South Florida Water Management District
2015 Estimated Water Use Report

February 2017

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EXECUTIVE SUMMARY

This report compiles estimated water use by use category within the South Florida Water Management District for calendar year 2015 based primarily on water pumpage records reported pursuant to water use permitting requirements. Water use is defined as any consumptive use of water that reduces the supply from which it was withdrawn or diverted. This report is not intended to comprehensively account for all water used or conveyed within the District (e.g., for flood control, natural systems, water quality treatment). In 2015, approximately 1 trillion gallons (2,943 million gallons per day [mgd] average) of surface water and groundwater were used in the following categories:

- Public Water Supply (1,118 mgd)
- Domestic Self-Supply (37 mgd)
- Agricultural Self-Supply (1,380 mgd)
- Industrial/Commercial/Institutional Self-Supply (105 mgd)
- Recreational/Landscape Self-Supply (263 mgd)
- Power Generation Self-Supply (40 mgd)

Of the 2,943 mgd, approximately 1,642 mgd were derived from groundwater and 1,301 mgd were derived from surface water sources, with 2,775 mgd being freshwater and 168 mgd considered saline water. Additionally, approximately 232 mgd of reclaimed water were used primarily for landscape irrigation and, to a lesser extent, industrial and power generation uses.

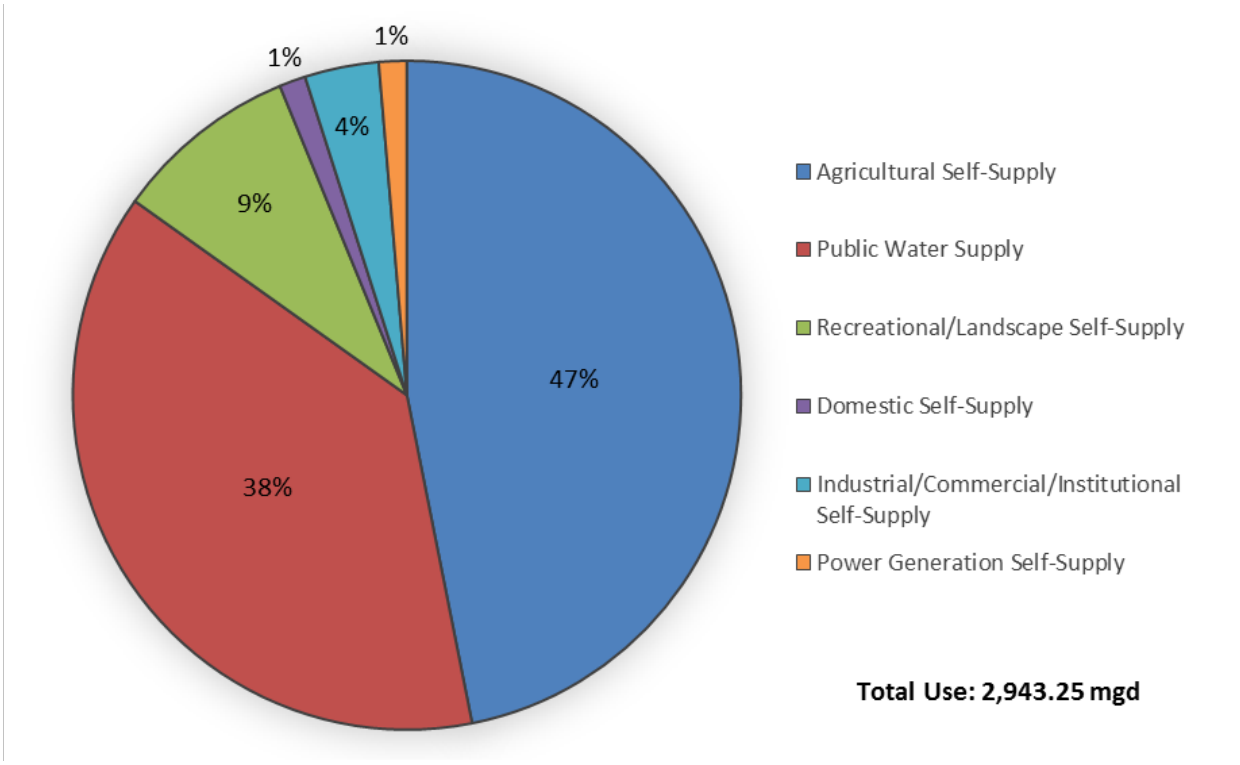

Figure ES-1. Percentage Water Use by Category

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ACRONYMS AND ABBREVIATIONS

AGR	Agricultural Self-Supply
D&I	Diversion and Impoundment
District	South Florida Water Management District
DSS	Domestic Self-Supply
EAA	Everglades Agricultural Area
FDEP	Florida Department of Environmental Protection
ICI	Industrial/Commercial/Institutional Self-Supply
mgd	million gallons per day
mg/L	milligrams per liter
PWR	Power Generation Self-Supply
PWS	Public Water Supply
REC	Recreational/Landscape Self-Supply
SFWMD	South Florida Water Management District
USGS	United States Geological Survey

