Technical Fact Sheet SJ2020-FS1

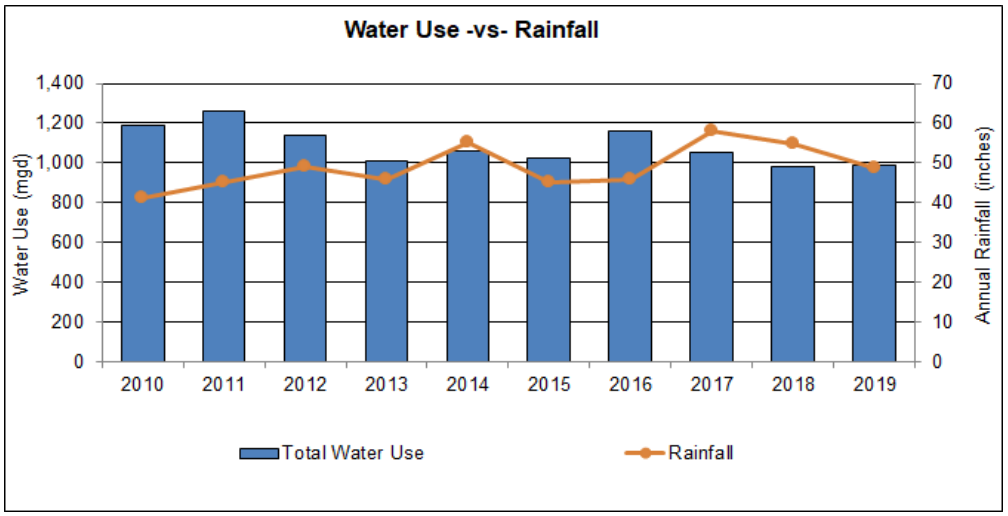
2019 Survey of Annual Water Use for St. Johns River Water Management District

St. Johns River Water Management District
2019 Annual Water Use Executive Summary

This executive summary provides a brief overview 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. Unless specifically indicated, water use data in this report does not include beneficial reclaimed water use amounts.

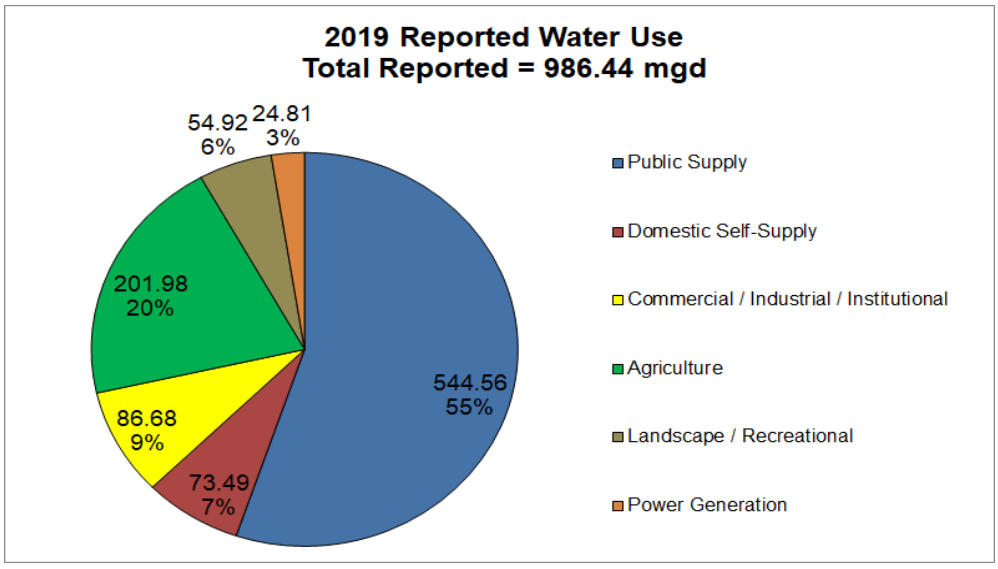
2019 Rainfall

- At 49 inches, it was the fifth wettest year in the last decade
- 8 inches higher than the 10-year low in 2010 and approximately equal to the 10-year average
- The majority of the rainfall (over 60 percent) occurred during the second half of 2019



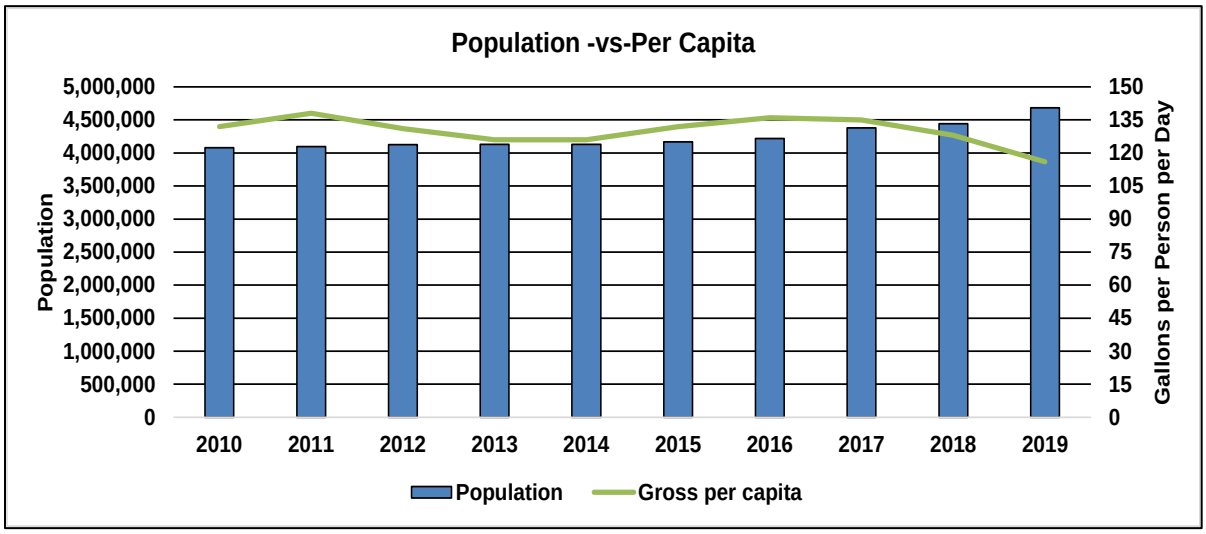
2019 Total Water Use

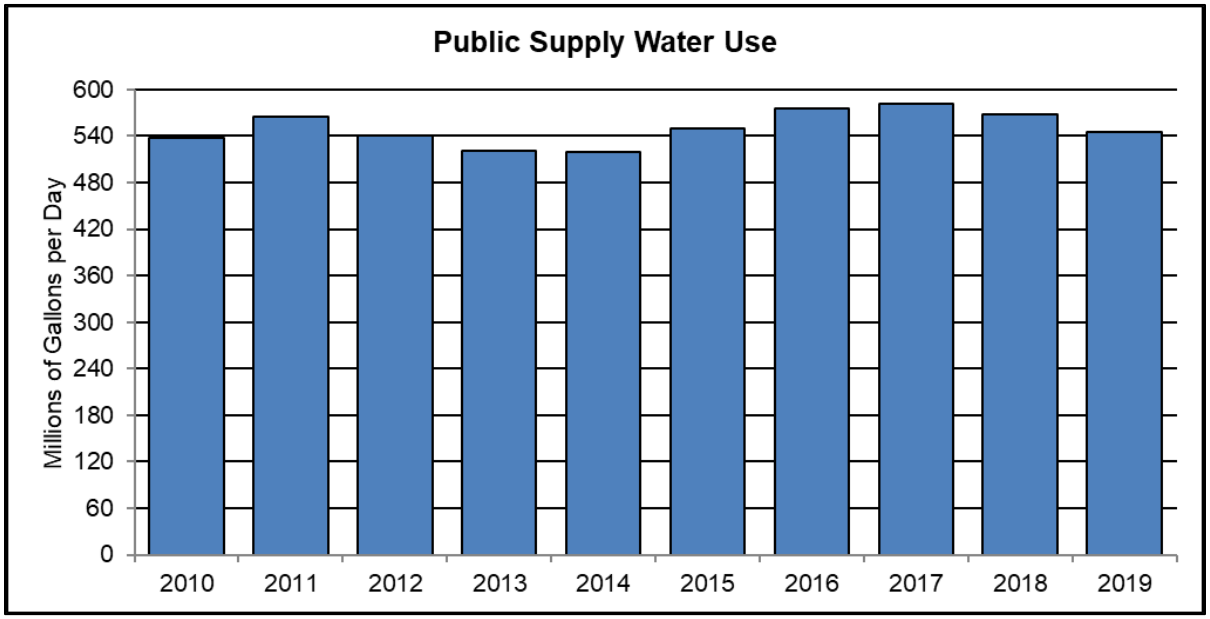
- 9% lower than the 10-year average and 1% higher than 2018 use



2019 Public Supply Water Use

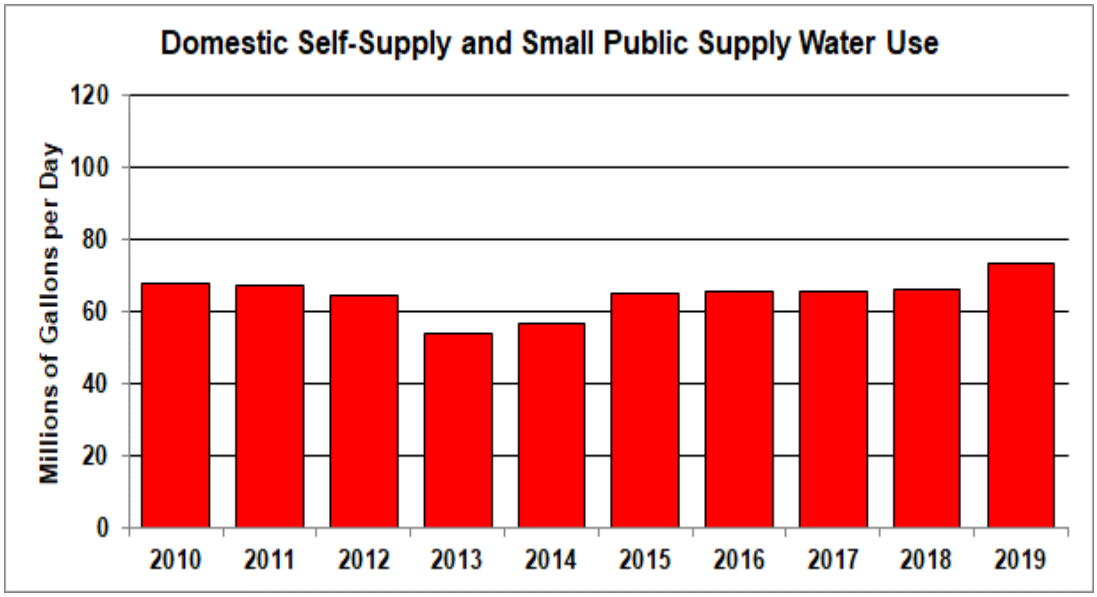
- Between 2010 and 2019, public supply water use increased 1% from 537.24 million gallons per day (mgd) to 544.56 mgd, while population increased 15% from 4,079,938 to 4,684,674 persons
- Between 2010 and 2019, gross per capita rates decreased 12% from 132 gallons per person per day to 116 gallons per person per day (the 10-year average was 130).
- Changes in public supply water use can be attributed to several factors, such as rainfall, implementation of conservation, increased use of reclaimed water, economic factors, etc.
- Public supply water use decreased 4% from 2018





