial		0.07	Floridan aquifer	0.00	
HCA - Grant Center Hospital	Institutional		0.01	Floridan aquifer	0.00	
Marion Correctional Fac.	Institutional		0.21	Floridan aquifer	0.00	
Ocala Jai-Alai	Institutional		0.01	Floridan aquifer	0.00	
Sierra Beach Motel	Institutional		0.01	Floridan aquifer	0.00	
Silver Springs Inc.	Institutional		0.44	Floridan aquifer	0.00	
Total Com/ind.			1.51		0.00	

*Mining industry

MARION COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	70	70	0.04	0.00	0.04
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	5	5	0.01	0.00	0.01
Sweet corn	10	10	0.01	0.00	0.01
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	1,700	940	0.14	0.00	0.14
Fruit Crops					
Blueberries	10	10	0.02	0.00	0.02
Citrus	700	300	0.57	0.04	0.61
Grapes	20	20	0.04	0.00	0.04
Peaches	10	10	0.02	0.00	0.02
Pecans	10	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	1,450	1,450	0.58	0.00	0.58
Misc. fruit	200	100	0.33	0.00	0.33
Field Crops					
Field corn	3,000	350	0.21	0.16	0.37
Peanuts	2,000	134	0.20	0.00	0.20
Rice	0	0	0.00	0.00	0.00
Sorghum	300	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	1,500	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	20	20	0.06	0.00	0.06
Flowers and foliage	14	14	0.03	0.00	0.03
Woody ornamentals	52	52	0.22	0.05	0.27
Improved pasture	59,230	940	0.39	0.27	0.66
Sod	660	660	0.98	0.00	0.98
Turf grass (golf)	1,500	500	0.87	0.63	1.50
Turf grass (other)	83	83	0.20	0.00	0.20
Misc. Agricultural					
Livestock	0	0	0.51	0.00	0.51
Fish farming	0	0	0.00	0.00	0.00
Totals	72,544	5,668	5.44	1.14	6.58

Sprinkler Acreage	5,668
Low Pressure Acreage	0
Flood Acreage	0
Total Irrigated Acreage	5,668

NASSAU COUNTY

Total Population 44,957
Total Land Area 671 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	44,957	Total area	429,440 (671 mi^2)
Public supply	22,727	Farmed	7,406
Self-supplied	22,230	Irrigated	770
Per capita	178		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	4.04	0.00	4.04	0.00
Domestic self-supply	3.96	0.00	3.96	0.00
Com/ind. self-supply	32.71	0.00	32.71	1.40
Agricultural irr.	2.34	0.23	2.57	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.32	0.00	0.32	0.00
Totals	43.37	0.23	43.60	1.40
Total Ground	43.37			
Total Surface	1.63			
County Total	45.00			

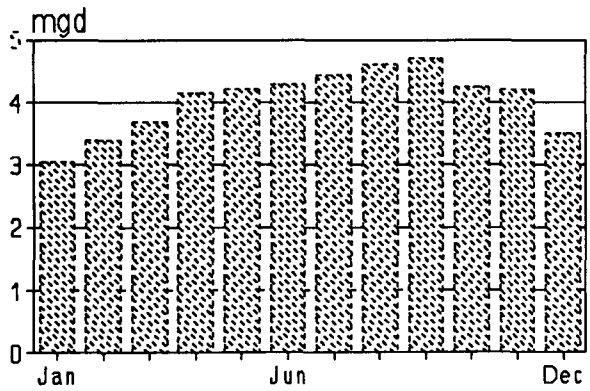


Figure A23. Nassau County monthly public supply water use, 1991

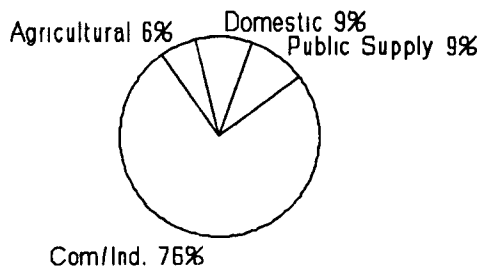


Figure A24. Nassau County—percentages, by category, of freshwater use, 1991. Miscellaneous water use is less than 1%.

1991 WATER USERS IN NASSAU COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Callahan - Town of	Public supply	1,298	0.16	Floridan aquifer	0.00	
Eastwood Oaks	Public supply	365	0.03	Floridan aquifer	0.00	
Fernandina Beach - City of	Public supply	13,281	2.77	Floridan aquifer	0.00	
Hilliard - Town of	Public supply	2,080	0.22	Floridan aquifer	0.00	
Marsh Cove Apt.	Public supply	267	0.03	Floridan aquifer	0.00	
Southern States Util. (Amelia Is.)	Public supply	5,436	0.83	Floridan aquifer	0.00	
Total Public Supply		22,727	4.04		0.00	
Container Corp. of America	Industrial*		14.65	Floridan aquifer	0.00	
ITT Rayonier Inc.	Industrial*		17.98	Floridan aquifer	1.40	Amelia River**
Terminal Paper Co.	Industrial*		0.03	Floridan aquifer	0.00	
Florida DOT - I-95 Welcome Center	Institutional		0.03	Floridan aquifer	0.00	
Nassau Correctional Fac.	Institutional		0.02	Floridan aquifer	0.00	
Total Com/ind.			32.71		0.00	

