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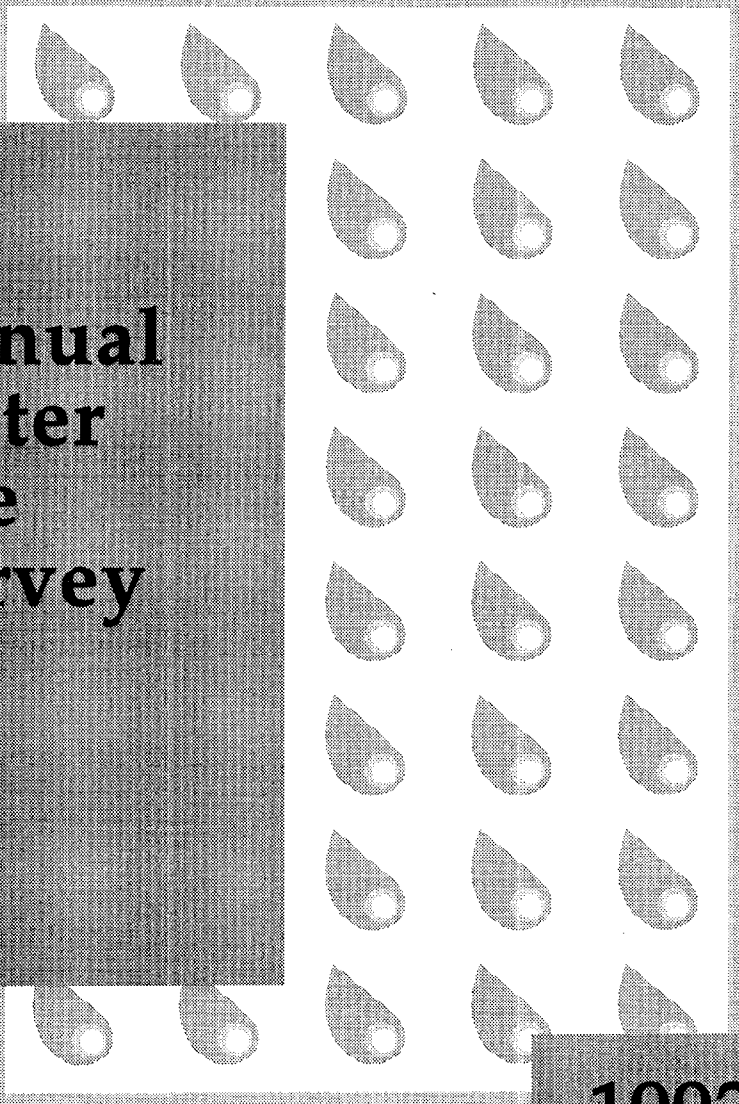

Annual Water Use Survey

1993

St. Johns River Water Management District

Technical Publication SJ96-1

ANNUAL WATER USE SURVEY: 1993

by

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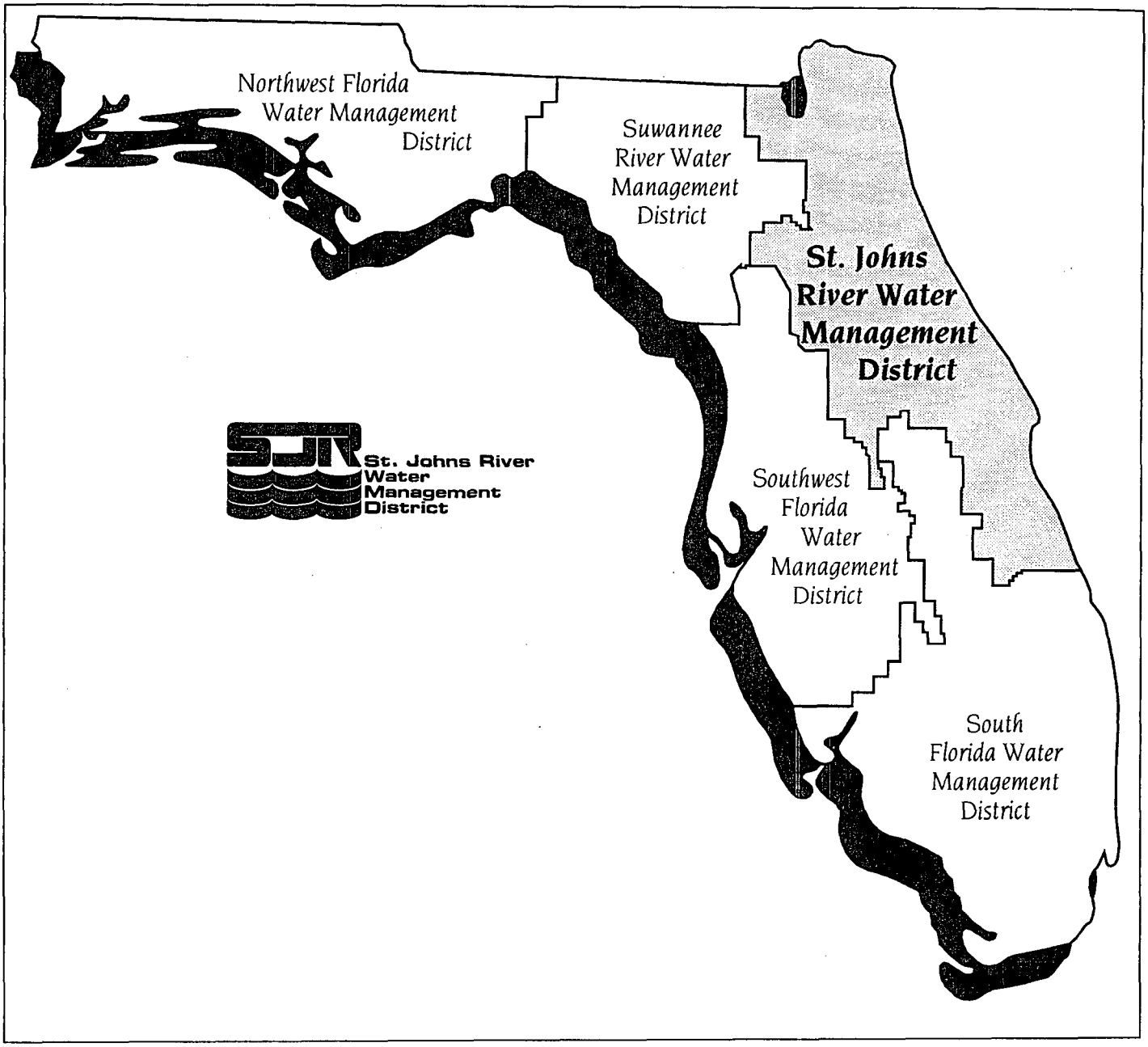
St. Johns River Water Management District
Palatka, Florida

1996



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

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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 1993; 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 withdrawals from ground or surface water sources and is expressed in million gallons per day (mgd).

The total amount of water used in SJRWMD in 1993, including fresh and saline water, was 3,249.87 mgd. Of that total, 1,503.67 mgd, or 46%, was fresh water. The total surface water use for SJRWMD was 2,150.35 mgd, of which 1,746.20 mgd was saline and 404.15 mgd was fresh. The total amount of ground water withdrawn in SJRWMD was 1,099.52 mgd. All ground water was fresh water.

The largest use of fresh ground water was for public supply—425.94 mgd, or 39% of the total fresh ground water use in SJRWMD. Agricultural water use was 357.17 mgd, or 32% of the ground water total.

The largest use of fresh surface water was for agriculture—213.09 mgd, or 53% of the total fresh surface water use in SJRWMD. Most surface water used was saline water, used primarily for thermoelectric power generation (1,746.11 mgd).

Brevard County had the largest total water use, at 1,379.93 mgd, and the highest total freshwater use, at 260.35 mgd.

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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 1993; 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 withdrawals from ground or surface water sources and is expressed in million gallons per day (mgd). This unit, mgd, is based on the average annual water use (see glossary).

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		

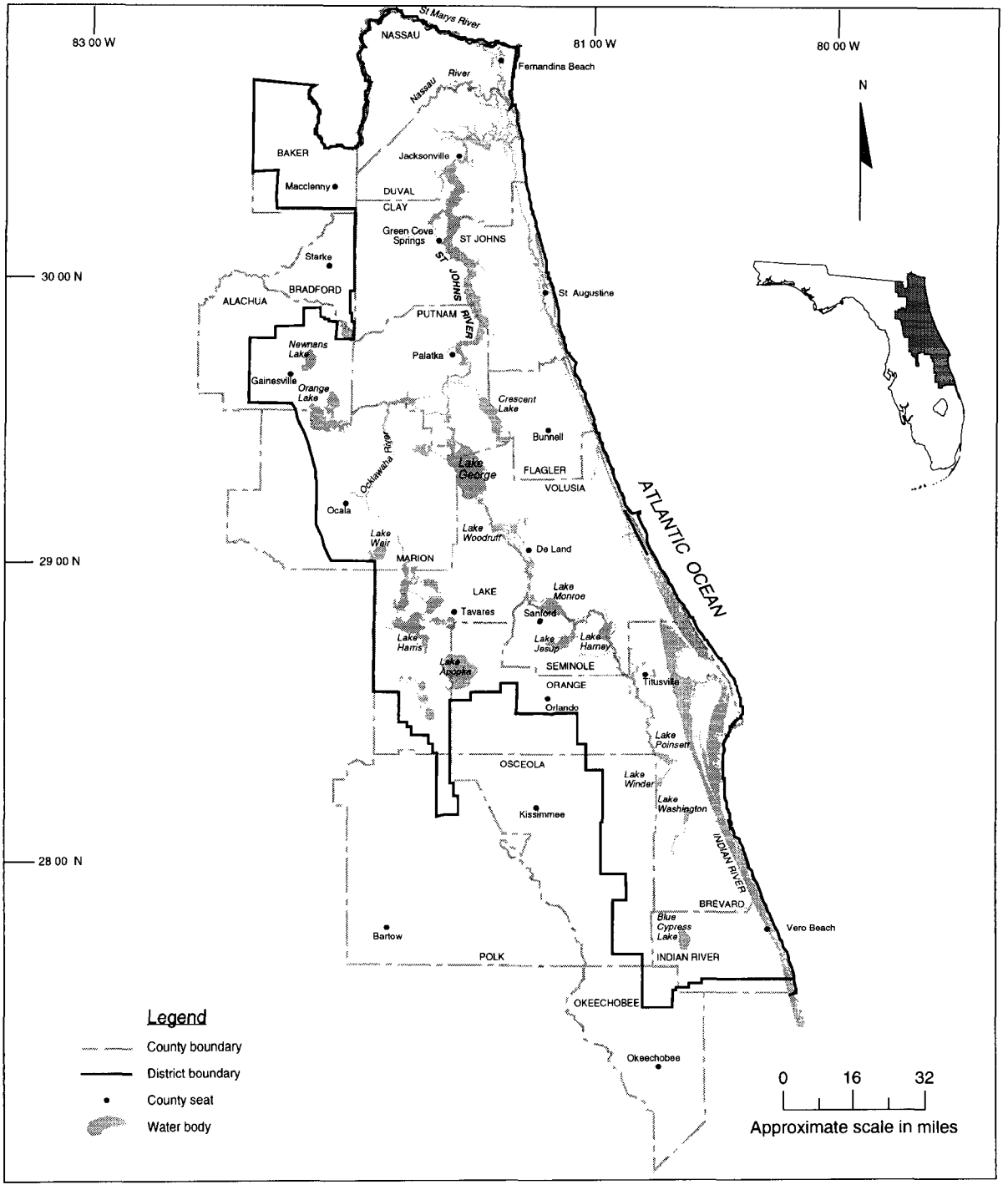

Figure 1. The St. Johns River Water Management District

WATER USE CATEGORIES

Water use information is reported for seven categories of use:

- Public supply
- Domestic self-supply
- Commercial/industrial use
- Agricultural irrigation
- Recreational irrigation
- Thermoelectric power generation
- 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 from the ground water system as water enters the treatment plant and others report only the amount of water delivered from the plant, which can be less than the actual 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. Public supply water use data come from utility records and are estimated to the nearest 0.01 mgd.

One hundred eighty-four public supply utilities served 2,858,527 people in 1993, or 85% of the total population in SJRWMD (Table 1 and appendix). 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 (University of Florida 1993, 1994b). Public supply data are estimated from the average number of service connections reported in the utility records multiplied by the average number of persons per household (University of Florida 1994a).

Table 1. Population in the St. Johns River Water Management District (SJRWMD) by county, 1993

County	County Population	SJRWMD Population	Percentage of County Population in SJRWMD	Public Supply Population	Domestic Self-Supply Population
Alachua	190,655	154,812	81	139,783	15,029
Baker	19,527	18,551	95	4,220	14,331
Bradford	23,312	1,748	7	374	1,374
Brevard	427,035	427,035	100	419,162	7,873
Clay	114,918	114,918	100	77,734	37,184
Duval	701,608	701,608	100	647,398	54,210
Flagler	33,544	33,544	100	23,904	9,640
Indian River	95,641	95,641	100	61,869	33,772
Lake	167,167	165,495	99	132,272	33,223
Marion	212,025	166,016	78	73,939	92,077
Nassau	46,450	46,450	100	23,333	23,117
Okeechobee	31,758	476	2	0	476
Orange	727,780	582,224	80	505,912	76,312
Osceola	125,675	2,891	2	0	2,891
Polk	429,943	4,299	1	1,543	2,756
Putnam	67,625	67,625	100	24,356	43,269
St. Johns	91,197	91,197	100	87,478	3,719
Seminole	310,890	310,890	100	302,509	8,381
Volusia	390,066	390,066	100	332,741	57,325
Total	4,206,816	3,375,486		2,858,527	516,959

Source: University of Florida 1993, 1994a, 1994b

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 these wells are drilled into the easiest accessible aquifer that could produce potable 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 (1995).

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 USE

The commercial/industrial use category consists of the larger commercial and industrial users not served by public supply utilities. The commercial category includes businesses and institutions, such as government facilities, military installations, schools, prisons, and hospitals. 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 facilities that used more than 0.01 mgd of ground or surface water were inventoried. In 1993, 53 industrial users and 42 commercial users, including 41 institutions, are included in this report (see appendix). Of the commercial/industrial users, 6 users had an average water use in 1993 that was less than 0.01 mgd. Water used for transporting materials from the mine pit to the plant and for dewatering mine pits is considered conveyance and is 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 (CUPs) issued by SJRWMD to the facilities and information from monthly operating reports received by SJRWMD, the Florida Department of Environmental Protection (FDEP), or the Florida Department of Health and Rehabilitative Services (HRS). Industries not reporting to FDEP, HRS, or SJRWMD were contacted by SJRWMD staff.

AGRICULTURAL IRRIGATION

The agricultural water use category consists of estimated water withdrawals from ground and surface sources for crop irrigation. This water is not provided by public supply utilities. 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 crops have specific consumptive use requirements (USDA 1970). There are 32 crop categories assessed, and these are divided into four groups (Table 2):

- Vegetable crops
- Fruit crops
- Field crops
- Ornamentals and grasses

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	Foliage
Cucumbers	Grapes	Rice	Woody ornamentals
Peppers	Peaches	Sorghum	Improved pasture
Potatoes	Pecans	Soybeans	Sod
Tomatoes	Strawberries	Sugar cane	Turf grass (other than golf)
Sweet corn	Watermelons	Tobacco	
Watercress	Miscellaneous fruits	Wheat	
Miscellaneous vegetables		Miscellaneous grains	

The acreage data are supplied primarily by the Cooperative Extension Service of the Institute of Food and Agricultural Sciences (IFAS) at the University of Florida, supplemented by information from SJRWMD and

the Florida Department of Agriculture and Consumer Services (FDACS 1994a–c). In some instances, discrepancies exist between IFAS and SJRWMD in crop acreage estimates, for example, fern acreage in Volusia County and irrigated pasture acreage in Indian River and Brevard counties. IFAS figures have been used in the 1993 survey to maintain consistency with previous surveys.

The estimates of irrigation necessary for each crop acre are calculated using the modified Blaney-Criddle irrigation model (USDA 1970) and data from the SJRWMD Benchmark Farms irrigation monitoring program (Singleton 1994), 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 1993a–g).

RECREATIONAL IRRIGATION

The recreational irrigation category includes water used to irrigate turf grass for golf courses. This water is not provided by public supply utilities. Prior to the 1992 *Annual water use survey* report, turf grass irrigation was included in the agricultural water use category as "turf grass (golf)". In the 1992 survey, the recreational irrigation category also included turf grass used for recreational purposes other than golf. Recreational water use is assumed to be fresh water and does not include estimates of reclaimed water use.

The acreage data are supplied primarily by the Cooperative Extension Service of IFAS at the University of Florida, supplemented by information from the CUP files at SJRWMD and from the Florida Department of Agriculture and Consumer Services (FDACS 1994a–c). The estimate of irrigation necessary for the crop acreage is calculated using the modified Blaney-Criddle irrigation model (USDA 1970).

THERMOELECTRIC POWER GENERATION

The thermoelectric power generation category of water use consists of water used by power plants primarily for cooling. This water is not provided by public supply utilities. These figures are derived from information in the CUP files at SJRWMD or from data supplied by the

power companies to SJRWMD, FDEP, or HRS in monthly operating reports. In 1993, water use data were collected for 12 self-supplied thermoelectric power plants.

ABANDONED ARTESIAN WELLS

The abandoned artesian wells category includes water flowing from abandoned artesian wells. According to available data, all abandoned artesian wells are supplied by 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 measured, the districtwide average for all wells of known flow is used. In 1993, the districtwide average for all wells of known flow was about 0.24 mgd per well (Davis 1995).

In previous *Annual water use survey* reports, the estimated amount of water flowing from abandoned artesian wells was included in the miscellaneous category of water use.

Abandoned artesian well reports are dated by the year in which the fiscal year ends (e.g., October 1992 through September 1993 is the 1993 report).

1993 WATER USE BY SOURCE

Water in SJRWMD is withdrawn from both surface and ground water sources. Water quality from either source is defined as fresh, saline, or slightly saline.

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. 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 1993 was 3,249.87 mgd, of which 2,150.35 mgd came from surface water sources and 1,099.52 mgd came from ground water sources. These figures do not include reused wastewater. Over one-half of the total water use was saline (1,746.20 mgd), and the remaining water use was fresh water (1,503.67 mgd) (Table 3).

The largest use of saline surface water was for thermoelectric power generation—1,746.11 mgd (Table 4), or nearly all of the total saline surface water use in SJRWMD.

Table 3. Total 1993 water use by county St. Johns River Water Management District (in million gallons per day)

County	Fresh Water			Saline Water	Total Water Use
	Ground	Surface	Total	Surface	
Alachua	32.18	0.12	32.30	0.00	32.30
Baker	4.40	0.44	4.84	0.00	4.84
Bradford	0.35	0.00	0.35	0.00	0.35
Brevard[1]	231.37	28.98	260.35	1,119.58	1,379.93
Clay	21.90	0.36	22.26	0.00	22.26
Duval	151.70	0.96	152.66	488.56	641.22
Flagler	13.16	1.04	14.20	0.00	14.20
Indian River	97.34	133.88	231.22	137.97	369.19
Lake	73.11	11.81	84.92	0.00	84.92
Marion	33.38	1.10	34.48	0.00	34.48
Nassau	49.02	0.22	49.24	0.09	49.33
Okeechobee	12.07	0.00	12.07	0.00	12.07
Orange[2]	130.00	45.35	175.35	0.00	175.35
Osceola	5.44	9.50	14.94	0.00	14.94
Polk	5.02	0.45	5.47	0.00	5.47
Putnam	43.22	46.25	89.47	0.00	89.47
St. Johns	49.46	1.03	50.49	0.00	50.49
Seminole	67.21	1.10	68.31	0.00	68.31
Volusia	79.19	121.56	200.75	0.00	200.75
Total	1,099.52	404.15	1,503.67	1,746.20	3,249.87

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

[1]Includes 25.06 mgd withdrawn from Orange County for public supply use in Brevard County
[2]Does not include 35.59 mgd of water used in the South Florida Water Management District

The largest use of fresh water was for agricultural irrigation—570.26 mgd (Table 4), or 38% of the total fresh water. The second largest use of fresh water was for public supply—440.86 mgd, or 29% of the total freshwater use in SJRWMD.

SURFACE WATER

In 1993, surface water accounted for a total of 2,150.35 mgd of water use (Table 3). This use included water from both fresh and saline surface water sources. Nineteen percent (404.15 mgd) of the total surface water used in SJRWMD came from fresh surface water sources. The remaining

81% 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 (133.88 mgd) was Indian River County (Table 3). Virtually all of this water was for agricultural irrigation. Volusia County used 121.56 mgd of fresh surface water, 97% of which was for thermoelectric power generation. Combined water use in these two counties totaled 255.44 mgd, or 63% of the total fresh surface water use in SJRWMD in 1993.

The largest category of fresh surface water use was agricultural irrigation, which accounted for 213.09 mgd (Table 4), or 53% (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 129.96 mgd, or 32% of the total. Commercial/industrial water use accounted for 34.28 mgd, or 8% of the total fresh surface water use in SJRWMD. Fresh surface water withdrawn for public supply accounted for 14.92 mgd, or 4% of the total fresh surface water used. Fresh surface water withdrawn for recreational irrigation accounted for 11.90 mgd, or 3% of the total fresh surface water used.

Saline Water

Total saline water use in SJRWMD in 1993 was 1,746.20 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 saline water 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 had the highest saline surface water use—1,119.58 mgd (Table 3)—for thermoelectric power generation at two plants:

- Florida Power and Light (601.64 mgd)
- Orlando Utilities Commission (517.94 mgd)

Table 4. Total 1993 water use by category St. Johns River Water Management District (in million gallons per day)

Category	Fresh Water			Saline Water*
	Ground	Surface	Total	Surface
Public supply	425.94	14.92	440.86	0.00
Domestic self-supply	82.20	0.00	82.20	0.00
Commercial/industrial use	99.46	34.28	133.74	0.09
Agricultural irrigation	357.17	213.09	570.26	0.00
Recreational irrigation	25.02	11.90	36.92	0.00
Thermoelectric power generation	7.00	129.96	136.96	1,746.11
Abandoned artesian wells	102.73	0.00	102.73	0.00
Total	1,099.52	404.15	1,503.67	1,746.20

*Saline water is all from surface water sources

Duval County had the next highest saline surface water use—488.56 mgd (Table 3)—for thermoelectric power generation at two plants:

- Jacksonville Electric Authority—Eastport Power Plant (436.82 mgd)
- St. Johns River Power Park (51.74 mgd)

Indian River County had a saline surface water use of 137.97 mgd at the Vero Beach Municipal Power Plant, and Nassau County had saline water use of 0.09 mgd at the ITT Rayonier paper mill.

GROUND WATER

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.

In 1993, ground water accounted for a total of 1,099.52 mgd of water use (Table 3), or 73% of the total freshwater use in SJRWMD. Generally, all ground water withdrawals are from freshwater sources.