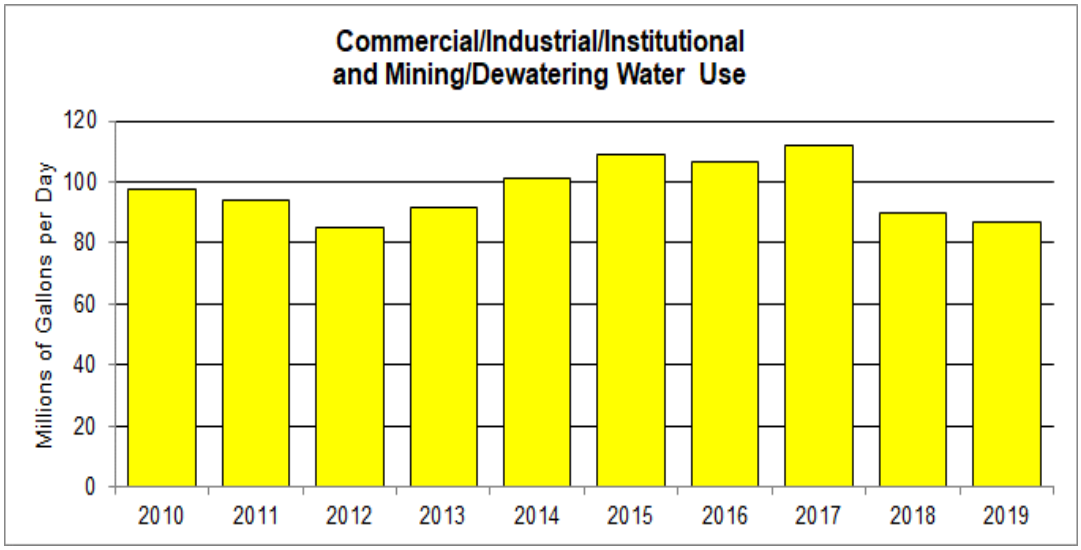
2019 Domestic Self-Supply

- At 73.49 mgd, 2019 use was 14% higher than the average use over the last 10 years
- Additional water use data for small public supply systems was available for this year's report, which added approximately 5 mgd
- Self-supplied households consumed an average 85 gallons per person per day



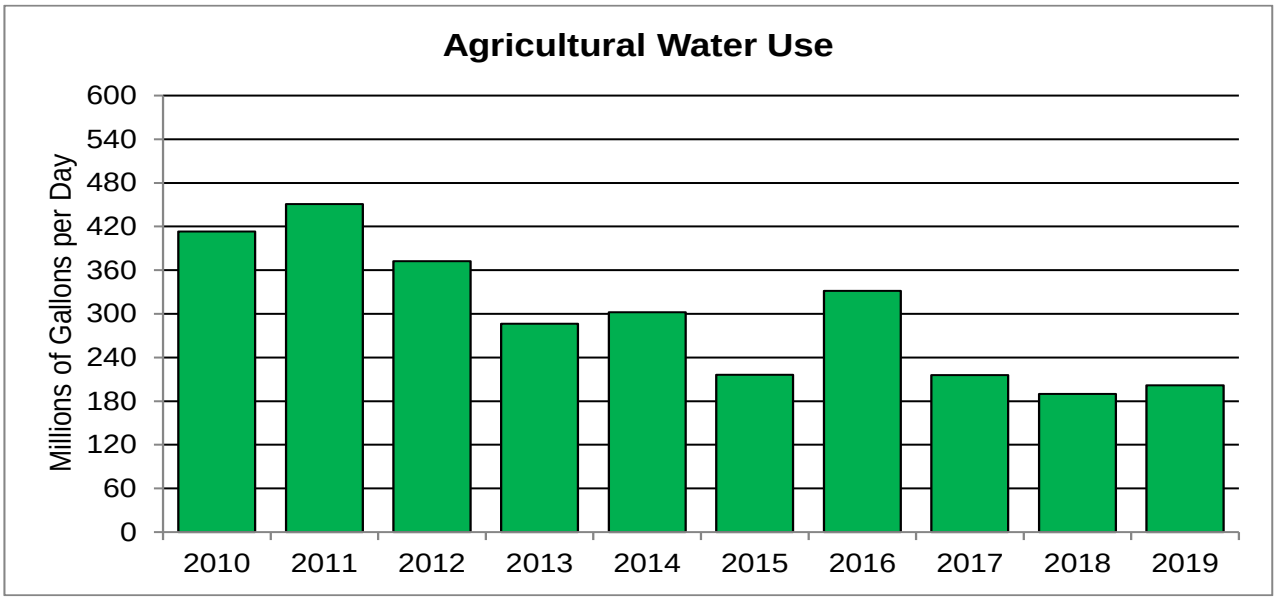
2019 Commercial/Industrial/Institutional and Mining/Dewatering (CII/MD)

- Mining and pulp and paper make up 71% of CII/MD water use
- At 86.68 mgd, CII/MD use was 11% below the annual average of the last 10 years



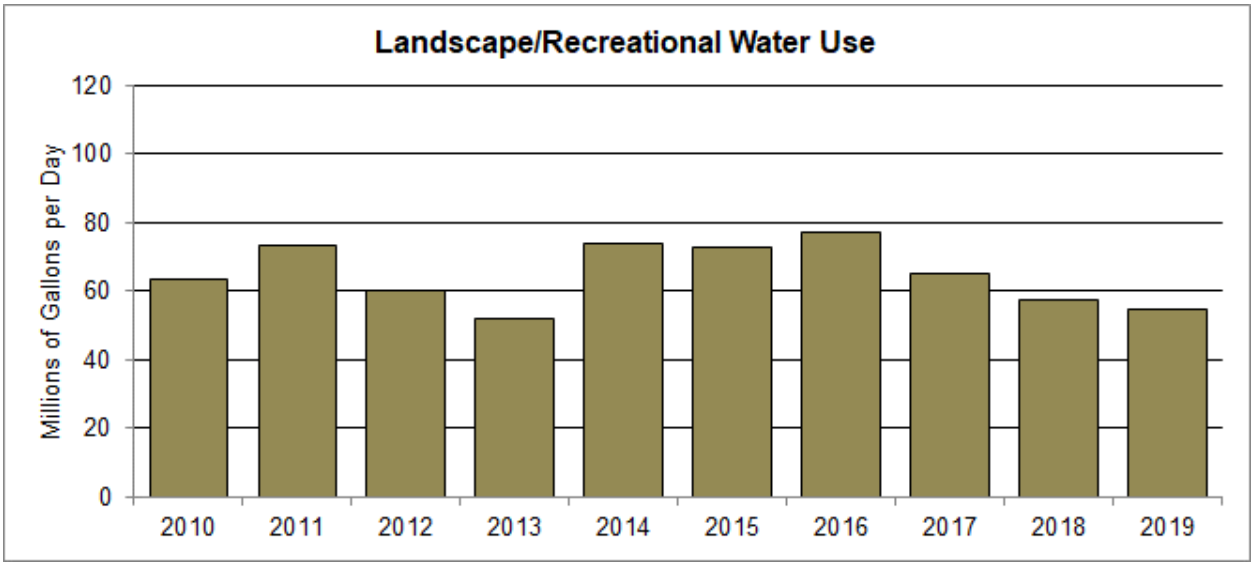
2019 Agricultural Water Use

- At 201.98 mgd, reported water use was 32% lower than the annual average over the last 10 years
- As stated earlier, 2019 was the fifth wettest year since 2010, with the majority of the rainfall occurring during the second half of the year, requiring less water for irrigation of crops



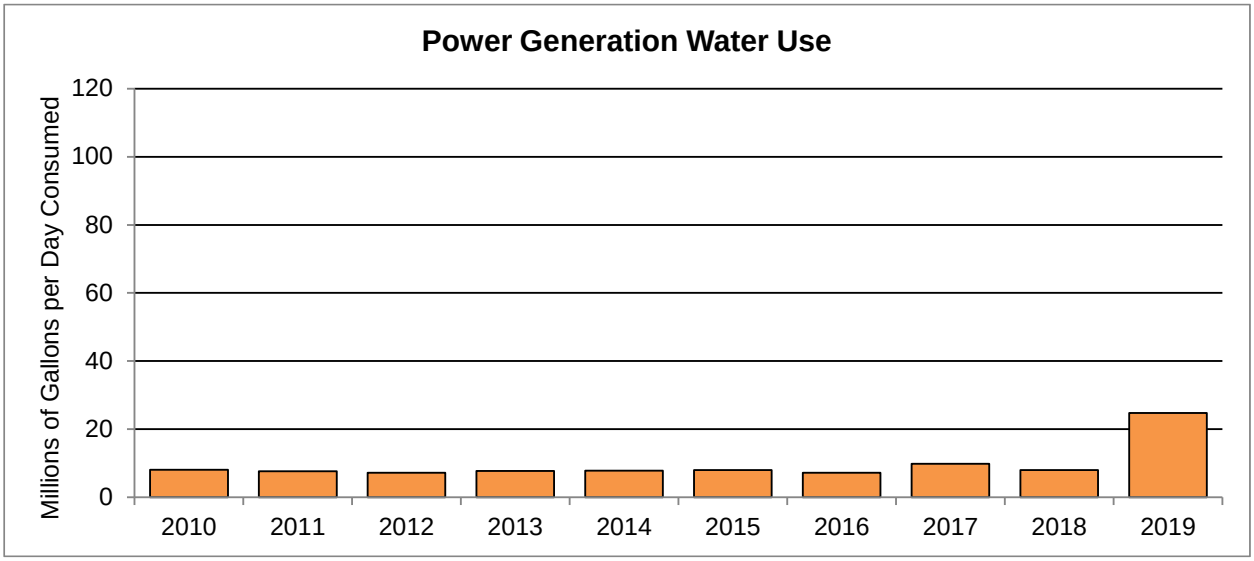
2019 Landscape/Recreational (LR)

- At 54.92 mgd, active golf courses represent 78% of the water use under this category (42.73 mgd)
- Total LR water use was 5% lower than 2018 and was 16% lower than the annual average over the last 10 years



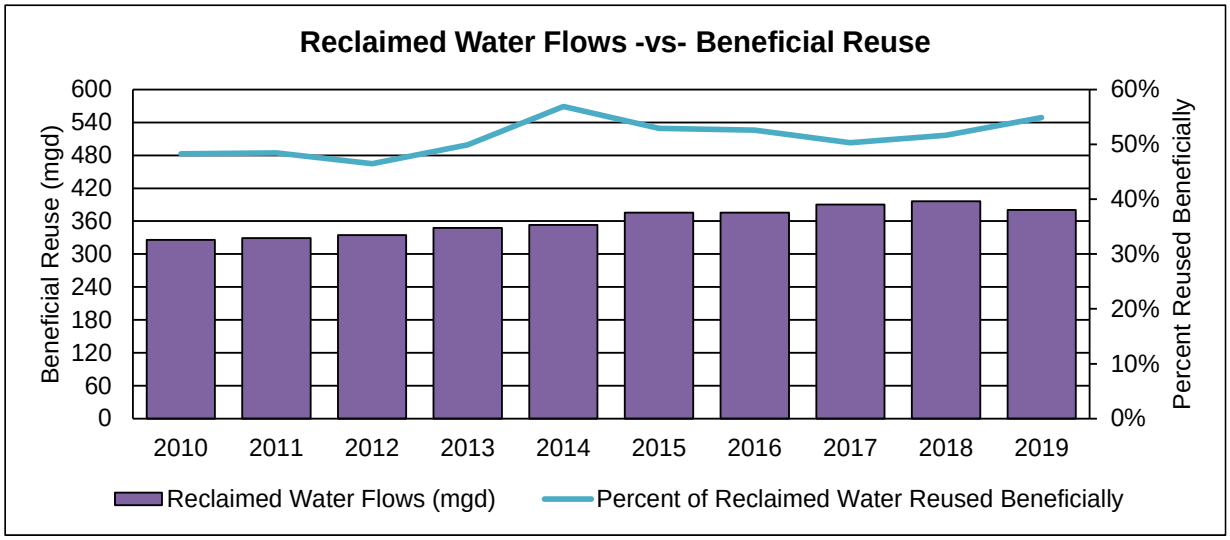
2019 Power Generation Water Use

- In 2019, the combined consumptive water use was 24.80 mgd
- Based upon stakeholder feedback, 2% of surface water withdrawals have been included to account for evaporative losses
- This category represents approximately 3% of the total water withdrawals
- The 2019 value is significantly larger than past years due to water use in Brevard County (10.27 mgd) which was not previously reported and Okeechobee County (5.54 mgd) which is a new facility.