*Pulp and paper industry
**Saline water

NASSAU COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	100	50	0.01	0.00	0.01
Fruit Crops					
Blueberries	30	15	0.02	0.00	0.02
Citrus	0	0	0.00	0.00	0.00
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	500	50	0.04	0.00	0.04
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	1,000	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	40	40	0.02	0.00	0.02
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	20	20	0.03	0.00	0.03
Woody ornamentals	3	0	0.00	0.00	0.00
Improved pasture	5,000	0	0.00	0.00	0.00
Sod	0	0	0.00	0.00	0.00
Turf grass (golf)	645	565	1.47	0.23	1.70
Turf grass (other)	68	30	0.06	0.00	0.06
Misc. Agricultural					
Livestock	0	0	0.67	0.00	0.67
Fish farming	0	0	0.02	0.00	0.02
Totals	7,406	770	2.34	0.23	2.57

Sprinkler Acreage	770
Low Pressure Acreage	0
Flood Acreage	0
Total Irrigated Acreage	770

OKEECHOBEE COUNTY

St. Johns River Water Management District

Total Population 30,166
Total Land Area 780 mi^2

Population	
Total	453
Public supply	0
Self-supplied	453
Per capita (1)	153

Land Area (acres)	
Total area	65,920 (103 mi^2)
Farmed	24,468
Irrigated	7,250

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	0.00	0.00	0.00	0.00
Domestic self-supply	0.07	0.00	0.07	0.00
Com/ind. self-supply	0.10	0.00	0.10	0.00
Agricultural irr.	9.86	0.00	9.86	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Totals	10.03	0.00	10.03	0.00

Total Ground	10.03
Total Surface	0.00
County Total	10.03

(1) Used SJRWMD average per capita.

1991 WATER USERS IN OKEECHOBEE COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Florida DOT - Ft. Drum Plaza	Institutional		0.10	Floridan aquifer	0.00	

OKEECHOBEE COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	0	0	0.00	0.00	0.00
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	4,468	4,468	5.34	0.00	5.34
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	0	0	0.00	0.00	0.00
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	0	0	0.00	0.00	0.00
Woody ornamentals	0	0	0.00	0.00	0.00
Improved pasture	20,000	2,782	3.59	0.00	3.59
Sod	0	0	0.00	0.00	0.00
Turf grass (golf)	0	0	0.00	0.00	0.00
Turf grass (other)	0	0	0.00	0.00	0.00
Misc. Agricultural					
Livestock	0	0	0.75	0.00	0.75
Fish farming	0	0	0.18	0.00	0.18
Totals	24,468	7,250	9.86	0.00	9.86

Sprinkler Acreage	0
Low Pressure Acreage	4,468
Flood Acreage	2,782
Total Irrigated Acreage	7,250

ORANGE COUNTY

St. Johns River Water Management District

Total Population 701,292
Total Land Area 1,003 mi^2

Population		Land Area (acres)	
Total	561,034	Total area	476,160 (744 mi^2)
Public supply	476,135	Farmed	69,714
Self-supplied	84,899	Irrigated	47,958
Per capita	195		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply (1)	92.91	0.00	92.91	0.00
Domestic self-supply (2)	12.99	0.00	12.99	0.00
Com/ind. self-supply	3.46	0.00	3.46	0.00
Agricultural irr.	19.95	49.89	69.84	0.00
Power generation s-s	0.33	0.00	0.33	0.00
Miscellaneous	2.92	0.00	2.92	0.00
Totals	132.56	49.89	182.45	0.00
Total Ground	132.56			
Total Surface	49.89			
County Total	182.45			

(1) Does not include 22.46 mgd of water withdrawn in Orange County for public supply use in Brevard County.
(2) Domestic self-supplied water use estimated at 153 mgd, SJRWMD average per capita (Rick Coleman, OUC, pers. com. 1/6/94).

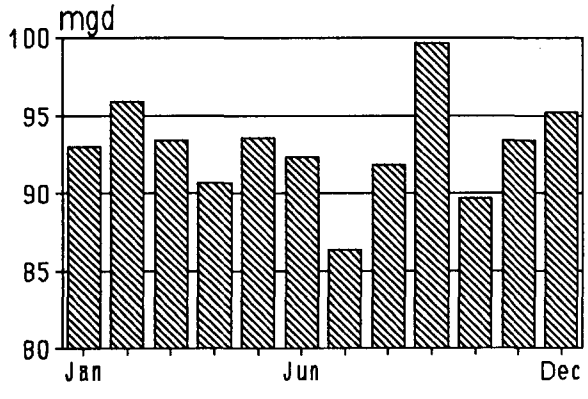


Figure A25. Orange County monthly public supply water use, 1991

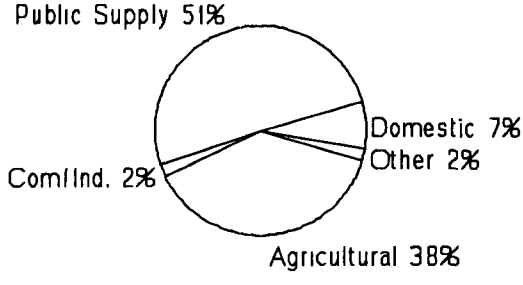


Figure A26. Orange County—percentages, by category, of freshwater use, 1991. *Other* includes power generation and miscellaneous water use.