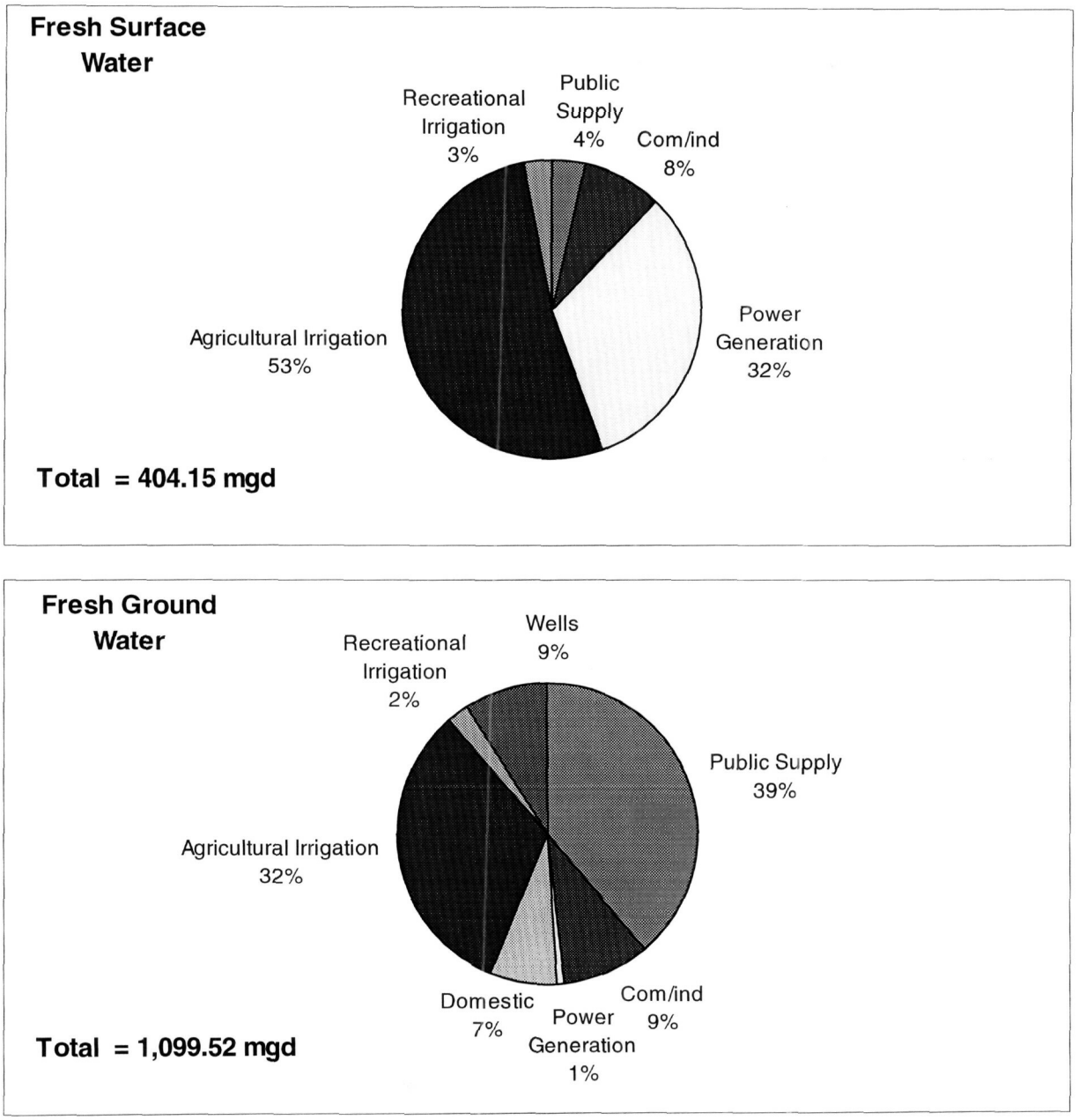

Figure 2. Total freshwater use, 1993. *Most of the fresh water used in the St. Johns River Water Management District came from ground water sources. Surface water is used primarily for agricultural irrigation and thermoelectric power generation.*

The counties in SJRWMD where the most ground water was used were Brevard, Duval, and Orange (Table 3). Each of these counties used more than 100 mgd of ground water, for a combined total of 513.07 mgd for the three counties, or 47% of the total ground water use in SJRWMD in 1993.

The largest category of ground water use in 1993 in SJRWMD was public supply, which accounted for about 425.94 mgd (Table 4), or 39% of the total ground water use (Figure 2). The second largest category of ground water use was agricultural irrigation, accounting for 357.17 mgd, or 32% of the total ground water use. Abandoned artesian wells accounted for 102.73 mgd, or 9% of the total ground water use; commercial/industrial water use accounted for 99.46 mgd, or 9% of the total; domestic self-supply accounted for 82.20 mgd, or 7% of the total; recreational irrigation accounted for 25.02 mgd, or 2% of the total; and thermoelectric power generation accounted for 7.00 mgd, or 1% of the total ground water use.

1993 WATER USE BY CATEGORY

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

- Public supply
- Domestic self-supply
- Agricultural irrigation
- Recreational irrigation
- Abandoned artesian wells

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

- Commercial/industrial use
- Thermoelectric power generation

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 1993 was 440.86 mgd (Tables 4 and 5). All public supply water was fresh water, and most of the water supplied in 1993 (97%) was ground water (Table 4). Fresh surface water (14.92 mgd) was used for public supply in Brevard County. Eighty-nine percent of the ground water used in SJRWMD for public supply was withdrawn from the Floridan aquifer system; the remaining 11% was withdrawn from the intermediate and surficial aquifer systems (SJRWMD 1992). The public supply category of ground water use accounted for 39% of the total ground water use in SJRWMD in 1993 (Figure 2).

The figures in this report for fresh ground water use include a small amount of slightly saline ground water that was treated by reverse osmosis or blended with fresh water for use as potable water. In the SJRWMD *Annual water use survey* reports published before 1987, this slightly saline ground water was reported as saline water.

Table 5. Public supply and domestic self-supply water use in the St. Johns River Water Management District (SJRWMD), 1993

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	139,783	21.60	155	15,029	2.33
Baker	4,220	0.76	180	14,331	2.58
Bradford	374	0.04	107	1,374	0.15
Brevard	419,162	[a]51.38	123	7,873	0.97
Clay	77,734	9.43	121	37,184	4.50
Duval	647,398	99.78	154	54,210	8.35
Flagler	23,904	4.07	170	9,640	1.64
Indian River	61,869	11.39	184	33,772	6.21
Lake	132,272	21.78	165	33,223	5.48
Marion	73,939	11.30	153	92,077	14.09
Nassau	23,333	4.43	190	23,117	4.39
Okeechobee	0	0.00	[b]154	476	0.07
Orange	505,912	[c]93.69	185	76,312	14.12
Osceola	0	0.00	[b]154	2,891	0.45
Polk	1,543	0.23	149	2,756	0.41
Putnam	24,356	3.71	152	43,269	6.58
St. Johns	87,478	11.54	132	3,719	0.49
Seminole	302,509	49.10	162	8,381	1.36
Volusia	332,741	46.63	140	57,325	8.03
Total	2,858,527	440.86	[d]154	516,959	[e]82.20

Note: mgd = million gallons per day

[a]Includes 25.06 mgd withdrawn in Orange County
[b]Districtwide per capita (see footnote [e])
[c]Does not include 25.06 mgd withdrawn in Orange County for use in Brevard County
[d]Represents districtwide per capita based on counties for which per capita data were available
[e]Total of the county domestic self-supply figures, not based on SJRWMD per capita

Per Capita

The average per capita water use in SJRWMD in 1993, based on the population served by public supply, was 154 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 about 40% of the SJRWMD public supply water use population.

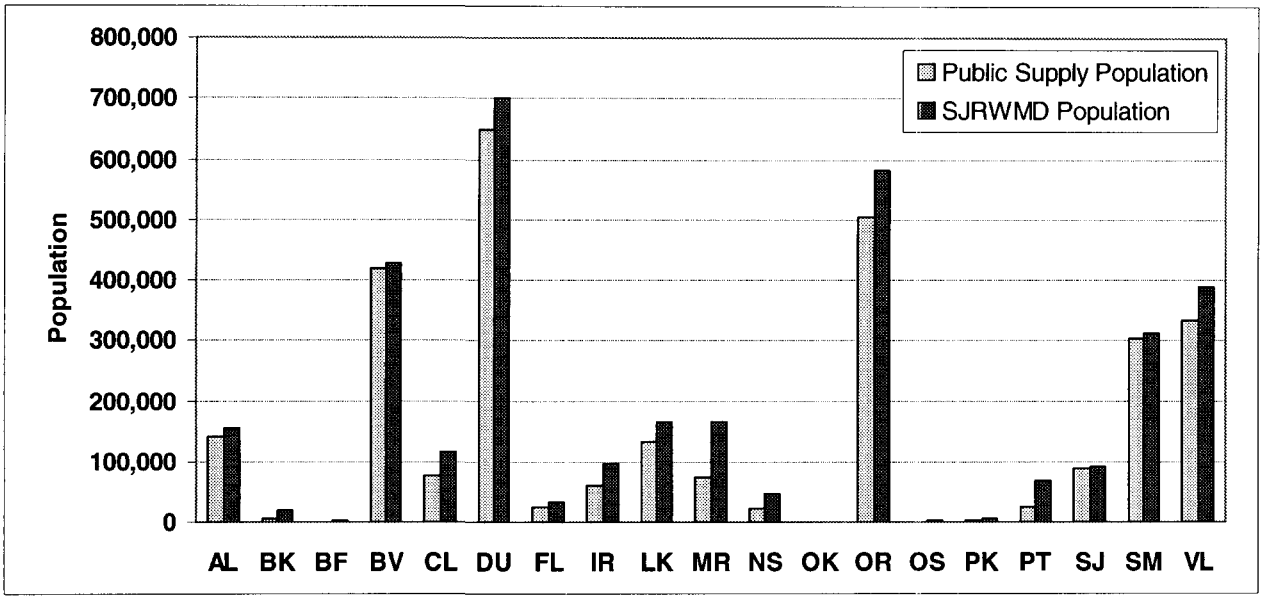

Figure 3. Population served by public supply in the St. Johns River Water Management District (SJRWMD), 1993. *Duval and Orange are the largest counties in population in SJRWMD. Okeechobee and Osceola counties do not have a public supply population in SJRWMD. County abbreviations are listed on page 1.*

Combined water use for public supply in Duval (99.78 mgd) and Orange (93.69 mgd) counties was 193.47 mgd, or 44% of the public supply water use in SJRWMD in 1993. Orange County is split between two water management districts; 35.59 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 (25.06 mgd) was for the City of Cocoa public supply system in Brevard County (Table 5).

The City of Jacksonville (Duval County), which has the largest public supply utility in SJRWMD, supplied its 470,280 customers with 73.14 mgd of fresh ground water in 1993 (see appendix).

DOMESTIC SELF-SUPPLY

In 1993, an estimated 516,959 people used 82.20 mgd of domestic self-supplied water (Table 5), or 7% of the total fresh ground water use in SJRWMD (Table 4). All of the domestic self-supplied water was assumed to be ground water.

Marion County had the largest self-supplied population—92,077 people (Table 5). Orange County had the second largest, with 76,312 people, followed by Volusia County with 57,325 people.

COMMERCIAL/INDUSTRIAL USE

The total freshwater use in the commercial/industrial category was 133.74 mgd (Tables 4 and 6), or 9% of the total freshwater use in SJRWMD. Of this total, 99.46 mgd was ground water and 34.28 mgd was fresh surface water. In addition, 0.09 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 1993, water use for pulp and paper production included 71.10 mgd of fresh ground water, 30.84 mgd of fresh surface water, and 0.09 mgd of saline surface water (see appendix). The second largest water user in this category was the mining industry, which accounted for 13.74 mgd of fresh water. Together, pulp and paper production and mining accounted for 115.68 mgd of fresh water, or 87% of the commercial/industrial freshwater use in SJRWMD.

Table 6. Commercial/industrial water use in the St. Johns River Water Management District, 1993 (in million gallons per day)

County	Fresh Water			Saline Water
	Ground	Surface*	Total	Surface
Alachua	1.94	0.00	1.94	0.00
Baker	0.20	0.00	0.20	0.00
Bradford	0.00	0.00	0.00	0.00
Brevard	0.15	0.00	0.15	0.00
Clay	6.22	0.00	6.22	0.00
Duval	23.41	0.00	23.41	0.00
Flagler	0.17	0.00	0.17	0.00
Indian River	0.18	0.00	0.18	0.00
Lake	4.40	1.14	5.54	0.00
Marion	1.61	0.00	1.61	0.00
Nassau	38.10	0.00	38.10	0.09
Okeechobee	0.06	0.00	0.06	0.00
Orange	2.59	0.00	2.59	0.00
Osceola	0.00	0.00	0.00	0.00
Polk	0.19	0.00	0.19	0.00
Putnam	18.94	33.14	52.08	0.00
St. Johns	0.06	0.00	0.06	0.00
Seminole	0.41	0.00	0.41	0.00
Volusia	0.83	0.00	0.83	0.00
Total	99.46	34.28	133.74	0.09

*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

The largest amount of fresh water used for commercial/industrial purposes (52.08 mgd) was in Putnam County (Table 6). Nassau (38.10 mgd) and Duval (23.41 mgd) counties also had significant amounts of freshwater use in this category. Of the total fresh water used for commercial/industrial purposes in SJRWMD, 85% (113.59 mgd) was in these three counties.

AGRICULTURAL IRRIGATION

Almost all of the water used for agricultural irrigation in SJRWMD was fresh water. Information from the CUP files at SJRWMD indicates that 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 570.26 mgd, or 38% of the total freshwater use in SJRWMD in 1993 (Tables 4 and 7). Of this total, 357.17 mgd, or 63% 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.

Table 7. Agricultural irrigation water use in the St. Johns River Water Management District, 1993 (in million gallons per day)

County	Fresh Water			Acreage	
	Ground	Surface	Total	Farmed	Irrigated
Alachua	5.16	0.03	5.19	38,350	5,445
Baker	0.71	0.44	1.15	14,797	705
Bradford	0.09	0.00	0.09	160	160
Brevard	139.42	11.18	150.60	142,363	97,453
Clay	0.54	0.00	0.54	44,011	369
Duval	1.93	0.12	2.05	13,450	1,552
Flagler	7.01	0.15	7.16	24,705	7,240
Indian River	59.00	132.50	191.50	134,543	95,032
Lake	38.98	9.57	48.55	81,131	30,417
Marion	4.46	0.54	5.00	71,349	5,173
Nassau	0.25	0.00	0.25	6,761	205
Okeechobee	11.94	0.00	11.94	34,485	7,485
Orange	14.92	44.90	59.82	68,181	47,019
Osceola	4.99	9.50	14.49	126,800	12,180
Polk	4.19	0.45	4.64	8,312	3,136
Putnam	12.12	0.84	12.96	51,455	9,455
St. Johns	27.00	0.00	27.00	30,700	26,200
Seminole	6.55	0.09	6.64	11,040	4,370
Volusia	17.91	2.78	20.69	12,891	9,760
Total	357.17	213.09	570.26	915,484	363,356

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

Water Use by County

The largest water use for agricultural irrigation occurred in Indian River County—191.50 mgd of fresh water (Table 7), or 34% of the agricultural water use in SJRWMD. Most of this amount, 132.50 mgd, was fresh surface water. The second largest water use for agriculture was in

Brevard County—150.60 mgd, most of which was ground water. The combined water use in these two counties was 342.10 mgd, or 60% of the total agricultural irrigation water use in SJRWMD in 1993.

Water Use by Acreage and Crop

An estimated 915,484 acres were farmed in SJRWMD in 1993, of which 363,356 acres were irrigated (see Table 7 and appendix). Of the total acreage irrigated, 239,367 acres were irrigated by flood systems, 58,211 acres were irrigated by low pressure/low volume systems, and 65,778 acres were irrigated by sprinkler systems. The amount of irrigated acres increased from 362,872 acres in 1992 (including turf grass [other])—a net increase of 484 acres (Florence 1995).

The largest water use for a crop type was for ornamental plants and grasses, which accounted for 41% of the agricultural water use (Figure 4). However, the largest water use for a single crop was for citrus irrigation, which accounted for 208.98 mgd, or 37% of the agricultural water use in SJRWMD (see appendix). Irrigation of improved pasture land accounted for 186.42 mgd, or 33% of the agricultural water use.

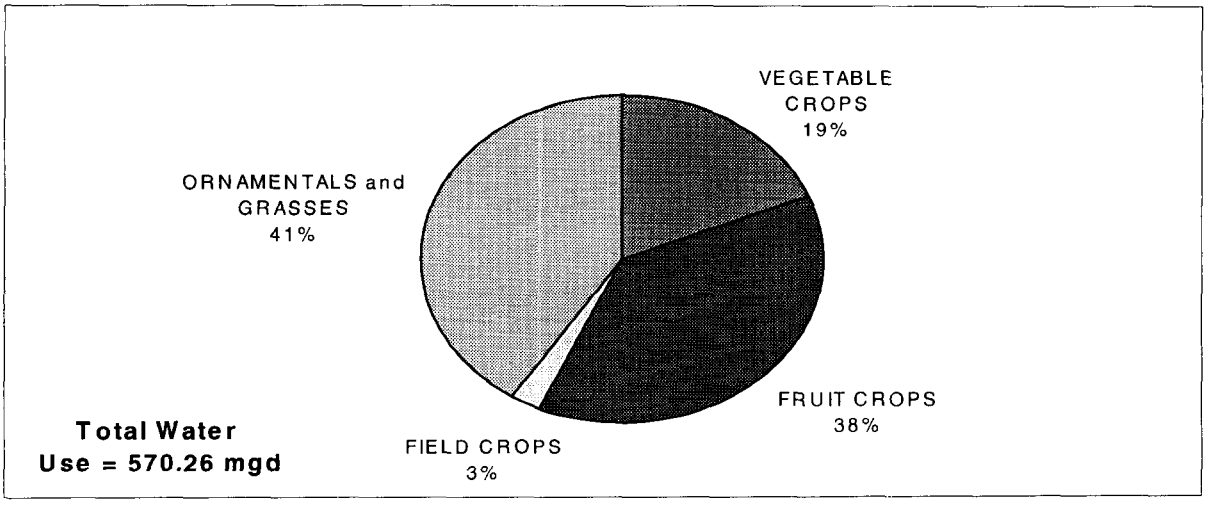

Figure 4. Agricultural water use in the St. Johns River Water Management District for four crop types, 1993. *Ornamentals and grasses accounted for 41% of agricultural irrigation water use in 1993.*

RECREATIONAL IRRIGATION

Water used in the recreational irrigation category totaled 36.92 mgd, or about 2% of the total fresh water use in SJRWMD (Tables 4 and 8). Of this amount, 25.02 mgd was ground water.

Table 8. Recreational irrigation water use in the St. Johns River Water management District, 1993 (in million gallons per day)

County	Fresh Water			Acreage	
	Ground	Surface	Total	Farmed	Irrigated
Alachua	0.71	0.09	0.80	480	328
Baker	0.15	0.00	0.15	124	60
Bradford	0.07	0.00	0.07	40	30
Brevard	1.74	2.88	4.62	1,800	1,425
Clay	0.70	0.36	1.06	530	380
Duval	3.48	0.84	4.32	2,992	1,413
Flagler	0.13	0.89	1.02	362	362
Indian River	2.80	1.38	4.18	1,637	1,276
Lake	1.35	1.10	2.45	1,591	769
Marion	0.77	0.56	1.33	1,500	500
Nassau	1.39	0.22	1.61	645	565
Okeechobee	0.00	0.00	0.00	0	0
Orange	2.33	0.45	2.78	1,533	939
Osceola	0.00	0.00	0.00	0	0
Polk	0.00	0.00	0.00	0	0
Putnam	0.21	0.00	0.21	196	76
St. Johns	1.77	1.03	2.80	1,192	1,011
Seminole	4.01	1.01	5.02	2,875	1,678
Volusia	3.41	1.09	4.50	2,960	1,563
Total	25.02	11.90	36.92	20,457	12,375

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

The largest water use for recreational irrigation occurred in Seminole County—5.02 mgd (Table 8). The second largest water use was in Brevard County—4.62 mgd.

Approximately 12,375 of 20,457 acres are irrigated using sprinkler systems (see appendix). The amount of irrigated acres was the same in 1992 and 1993.

THERMOELECTRIC POWER GENERATION

Water used for thermoelectric power generation totaled 1,883.07 mgd, or 58% of all water use in SJRWMD for 1993 (Tables 4 and 9). Total water use for the 12 self-supplied power plants accounted for 1,746.11 mgd of saline surface water, 129.96 mgd of fresh surface water, and 7.00 mgd of fresh ground water. The largest amount of saline water used for thermoelectric power generation was in Brevard County—1,119.58 mgd. The largest amount of freshwater use was in Volusia County—118.28 mgd.

Table 9. Thermoelectric power generation water use in the St. Johns River Water Management District, 1993 (in million gallons per day)

County	Fresh Water			Saline Water
	Ground	Surface	Total	Surface
Alachua	0.20	0.00	0.20	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	1,119.58
Clay	0.00	0.00	0.00	0.00
Duval	5.00	0.00	5.00	488.56
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	0.30	0.00	0.30	0.00
Osceola	0.00	0.00	0.00	0.00
Polk	0.00	0.00	0.00	0.00
Putnam	0.55	12.27	12.82	0.00
St. Johns	0.00	0.00	0.00	0.00
Seminole	0.00	0.00	0.00	0.00
Volusia	0.59	117.69	118.28	0.00
Total	7.00	129.96	136.96	1,746.11

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

ABANDONED ARTESIAN WELLS

Water flowing from 518 abandoned artesian wells totaled an estimated 102.73 mgd in SJRWMD (Tables 4 and 10). The total known flow for 56 wells was 10.05 mgd. The estimated flow from 462 wells was 92.67 mgd. All water was fresh ground water (Davis 1995).

Table 10. Estimated flow from abandoned artesian wells in the St. Johns River Water Management District, 1993

County	Number of Wells of Known Flow	Known Flow (mgd)	Number of Wells of Unknown Flow	Estimated Flow (mgd)	Total Estimated Flow (mgd)
Alachua	0	0.00	*1	0.24	0.24
Baker	0	0.00	0	0.00	0.00
Bradford	0	0.00	0	0.00	0.00
Brevard	25	4.95	186	47.39	†52.35
Clay	0	0.00	*5	0.51	0.51
Duval	0	0.00	*15	9.75	9.75
Flagler	0	0.00	*4	0.14	0.14
Indian River	9	3.84	38	13.84	17.68
Lake	0	0.00	*26	1.12	1.12
Marion	0	0.00	*14	1.15	1.15
Nassau	0	0.00	*8	0.46	0.46
Okeechobee	0	0.00	0	0.00	0.00
Orange	0	0.00	*32	2.05	2.05
Osceola	0	0.00	*1	0.00	0.00
Polk	0	0.00	0	0.00	0.00
Putnam	2	0.06	22	1.05	1.11
St. Johns	1	0.14	24	8.46	8.60
Seminole	18	1.03	66	4.75	5.78
Volusia	1	0.03	20	1.76	1.79
Total	56	†10.05	462	†92.67	†102.73

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

*SJRWMD average (0.24 mgd) used for estimated flow
†Davis (1995) data is presented to four decimal places. Mathematical inaccuracies are due to rounding. See Davis (1995) for precise numbers

Source: Davis 1995

SJRWMD began its Abandoned Artesian Well Plugging Program in 1976. As of 1993, 2,097 abandoned artesian wells had been identified, of which 880 wells had been plugged or repaired by SJRWMD, 699 had been plugged or repaired by the well owners, and 518 are still flowing (Davis 1995). From October 1, 1992, to September 30, 1993, an estimated 27.09 mgd of fresh water had been saved. As of September 1993, a total estimated 206.61 mgd of fresh water had been saved.

TRENDS

1984 TO 1993

Total freshwater use increased by 11% over the period 1984 through 1993 (Table 11). The increase has been gradual and fairly consistent over the years, but the increase has occurred at a slower rate than population growth (Figure 5). The estimated SJRWMD population increased by 31% between 1984 and 1993. In general, the increase in total water use has been driven by increases in public supply water use offset by the decrease in agricultural irrigation water use.