2019 Beneficial Reuse

- Beneficial Reuse totaled 217 mgd, including 13 mgd of recharge in Alachua County
- Districtwide, more than 50% of wastewater flows have been reused beneficially since 2014
- Countywide reuse utilization rates range from 7% (Baker) to 96% (Alachua)



2019 Survey of Annual Water Use for St. Johns River Water Management District

20-Year Historical Perspective

Category	2000		2019		% Change
	Water Use	Percent of Total	Water Use	Percent of Total	
Public supply (PS)	572.55	39	544.56	55	-5
Agriculture irrigation self-supply (AG)	601.59	41	201.98	20	-66
Power generation self-supply (PG)	10.86	1	24.81	3	128
Commercial / Industrial / Institutional and Mining Dewatering self-supply (CII/MD)	123.6	8	86.68	9	-30
Landscape / Recreational / self-supply (LR)	104.6	7	54.92	6	-48
Domestic self-supply and small public supply systems (DSS)	58.38	4	73.49	7	26
Total	**1,471.58**	**100**	**986.44**	**100**	**-33**

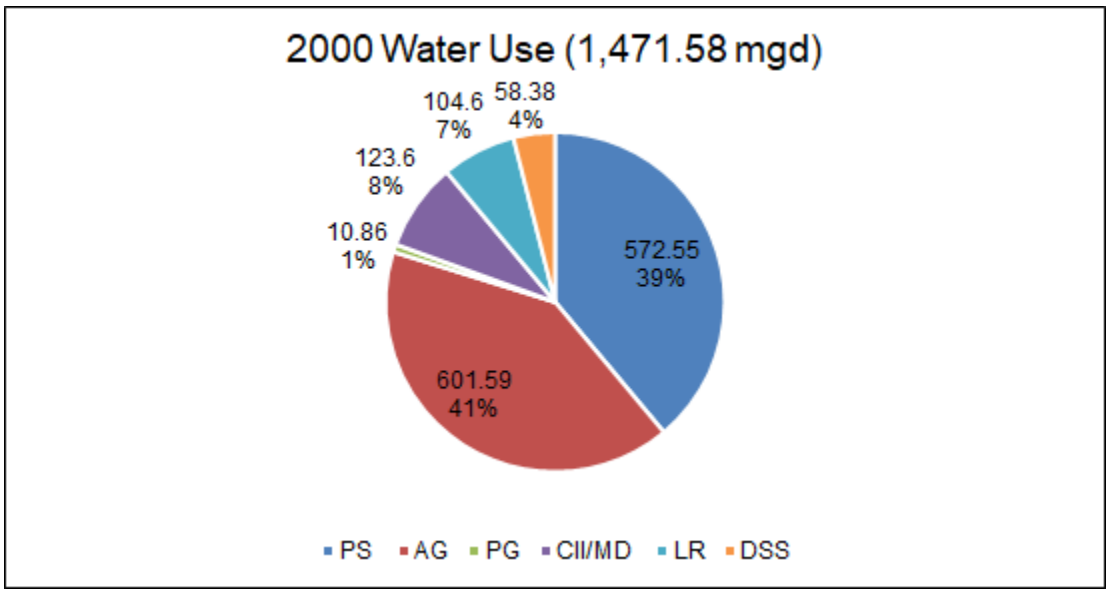
Category	2000		2019		% Change
	Population	Percent of Total	Population	Percent of Total	
Public supply	3,318,138	85	4,684,674	84	41
Domestic self-supply and small public supply systems	564,933	15	861,779	16	53
Total	**3,883,071**	**100**	**5,546,453**	**100**	**43**

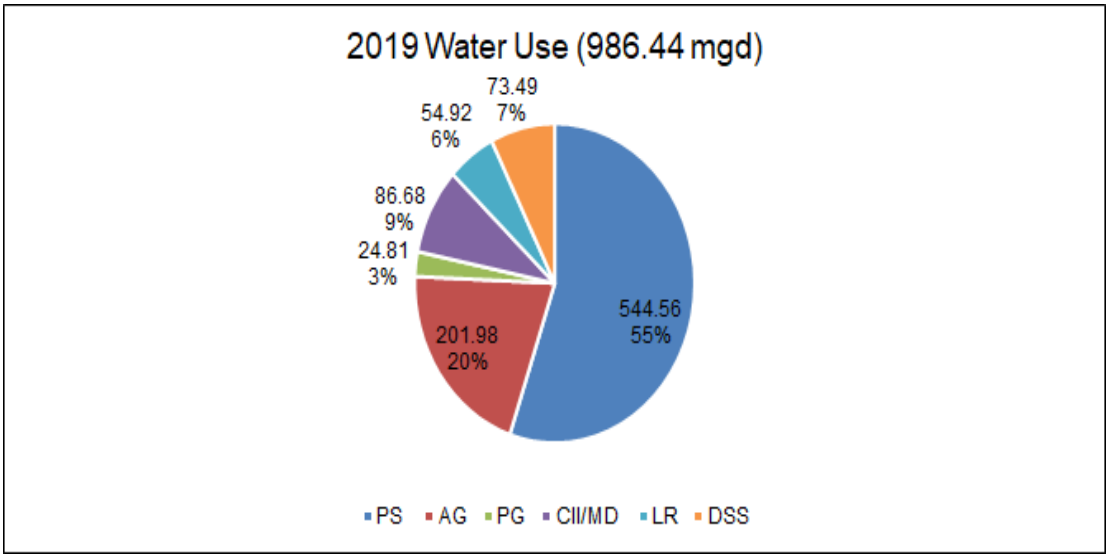
Per Capita Rates	2000	2019	% Change
Gross Per Capita	173	116	-33
Residential Per Capita	103	85	-18

Reclaimed Water	2000	2019	% Change
Total flow	289.38	380.39	31
Beneficially used	108.35	216.56	100
Percent beneficially used	37	57	54

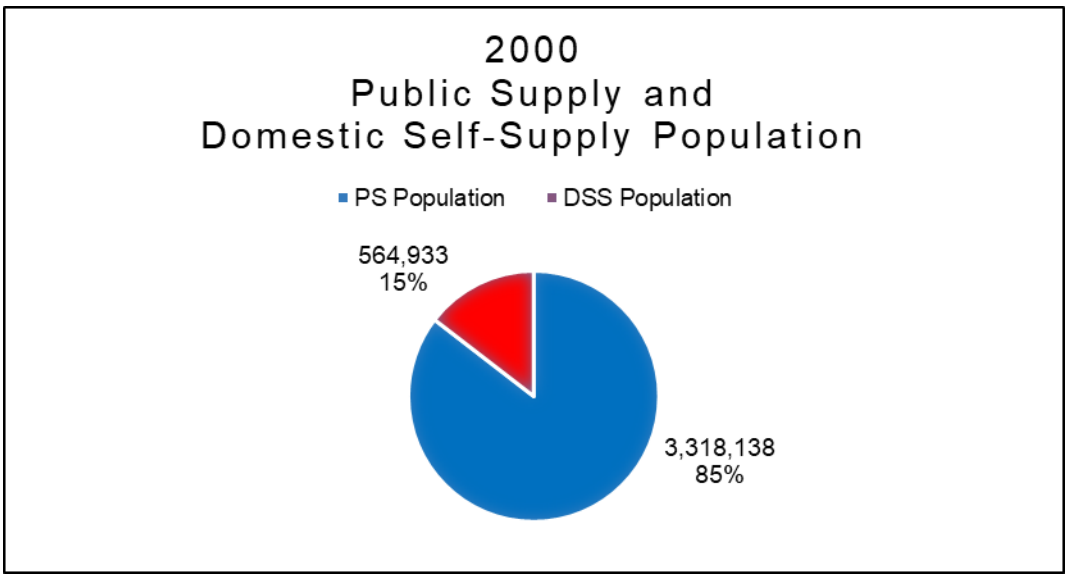
Note: Water use and reclaimed water flows are shown in million gallons per day (mgd).

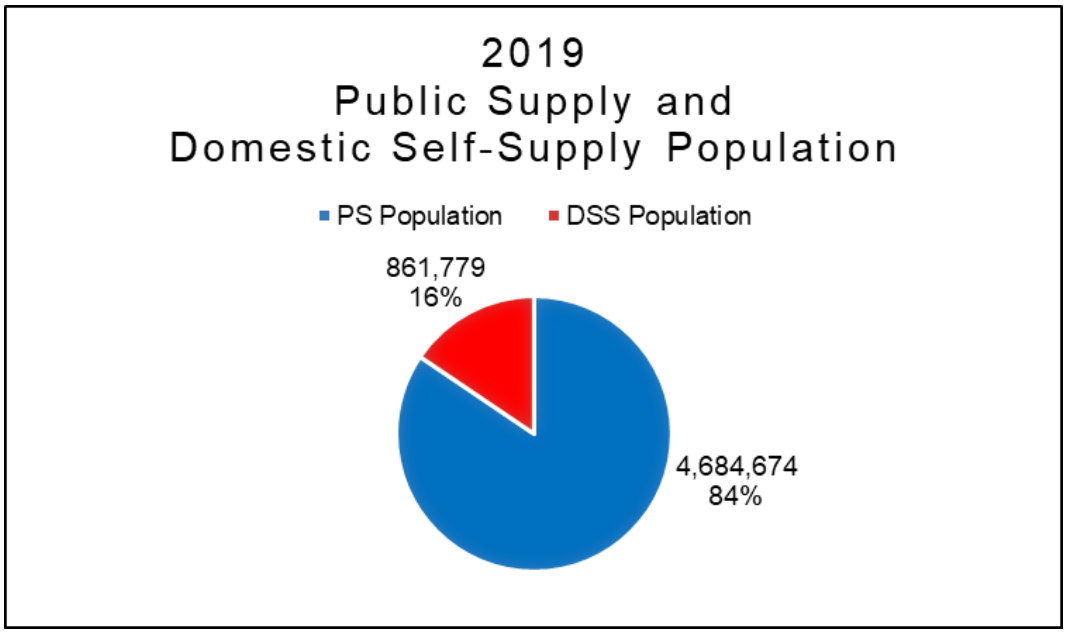
20-Year Historical Perspective (Cont.)

