Technical Fact Sheet SJ2012-FS1

2011 Survey of Estimated Annual Water Use for St. Johns River Water Management District

Technical Fact Sheet SJ2012-FS1
2011 Survey of Estimated Annual Water Use
for St. Johns River Water Management District

Introduction

St. Johns River Water Management District (SJRWMD) has published estimates of annual water use data since 1978. These "annual water use surveys" assess estimated total water use, with data arranged by source, category of use, and county. Estimated amounts are based on best available data at the time of publication. Published reports can be found on the SJRWMD website, *floridaswater.com*. In publishing the annual data, SJRWMD cooperates with U.S. Geological Survey (USGS) that compiles national estimates of water use on 5-year intervals.

Geographic Survey Area

SJRWMD includes all or part of 18 counties, encompassing 12,300 square miles in northeast and east-central Florida and representing 4.7 million people, or approximately 25% of the state's population. The following water basins are located within SJRWMD: the entire St. Johns River and Nassau River basins, the Indian River Lagoon and Northern Coastal basins, and Florida's portion of the St. Marys River Basin.

Area Rainfall Statistics

Average annual rainfall within SJRWMD for the 10-year period January 2002–December 2011 was 49.79 inches. Annual rainfall within SJRWMD for 2011 was 44.93 inches. The driest year of the 10-year period was 2006, with 36.23 inches, 27% below normal. The wettest year of the 10-year period was 2005, with 59.82 inches, 20% above normal.

From 2007 to 2011, average annual rainfall within SJRWMD varied by nearly 11 inches (from 41.51 to 52.80 inches). Above-average annual rainfall occurred in 2008 (52.80 inches) and 2009 (52.57 inches), while below-average rainfall occurred in 2007 (44.29 inches), 2010 (41.51 inches), and 2011 (44.93 inches).

Through evapotranspiration, nearly 70% of rainfall within SJRWMD is returned to the atmosphere, while the remaining 30% becomes runoff to surface waters or recharge to aquifers (Fernald and Purdum 1998).

Data Sources and Methodology

SJRWMD is not the only source of water use data for the reporting of 2011 Survey of Estimated Annual Water Use. Water use data were obtained from the following sources: raw water withdrawal data submitted to SJRWMD on or before March 28, 2012, (via EN-50 forms) and treated water data from Florida Department of Environmental Protection (DEP) monthly operating reports (MORs). Reuse water data were derived from the 2011 Reuse Inventory report (DEP 2011). Rainfall by county was obtained from SJRWMD's radar rainfall data via the SJRWMD Oracle database. In this 2011 survey, the estimated amounts are based on best available data at the time of publication. SJRWMD attempts to compile the best available data, but it cannot guarantee that contributors use consistent measurement techniques or quality control standards. In most cases, very limited quality assurance of the data is conducted by SJRWMD and the information is reported as received. If water use information is not available from any other source, SJRWMD uses professional analyses of historical data and trends to

estimate values. Water use statistics are subject to change as updated information becomes available. Changes in methodologies may make year-to-year data comparisons inappropriate.

Data Collection Terminology

Freshwater. Water with concentration of total dissolved solids (TDS) less than 1,000 milligrams per liter (mg/L) is considered freshwater and may be withdrawn from either groundwater or surface water sources. This definition is based on the one provided by USGS, in Water Supply Paper 2254 (Hem 1985), and has been used for reporting consistency with USGS. This definition differs from that used by SJRWMD in determining if a source is "brackish" when identifying an alternative water supply source. Source waters that do not always meet federal and state drinking water standards for chloride, sulfate, or total dissolved solids are generally identified by SJRWMD as "brackish" waters. SJRWMD may list brackish waters as alternative water supply sources in some areas.

Saline water. Water with more than 1,000 mg/L TDS is considered saline. All water reported as saline is withdrawn from surface water or surficial aquifer sources.

Reuse. Reclaimed water is treated wastewater that has received at least secondary treatment and basic disinfection. It may be distributed for nonpotable uses that achieve a water resource benefit (SJRWMD 2006).

Data Source/Methodology: SJRWMD's methodology is based on quantities of reuse water reported by DEP in *2011 Reuse Inventory* (DEP 2012). DEP regards several applications of reclaimed water as reuse that SJRWMD does not. Therefore, it is common for SJRWMD to report beneficial reuse quantities lower than that reported by DEP. SJRWMD requires that water be applied in such a way as to achieve a water resource benefit before qualifying as reuse. In particular, SJRWMD requires that reuse must take the place of an existing or potential use of higher-quality water or be used to grow useful crops; restore or maintain adopted minimum flows and/or levels of a river, lake, or wetland; or effectively recharge a useable aquifer. If the water applied does not meet one of these requirements, it is considered by SJRWMD as disposal. Types of reclaimed water considered as reuse by DEP but disposal by SJRWMD are as follows: underground injection; absorption fields and rapid infiltration basins located in discharge areas; surface water augmentation where not required; spray fields; artificial wetlands.

Florida population. This is the estimated number of permanent residents living within Florida.

Data Source/Methodology: The source for population is the March 2012, *Projections of Florida Population by County, 2011–2040* (BEBR 2012).

SJRWMD population. This is the estimated number of permanent residents living within SJRWMD's 18-county region.

Data Source/Methodology: Population estimates are intended for planning purposes only; 2011 county population estimates are from the March 2012, *Projections of Florida Population by County, 2011–2040* (BEBR 2012). For counties located within more than one water management district, the amount of the 2011 estimates within SJRWMD is derived by estimating SJRWMD's portion of the 2000 U.S. Census population at the block level.

Water use category. Classification of water use is based on one of the following six categories: (1) public supply, (2) domestic self-supply and small public supply systems, (3) agricultural irrigation self-supply, (4) commercial/industrial/institutional self-supply, (5) recreational self-supply, (6) thermoelectric power generation self-supply.

Public supply. Water withdrawn, treated, and delivered to service areas within SJRWMD by privately and publicly owned water supply utilities (or systems) is defined as public supply. This encompasses both residential and nonresidential uses by utilities that withdraw more than 0.10 million gallons per day (mgd) from groundwater or surface water sources.

Data Source/Methodology: Water use data in this category were obtained from SJRWMD EN-50 forms. In cases where SJRWMD EN-50 forms were missing, MORs submitted to DEP were used. Of note, MORs are submitted to DEP by approximately 98% of the public supply utilities for which SJRWMD had consumptive use permits (CUPs) in effect during 2011 for quantities greater than 0.10 mgd. (Note: Water for use by the city of Cocoa, Brevard County, is withdrawn from Orange County.)

Domestic self-supply and small public supply systems. Domestic self-supply water use refers primarily to water use by individuals not served by a public supply water utility (e.g., a residence with a private well). The population associated with small public supply utility systems (average

daily flow under 0.10 mgd) is also included in this category. In most cases, small public supply utility systems need not report water use data to SJRWMD.

Data Source/Methodology: Water use statistics in this category are estimated from residential population and residential public supply per capita water use rates at the county level. Residential water use for each public supply utility is calculated by multiplying the total public supply water use by the percent of the total water use allocated to residential use, as authorized in the SJRWMD-issued CUP. The resulting water use values for each public supply utility are then summed to the county level and divided by the total county permanent/residential public supply population to obtain the county-level residential per capita value. The residential per capita value is multiplied by the domestic self-supply population, resulting in the estimated amount of water use for this category. The domestic self-supply population for each county is obtained by subtracting the total number of people served by public supply utilities in a county from the total number of permanent residents living in the county. For counties with a population of less than 5% within the jurisdiction of SJRWMD or that have no public supply water use, SJRWMD's average residential public supply per capita figure of 108 gallons per day (gpd) was used as a best estimate. For the purpose of reporting, all domestic self-supply water is assumed to be groundwater.

Commercial/industrial/institutional self-supply. This is water use for commercial, industrial, or institutional purposes not provided by public supply systems. It includes businesses, government facilities, military installations, schools, prisons, hospitals, and industrial uses such as mining, processing, and manufacturing. (Note: For this report, surface water use by mining operations in the commercial/industrial/institutional self-supply category represents 5% of surface water use, to account for the loss of water in mining products. The remaining surface water is assumed to be recirculated in the mining process and, therefore, is considered nonconsumptive. Nonconsumptive is defined by SJRWMD as any use of water that does not reduce the supply from which it is withdrawn or diverted.)