1991 WATER USERS IN ORANGE COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Apopka - City of	Public supply	24,300	5.02	Floridan aquifer	0.00	
Eatonville - Town of	Public supply	2,208	0.66	Floridan aquifer	0.00	
Econ Utilities - Wedgefield	Public supply	1,344	0.15	Floridan aquifer	0.00	
Maitland - City of	Public supply	9,104	2.75	Floridan aquifer	0.00	
Oakland - Town of	Public supply	707	0.11	Floridan aquifer	0.00	
Ocoee - City of	Public supply	14,220	2.67	Floridan aquifer	0.00	
SJRWMD portion of Orange County Public Utilities[a]	Public supply	79,527	17.07	Floridan aquifer	0.00	
SJRWMD portion of Orlando Utilities Commission[b]	Public supply	242,774	47.72	Floridan aquifer	0.00	
Rock Springs MHP	Public supply	1,275	0.21	Floridan aquifer	0.00	
Shadowhills MHP	Public supply	1,709	0.20	Floridan aquifer		
Southern States Utilities	Public supply	6,808	0.95	Floridan aquifer	0.00	
Starlight Ranch MHP	Public supply	1,560	0.13	Floridan aquifer	0.00	
Tangerine - Town of	Public supply	525	0.12	Floridan aquifer	0.00	
Utilities Inc. of Florida	Public supply	803	0.09	Floridan aquifer	0.00	
Winter Garden - City of	Public supply	13,176	1.71	Floridan aquifer	0.00	
Winter Park - City of	Public supply	72,785	12.33	Floridan aquifer	0.00	
Zellwood Station Utilities	Public supply	2,410	0.71	Floridan aquifer	0.00	
Zellwood Water Assoc.	Public supply	900	0.30	Floridan aquifer	0.00	
Total Public Supply		476,135	92.91[c]		0.00	
Coca Cola - Plymouth plant	Industrial		0.11	Floridan aquifer	0.00	
Lust & Long Precooler Co.	Industrial		0.08	Floridan aquifer	0.00	
Ralston Purina - Zellwood Farms	Industrial		0.17	Floridan aquifer	0.00	
Winter Garden citrus plant	Industrial		2.29	Floridan aquifer	0.00	
Sun Resort Inc.	Institutional		0.13	Floridan aquifer	0.00	
University of Central Florida	Institutional		0.68	Floridan aquifer	0.00	
Total Com/Ind.			3.46		0.00	

1991 WATER USERS—*Continued*

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
OUC - Stanton plant	Power generation		0.33	Floridan aquifer	3.39	Retention pond[d]
Total Power Generation			0.33		3.39	

[a]Water also used in South Florida Water Management District. Total public supply population served by OCPU: 98,181; total amount of ground water used: 25.77 mgd.
[b]Water also used in South Florida Water Management District. Total public supply population served by OUC: 334,860; total amount of ground water used: 71.43 mgd. Population-served estimates from R. Coleman, OUC (pers. com. 1/6/94).
[c]Does not include the water withdrawn (22.46 mgd) for public supply use in Brevard County.
[d]Wastewater treatment plant discharge supplies retention pond with water. This surface water is considered reuse and is not included in overall totals.

ORANGE COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	1,200	800	0.94	0.00	0.94
Carrots	13,500	11,600	2.58	23.21	25.79
Cucumbers	1,020	1,020	0.56	0.00	0.56
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	75	75	0.10	0.00	0.10
Sweet corn	13,600	13,300	2.18	19.58	21.75
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	14,100	14,100	0.57	5.10	5.67
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	3,596	3,596	5.37	0.59	5.96
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.000
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	150	150	0.08	0.00	0.08
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	200	200	0.18	0.00	0.18
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	200	200	0.09	0.09	0.18
Soybeans	200	200	0.10	0.10	0.19
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	40	40	0.11	0.00	0.11
Flowers and foliage	581	581	0.71	0.18	0.89
Woody ornamentals	576	576	2.70	0.30	3.00
Improved pasture	18,562	0	0.00	0.00	0.00
Sod	200	200	0.17	0.19	0.35
Turf grass (golf)	1,533	939	2.37	0.45	2.82
Turf grass (other)	381	381	0.67	0.11	0.78
Misc. Agricultural					
Livestock	0	0	0.37	0.00	0.37
Fish farming	0	0	0.12	0.00	0.12
Totals	69,714	47,958	19.95	49.89	69.84

Sprinkler Acreage	4,625
Low Pressure Acreage	1,913
Flood Acreage	41,420
Total Irrigated Acreage	47,958

OSCEOLA COUNTY

Total Population 114,411
Total Land Area 1,467 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	2,574	Total area	346,880 (542 mi^2)
Public supply	0	Farmed	126,800
Self-supplied	2,574	Irrigated	12,180
Per capita (1)	153		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	0.00	0.00	0.00	0.00
Domestic self-supply	0.39	0.00	0.39	0.00
Com/ind. self-supply	0.00	0.00	0.00	0.00
Agricultural irr.	6.90	9.70	16.60	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.11	0.00	0.11	0.00
Totals	7.40	9.70	17.10	0.00

Total Ground	7.40
Total Surface	9.70
County Total	17.10

(1) Used SJRWMD average per capita.

OSCEOLA COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	0	0	0.00	0.00	0.00
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	1,000	1,000	2.32	0.00	2.32
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	0	0	0.00	0.00	0.00
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	0	0	0.00	0.00	0.00
Woody ornamentals	0	0	0.00	0.00	0.00
Improved pasture	125,800	11,180	2.73	9.70	12.43
Sod	0	0	0.00	0.00	0.00
Turf grass (golf)	0	0	0.00	0.00	0.00
Turf grass (other)	0	0	0.00	0.00	0.00
Misc. Agricultural					
Livestock	0	0	1.85	0.00	1.85
Fish farming	0	0	0.00	0.00	0.00
Totals	126,800	12,180	6.90	9.70	16.60

Sprinkler Acreage	100
Low Pressure Acreage	180
Flood Acreage	11,900
Total Irrigated Acreage	12,180