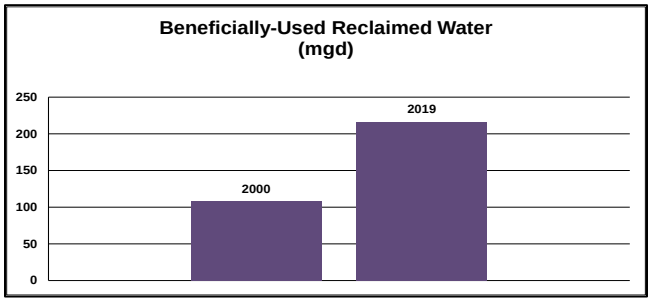


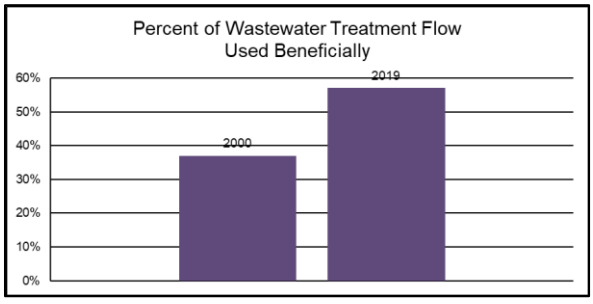


20-Year Historical Perspective (Cont.)









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2019 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. Unless specifically indicated, water use data in this report does not include beneficial reclaimed water use amounts. 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 2000, total public supply water use, which represents 55% of total water use in 2019, has decreased by 5% (from 572.55 mgd to 544.55 mgd). At the same time, total population served by public supply has increased 38% (from 3,400,959 to 4,684,674 persons). In the 10-year period ending in 2019, public supply water use increased 1% (from 537.24 mgd to 544.55 mgd), while population served by public supply increased 15% from 4,079,938 to 4,684,674 persons. Although public supply water use in 2019 is higher than the 10-year average (due to factors such as rainfall / drought conditions and economic factors), the gross per capita rate has seen a significant decrease since 2000 and is 12% lower than 2010.

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 2000, gross per capita water use has decreased from 168 gallons per person per day to 116 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 5.5 million people, or approximately 26% 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 2019 was 48.79 inches. From the most recent 10-year period, 2010–2019, 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 2010–December 2019 was 48.87 inches. A comparison of rainfall and water use over the most recent 10-year period, 2010–2019, is shown in Figures 11 and 12.

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 2019 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 2019 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 2019 Reuse Inventory Report* (DEP 2019).

Rainfall by county was obtained from SJRWMD's monthly hydrologic conditions reports (SJRWMD 2019). Water use for those small users (18% of the 2019 total water use) that are not required to report information to SJRWMD or DEP is estimated using analyses of historical data and trends.


Moses Creek Conservation Area

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 2019 Reuse Inventory Report* (DEP 2019). 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 2019* (BEBR 2019a).

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; 2019 county population estimates are from *Projections of Florida Population by County, 2020–2045, with Estimates for 2019* (BEBR 2019a).

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 self-supply, and (6) 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

2019. (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 2019 number of persons per household obtained from BEBR (BEBR 2019b). 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 85 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.

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 rainstorm, 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 Agriculture and Consumer Services (FDACS) Florida Statewide Agricultural Irrigation Demand (FSAID VI). 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 VI (Balmoral, 2019).

Landscape/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 SJRWMD EN-50 forms.

2019 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 2019 survey, the water use amounts are based on best available data as of April 2, 2020. As shown in Figure 1, 82% of the 2019 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 irrigation self-supply, and (6) 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 2019. Consumptive use is defined by SJRWMD as any use of water that reduces the supply from which it is withdrawn or diverted.

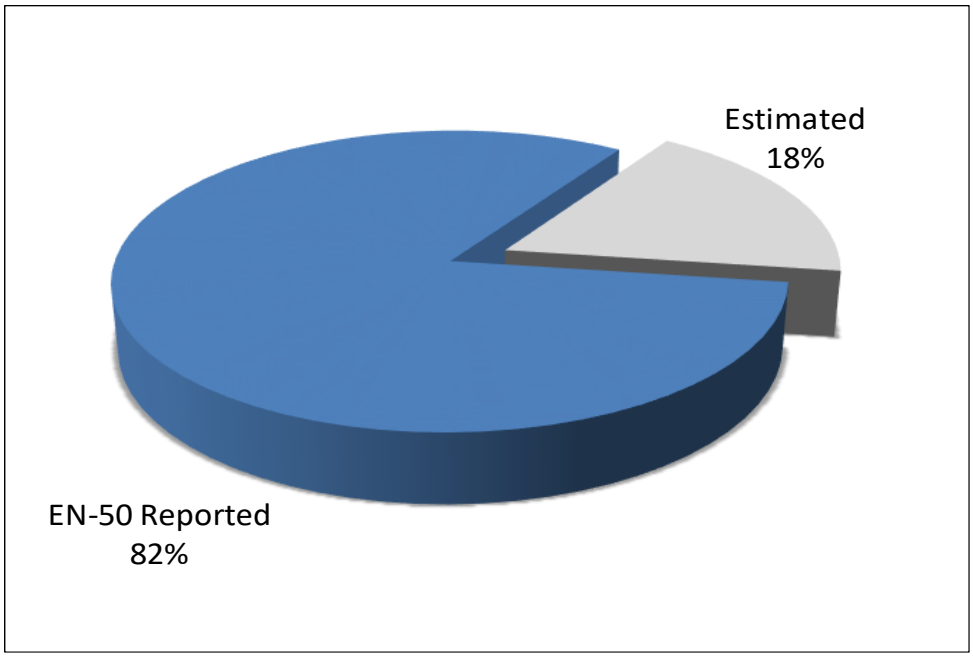

Figure 1. Reported and estimated water use (mgd) in SJRWMD, 2019

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 2019, including fresh, saline and reuse (reclaimed) water, was 1,195.05 mgd. Of the total consumptive amount, 986.44 mgd was freshwater and 4.64 mgd was saline water (Tables 1–3). In 2019, the largest consumptive use of freshwater within SJRWMD was public supply, which totaled 544.56 mgd, or 55%, of total consumptive freshwater use (Tables 2 and 3, Figure 2). Next was agricultural water use, which used 201.98 mgd, or 20%, of total consumptive freshwater within SJRWMD (Tables 2 and 3, Figure 1). Beneficial use of reclaimed water accounted for 216.56 mgd and was reported under the agricultural, commercial/industrial/institutional and landscape/recreational categories of water use (Tables 2 and 3). An additional 12.59 mgd in Alachua County was used for recharge.

Public Supply. In 2019, 179 public supply utilities (or systems) served approximately 4,684,674 people, or 84%, of the SJRWMD total population (Table 4 note). Total water use, from both groundwater and surface water sources, was 3% 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 116 gallons per capita per day (gpcd). As seen in Table 5, gross per capita ranges from 32 gpd to 153 gpd. Average residential per capita (with the inclusion of Bradford and Okeechobee counties) for SJRWMD is 85 gpd. It ranges from 38 gpd to 121. Bradford County is excluded for comparison since it only has a small population which is served by Clay County Utility Authority. 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 2019, water use ranged from a low of 499.68 mgd in December to a high of 626.20 mgd in May (Figure 3). Of the total water withdrawn for public supply use, 98% was groundwater.

Water supply pumps at Lake Washington, left. Reclaimed system, Daytona Beach Bennett Swamp wetland restoration, right.

Counties with the largest public supply water use during 2019 were Orange County[1] (111.28 mgd, serving 1,054,611 people; 106 gpcd) and Duval County (115.89 mgd, serving 800,349 people; 145 gpcd) (Table 3, Figures 4 and 5). These counties combined represented 42% of total public supply water use and 40% 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 2019, approximately 861,779 people used 73.49 mgd of domestic self-supply water (including small public supply systems), or 7%, of total water used in SJRWMD (Tables 1–3, Figure 2). Duval County had the largest self-supplied population, with 170,323 people (16.56 mgd). Marion County had the second-largest population, 116,025 (8.11 mgd), followed by St. Johns County, 105,980 (10.18 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 73.49 mgd in 2019. The average for the 10-year period was 64.64 mgd; water use in 2019 was 14% above average. Fluctuations in water use are mainly attributed to changes in methodologies since the initial publication of the AWUS in 1978. In 2019, average domestic self-supply and small public supply system water use per capita within SJRWMD was 85 gpcd (Table 5).

Commercial/Industrial/Institutional and Mining/Dewatering Self-Supply. In 2019, a total of 107 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 86.68 mgd, or 9%, of total freshwater use (Tables 2 and 3, Figure 2). Of this freshwater total, 66.66 mgd was groundwater and 20.04 mgd was surface water. Additional reclaimed water use totaled 28.10 mgd (Tables 2 and 3).

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

Most of the water 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 2019 totaled 54.14 mgd. It included 35.42 mgd of fresh groundwater, 17.47 mgd of fresh surface water, and 1.25 mgd of saline surface water. The second-largest water user in this category was the mining industry, which accounted for 6.66 mgd of fresh groundwater and 2.09 mgd of fresh surface water. Pulp/paper production and mining accounted for a combined total of 61.64 mgd of freshwater, or 71%, of the commercial/industrial/institutional and mining/dewatering freshwater use.

Over the last ten years 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 97.33 mgd; water use in 2019 was 11% below this average. Commercial/industrial/institutional and mining/dewatering freshwater use in 2019 varied from a low of 86.18 mgd in September to a high of 96.56 mgd in May (Figure 6).

Agricultural Self-Supply. Total consumptive use of water for agricultural water use was 201.98 mgd, which is 20% of total freshwater use in SJRWMD during 2019 (Tables 2 and 3, Figure 2). Reuse water accounted for 1.41 mgd of agricultural water use. Agricultural permittees used 175.05 mgd of groundwater (87%) and 26.92 mgd of surface water (13%). There are currently 674,893 irrigated acres in agricultural production in SJRWMD. Seventy-six percent of these acres (512,281) are covered by a consumptive use permit. There was a decrease of 800 acres for citrus usage since 2018. Agricultural water use in 2019 reached a low of 150.44 mgd in August and a high of 260.31 mgd in March (Figure 7). This fluctuation is typical of irrigation water use and is related to rainfall patterns and timing of planting and harvesting.

By county, the largest water use for agriculture occurred in Brevard County, with 39.75 mgd, accounting for 20% of total SJRWMD agricultural water use (Table 3). Ninety-five percent of the water used in this county was withdrawn from groundwater sources.

During 2019 in SJRWMD, the largest agricultural water use was for cut foliage and ornamentals, which accounted for 41.02 mgd, 20.31% of total agricultural water use. Hay / pasture and citrus were the two other largest categories; accounting for 14.97–17.59% of total agricultural water use (Figure 8).

Landscape/Recreational Irrigation Self-Supply. The landscape/recreational/ aesthetic (LR) 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 LR irrigation category totaled 54.92 mgd, about 6% of total freshwater use in 2019. Nearly 77% (42.40 mgd) of the quantities were withdrawn from surface water sources. The remaining 12.50 mgd (23%) came from groundwater sources. Reuse water under this category totaled 174.46 mgd. By county (Table 3), the largest freshwater use for LR irrigation occurred in Lake County (13.53 mgd), followed by Indian River County (10.89 mgd), and St. Johns County (4.77 mgd). In terms of reuse, the four counties with the largest reclaimed water

used for LR are Orange (54.19 mgd), Volusia (22.57 mgd), Seminole (21.79 mgd), and Brevard (19.04 mgd).

During the past 10 years (2010–2019), LR irrigation freshwater use was highest in 2016 (77.03 mgd) and lowest in 2010 (43.14 mgd). Average water use over the 10-year period was 65.04 mgd. Landscape/recreational irrigation water use in 2019 was 16% below the 10-year average. Landscape/recreational irrigation freshwater use in 2019 varied from a low of 33.87 mgd in February to a high of 72.12 mgd in May (Figure 9).