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INTRODUCTION

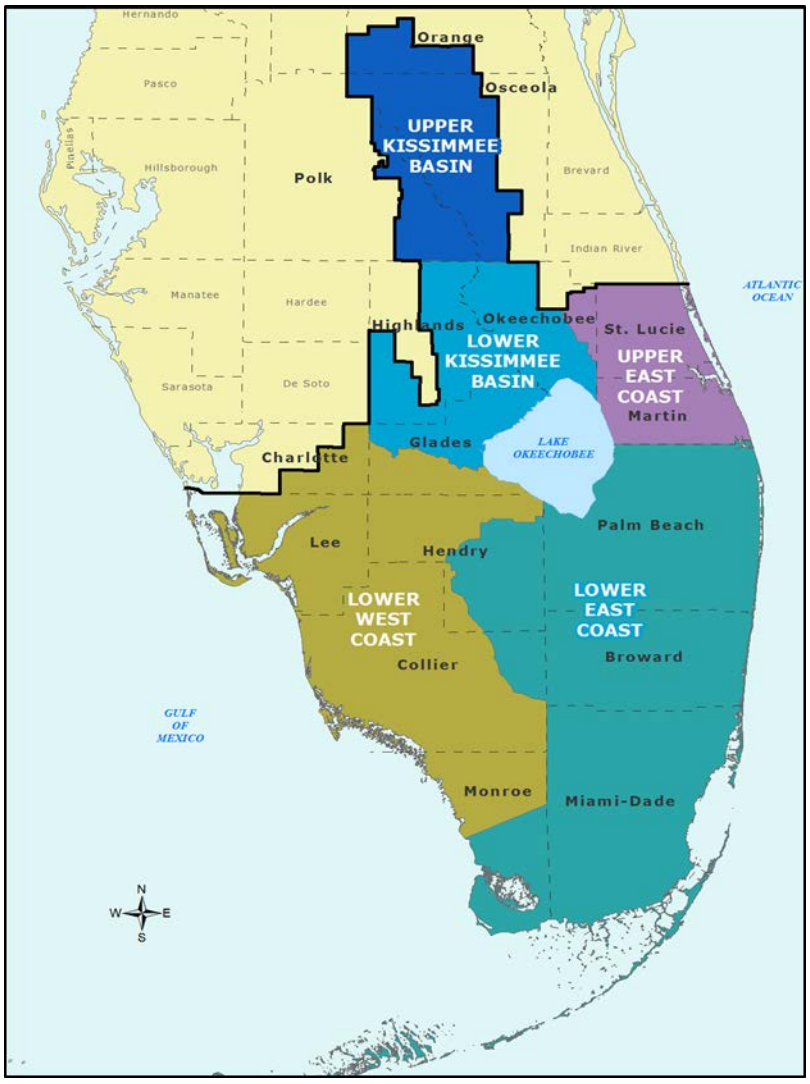
The South Florida Water Management District (SFWMD or District) is a regional government agency created in 1949 responsible for managing and protecting the water resources of South Florida by balancing and improving water quality, flood control, natural systems, and water supply. The District encompasses all or part of 16 counties from Orlando to the Florida Keys and serves a current population of approximately 8.1 million residents. It is the oldest and largest of the state's five water management districts. Among other responsibilities, water management districts are responsible for water use permitting as well as water supply planning within their jurisdictional area.

This report compiles estimated water use within the SFWMD for calendar year 2015. Water use is defined as any consumptive use of water that reduces the supply from which it was withdrawn or diverted. This report is a complement to the regional water supply plans, which capture current and projected water use, and the United States Geological Survey (USGS)-Florida Department of Environmental Protection (FDEP) report *Water Withdrawals, Use, and Trends in Florida* (Marella 2014) historically produced every 5 years. This report is based primarily on water pumpage records reported pursuant to water use permitting requirements. However, because nearly one-third of the overall volume was estimated, rather than reported, this report is called the *Estimated Water Use Report*. This report is an important source of data and information to support the District's water resource programs and initiatives, including water supply planning, water use permitting, and water conservation.

This report documents the District's assessment of total water use. Estimated amounts are based on best available data at the time of publication. The document is not intended to comprehensively cover an accounting for all water used or conveyed within the District (e.g., for flood control, natural systems, water quality treatment). This report can be found on the SFWMD website, www.sfwmd.gov.