Data Source/Methodology: Data in this category reflect water use information reported to SJRWMD by consumptive use permittees via EN-50 forms.

Thermoelectric power generation self-supply. This is water withdrawn from groundwater and surface water sources and used by power plants not supplied by public supply systems. (Note: This does not include water used for once-through cooling, which is considered nonconsumptive.)

Data Source/Methodology: Data in this category reflect water use information reported to SJRWMD by power plant operators via EN-50 forms or through SJRWMD survey.

Agricultural irrigation self-supply. This is water withdrawn from groundwater and surface water sources for use in supplemental crop irrigation.

Data Source/Methodology: Water use for irrigation is assessed by crop type due to crop-specific consumption requirements. Monthly water use estimates are based on a modified Blaney-Criddle model (for calculating evapotranspiration). Climate data for running a modified Blaney-Criddle model is obtained from the National Oceanic and Atmospheric Administration (NOAA) and the Florida Climate Center. In places where climate data are missing, substitute data are obtained

from historical (or average values) or data from the next closest weather station. Crop type and acreage data are provided through SJRWMD surveys and geographic information system (GIS)-based crop layers or through data from the University of Florida–Institute of Food and Agricultural Sciences (IFAS), county agricultural extension agents, and U.S. Department of Agriculture surveys.

Recreational self-supply. This is water withdrawn from groundwater and surface water sources for use in golf course irrigation, irrigation of urban landscapes or athletic fields, water-based recreational areas, and ornamental or decorative purposes not supplied by public supply systems.

Data Source/Methodology: Data in this category reflect water use information reported to SJRWMD by consumptive use permittees via EN-50 forms or through SJRWMD survey.

2011 Estimated Water Use by Category

Water use is estimated for water withdrawals from fresh, saline, and reuse water sources, expressed in average million gallons per day unless otherwise noted. In this 2011 survey, the estimated amounts are based on best available data as of Sept. 30, 2012. Water withdrawal information is reported for six categories of use: (1) public supply, (2) domestic self-supply and small public supply systems, (3) commercial/industrial/institutional self-supply, (4) agricultural irrigation self-supply, (5) recreational irrigation self-supply, and (6) thermoelectric power generation self-supply. A reporting threshold of 0.10 mgd of average daily flow by individual water users was used for all water use categories, excluding agricultural irrigation, in the reporting of consumptive use for 2011. Consumptive use is defined by SJRWMD as any use of water that reduces the supply from which it is withdrawn or diverted.

Rainfall and water use totals within SJRWMD are shown in Table 1, with figures tabulated by county. Table 2 shows total water use by category, and Table 3 shows water use by county and category. The estimated total consumptive use in SJRWMD for 2011, including fresh, saline, and reuse (reclaimed) water, was 1,426.06 mgd. Of the estimated total consumptive amount, 1,258.75 mgd was freshwater and 3.04 mgd was saline water (Tables 1–3). In 2011, the largest consumptive use of freshwater within SJRWMD was public supply, which totaled 565.50 mgd, or 45%, of total consumptive freshwater use (Table 3, Figure 1). Next was agricultural irrigation, which used 450.83 mgd, or 36%, of total consumptive freshwater within SJRWMD (Figure 1). Reuse water accounted for 164.27 mgd and was reported under the commercial/industrial/institutional, agricultural irrigation, and recreational categories of water use (Table 2).

Public Supply

The public supply water use category consists of water supplied to homes and industries by both privately and publicly owned water supply utilities. It includes both residential and nonresidential uses. Utilities that withdraw 0.10 mgd or more from groundwater or surface water sources are included in this category.

In 2011, 175 public supply utilities (or systems) served an estimated 4,096,942 people, or 87%, of the SJRWMD total population (see Table 4 note). Total water use, from both groundwater and surface water sources, was 565.50 mgd (Table 2, Figure 2), nearly 1% below the average annual use of 573.15 mgd for the 10-year period. Average gross per capita use, based on the population served by public supply, was 138 gallons per capita per day (gpcd). Public supply water use

typically fluctuates during the year in response to seasonal rainfall and temperature variations. Water use tends to increase during the warm season (April–October), when outdoor use is highest. The monthly average gross per capita also fluctuates throughout the year in response to these variations. In 2011, water use ranged from a low of 482.46 mgd (118 gpcd) in January to a high of 675.97 mgd (165 gpcd) in May (Figure 2).

Of the total water withdrawn for public supply use, 97% was groundwater, of which 89% was withdrawn from the Floridan aquifer; the remaining 11% was withdrawn from the intermediate and surficial aquifers.

Counties with the largest public supply water use during 2011 were Duval County (124.57 mgd, serving 821,371 people; 152 gpcd) and Orange County (117.67 mgd, serving 782,769 people; 150 gpcd) (Table 3, Figures 3 and 4). These counties combined represented 43% of total public supply water use for 39% of the public supply population. (Note: There is no public supply water use in the portions of Okeechobee and Osceola counties within SJRWMD.)

Domestic Self-Supply

The domestic self-supply category includes water withdrawn from individual domestic wells. Water use for domestic self-supply was not inventoried, so water use is estimated at a county level based on population not served by public supply and residential per capita rates for the public supply utilities within the county. For the purpose of reporting, all domestic self-supply water was assumed to be groundwater.

In 2011, an estimated 624,281 people used 67.37 mgd of domestic self-supply water, or 5%, of total freshwater used in SJRWMD (Figure 1). Marion County had the largest self-supplied population, with 90,269 people. Orange County had the second-largest population, 86,974, followed by Putnam County, 60,723 (Table 4).

Domestic self-supply water use has fluctuated over the 10-year period, reaching a low of 64.40 mgd in 2009 to a high of 72.91 mgd in both 2004 and 2006. The average for the 10-year period was 69.68 mgd; water use in 2011 was about 3% below average. Fluctuations in water use are attributed to changes in methodologies over the years. For each county, the residential public supply per capita was calculated by multiplying the percent of the total public supply water use allocated to residential use by the total public supply water use. In 2011, average residential public supply per capita within SJRWMD was 108 gpcd. This average gpcd was used to estimate the total for domestic self-supplied water in Bradford, Okeechobee, and Osceola counties.

Commercial/Industrial/Institutional Self-Supply

The commercial/industrial/institutional self-supply use category consists of larger commercial, industrial, and institutional users not served by public supply utilities that withdraw more than 0.10 mgd. The commercial and institutional categories include 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. Surface water use by mining operations in the commercial/industrial/institutional self-supply category represents 5% of surface water use, to account for the loss of water in mining products. The remaining surface water is assumed to be recirculated in the mining process and, therefore, is considered

nonconsumptive. There were 189 commercial, industrial, and institutional users reported in 2011.

Total freshwater use in the commercial/industrial/institutional category was 94.29 mgd, or 8%, of total freshwater use (Table 2, Figure 1). Of this freshwater total, 72.09 mgd was groundwater and 22.20 mgd was surface water. Saline surface water accounted for 3.04 mgd, and reuse was 26.44 mgd (Table 2).

Most of the freshwater withdrawn for commercial/industrial/institutional purposes supplied the pulp and paper industries in Duval, Nassau, and Putnam counties. Water use for pulp and paper production in 2011 included 44.61 mgd of fresh groundwater, 19.98 mgd of fresh surface water, and 0.94 mgd of saline surface water. The second-largest water user in this category was the mining industry, which accounted for 3.74 mgd of fresh groundwater and 0.96 mgd of fresh surface water. Pulp and paper production and mining accounted for a combined total of 69.30 mgd of freshwater, or 74%, of the commercial/industrial/institutional freshwater use.

Commercial/industrial/institutional self-supply water use was highest in 2004 (154.83 mgd) and lowest in 2011 (94.29 mgd). The average for the 10-year period was 116.83 mgd; water use in 2011 was about 19% below the average. Commercial/industrial/institutional freshwater use in 2011 varied from a low of 88.02 mgd in October to a high of 107.57 mgd in June (Figure 5).