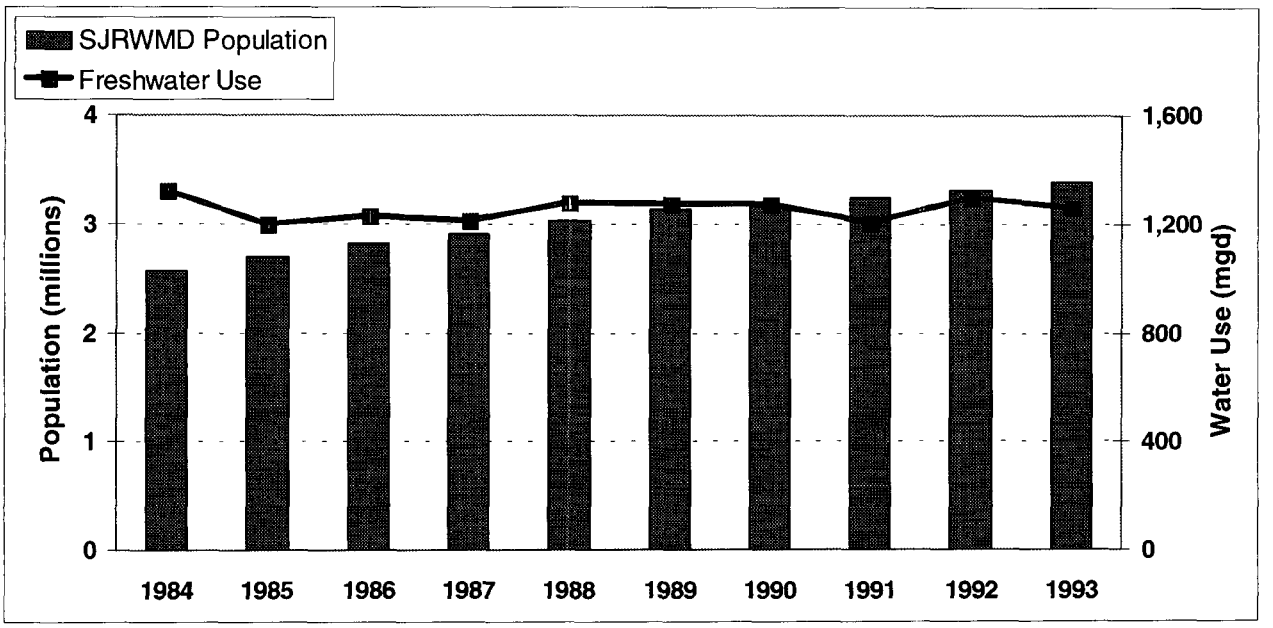

Figure 5. Freshwater use and population in the St. Johns River Water Management District (SJRWMD) from 1984 to 1993. *Water use has remained constant, changing only slightly from year to year, while the population has increased gradually. Note: thermoelectric power generation and abandoned artesian well water uses are not included.*

Table 11. Population and freshwater use (in million gallons per day) in the St. Johns River Water Management District (SJRWMD), 1984–93

Category	1984	1985	1986	1987	1988	1989*	1990	1991	1992	1993	10-year Average
SJRWMD population	2,574,947	2,690,133	2,813,578	2,919,028	3,023,277	3,135,756	3,166,715	3,243,380	3,313,721	3,375,486	Not applicable
Public supply population	2,037,833	2,201,080	2,315,929	2,403,847	2,498,520	2,598,404	2,665,791	2,700,294	2,785,107	2,858,527	Not applicable
Domestic self-supply population	537,114	485,923	497,646	515,181	521,607	537,352	500,924	543,086	528,614	516,959	Not applicable
Public supply per capita	163	163	165	167	164	166	167	153	152	154	Not applicable
Fresh ground water	1,066.24	991.04	1,003.12	1,012.03	1,054.55	1,119.32	1,085.97	1,027.22	1,042.67	1,099.52	1,050.17
Fresh surface water	290.01	363.76	379.62	353.47	379.15	360.47	459.00	373.41	469.22	404.15	383.23
Total fresh water†	1,356.25	1,354.80	1,382.74	1,365.50	1,433.70	1,479.79	1,544.97	1,400.63	1,511.89	1,503.67	1,433.39
Public supply	331.22	358.53	381.99	400.39	409.29	431.12	444.14	414.15	424.63	440.86	403.63
Domestic self-supply	87.72	81.76	82.33	85.71	86.73	90.24	83.86	84.51	84.92	82.20	85.00
Commercial/industrial use	150.24	172.34	148.46	145.67	150.11	148.66	137.65	144.24	148.20	133.74	147.93
Agricultural and recreational irrigation	753.90	584.68	617.97	581.24	630.92	600.09	605.31	561.12	642.04	**607.18	618.45
Thermoelectric power generation	7.12	124.41	133.72	134.37	135.78	137.11	213.31	139.99	136.43	136.96	129.92
Abandoned artesian wells	26.05	33.08	18.27	18.12	20.87	56.60	60.70	56.62	75.67	102.73	46.87

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

*Abandoned artesian well data came from Davis (1995); the sum of water use by category will not match the total by water source.
†Excluding heat pump and air-conditioning.
**In 1992, recreational irrigation water use became a separate category; it had previously been included under agricultural irrigation. For this table, the 1992 quantity is a sum of both categories.

Source: Marella 1985, 1986, 1988, 1990; Florence 1990, 1991, 1992, 1994, 1995; Davis 1995

Although the trend for the 10-year (yr) period has been one of gradual increase in water use, annual fluctuations occur in response to seasonal patterns and distribution of rainfall. The normal yearly rainfall for the period 1961–90 is 49.84 inches (in.) (SJRWMD 1994). The 10-yr average of 41.86 in. of rainfall (Table 12) is 16% below normal. The arithmetic mean of total freshwater use for this 10-yr period is 1,433.39 mgd. The highest total water use occurred in 1990, at 1,544.97 mgd, 8% above the 10-yr average. This year (1990) was the driest year of the period, with an average of 38.85 in. of rainfall (Table 12), or 22% below normal and 7% below the 10-yr average.

The second highest amount of water use occurred in 1992, at 1,511.89 mgd, 5% above the 10-yr average. The year 1992 was one of the wettest years during the period, with an average rainfall of 55.20 in. (Table 12), or 11% above normal and 32% above the 10-yr average. However, much of the excess rainfall occurred during the first 3 months of the year when crop and public supply water use tend to be low. Rainfall in subsequent months was low, so that total water use for the year was above average. The lowest amount of water use occurred in 1985, at 1,354.80 mgd, or 5% below the 10-yr average.

Public supply water use has increased steadily, with some annual fluctuations (Figure 6 and Table 11). Water use for this category was highest in 1990 (444.14 mgd) and lowest in 1984 (331.22 mgd). There appears to be a general decline in per capita water use. Districtwide per capita use for 1991 to 1993 ranged from 152 to 154 gallons per day, whereas the average use between 1984 and 1990 ranged from 162 to 167 gallons per day. The arithmetic mean for this 10-yr period is 403.63 mgd; water use in 1993 was 9% above the mean.

Domestic self-supply water use has remained relatively constant, with little fluctuation over the 10-yr period (Table 11). Water use for this category was highest in 1989 (90.24 mgd) and lowest in 1985 (81.76 mgd). The arithmetic mean for this 10-yr period was 85.00 mgd; water use in 1993 was 3% below the mean.

Table 12. Average annual rainfall from ten rainfall stations in the St. Johns River Water Management District, 1984–93 (in inches)

Station	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	10-year Average
Clermont	48.75	50.64	48.58	52.92	58.89	49.89	44.58	43.34	53.78	36.45	48.78
Daytona	46.71	45.38	48.00	45.72	40.91	44.65	36.12	67.19	46.41	35.71	45.68
Gainesville	39.25	49.83	52.31	46.63	61.21	46.38	47.56	57.00	51.65	43.65	49.55
Glen St. Mary	57.00	48.12	49.33	53.97	59.00	43.10	31.61	74.16	61.82	53.41	53.15
Jacksonville Airport	48.96	58.39	44.10	43.39	60.68	51.45	31.20	79.63	63.18	50.12	53.11
Melbourne	38.53	51.52	30.90	50.38	36.11	43.00	48.00	58.58	49.36	39.29	44.57
Ocala	38.64	48.09	45.94	50.58	55.23	51.88	33.94	48.86	45.07	40.78	45.90
Orlando	44.44	47.19	49.83	56.79	52.49	45.66	31.68	60.90	52.96	44.53	48.65
Sanford	47.71	49.48	43.90	46.23	60.00	40.65	36.59	69.28	68.88	34.49	49.72
Titusville	50.59	56.64	40.37	50.32	59.80	45.62	47.24	73.20	58.84	40.18	52.28
Average	46.06	50.53	45.33	49.69	54.43	46.23	38.85	63.21	55.20	41.86	49.14

Source: Jenab and Clapp 1995, draft; NOAA 1993h

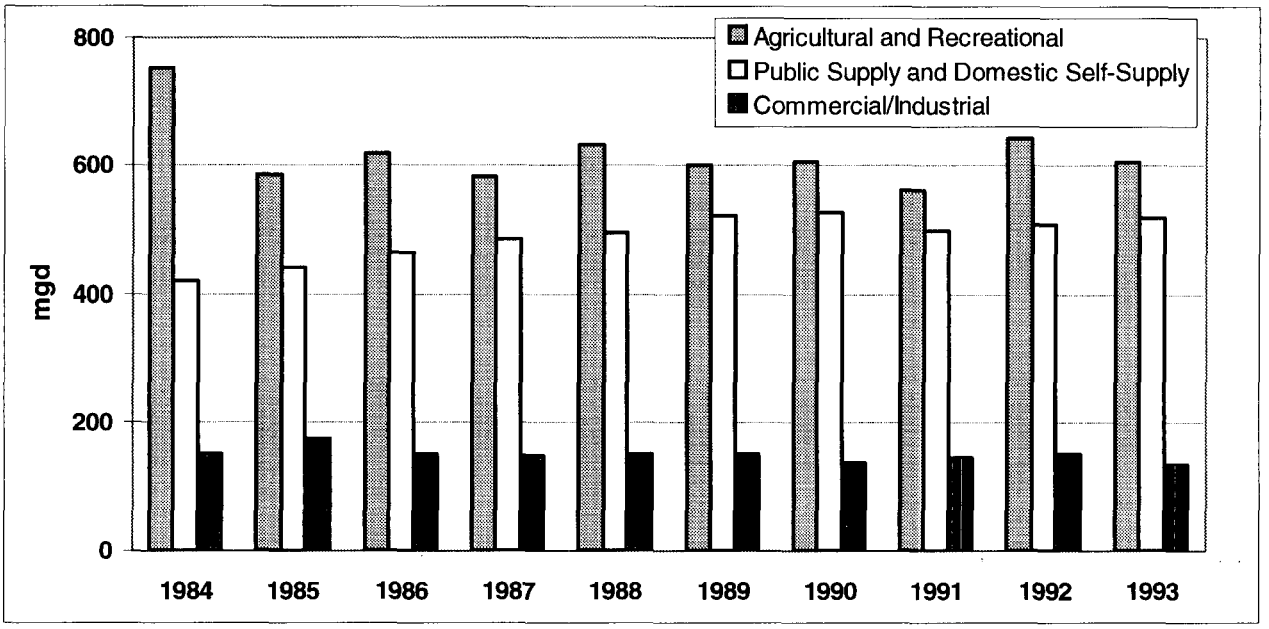

Figure 6. Freshwater use in the St. Johns River Water Management District by category from 1984 to 1993. *Water use for agricultural and recreational irrigation has fluctuated from year to year in response to rainfall. Water use for public supply has increased steadily with increasing population and tourism.*

Commercial/industrial water use has remained relatively constant, with little fluctuation over the 10-yr period, with the exception of 1985 (Figure 6 and Table 11). Water use for this category was highest in 1985 (172.34 mgd) and lowest in 1993 (133.74 mgd). The arithmetic mean for this 10-yr period is 147.93 mgd; water use in 1993 was 10% below the mean.

Agricultural and recreational (turf grass) irrigation water use over the 10-yr period has fluctuated with a general decline in nature (Figure 6 and Table 11). Water use for these categories was highest in 1984 (753.90 mgd) and lowest in 1991 (561.12 mgd). The arithmetic mean for this 10-yr period is 618.45 mgd; water use in 1993 for these categories was 2% 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.

1992 TO 1993

From 1992 to 1993, total freshwater use in SJRWMD decreased from 1,511.89 mgd to 1,503.67 mgd, or about 1%. Fresh ground water use increased from 1,042.67 mgd to 1,099.52 mgd, or 5%. Fresh surface water use decreased from 469.22 mgd to 404.15 mgd, or 14%. Saline surface water use decreased from 1,839.68 mgd to 1,746.20 mgd, or 5% (Florence 1995).

The following three categories of freshwater use increased from 1992 to 1993:

- Public supply freshwater use increased 4%, from 424.63 mgd in 1992 to 440.86 mgd in 1993. This increase in water use can be attributed to population growth during the year and the expansion of public supply services to previously unincorporated areas.

- Thermoelectric power generation freshwater use increased just slightly, from 136.43 mgd in 1992 to 136.96 mgd in 1993. Saline surface water withdrawals, however, decreased 4%, from 1,811.81 mgd in 1992 to 1,746.11 mgd in 1993.

- Abandoned artesian well estimated flows increased 36%, from 75.67 mgd in 1992 to 102.73 mgd in 1993. The increase was due largely to a number of large diameter wells which were added to the inventory. The flow from these wells was significantly higher than that from wells in the previous year's inventory.

The following three categories of freshwater use decreased from 1992 to 1993:

- Domestic self-supplied freshwater use decreased 3%, from 84.92 mgd in 1992 to 82.20 mgd in 1993.

- Commercial/industrial freshwater use decreased 10%, from 148.20 mgd in 1992 to 133.74 mgd in 1993. Saline surface water

withdrawals decreased nearly 100%, from 27.87 mgd in 1992, to 0.09 mgd in 1993. This decrease is attributed to Seminole Kraft (Duval County) not withdrawing saline surface water in 1993.

- Agricultural and recreational irrigation freshwater use decreased 5%, from 642.04 mgd in 1992 to 607.18 mgd in 1993.

SEASONAL TRENDS

The monthly totals for each water use category were summed and divided by 365 days to get an average value in million gallons per day. The seasonal trends are evaluated based on the monthly totals.

In 1993, total freshwater use was highest in May (Figure 7). Monthly trends in total water use follow the trends in agricultural water use, which depend on rainfall and growing season. 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

Combined public supply water use in SJRWMD in 1993 fluctuated from a low of 353.85 mgd in January to a high of 533.69 mgd in May (Table 13 and Figures 7 and 9). Typically, water use increases during the warm season (April through October), when outdoor residential use is at a high.

Commercial/Industrial Use

Commercial/industrial freshwater use in SJRWMD in 1993 varied from a low of 117.69 mgd in March to a high of 145.34 mgd in June (Table 14 and Figures 7 and 10).

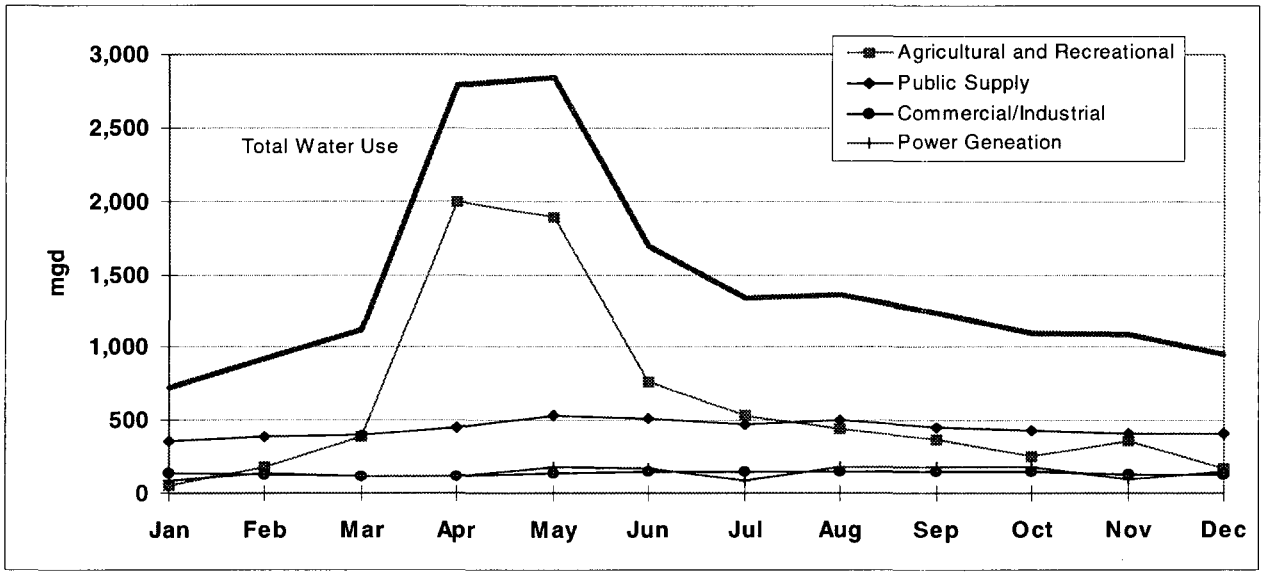

Figure 7. Total monthly freshwater use and freshwater use by category in the St. Johns River Water Management District, 1993. *Total monthly fluctuations in water use follow the fluctuations in agricultural irrigation.*

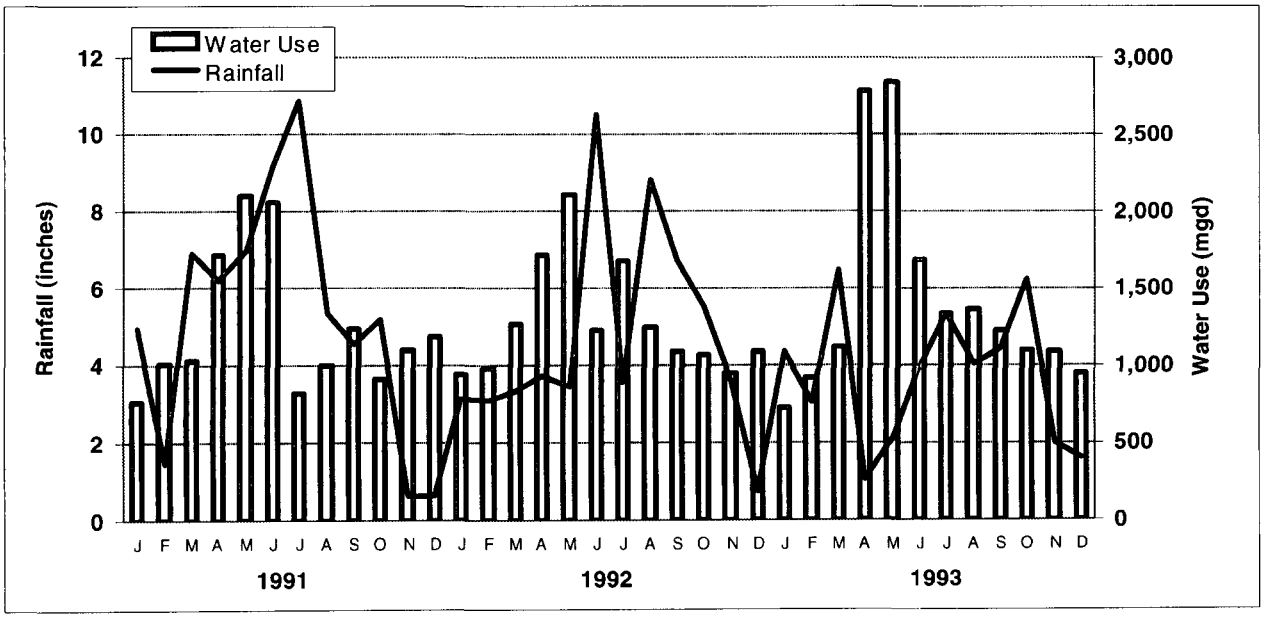

Figure 8. Total monthly freshwater use and average rainfall in the St. Johns River Water Management District, 1991–93. *Water use is usually higher during periods of low rainfall.*

Table 13. Monthly public supply water use by county, 1993 (in million gallons per day)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alachua	18.42	18.81	19.25	21.67	24.89	24.13	21.40	25.54	23.49	22.18	20.39	18.94
Baker	0.65	0.64	0.64	0.71	0.92	0.81	0.78	0.85	0.79	0.77	0.80	0.81
Bradford	0.03	0.03	0.04	0.06	0.05	0.04	0.04	0.05	0.03	0.04	0.03	0.03
Brevard	44.67	46.52	48.68	51.95	58.13	56.14	56.05	55.68	51.26	51.01	46.63	49.41
Clay	7.17	7.73	8.59	9.53	11.34	12.65	11.75	10.77	9.43	8.66	7.76	7.89
Duval	83.21	84.19	89.25	99.21	118.83	121.99	110.89	114.36	102.85	93.18	89.28	88.73
Flagler	3.08	3.27	3.25	4.11	4.82	4.92	4.88	4.86	4.18	3.86	3.74	3.72
Indian River	9.79	10.74	10.72	11.74	12.96	12.01	12.58	12.35	10.99	9.88	11.59	11.10
Lake	16.06	16.58	16.91	20.75	26.83	24.47	20.56	24.85	20.06	20.38	19.85	19.46
Marion	10.10	9.97	10.27	11.93	13.95	12.52	11.23	12.60	11.16	10.77	10.50	10.50
Nassau	3.54	3.66	3.78	4.44	4.86	5.56	5.56	4.96	4.44	4.13	4.03	4.11
Orange	65.70	83.41	83.51	97.34	116.45	104.41	94.19	106.45	94.50	94.47	92.86	90.78
Polk	0.22	0.24	0.23	0.28	0.19	0.31	0.13	0.21	0.20	0.22	0.31	0.25
Putnam	3.45	3.88	3.75	3.96	4.29	3.61	3.72	3.85	3.55	3.49	3.70	3.44
St. Johns	8.63	9.97	9.80	10.56	13.58	14.82	14.25	13.91	12.05	10.51	9.90	10.51
Seminole	39.61	40.90	41.68	50.82	65.36	57.14	47.72	56.50	48.36	48.23	46.32	45.94
Volusia	39.52	42.45	43.79	49.68	56.24	51.67	48.56	53.33	46.36	43.62	42.67	41.49
Total	353.85	382.99	394.14	448.74	533.69	507.20	464.29	501.12	443.70	425.40	410.36	407.11

Note: Okeechobee and Osceola counties did not have public supply water use in 1993

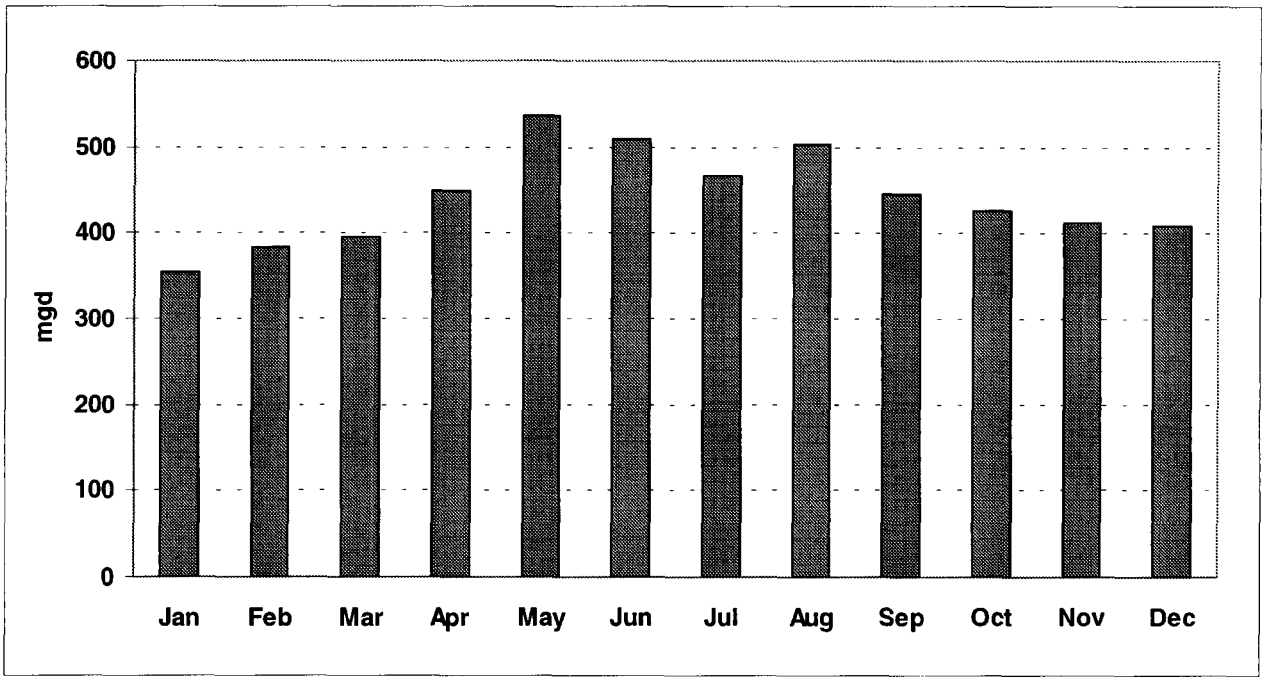

Figure 9. Monthly freshwater use for public supply in the St. Johns River Water Management District, 1993. *Water use increases when outdoor residential use is high, typically during the warmer months of the year.*

Agricultural and Recreational Irrigation

Agricultural and recreational irrigation water use in SJRWMD in 1993 had a greater seasonal fluctuation than any other water use category—from a low of 52.41 mgd in January to a high of 2,000.87 mgd in April (Table 15 and Figures 7 and 11). These fluctuations are typical of irrigation water use and are inversely correlated to rainfall.