Power Generation Self-Supply. The 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 2019 reflect consumptive use data for 15 self-supplied power plants, totaling 24.80 mgd (Tables 2 and 3, Figure 2). The largest amount of consumptive water use within this category (Table 3) occurred in Brevard County (10.27 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. In addition, for 2019 water use in Brevard County (10.27 mgd) which was not previously reported and Okeechobee County (5.54 mgd) which is a new facility has been added.

Power generation water use in 2019 fluctuated from a low of 16.97 mgd in March to a high of 30.52 mgd in June (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 landscsape/recreation demands. In 2019, 216.56 mgd of reclaimed water was used for beneficial purposes. In terms of utilization rates, the top four counties were Orange (32%), Seminole (13%), Volusia (12%), and Brevard (10%) (Figures 13 and 14). Eighty-six percent of the reclaimed water is applied to landscape, fields and golf courses (Figure 15). Of note, 12.59 mgd in Alachua County was used for recharge.

SJRWMD Executive Director Dr. Ann B. Shortelle (far left) joined the city of Daytona Beach in June 2019 to celebrate the completion of the Bennett Swamp wetland restoration, a district cost-share project serving the people of Daytona Beach.

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Table 1. Total water use (mgd) and rainfall by county in SJRWMD, 2019

County	Freshwater (mgd)	Saline Water (mgd)	Reuse (mgd)	Total Water Use (mgd)	Rainfall (inches)
Alachua	29.63	0.00	5.63	35.26	49.60
Baker	4.30	0.00	0.08	4.38	43.17
Bradford	1.49	0.00	0.00	1.49	41.55
Brevard	104.18	0.00	20.93	125.11	55.07
Clay	21.87	0.00	6.41	28.28	42.78
Duval	156.12	0.00	18.17	174.29	43.97
Flagler	20.88	3.03	6.62	30.53	44.79
Indian River	67.49	0.00	6.23	73.72	46.25
Lake	104.25	0.00	15.16	119.41	51.44
Marion	38.22	0.00	3.57	41.79	53.09
Nassau	45.94	1.61	1.62	49.17	44.33
Okeechobee	9.15	0.00	0.00	9.15	47.87
Orange	128.63	0.00	64.66	193.29	53.25
Osceola	14.18	0.00	0.00	14.18	48.99
Putnam	40.85	0.00	1.67	42.52	43.11
St. Johns	55.70	0.00	3.62	59.32	55.00
Seminole	62.96	0.00	25.56	88.52	44.43
Volusia	80.60	0.00	24.04	104.64	52.96
Total	**986.44**	**4.64**	**203.97**	**1,195.05**	**48.79**

Note: Total water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.
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, 2019

Category	Freshwater (mgd)	Saline Water (mgd)	Reuse (mgd)	Total Water Use (mgd)
Public supply	544.56	0.00	0.00	544.56
Domestic self-supply and small public supply systems	73.49	0.00	0.00	73.49
Commercial / Industrial / Institutional and Mining / Dewatering self-supply	86.68	4.64	28.10	119.42
Agricultural irrigation self-supply	201.98	0.00	1.41	203.39
Landscape / Recreational self-supply	54.92	0.00	174.46	229.38
Power generation self-supply	24.81	0.00	0.00	24.81
Total	**986.44**	**4.64**	**203.97**	**1,195.05**

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, 2020.

Table 3. Total water use (mgd) by county and category in SJRWMD, 2019

County	Freshwater							Saline Water	Reuse	All Water Use
	Public Supply	Domestic Self-Supply	Commercial/ Industrial/ Institutional	Agricultural Self-Supply	Landscape/ Recreational Self-Supply	Power Generation Self-Supply	Total Freshwater	Commercial/ Industrial/ Institutional		
Alachua	23.89	0.96	0.10	4.10	0.20	0.38	29.63	0.00	5.63	35.26
Baker	1.02	2.40	0.33	0.55	0.00	0.00	4.30	0.00	0.08	4.38
Bradford	0.03	1.46	0.00	0.00	0.00	0.00	1.49	0.00	0.00	1.49
Brevard	45.52	2.27	2.70	39.75	3.67	10.27	104.18	0.00	20.93	125.11
Clay	14.47	5.79	0.24	1.24	0.13	0.00	21.87	0.00	6.41	28.28
Duval	115.89	16.56	12.60	1.48	4.46	5.13	156.12	0.00	18.17	174.29
Flagler	10.83	0.45	0.00	7.91	1.69	0.00	20.88	3.03	6.62	30.53
Indian River	19.25	0.25	0.39	36.71	10.89	0.00	67.49	0.00	6.23	73.72
Lake	45.19	6.98	13.85	24.48	13.53	0.22	104.25	0.00	15.16	119.41
Marion	18.97	8.11	0.81	6.50	3.83	0.00	38.22	0.00	3.57	41.79
Nassau	8.94	4.01	30.22	0.58	2.19	0.00	45.94	1.61	1.62	49.17
Okeechobee	0.00	0.13	0.01	3.47	0.00	5.54	9.15	0.00	0.00	9.15
Orange	111.28	4.51	2.99	7.85	1.45	0.55	128.63	0.00	64.66	193.29
Osceola	0.02	0.10	0.00	14.06	0.00	0.00	14.18	0.00	0.00	14.18
Putnam	1.09	1.99	21.07	15.15	0.86	0.69	40.85	0.00	1.67	42.52
St. Johns	20.91	10.18	0.56	19.28	4.77	0.00	55.70	0.00	3.62	59.32
Seminole	55.16	2.47	0.00	2.83	2.50	0.00	62.96	0.00	25.56	88.52
Volusia	52.10	4.87	0.81	16.04	4.75	2.03	80.60	0.00	24.04	104.64
Total	**544.56**	**73.49**	**86.68**	**201.98**	**54.92**	**24.81**	**986.44**	**4.64**	**203.97**	**1,195.05**

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.
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 are 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.

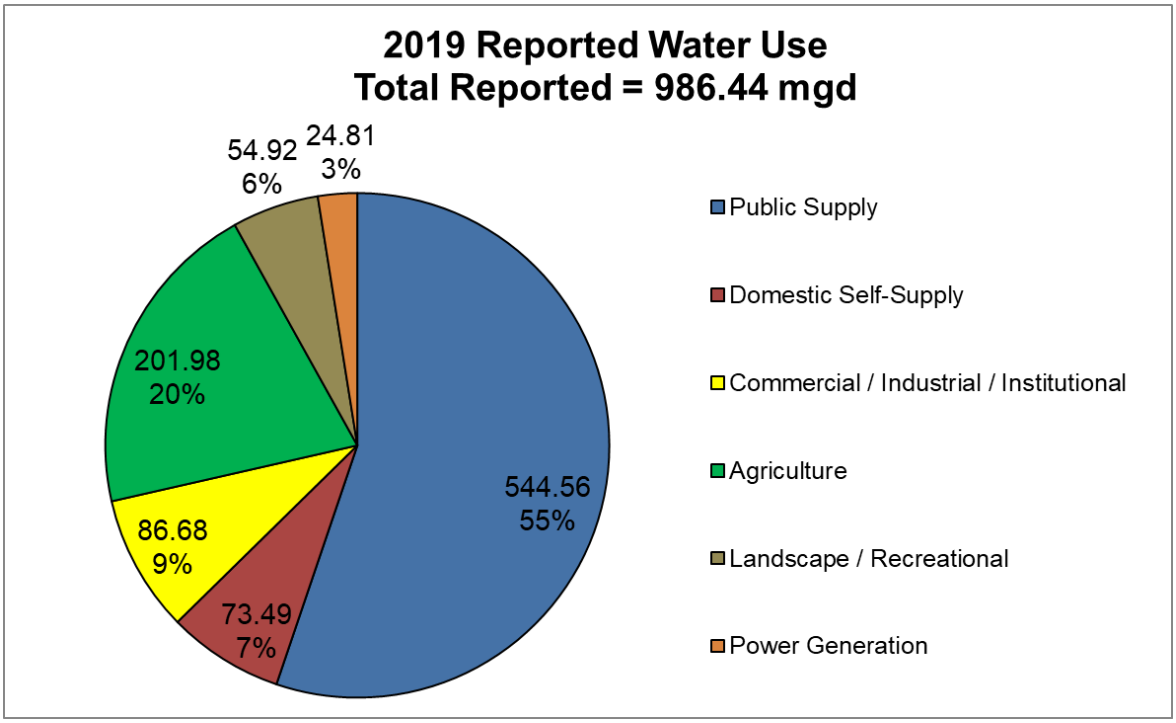

Figure 2. Total water use (mgd), 2019

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.
Source of domestic self-supply is assumed to be groundwater.

Table 4. Population by county, 2019

County	SJRWMD Population	Public Supply Population	Domestic Self-Supply and Small Public Supply Systems Population
Alachua*	205,839	192,150	13,689
Baker*	27,768	7,148	20,620
Bradford*	5,668	930	4,739
Brevard	610,101	565,307	44,794
Clay	215,243	137,508	77,735
Duval	970,672	800,349	170,323
Flagler	115,549	108,556	6,993
Indian River	169,582	163,220	6,362
Lake*	364,943	302,704	62,239
Marion*	240,660	124,636	116,025
Nassau	91,472	58,312	33,161
Okeechobee*	1,599	0	1,599
Orange*	1,099,493	1,054,611	44,882
Osceola*	1,252	0	1,252
Putnam	72,857	21,098	51,759
St. Johns	254,412	148,432	105,980
Seminole	494,326	460,798	33,529
Volusia	605,013	538,915	66,098
Total	**5,546,449**	**4,684,674**	**861,779**

Note: 2019 county population is from BEBR, Florida Estimates of Population (BEBR 2019a)
Total population for the state of Florida in 2019 = 21,208,589
Percent of total state of Florida population that lives within SJRWMD = 26%
Percent of SJRWMD population served by public supply = 84%
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	124	70
Baker	143	116
Bradford	105	74
Brevard	81	51
Clay	105	74
Duval	145	97
Flagler	100	64
Indian River	118	39
Lake	149	112
Marion	152	70
Nassau	153	121
Okeechobee	N/A	81
Orange	106	100
Osceola	N/A	80
Putnam	51	38
St. Johns	141	96
Seminole	120	74
Volusia	97	74
Total	**116**	**85**

Note: As of December 2019, there were no significant permitted public supply uses in SJRWMD's portion of Okeechobee and Osceola counties. The population residing therein rely on domestic wells for their potable needs.