Agricultural Irrigation Self-Supply

The agricultural irrigation self-supply category consists of estimated water withdrawals from freshwater sources for supplemental crop irrigation. Estimates of the acreage planted in various crops are multiplied by estimates of the quantity of water per acre necessary to irrigate those crops. Water use for irrigation is assessed by crop, because crops have specific consumptive use requirements and suitable water quality.

Total consumptive use of freshwater for agricultural irrigation was estimated at 450.83 mgd, which is 36% of total freshwater use in SJRWMD during 2011 (Table 2, Figure 1). Reuse water accounted for 8.64 mgd of agricultural irrigation use. Although both groundwater and surface water were used for agricultural irrigation, use by water source has not been defined for this report. Agricultural irrigation allocations with SJRWMD permits in effect during 2011 indicated that 66% of agricultural irrigation use was groundwater and 34% was surface water. For the purpose of reporting, it was assumed that groundwater for agricultural irrigation originated from the Upper and Lower Floridan aquifers, because of available quantities.

It is estimated that of the total 186,786 acres irrigated, 78,359 acres were irrigated by low-pressure/low-volume systems; 73,259 acres were irrigated by flood systems; 35,168 acres were irrigated by sprinkler systems. Agricultural irrigation water use in 2011 had the largest seasonal fluctuation than any other water use category, reaching a low of 32.69 mgd in January to a high of 1,090.76 mgd in May (Figure 6). These fluctuations are typical of irrigation water use and inversely correlated to rainfall.

By county, the largest water use for agricultural irrigation occurred in Indian River County, with 137.49 mgd of freshwater, accounting for 30% of total SJRWMD agricultural irrigation water use (Table 3). Based on agricultural irrigation allocations with permits in effect during 2011, Indian River County is permitted to use 66% of its agricultural irrigation from surface water

sources and 34% from groundwater sources. This would imply a surface water use of 90.74 mgd and an estimated groundwater use of 46.75 mgd.

Districtwide, the largest estimated water use for a single crop was for citrus, which accounted for 163.82 mgd, or 36%, of total agricultural irrigation water use. Improved pasture irrigation accounted for 143.90 mgd, or 32%, of total agricultural irrigation water use (Figure 7). (Historically, for those areas where Benchmark Farms Program (BMF) crops were significantly represented [Indian River, Lake, Putnam, St. Johns, and Volusia counties], crop-specific data were substituted for modified Blaney-Criddle data. Due to budgetary constraints, the BMF program has ended and crop-specific data were not available for 2011.) Of note, the 2011 water use estimate in Osceola County is higher than the 2010 estimate; information obtained from the Osceola County agricultural extension agent indicated a conversion of agricultural crops to citrus.

Recreational Irrigation Self-Supply

The recreational irrigation self-supply category includes water used to irrigate turf grass for golf courses, urban landscapes, athletic fields, water-based recreational areas, or for ornamental or decorative purposes. Use of freshwater in the recreational irrigation category totaled 73.09 mgd, about 6% of total freshwater use in 2011. Reuse water accounted for 129.19 mgd of recreational irrigation use. By county (Table 3), the largest freshwater use for recreational irrigation occurred in Indian River County (14.17 mgd), followed by Lake County (13.26 mgd), and Duval County (7.17 mgd).

During the 10-year period (January 2002–December 2011), recreational irrigation freshwater use was highest in 2011 (73.09 mgd) and lowest in 2002 (39.83 mgd), with 2002 as one of the wettest years (Figure 10). Average water use for the 10-year period was 54.98 mgd. Recreational irrigation water use was 33% above the 10-year average, because of the inclusion of other recreational water uses within this category. (Historically, recreational irrigation water use has only included water for turf grass irrigation at golf courses. Recreational irrigation water use reporting was expanded in 2010 to include the uses mentioned above.) Recreational irrigation freshwater use in 2011 varied from a low of 40.56 mgd in January to a high of 132.67 mgd in May (Figure 8).

Thermoelectric Power Generation Self-Supply

The thermoelectric power generation self-supply category consists of water withdrawn from groundwater and surface water sources by power plants, excluding reuse water or water used for

once-through cooling, which is considered nonconsumptive use. Estimates for 2011 reflect consumptive use data for 15 self-supplied thermoelectric power plants, totaling 7.67 mgd (Figure 1). The largest amount of freshwater use within this category (Table 3) occurred in Duval County (5.28 mgd).

Thermoelectric power generation freshwater use in 2011 fluctuated from a low of 5.00 mgd in March to a high of 7.99 mgd in September (Figure 9). Fluctuations in water use are related to power plant shutdowns for maintenance or increased power demands during periods of extremely high or low temperatures.

Summary of 2011 Estimated Water Use

Since 1978, when SJRWMD published its first annual survey, there has been a gradual increase in freshwater use (Figure 10). Total public supply water use has increased by nearly 142% (from 233.84 mgd to 565.50 mgd) during this 33-year period, while total population served by public supply has increased by 180% (from 1,460,900 to 4,096,942). However, between 2007 and 2011, public supply water use decreased by 8% (from 611.47 mgd to 565.50 mgd), while population served by public supply increased by nearly 1% (from 4,081,029 to 4,096,942; the small increase in population during this time frame can be attributed to economic conditions and housing foreclosures. In 2008, total population served by public supply was 4,119,163). Decreases in public supply water use are attributed to fluctuations in rainfall and conservation. For example, during the 5-year period extending January 2007–December 2011, average annual rainfall throughout SJRWMD varied by nearly 11 inches (from 52.80 inches in 2008 to 41.51 inches in 2010). Above-average annual rainfall occurred in 2008 (52.80 inches) and 2009 (52.57 inches), while below-average rainfall occurred in 2007 (44.29 inches), 2010 (41.51 inches), and 2011 (44.93 inches). Meanwhile, improved irrigation management by growers has brought a decrease in agricultural irrigation self-supply water use. In general, the trend in agricultural irrigation is static, if not declining, within SJRWMD. Water use amounts reported in this 2011 survey are estimated based on best available data through Sept. 30, 2012. For additional information, please visit *floridaswater.com* or contact:

Tammy B. Bader, Water Use Analyst
Division of Water Resources
St. Johns River Water Management District
4049 Reid St.
Palatka, FL 32177
(386) 329-4209
tbader@sjrwmd.com

References Bibliography

[BEBR] Bureau of Economic and Business Research 2012. *Projections of Florida Population by County, 2011–2040.* (Released March 2012.) Gainesville, Fla.: Bureau of Economic Business and Research, Univ. of Florida.

[DEP] Florida Department of Environmental Protection. 2012. *2011 Reuse Inventory*, S. Speas-Frost, ed. Available online at *www.dep.state.fl.us/water/reuse/inventory.htm*. Tallahassee: Florida Department of Environmental Protection, Water Reuse Program.

Fernald, E.A., and E.D. Purdum (eds.). 1998. *Water Resources Atlas of Florida*. Tallahassee: Institute of Science and Public Affairs, Florida State Univ.

Hem, J.D. 1985. *Study and Interpretation of the Chemical Characteristics of Natural Water*. 3rd ed. U.S. Geological Survey Water Supply Paper 2254. Alexandria, Va.: Dept. of the Interior, U.S. Geological Survey.

[SJRWMD] St. Johns River Water Management District. 2006. *District Water Supply Plan, 2005*. Technical Publication SJ2006-2. Palatka, Fla.: St. Johns River Water Management District.

