Technical Fact Sheet SJ2018-FS1

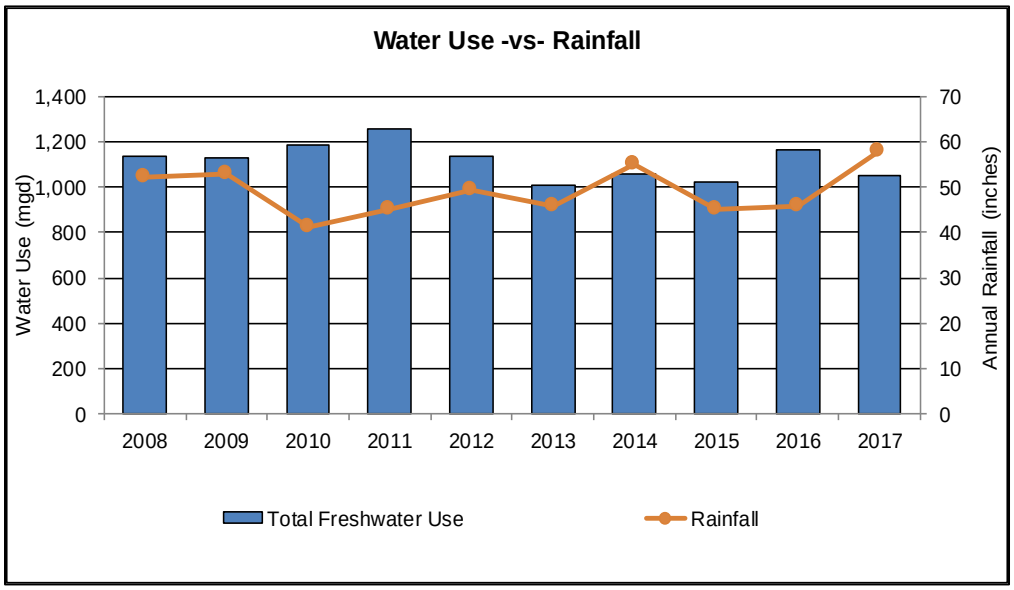
2017 Survey of Annual Water Use for St. Johns River Water Management District

St. Johns River Water Management District
2017 Annual Water Use Executive Summary

This executive summary provides a brief overview and glance of the water use statistics for the last 10 years. Definitions for the categories of water use and explanations regarding changes in water use are included in the report, following the executive summary.

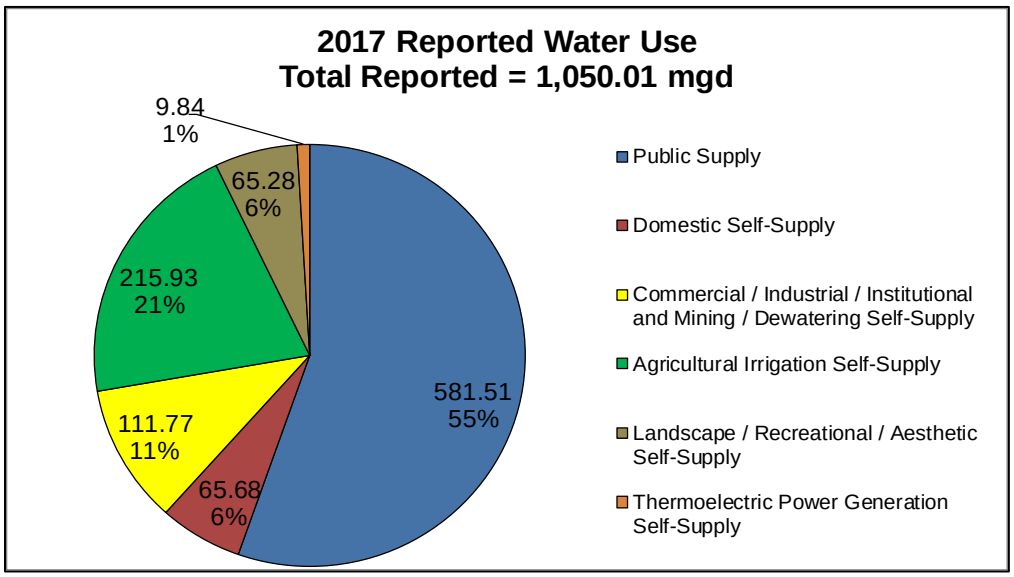
2017 Rainfall

- At 58 inches, it was the wettest year in the last decade
- 17 inches higher than the 10-year low in 2010 and 9 inches above the 10-year average
- The majority of the rainfall occurred during the second half of 2017



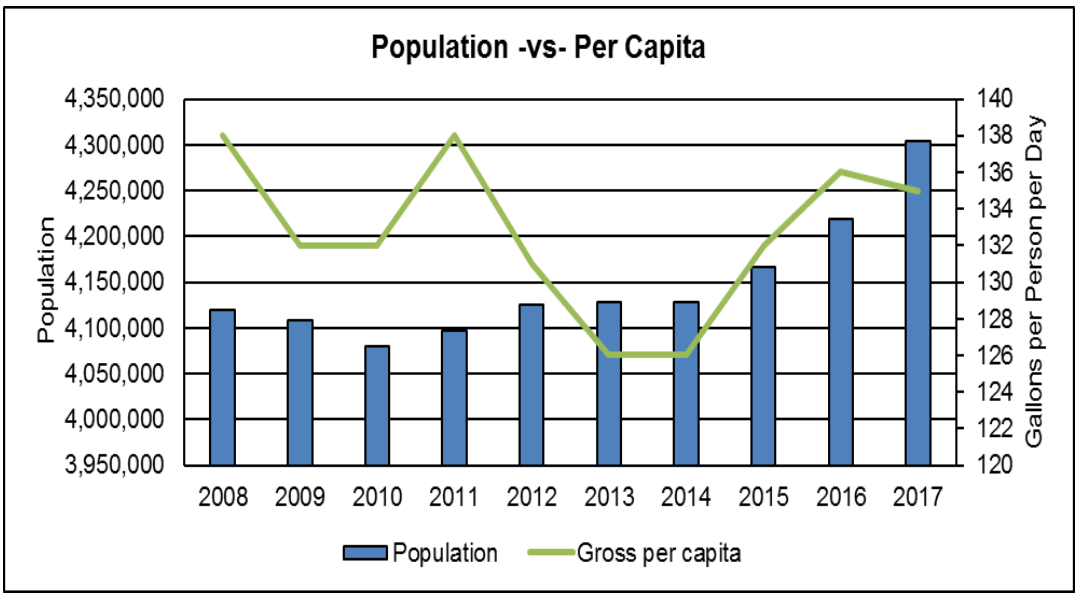
2017 Total Water Use

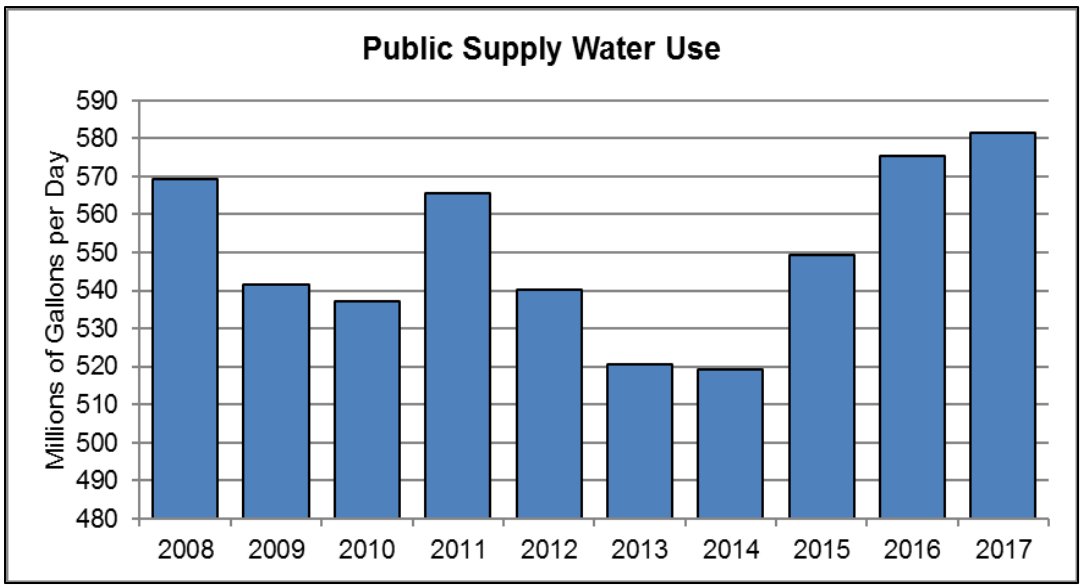
- 6% lower than the 10-year average and 10% lower than 2016 use



2017 Public Supply Water Use

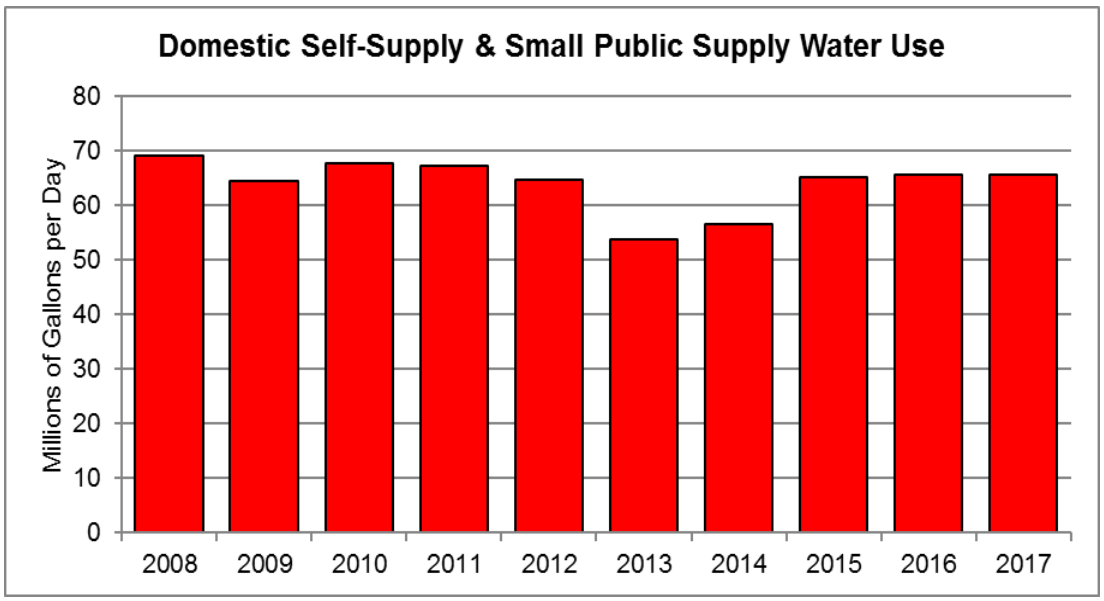
- Between 2008 and 2017, public supply water use increased 2% from 569.28 million gallons per day (mgd) to 581.51 mgd, while population increased 4% from 4,119,163 to 4,304,156 persons
- Public supply water use increased 1% from 2016





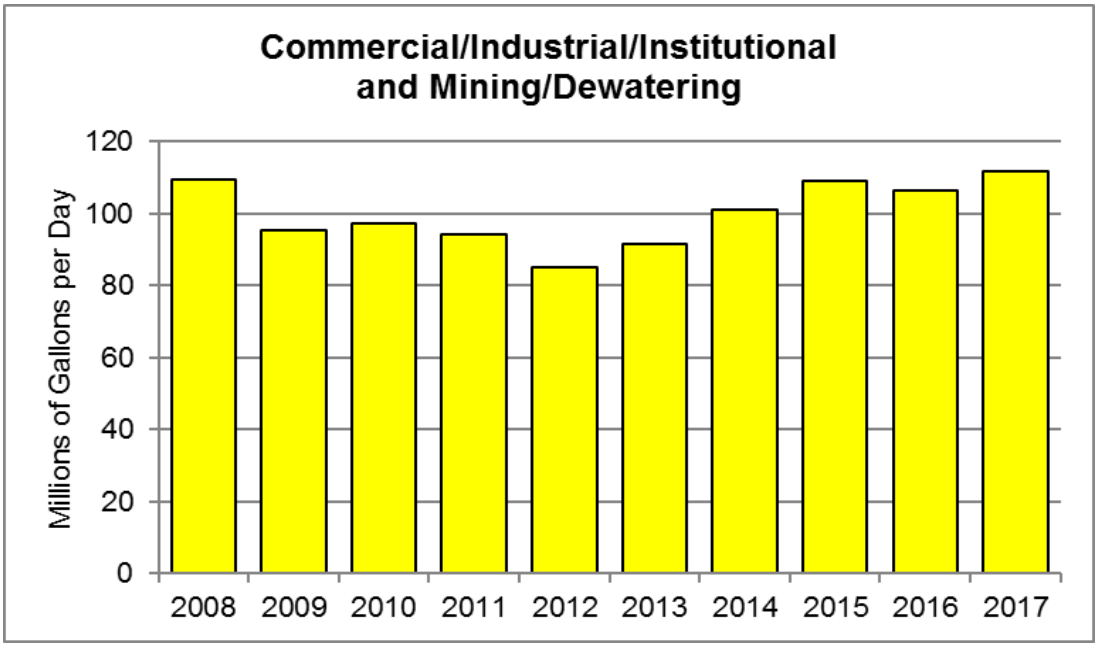
2017 Domestic Self-Supply

- At 65.68 mgd, 2017 use was 3% higher than the average use over the last 10 years
- Self-supplied households consumed an average 87 gallons per person per day