Thermoelectric Power Generation

Thermoelectric power generation freshwater use in SJRWMD in 1993 fluctuated from a low of 79.06 mgd in January to a high of 178.13 mgd in August (Table 16 and Figures 7 and 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.

Table 14. Monthly commercial/industrial water use by county, 1993 (in million gallons per day)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alachua	1.89	1.90	1.86	1.91	1.95	1.99	2.02	2.00	1.97	1.93	1.92	1.91
Baker	0.20	0.19	0.19	0.18	0.21	0.19	0.20	0.21	0.22	0.19	0.20	0.19
Brevard	0.13	0.19	0.17	0.16	0.15	0.17	0.17	0.14	0.16	0.15	0.12	0.13
Clay	5.63	4.70	5.25	6.28	6.66	6.77	6.64	5.94	6.65	6.38	6.90	6.65
Duval	22.81	20.48	21.45	23.58	25.79	24.89	25.48	25.44	24.36	25.33	22.32	18.75
Flagler	0.12	0.14	0.16	0.16	0.17	0.15	0.21	0.20	0.19	0.17	0.17	0.16
Indian River	0.21	0.27	0.26	0.23	0.19	0.17	0.13	0.15	0.13	0.13	0.16	0.21
Lake	7.83	8.04	6.67	4.80	5.23	4.87	4.57	5.18	5.03	4.93	4.88	4.60
Marion	1.32	1.90	1.69	1.84	1.68	1.44	1.62	1.85	1.84	1.38	1.26	1.59
Nassau	40.91	40.47	38.73	35.78	40.69	41.43	39.00	39.45	36.89	33.96	36.89	34.26
Okeechobee	0.08	0.09	0.10	0.11	0.09	0.08	0.08	0.01	0.02	0.03	0.04	0.03
Orange	4.93	4.95	3.25	3.11	3.60	1.57	1.24	1.37	1.33	1.72	1.37	2.81
Polk	0.27	0.24	0.24	0.22	0.21	0.17	0.16	0.13	0.13	0.16	0.16	0.18
Putnam	48.67	35.57	36.32	38.87	52.75	59.97	62.25	60.47	61.81	66.37	51.50	48.93
St. Johns	0.06	0.06	0.05	0.05	0.05	0.06	0.09	0.06	0.05	0.05	0.06	0.06
Seminole	0.39	0.45	0.39	0.48	0.56	0.56	0.43	0.43	0.32	0.33	0.31	0.27
Volusia	0.87	0.90	0.91	0.86	0.87	0.86	0.83	0.85	0.82	0.78	0.78	0.77
Total	136.32	120.54	117.69	118.62	140.85	145.34	145.12	143.88	141.92	143.99	129.04	121.50

Note: Bradford and Osceola counties did not have any commercial/industrial water use in 1993

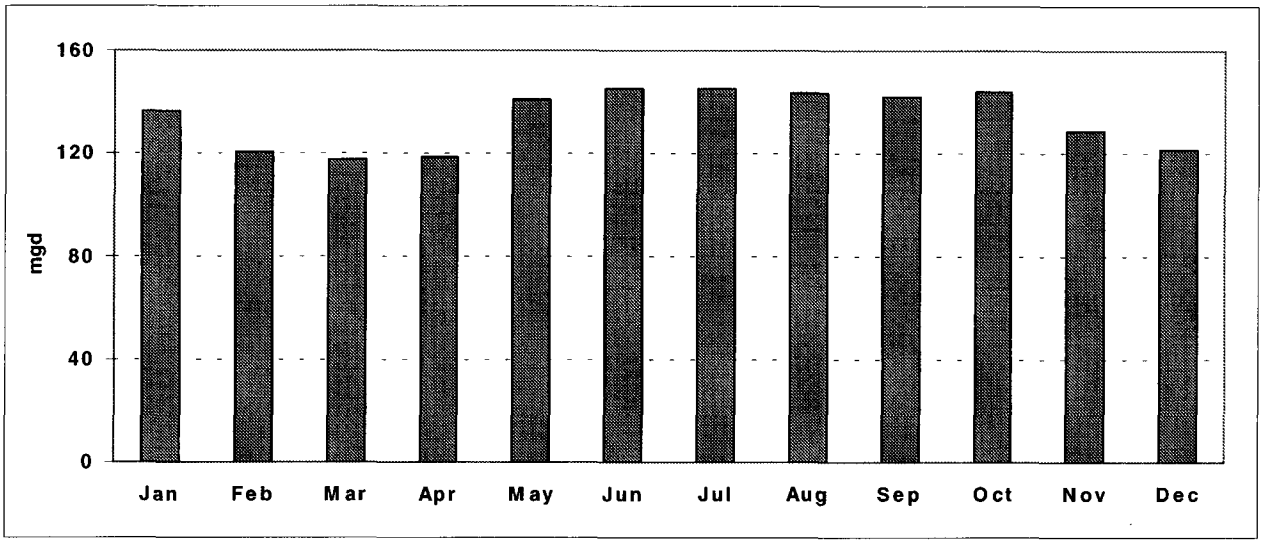

Figure 10. Monthly freshwater use for commercial/industrial purposes in the St. Johns River Water Management District, 1993. *Commercial/industrial water use fluctuates slightly over the year.*

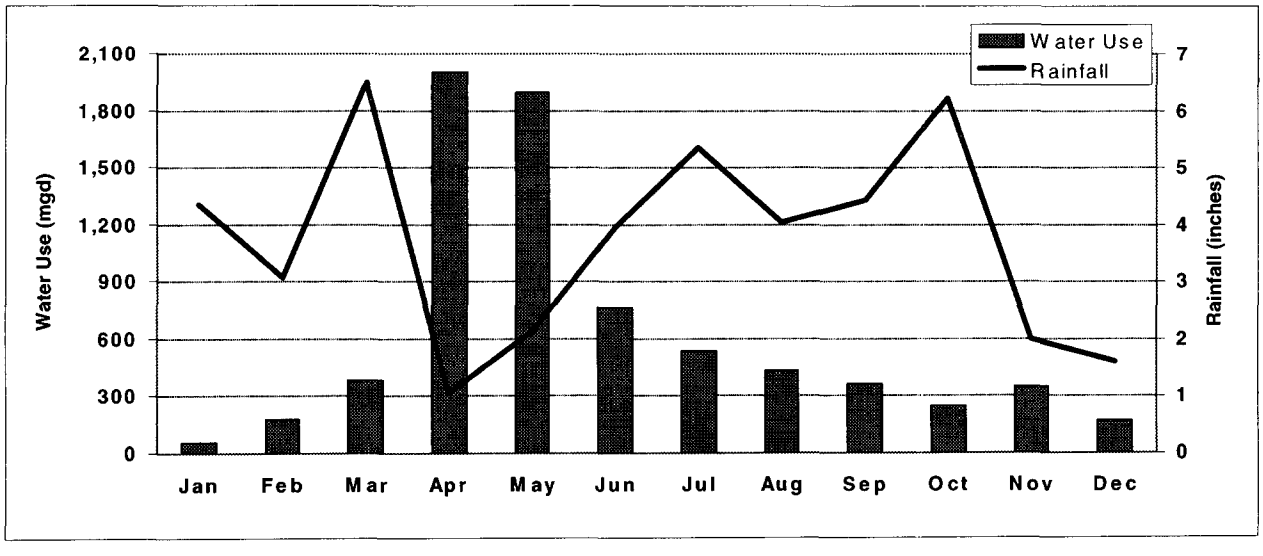

Figure 11. Monthly freshwater use for agricultural and recreational irrigation in the St. Johns River Water Management District, 1993. *Agricultural irrigation water use is inversely correlated to rainfall.*

Table 15. Monthly agricultural and recreational water use by county, 1993 (in million gallons per day)

County	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alachua	0.41	0.19	0.88	18.44	20.31	14.34	6.46	6.49	5.98	2.31	1.69	0.46
Baker	0.02	0.02	0.30	2.35	3.28	2.80	2.41	2.15	1.73	0.03	0.74	0.05
Bradford	0.03	0.03	0.10	0.66	0.41	0.27	0.18	0.18	0.26	0.01	0.09	0.04
Brevard	2.27	11.92	137.04	746.10	774.89	59.17	43.56	29.71	27.08	15.07	22.36	13.06
Clay	0.21	0.28	0.79	2.98	3.81	2.81	2.83	2.22	2.30	0.24	1.19	0.39
Duval	0.35	1.03	5.69	12.95	16.09	14.00	10.99	6.87	8.02	0.06	3.55	0.96
Flagler	0.06	4.59	8.59	31.56	14.70	8.67	3.01	2.51	6.02	8.06	8.38	1.04
Indian River	19.81	76.68	111.64	492.87	460.15	259.23	221.40	208.47	165.42	120.12	146.27	88.23
Lake	8.58	16.17	19.58	96.37	109.22	107.12	71.73	55.50	48.12	35.39	40.58	15.99
Marion	0.61	1.49	3.15	20.32	18.04	15.46	7.40	5.65	5.33	2.99	3.82	1.16
Nassau	0.15	0.26	0.86	3.14	3.97	3.54	3.27	2.80	2.64	0.39	1.30	0.30
Okeechobee	0.90	3.61	7.45	39.12	36.17	11.24	10.42	10.19	8.04	5.72	6.96	4.13
Orange	14.32	19.61	12.74	175.16	179.83	153.86	73.79	20.49	22.15	15.29	56.51	24.84
Osceola	0.00	1.55	1.16	80.53	83.39	8.41	7.59	6.87	5.69	3.38	5.02	2.67
Polk	0.00	2.58	0.43	7.20	8.52	9.89	5.19	6.84	6.19	2.49	5.24	1.88
Putnam	0.17	6.17	13.63	47.45	25.73	13.54	9.30	11.12	7.86	4.10	7.85	2.21
Seminole	0.69	4.96	5.14	24.03	24.32	21.54	14.26	13.17	10.56	8.71	9.79	3.32
St. Johns	0.18	19.07	47.44	152.28	64.02	13.52	5.55	4.98	7.38	3.52	7.46	0.99
Volusia	3.65	10.00	10.59	47.36	46.03	44.49	37.42	38.14	25.89	21.24	21.57	7.57
Total	52.41	180.21	387.20	2000.87	1892.88	763.90	536.76	434.35	366.66	249.12	350.37	169.29

Table 16. Monthly thermoelectric power generation water use by county, 1993 (in million gallons per day)

Fresh Ground	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alachua	0.00	0.02	0.37	0.49	0.06	0.24	0.44	0.47	0.25	0.05	0.03	0.02
Brevard	0.25	0.26	0.28	0.24	0.24	0.33	0.33	0.35	0.28	0.26	0.25	0.34
Duval	5.00	4.86	4.96	4.46	5.13	5.34	5.45	5.24	5.13	5.12	4.59	4.73
Indian River	0.05	0.04	0.04	0.12	0.04	0.05	0.18	0.22	0.08	0.04	0.06	0.07
Orange	0.36	0.31	0.29	0.30	0.30	0.30	0.29	0.29	0.28	0.28	0.29	0.27
Putnam	0.50	0.51	0.59	0.54	0.52	0.57	0.44	0.45	0.49	0.52	0.76	0.75
Volusia	0.50	0.56	0.45	0.55	0.66	0.66	0.67	0.58	0.50	0.67	0.58	0.63
Total	6.66	6.56	6.98	6.70	6.95	7.49	7.80	7.60	7.01	6.94	6.56	6.81
Fresh Surface	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Putnam	13.69	4.16	10.84	10.81	11.75	9.99	15.27	15.67	17.22	15.03	9.12	12.83
Volusia	58.71	124.07	101.65	96.13	156.60	152.18	61.69	154.86	148.91	152.76	76.79	128.67
Total	72.40	128.23	112.49	106.94	168.35	162.17	76.96	170.53	166.13	167.79	85.91	141.50
Saline Surface	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Brevard	1,080.23	1,042.93	1,206.23	1,058.33	850.23	1,418.03	1,505.74	1,479.97	1,095.77	920.32	793.50	972.71
Duval	194.35	368.20	454.24	179.32	335.12	663.72	777.11	850.22	719.79	320.89	490.21	501.09
Indian River	137.97	137.96	137.97	137.97	137.97	137.97	137.97	137.97	137.97	137.97	137.97	137.97
Total	1,412.55	1,549.09	1,798.44	1,375.62	1,323.32	2,219.72	2,420.82	2,468.16	1,953.53	1,379.18	1,421.68	1,611.77

Note: Counties not listed did not have any thermoelectric power generation water use in 1993

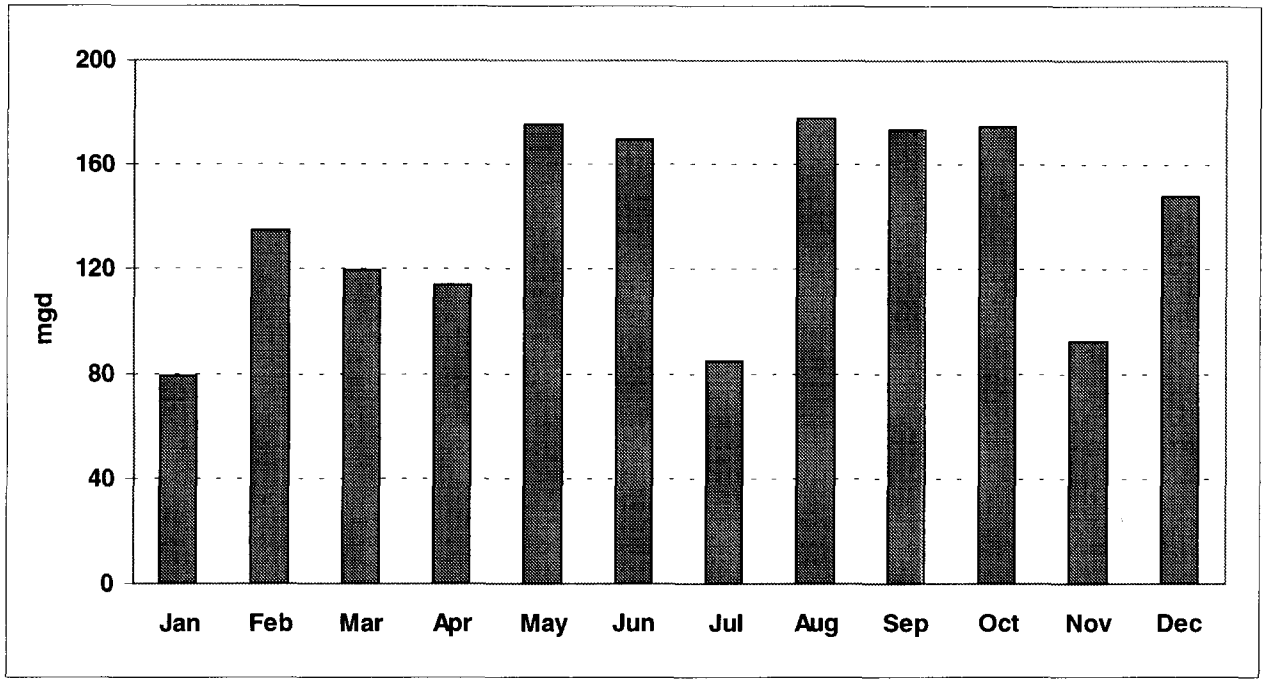

Figure 12. Monthly freshwater use for thermoelectric power generation in the St. Johns River Water Management District, 1993. *Monthly fluctuations in water use for power generation are due to increased seasonal power demands or plant shutdowns for maintenance.*

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 the St. Johns River Water Management District, 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 estimated annual average daily use determined by dividing the total quantity of water withdrawn from ground or surface water sources during the year (in gallons) by 365 days, except in a leap year. Total quantity is calculated by summing monthly totals reported in million gallons per month. Water use is reported in million gallons per day (mgd).

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

Per Capita Use. The average amount of water used per person during a standard time period, generally per day. Public supply per capita use refers to the amount of water withdrawn for all uses by public supply water, divided by the population served.

Potable Water. Water that meets the public drinking water quality standards for chloride and total dissolved solids set by the Florida 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 desalinization 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 the St. Johns River Water Management District. 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.

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APPENDIX: 1993 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 (University of Florida 1993), water withdrawals by category, and agricultural acreage and water use by crop.

Then, for each county, tables present population and land area totals, water withdrawals by category, the reported water use of large 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 Okeechobee and Osceola counties, which have only a small area in SJRWMD and where the numbers are very small. Some totals may not equal 100% because of rounding.

CONTENTS

STATE OF FLORIDA

Total population	13,608,627
Total area	53,937 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	3,375,486	Total area	7,096,817 (11,089 mi^2)
Public supply	2,858,527	Farmed	935,941
Self-supplied	516,959	Irrigated	375,731
Per capita	154		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total Fresh	Surface
Public supply	425.94	14.92	440.86	0.00
Domestic self-supply	82.20	0.00	82.20	0.00
Commercial/industrial use	99.46	34.28	133.74	0.09
Agricultural irrigation	357.17	213.09	570.26	0.00
Recreational irrigation	25.02	11.90	36.92	0.00
Thermoelectric power generation	7.00	129.96	136.96	1,746.11
Abandoned artesian wells	102.73	0.00	102.73	0.00
Total	1,099.52	404.15	1,503.67	1,746.20

Total ground	1,099.52
Total surface	2,150.35
SJRWMD total	3,249.87

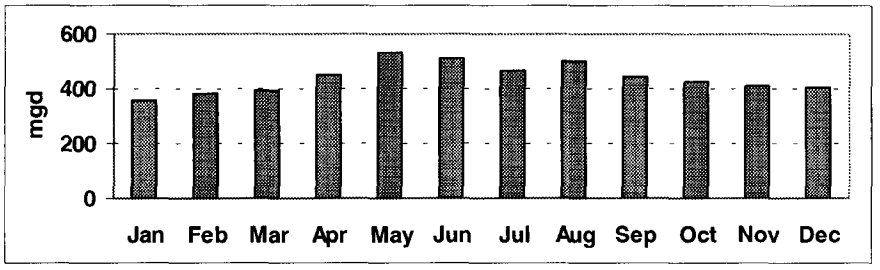


Figure A1. Monthly public supply water use in the St. Johns River Water Management District, 1993

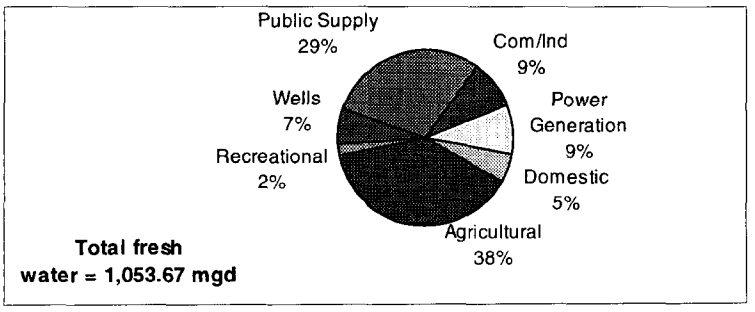


Figure A2. St. Johns River Water Management District—percentages, by category, of freshwater use, 1993

1993 Total St. Johns River Water Management District Agricultural and Recreational Water Use

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	6,245	5,795	3.92	0.09	4.01
Carrots	15,250	13,350	2.29	12.41	14.70
Cucumbers	2,470	2,310	1.75	0.14	1.89
Peppers	380	380	0.38	0.00	0.38
Potatoes	31,475	31,475	31.72	0.00	31.72
Tomatoes	95	95	0.10	0.00	0.10
Sweet corn	17,030	16,630	5.40	17.17	22.57
Watercress	150	150	0.67	0.00	0.67
Miscellaneous vegetables	26,112	24,000	11.68	20.58	32.26
Fruit Crops					
Blueberries	856	809	0.73	0.00	0.73
Citrus	112,641	103,889	92.20	116.78	208.98
Grapes	148	145	0.28	0.00	0.28
Peaches	102	102	0.23	0.00	0.23
Pecans	2,765	390	0.81	0.00	0.81
Strawberries	120	120	0.07	0.00	0.07
Watermelons	4,110	3,380	2.02	0.04	2.06
Miscellaneous fruit	415	305	1.02	0.02	1.04
Field Crops					
Field corn	17,740	8,740	7.60	3.21	10.81
Peanuts	2,250	209	0.21	0.00	0.21
Rice	50	50	0.18	0.00	0.18
Sorghum	9,000	2,150	2.44	0.18	2.62
Soybeans	300	200	0.13	0.13	0.26
Sugar cane	0	0	0.00	0.00	0.00
Tobacco	168	120	0.04	0.08	0.12
Wheat	1,150	1,000	0.70	0.00	0.70
Miscellaneous grains	7,894	510	0.34	0.15	0.49
Ornamentals and Grasses					
Ferns	8,190	7,590	17.43	3.53	20.96
Foliage	1,976	1,976	5.74	0.37	6.11
Woody ornamentals	3,239	2,893	6.28	0.79	7.07
Improved pasture	633,580	125,178	152.16	34.26	186.42
Sod	6,986	6,856	6.16	2.73	8.89
Turf grass (other)	2,597	2,559	2.49	0.43	2.92
Total Agricultural	915,484	363,356	357.17	213.09	570.26
Recreational					
Turf grass (golf)	20,457	12,375	25.02	11.90	36.92
Grand total	935,941	375,731	382.19	224.99	607.18

Sprinkler acreage	78,153
Flood acreage	239,367
Low volume acreage	58,211
Total irrigated acreage	375,731

ALACHUA COUNTY

Total population	190,655
Total area	874 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	154,812	Total area	280,799 (439 mi^2)
Public supply	139,783	Farmed	38,830
Self-supplied	15,029	Irrigated	5,773
Per capita	155		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	21.60	0.00	21.60	0.00
Domestic self-supply	2.33	0.00	2.33	0.00
Commercial/industrial use	1.94	0.00	1.94	0.00
Agricultural irrigation	5.16	0.03	5.19	0.00
Recreational irrigation	0.71	0.09	0.80	0.00
Thermoelectric power generation	0.20	0.00	0.20	0.00
Abandoned artesian wells	0.24	0.00	0.24	0.00
Total	32.18	0.12	32.30	0.00
Total ground	32.18			
Total surface	0.12			
County total	32.30			