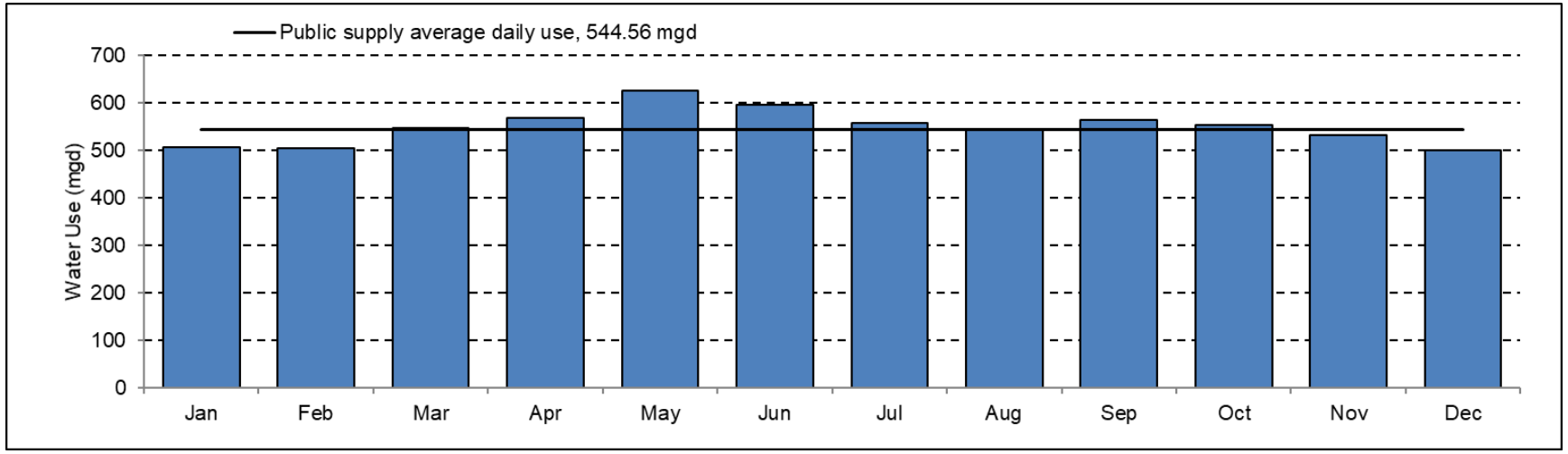

Figure 3. Average daily public supply water use (mgd) by month, 2019

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.

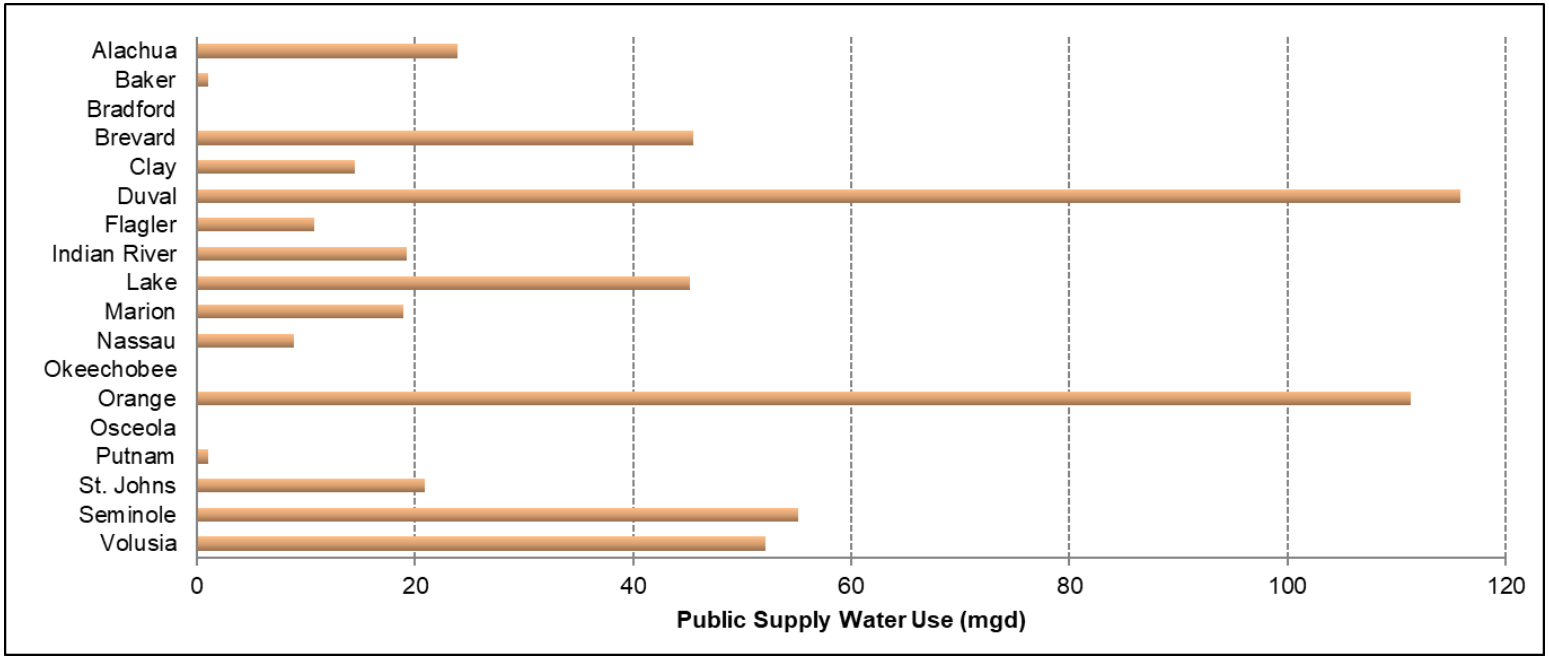

Figure 4. Water use (mgd) for public supply in SJRWMD, 2019

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.
Total public supply water use in SJRWMD for 2019 was 544.56 mgd.
Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the water consumed in SJRWMD.

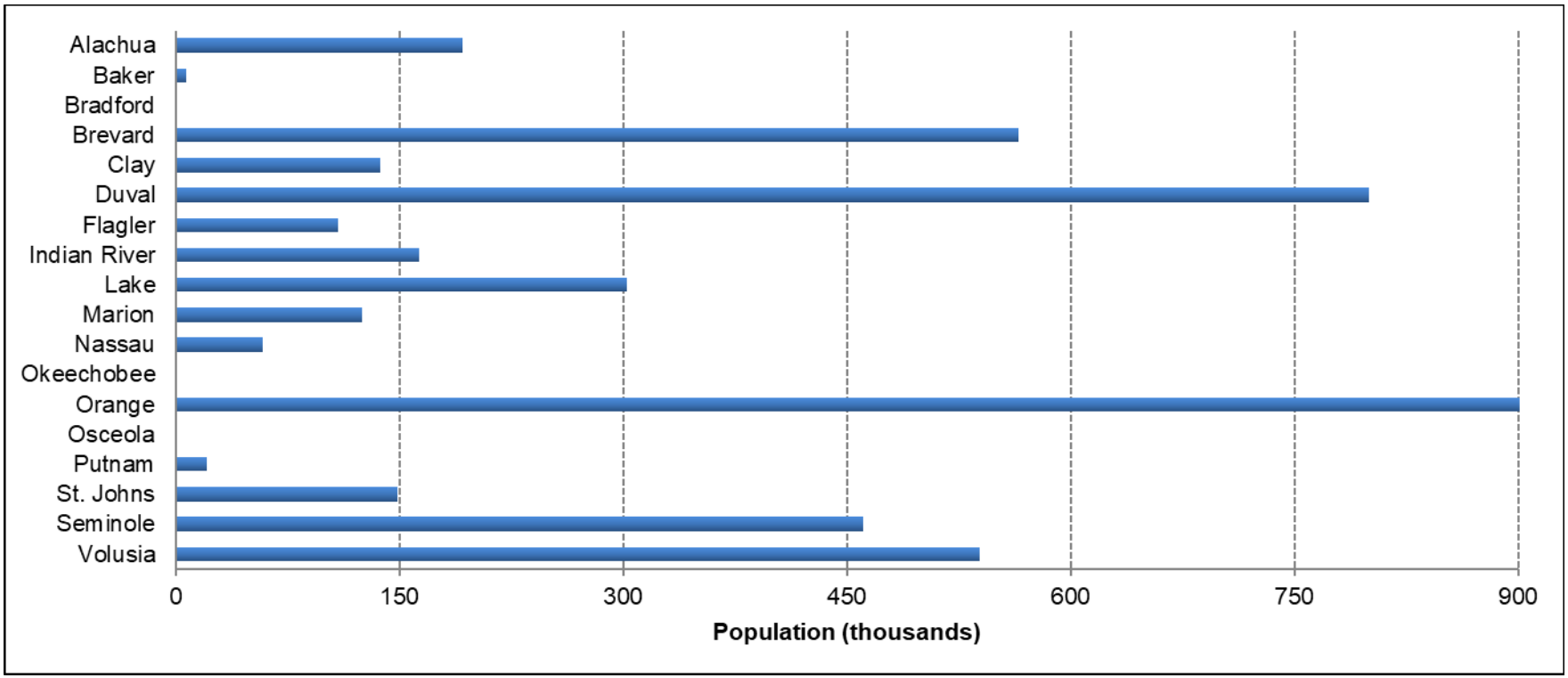

Figure 5. Population served by public supply in SJRWMD, 2019

Note: Population estimates are based on best available data as of April 2, 2020.
Total public supply population in SJRWMD for 2019 was 4,684,674.
Orange County (Orange County Utilities / Orlando Utilities Commission) totals only include the population served in SJRWMD.

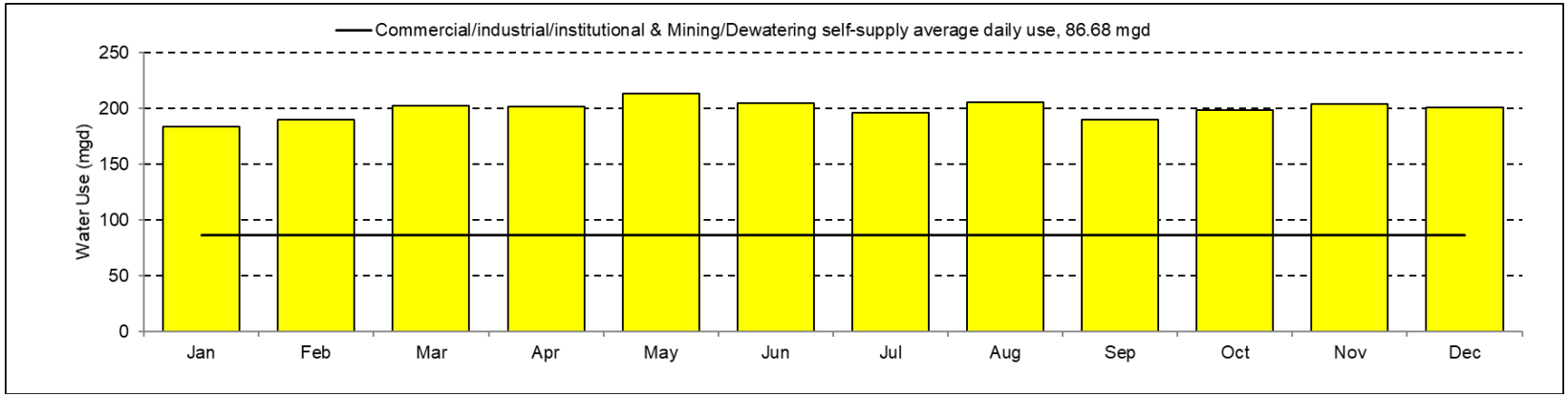

Figure 6. Average daily commercial/industrial/institutional and mining/dewatering self-supply water use (mgd) by month, 2019

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.