POLK COUNTY

Total Population 414,700
Total Land Area 2,048 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	4,147	Total area	40,320 (63 mi^2)
Public supply	1,128	Farmed	7,727
Self-supplied	3,019	Irrigated	2,827
Per capita	168		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	0.19	0.00	0.19	0.00
Domestic self-supply	0.51	0.00	0.51	0.00
Com/ind. self-supply	0.21	0.00	0.21	0.00
Agricultural irr.	5.30	0.56	5.86	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	0.00	0.00	0.00	0.00
Totals	6.21	0.56	6.77	0.00

Total Ground	6.21
Total Surface	0.56
County Total	6.77

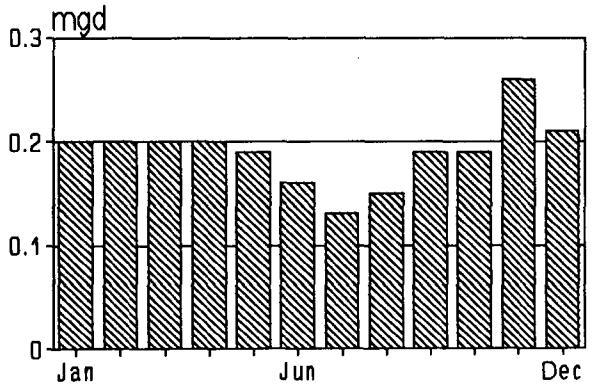


Figure A27. Polk County monthly public supply water use, 1991

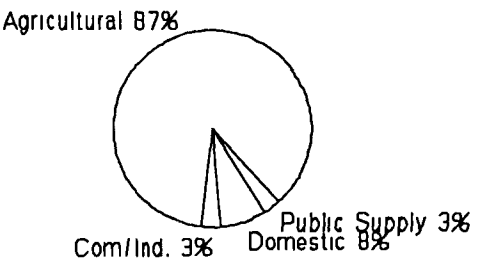


Figure A28. Polk County—percentages, by category, of freshwater use, 1991

1991 WATER USERS IN POLK COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Emerald Acres	Public supply	80	0.01	Floridan aquifer	0.00	
PCU - Polo Davenport	Public supply	1,048	0.18	Floridan aquifer	0.00	
Total Public Supply		1,128	0.19		0.00	
B.C. Cook & Sons citrus plant	Industrial[a]		0.00	Floridan aquifer	0.00	
Horizon's End Resort	Institutional		0.04	Floridan aquifer	0.00	
Oak Harbour campground	Institutional		0.02	Floridan aquifer	0.00	
Outdoor Resorts of Orlando	Institutional		0.15	Floridan aquifer	0.00	
Total Com/ind.			0.21		0.00	

[a]Less than 10,000 gallons per day used during 1991

POLK COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	0	0	0.00	0.00	0.00
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	0	0	0.00	0.00	0.00
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	2,172	2,172	4.37	0.49	4.86
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	1,000	500	0.58	0.00	0.58
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Flowers and foliage	5	5	0.01	0.00	0.01
Woody ornamentals	50	50	0.26	0.00	0.26
Improved pasture	4,500	100	0.08	0.07	0.15
Sod	0	0	0.00	0.00	0.00
Turf grass (golf)	0	0	0.00	0.00	0.00
Turf grass (other)	0	0	0.00	0.00	0.00
Misc. Agricultural					
Livestock	0	0	0.00	0.00	0.00
Fish farming	0	0	0.00	0.00	0.00
Totals	7,727	2,827	5.30	0.56	5.86

Sprinkler Acreage	2,488
Low Pressure Acreage	239
Flood Acreage	100
Total Irrigated Acreage	2,827

PUTNAM COUNTY

Total Population 66,002
Total Land Area 1,020 mi^2

St. Johns River Water Management District

Population	
Total	66,002
Public supply	22,963
Self-supplied	43,039
Per capita	156

Land Area (acres)	
Total area	652,460 (1,020 mi^2) (1)
Farmed	50,666
Irrigated	9,026

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	3.59	0.00	3.59	0.00
Domestic self-supply	6.71	0.00	6.71	0.00
Com/ind. self-supply	23.35	26.37	49.72	0.00
Agricultural irr.	13.41	0.64	14.05	0.00
Power generation s-s	0.61	14.93	15.54	0.00
Miscellaneous	0.29	0.00	0.29	0.00
Totals	47.96	41.94	89.90	0.00
Total Ground	47.96			
Total Surface	41.94			
County Total	89.90			

(1) Approximately 100 acres of Putnam County is located in the Suwannee River Water Management District.

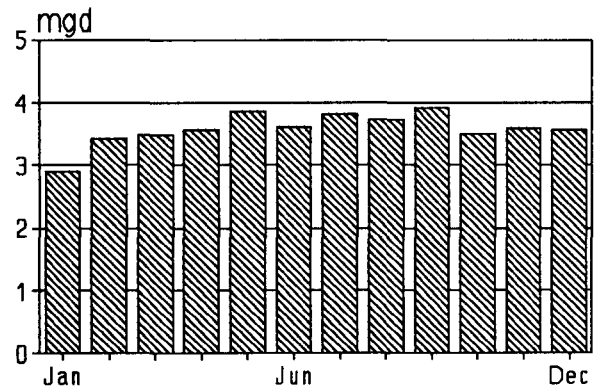


Figure A29. Putnam County monthly public supply water use, 1991

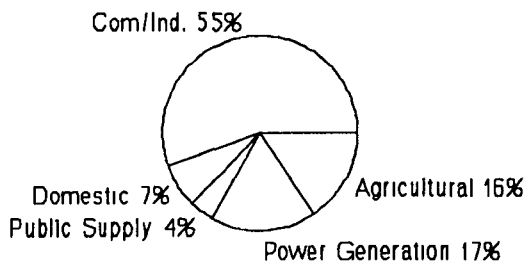


Figure A30. Putnam County—percentages, by category, of freshwater uses, 1991. Miscellaneous water use is less than 1%.