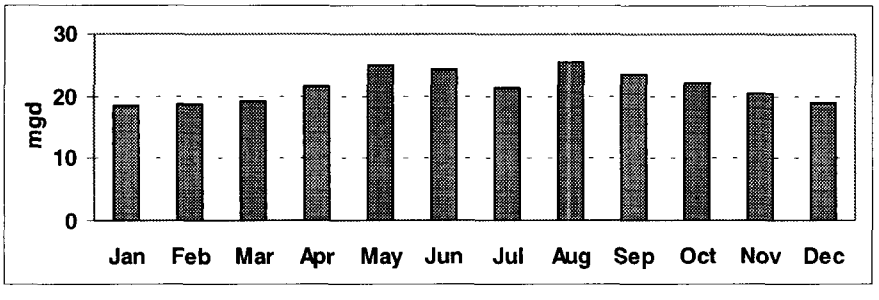


Figure A3. Monthly public supply water use in Alachua County, 1993

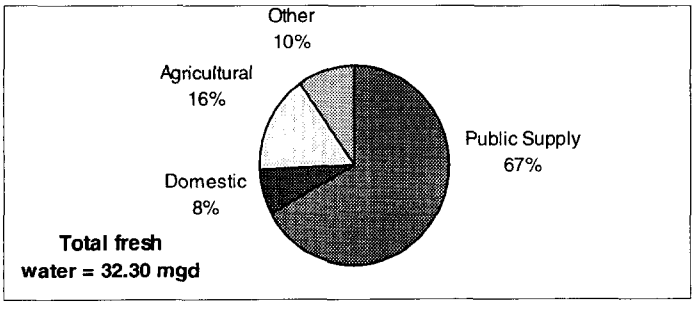


Figure A4. Alachua County—percentages, by category, of freshwater use, 1993. *The "other" category includes abandoned artesian wells, commercial/industrial, thermoelectric power generation, and recreational irrigation water use.*

1993 Water Users in Alachua County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Arredondo Utility	Public supply	700	0.06	Floridan aquifer	0.00	
Gainesville, City of	Public supply	135,000	21.06	Floridan aquifer	0.00	
Hawthorne, City of	Public supply	1,400	0.20	Floridan aquifer	0.00	
Kincaid Hills subdivision	Public supply	900	0.10	Floridan aquifer	0.00	
Micanopy, Town of	Public supply	837	0.09	Floridan aquifer	0.00	
Oak Park MHP	Public supply	621	0.06	Floridan aquifer	0.00	
West Gate MHP	Public supply	325	0.03	Floridan aquifer	0.00	
Total Public Supply		139,783	21.60		0.00	
Sunland Training Center	Institutional		0.23	Floridan aquifer	0.00	
University of Florida	Institutional		1.71	Floridan aquifer	0.00	
Total Commercial/Industrial			1.94		0.00	
Gainesville Regional Utilities—J.R. Kelly	Power generation		0.20	Floridan aquifer	0.00	
Total Power Generation			0.20		0.00	

Note: MHP = mobile home park

1993 Agricultural and Recreational Water Use in Alachua County

	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	0.15	0.00	0.15
Peppers	250	250	0.22	0.00	0.22
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	200	200	0.24	0.00	0.24
Watercress	0	0	0.00	0.00	0.00
Miscellaneous vegetables	1,300	1,300	1.26	0.00	1.26
Fruit Crops					
Blueberries	450	450	0.40	0.00	0.40
Citrus	0	0	0.00	0.00	0.00
Grapes	30	30	0.05	0.00	0.05
Peaches	15	15	0.03	0.00	0.03
Pecans	2,600	300	0.59	0.00	0.59
Strawberries	5	5	0.00	0.00	0.00
Watermelons	1,100	1,100	0.65	0.00	0.65
Miscellaneous fruit	90	80	0.21	0.00	0.21
Field crops					
Field corn	1,200	100	0.07	0.00	0.07
Peanuts	200	75	0.07	0.00	0.07
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
Miscellaneous grains	1,500	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	4	4	0.01	0.00	0.01
Woody ornamentals	100	100	0.17	0.03	0.20
Improved pasture	28,500	680	0.59	0.00	0.59
Sod	100	50	0.05	0.00	0.05
Turf grass (other)	406	406	0.40	0.00	0.40
Total Agricultural	38,350	5,445	5.16	0.03	5.19
Recreational					
Turf grass (golf)	480	328	0.71	0.09	0.80

Sprinkler acreage	5,218
Flood acreage	0
Low volume acreage	555
Total irrigated acreage	5,773

BAKER COUNTY

Total population	19,527
Total area	585 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	18,551	Total area	341,453 (534 mi^2)
Public supply	4,220	Farmed	14,921
Self-supplied	14,331	Irrigated	765
Per capita	180		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total Fresh	Surface
Public supply	0.76	0.00	0.76	0.00
Domestic self-supply	2.58	0.00	2.58	0.00
Commercial/industrial use	0.20	0.00	0.20	0.00
Agricultural irrigation	0.71	0.44	1.15	0.00
Recreational irrigation	0.15	0.00	0.15	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.00	0.00	0.00	0.00
Total	4.40	0.44	4.84	0.00

Total ground	4.40
Total surface	0.44
County total	4.84

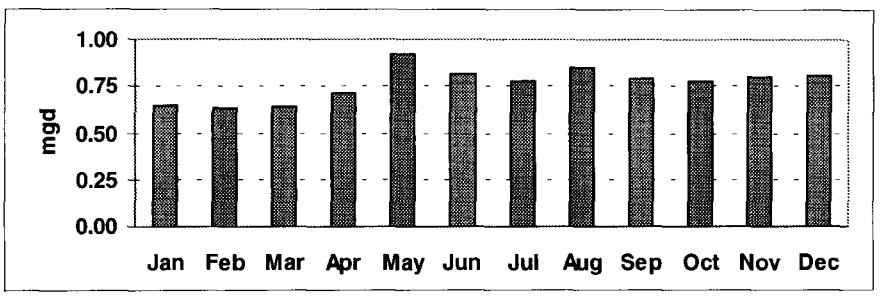


Figure A5. Monthly public supply water use in Baker County, 1993

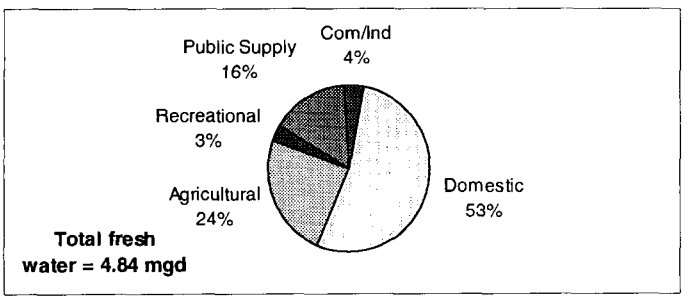


Figure A6. Baker County—percentages, by category, of freshwater use, 1993

1993 Water Users in Baker County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
MacClenny, City of	Public supply	4,100	0.73	Floridan aquifer	0.00	
MacClenny subdivision	Public supply	120	0.03	Floridan aquifer	0.00	
Total Public Supply		4,220	0.76		0.00	
Florida Wire and Cable	Industrial		0.03	Floridan aquifer	0.00	
Northeast Florida State Hospital	Institutional		0.17	Floridan aquifer	0.00	
Total Commercial/Industrial			0.20		0.00	

1993 Agricultural and Recreational Water Use in Baker County

	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	0.02	0.00	0.02
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	100	0	0.00	0.00	0.00
Watercress	0	0	0.00	0.00	0.00
Miscellaneous vegetables	522	100	0.10	0.00	0.10
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	0.03	0.00	0.03
Miscellaneous 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	0.08	0.08
Wheat	150	0	0.00	0.00	0.00
Miscellaneous grains	1,584	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	0	0	0.00	0.00	0.00
Woody ornamentals	763	420	0.55	0.36	0.91
Improved pasture	10,000	0	0.00	0.00	0.00
Sod	0	0	0.00	0.00	0.00
Turf grass (other)	0	0	0.00	0.00	0.00
Total Agricultural	14,797	705	0.71	0.44	1.15
Recreational					
Turf grass (golf)	124	60	0.15	0.00	0.15

Sprinkler acreage	660
Flood acreage	0
Low volume acreage	105
Total irrigated acreage	765

BRADFORD COUNTY

Total population	23,312
Total area	293 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	1,748	Total area	3,750 (6 mi^2)
Public supply	374	Farmed	200
Self-supplied	1,374	Irrigated	190
Per capita	107		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total Fresh	Surface
Public supply	0.04	0.00	0.04	0.00
Domestic self-supply	0.15	0.00	0.15	0.00
Commercial/industrial use	0.00	0.00	0.00	0.00
Agricultural irrigation	0.09	0.00	0.09	0.00
Recreational irrigation	0.07	0.00	0.07	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.00	0.00	0.00	0.00
Total	0.35	0.00	0.35	0.00

Total ground	0.35
Total surface	0.00
County total	0.35

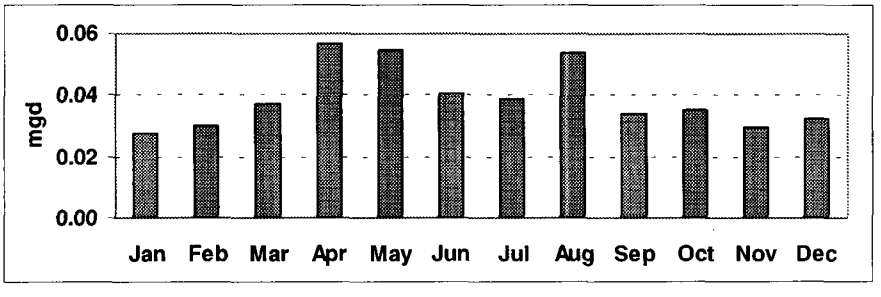


Figure A7. Monthly public supply water use in Bradford County, 1993

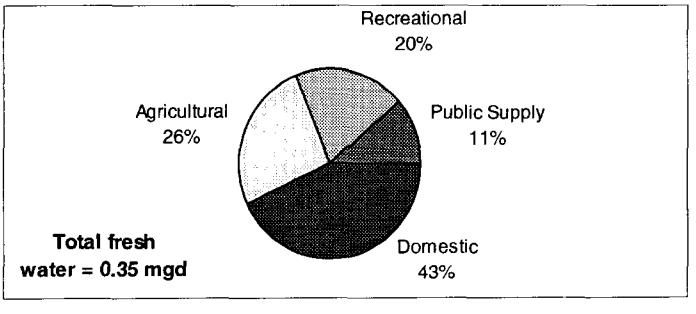


Figure A8. Bradford County—percentages, by category, of freshwater use, 1993

1993 Water Users in Bradford County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Keystone Club Estates	Public supply	374	0.04	Floridan aquifer	0.00	
Total Public Supply		374	0.04		0.00	

1993 Agricultural and Recreational Water Use in Bradford County

	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	0.02	0.00	0.02
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
Miscellaneous vegetables	50	50	0.04	0.00	0.04
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	0.02	0.00	0.02
Watermelons	0	0	0.00	0.00	0.00
Miscellaneous 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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
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 (other)	10	10	0.01	0.00	0.01
Total Agricultural	160	160	0.09	0.00	0.09
Recreational					
Turf grass (golf)	40	30	0.07	0.00	0.07

Sprinkler acreage	190
Flood acreage	0
Low volume acreage	0
Total irrigated acreage	190

BREVARD COUNTY

Total population	427,035
Total area	1,019 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	427,035	Total area	652,160 (1,019 mi^2)
Public supply	419,162	Farmed	144,163
Self-supplied	7,873	Irrigated	98,878
Per capita	123		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply*	36.46	14.92	51.38	0.00
Domestic self-supply	0.97	0.00	0.97	0.00
Commercial/industrial use	0.15	0.00	0.15	0.00
Agricultural irrigation	139.42	11.18	150.60	0.00
Recreational irrigation	1.74	2.88	4.62	0.00
Thermoelectric power generation	0.28	0.00	0.28	1,119.58
Abandoned artesian wells	52.35	0.00	52.35	0.00
Total	231.37	28.98	260.35	1,119.58

Total ground	231.37
Total surface	1,148.56
County total	1,379.93

*Includes slightly saline water (250 to 1,000 mg/L chlorides) treated through reverse osmosis and diluted with fresh water. Includes 25.06 mgd of water withdrawn in Orange County for public supply use in Brevard County

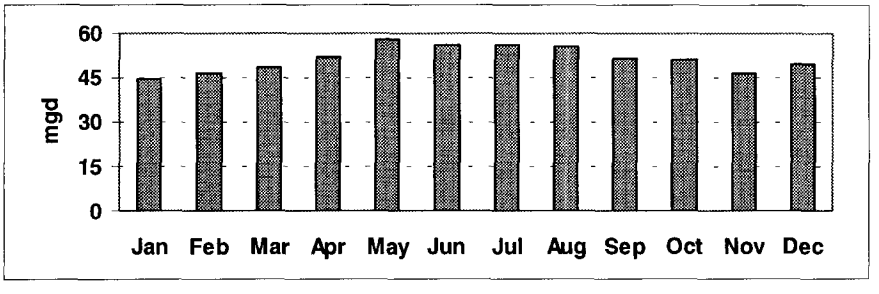


Figure A9. Monthly public supply water use in Brevard County, 1993

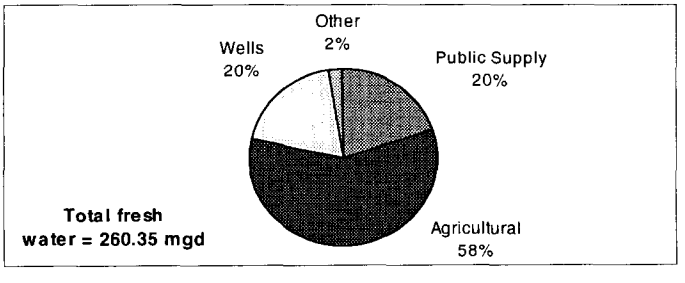


Figure A10. Brevard County—percentages, by category, of freshwater use, 1993. *The "other" category includes commercial/ industrial, thermoelectric power generation, recreational irrigation, and domestic self-supply water use.*

1993 Water Users in Brevard County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Aquarina Utilities	Public supply	200	0.02	Floridan aquifer and R/O	0.00	
Avatar Utilities	Public supply	8,600	0.57	Surficial aquifer	0.00	
Cocoa Wellfield*	Public supply	146,450	25.06	Floridan aquifer	0.00	
Melbourne, City of	Public supply	146,500			14.92	Lake Washington
N. Brevard Utilities	Public supply	5,172	0.61	Surficial aquifer	0.00	
Palm Bay Utilities	Public supply	71,141	4.70	Floridan and surficial aquifers	0.00	
S. Brevard Utilities	Public supply	760	0.07	Floridan aquifer and R/O	0.00	
Titusville	Public supply	40,339	5.43	Floridan aquifer	0.00	
Total Public Supply		419,162	36.46		14.92	
FDOT I-95 rest facility	Institutional		0.02	Surficial aquifer	0.00	
Harris Corp.	Industrial		0.03	Surficial aquifer	0.00	
Praxair, Inc.	Industrial		0.10	Surficial aquifer	0.00	
Total Commercial/Industrial			0.15		0.00	
FPL, Cape Canaveral	Power generation		0.18	Surficial aquifer	601.64	Indian River[1]
OUC, Indian River	Power generation		0.10	Surficial aquifer	517.94	Indian River[1]
Total Power Generation			0.28		1,119.58	

Note: R/O = reverse osmosis
FDOT = Florida Department of Transportation
FPL = Florida Power & Light
OUC = Orlando Utilities Commission

*Water withdrawn from Orange County
[1]Saline water

1993 Agricultural and Recreational Water Use in Brevard County

	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	1.31	0.00	1.31
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
Miscellaneous vegetables	100	100	0.12	0.00	0.12
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	11,500	6,450	9.28	3.61	12.89
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	40	40	0.03	0.00	0.03
Watermelons	320	300	0.25	0.04	0.29
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	2,500	2,500	3.25	0.00	3.25
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	1,800	1,800	2.24	0.00	2.24
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	1,000	1,000	0.70	0.00	0.70
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	10	10	0.03	0.00	0.03
Woody ornamentals	190	190	0.52	0.00	0.52
Improved pasture	121,700	81,860	120.16	6.32	126.48
Sod	1,300	1,300	0.80	1.20	2.00
Turf grass (other)	603	603	0.73	0.01	0.74
Total Agricultural	142,363	97,453	139.42	11.18	150.60
Recreational					
Turf grass (golf)	1,800	1,425	1.74	2.88	4.62

Sprinkler acreage	4,278
Flood acreage	90,300
Low volume acreage	4,300
Total irrigated acreage	98,878

CLAY COUNTY

Total population	114,918
Total area	601 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	114,918	Total area	384,640 (601 mi^2)
Public supply	77,734	Farmed	44,541
Self-supplied	37,184	Irrigated	749
Per capita	121		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	9.43	0.00	9.43	0.00
Domestic self-supply	4.50	0.00	4.50	0.00
Commercial/industrial use	6.22	0.00	6.22	0.00
Agricultural irrigation	0.54	0.00	0.54	0.00
Recreational irrigation	0.70	0.36	1.06	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.51	0.00	0.51	0.00
Total	21.90	0.36	22.26	0.00
Total ground	21.90			
Total surface	0.36			
County total	22.26			

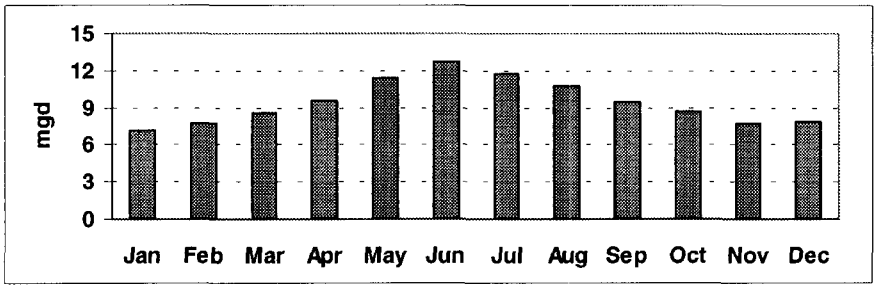


Figure A11. Monthly public supply water use in Clay County, 1993

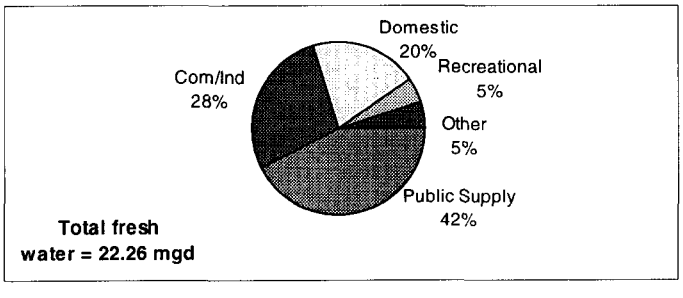


Figure A12. Clay County—percentages, by category, of freshwater use, 1993. *The "other" category includes abandoned artesian wells and agricultural irrigation water use.*

1993 Water Users in Clay County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Clay Utilities	Public supply	4,728	0.47	Floridan aquifer	0.00	
Green Cove Springs	Public supply	5,300	0.87	Floridan aquifer	0.00	
Keystone Heights	Public supply	3,300	0.36	Floridan aquifer	0.00	
Kingsley Service	Public supply	49,900	5.70	Floridan aquifer	0.00	
Lake Asbury	Public supply	2,100	0.24	Floridan aquifer	0.00	
Magnolia Apts.	Public supply	800	0.10	Floridan aquifer	0.00	
McRae Landing	Public supply	270	0.03	Floridan aquifer	0.00	
Orange Park	Public supply	9,970	1.50	Floridan aquifer	0.00	
Penney Farms, Town of	Public supply	651	0.04	Floridan aquifer	0.00	
Penney Retirement Community	Public supply	450	0.07	Floridan aquifer	0.00	
The Ravines Village & Resort	Public supply	265	0.05	Floridan aquifer	0.00	
Total Public Supply		77,734	9.43		0.00	
Camp Blanding Military Base	Institutional		0.34	Floridan aquifer	0.00	
E.I. DuPont	Industrial*		2.18	Floridan aquifer	0.00	
FRI-Goldhead Sand	Industrial*		2.07	Floridan aquifer	0.00	
J-M Manufacturing	Industrial		0.06	Floridan aquifer	0.00	
Paramount Poultry	Industrial		0.01	Floridan aquifer	0.00	
Reynolds Industrial Park	Industrial		0.30	Floridan aquifer	0.00	
RGC Mineral Sands	Industrial*		1.26	Floridan aquifer	0.00	
Total Commercial/Industrial			6.22		0.00	

Note: FRI = Florida Rock Industries

*Mining industry

1993 Agricultural and Recreational Water Use in Clay County

	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
Miscellaneous vegetables	200	60	0.06	0.00	0.06
Fruit Crops					
Blueberries	15	13	0.01	0.00	0.01
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
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	800	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
Miscellaneous grains	2,800	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	50	50	0.15	0.00	0.15
Woody ornamentals	0	0	0.00	0.00	0.00
Improved pasture	40,000	100	0.15	0.00	0.15
Sod	0	0	0.00	0.00	0.00
Turf grass (other)	146	146	0.17	0.00	0.17
Total Agricultural	44,011	369	0.54	0.00	0.54
Recreational					
Turf grass (golf)	530	380	0.70	0.36	1.06

Sprinkler acreage	636
Flood acreage	110
Low volume acreage	3
Total irrigated acreage	749

DUVAL COUNTY

Total population	701,608
Total area	774 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	701,608	Total area	495,360 (774 mi^2)
Public supply	647,398	Farmed	16,442
Self-supplied	54,210	Irrigated	2,965
Per capita	154		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	99.78	0.00	99.78	0.00
Domestic self-supply	8.35	0.00	8.35	0.00
Commercial/industrial use	23.41	0.00	23.41	0.00
Agricultural irrigation	1.93	0.12	2.05	0.00
Recreational irrigation	3.48	0.84	4.32	0.00
Thermoelectric power generation	5.00	0.00	5.00	488.56
Abandoned artesian wells	9.75	0.00	9.75	0.00
Total	151.70	0.96	152.66	488.56
Total ground	151.70			
Total surface	489.52			
County total	641.22			

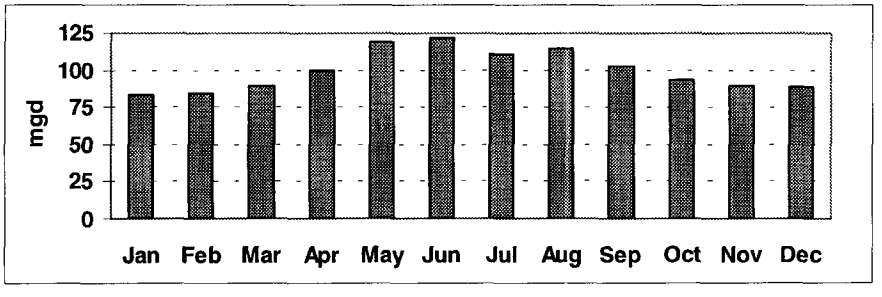


Figure A13. Monthly public supply water use in Duval County, 1993

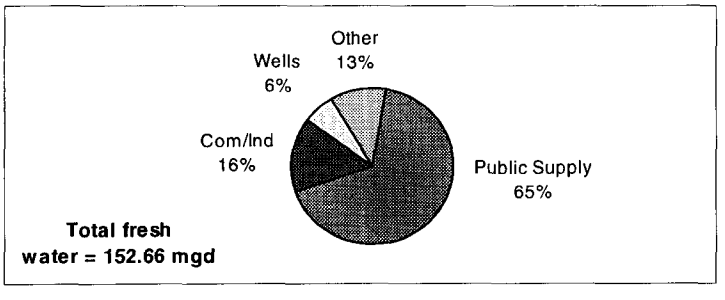


Figure A14. Duval County—percentages, by category, of freshwater use, 1993. *The "other" category includes thermoelectric power generation, domestic self-supply, recreational irrigation, and agricultural irrigation water use.*