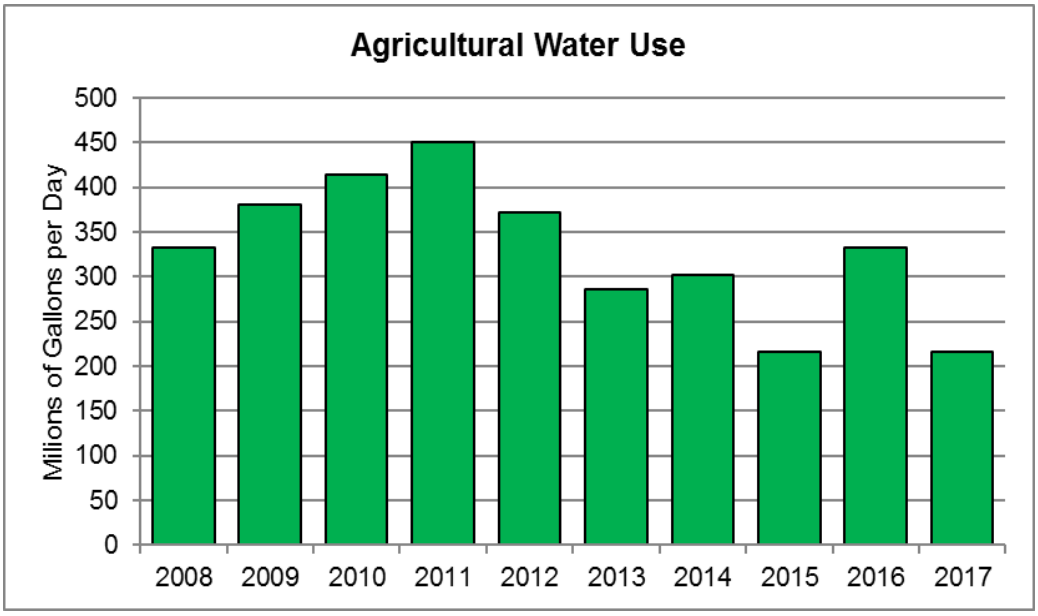
2017 Commercial/Industrial/Institutional and Mining/Dewatering (CII/MD)

- Mining and pulp and paper make up 71% of CII/MD water use
- At 111.77 mgd, CII/MD use was 12% above the annual average of the last 10 years



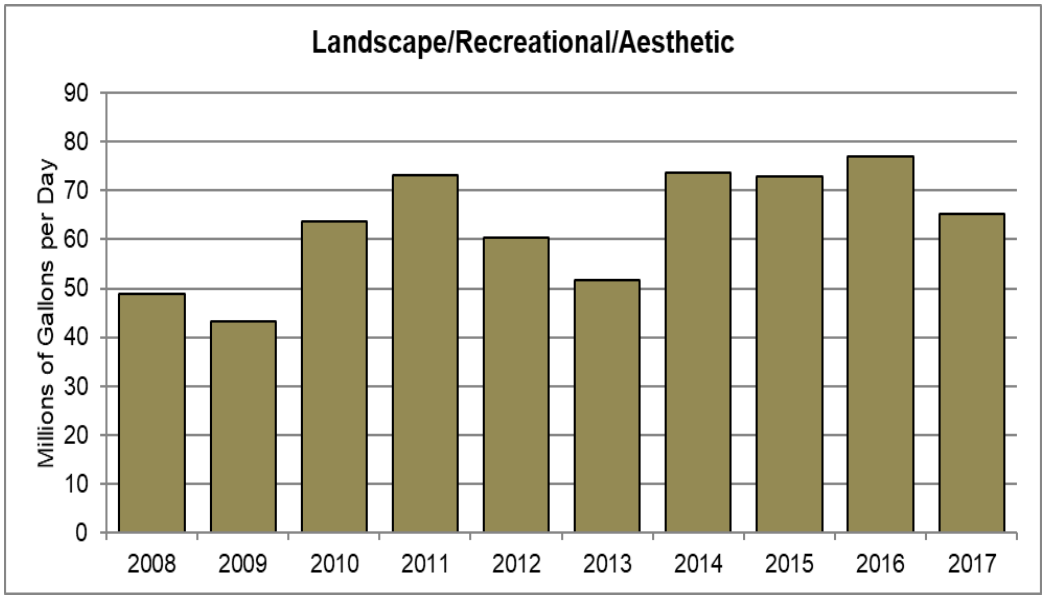
2017 Agricultural Water Use

- At 215.93 mgd, reported water use was 35% lower than the annual average over the last 10 years
- As stated earlier, 2017 was the wettest year since 2008, with the majority of the rainfall occurring during the second half of the year



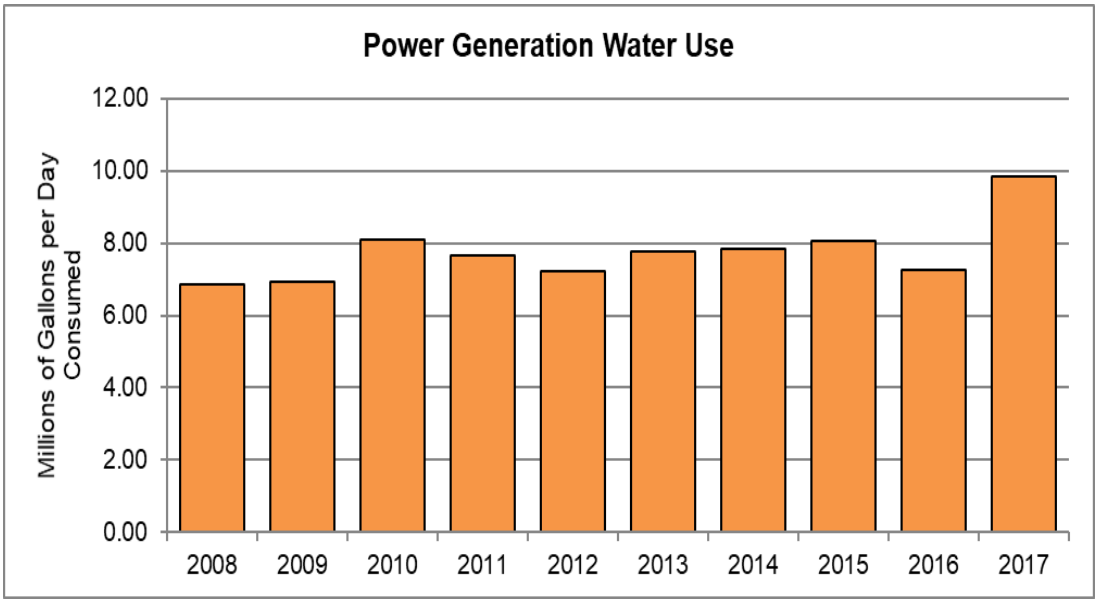
2017 Landscape/Recreational/Aesthetic (L/R/A)

- At 65.28 mgd, the 182 active golf courses represent 81% of the water use under this category (52.81 mgd)
- Although total L/R/A water use was 15% lower than 2016, it was still 4% higher than the annual average over the last 10 years



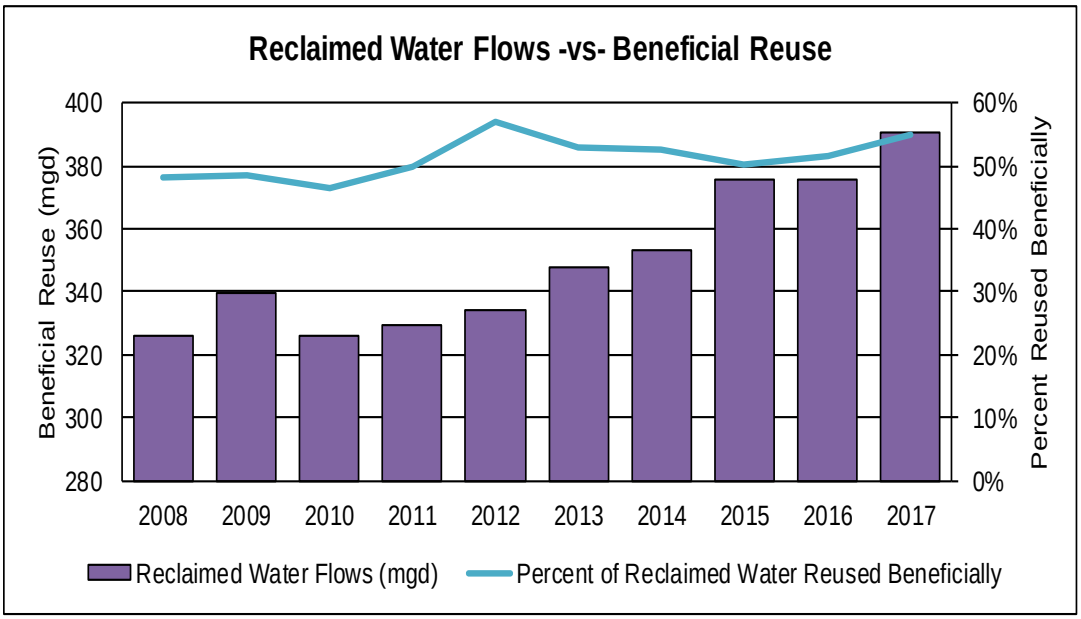
2017 Power Generation Water Use

- As a result from stakeholder feedback, beginning in this report, 2% of surface water withdrawals have been included to account for evaporative losses
- In 2017, the combined consumptive water use was 9.84 mgd
- This category represents approximately 1% of the total water withdrawals



2017 Beneficial Reuse

- At 223 mgd, beneficial reuse set another record for highest reclaimed water used beneficially; this includes 8 mgd of recharge in Alachua County
- Districtwide, more than 50% of wastewater flows have been reused beneficially since 2010
- Countywide reuse utilization rates range from 9% (Baker) to 96% (Alachua)



2017 Survey of Annual Water Use for St. Johns River Water Management District

20-Year Historical Perspective

Category	1998		2017		% Change
	Water Use	Percent of Total	Water Use	Percent of Total	
Public supply (PS)	529.98	37	581.51	55	10
Agriculture irrigation self-supply (AG)	614.56	43	215.93	21	-65
Thermoelectric power generation self-supply (PG)	27.16	2	9.84	1	-64
Commercial / Industrial / Institutional and Mining Dewatering self-supply (CII/MD)	131.77	9	111.77	11	-15
Landscape / Recreational / Aesthetic self-supply (LRA)	46.46	3	65.28	6	41
Domestic self-supply and small public supply systems (DSS)	91.67	6	65.68	6	-28
Total	**1,441.60**	**100**	**1,050.01**	**100**	**-27**

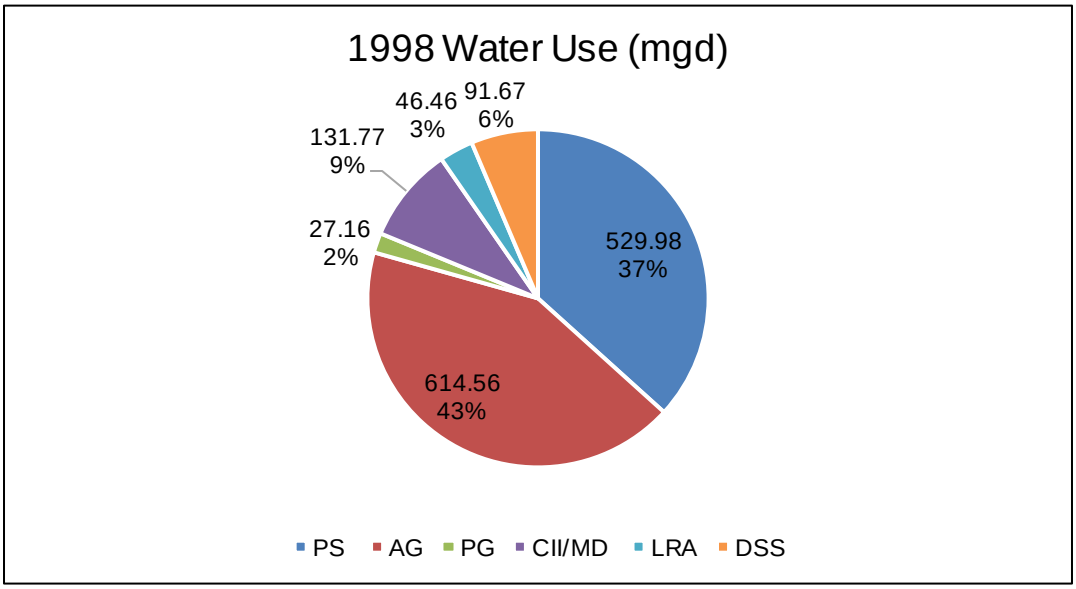
Category	1998		2017		% Change
	Population	Percent of Total	Population	Percent of Total	
Public supply	3,185,112	86	4,304,156	85	35
Domestic self-supply and small public supply systems	537,124	14	753,088	15	40
Total	**3,722,236**	**100**	**5,057,244**	**100**	**36**