GEOGRAPHIC DESCRIPTION

The District encompasses more than 18,000 square miles in all or part of 16 counties of central and southern Florida. In order to manage water supply and plan for current and future water uses, the District is geographically divided into five regions (**Figure 1**). These regions are home to many permanent and seasonal residents in addition to a large tourist industry, a significant agricultural industry, and a growing industrial and commercial sector. Several major natural systems are located within the District, including the Upper Chain of Lakes, Kissimmee River and floodplain, Lake Okeechobee, Caloosahatchee River and Estuary, St. Lucie River and Estuary, Big Cypress National Preserve, Everglades Water Conservation Areas, Everglades National Park/Florida Bay, and Biscayne National Park.



Upper Kissimmee Basin: Osceola County and portions of Orange and Polk counties

Lower Kissimmee Basin: Portions of Okeechobee, Highlands, and Glades counties

Upper East Coast: Martin and St. Lucie counties and a portion of eastern Okeechobee County

Lower East Coast: Palm Beach, Broward, and Miami-Dade counties and portions of Monroe, Collier, and Hendry counties

Lower West Coast: Lee and Collier counties, and portions of Glades, Hendry, Monroe, and Charlotte counties

Figure 1. Water Supply Planning Regions

WATER USE PERMITTING AND REPORTING

Ensuring an adequate supply of water to protect, enhance, and restore natural systems and to meet all other existing and projected needs is a fundamental element of the SFWMD's mission. The District has adopted rules for regulating the use of water as contained in Chapter 40E-2, Florida Administrative Code, including the *Applicant's Handbook for Water Use Permit Applications* (Applicant's Handbook; SFWMD 2015). Uses exempt from permitting are indoor domestic use at a single-family or duplex dwelling, water used for firefighting purposes, the use of seawater, and the use of reclaimed water. The SFWMD issues two types of permits based primarily on the quantity of water required: Individual and General (both by rule and noticed). Individual permits normally are those allocating at least 0.1 mgd of water (averaged annually). Regional exceptions exist, such as the South Dade Agricultural Area, where Individual permits are issued for allocations of at least 0.3 mgd, and the Lower West Coast, where Individual permits are issued for groundwater allocations of at least 0.01 mgd. General permits by rule include landscape irrigation at a single-family dwelling or duplex, on-site short-term dewatering, and closed-loop systems.

Noticed General permits, typically are for water users with usage of less than 0.1 mgd that meet certain other requirements. Users with General permits (whether by rule or noticed) are not required to account for or report their water use.

Users with Individual permits typically are required to account for their water use and report a monthly volume used to the District. Individual permits are required to have a reliable, repeatable water use accounting system to record water usage from all withdrawal facilities. For pumped systems, acceptable water use accounting systems include calibrated flowmeters or clocks which totalize pump operation. For gravity flow systems, acceptable methods include rated water control structures and rating curves, which are used for unrated structures. Water use accounting and calibration methods must be submitted as a part of the permit application. Prior to the use of any authorized facility, the approved water use accounting method must be operating and the initial calibration submitted to the District. Recalibration results for the water use accounting method are required every 5 years (from the date of last calibration).

The water use of 18,766 permits was evaluated for calendar year 2015. In addition, there are 745 active permits for dewatering and 390 active permits for heating and cooling of pools and air conditioning units. These 390 permittees recirculate water in such a way that there is no net consumption (closed loop system); therefore, these permits were not included in the total use estimates. Another 127 permits exist within the boundaries of the Everglades Agricultural Area (EAA), which were evaluated holistically and are discussed later. Finally, there are 34 permits with a use classification of "other", which cumulatively contribute a negligible volume (less than 0.8 mgd), that were disregarded.

WATER USE ESTIMATION METHODOLOGY

The most accurate way to determine the amount of water used each year would be to total the annual water use of every user. However, as described previously, not all water users are required to account for and report their annual use, and some users had not reported their water use at the time of this report. Recognizing these data deficiencies, this report utilized water use information from water users that had reported their use in 2015 and estimated the amount of water used by those who had not reported.

The specific water demands of each permittee are evaluated at the time of permit application and each permittee has a calculated maximum volume of water allowed for use (i.e., a permit allocation). The annual permit allocation is determined by calculating the quantity of water to be withdrawn over a 12-month period under a 1-in-10 year drought condition for the associated use category. For irrigation users, it is the amount of water a crop needs to supplement the rainfall received during a 1-in-10 year drought condition. For other use categories, it is the quantity of water required by each component of demand for the particular use, which may include factors such as treatment losses; other sources of water; conservation practices; and water purchased, sold, or transferred. It is important to understand that the allocated permit volume for most categories is the water volume required by those users during a 1-in-10 year drought condition. Therefore, during a 1-in-10 year drought condition for the entire area of the District, the total water use for the District should approximate the summation of all the permit allocations. During a year when it is drier than 1-in-10 year drought condition, additional water, even above the permit allocation,

may be used. Water use in 2015 was less than the amount allocated, which is the amount that would be used in a typical 1-in-10 drought year.