1993 Water Users in Duval County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Atlantic Beach, City of	Public supply	15,460	3.05	Floridan aquifer	0.00	
Baldwin, City of	Public supply	1,513	0.20	Floridan aquifer	0.00	
Beauclerc Utilities	Public supply	7,210	0.73	Floridan aquifer	0.00	
Canal Utilities	Public supply	9,092	2.43	Floridan aquifer	0.00	
Jacksonville	Public supply	470,280	73.14	Floridan aquifer	0.00	
Jacksonville Beach, City of	Public supply	19,234	2.80	Floridan aquifer	0.00	
Jacksonville Suburban Utilities	Public supply	76,160	10.62	Floridan aquifer	0.00	
Lamplighter MHP	Public supply	735	0.09	Floridan aquifer	0.00	
Neighborhood Utilities	Public supply	531	0.04	Floridan aquifer	0.00	
Neptune Beach, City of	Public supply	7,235	1.38	Floridan aquifer	0.00	
Normandy Village Utilities	Public supply	4,172	0.52	Floridan aquifer	0.00	
Oaks of Atlantic Beach	Public supply	866	0.09	Floridan aquifer	0.00	
Ortega Utilities	Public supply	8,850	1.00	Floridan aquifer	0.00	
Regency Utilities	Public supply	4,900	0.90	Floridan aquifer	0.00	
Southern Gulf	Public supply	2,148	0.20	Floridan aquifer	0.00	
Southern States Utilities	Public supply	16,482	2.37	Floridan aquifer	0.00	
Springtree Village	Public supply	2,530	0.22	Floridan aquifer	0.00	
Total Public Supply		647,398	99.78		0.00	
Building (Celotex)	Industrial		0.03	Floridan aquifer	0.00	
Castleton Beverages Company	Industrial		0.07	Floridan aquifer	0.00	
Gate Maritime	Industrial		0.07	Floridan aquifer	0.00	
JPA - Blount Island	Industrial		0.09	Floridan aquifer	0.00	
Reinhold Chemical Company	Industrial		0.18	Floridan aquifer	0.00	
Simplex Mfg. Company	Industrial		0.28	Floridan aquifer	0.00	
Swisher & Son Mfg. Company	Industrial		1.26	Floridan aquifer	0.00	
Jefferson Smurfit	Industrial*		6.73	Floridan aquifer	0.00	
Seminole Kraft Paper Company	Industrial*		10.22	Floridan aquifer	0.00	
Cecil Field NAS	Institutional		0.38	Floridan aquifer	0.00	
Dinsmore Correctional Facility	Institutional		0.01	Floridan aquifer	0.00	
FDOT, I-10 rest facility†	Institutional		0.00	Floridan aquifer	0.00	
Jacksonville Int. Airport	Institutional		0.24	Floridan aquifer	0.00	
Jacksonville NAS	Institutional		1.62	Floridan aquifer	0.00	
Jacksonville University	Institutional		0.42	Floridan aquifer	0.00	
Jacksonville Zoo†	Institutional		0.00	Floridan aquifer	0.00	
Mayport NAS	Institutional		1.81	Floridan aquifer	0.00	
Total Commercial/Industrial			23.41		0.00	

1993 Water Users in Duval County—*Continued*

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
JEA-Eastport Power	Power generation		0.92	Floridan aquifer	436.82	St. Johns River**
SJR Power Park	Power generation		4.08	Floridan aquifer	51.74	St. Johns River**
Total Power Generation			5.00		488.56	

Note: MHP = mobile home park
JPA = Jacksonville Port Authority
NAS = Naval Air Station
FDOT = Florida Department of Transportation
JEA = Jacksonville Electric Authority
SJR = St. Johns River

*Pulp and paper industry
†Pumpage less than 0.01 mgd
**Saline water

1993 Agricultural and Recreational Water Use in Duval County

	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
Miscellaneous vegetables	200	10	0.01	0.00	0.01
Fruit Crops					
Blueberries	18	13	0.01	0.00	0.01
Citrus	0	0	0.00	0.00	0.00
Grapes	10	7	0.02	0.00	0.02
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
Miscellaneous 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
Miscellaneous grains	200	200	0.18	0.00	0.18
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	12	12	0.03	0.00	0.03
Woody ornamentals	60	60	0.15	0.00	0.15
Improved pasture	12,000	500	0.63	0.00	0.63
Sod	600	600	0.70	0.12	0.82
Turf grass (other)	150	150	0.20	0.00	0.20
Total Agricultural	13,450	1,552	1.93	0.12	2.05
Recreational					
Turf grass (golf)	2,992	1,413	3.48	0.84	4.32

Sprinkler acreage	2,891
Flood acreage	40
Low volume acreage	34
Total irrigated acreage	2,965

FLAGLER COUNTY

Total population	33,544
Total area	485 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	33,544	Total area	310,400 (485 mi^2)
Public supply	23,904	Farmed	25,067
Self-supplied	9,640	Irrigated	7,602
Per capita	170		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	4.07	0.00	4.07	0.00
Domestic self-supply	1.64	0.00	1.64	0.00
Commercial/industrial use	0.17	0.00	0.17	0.00
Agricultural irrigation	7.01	0.15	7.16	0.00
Recreational irrigation	0.13	0.89	1.02	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.14	0.00	0.14	0.00
Total	13.16	1.04	14.20	0.00

Total ground	13.16
Total surface	1.04
County total	14.20

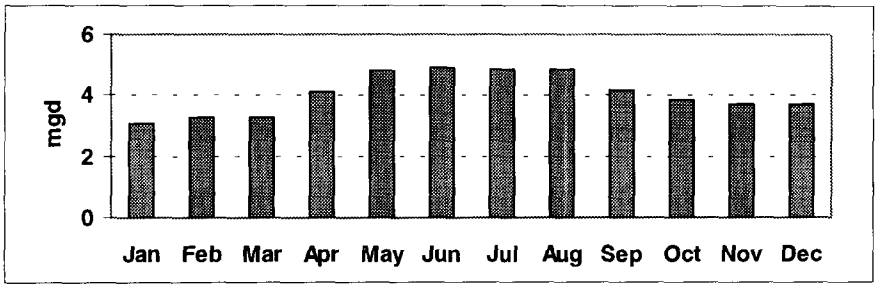


Figure A15. Monthly public supply water use in Flagler County, 1993

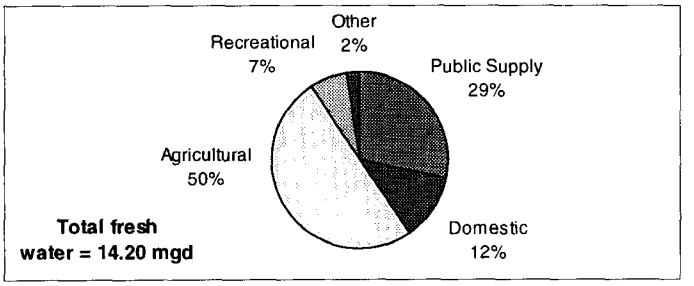


Figure A16. Flagler County—percentages, by category, of freshwater use, 1993. *The "other" includes abandoned artesian wells and commercial/ industrial water use.*

1993 Water Users in Flagler County

User Utility/Facility	Category	Population *Served*	Ground *Water* (mgd)	Withdrawal *Source*	Surface *Water* (mgd)	Withdrawal *Source*
Beverly Beach Utility	Public supply	322	0.05	Floridan aquifer	0.00	
Bunnell, City of	Public supply	2,120	0.31	Floridan aquifer	0.00	
Flagler Beach, City of	Public supply	4,000	0.50	Floridan aquifer	0.00	
Palm Coast Utilities	Public supply	17,100	3.11	Floridan aquifer	0.00	
Plantation Bay	Public supply	362	0.10	Floridan aquifer	0.00	
Total Public Supply		23,904	4.07		0.00	
Bulow KOA	Institutional		0.08	Floridan aquifer	0.00	
Holiday Travel Park	Institutional		0.01	Floridan aquifer	0.00	
Marineland	Institutional		0.05	Floridan aquifer	0.00	
Rinker Materials	Industrial		0.03	Floridan aquifer	0.00	
Total Commercial/Industrial			0.17		0.00	

1993 Agricultural and Recreational Water Use in Flagler County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	2,000	2,000	1.47	0.00	1.47
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	3,000	3,000	3.02	0.00	3.02
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
Miscellaneous vegetables	1,000	1,000	1.18	0.00	1.18
Fruit Crops					
Blueberries	20	20	0.02	0.00	0.02
Citrus	50	50	0.11	0.00	0.11
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	0.06	0.00	0.06
Miscellaneous 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	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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	0	0	0.00	0.00	0.00
Woody ornamentals	5	5	0.01	0.00	0.01
Improved pasture	16,580	695	0.89	0.00	0.89
Sod	300	220	0.24	0.00	0.24
Turf grass (other)	150	150	0.01	0.15	0.16
Total Agricultural	24,705	7,240	7.01	0.15	7.16
Recreational					
Turf grass (golf)	362	362	0.13	0.89	1.02

Sprinkler acreage	1,652
Flood acreage	5,950
Low volume acreage	0
Total irrigated acreage	7,602

INDIAN RIVER COUNTY

Total population	95,641
Total area	503 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	95,641	Total area	321,920 (503 mi^2)
Public supply	61,869	Farmed	136,180
Self-supplied	33,772	Irrigated	96,308
Per capita	184		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply*	11.39	0.00	11.39	0.00
Domestic self-supply	6.21	0.00	6.21	0.00
Commercial/industrial use	0.18	0.00	0.18	0.00
Agricultural irrigation	59.00	132.50	191.50	0.00
Recreational irrigation	2.80	1.38	4.18	0.00
Thermoelectric power generation	0.08	0.00	0.08	137.97
Abandoned artesian wells	17.68	0.00	17.68	0.00
Total	97.34	133.88	231.22	137.97
Total ground	97.34			
Total surface	271.85			
County total	369.19			

*Includes slightly saline water (250 to 1,000 mg/L chlorides) treated through reverse osmosis and diluted with fresh water

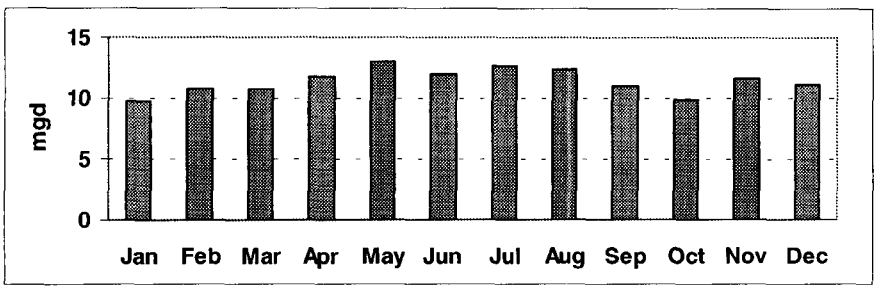


Figure A17. Monthly public supply water use in Indian River County, 1993

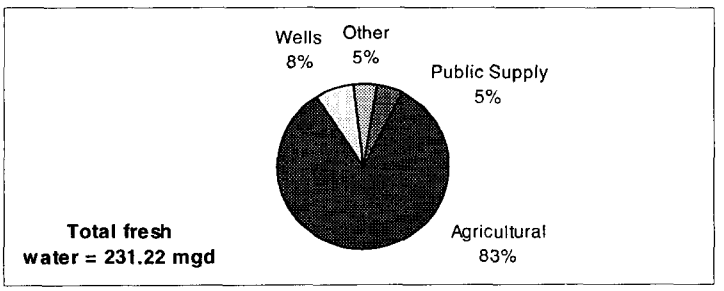


Figure A18. Indian River County—percentages, by category, of freshwater use, 1993. *The "other" category includes commercial/industrial, thermoelectric power generation, recreational irrigation, and domestic self-supply water use.*

1993 Water Users in Indian River County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Indian River County Utilities	Public supply	19,247	3.38	Floridan aquifer and R/O	0.00	
Lakewood Village	Public supply	940	0.04	Surficial aquifer	0.00	
North Beach	Public supply	2,011	0.26	Floridan aquifer	0.00	
Sebastian	Public supply	2,901	0.37	Floridan aquifer	0.00	
Vero Beach, City of	Public supply	35,997	7.31	Floridan and surficial aquifers	0.00	
Whispering Palms MHP	Public supply	773	0.03	Floridan aquifer and R/O	0.00	
Total Public Supply		61,869	11.39		0.00	
Fellsmere Packing House	Industrial		0.02	Surficial aquifer	0.00	
Ocean Spray processing plant	Industrial		0.11	Floridan and surficial aquifers	0.00	
Indian River Correctional Facility	Institutional		0.03	Surficial aquifer	0.00	
Sebastian Medical Center	Institutional		0.02	Surficial aquifer	0.00	
Total Commercial/Industrial			0.18		0.00	
Vero Beach Municipal Power Plant	Power generation		0.08	Floridan aquifer	137.97	Indian River*
Total Power Generation			0.08		137.97	

Note: R/O = reverse osmosis
MHP = mobile home park

*Saline water

1993 Agricultural and Recreational Water Use in Indian River County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	150	150	0.13	0.00	0.13
Carrots	50	50	0.07	0.00	0.07
Cucumbers	0	0	0.00	0.00	0.00
Peppers	0	0	0.00	0.00	0.00
Potatoes	100	100	0.10	0.00	0.10
Tomatoes	10	10	0.01	0.00	0.01
Sweet corn	700	700	0.68	0.68	1.36
Watercress	150	150	0.67	0.00	0.67
Miscellaneous vegetables	2,020	2,020	1.57	1.57	3.14
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	65,446	65,446	36.12	108.37	144.49
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	0.05	0.00	0.05
Miscellaneous fruit	100	100	0.46	0.00	0.46
Field Crops					
Field corn	2,000	2,000	0.00	2.80	2.80
Peanuts	0	0	0.00	0.00	0.00
Rice	50	50	0.18	0.00	0.18
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
Miscellaneous grains	300	300	0.15	0.15	0.30
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	25	25	0.07	0.00	0.07
Woody ornamentals	60	60	0.15	0.00	0.15
Improved pasture	62,208	22,747	17.97	17.97	35.94
Sod	1,000	1,000	0.60	0.90	1.50
Turf grass (other)	54	54	0.00	0.06	0.06
Total Agricultural	134,543	95,032	59.00	132.50	191.50
Recreational					
Turf grass (golf)	1,637	1,276	2.80	1.38	4.18

Sprinkler acreage	2,040
Flood acreage	67,545
Low volume acreage	26,723
Total irrigated acreage	96,308

LAKE COUNTY

Total population	167,167
Total area	953 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	165,495	Total area	555,637 (868 mi^2)
Public supply	132,272	Farmed	82,722
Self-supplied	33,223	Irrigated	31,186
Per capita	165		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	21.78	0.00	21.78	0.00
Domestic self-supply	5.48	0.00	5.48	0.00
Commercial/industrial use	4.40	1.14	5.54	0.00
Agricultural irrigation	38.98	9.57	48.55	0.00
Recreational irrigation	1.35	1.10	2.45	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	1.12	0.00	1.12	0.00
Total	73.11	11.81	84.92	0.00
Total ground	73.11			
Total surface	11.81			
County total	84.92			

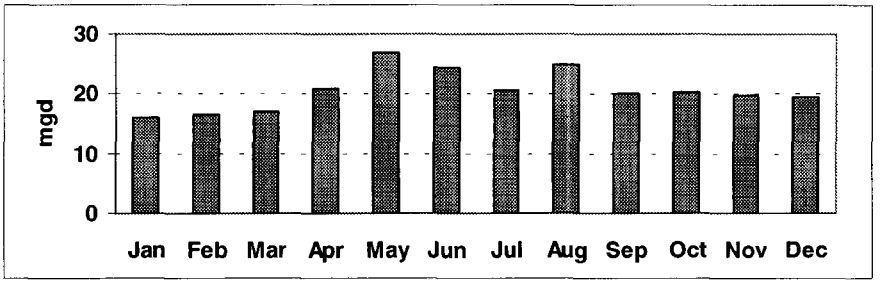


Figure A19. Monthly public supply water use in Lake County, 1993

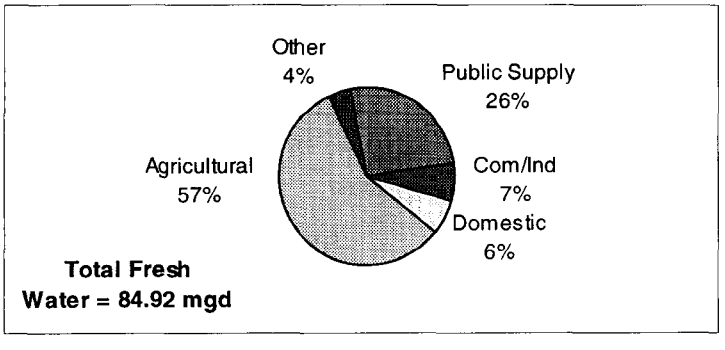


Figure A20. Lake County—percentages, by category, of freshwater use, 1993. *The "other" category includes abandoned artesian wells and recreational irrigation water use.*

1993 Water Users in Lake County

Utility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Astor Park Water Association	Public supply	3,577	0.25	Floridan aquifer	0.00	
Brittany Estates	Public supply	315	0.06	Floridan aquifer	0.00	
Clermont, City of	Public supply	7,013	1.57	Floridan aquifer	0.00	
Deanza, Mid Florida Lakes	Public supply	2,675	0.41	Floridan aquifer	0.00	
Eustis, City of	Public supply	22,445	2.54	Floridan aquifer	0.00	
Fruitland Park, City of	Public supply	4,025	0.44	Floridan aquifer	0.00	
Groveland, City of	Public supply	2,373	0.28	Floridan aquifer	0.00	
Hawthorne @ Leesburg	Public supply	2,930	0.48	Floridan aquifer	0.00	
Howey-in-the-Hills, Town of	Public supply	1,400	0.22	Floridan aquifer	0.00	
Lady Lake	Public supply	4,990	0.29	Floridan aquifer	0.00	
Lakeview Terrace Center	Public supply	271	0.04	Floridan aquifer	0.00	
Leesburg, City of	Public supply	23,783	4.68	Floridan aquifer	0.00	
Mascotte, Town of	Public supply	1,775	0.21	Floridan aquifer	0.00	
Minneola, City of	Public supply	1,783	0.24	Floridan aquifer	0.00	
Molakai Park Water System	Public supply	675	0.03	Floridan aquifer	0.00	
Monteverde, Town of	Public supply	1,050	0.15	Floridan aquifer	0.00	
Mount Dora, City of	Public supply	18,389	2.81	Floridan aquifer	0.00	
South Umatilla Water Association	Public supply	315	0.06	Floridan aquifer	0.00	
Southern States Utilities	Public supply	7,711	1.24	Floridan aquifer	0.00	
Sunlake Estates	Public supply	734	0.29	Floridan aquifer	0.00	
Tavares, City of	Public supply	9,462	1.49	Floridan aquifer	0.00	
Umatilla, City of	Public supply	2,376	0.44	Floridan aquifer	0.00	
Utilities Inc. of Florida	Public supply	469	0.11	Floridan aquifer	0.00	
Villages of Lake	Public supply	10,476	3.14	Floridan aquifer	0.00	
Water Oak Estates	Public supply	1,260	0.31	Floridan aquifer	0.00	
Total Public Supply		132,272	21.78		0.00	
B & W Canning, Groveland plant	Industrial		0.40	Floridan aquifer	0.00	
Coca Cola, Leesburg plant	Industrial		0.53	Floridan aquifer	0.00	
Eustis Sand Company	Industrial*		0.34	Floridan aquifer	1.14	Mine pit
Golden Gem, Umatilla plant	Industrial		1.54	Floridan aquifer	0.00	
Silver Sand Company, Clermont mine	Industrial*		0.66	Floridan aquifer	0.00	
Silver Springs Citrus Plant	Industrial		0.78	Floridan aquifer	0.00	
Groveland Health Center	Institutional		0.03	Floridan aquifer	0.00	
Lake Correctional Facility	Institutional		0.12	Floridan aquifer	0.00	
Total Commercial/Industrial			4.40		1.14	

*Mining industry

1993 Agricultural and Recreational Water Use in Lake County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	200	200	0.09	0.09	0.18
Carrots	1,700	1,700	0.95	0.95	1.90
Cucumbers	300	300	0.14	0.14	0.28
Peppers	25	25	0.02	0.00	0.02
Potatoes	125	125	0.13	0.00	0.13
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	2,375	2,375	2.77	1.84	4.61
Watercress	0	0	0.00	0.00	0.00
Miscellaneous vegetables	2,900	2,900	2.62	1.72	4.34
Fruit Crops					
Blueberries	61	61	0.06	0.00	0.06
Citrus	18,604	17,674	25.22	3.77	28.99
Grapes	54	54	0.10	0.00	0.10
Peaches	7	7	0.02	0.00	0.02
Pecans	80	80	0.19	0.00	0.19
Strawberries	5	5	0.00	0.00	0.00
Watermelons	400	380	0.25	0.00	0.25
Miscellaneous fruit	25	25	0.06	0.02	0.08
Field Crops					
Field corn	2,000	500	0.27	0.27	0.54
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	300	150	0.08	0.06	0.14
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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	550	550	1.37	0.15	1.52
Foliage	100	100	0.28	0.00	0.28
Woody ornamentals	950	950	2.26	0.12	2.38
Improved pasture	50,000	1,886	1.92	0.08	2.00
Sod	250	250	0.06	0.34	0.40
Turf grass (other)	120	120	0.12	0.02	0.14
Total Agricultural	81,131	30,417	38.98	9.57	48.55
Recreational					
Turf grass (golf)	1,591	769	1.35	1.10	2.45

Sprinkler acreage	7,447
Flood acreage	7,950
Low volume acreage	15,789
Total irrigated acreage	31,186

MARION COUNTY

Total population	212,025
Total area	1,579 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	166,016	Total area	730,635 (1,142 mi^2)
Public supply	73,939	Farmed	72,849
Self-supplied	92,077	Irrigated	5,673
Per capita	153		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	11.30	0.00	11.30	0.00
Domestic self-supply	14.09	0.00	14.09	0.00
Commercial/industrial use	1.61	0.00	1.61	0.00
Agricultural irrigation	4.46	0.54	5.00	0.00
Recreational irrigation	0.77	0.56	1.33	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	1.15	0.00	1.15	0.00
Total	33.38	1.10	34.48	0.00
Total ground	33.38			
Total surface	1.10			
County total	34.48			

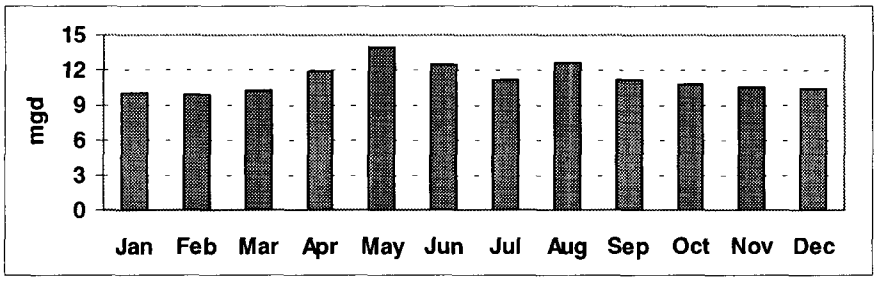


Figure A21. Monthly public supply water use in Marion County, 1993

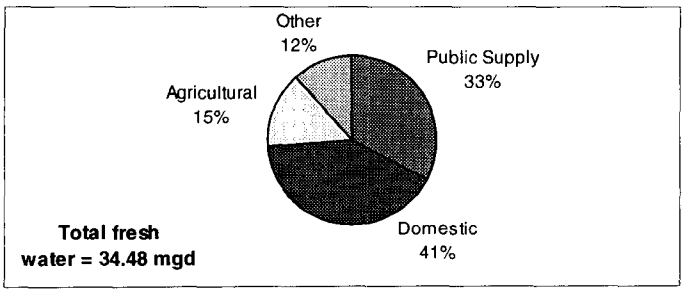


Figure A22. Marion County—percentages, by category, of freshwater use, 1993. *The "bther" category includes abandoned artesian wells, commercial/industrial, and recreational irrigation water use.*