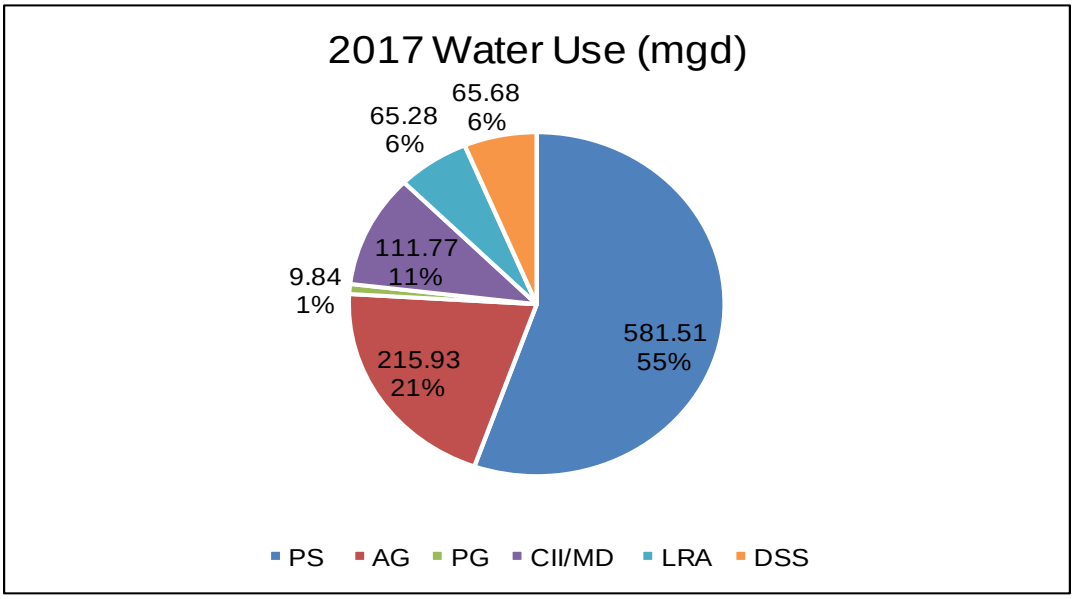
Per Capita Rates	1998	2017	% Change
Gross Per Capita	166	135	-19
Residential Per Capita	155	87	-44

Reclaimed Water	1998	2017	% Change
Total flow	301.26	390.34	30
Beneficially used	93.02	223.02	140
Percent beneficially used	31	57	84

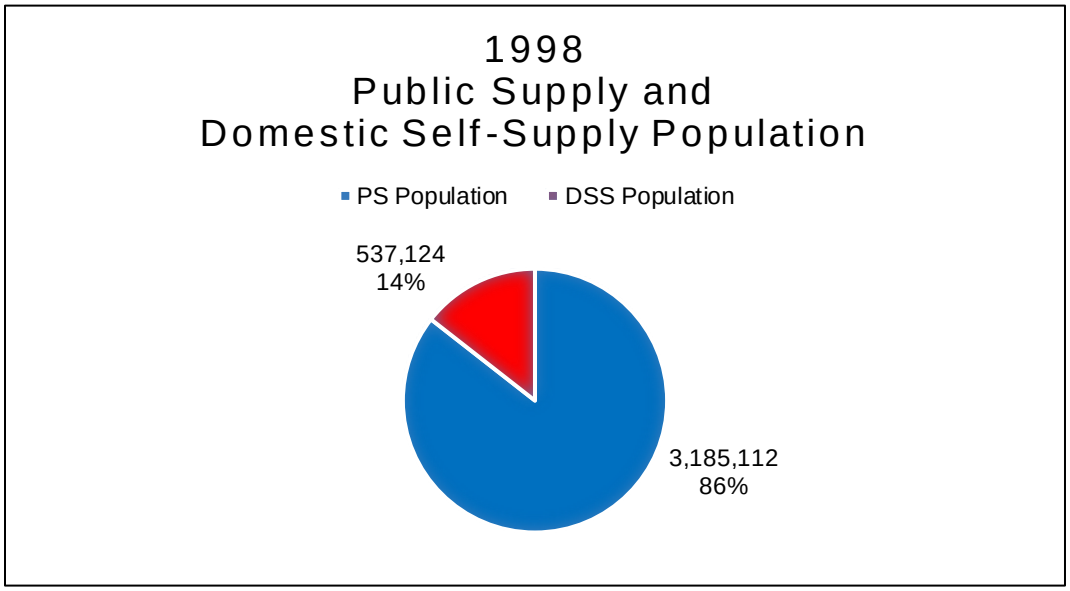
Note: Water use and reclaimed water flows are shown in million gallons per day (mgd).

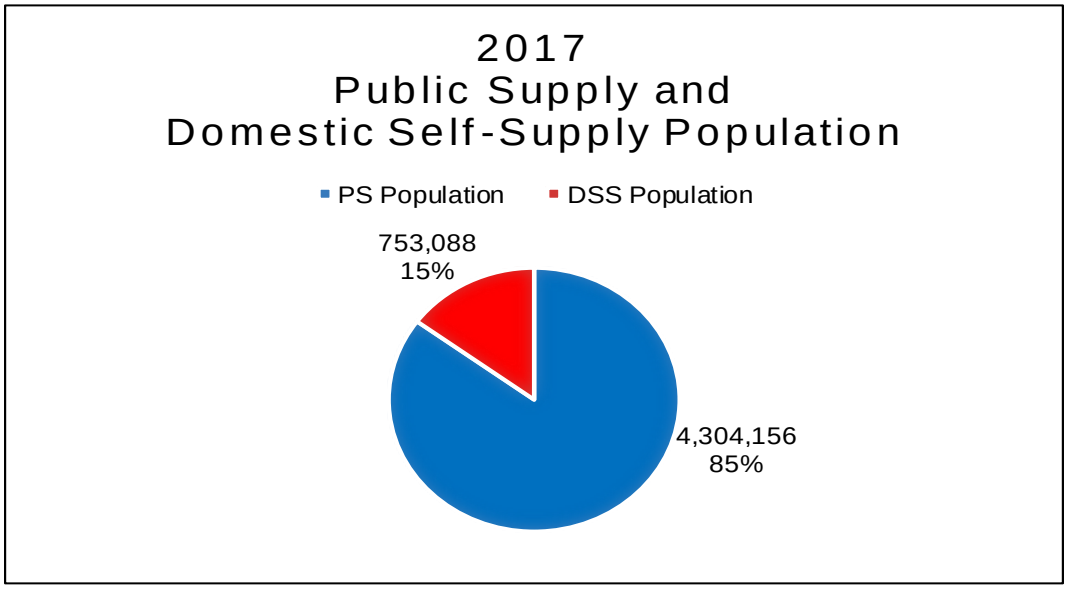
20-Year Historical Perspective (Cont.)

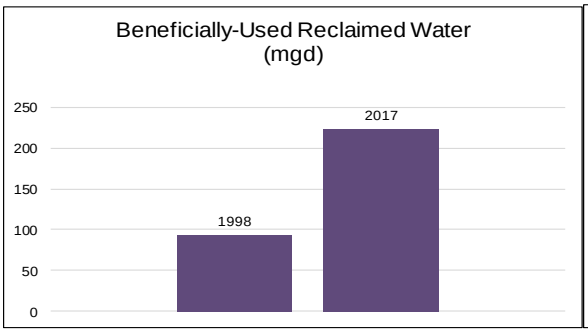


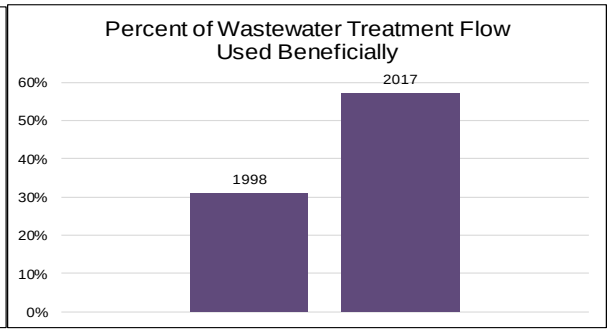


20-Year Historical Perspective (Cont.)









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2017 Survey of Annual Water Use
for St. Johns River Water Management District

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

Since 1998, total public supply water use, which represents 55% of total water use in 2017, has increased by 10% (from 529.98 mgd to 581.51 mgd). At the same time, total population served by public supply has increased 35% (from 3,185,112 to 4,304,156 persons). In the 10-year period ending in 2017, public supply water use increased 2% (from 569.28 mgd to 581.51 mgd), while population served by public supply increased 4% from 4,119,163 to 4,304,156 persons. Although public supply water use and gross per capita rates in 2016 and 2017 are higher than the 10-year average (due to factors such as rainfall / drought conditions and economic factors), they have both seen a significant decrease since 1998 and are only 2% higher than 2008.

Factors such as conservation, less landscape irrigation with potable water and increases in multifamily housing occupancy can decrease gross per capita rates. Conversely, expanded tourism and other commercial development, larger irrigated lots, and increases in single family housing can increase gross per capita rates. Since 1998, gross per capita water use has decreased from 166 gallons per person per day to 135 gallons per person per day.

Geographic Survey Area. SJRWMD includes all or part of 18 counties, encompassing 12,300 square miles in northeast and east-central Florida and representing more than 5.0 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 portions of the St. Marys River Basin and Florida Ridge.

Area Rainfall Statistics. Average annual rainfall within SJRWMD for 2017 was 57.96 inches. From the most recent 10-year period, 2008–2017, average annual rainfall within SJRWMD varied by 16.86 inches (from 41.10 to 57.96 inches). Average annual rainfall within SJRWMD for the 10-year period January 2008–December 2017 was 49.05 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, Methodology and Terminology. Data for the 2017 Annual Water Use Survey (AWUS) came from a variety of sources: raw water withdrawal data submitted to SJRWMD (via EN-50 forms; which represents 82% of the 2017 water use in this report) and treated water data from Florida Department of Environmental Protection (DEP) monthly operating reports (MORs). Reuse water data were derived from the *Draft 2017 Reuse Inventory Report* (DEP 2018). Rainfall by county was obtained from SJRWMD's monthly hydrologic conditions reports (SJRWMD 2018). Water use for those small users (18% of the 2017 total water use) that are not

required to report information to SJRWMD or DEP is estimated using professional analyses of historical data and trends.

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. The state's five water management districts have efforts underway to standardize the classification of freshwater for water supply planning and consumptive use permitting practices.

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 in SJRWMD.

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 the *Draft 2017 Reuse Inventory Report* (DEP 2018). Water management districts refine the quantities of beneficial reuse reports in DEP's Reuse

Inventory Report to reflect those uses of reclaimed water that achieve a water resource benefit. In particular, 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 as disposal. Types of reclaimed water considered as reuse by DEP are as follows: underground injection for disposal; 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 number of permanent residents living within Florida.

Data Source/Methodology: The source for population is *Projections of Florida Population by County, 2020–2045, with Estimates for 2017* (BEBR 2017a).

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

Data Source/Methodology: Population estimates are intended for planning purposes only; 2017 county population estimates are from *Projections of Florida Population by County, 2020–2045, with Estimates for 2017* (BEBR 2017a).

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 self-supply, (4) commercial/industrial/institutional and mining/dewatering self-supply, (5) landscape/recreational/aesthetic self-supply, and (6) thermoelectric power generation self-supply. Beneficial use of reclaimed water is also included in this report. Listed below are the definitions for each water use category and the source or methodology for the data presented in this report.

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 are permitted to withdraw equal to or 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 two sources: SJRWMD EN-50 forms and DEP's MOR datasets. All Individual Consumptive Use Permits (CUPs) require the permittee to measure their water use. Individual CUPs that are permitted to withdraw more than 0.10 mgd are required to submit this pumpage data to SJRWMD via the EN-50. Water use data for permits with allocations of 0.10 mgd or less are also required to measure their water use and maintain the data, but are not required to report water use to SJRWMD unless specifically requested. The water use data for these CUPs was obtained from MORs. These are submitted to DEP by approximately 98% of the public supply utilities for which SJRWMD had individual CUPs in effect during 2017. (Note: Water for use by the City of Cocoa, in Brevard County, is withdrawn from wells in 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 (permitted 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. However, many of these small public supply utility systems do report water use data to DEP via MORs.

> Data Source/Methodology: Domestic self-supply water use is calculated from residential population and residential public supply (including small public supply systems) per capita water use rates at the county level. Residential water use for each public supply utility and small public supply system is calculated by multiplying the total public supply and small public supply system 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 and small public supply system are then summed to the county level and divided by the total county permanent/residential public supply and small public supply population to obtain the county-level residential per capita value. The county residential per capita value is multiplied by the domestic self-supply population, resulting in the amount of water use for domestic self-supply. The domestic self-supply population for each county wholly within SJRWMD is obtained by subtracting the total number of people served by public supply utilities and small public supply systems in a county from the total number of permanent residents living in the county. The domestic self-supply population for each county partially within SJRWMD is obtained by multiplying the number of residential parcels within SJRWMD known to have domestic-self supply wells by the 2017 number of persons per household obtained from BEBR (BEBR 2017b). For counties with a population of less than 5% within the jurisdiction of SJRWMD or that have no public supply or small public supply system water use, SJRWMD's average residential public supply (including small public supply systems) per capita figure of 96 gallons per day (gpd) was used. For the purpose of reporting, all domestic self-supply water is assumed to be groundwater. Water use data for small public supply systems was obtained from SJRWMD EN-50 and/or DEP MORs.