1991 Water Users in Putnam County

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Crescent - City of	Public supply	2,151	0.29	Floridan aquifer	0.00	
Interlachen - Town of	Public supply	1,202	0.08	Floridan aquifer	0.00	
Lake Como Water Association	Public supply	320	0.01	Floridan aquifer	0.00	
Melrose - Town of	Public supply	889	0.08	Floridan aquifer	0.00	
Palatka - City of	Public supply	15,000	2.90	Floridan aquifer	0.00	
Southern States Utilities	Public supply	3,249	0.22	Floridan aquifer	0.00	
Welaka - Town of	Public supply	152	0.01	Floridan aquifer		
Total Public Supply		22,963	3.59		0.00	
Feldspar Corp. - Edgar mine	Industrial*		5.23	Floridan aquifer	1.99	Retention pond
Florida Rock - Grandin mine	Industrial*		2.02	Floridan aquifer	0.00	
Florida Rock - Keuka mine	Industrial*		0.51	Floridan aquifer	4.28	Retention pond
Georgia Pacific - Palatka plant	Industrial**		15.54	Floridan aquifer	20.09	Simms/Etonia creeks
Georgia Pacific - Hawthorne plant	Industrial**		0.01	Floridan aquifer	0.00	
Putnam Correctional Fac.	Institutional		0.04	Floridan aquifer	0.00	
Total Com/ind.			23.35		26.37	
Florida Power & Light - Putnam	Power generation		0.09	Floridan aquifer	1.93	St. Johns River
Seminole Electric Corp.	Power generation		0.52	Floridan aquifer	13.00	St. Johns River
Total Power Generation			0.61		14.93	

*Mining industry
**Pulp and paper industry

PUTNAM COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	600	600	0.61	0.00	0.61
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	5,500	5,500	4.64	0.00	4.64
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	200	200	0.05	0.00	0.05
Fruit Crops					
Blueberries	100	80	0.10	0.00	0.10
Citrus	95	95	0.12	0.00	0.12
Grapes	10	10	0.01	0.00	0.01
Peaches	70	70	0.09	0.00	0.09
Pecans	100	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	200	200	0.07	0.00	0.07
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	2,000	500	0.46	0.02	0.48
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	400	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	2,500	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	1,100	1,100	2.50	0.62	3.12
Flowers and foliage	250	250	0.49	0.00	0.49
Woody ornamentals	100	100	0.52	0.00	0.52
Improved pasture	37,000	0	0.00	0.00	0.00
Sod	220	220	0.21	0.00	0.21
Turf grass (golf)	196	76	0.23	0.00	0.23
Turf grass (other)	25	25	0.04	0.00	0.04
Misc. Agricultural					
Livestock	0	0	0.41	0.00	0.41
Fish farming	0	0	2.86	0.00	2.86
Totals	50,666	9,026	13.41	0.64	14.05

Sprinkler Acreage	1,896
Low Pressure Acreage	80
Flood Acreage	7,050
Total Irrigated Acreage	9,026

ST. JOHNS COUNTY

Total Population 86,118
Total Land Area 660 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	86,118	Total area	422,400 (660 mi^2)
Public supply	64,083	Farmed	31,892
Self-supplied	22,035	Irrigated	27,211
Per capita	119		

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	7.63	0.00	7.63	0.00
Domestic self-supply	2.62	0.00	2.62	0.00
Com/ind. self-supply	0.07	0.00	0.07	0.00
Agricultural irr.	30.56	1.12	31.68	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	3.46	0.00	3.46	0.00
Totals	44.34	1.12	45.46	0.00
Total Ground	44.34			
Total Surface	1.12			
County Total	45.46			

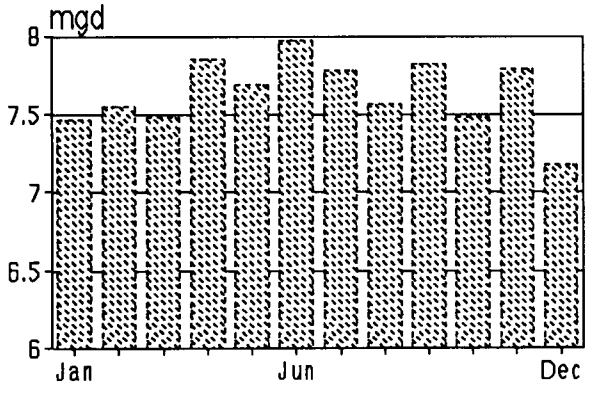


Figure A31. St. Johns County monthly public supply water use, 1991

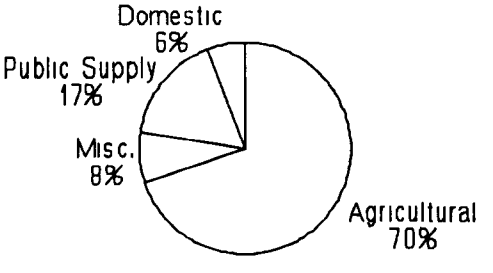


Figure A32. St. Johns County—percentages, by category, of freshwater use, 1991. Commercial/ industrial water use is less than 1%.