1993 Water Users in Marion County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Belleview, City of	Public supply	3,160	0.61	Floridan aquifer	0.00	
GDU-Silver Springs Shores	Public supply	12,691	0.93	Floridan aquifer	0.00	
Maco/South Oaks subdivision	Public supply	1,050	0.14	Floridan aquifer	0.00	
Marion Utilities	Public supply	4,552	0.42	Floridan aquifer	0.00	
McIntosh, City of	Public supply	410	0.08	Floridan aquifer	0.00	
Ocala, City of	Public supply	42,400	8.10	Floridan aquifer	0.00	
Ocala East Villas	Public supply	382	0.11	Floridan aquifer	0.00	
Ocala Oaks Utilities	Public supply	2,829	0.26	Floridan aquifer	0.00	
Southern States Utilities	Public supply	1,249	0.17	Floridan aquifer	0.00	
Sunshine Utilities	Public supply	3,936	0.37	Floridan aquifer	0.00	
Tradewinds Utilities	Public supply	980	0.08	Floridan aquifer	0.00	
Woods & Lakes subdivision	Public supply	300	0.03	Floridan aquifer	0.00	
Total Public Supply		73,939	11.30		0.00	
Certified Grocers, Inc.	Industrial		0.03	Floridan aquifer	0.00	
FRI, Marion mine	Industrial*		1.02	Floridan aquifer	0.00	
Golden Flake Inc., Ocala plant	Industrial		0.09	Floridan aquifer	0.00	
Daytop Village-Grant†	Institutional		0.00	Floridan aquifer	0.00	
Marion Correctional Facility	Institutional		0.22	Floridan aquifer	0.00	
Ocala Jai-Alai†	Institutional		0.00	Floridan aquifer	0.00	
Silver Springs Inc.	Institutional		0.25	Floridan aquifer	0.00	
Total Commercial/Industrial			1.61		0.00	

Note: FRI = Florida Rock Industries

*Mining industry
†Pumpage less than 0.01 mgd

1993 Agricultural and Recreational Water Use in Marion County

	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	10	10	0.01	0.00	0.01
Sweet corn	40	40	0.05	0.00	0.05
Watercress	0	0	0.00	0.00	0.00
Miscellaneous vegetables	1,700	940	0.81	0.00	0.81
Fruit Crops					
Blueberries	100	100	0.09	0.00	0.09
Citrus	1,200	700	0.91	0.06	0.97
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	1,300	1,000	0.49	0.00	0.49
Miscellaneous fruit	200	100	0.29	0.00	0.29
Field Crops					
Field corn	3,000	350	0.16	0.12	0.28
Peanuts	2,000	134	0.14	0.00	0.14
Rice	0	0	0.00	0.00	0.00
Sorghum	200	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
Miscellaneous grains	1,500	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	20	20	0.06	0.00	0.06
Foliage	14	14	0.04	0.00	0.04
Woody ornamentals	52	52	0.10	0.03	0.13
Improved pasture	59,230	940	0.50	0.33	0.83
Sod	660	660	0.67	0.00	0.67
Turf grass (other)	83	83	0.08	0.00	0.08
Total Agricultural	71,349	5,173	4.46	0.54	5.00
Recreational					
Turf grass (golf)	1,500	500	0.77	0.56	1.33

Sprinkler acreage	4,973
Flood acreage	0
Low volume acreage	700
Total irrigated acreage	5,673

NASSAU COUNTY

Total population	46,450
Total area	652 mi²

St. Johns River Water Management District

Population		Land Area (acres)	
Total	46,450	Total area	417,280 (652 mi²)
Public supply	23,333	Farmed	7,406
Self-supplied	23,117	Irrigated	770
Per capita	*190*		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	4.43	0.00	4.43	0.00
Domestic self-supply	4.39	0.00	4.39	0.00
Commercial/industrial use	38.10	0.00	38.10	0.09
Agricultural irrigation	0.25	0.00	0.25	0.00
Recreational irrigation	1.39	0.22	1.61	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.46	0.00	0.46	0.00
Total	49.02	0.22	49.24	0.09
Total ground	49.02			
Total surface	0.31			
County total	49.33			

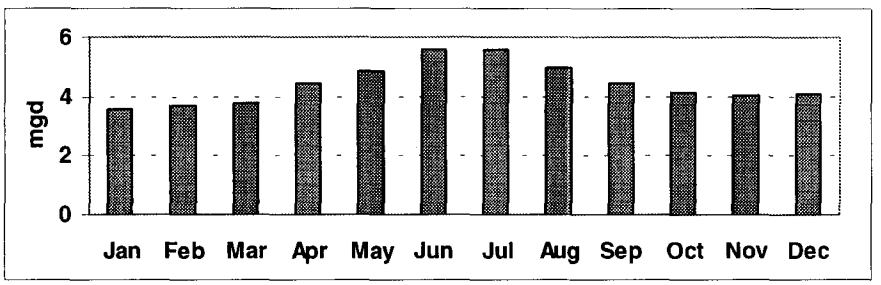


Figure A23. Monthly public supply water use in Nassau County, 1993

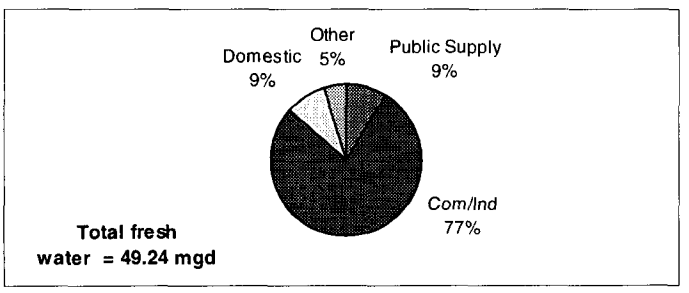


Figure A24. Nassau County—percentages, by category, of freshwater use, 1993. *The "other" category includes abandoned artesian wells, recreational irrigation, and agricultural irrigation water use.*

1993 Water Users in Nassau County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Callahan, Town of	Public supply	1,293	0.16	Floridan aquifer	0.00	
Eastwood Oaks Apts.	Public supply	277	0.03	Floridan aquifer	0.00	
Fernandina Beach, City of	Public supply	13,244	2.92	Floridan aquifer	0.00	
Hillard, Town of	Public supply	2,200	0.22	Floridan aquifer	0.00	
Marsh Cove Apts.	Public supply	319	0.05	Floridan aquifer	0.00	
SSU-Amelia Island	Public supply	6,000	1.05	Floridan aquifer	0.00	
Total Public Supply		23,333	4.43		0.00	
Container Corp. of America	Industrial*		21.97	Floridan aquifer	0.00	
ITT Rayonier	Industrial*		16.08	Floridan aquifer	0.09	Amelia River†
Stone Container	Industrial		0.02	Floridan aquifer	0.00	
FDOT I-95 Welcome Center	Institutional		0.01	Floridan aquifer	0.00	
Nassau Correctional Facility	Institutional		0.02	Floridan aquifer	0.00	
Total Commercial/Industrial			38.10		0.09	

Note: SSU = Southern States Utilities
FDOT = Florida Department of Transportation

*Pulp and paper industry
†Saline water

1993 Agricultural and Recreational Water Use in Nassau County

	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
Miscellaneous vegetables	100	50	0.05	0.00	0.05
Fruit Crops					
Blueberries	30	15	0.01	0.00	0.01
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
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	500	50	0.05	0.00	0.05
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	0.04	0.00	0.04
Wheat	0	0	0.00	0.00	0.00
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	20	20	0.06	0.00	0.06
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 (other)	68	30	0.04	0.00	0.04
Total Agricultural	6,761	205	0.25	0.00	0.25
Recreational					
Turf grass (golf)	645	565	1.39	0.22	1.61

Sprinkler acreage	770
Flood acreage	0
Low volume acreage	0
Total irrigated acreage	770

OKEECHOBEE COUNTY

Total population	31,758
Total area	774 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	476	Total area	65,388 (102 mi^2)
Public supply	0	Farmed	34,485
Self-supplied	476	Irrigated	7,485
Per capita*	154		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	0.00	0.00	0.00	0.00
Domestic self-supply	0.07	0.00	0.07	0.00
Commercial/industrial use	0.06	0.00	0.06	0.00
Agricultural irrigation	11.94	0.00	11.94	0.00
Recreational irrigation	0.00	0.00	0.00	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.00	0.00	0.00	0.00
Total	12.07	0.00	12.07	0.00
Total ground	12.07			-
Total surface	0.00			
County total	12.07			

*Used St. Johns River Water Management District average per capita

1993 Water Users in Okeechobee County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
FDOT-Fort Drum Plaza	Institutional		0.06	Floridan aquifer	0.00	
Total Commercial/Industrial			0.06		0.00	

Note: FDOT = Florida Department of Transportation

1993 Agricultural and Recreational Water Use in Okeechobee County

	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
Miscellaneous vegetables	0	0	0.00	0.00	0.00
Fruit Crops					
Blueberries	17	17	0.03	0.00	0.03
Citrus	4,468	4,468	7.23	0.00	7.23
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
Miscellaneous 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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	0	0	0.00	0.00	0.00
Woody ornamentals	0	0	0.00	0.00	0.00
Improved pasture	30,000	3,000	4.68	0.00	4.68
Sod	0	0	0.00	0.00	0.00
Turf grass (other)	0	0	0.00	0.00	0.00
Total Agricultural	34,485	7,485	11.94	0.00	11.94
Recreational					
Turf grass (golf)	0	0	0.00	0.00	0.00

Sprinkler acreage	0
Flood acreage	3,017
Low volume acreage	4,468
Total irrigated acreage	7,485

ORANGE COUNTY

Total population	727,780
Total area	908 mi²

St. Johns River Water Management District

Population		Land Area (acres)	
Total	582,224	Total area	431,191 (674 mi²)
Public supply	505,912	*Farmed*	69,714
Self-supplied	76,312	Irrigated	47,958
Per capita	185		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply*	93.69	0.00	93.69	0.00
Domestic self-supply	14.12	0.00	14.12	0.00
Commercial/industrial use	2.59	0.00	2.59	0.00
Agricultural irrigation	14.92	44.90	59.82	0.00
Recreational irrigation	2.33	0.45	2.78	0.00
Thermoelectric power generation	0.30	0.00	0.30	0.00
Abandoned artesian wells	2.05	0.00	2.05	0.00
Total	130.00	45.35	175.35	0.00

Total ground	130.03
Total surface	45.35
County total	175.35

*Does not include 25.06 mgd of water withdrawn in Orange County for public supply use in Brevard County

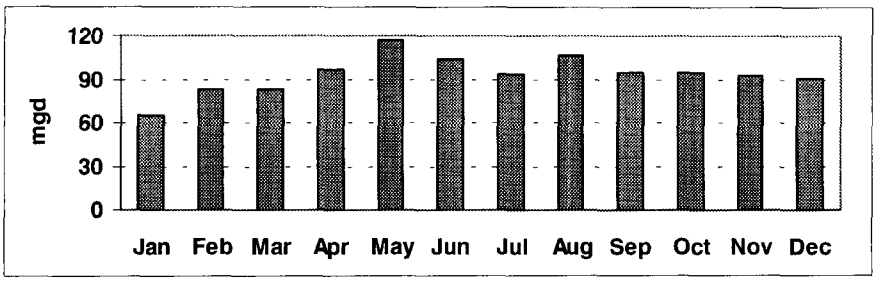


Figure A25. Monthly public supply water use in Orange County, 1993

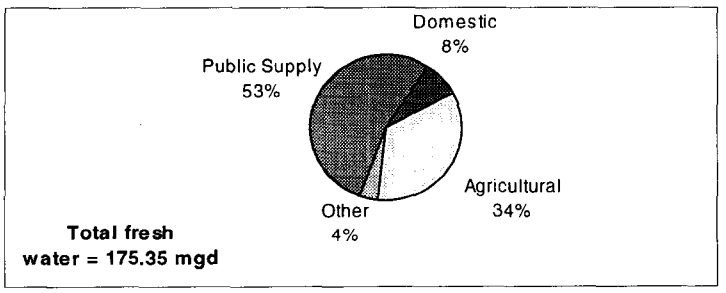


Figure A26. Orange County—percentages, by category, of freshwater use, 1993. *The "other" category includes abandoned artesian wells, commercial/industrial, thermoelectric power generation, and recreational irrigation water use.*

1993 Water Users in Orange County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Apopka, City of	Public supply	32,596	4.94	Floridan aquifer	0.00	
Eatonville, Town of	Public supply	2,470	0.44	Floridan aquifer	0.00	
Econ Utilities, Wedgefield	Public supply	1,630	0.18	Floridan aquifer	0.00	
Maitland, City of	Public supply	9,096	2.82	Floridan aquifer	0.00	
Oakland, Town of	Public supply	746	0.11	Floridan aquifer	0.00	
Ocoee, City of	Public supply	16,418	3.08	Floridan aquifer	0.00	
Orange County Utilities*	Public supply	81,511	18.99	Floridan aquifer	0.00	
Orlando Utilities Commission (OUC)*	Public supply	253,267	47.68	Floridan aquifer	0.00	
Rock Springs MHP	Public supply	1,771	0.24	Floridan aquifer	0.00	
Shadowhills MHP	Public supply	1,700	0.21	Floridan aquifer	0.00	
Southern States Utilities	Public supply	7,783	0.92	Floridan aquifer	0.00	
Starlight Ranch MHP	Public supply	2,583	0.15	Floridan aquifer	0.00	
Tangerine, Town of	Public supply	525	0.12	Floridan aquifer	0.00	
Utilities Inc. of Florida	Public supply	1,007	0.10	Floridan aquifer	0.00	
Winter Garden, City of	Public supply	14,283	1.42	Floridan aquifer	0.00	
Winter Park, City of	Public supply	75,404	11.57	Floridan aquifer	0.00	
Zellwood Station Utilities	Public supply	1,950	0.58	Floridan aquifer	0.00	
Zellwood Water Association	Public supply	1,172	0.14	Floridan aquifer	0.00	
Total Public Supply		505,912	[1]93.69		0.00	
Coca Cola, Plymouth plant	Industrial		0.20	Floridan aquifer	0.00	
Lust & Long Precooler Company	Industrial		0.05	Floridan aquifer	0.00	
Ralston Purina-Terry	Industrial		0.10	Floridan aquifer	0.00	
Winter Garden Citrus Plant	Industrial		1.77	Floridan aquifer	0.00	
Sun Resort Inc.	Institutional		0.14	Floridan aquifer	0.00	
University of Central Florida	Institutional		0.33	Floridan aquifer	0.00	
Total Commercial/Industrial			2.59		0.00	
OUC - Stanton Power	Power generation		0.30	Floridan aquifer	0.00	
Total Power Generation			0.30		0.00	

Note: MHP = mobile home park

*Water also used in South Florida Water Management District (SFWMD)

[1]Does not include the water withdrawn (25.06 mgd) for public supply use in Brevard County by the City of Cocoa. Total public supply water use for the county, including that consumed in SFWMD, is 129.28 mgd.

1993 Agricultural and Recreational Water Use in Orange County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	1,200	800	0.70	0.00	0.70
Carrots	13,500	11,600	1.27	11.46	12.73
Cucumbers	1,020	1,020	0.93	0.00	0.93
Peppers	0	0	0.00	0.00	0.00
Potatoes	0	0	0.00	0.00	0.00
Tomatoes	75	75	0.08	0.00	0.08
Sweet corn	13,600	13,300	1.63	14.65	16.28
Watercress	0	0	0.00	0.00	0.00
Miscellaneous vegetables	14,100	14,100	1.92	17.29	19.21
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	3,596	3,596	4.50	0.50	5.00
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	150	150	0.09	0.00	0.09
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	200	200	0.17	0.00	0.17
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	200	200	0.12	0.12	0.24
Soybeans	200	200	0.13	0.13	0.26
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
Miscellaneous gains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	40	40	0.11	0.00	0.11
Foliage	581	581	1.51	0.37	1.88
Woody ornamentals	576	576	1.24	0.14	1.38
Improved pasture	18,562	0	0.00	0.00	0.00
Sod	200	200	0.15	0.17	0.32
Turf grass (other)	381	381	0.37	0.07	0.44
Total Agricultural	68,181	47,019	14.92	44.90	59.82
Recreational					
Turf grass (golf)	1,533	939	2.33	0.45	2.78

Sprinkler acreage	17,925
Flood acreage	28,120
Low volume acreage	1,913
Total irrigated acreage	47,958

OSCEOLA COUNTY

Total population	125,675
Total area	1,322 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	2,891	Total area	312,204 (488 mi^2)
Public supply	0	Farmed	126,800
Self-supplied	2,891	Irrigated	12,180
Per capita*	154		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	0.00	0.00	0.00	0.00
Domestic self-supply	0.45	0.00	0.45	0.00
Commercial/industrial use	0.00	0.00	0.00	0.00
Agricultural irrigation	4.99	9.50	14.49	0.00
Recreational irrigation	0.00	0.00	0.00	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.00	0.00	0.00	0.00
Total	5.44	9.50	14.94	0.00

Total ground	5.44
Total surface	9.50
County total	14.94

*Used St. Johns River Water Management District average per capita

1993 Agricultural and Recreational Water Use in Osceola County

	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
Miscellaneous 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	2.31	0.00	2.31
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
Miscellaneous 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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
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	2.68	9.50	12.18
Sod	0	0	0.00	0.00	0.00
Turf grass (other)	0	0	0.00	0.00	0.00
Total Agricultural	126,800	12,180	4.99	9.50	14.49
Recreational					
Turf grass (golf)	0	0	0.00	0.00	0.00

Sprinkler acreage	11,280
Flood acreage	720
Low volume acreage	180
Total irrigated acreage	12,180

POLK COUNTY

Total population	429,943
Total area	1,875 mi²

St. Johns River Water Management District

Population		Land Area (acres)	
Total	4,299	Total area	37,200 (58 mi²)
Public supply	1,543	Farmed	8,312
Self-supplied	2,756	Irrigated	3,136
Per capita	149		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	0.23	0.00	0.23	0.00
Domestic self-supply	0.41	0.00	0.41	0.00
Commercial/industrial use	0.19	0.00	0.19	0.00
Agricultural irrigation	4.19	0.45	4.64	0.00
Recreational irrigation	0.00	0.00	0.00	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	0.00	0.00	0.00	0.00
Total	5.02	0.45	5.47	0.00

Total ground	5.02
Total surface	0.45
County total	5.47

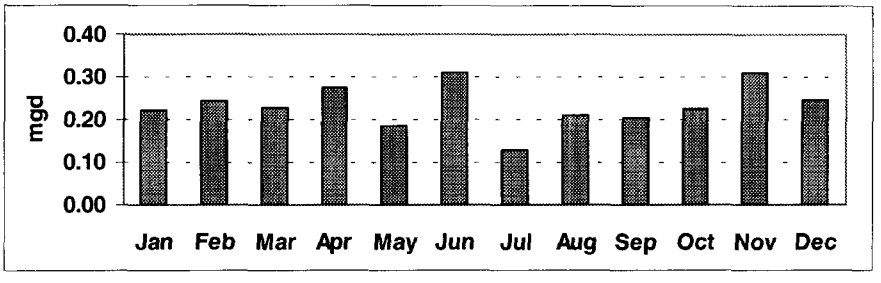


Figure A27. Monthly public supply water use in Polk County, 1993

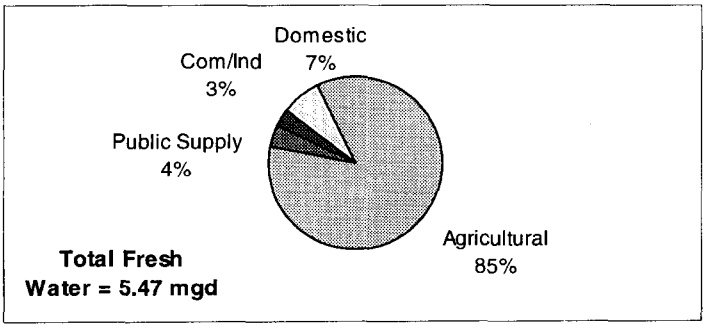


Figure A28. Polk County—percentages, by category, of freshwater use, 1993

1993 Water Users in Polk County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Emerald Acres	Public supply	80	0.01	Floridan aquifer	0.00	
PCU Davenport	Public supply	1,463	0.22	Floridan aquifer	0.00	
Total Public Supply		1,543	0.23		0.00	
B.C. Cook Citrus Plant*	Industrial		0.00	Floridan aquifer	0.00	
Horizon's End Resort	Institutional		0.04	Floridan aquifer	0.00	
Oak Harbor Campground	Institutional		0.02	Floridan aquifer	0.00	
Outdoor Resorts of Orlando	Institutional		0.13	Floridan aquifer	0.00	
Total Commercial/Industrial			0.19		0.00	

*Pumpage less than 0.01 mgd

1993 Agricultural and Recreational Water Use in Polk County

	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
Miscellaneous vegetables	0	0	0.00	0.00	0.00
Fruit Crops					
Blueberries	0	0	0.00	0.00	0.00
Citrus	2,757	2,481	3.54	0.39	3.93
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
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	1,000	500	0.43	0.00	0.43
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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	5	5	0.02	0.00	0.02
Woody ornamentals	50	50	0.13	0.00	0.13
Improved pasture	4,500	100	0.07	0.06	0.13
Sod	0	0	0.00	0.00	0.00
Turf grass (other)	0	0	0.00	0.00	0.00
Total Agricultural	8,312	3,136	4.19	0.45	4.64
Recreational					
Turf grass (golf)	0	0	0.00	0.00	0.00

Sprinkler acreage	1,051
Flood acreage	100
Low volume acreage	1,985
Total irrigated acreage	3,136

PUTNAM COUNTY

Total population	67,625
Total area	722 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	67,625	Total area	462,080 (722 mi^2)
Public supply	24,356	Farmed	51,651
Self-supplied	43,269	Irrigated	9,531
Per capita	152		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	3.71	0.00	3.71	0.00
Domestic self-supply	6.58	0.00	6.58	0.00
Commercial/industrial use	18.94	33.14	52.08	0.00
Agricultural irrigation	12.12	0.84	12.96	0.00
Recreational irrigation	0.21	0.00	0.21	0.00
Thermoelectric power generation	0.55	12.27	12.82	0.00
Abandoned artesian wells	1.11	0.00	1.11	0.00
Total	43.22	46.25	89.47	0.00
Total ground	43.22			
Total surface	46.25			
County total	89.47			

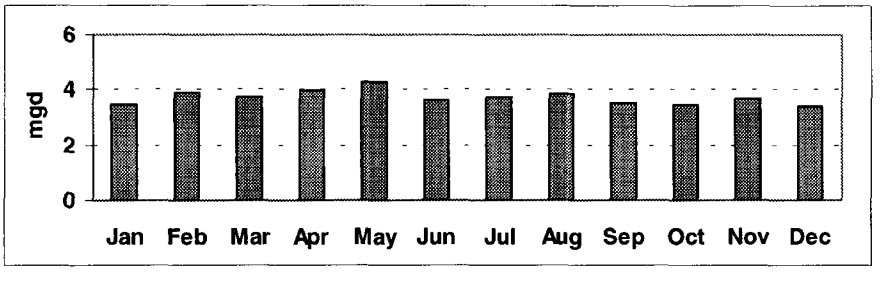


Figure A29. Monthly public supply water use in Putnam County, 1993

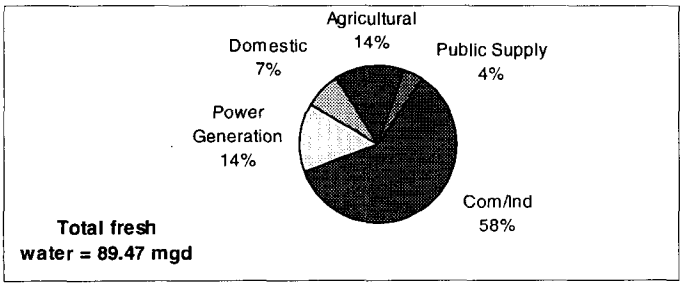


Figure A30. Putnam County—percentages, by category, of freshwater use, 1993. *Abandoned artesian wells and recreational irrigation water use were each less than 1%.*