Table 1. Total water use (mgd) and rainfall by county in SJRWMD, 2011

County	Freshwater (mgd)	Saline Water (mgd)	Reuse (mgd)	Total Water Use (mgd)	Rainfall (inches)
Alachua	29.15	0.00	4.70	33.85	41.29
Baker	7.90	0.00	0.00	7.90	41.78
Bradford	1.52	0.00	0.00	1.52	42.12
Brevard	130.89	0.00	23.19	154.08	48.51
Clay	24.89	0.00	5.59	30.48	41.35
Duval	163.28	0.00	12.94	176.22	40.97
Flagler	26.34	2.10	5.19	33.63	42.86
Indian River	167.68	0.00	6.14	173.82	52.31
Lake	114.35	0.00	9.97	124.32	45.72
Marion	44.75	0.00	3.89	48.64	45.86
Nassau	52.33	0.94	1.35	54.62	39.95
Okeechobee	19.63	0.00	0.00	19.63	44.86
Orange	151.73	0.00	40.65	192.38	50.79
Osceola	53.11	0.00	0.00	53.11	56.99
Putnam	55.20	0.00	0.46	55.66	36.80
St. Johns	60.47	0.00	3.32	63.79	38.87
Seminole	69.62	0.00	23.37	92.99	50.14
Volusia	85.91	0.00	23.51	109.42	47.49
Total	**1,258.75**	**3.04**	**164.27**	**1,426.06**	**44.93***

Note: Total water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.
Source of domestic self-supply is assumed to be groundwater, and domestic self-supply is an estimate.
* Districtwide rainfall average.

Table 2. Total water use (mgd) by category in SJRWMD, 2011

Category	Freshwater (mgd)	Saline Water (mgd)	Reuse (mgd)	Total Water Use (mgd)
Public supply	565.50	0.00	0.00	565.50
Domestic self-supply and small public supply systems	67.37	0.00	0.00	67.37
Commercial/industrial/institutional self-supply	94.29	3.04	26.44	123.77
Agricultural irrigation self-supply	450.83	0.00	8.64	459.47
Recreational self-supply	73.09	0.00	129.19	202.28
Thermoelectric power generation self-supply	7.67	0.00	0.00	7.67
Total	**1,258.75**	**3.04**	**164.27**	**1,426.06**

Note: Water use is in million gallons per day (mgd).
Source of domestic self-supply is assumed to be groundwater, and domestic self-supply is an estimate.
Estimated amounts are based on best available data as of Sept. 30, 2012.

Table 3. Total water use (mgd) by county and category in SJRWMD, 2011

County	Freshwater							Saline Water	Reuse	All Water Use
	Public Supply	Domestic Self-Supply	Commercial/ Industrial/ Institutional Fresh Water	Agricultural Irrigation Self-Supply	Recreational Self-Supply	Thermoelectric Power Generation Self-Supply	Total Freshwater	Commercial/ Industrial/ Institutional Saline Water		
Alachua	25.01	0.78	0.47	2.10	0.46	0.33	29.15	0.00	4.70	33.85
Baker	1.06	3.47	0.45	2.92	0.00	0.00	7.90	0.00	0.00	7.90
Bradford	0.48	0.10	0.20	0.74	0.00	0.00	1.52	0.00	0.00	1.52
Brevard	54.37	1.88	5.23	63.54	5.85	0.02	130.89	0.00	23.19	154.08
Clay	14.27	5.38	0.34	3.76	1.14	0.00	24.89	0.00	5.59	30.48
Duval	124.57	4.28	18.91	3.07	7.17	5.28	163.28	0.00	12.94	176.22
Flagler	9.70	1.42	0.00	12.80	2.42	0.00	26.34	2.10	5.19	33.63
Indian River	15.05	0.87	0.10	137.49	14.17	0.00	167.68	0.00	6.14	173.82
Lake	46.36	8.03	2.56	43.48	13.26	0.66	114.35	0.00	9.97	124.32
Marion	19.64	8.12	2.87	10.76	3.36	0.00	44.75	0.00	3.89	48.64
Nassau	7.79	7.22	32.24	2.02	3.06	0.00	52.33	0.94	1.35	54.62
Okeechobee	0.00	0.08	0.00	19.55	0.00	0.00	19.63	0.00	0.00	19.63
Orange	117.67	9.83	2.46	16.53	4.79	0.45	151.73	0.00	40.65	192.38
Osceola	0.00	0.10	0.00	53.00	0.00	0.01	53.11	0.00	0.00	53.11
Putnam	2.72	6.80	26.57	15.88	2.62	0.61	55.20	0.00	0.46	55.66
St. Johns	17.58	3.39	0.18	34.00	5.32	0.00	60.47	0.00	3.32	63.79
Seminole	53.94	1.66	0.02	10.00	4.00	0.00	69.62	0.00	23.37	92.99
Volusia	55.29	3.96	1.69	19.19	5.47	0.31	85.91	0.00	23.51	109.42
Total	**565.50**	**67.37**	**94.29**	**450.83**	**73.09**	**7.67**	**1,258.75**	**3.04**	**164.27**	**1,426.06**

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.
Source of domestic self-supply is assumed to be groundwater, and domestic self-supply is an estimate.

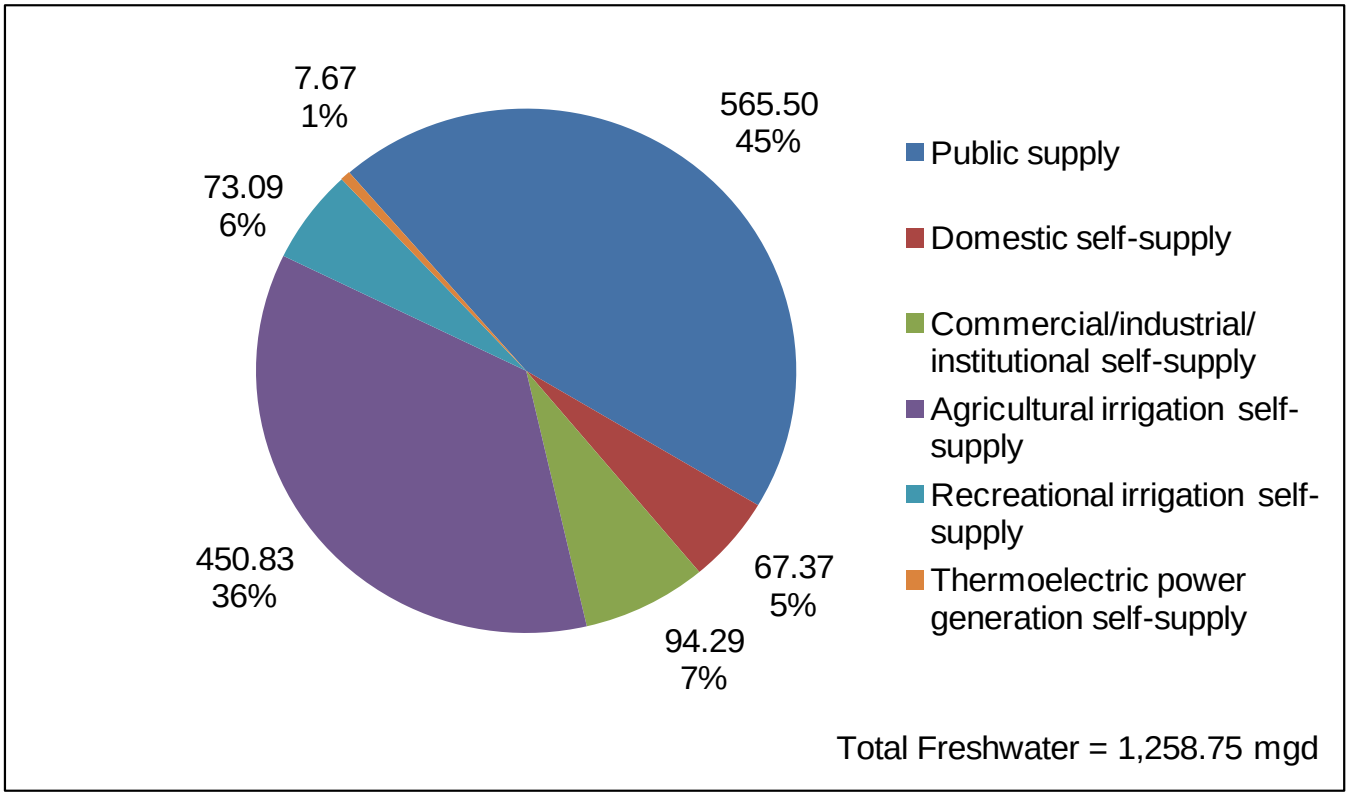

Figure 1. Total freshwater use (mgd), 2011

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.
Source of domestic self-supply is assumed to be groundwater, and domestic self-supply is an estimate.