1991 WATER USERS IN ST. JOHNS COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Anastasia/mainland water system	Public supply	17,258	2.15	Surficial and Floridan aquifers	0.00	
Fountain Condominiums	Public supply	369	0.05	Floridan aquifer	0.00	
Fruit Cove Oaks S/D	Public supply	450	0.06	Floridan aquifer	0.00	
GDU - Julington Creek S/D	Public supply	294	0.03	Floridan aquifer	0.00	
Hastings - City of	Public supply	642	0.09	Surficial and Floridan aquifers	0.00	
Intracoastal Utilities	Public supply	4,078	0.63	Floridan aquifer	0.00	
North Beach water system	Public supply	1,327	0.19	Floridan aquifer	0.00	
Palm Valley water system	Public supply	525	0.08	Floridan aquifer	0.00	
Ponce de Leon Util. - Goodwin Beach	Public supply	360	0.05	Floridan aquifer	0.00	
Ponte Vedra Utilities	Public supply	3,341	0.77	Floridan aquifer	0.00	
St. Augustine - City of	Public supply	16,646	1.68	Surficial and Floridan aquifers	0.00	
St. Augustine Shores Utilities	Public supply	5,638	0.34	Surficial aquifer	0.00	
St. Johns Forest (CR 210)	Public supply	*	0.01	Floridan aquifer	0.00	
St. Johns North Utility	Public supply	722	0.13	Floridan aquifer	0.00	
St. Johns Service Co.	Public supply	11,445	1.20	Floridan aquifer	0.00	
S. Ponte Vedra Beach Utilities	Public supply	508	0.07	Floridan aquifer	0.00	
SSU - Remington Forest	Public supply	80	0.02	Floridan aquifer	0.00	
Wesley Manor water system	Public supply	400	0.08	Floridan aquifer	0.00	
Total Public Supply		64,083	7.63		0.00	
Borden/Wise Potato Chips plant	Industrial		0.01	Floridan aquifer	0.00	
G & M Union 76 truck stop	Commercial		0.02	Floridan aquifer	0.00	
Florida DOT - I-95 rest fac. (S.R. 210)	Institutional		0.01	Floridan aquifer	0.00	
Florida DOT - I-95 rest fac. (S.R. 206)	Institutional		0.02	Floridan aquifer	0.00	
KOA campground	Institutional		0.01	Floridan aquifer	0.00	
Total Com/ind.			0.07		0.00	

*New housing development; population unknown in 1991

ST. JOHNS COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	1,500	1,500	1.61	0.00	1.61
Carrots	0	0	0.00	0.00	0.00
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	21,000	21,000	19.17	0.00	19.17
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	500	500	0.12	0.00	0.12
Fruit Crops					
Blueberries	10	10	0.01	0.00	0.01
Citrus	0	0	0.00	0.00	0.00
Grapes	10	10	0.01	0.00	0.01
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	2,000	2,000	1.83	0.00	1.83
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Flowers and foliage	0	0	0.00	0.00	0.00
Woody ornamentals	25	25	0.03	0.00	0.03
Improved pasture	75	75	0.39	0.00	0.39
Sod	5,500	1,000	0.76	0.00	0.76
Turf grass (golf)	60	60	0.06	0.00	0.06
Turf grass (other)	1,192	1,011	1.91	1.12	3.03
Misc. Agricultural					
Livestock	0	0	0.35	0.00	0.35
Fish farming	0	0	4.31	0.00	4.31
Totals	31,892	27,211	30.56	1.12	31.68

Sprinkler Acreage	1,166
Low Pressure Acreage	45
Flood Acreage	26,000
Total Irrigated Acreage	27,211

SEMINOLE COUNTY

Total Population 298,057
Total Land Area 352 mi^2

St. Johns River Water Management District

Population	
Total	298,057
Public supply	294,145
Self-supplied	3,912
Per capita	158

Land Area (acres)	
Total area	225,280 (352 mi^2)
Farmed	13,915
Irrigated	6,048

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply	46.44	0.00	46.44	0.00
Domestic self-supply	0.62	0.00	0.62	0.00
Com/ind. self-supply	0.53	0.00	0.53	0.00
Agricultural irr.	9.78	1.16	10.94	0.00
Power generation s-s	0.00	0.00	0.00	0.00
Miscellaneous	3.78	0.00	3.78	0.00
Totals	61.15	1.16	62.31	0.00

Total Ground	61.15
Total Surface	1.16
County Total	62.31

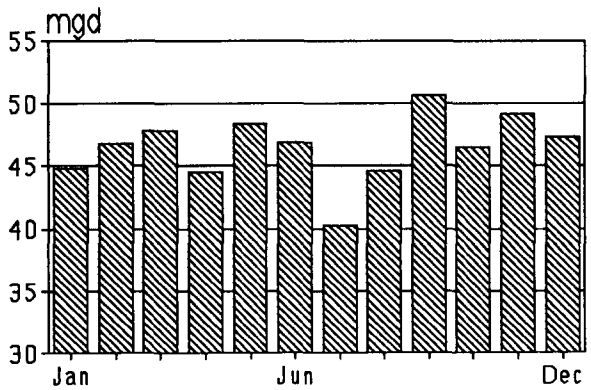


Figure A33. Seminole County monthly public supply water use, 1991

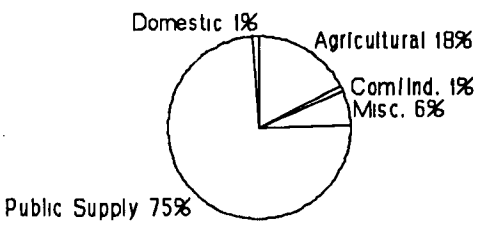


Figure A34. Seminole County—percentages, by category, of freshwater use, 1991.