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

Data Source/Methodology: Data in this category reflects water use information reported to SJRWMD by consumptive use permittees via SJRWMD 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: For the first time in this report, surface water use for once-through cooling represents 2% of surface water use, to account for the loss of water through evaporation.)

Data Source/Methodology: Data in this category reflect water use information reported to SJRWMD by power plant operators via SJRWMD EN-50 forms or through a yearly SJRWMD survey. Monthly operating report data from DEP was used to cross-check EN-50 data and fill in any data gaps.

Agricultural self-supply. This is reported and calculated water from groundwater and surface water sources for use in supplemental crop irrigation. It also includes non-irrigation use such as draining an agricultural field after a large rain storm, as well as water use associated with aquaculture, livestock, etc.

Data Source/Methodology: Data in this category reflect water use information reported to SJRWMD by agricultural water users via SJRWMD EN-50 forms and water use amounts provided by the Florida Department of Agricultural and Consumer Services (FDACS) Florida Statewide Agricultural Irrigation Demand (FSAID IV). Individual CUPs report water use data via the EN-50 forms. For smaller CUPs and non-permitted agricultural fields, water use was obtained from the draft FSAID IV (Balmoral, 2017).

Landscape/recreational/aesthetic 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 SJRWMD EN-50 forms.

2017 Water Use by Category. Water use is reported for water withdrawals from fresh, saline, and reuse water sources, expressed in average mgd unless otherwise noted. In this 2017 survey, the water use amounts are based on best available data as of April 2, 2018. As shown in Figure 1, 82% of the 2017 water use was reported to SJRWMD via EN-50 forms. 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 and mining/dewatering self-supply, (4) agricultural self-supply, (5) landscape/recreational/aesthetic irrigation self-supply, and (6) thermoelectric power generation self-supply. This report also includes information on beneficially reused wastewater flows. A reporting threshold of 0.10 mgd of permitted average daily flow by individual water users was used for all water use categories, excluding the agricultural self-supply and domestic self-supply and small public supply systems categories, in

the reporting of consumptive use for 2017. Consumptive use is defined by SJRWMD as any use of water that reduces the supply from which it is withdrawn or diverted.

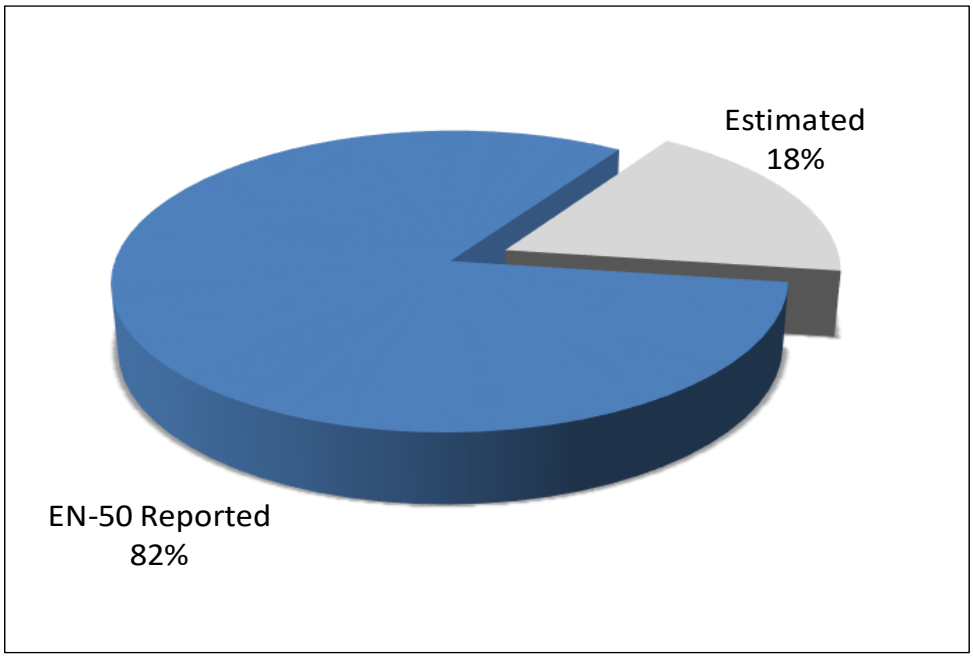

Figure 1. Reported and estimated water use (mgd) in SJRWMD, 2017

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 total consumptive use in SJRWMD for 2017, including fresh, saline and reuse (reclaimed) water, was 1,269.08 mgd. Of the total consumptive amount, 1,050.01 mgd was freshwater and 3.80 mgd was saline water (Tables 1–3). In 2017, the largest consumptive use of freshwater within SJRWMD was public supply, which totaled 581.51 mgd, or 55%, of total consumptive freshwater use (Tables 2 and 3, Figure 2). Next was agricultural water use, which used 215.93 mgd, or 21%, of total consumptive freshwater within SJRWMD (Tables 2 and 3, Figure 1). Beneficial use of reclaimed water accounted for 215.27 mgd and was reported under the agricultural, commercial/industrial/institutional and landscape/recreational/aesthetic categories of water use (Tables 2 and 3). An additional 7.74 mgd in Alachua County was used for recharge.

Public Supply. In 2017, 347 public supply utilities (or systems) served approximately 4,304,156 people, or 85%, of the SJRWMD total population (Table 4 note). Total water use, from both groundwater and surface water sources, was 1% below the average annual use for the preceding 5-year period (Tables 2 and 3, Figures 2 and 3). Average gross per capita use, based on the population served by a public supply system, was 135 gallons per capita per day (gpcd). As seen in Table 5, gross per capita ranges from 100 gpd (Brevard) to 204 gpd (Lake). Average residential per capita (with the inclusion of Bradford and Okeechobee counties) for SJRWMD is 87 gpd. It ranges from 44 gpd (Indian River) to 142 (Nassau). Bradford County is excluded for comparison as only a small population is served by Clay County utilities. 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. In 2017,

water use ranged from a low of 537.11 mgd (125 gpcd) in December to a high of 681.94 mgd (158 gpcd) in April (Figure 3). Of the total water withdrawn for public supply use, 94% was groundwater.

Reverse osmosis membrane unit in Palm Coast, left. Water storage tank in St. Johns County, right.

Counties with the largest public supply water use during 2017 were Orange County[1] (129.07 mgd, serving 869,672 people; 148 gpcd) and Duval County (116.74 mgd, serving 773,557 people; 151 gpcd) (Table 3, Figures 4 and 5). These counties combined represented 42% of total public supply water use and 38% 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 and Small Public Supply Systems. In 2017, approximately 753,088 people used 65.68 mgd of domestic self-supply water (including small public supply systems), or 6%, of total freshwater used in SJRWMD (Tables 1–3, Figure 2). Duval County had the largest self-supplied population, with 163,254 people (16.16 mgd). Marion County had the second-largest population, 114,077 (8.34 mgd), followed by Clay County, 75,332 (6.80 mgd) (Table 4).

Domestic self-supply water use (including small public supply systems) has fluctuated over the 10-year period, reaching a low of 53.84 mgd in 2013 to a high of 69.20 mgd in 2008. The average for the 10-year period was 64.05 mgd; water use in 2017 was 3% above average. Fluctuations in water use are mainly attributed to changes in methodologies since the initial publication of the AWUS in 1978. In 2017, average domestic self-supply and small public supply system water use per capita within SJRWMD was 87 gpcd (Table 5).

Commercial/Industrial/Institutional and Mining/Dewatering Self-Supply. In 2017, a total of 127 commercial/industrial/institutional and mining/dewatering individual permit holders reported water use. Total freshwater use in the commercial/industrial/institutional and mining/dewatering category was 111.77 mgd, or 11%, of total freshwater use (Tables 2 and 3, Figure 2). Of this freshwater total, 81.83 mgd was groundwater and

[1] Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the water consumed and population served in SJRWMD.

29.94 mgd was surface water. Additional reclaimed water use totaled 27.32 mgd (Tables 2 and 3).

Most of the freshwater withdrawn for commercial/industrial/institutional and mining/dewatering purposes supplied the pulp and paper industries in Duval, Nassau and Putnam counties. Water use for pulp and paper production in 2017 totaled 62.44 mgd. It included 42.16 mgd of fresh groundwater, 19.02 mgd of fresh surface water and 1.26 mgd of saline surface water. The second-largest water user in this category was the mining industry, which accounted for 16.59 mgd of fresh groundwater and 2.01 mgd of fresh surface water. Pulp/paper production and mining accounted for a combined total of 79.78 mgd of freshwater, or 71%, of the commercial/industrial/institutional and mining/dewatering freshwater use.

Commercial/industrial/institutional and mining/dewatering self-supply water use was highest in 2017 (111.77 mgd) and lowest in 2012 (84.91 mgd). The average for the 10-year period was 100.15 mgd; water use in 2017 was 12% above this average. Commercial/industrial/institutional and mining/dewatering freshwater use in 2017 varied from a low of 100.02 mgd in February to a high of 127.41 mgd in May (Figure 6).

Agricultural Self-Supply. Total consumptive use of freshwater for agricultural water use was 215.93 mgd, which is 21% of total freshwater use in SJRWMD during 2017 (Tables 2 and 3, Figure 2). Reuse water accounted for 3.91 mgd of agricultural water use. Agricultural permittees used 174.73 mgd of groundwater (81%) and 41.20 mgd of surface water (19%). There are currently 454,060 agricultural acres in SJRWMD. Seventy-eight percent of these acres (354,656) are covered by a consumptive use permit. Agricultural water use in 2017 had the largest seasonal fluctuation of any other water use category, reaching a low of 60.10 mgd in December to a high of 242.33 mgd in April (Figure 7). These fluctuations are typical of irrigation water use and are related to rainfall patterns and planting / harvesting times.

By county, the largest water use for agriculture occurred in Brevard County, with 49.75 mgd of freshwater, accounting for 23% of total SJRWMD agricultural water use (Table 3). Ninety-six percent of the freshwater water used in this county was withdrawn from groundwater sources.

During 2017 in SJRWMD, the largest agricultural water use was for hay and pasture, which accounted for 41.15 mgd, 19.1% of total agricultural water use. Citrus, cut foliage and potatoes were the three other largest categories; accounting for 12.6–15.5% of total agricultural water use (Figure 8).

Landscape/Recreational/Aesthetic Irrigation Self-Supply. The landscape/recreational/aesthetic (L/R/A) 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 L/R/A irrigation category totaled 65.28 mgd, about 6% of total freshwater use in 2017. Nearly 69% (44.82 mgd) of the quantities were withdrawn from surface water sources. The remaining 20.46 mgd (31%) came from groundwater sources. Reuse water under this category totaled 184.04 mgd. By county (Table 3), the largest freshwater use for L/R/A irrigation occurred in

Indian River County (13.78 mgd), followed by Lake County (13.28 mgd), and Duval and Volusia counties (6.01 mgd, each). In terms of reuse, the four counties with the largest reclaimed water used for L/R/A are Orange (57.67 mgd), Volusia (22.14 mgd), Brevard (20.91 mgd), and Seminole (20.55 mgd).

During the past 10 years (2008–2017), L/R/A irrigation freshwater use was highest in 2016 (77.03 mgd) and lowest in 2009 (43.14 mgd). Average water use over the 10-year period was 63.00 mgd. Landscape/recreational/aesthetic irrigation water use in 2017 was 4% above the 10-year average. Landscape/recreational/aesthetic irrigation freshwater use in 2017 varied from a low of 43.33 mgd in January to a high of 94.96 mgd in May (Figure 9).

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. Water use amounts for 2017 reflect consumptive use data for 15 self-supplied thermoelectric power plants, totaling 9.84 mgd (Tables 2 and 3, Figure 2). The largest amount of consumptive freshwater use within this category (Table 3) occurred in Duval County (5.78 mgd).

Starting with the 2017 report, consumptive water use also includes 2% of surface water use by power generation facilities. This is to account for the loss of water due to evaporation. Previously, once-through cooling with surface water was considered nonconsumptive because the water is returned to the resource. This change in methodology coincides with current regional water supply planning methods and input from stakeholders.

Thermoelectric power generation freshwater use in 2017 fluctuated from a low of 8.58 mgd in February to a high of 10.57 mgd in August (Figure 10). Fluctuations in water use are related to power plant shutdowns for maintenance or increased power demands during periods of high or low temperatures.

Beneficial Reuse (Reclaimed Water). As explained on Page 10, beneficially reused wastewater has received at least secondary treatment and basic disinfection. It is currently used by permittees to help meet agricultural, commercial/industrial/institutional and recreation/aesthetic demands. In 2017, 223.01 mgd of reclaimed water was used for beneficial purposes. In terms of utilization rates, the top four counties were Alachua (96%), Indian River (90%), Putnam (86%), and Lake (86%) (Figure 14). Eighty-five percent of the reclaimed water is applied to landscape, fields and golf courses (Figure 15). Of note, 7.74 mgd in Alachua County was used for recharge.

Reclaimed water piping installation, Duval County, JEA.