Table 4. Population by county, 2011

County	County Population	Percentage of County Population in SJRWMD	SJRWMD Population	Public Supply Population	Domestic Self-Supply and Small Public Supply Systems Population
Alachua	247,337	79.5%	196,732	186,895	9,837
Baker	26,927	98.1%	26,413	5,018	21,395
Bradford	28,662	4.2%	1,215	328	887
Brevard	545,184	100.0%	545,184	517,925	27,259
Clay	191,143	100.0%	191,143	135,712	55,431
Duval	864,601	100.0%	864,601	821,371	43,230
Flagler	96,241	100.0%	96,241	76,993	19,248
Indian River	138,694	100.0%	138,694	120,664	18,030
Lake	298,265	99.8%	297,519	240,990	56,529
Marion	331,745	69.8%	231,458	141,189	90,269
Nassau	73,684	100.0%	73,684	36,105	37,579
Okeechobee	39,870	1.9%	746	0	746
Orange	1,157,342	75.2%	869,743	782,769	86,974
Osceola	273,867	0.4%	959	0	959
Putnam	74,052	100.0%	74,052	13,329	60,723
St. Johns	192,852	100.0%	192,852	154,282	38,570
Seminole	424,587	100.0%	424,587	407,604	16,983
Volusia	495,400	100.0%	495,400	455,768	39,632
Total	**5,500,453**		**4,721,223**	**4,096,942**	**624,281**

Note: Population estimates: *Projections of Florida Population by County, 2011–2040* (BEBR 2012)
Total Florida population in 2011 = 18,905,048
Percent of total Florida population within SJRWMD in 2011 = 25%
Percent of SJRWMD population served by public supply in 2011 = 87%

SJRWMD population is derived from the county population multiplied by the percentage of county population in SJRWMD. The percentage of county population, as presented, is rounded to the nearest tenth. Thus, in some cases, the presented SJRWMD population is slightly different from the product of the county population multiplied by the percentage of county population within SJRWMD.

The domestic self-supply category includes water withdrawn from individual domestic wells. Water use for domestic self-supply was not inventoried, so water use is estimated at a county level based on population not served by public supply and residential per capita rates for the public supply utilities within the county. Source of domestic self-supply is assumed to be groundwater, and domestic self-supply is an estimate.

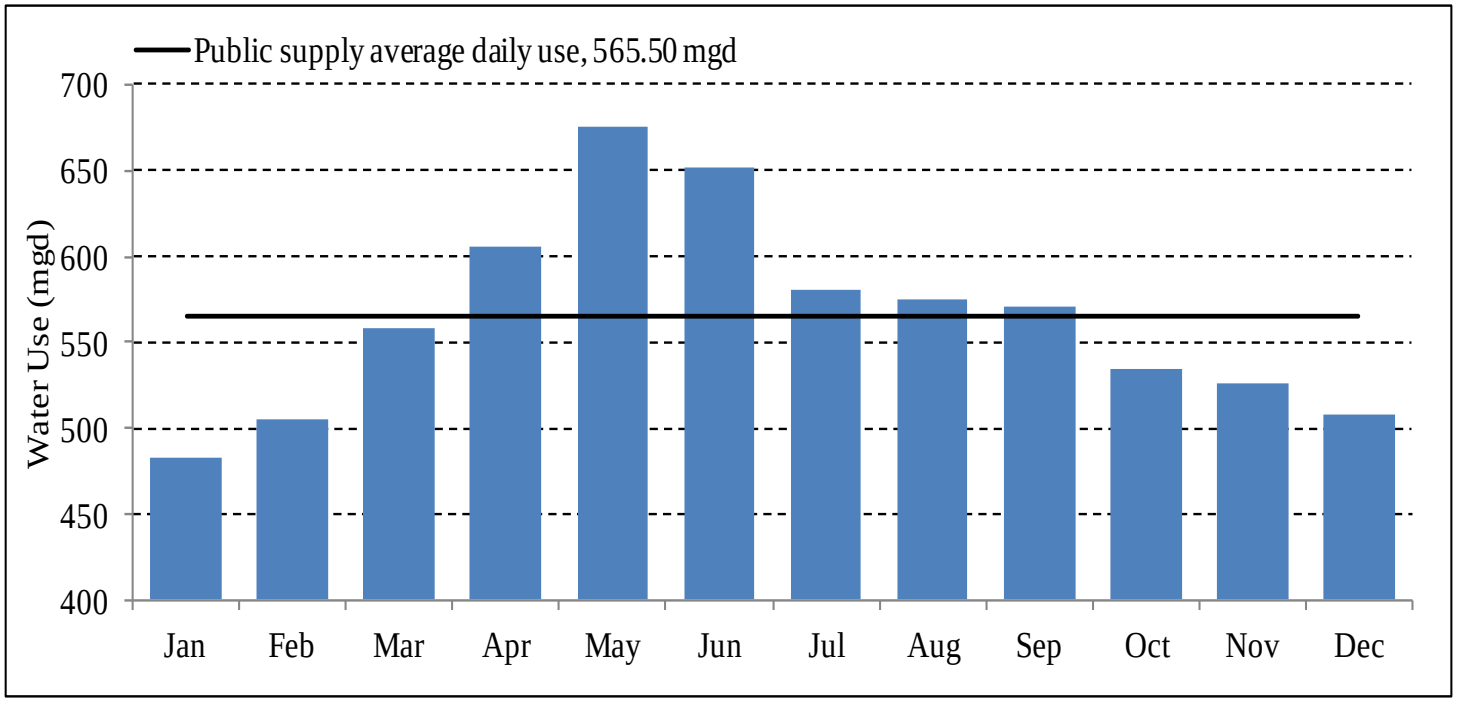

Figure 2. Average daily public supply water use (mgd) by month, 2011

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.