1991 WATER USERS IN SEMINOLE COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Altamonte Springs - City of	Public supply	35,348	7.00	Floridan aquifer	0.00	
Casselberry - City of	Public supply	54,600	6.70	Floridan aquifer	0.00	
Indian Creek - Seminole Pines	Public supply	281	0.05	Floridan aquifer	0.00	
Lake Harney Water Assoc.	Public supply	458	0.03	Floridan aquifer	0.00	
Lake Mary - City of	Public supply	6,223	1.14	Floridan aquifer	0.00	
Longwood - City of	Public supply	13,321	1.96	Floridan aquifer	0.00	
Luthern Haven water system	Public supply	435	0.04	Floridan aquifer	0.00	
Mullet Lake Water Assoc.	Public supply	668	0.04	Floridan aquifer	0.00	
Oviedo - City of	Public supply	13,049	1.99	Floridan aquifer	0.00	
Palm Ventures MHP	Public supply	687	0.16	Floridan aquifer	0.00	
Sanford - City of [a]	Public supply	38,600	5.47	Floridan aquifer	0.00	
Sanlando Utilities	Public supply	45,186	8.69	Floridan aquifer	0.00	
Seminole County Water & Sewer	Public supply	45,465	8.02	Floridan aquifer	0.00	
Southern States Utilities	Public supply	8,190	1.25	Floridan aquifer	0.00	
Utilities Inc. of Florida	Public supply	8,971	0.83	Floridan aquifer	0.00	
Winter Springs - City of	Public supply	22,663	3.07	Floridan aquifer	0.00	
Total Public Supply		294,145	46.44		0.00	
Deep South processing plant	Industrial		0.31	Floridan aquifer	0.00	
I-4 Industrial Park	Industrial		0.16	Floridan aquifer	0.00	
United Technology (Stromberg)	Industrial		0.03	Floridan aquifer	0.00	
Iron Bridge fac.	Institutional		0.03	Floridan aquifer	0.00	
Total Com/ind.			0.53		0.00	

[a]Population served estimates from Bill Marcus, City of Sanford (pers. com. 1/14/94)

SEMINOLE COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	300	250	0.30	0.00	0.30
Carrots	0	0	0.00	0.00	0.00
Cucumbers	400	320	0.19	0.00	0.19
Peppers	0	0	0.00	0.00	0.00
Potatoes	450	450	0.33	0.00	0.33
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	15	15	0.01	0.00	0.01
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	560	530	0.01	0.00	0.01
Fruit Crops					
Blueberries	5	5	0.01	0.00	0.01
Citrus	1,024	1,024	1.56	0.00	1.56
Grapes	0	0	0.00	0.00	0.00
Peaches	0	0	0.00	0.00	0.00
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	40	40	0.01	0.00	0.01
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	40	40	0.03	0.00	0.03
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	10	10	0.01	0.00	0.01
Ornamentals and Grasses					
Ferns	20	20	0.06	0.00	0.06
Flowers and foliage	560	560	0.77	0.00	0.77
Woody ornamentals	160	160	0.70	0.13	0.83
Improved pasture	7,000	490	0.21	0.00	0.21
Sod	320	320	0.35	0.00	0.35
Turf grass (golf)	2,875	1,678	4.02	1.01	5.03
Turf grass (other)	136	136	0.23	0.01	0.24
Misc. Agricultural					
Livestock	0	0	0.99	0.00	0.99
Fish farming	0	0	0.00	0.00	0.00
Totals	13,915	6,048	9.78	1.16	10.94

Sprinkler Acreage	4,042
Low Pressure Acreage	356
Flood Acreage	1,650
Total Irrigated Acreage	6,048

VOLUSIA COUNTY

Total Population 376,695
Total Land Area 1,207 mi^2

St. Johns River Water Management District

Population	
Total	376,695
Public supply	354,565
Self-supplied	22,130
Per capita	119

Land Area (acres)	
Total area	772,480 (1,207 mi^2)
Farmed	15,851
Irrigated	11,323

1991 Water Withdrawals (mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Public supply (1)	42.06	0.00	42.06	0.00
Domestic self-supply	2.63	0.00	2.63	0.00
Com/ind. self-supply	0.82	0.00	0.82	0.00
Agricultural irr.	20.71	4.04	24.75	0.00
Power generation s-s	0.51	118.19	118.70	0.00
Miscellaneous	0.53	0.00	0.53	0.00
Totals	67.26	122.23	189.49	0.00
Total Ground	67.26			
Total Surface	122.23			
County Total	189.49			

(1) Includes 0.05 mgd of slightly saline water withdrawn for public supply (250 to 1,000 mg/L chlorides) and treated through reverse osmosis

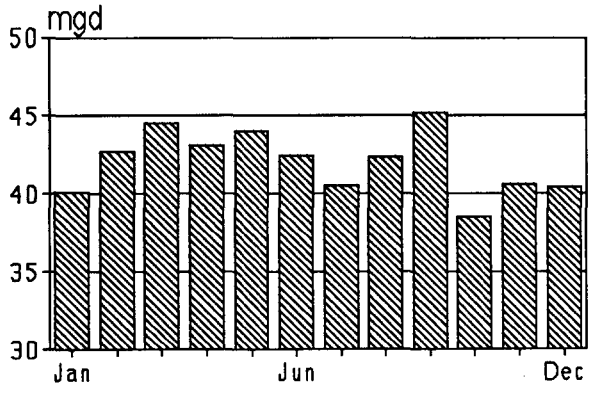


Figure A35. Volusia County monthly public supply water use, 1991

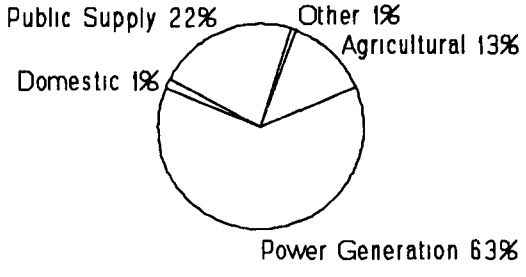


Figure A36. Volusia County—percentages, by category, of freshwater use, 1991. *Other* includes commercial/industrial and miscellaneous water use.