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Table 1. Total water use (mgd) and rainfall by county in SJRWMD, 2017

County	Freshwater (mgd)	Saline Water (mgd)	Reuse (mgd)	Total Water Use (mgd)	Rainfall (inches)
Alachua	32.05	0.00	11.16	43.21	58.07
Baker	3.60	0.00	0.07	3.67	55.04
Bradford	0.47	0.00	0.00	0.47	59.62
Brevard	122.60	0.00	22.49	145.09	58.47
Clay	22.45	0.00	6.40	28.85	58.52
Duval	165.67	0.00	19.95	185.62	59.26
Flagler	22.78	2.26	6.53	31.57	62.84
Indian River	77.52	0.00	7.37	84.89	62.61
Lake	104.62	0.00	13.53	118.15	54.32
Marion	40.21	0.00	4.22	44.43	57.48
Nassau	47.89	1.54	1.29	50.72	55.20
Okeechobee	2.65	0.00	0.00	2.65	56.00
Orange	142.13	0.00	69.09	211.22	52.78
Osceola	0.98	0.00	0.00	0.98	53.27
Putnam	49.88	0.00	1.50	51.38	64.45
St. Johns	64.78	0.00	3.39	68.17	54.96
Seminole	61.38	0.00	24.06	85.44	58.31
Volusia	88.35	0.00	24.22	112.57	55.90
Total	**1,050.01**	**3.80**	**215.27**	**1,269.08**	**57.96**

Note: Total water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.
Source of domestic self-supply is assumed to be groundwater.
Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the water consumed and population served in SJRWMD.

Table 2. Total water use (mgd) by category in SJRWMD, 2017

Category	Freshwater (mgd)	Saline Water (mgd)	Reuse (mgd)	Total Water Use (mgd)
Public supply	581.51	0.00	0.00	581.51
Domestic self-supply and small public supply systems	65.68	0.00	0.00	65.68
Commercial / Industrial / Institutional and Mining / Dewatering self-supply	111.77	3.80	27.32	142.89
Agricultural irrigation self-supply	215.93	0.00	3.91	219.84
Landscape / Recreational / Aesthetic self-supply	65.28	0.00	184.04	249.32
Thermoelectric power generation self-supply	9.84	0.00	0.00	9.84
Total	**1,050.01**	**3.80**	**215.27**	**1,269.08**

Note: Water use is in million gallons per day (mgd).
Source of domestic self-supply is assumed to be groundwater.
Amounts are based on best available data as of April 2, 2018.

Table 3. Total water use (mgd) by county and category in SJRWMD, 2017

County	Freshwater							Saline Water	Reuse	All Water Use
	Public Supply	Domestic Self-Supply	Commercial/ Industrial/ Institutional	Agricultural Self-Supply	Landscape/ Recreational /Aesthetic Self-Supply	Thermoelectric Power Generation Self-Supply	Total Freshwater	Commercial/ Industrial/ Institutional		
Alachua	22.23	0.84	5.08	2.76	0.62	0.52	32.05	0.00	11.16	43.21
Baker	0.94	2.06	0.40	0.20	0.00	0.00	3.60	0.00	0.07	3.67
Bradford	0.03	0.44	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.47
Brevard	54.72	2.72	10.19	49.75	5.20	0.02	122.60	0.00	22.49	145.09
Clay	13.65	6.80	0.41	0.34	1.25	0.00	22.45	0.00	6.40	28.85
Duval	116.74	16.16	19.84	1.14	6.01	5.78	165.67	0.00	19.95	185.62
Flagler	10.04	0.38	0.00	9.76	2.60	0.00	22.78	2.26	6.53	31.57
Indian River	19.07	0.22	0.20	44.25	13.78	0.00	77.52	0.00	7.37	84.89
Lake	54.76	6.72	6.44	23.29	13.28	0.13	104.62	0.00	13.53	118.15
Marion	19.26	8.34	3.33	6.13	3.15	0.00	40.21	0.00	4.22	44.43
Nassau	7.85	4.40	33.18	0.03	2.43	0.00	47.89	1.54	1.29	50.72
Okeechobee	0.00	0.15	0.00	2.50	0.00	0.00	2.65	0.00	0.00	2.65
Orange	129.07	3.06	3.56	3.59	2.42	0.43	142.13	0.00	69.09	211.22
Osceola	0.00	0.11	0.00	0.87	0.00	0.00	0.98	0.00	0.00	0.98
Putnam	2.49	2.63	24.24	18.58	1.17	0.77	49.88	0.00	1.50	51.38
St. Johns	19.23	3.22	0.63	36.00	5.70	0.00	64.78	0.00	3.39	68.17
Seminole	57.49	1.63	0.00	0.60	1.66	0.00	61.38	0.00	24.06	85.44
Volusia	53.94	5.80	4.27	16.14	6.01	2.19	88.35	0.00	24.22	112.57
Total	**581.51**	**65.68**	**111.77**	**215.93**	**65.28**	**9.84**	**1,050.01**	**3.80**	**215.27**	**1,269.08**

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.
Source of domestic self-supply is assumed to be groundwater.
Small public supply systems are included in the domestic self-supply category.
Mining and dewatering is included in the commercial/industrial/institutional category.
Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the water consumed and population served in SJRWMD.

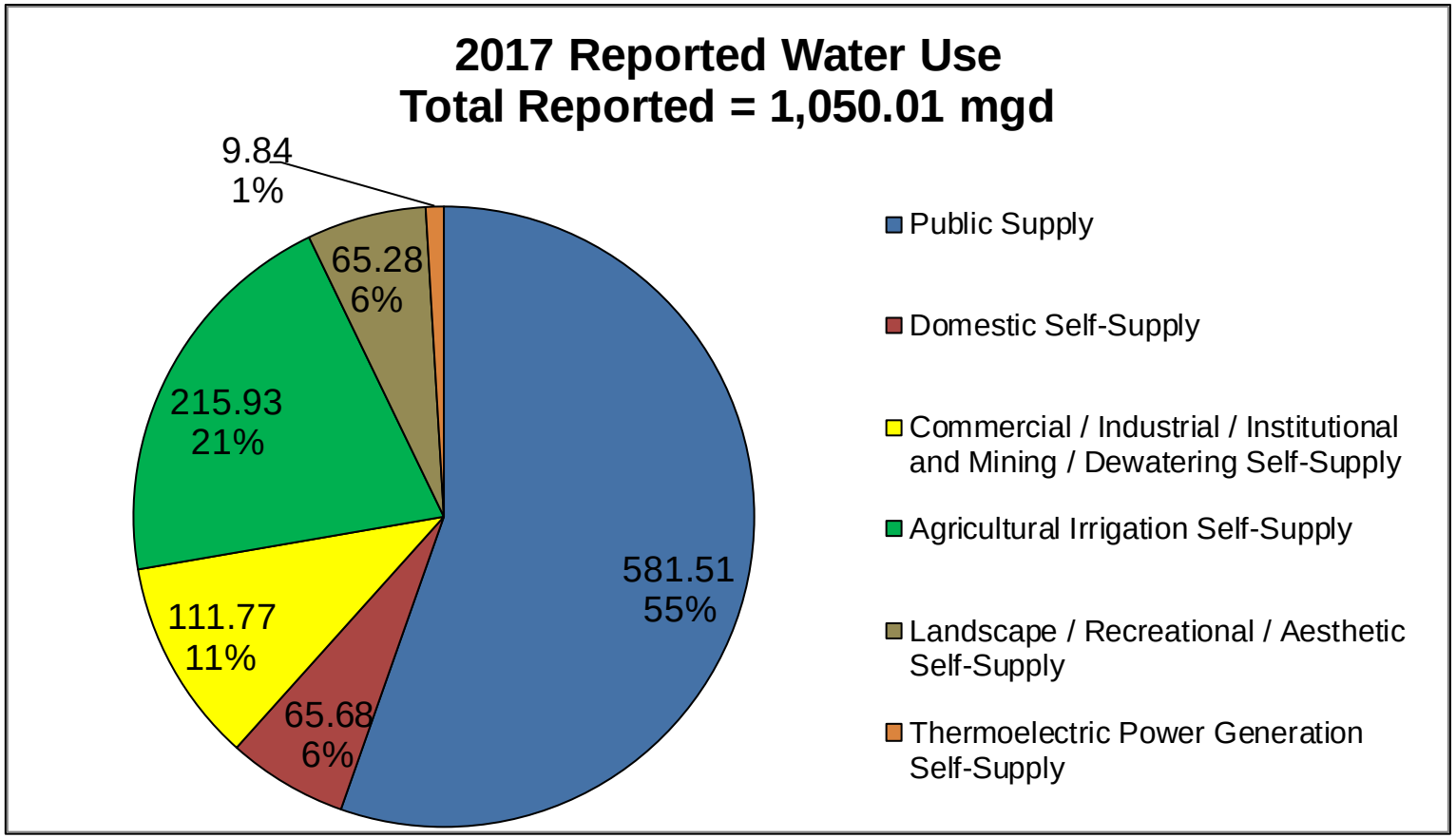

Figure 2. Total freshwater use (mgd), 2017

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.
Source of domestic self-supply is assumed to be groundwater.

Table 4. Population by county, 2017

County	County Population	Percentage of County Population in SJRWMD	SJRWMD Population	Public Supply Population	Domestic Self-Supply and Small Public Supply Systems Population
Alachua	260,003	77.2%	200,722	187,298	13,424
Baker	27,191	98.1%	26,674	6,912	19,762
Bradford	27,642	20.2%	5,575	910	4,665
Brevard	591,256	100.0%	591,256	546,837	44,419
Clay	208,549	100.0%	208,549	133,217	75,332
Duval	936,811	100.0%	936,811	773,557	163,254
Flagler	105,157	100.0%	105,157	98,299	6,858
Indian River	148,962	100.0%	148,962	143,995	4,967
Lake	331,724	99.7%	330,729	268,736	61,993
Marion	349,267	66.2%	231,215	117,138	114,077
Nassau	80,456	100.0%	80,456	49,366	31,090
Okeechobee	41,140	3.8%	1,563	0	1,563
Orange	1,313,880	68.3%	897,380	869,672	27,708
Osceola	337,614	0.2%	782	0	782
Putnam	73,176	100.0%	73,176	21,022	52,154
St. Johns	229,715	100.0%	229,715	183,840	45,875
Seminole	454,757	100.0%	454,757	433,351	21,406
Volusia	533,765	100.0%	533,765	470,006	63,759
Total	**6,051,065**		**5,057,244**	**4,304,156**	**753,088**

Note: 2017 population county population is from BEBR, Florida Estimates of Population (BEBR 2017a)
Total population for the state of Florida in 2017 = 20,484,142
Percent of total state of Florida population that lives within SJRWMD = 25%
Percent of SJRWMD population served by public supply = 85%
Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the population served in SJRWMD.

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

Table 5. Gross and residential public supply per capita water use in gallons per day

County	PS Gross Per Capita (gpcd)	PS Residential Per Capita (gpcd)
Alachua	119	63
Baker	136	104
Bradford*	33	94
Brevard	100	61
Clay	102	90
Duval	151	99
Flagler	102	55
Indian River	132	44
Lake	204	108
Marion	164	73
Nassau	159	142
Okeechobee*	N/A	96
Orange	148	110
Osceola*	N/A	141
Putnam	118	50
St. Johns	105	70
Seminole	133	76
Volusia	115	91
Total	**135**	**87**

Note: As of December 2017, there were no significant permitted public supply uses in SJRWMD's portion of Bradford, Okeechobee and Osceola counties. The population residing therein rely on domestic wells for their potable needs.

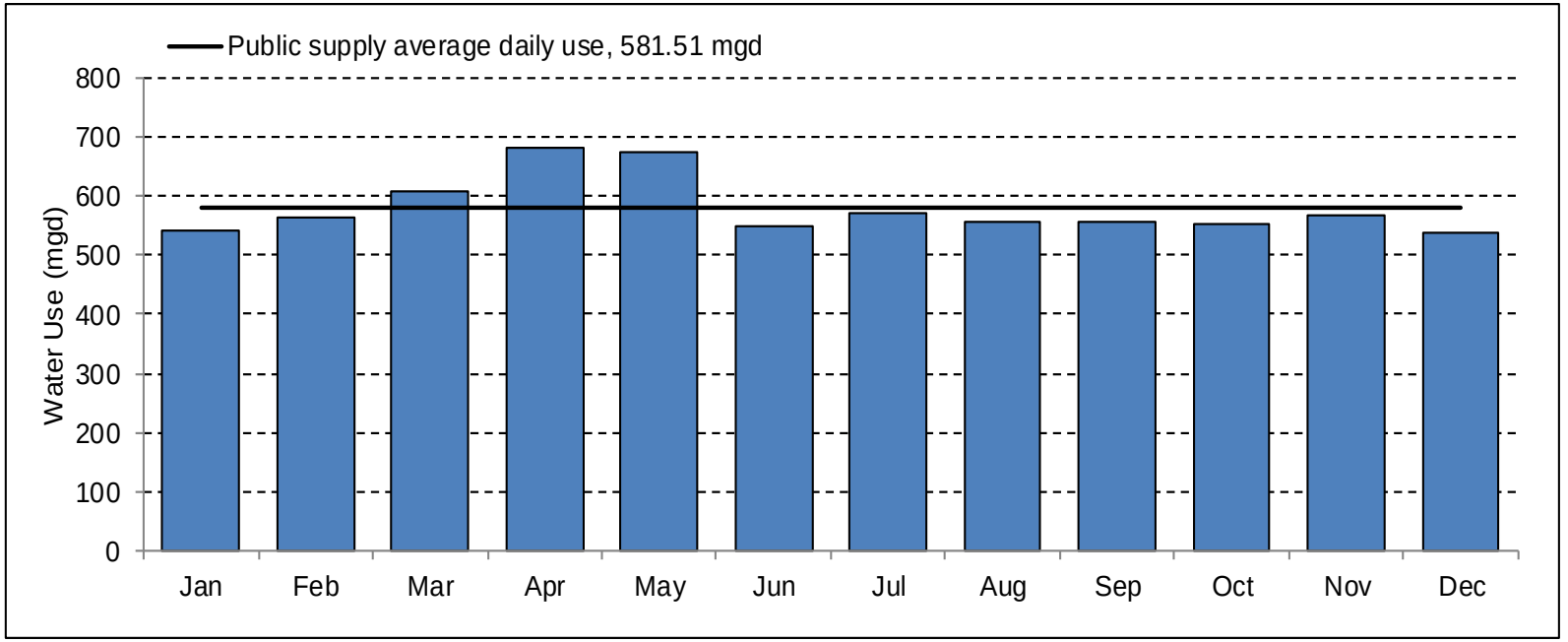

Figure 3. Average daily public supply water use (mgd) by month, 2017

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.