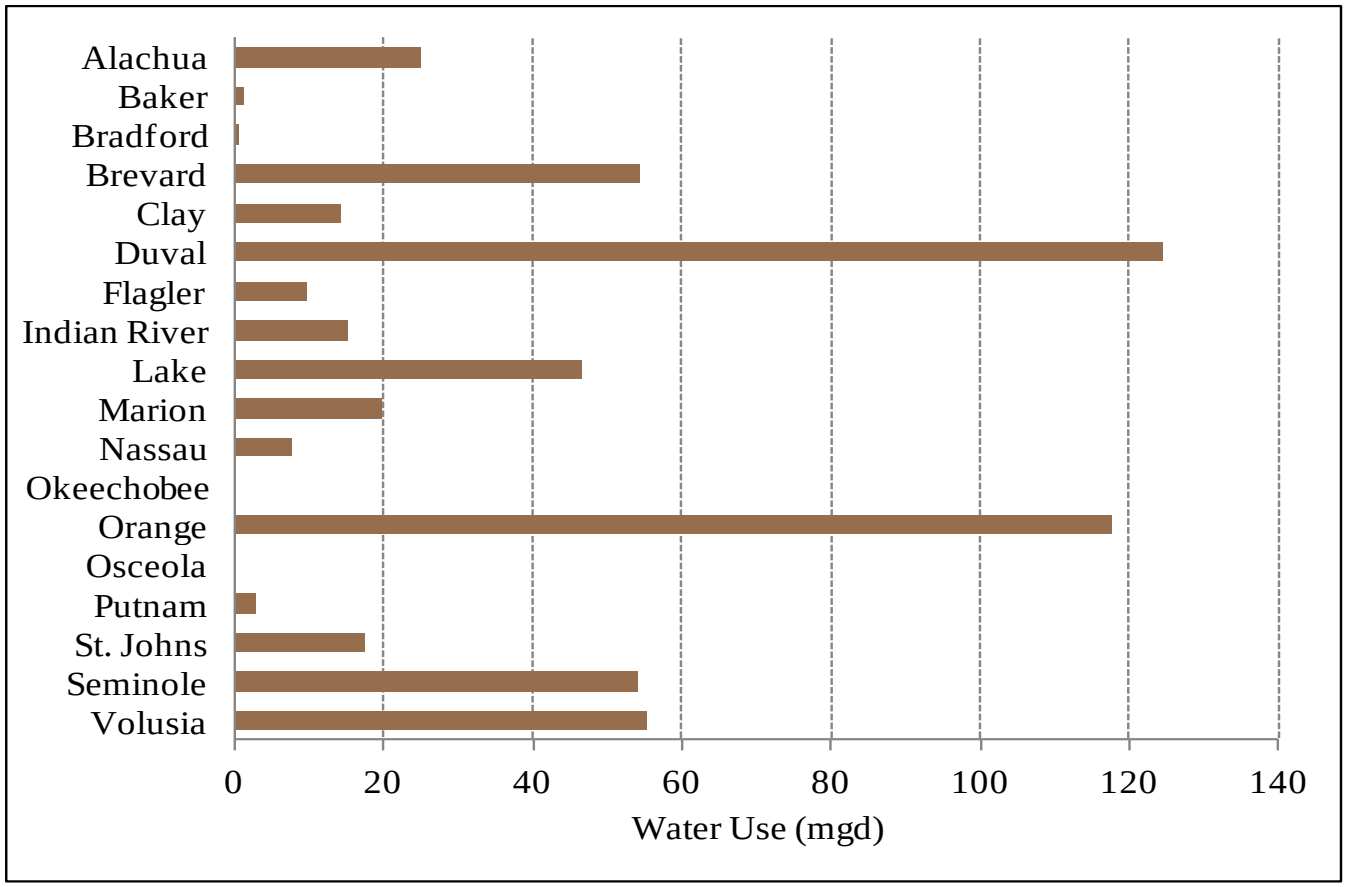

Figure 3. Freshwater use (mgd) for public supply in SJRWMD, 2011

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.
Source of domestic self-supply is assumed to be groundwater, and domestic self-supply is an estimate.

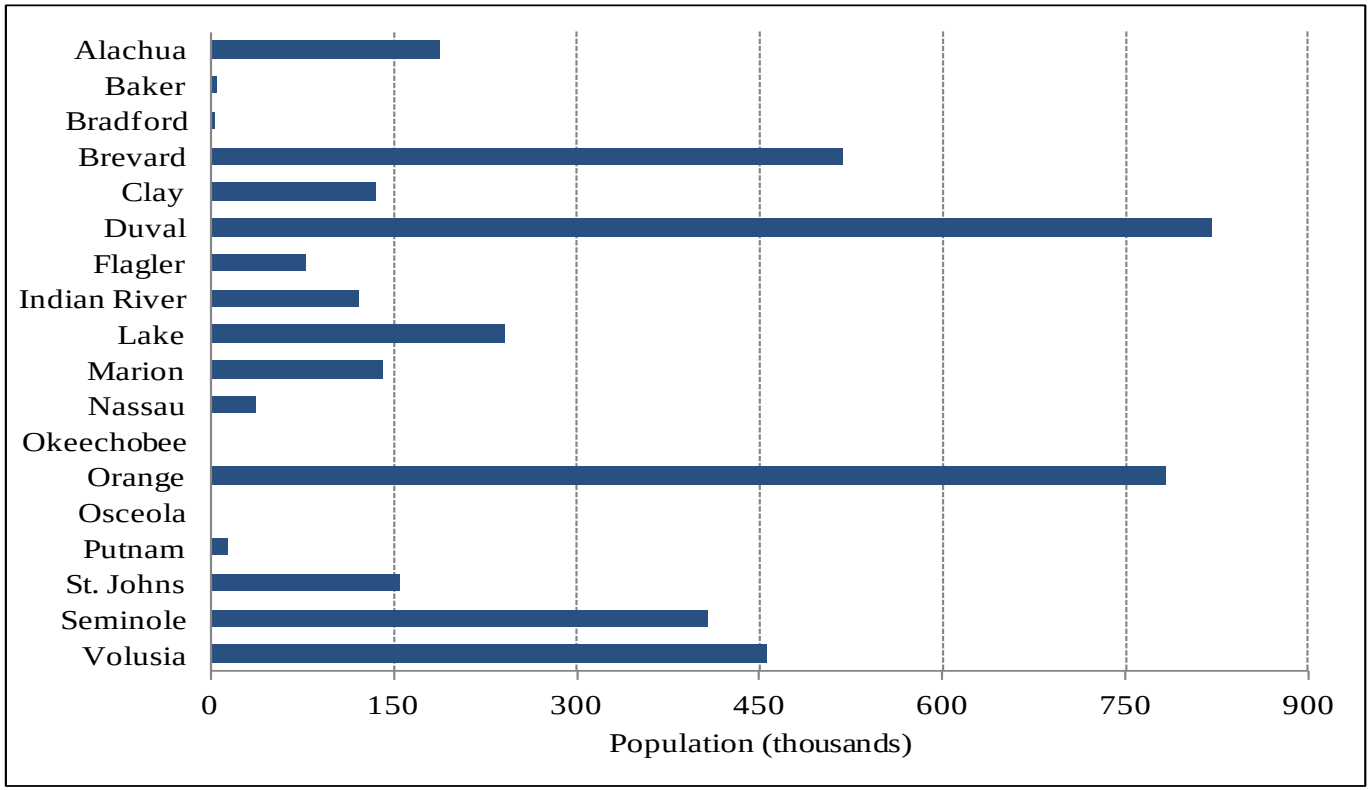

Figure 4. Population served by public supply in SJRWMD, 2011

Note: Estimated amounts are based on best available data as of Sept. 30, 2012.

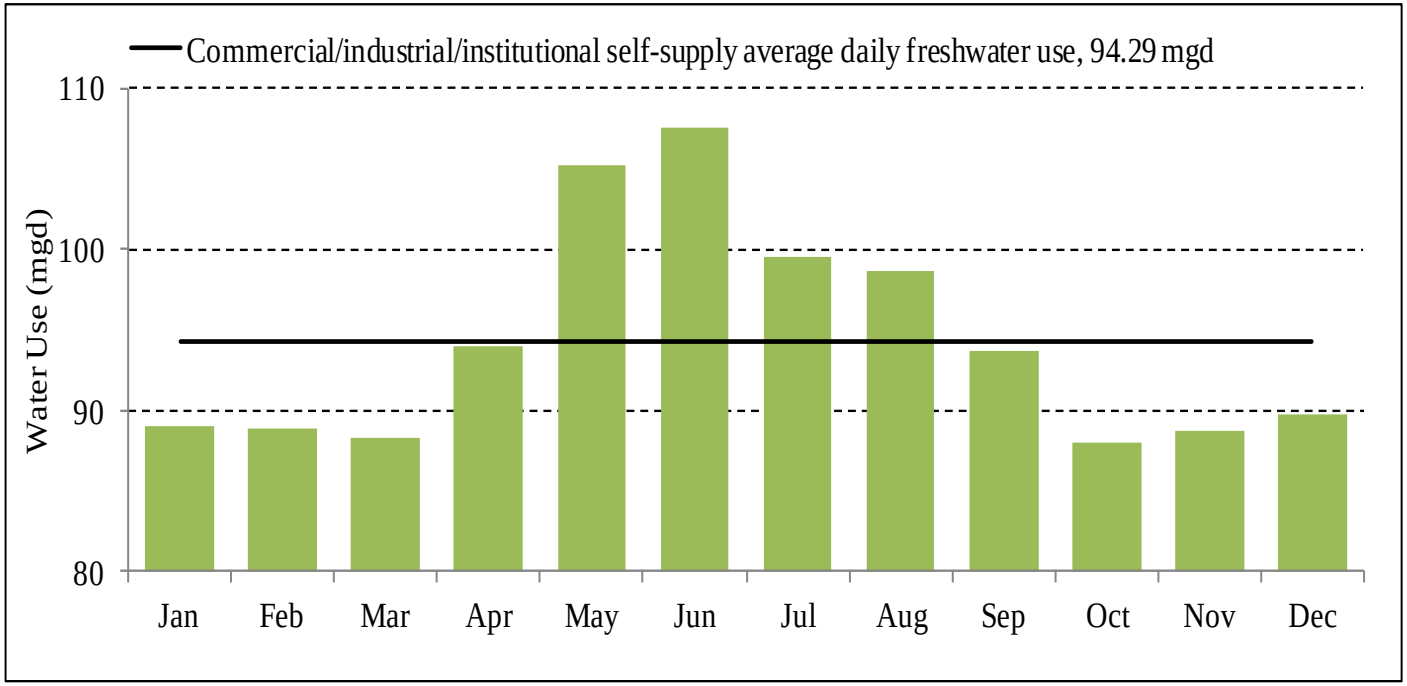

Figure 5. Average daily commercial/industrial/institutional self-supply freshwater use (mgd) by month, 2011

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.