1993 Water Users in Putnam County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Crescent City, City of	Public supply	2,345	0.33	Floridan aquifer	0.00	
Interlachen, Town of	Public supply	1,254	0.08	Floridan aquifer	0.00	
Lake Como Water Association	Public supply	319	0.02	Floridan aquifer	0.00	
Melrose, Town of	Public supply	1,300	0.10	Floridan aquifer	0.00	
Palatka, City of	Public supply	15,000	2.96	Floridan aquifer	0.00	
Southern States Utilities	Public supply	3,583	0.20	Floridan aquifer	0.00	
Welaka, Town of	Public supply	555	0.02	Floridan aquifer	0.00	
Total Public Supply		24,356	3.71		0.00	
Feldspar Corp.-Edgar	Industrial*		0.23	Floridan aquifer	2.30	Retention pond
FRI, Grandin Sand	Industrial*		2.17	Floridan aquifer	0.00	
FRI, Keuka Industrial	Industrial*		0.29	Floridan aquifer	0.00	
FRI, Keuka Sand	Industrial*		0.08	Floridan aquifer	0.00	
Georgia-Pacific, Hawthorne plant	Industrial†		0.01	Floridan aquifer	0.00	
Georgia-Pacific, Palatka plant	Industrial†		16.09	Floridan aquifer	30.84	Simms/Etonia
Putnam Correctional Facility	Institutional		0.07	Floridan aquifer	0.00	
Total Commercial/Industrial			18.94		33.14	
Florida Power & Light	Power generation		0.08	Floridan aquifer	1.87	St. Johns River
Seminole Electric	Power generation		0.47	Floridan aquifer	10.40	St. Johns River
Total Power Generation			0.55		12.27	

Note: FRI = Florida Rock Industries

*Mining industry
†Pulp and paper industry

1993 Agricultural and Recreational Water Use in Putnam County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	600	600	0.32	0.00	0.32
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	5.54	0.00	5.54
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
Miscellaneous vegetables	200	200	0.27	0.00	0.27
Fruit crops					
Blueberries	80	80	0.06	0.00	0.06
Citrus	200	200	0.26	0.00	0.26
Grapes	10	10	0.02	0.00	0.02
Peaches	70	70	0.16	0.00	0.16
Pecans	0	0	0.00	0.00	0.00
Strawberries	0	0	0.00	0.00	0.00
Watermelons	200	200	0.12	0.00	0.12
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	1,500	500	0.60	0.02	0.62
Peanuts	0	0	0.00	0.00	0.00
Rice	0	0	0.00	0.00	0.00
Sorghum	4,000	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	0	0	0.00	0.00	0.00
Wheat	0	0	0.00	0.00	0.00
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	1,500	1,500	3.32	0.82	4.14
Foliage	250	250	0.94	0.00	0.94
Woody ornamentals	100	100	0.23	0.00	0.23
Improved pasture	37,000	0	0.00	0.00	0.00
Sod	220	220	0.25	0.00	0.25
Turf grass (other)	25	25	0.03	0.00	0.03
Total Agricultural	51,455	9,455	12.12	0.84	12.96
Recreational					
Turf grass (golf)	196	76	0.21	0.00	0.21

Sprinkler acreage	2,251
Flood acreage	7,050
Low volume acreage	230
Total irrigated acreage	9,531

ST. JOHNS COUNTY

Total population	91,197
Total area	609 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	91,197	Total area	389,760 (609 mi^2)
Public supply	87,478	Farmed	31,892
Self-supplied	3,719	Irrigated	27,211
Per capita	132		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total Fresh	Surface
Public supply	11.54	0.00	11.54	0.00
Domestic self-supply	0.49	0.00	0.49	0.00
Commercial/industrial use	0.06	0.00	0.06	0.00
Agricultural irrigation	27.00	0.00	27.00	0.00
Recreational irrigation	1.77	1.03	2.80	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	8.60	0.00	8.60	0.00
Total	49.46	1.03	50.49	0.00

Total ground	49.46
Total surface	1.03
County total	50.49

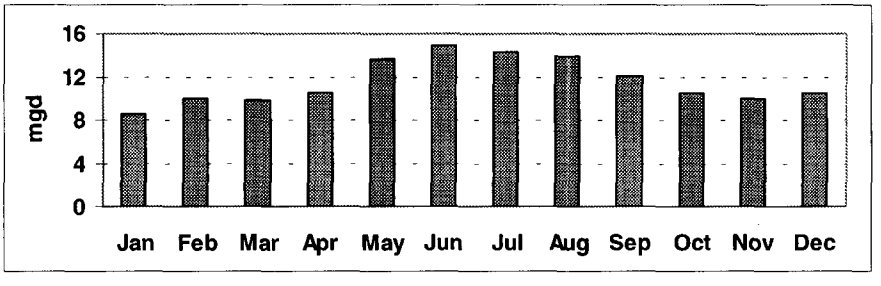


Figure A31. Monthly public supply water use in St. Johns County, 1993

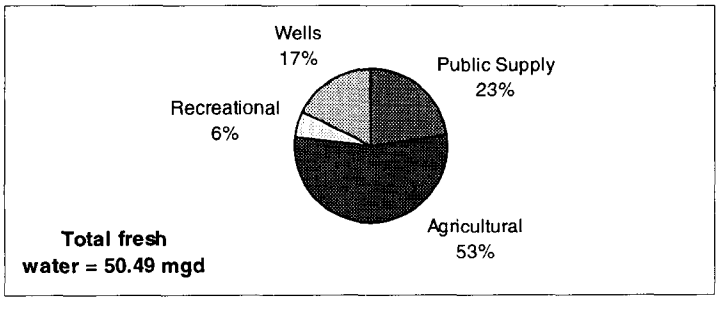


Figure A32. St. Johns County—percentages, by category, of freshwater use, 1993. *Commercial/industrial and domestic self-supply water use were each less than 1%.*

1993 Water Users in St. Johns County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Fountain Condominiums	Public supply	300	0.05	Floridan aquifer	0.00	
Fruit Cove Oaks subdivision	Public supply	472	0.06	Floridan aquifer	0.00	
GDU-Julington Creek subdivision	Public supply	486	0.08	Floridan aquifer	0.00	
Hastings, City of	Public supply	1,176	0.07	Floridan and surficial aquifers	0.00	
Intercoastal Utilities	Public supply	4,330	0.96	Floridan aquifer	0.00	
North Beach Water System	Public supply	1,519	0.22	Floridan aquifer	0.00	
Palm Valley Water System	Public supply	763	0.09	Floridan aquifer	0.00	
Ponce DeLeon Utility	Public supply	380	0.08	Floridan aquifer	0.00	
Ponte Vedra Utilities	Public supply	4,700	1.06	Floridan aquifer	0.00	
Remington Forest	Public supply	150	0.03	Floridan aquifer	0.00	
S. Ponte Vedra Beach	Public supply	508	0.07	Floridan aquifer	0.00	
St. Augustine, City of	Public supply	20,000	1.72	Floridan and surficial aquifers	0.00	
St. Johns County Utility	Public supply	23,939	2.93	Floridan and surficial aquifers	0.00	
St. Johns Forest	Public supply	13,506	1.90	Floridan aquifer	0.00	
St. Johns North Utility	Public supply	1,039	0.18	Floridan aquifer	0.00	
St. Johns Service Company	Public supply	13,750	1.96	Floridan aquifer	0.00	
Wesley Manor Water System	Public supply	460	0.08	Floridan aquifer	0.00	
Total Public Supply		87,478	11.54		0.00	
G & M Truck Stop	Commercial		0.02	Floridan aquifer	0.00	
Wise/Borden plant	Industrial		0.01	Floridan aquifer	0.00	
FDOT I-95 (SR 207)	Institutional		0.01	Floridan aquifer	0.00	
FDOT I-95 (SR 210)	Institutional		0.01	Floridan aquifer	0.00	
KOA campground	Institutional		0.01	Floridan aquifer	0.00	
Total Commercial/Industrial			0.06		0.00	

Note: FDOT = Florida Department of Transportation
SR = State Road

1993 Agricultural and Recreational Water Use in St. Johns County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	1,500	1,500	0.84	0.00	0.84
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	21.17	0.00	21.17
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
Miscellaneous vegetables	500	500	0.68	0.00	0.68
Fruit Crops					
Blueberries	10	10	0.01	0.00	0.01
Citrus	0	0	0.00	0.00	0.00
Grapes	10	10	0.02	0.00	0.02
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
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field Crops					
Field corn	2,000	2,000	2.54	0.00	2.54
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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	0	0	0.00	0.00	0.00
Foliage	25	25	0.06	0.00	0.06
Woody ornamentals	75	75	0.18	0.00	0.18
Improved pasture	5,500	1,000	1.41	0.00	1.41
Sod	60	60	0.07	0.00	0.07
Turf grass (other)	20	20	0.02	0.00	0.02
Total Agricultural	30,700	26,200	27.00	0.00	27.00
Recreational					
Turf grass (golf)	1,192	1,011	1.77	1.03	2.80

Sprinkler acreage	1,166
Flood acreage	26,000
Low volume acreage	45
Total irrigated acreage	27,211

SEMINOLE COUNTY

Total population	310,890
Total area	308 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	310,890	Total area	197,120 (308 mi^2)
Public supply	302,509	*Farmed*	13,915
Self-supplied	8,381	Irrigated	6,048
Per capita	162		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	**Surface**	**Total Fresh**	**Surface**
Public supply	49.10	0.00	49.10	0.00
Domestic self-supply	1.36	0.00	1.36	0.00
Commercial/industrial use	0.41	0.00	0.41	0.00
Agricultural irrigation	6.55	0.09	6.64	0.00
Recreational irrigation	4.01	1.01	5.02	0.00
Thermoelectric power generation	0.00	0.00	0.00	0.00
Abandoned artesian wells	5.78	0.00	5.78	0.00
Total	67.21	1.10	68.31	0.00

Total ground	67.21
Total surface	1.10
County total	68.31

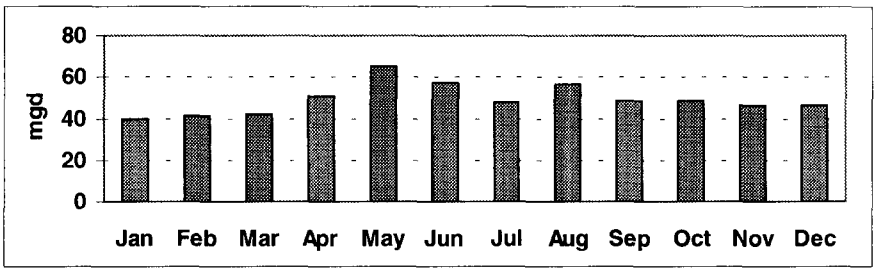


Figure A33. Monthly public supply water use in Seminole County, 1993

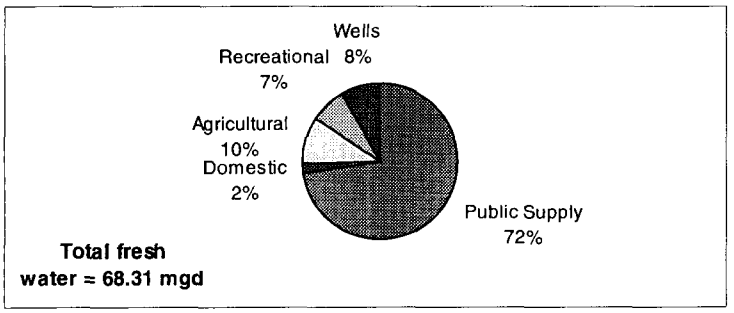


Figure A34. Seminole County—percentages, by category, of freshwater use, 1993. *Commercial/industrial water use was less than 1%.*

1993 Water Users in Seminole County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Altamonte Springs, City of	Public supply	36,770	6.70	Floridan aquifer	0.00	
Casselberry, City of	Public supply	50,000	5.85	Floridan aquifer	0.00	
Indian Creek, Seminole Pines	Public supply	318	0.04	Floridan aquifer	0.00	
Lake Harney Water Association	Public supply	290	0.03	Floridan aquifer	0.00	
Lake Mary, City of	Public supply	6,673	1.65	Floridan aquifer	0.00	
Longwood, City of	Public supply	13,418	2.17	Floridan aquifer	0.00	
Mullet Lake Water Association	Public supply	615	0.05	Floridan aquifer	0.00	
Oviedo, City of	Public supply	15,722	2.45	Floridan aquifer	0.00	
Palm Valley MHP	Public supply	1,610	0.23	Floridan aquifer	0.00	
Sanford, City of	Public supply	38,272	5.39	Floridan aquifer	0.00	
Sanlando Utilities	Public supply	47,409	9.22	Floridan aquifer	0.00	
Seminole County Utility	Public supply	47,671	9.59	Floridan aquifer	0.00	
Southern States Utilities	Public supply	10,559	1.23	Floridan aquifer	0.00	
Utilities Inc. of Florida	Public supply	9,174	0.87	Floridan aquifer	0.00	
Winter Springs, City of	Public supply	24,008	3.63	Floridan aquifer	0.00	
Total Public Supply		302,509	49.10		0.00	
Deep South Products	Industrial		0.24	Floridan aquifer	0.00	
I-4 Industrial Park	Industrial		0.10	Floridan aquifer	0.00	
Iron Bridge WWTP	Industrial		0.04	Floridan aquifer	0.00	
Siemens Stromberg	Industrial		0.03	Floridan aquifer	0.00	
Total Commercial/Industrial			0.41		0.00	

Note: MHP = mobile home park
WWTP = wastewater treatment plant

1993 Agricultural and Recreational Water Use in Seminole County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	300	250	0.18	0.00	0.18
Carrots	0	0	0.00	0.00	0.00
Cucumbers	400	320	0.26	0.00	0.26
Peppers	0	0	0.00	0.00	0.00
Potatoes	450	450	0.45	0.00	0.45
Tomatoes	0	0	0.00	0.00	0.00
Sweet corn	15	15	0.03	0.00	0.03
Watercress	0	0	0.00	0.00	0.00
Miscellaneous vegetables	560	530	0.78	0.00	0.78
Fruit Crops					
Blueberries	5	5	0.01	0.00	0.01
Citrus	1,024	1,024	1.65	0.00	1.65
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	0.03	0.00	0.03
Miscellaneous fruit	0	0	0.00	0.00	0.00
Field crops					
Field corn	40	40	0.06	0.00	0.06
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
Miscellaneous grains	10	10	0.01	0.00	0.01
Ornamentals and Grasses					
Ferns	20	20	0.06	0.00	0.06
Foliage	560	560	1.61	0.00	1.61
Woody ornamentals	160	160	0.38	0.08	0.46
Improved pasture	7,000	490	0.51	0.00	0.51
Sod	320	320	0.38	0.00	0.38
Turf grass (other)	136	136	0.15	0.01	0.16
Total Agricultural	11,040	4,370	6.55	0.09	6.64
Recreational					
Turf grass (golf)	2,875	1,678	4.01	1.01	5.02

Sprinkler acreage	4,042
Flood acreage	1,650
Low volume acreage	356
Total irrigated acreage	6,048

VOLUSIA COUNTY

Total population	390,066
Total area	1,106 mi^2

St. Johns River Water Management District

Population		Land Area (acres)	
Total	390,066	Total area	707,840 (1,106 mi^2)
Public supply	332,741	Farmed	15,851
Self-supplied	57,325	Irrigated	11,323
Per capita	140		

1993 Water Withdrawals (in mgd) by Category

	Fresh Water			Saline Water
	Ground	Surface	Total Fresh	Surface
Public supply*	46.63	0.00	46.63	0.00
Domestic self-supply	8.03	0.00	8.03	0.00
Commercial/industrial use	0.83	0.00	0.83	0.00
Agricultural irrigation	17.91	2.78	20.69	0.00
Recreational irrigation	3.41	1.09	4.50	0.00
Thermoelectric power generation	0.59	117.69	118.28	0.00
Abandoned artesian wells	1.79	0.00	1.79	0.00
Total	79.19	121.56	200.75	0.00

Total ground	79.19
Total surface	121.56
County total	200.75

*Includes slightly saline water (250 to 1,000 mg/L chlorides) treated through reverse osmosis and diluted with fresh water

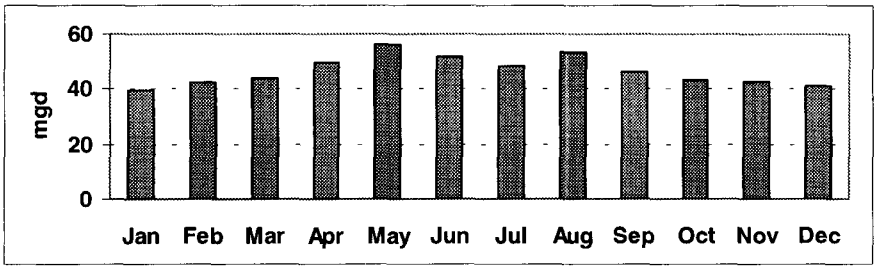


Figure A35. Monthly public supply water use in Volusia County, 1993

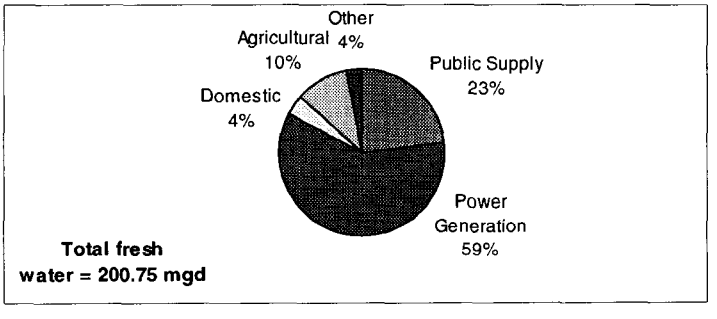


Figure A36. Volusia County—percentages, by category, of freshwater use, 1993. *The "other" category includes abandoned artesian wells, commercial/industrial, and recreational irrigation water use.*

1993 Water Users in Volusia County

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
Cassadaga Water Association	Public supply	283	0.02	Floridan aquifer	0.00	
Daytona Beach, City of	Public supply	79,664	12.78	Floridan aquifer	0.00	
De Land, City of	Public supply	32,000	4.57	Floridan aquifer	0.00	
Deltona Utilities	Public supply	57,300	9.23	Floridan aquifer	0.00	
Edgewater, City of	Public supply	16,745	1.54	Floridan aquifer	0.00	
Hacienda Del Rio	Public supply	888	0.09	Floridan aquifer	0.00	
Halifax Plantation	Public supply	232	0.04	Floridan aquifer	0.00	
Highland Country Estates	Public supply	784	0.02	Floridan aquifer	0.00	
Holly Hill, City of	Public supply	11,258	1.26	Floridan aquifer	0.00	
John Knox Village	Public supply	880	0.21	Floridan aquifer	0.00	
Kingston Shores Water Association	Public supply	212	0.03	Floridan aquifer and R/O	0.00	
Lake Beresford Water Association	Public supply	1,035	0.17	Floridan aquifer	0.00	
Lake Helen, City of	Public supply	2,381	0.18	Floridan aquifer	0.00	
New Smyrna Beach, City of	Public supply	24,560	4.14	Floridan aquifer	0.00	
Orange City	Public supply	5,813	0.86	Floridan aquifer	0.00	
Orange City Country Village	Public supply	1,392	0.26	Floridan aquifer	0.00	
Ormond Beach, City of	Public supply	37,876	4.75	Floridan aquifer	0.00	
Pierson, Town of	Public supply	1,222	0.11	Floridan aquifer	0.00	
Port Orange, City of	Public supply	46,326	5.23	Floridan aquifer	0.00	
South Water Front Park	Public supply	759	0.03	Floridan aquifer and R/O	0.00	
SSU - Sugar Mill	Public supply	1,436	0.13	Floridan aquifer	0.00	
Terra Mar Village Water & Sewer	Public supply	600	0.02	Floridan aquifer	0.00	
Tomoka View Water Works	Public supply	418	0.04	Floridan aquifer	0.00	
Tymber Creek Utilities	Public supply	905	0.11	Floridan aquifer	0.00	
Volusia County Utilities	Public supply	7,772	0.81	Floridan aquifer	0.00	
Total Public Supply		332,741	46.63		0.00	
Ardmore Farms	Industrial		0.13	Floridan aquifer	0.00	
Sherwood Medical Mfg. Company	Industrial		0.18	Floridan aquifer	0.00	
Sparton Electronics*	Industrial		0.00	Floridan aquifer	0.00	
T.G. Lee-Orange City	Industrial		0.09	Floridan aquifer	0.00	
FDOC-Tomoka State	Institutional		0.22	Floridan aquifer	0.00	
FDOT I-95	Institutional		0.01	Floridan aquifer	0.00	
FDNR state park	Institutional		0.01	Floridan aquifer	0.00	
Kampers Kove KOA	Institutional		0.01	Floridan aquifer	0.00	
VC government complex	Institutional		0.18	Floridan aquifer	0.00	
Total Commercial/Industrial			0.83		0.00	

1993 Water Users in Volusia County—*Continued*

User Utility/Facility	Category	Population Served	Ground Water (mgd)	Withdrawal Source	Surface Water (mgd)	Withdrawal Source
FPC, DeBary	Power generation		0.02	Floridan aquifer	0.00	
FPC, Lake Monroe	Power generation		0.09	Floridan aquifer	114.00	Lake Monroe
FPL, Sanford	Power generation		0.48	Floridan aquifer	3.69	St. Johns River
Total Power Generation			0.59		117.69	

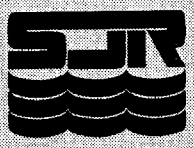
Note: R/O = reverse osmosis
SSU = Southern States Utilities
FDOC = Florida Department of Corrections
FDOT = Florida Department of Transportation
VC = Volusia County
FPC = Florida Power Corporation
FPL = Florida Power & Light

*Pumpage less than 0.01 mgd

1993 Agricultural and Recreational Water Use in Volusia County

	Total Acres		Water Use (mgd)		
	Farmed	Irrigated	Ground	Surface	Total
Vegetable Crops					
Cabbage	295	295	0.19	0.00	0.19
Carrots	0	0	0.00	0.00	0.00
Cucumbers	300	300	0.24	0.00	0.24
Peppers	80	80	0.12	0.00	0.12
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
Miscellaneous vegetables	660	140	0.21	0.00	0.21
Fruit Crops					
Blueberries	25	25	0.02	0.00	0.02
Citrus	2,796	800	1.07	0.08	1.15
Grapes	14	14	0.03	0.00	0.03
Peaches	0	0	0.00	0.00	0.00
Pecans	25	10	0.03	0.00	0.03
Strawberries	0	0	0.00	0.00	0.00
Watermelons	0	0	0.00	0.00	0.00
Miscellaneous 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
Miscellaneous grains	0	0	0.00	0.00	0.00
Ornamentals and Grasses					
Ferns	6,060	5,460	12.51	2.56	15.07
Foliage	320	320	0.93	0.00	0.93
Woody ornamentals	95	95	0.21	0.03	0.24
Improved pasture	0	0	0.00	0.00	0.00
Sod	1,976	1,976	2.19	0.00	2.19
Turf grass (other)	245	245	0.16	0.11	0.27
Total Agricultural	12,891	9,760	17.91	2.78	20.69
Recreational					
Turf grass (golf)	2,960	1,563	3.41	1.09	4.50

Sprinkler acreage	9,683
Flood acreage	815
Low volume acreage	825
Total irrigated acreage	11,323



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