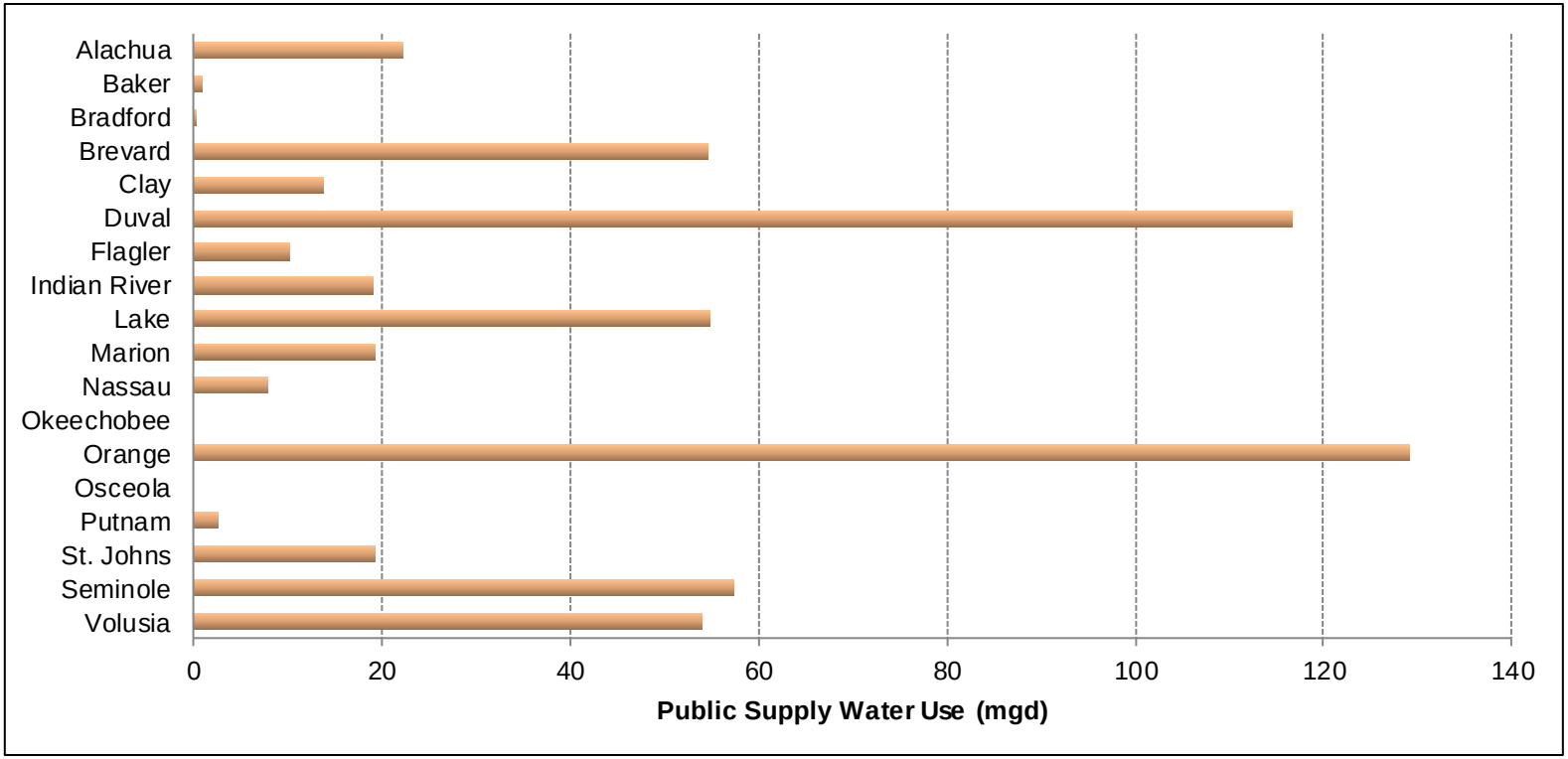

Figure 4. Freshwater use (mgd) for public supply in SJRWMD, 2017

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.
Total public supply water use in SJRWMD for 2017 was 581.51 mgd.
Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the water consumed in SJRWMD.

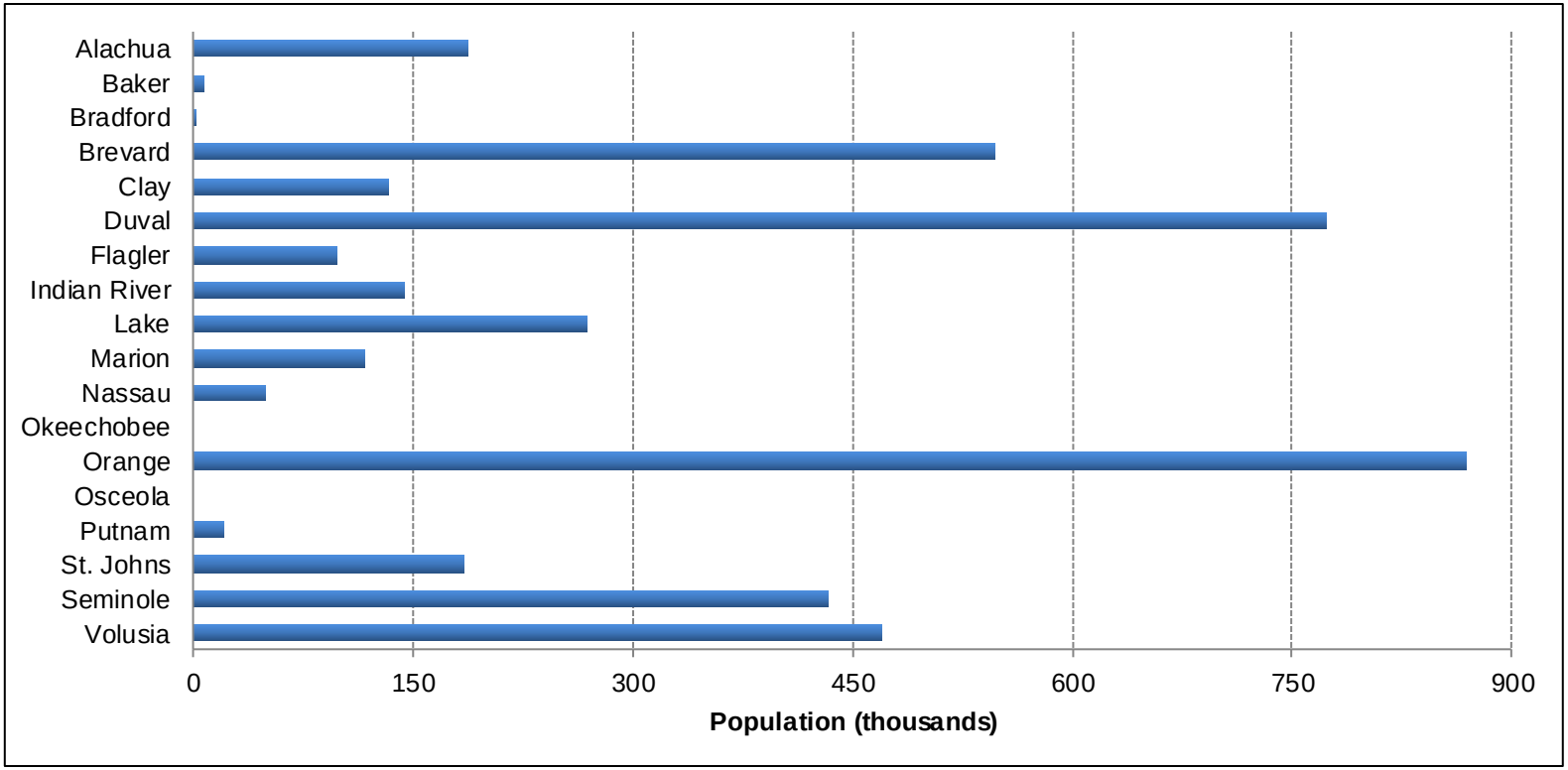

Figure 5. Population served by public supply in SJRWMD, 2017

Note: Population estimates are based on best available data as of April 2, 2018.
Total public supply population in SJRWMD for 2017 was 4,304,156.
Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the population served in SJRWMD.

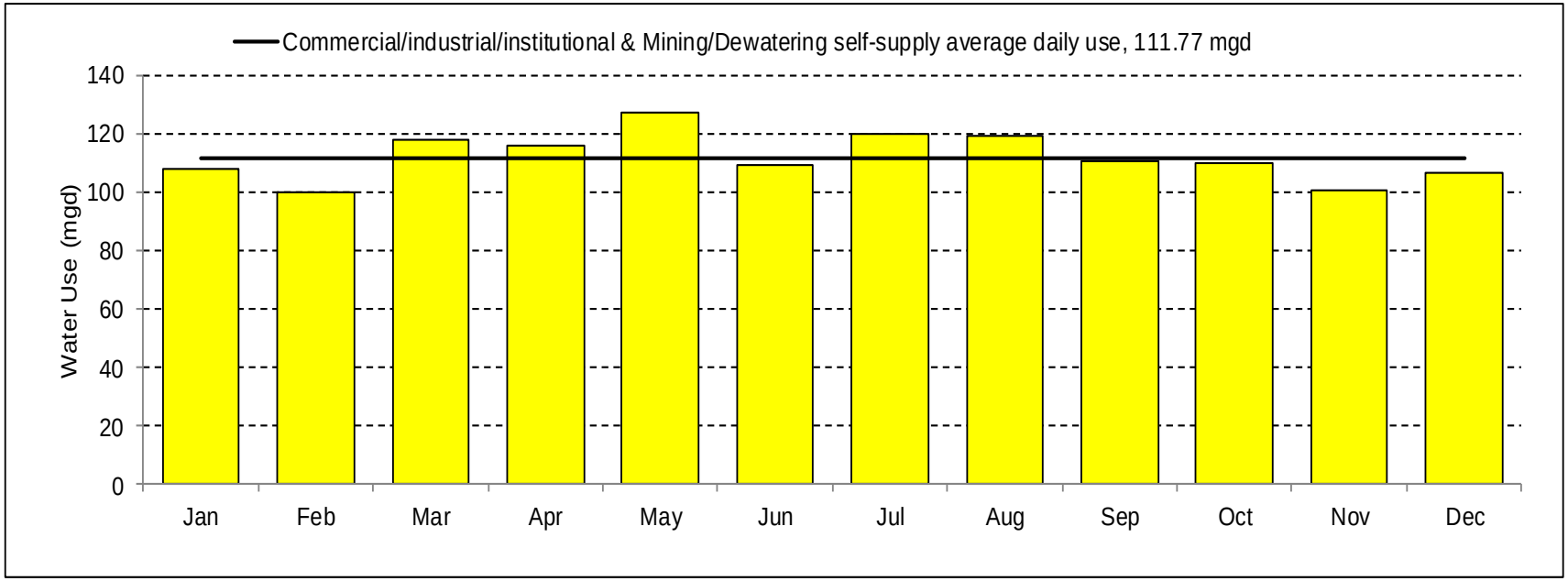

Figure 6. Average daily commercial/industrial/institutional and mining/dewatering self-supply freshwater use (mgd) by month, 2017

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.