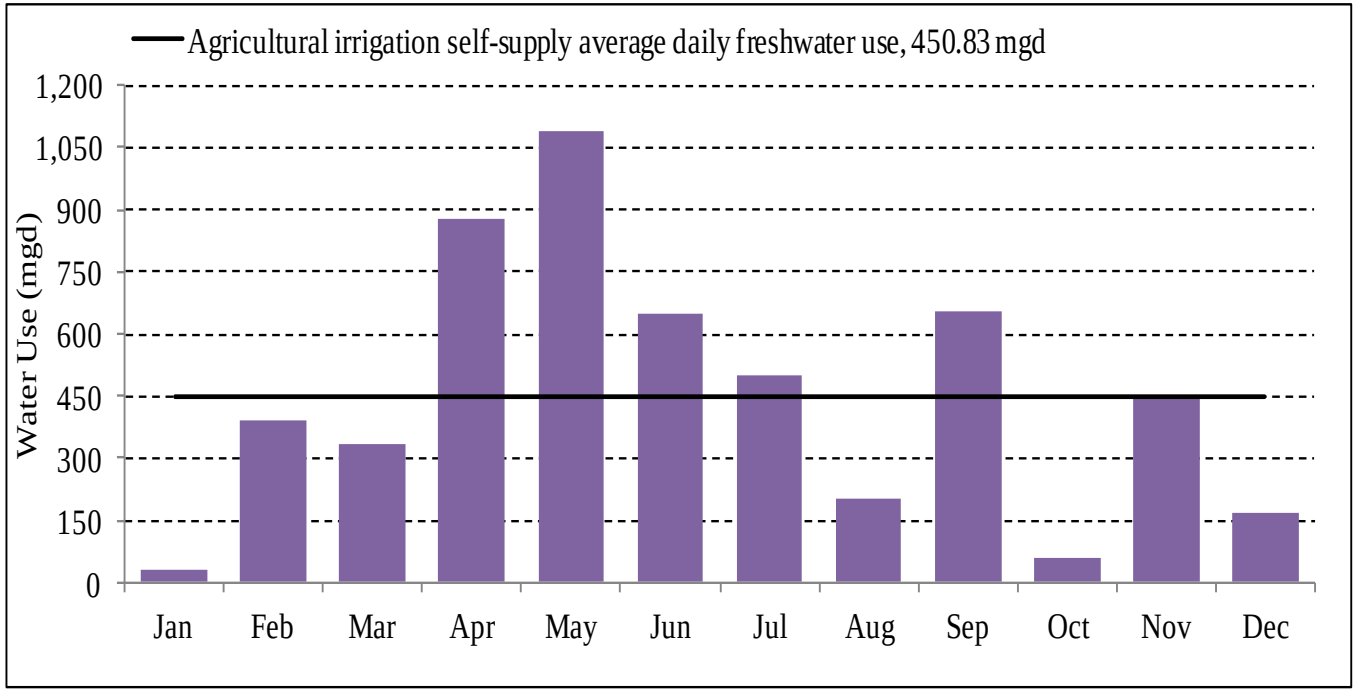

Figure 6. Average daily agricultural irrigation self-supply freshwater use (mgd) by month, 2011

Note: Water use is in million gallons per day (mgd).
Withdrawal amounts are estimated.
All estimates are based on best available data as of Sept. 30, 2012.

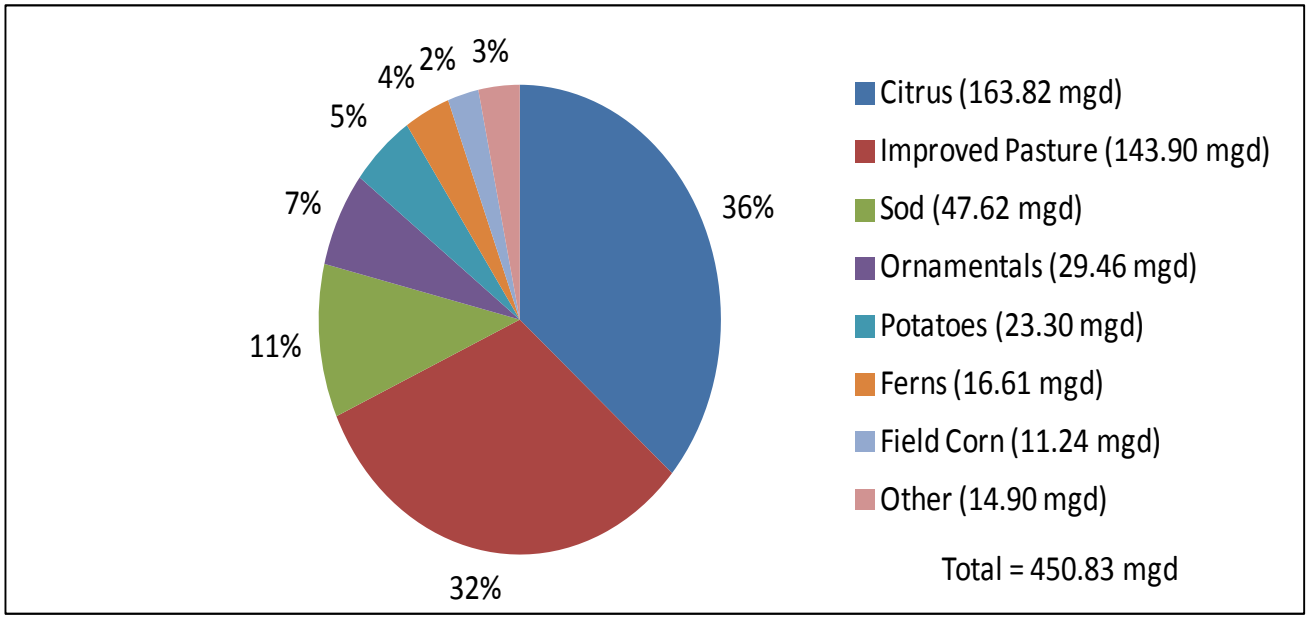

Figure 7. Agricultural irrigation by crop, 2011

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.
Calculation anomalies due to rounding account for nominal discrepancies.