1991 WATER USERS IN VOLUSIA COUNTY

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Cassadaga Water Assoc.	Public supply	281	0.02	Floridan aquifer	0.00	
Daytona Beach - City of	Public supply	80,750	12.10	Floridan aquifer	0.00	
De Land - City of	Public supply	38,639	3.69	Floridan aquifer	0.00	
Edgewater - City of	Public supply	15,975	1.41	Floridan aquifer	0.00	
Hacienda Del Rio	Public supply	638	0.05	Floridan aquifer	0.00	
Halifax Plantation	Public supply	232	0.06	Floridan aquifer	0.00	
Highland Country Estates	Public supply	854	0.28	Floridan aquifer	0.00	
Holly Hill - City of	Public supply	11,146	1.04	Floridan aquifer	0.00	
John Knox Village	Public supply	700	0.08	Floridan aquifer	0.00	
Kingston Shores Water Assoc.	Public supply	250	0.02	Floridan aquifer and reverse osmosis (R/O)	0.00	
Lake Beresford Water Assoc.	Public supply	1,000	0.16	Floridan aquifer	0.00	
Lake Helen - City of	Public supply	2,363	0.24	Floridan aquifer	0.00	
New Smyrna Beach - City of	Public supply	23,293	3.67	Floridan aquifer	0.00	
Orange City Country Village	Public supply	1,343	0.19	Floridan aquifer	0.00	
Orange City	Public supply	5,510	0.65	Floridan aquifer	0.00	
Ormond Beach - City of	Public supply	58,979	4.35	Floridan aquifer	0.00	
Pierson - Town of	Public supply	1,148	0.10	Floridan aquifer	0.00	
Port Orange - City of	Public supply	42,168	4.58	Floridan aquifer	0.00	
South Water Front Park	Public supply	738	0.03	Floridan aquifer and R/O	0.00	
SSU - Deltona Utilities	Public supply	55,400	8.32	Floridan aquifer	0.00	
SSU - Sugar Mill	Public supply	1,406	0.10	Floridan aquifer	0.00	
Terra Marie Village W/S	Public supply	200	0.02	Floridan aquifer	0.00	
Tomoka View Water Works	Public supply	397	0.05	Floridan aquifer	0.00	
Tymber Creek Utilities	Public supply	844	0.10	Floridan aquifer	0.00	
Volusia County Utilities	Public supply	10,311	0.75	Floridan aquifer	0.00	
Total Public Supply		354,565	42.06		0.00	
Ardmore Farms	Industrial		0.02	Floridan aquifer	0.00	
Harmac Manufacturing Co.	Industrial		0.01	Floridan aquifer	0.00	
Sherwood Medical Man. Co.	Industrial		0.21	Floridan aquifer	0.00	

1991 WATER USERS—*Continued*

User Utility/Facility	Use Type	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Sparton Electronics	Industrial		0.02	Floridan aquifer	0.00	
T.G. Lee - Orange City	Industrial		0.07	Floridan aquifer	0.00	
Florida DNR - state park fac.	Institutional		0.01	Floridan aquifer	0.00	
Florida DOC - Tomoka state fac.	Institutional		0.22	Floridan aquifer	0.00	
Florida DOT - I-95 rest fac.	Institutional		0.01	Floridan aquifer	0.00	
Kampers Kove KOA	Institutional		0.07	Floridan aquifer	0.00	
Volusia County gov. complex	Institutional		0.18	Floridan aquifer	0.00	
Total Com/ind.			0.82		0.00	
Florida Power & Light - Sanford	Power generation		0.40	Floridan aquifer	4.18	St. Johns River
Florida Power Corp. - Lk. Monroe	Power generation		0.09	Floridan aquifer	114.00	Lake Monroe
Florida Power Corp. - DeBary	Power generation		0.02	Floridan aquifer	0.00	
Total Power Generation			0.51		118.19	

VOLUSIA COUNTY ACREAGE AND WATER USE BY CROP FOR 1991

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	295	295	0.24	0.00	0.24
Carrots	0	0	0.00	0.00	0.00
Cucumbers	300	300	0.06	0.00	0.06
Peppers	80	80	0.03	0.00	0.03
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	0	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Misc. vegetables	660	140	0.03	0.00	0.03
Fruit Crops					
Blueberries	25	25	0.02	0.00	0.02
Citrus	2,796	800	0.73	0.06	0.79
Grapes	14	14	0.01	0.00	0.01
Peaches	0	0	0.00	0.00	0.00
Pecans	25	10	0.01	0.00	0.01
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Misc. fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	0	0	0.00	0.00	0.00
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	0	0	0.00	0.00	0.00
Soybeans	0	0	0.00	0.00	0.00
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Misc. grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	6,060	5,460	12.86	2.64	15.50
Flowers and foliage	320	320	0.34	0.00	0.34
Woody ornamentals	95	95	0.42	0.07	0.49
Improved pasture	0	0	0.00	0.00	0.00
Sod	1,976	1,976	1.43	0.00	1.43
Turf grass (golf)	2,960	1,563	3.57	1.12	4.69
Turf grass (other)	245	245	0.21	0.15	0.36
Misc. Agricultural					
Livestock	0	0	0.75	0.00	0.75
Fish farming	0	0	0.00	0.00	0.00
Totals	15,851	11,323	20.71	4.04	24.75

Sprinkler Acreage	9,683
Low Pressure Acreage	825
Flood Acreage	815
Total Irrigated Acreage	11,323

St. Johns River Water Management District
P. O. Box 1429
Palatka, Florida 32178-1429
(904) 329-4500 Fax: (904) 329-4290