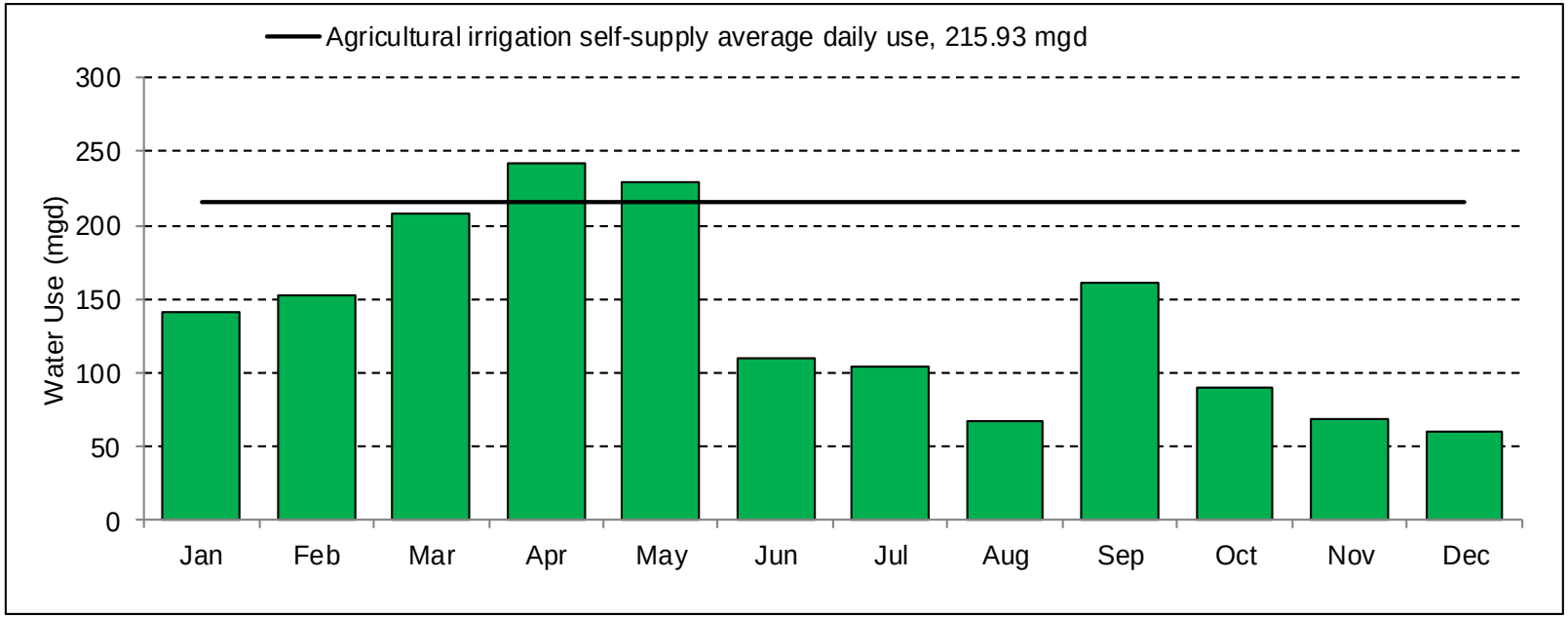

Figure 7. Average daily agricultural self-supply freshwater use (mgd) by month, 2017

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.

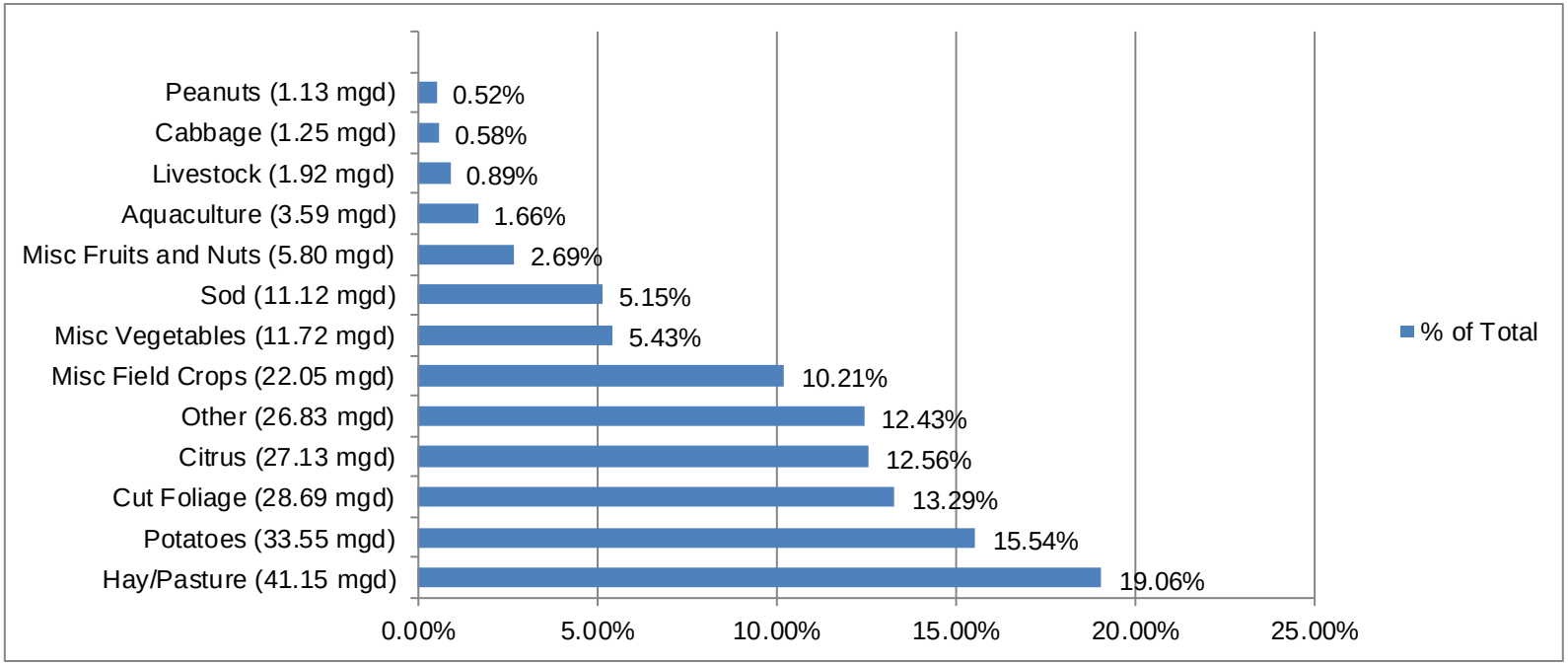

Figure 8. Agricultural water use by crop, 2017

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.
Calculation anomalies due to rounding account for nominal discrepancies.
Total agricultural water use in SJRWMD for 2017 was 215.93 mgd.

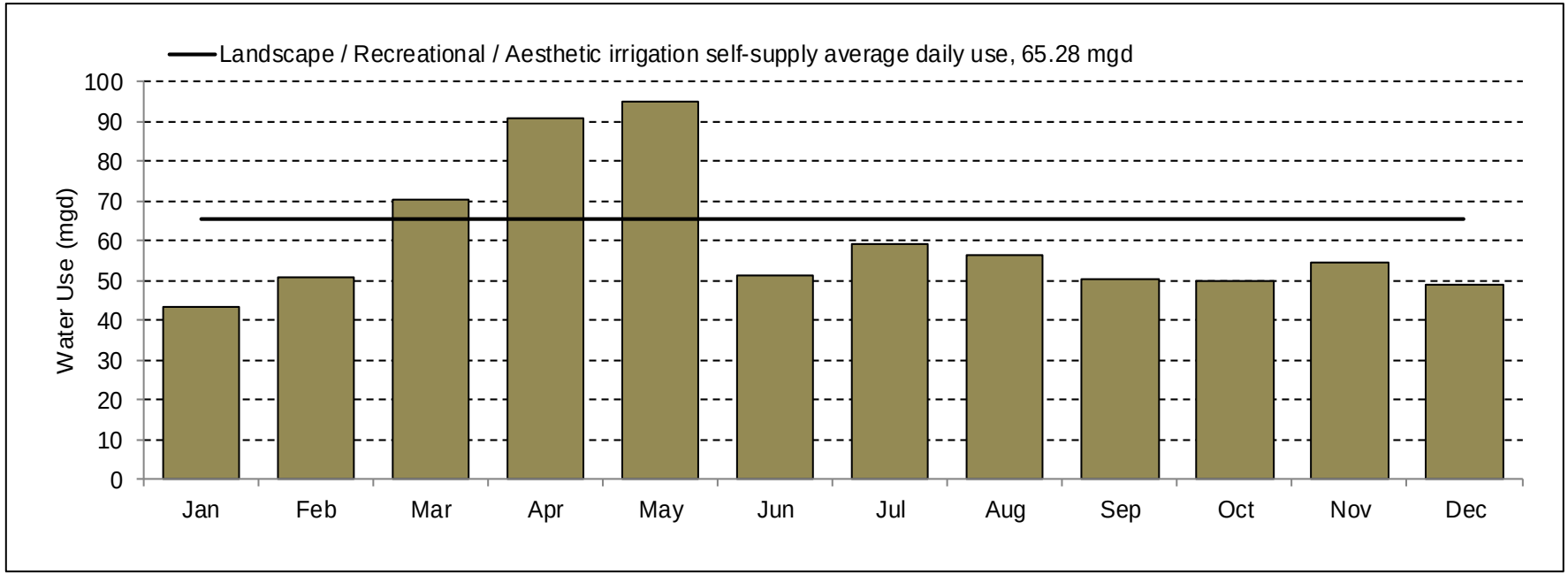

Figure 9. Average daily landscape/recreational/aesthetic irrigation self-supply freshwater use by month, 2017

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2018.

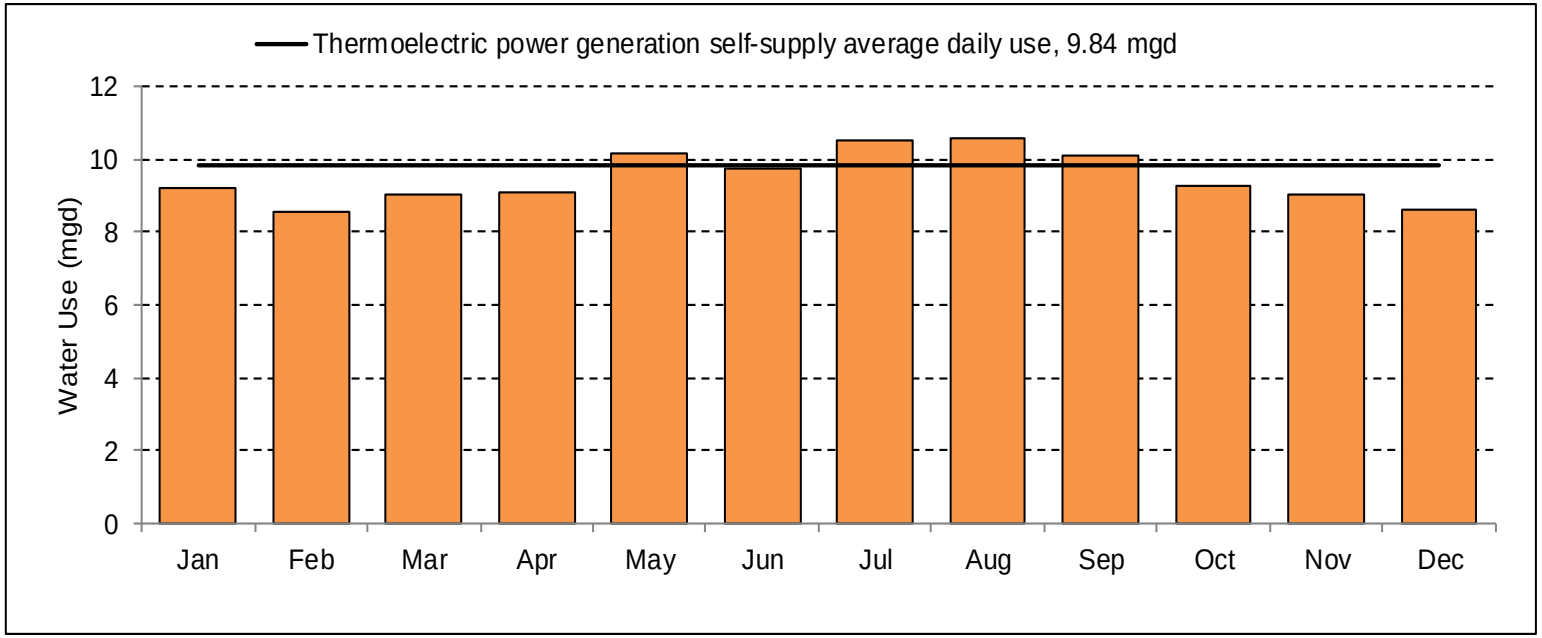

Figure 10. Average daily thermoelectric power generation self-supply freshwater use by month, 2017

Note: Water use is in million gallons per day (mgd).
Amounts of consumptive freshwater use are based on best available data as of April 2, 2018.

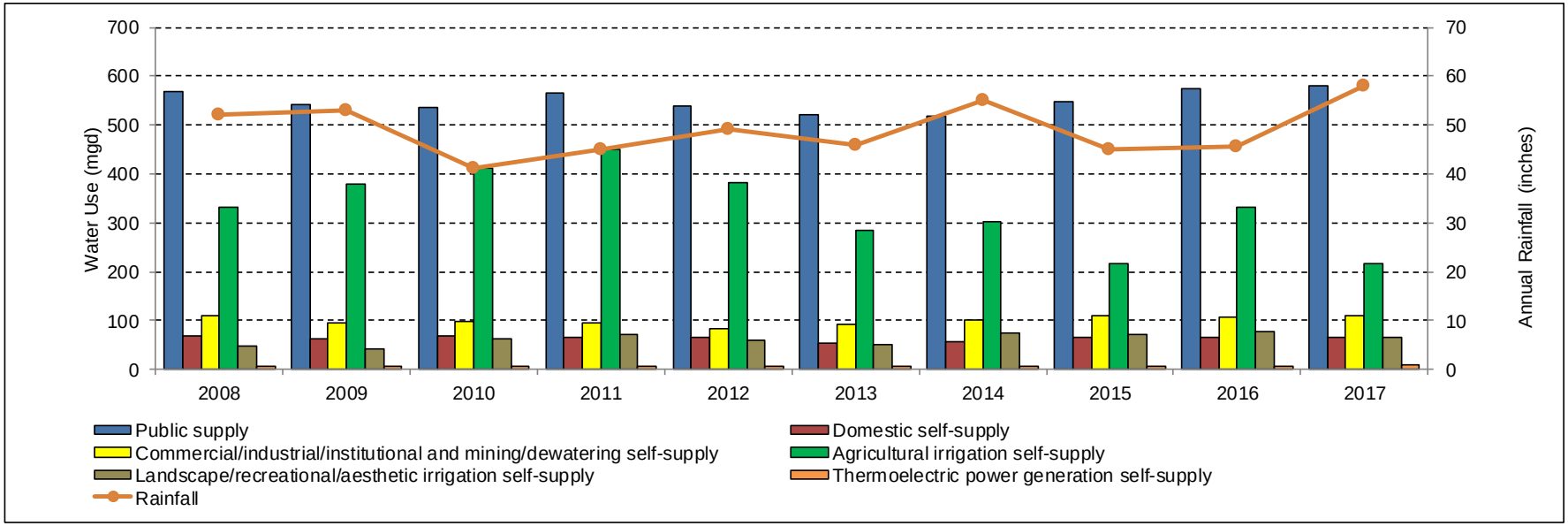

Figure 11. Annual rainfall and freshwater use by category, 2008–2017

Note: Water use is in million gallons per day (mgd); rainfall is measured in inches.
Amounts are based on best available data as of April 2, 2018.
Source of domestic self-supply is assumed to be groundwater.