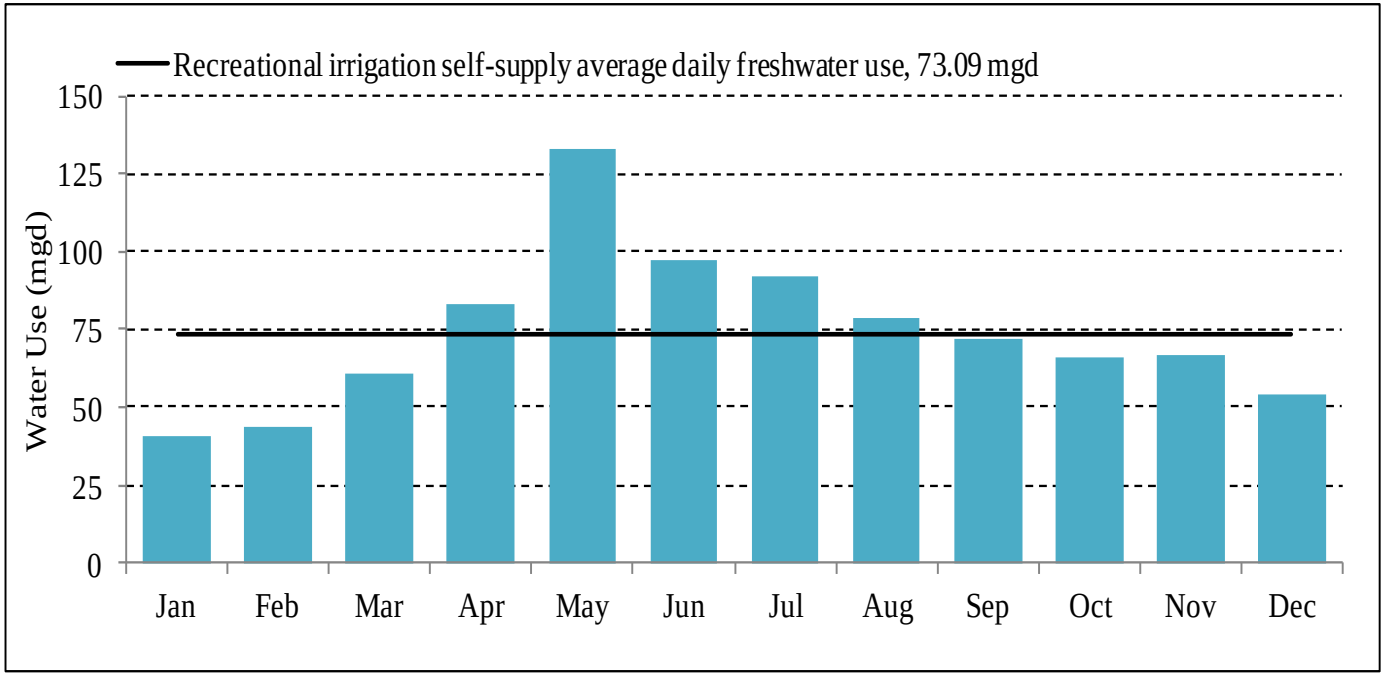

Figure 8. Average daily recreational irrigation self-supply freshwater use by month, 2011

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.

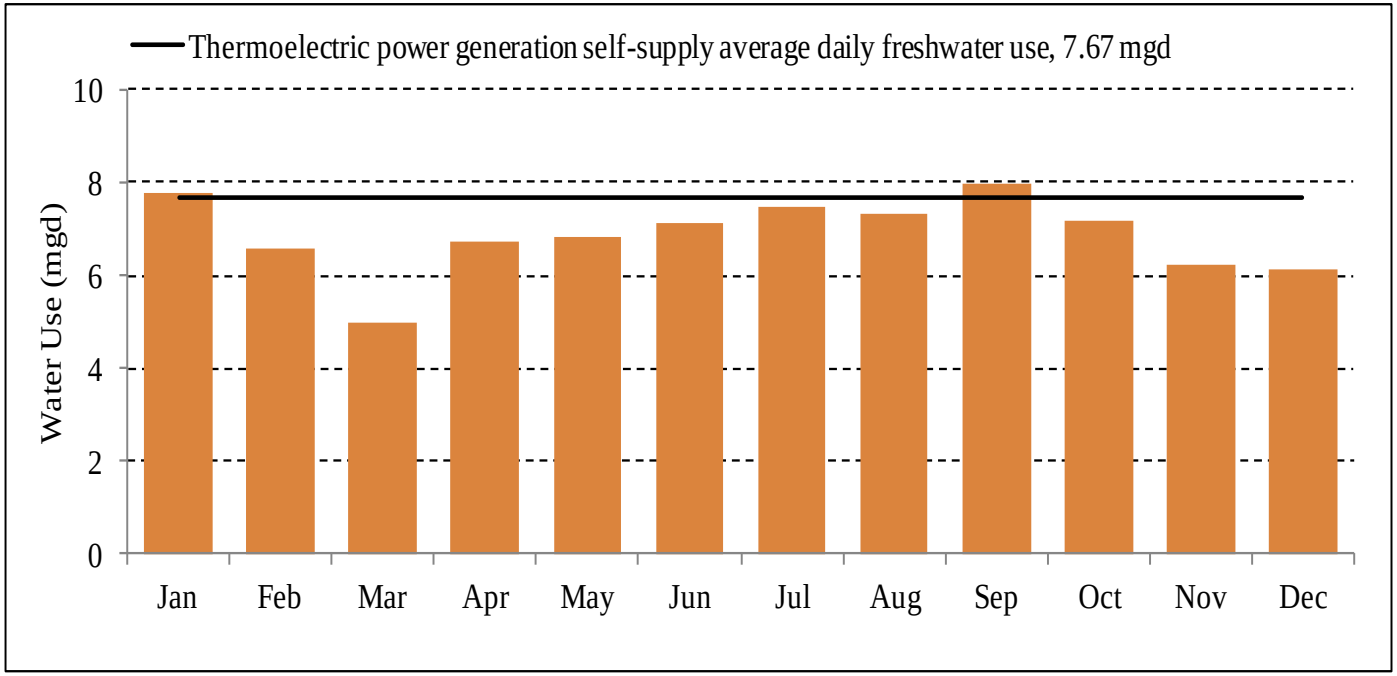

Figure 9. Average daily thermoelectric power generation self-supply freshwater use by month, 2011

Note: Water use is in million gallons per day (mgd).
Estimated amounts are based on best available data as of Sept. 30, 2012.

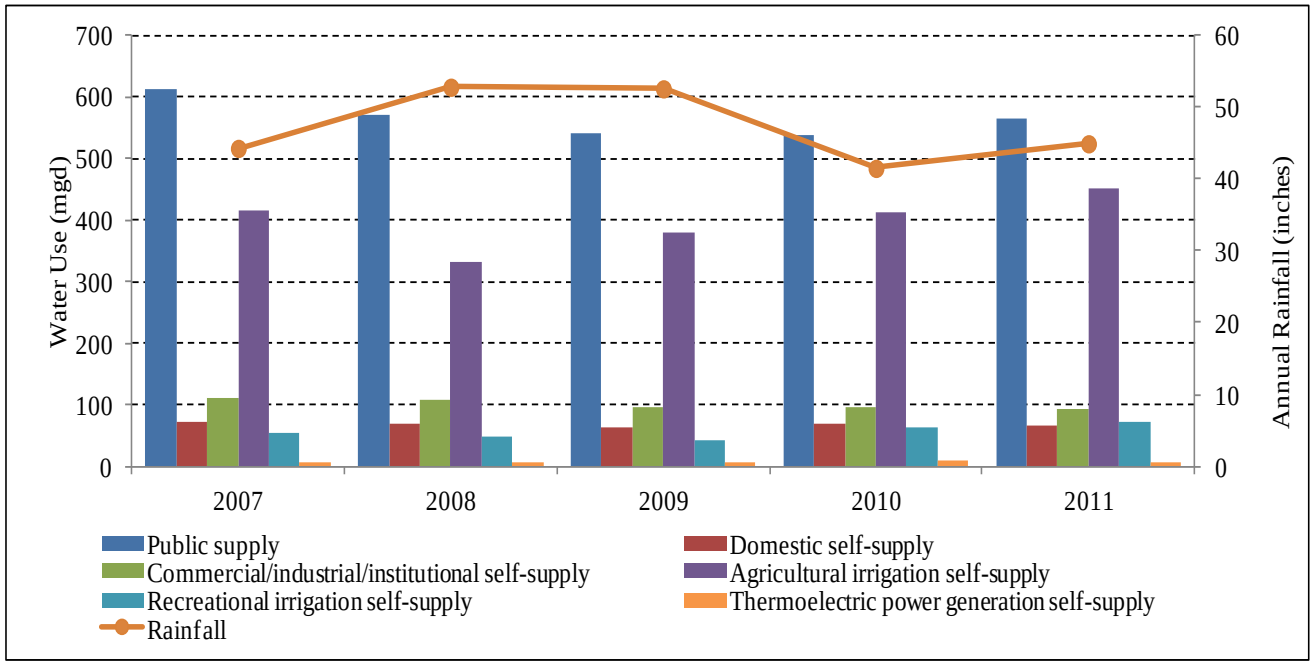

Figure 10. Annual rainfall and freshwater use by category, 2007–2011

Note: Water use is in million gallons per day (mgd); rainfall is measured in inches.
Estimated amounts are based on best available data as of Sept. 30, 2012.
Source of domestic self-supply is assumed to be groundwater, and domestic self-supply is an estimate.