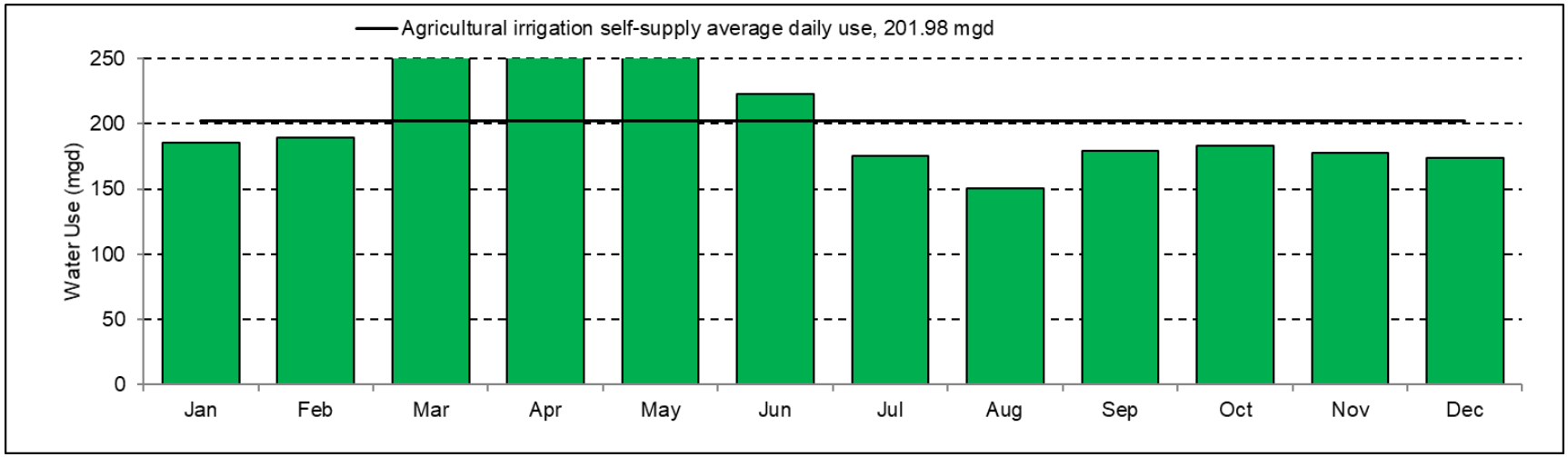

Figure 7. Average daily agricultural self-supply water use (mgd) by month, 2019

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.

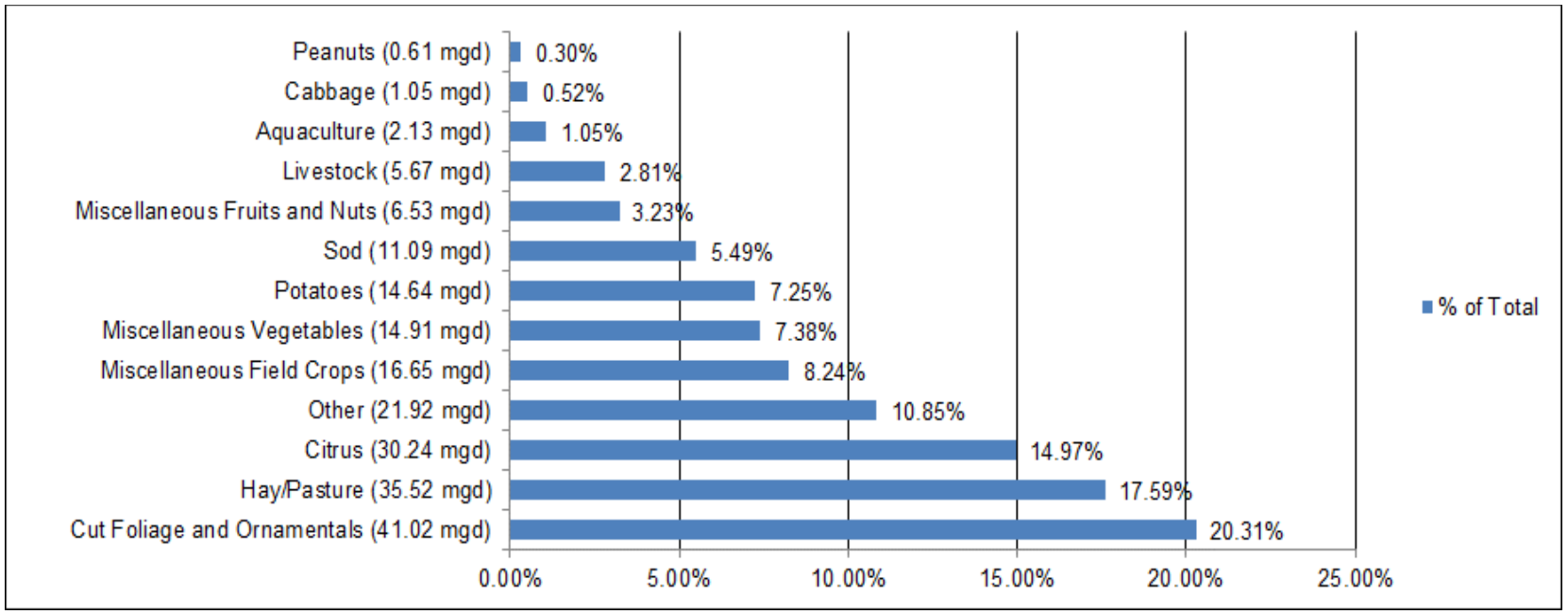

Figure 8. Agricultural water use by crop, 2019

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.
Calculation anomalies due to rounding account for nominal discrepancies.
Total agricultural water use in SJRWMD for 2019 was 201.98 mgd.

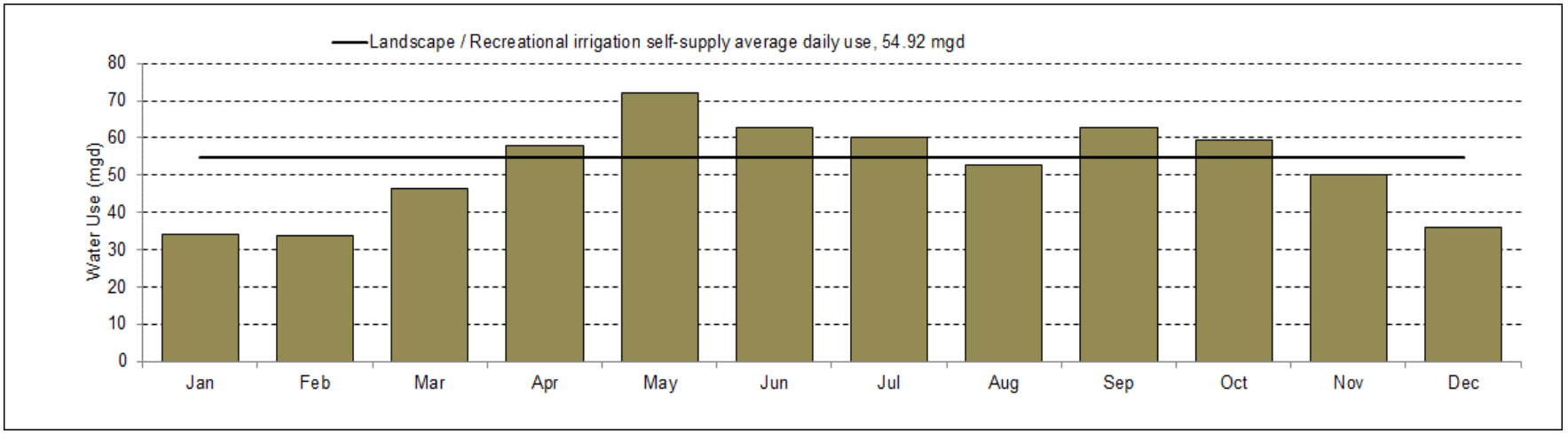

Figure 9. Average daily landscape/recreational irrigation self-supply water use by month, 2019

Note: Water use is in million gallons per day (mgd).
Amounts are based on best available data as of April 2, 2020.

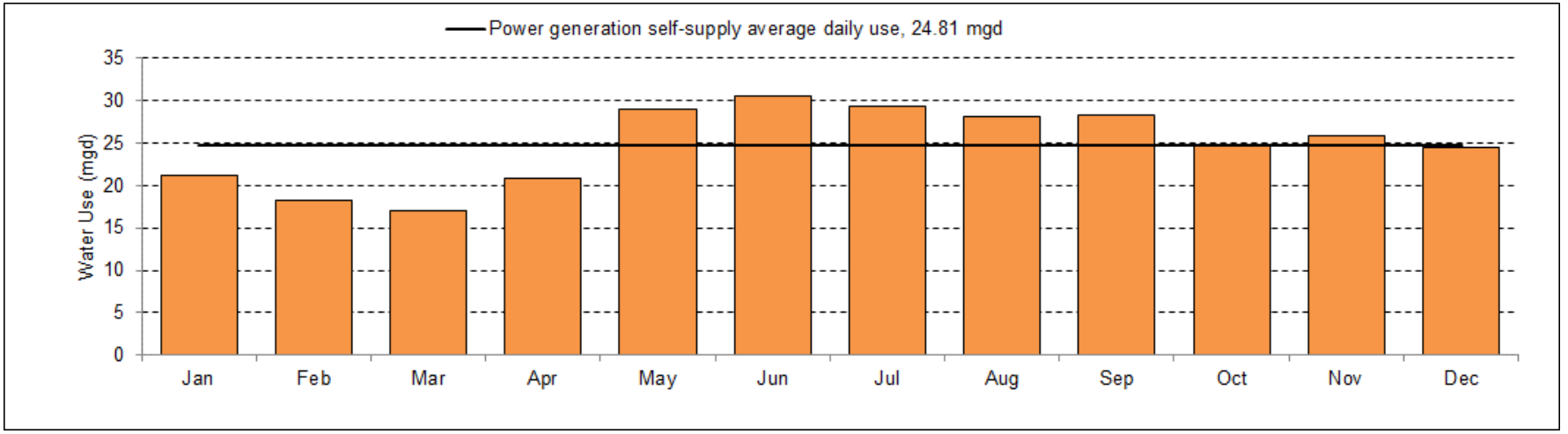

Figure 10. Average daily power generation self-supply water use by month, 2019

Note: Water use is in million gallons per day (mgd).
Amounts of consumptive water use are based on best available data as of April 2, 2020.

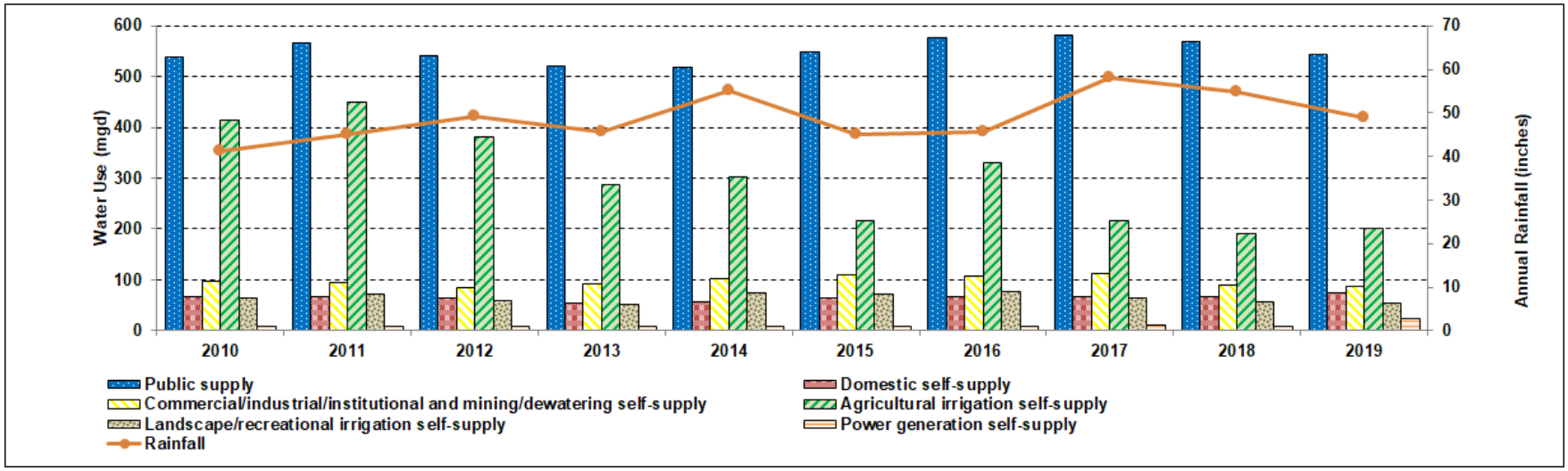

Figure 11. Annual rainfall and water use by category, 2010–2019

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, 2020.
Source of domestic self-supply is assumed to be groundwater.