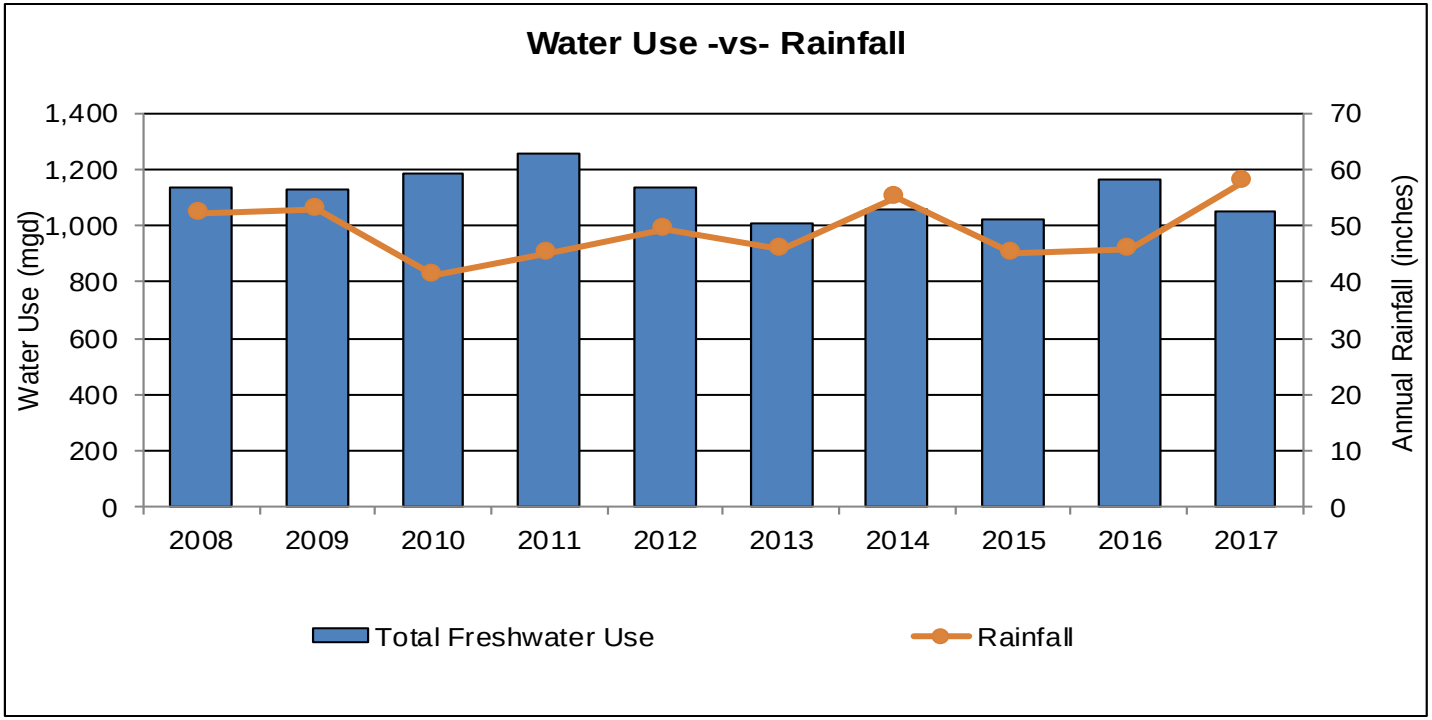

Figure 12. Annual rainfall and total freshwater use, 2008–2017

Note: Water use is in million gallons per day (mgd); rainfall is measured in inches.
Amounts are based on best available data as of April 2, 2018.
Source of domestic self-supply is assumed to be groundwater.

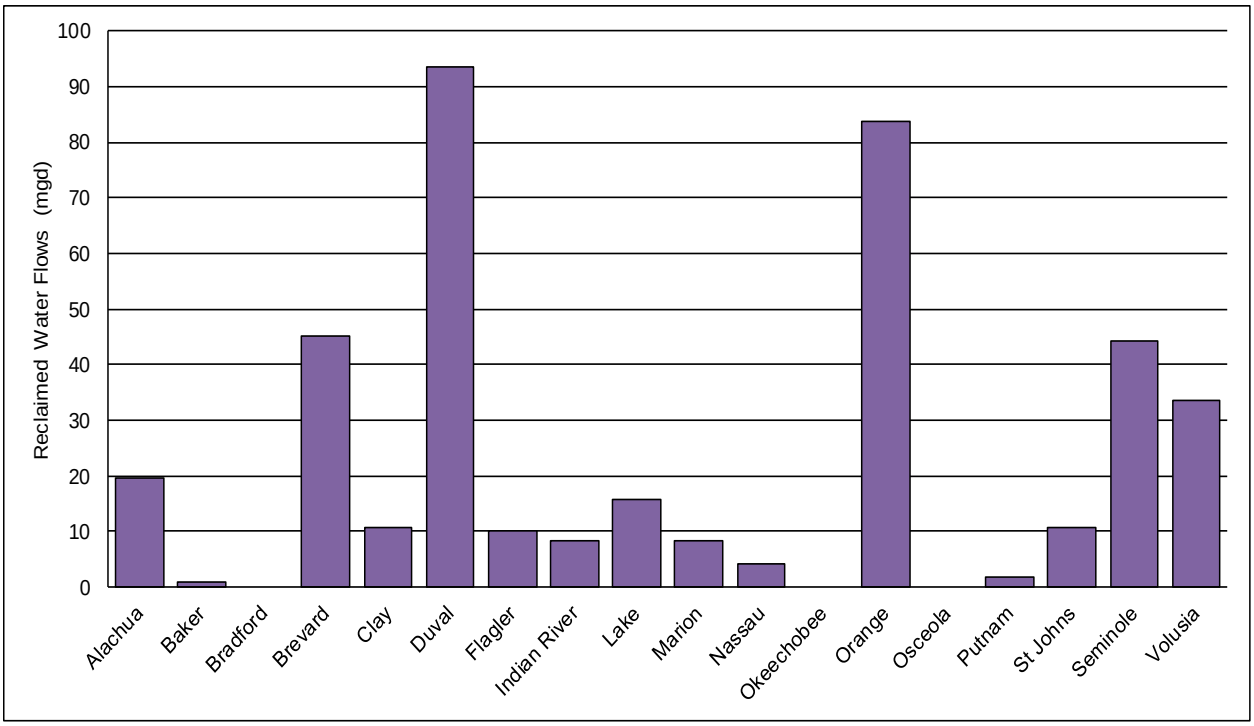

Figure 13. Wastewater flows reused beneficially, 2017

Note: Reclaimed water flows in million gallons per day (mgd).
Data obtained from the Draft 2017 DEP Reuse Inventory.

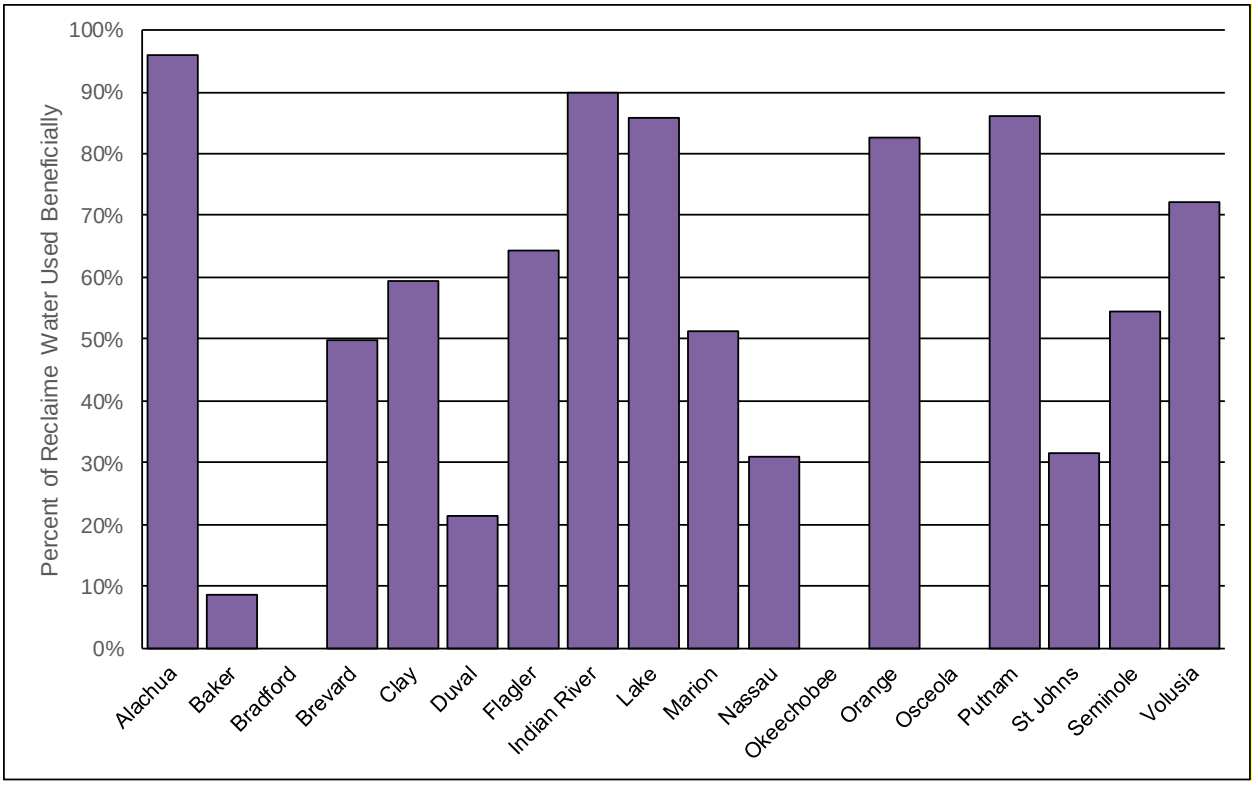

Figure 14. Percent of wastewater flows reused beneficially, 2017

Note: Data obtained from the Draft 2017 DEP Reuse Inventory.

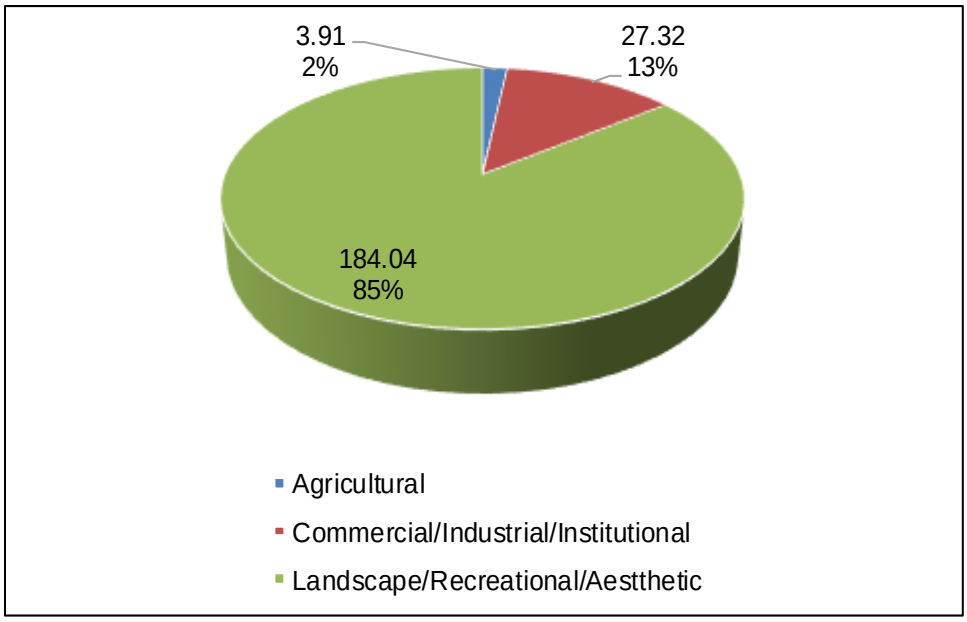

Figure 15. Beneficially used reclaimed water by use type, 2017

Note: Water use is in million gallons per day (mgd).
Data obtained from the Draft 2017 DEP Reuse Inventory.