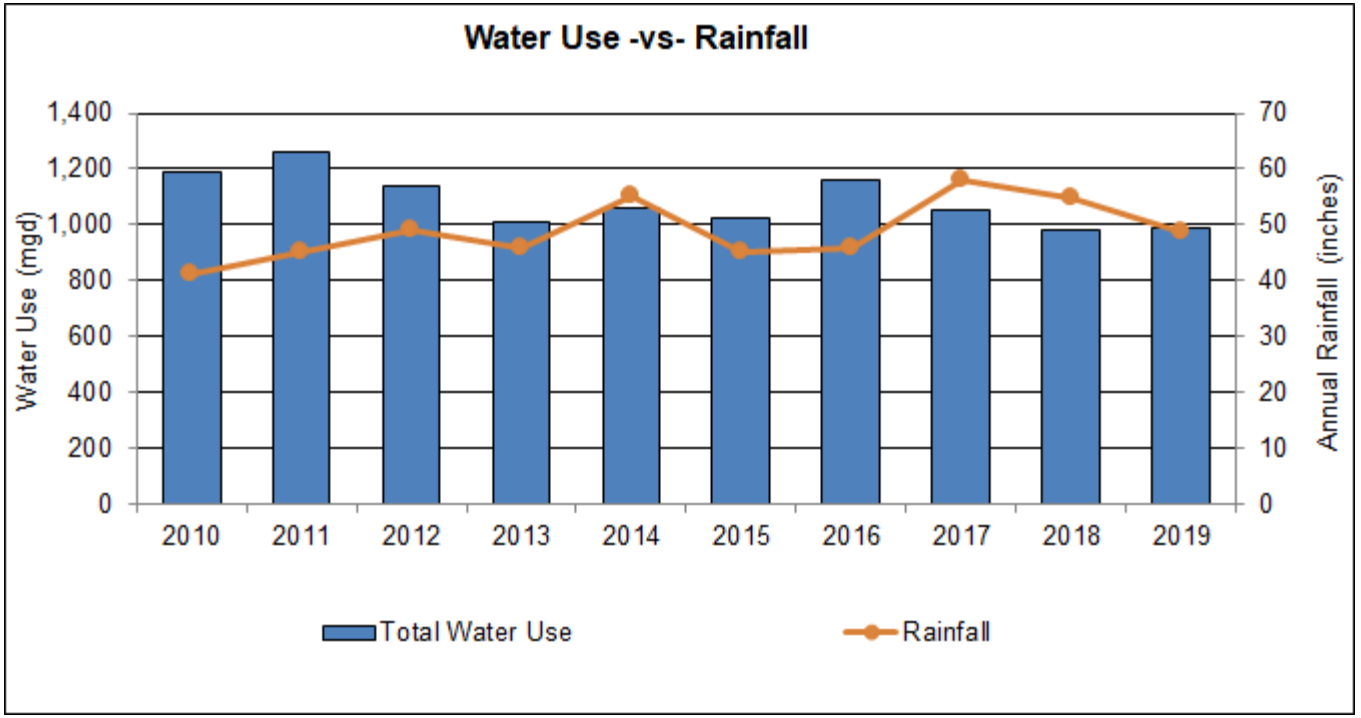

Figure 12. Annual rainfall and total water use, 2010–2019

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, 2020.
Source of domestic self-supply is assumed to be groundwater.

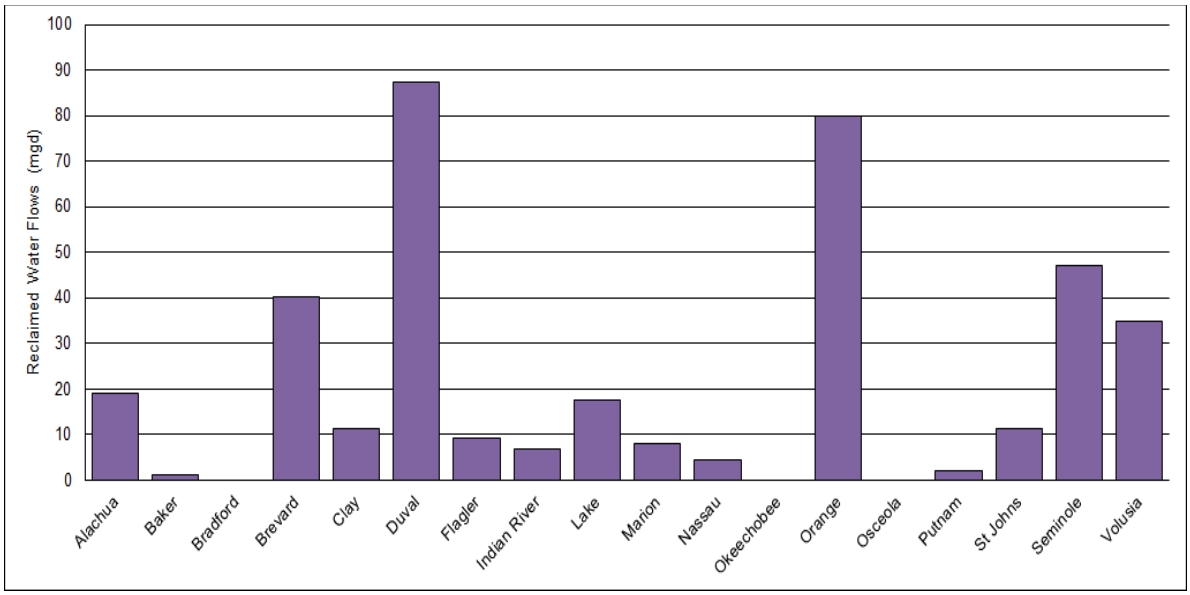

Figure 13. Reclaimed water flows, 2019

Note: Reclaimed water flows in million gallons per day (mgd).
Data obtained from the Draft 2019 DEP Reuse Inventory.

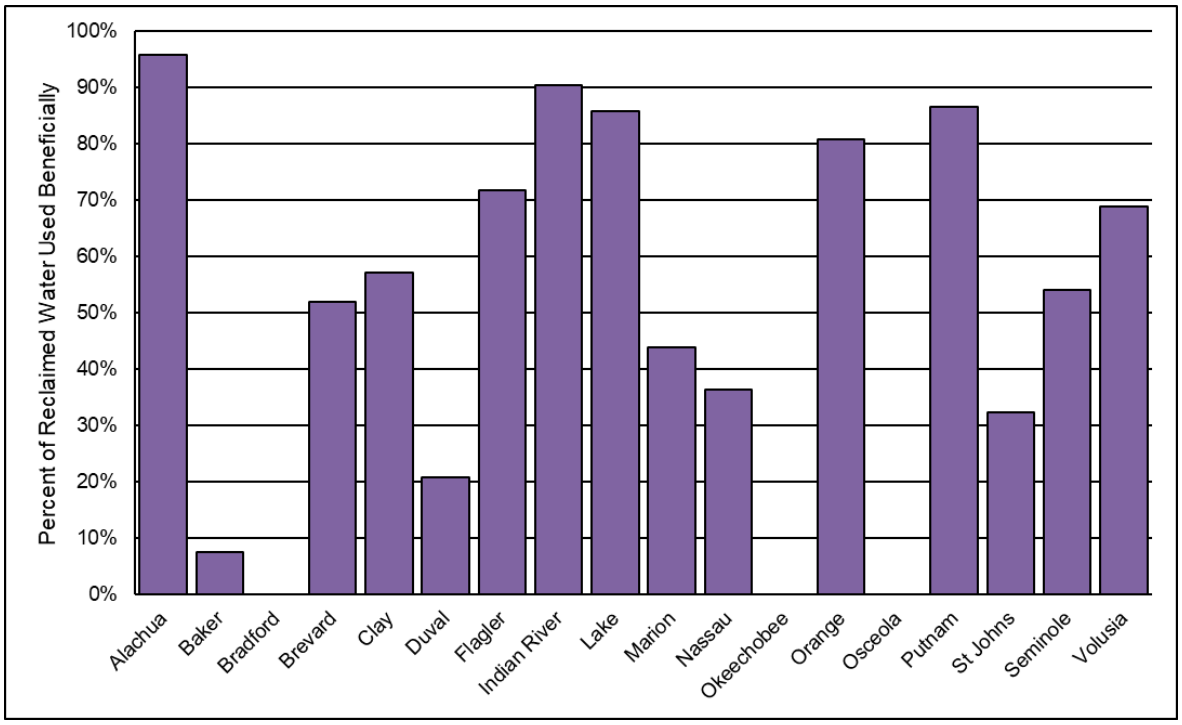

Figure 14. Percent of wastewater flows reused beneficially, 2019

Note: Data obtained from the Draft 2019 DEP Reuse Inventory.

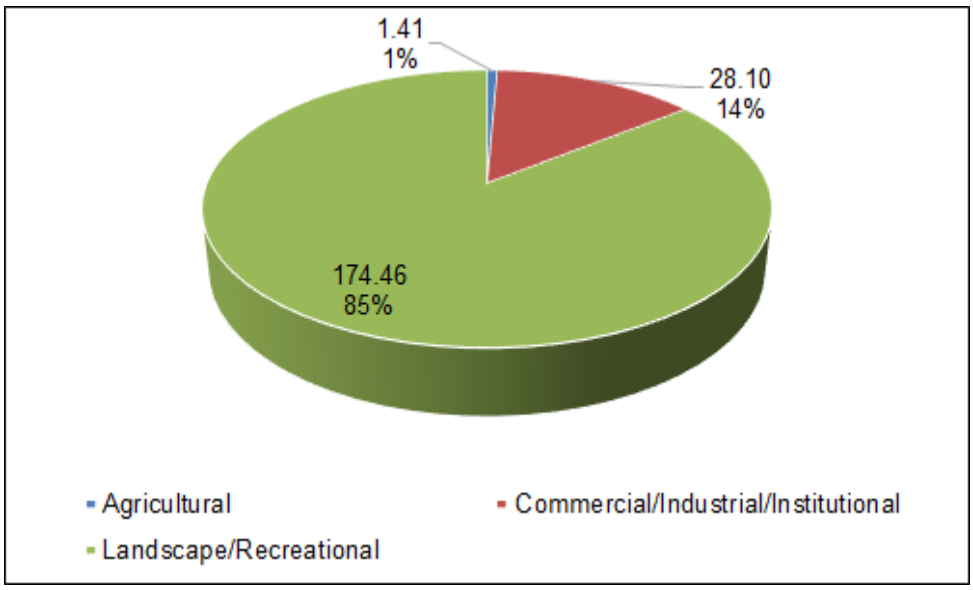

Figure 15. Beneficially used reclaimed water by use type, 2019

Note: Water use is in million gallons per day (mgd).
Data obtained from the Draft 2019 DEP Reuse Inventory.