The amount of water reported as used in 2015 when compared to the permit allocation (as a percentage) should reflect the demands based on actual 2015 weather conditions. This percentage of reported use to the permit allocation was used as an analogue to obtain an estimate of use for permittees who did not report or were not required to report. For purposes of calculating the percentages, the time series of individual reported water use were scrutinized to ensure that gaps in monthly reporting were properly accounted for. Using a combination of reported and estimated water usage for each permittee, the total amount of water used for each use category was estimated. Further information on specific methods by use category are described later in this document.

WATER SOURCES

This report estimates the volume of water withdrawn or diverted from groundwater and surface water sources. Reported pumpage data were ascribed to specific water sources (i.e., groundwater or surface water). All estimated data were assigned a source based on their related facility types. Permittees exclusively utilizing pumps to extract water are assigned as surface water users, and those exclusively using wells are designated as groundwater users. In cases where a permittee has both pumps and wells, the estimated volumes were split equally (50-50) between the sources. More specific ratios were utilized for some of the larger agricultural users (greater than 1 mgd) where it was determined to be more appropriate.

As stated earlier, the use of reclaimed water is not regulated by the water management districts. However, reclaimed water use is a key component of water resource management in the SFWMD. The beneficial use of reclaimed water for irrigation and other uses has provided a means for reducing the use of surface water and groundwater sources. Reclaimed water data are compiled separately in this report based on inventories produced by the FDEP from data submitted by utility providers. Reclaimed water users that did not report water withdrawals were assumed to have met all of their water demands from a reclaimed water supplier and were not estimated individually. In the case where reclaimed water was partially used (reported) by a permittee, care was taken to ensure that only the volume from the groundwater or surface water sources were counted to avoid double counting the reclaimed water volumes.

Additional information on sources is provided under individual use categories later in this report.

WATER QUALITY

Water use estimates contained in this report are divided into fresh water and saline water. For the purposes of this report, the following terms and definitions from the Applicant's Handbook (SFWMD 2015) are used to define different water qualities:

- ***Freshwater*** is water with a chloride concentration ≤250 milligrams per liter (mg/L)
- ***Saline water*** is water with a chloride concentration between 250 and 19,000 mg/L
- ***Seawater*** or ***Saltwater*** is water with a chloride concentration ≥19,000 mg/L

In general, freshwater sources in the SFWMD include the Upper Floridan aquifer in the Kissimmee Basin; the surficial aquifer system in the Upper East Coast Planning Area; the Biscayne aquifer in the Lower East Coast Planning Area; the Lower Tamiami, water table, and sandstone aquifers in the Lower West Coast Planning Area; and surface water upstream of coastal salinity water control structures. Saline water sources in the SFWMD include the Floridan aquifer system in the Upper East Coast, Lower East Coast, and Lower West Coast Planning Areas, while seawater sources include the Atlantic Ocean and Gulf of Mexico as well as connected tidal water bodies. Saline water and saltwater sources require blending with freshwater sources or desalination treatment prior to use as potable water or for irrigation. Only a fraction of the permits require water quality testing to determine salinity. Therefore, the volumes reported as saline are only for permits known to require treatment or blending from known saline sources, primarily in the Public Water Supply (PWS) category and to a lesser extent the Recreational/Landscape Self-Supply (REC) category. If the salinity of the source water and treatment/blending requirements are unknown, the water quantities are classified as fresh.

WATER SUPPLY CATEGORIES

Water use estimates in this report were developed for each of the following six water supply categories established by the FDEP for use in water supply planning:

- Public Water Supply (PWS)
- Domestic Self-Supply (DSS)
- Industrial/Commercial/Institutional Self-Supply (ICI)
- Agricultural Self-Supply (AGR)
- Recreational/Landscape Self-Supply (REC)
- Power Generation Self-Supply (PWR)

PWS includes treated potable water provided to some of the other use categories within a utility's service area boundaries. The "Self-Supply" designation indicates users that are separately permitted and do not receive their water from a utility but rather have their own water supply withdrawal facilities (e.g., wells, pumps, structures). These water supply categories are not identical to the use classes utilized in permitting. As a result, permitting use classes were combined in some cases to develop the water use estimate for the water supply categories used in this report.

Dewatering activities are not included in this report. Dewatering involves pumping water from an area to produce a dry working condition and includes withdrawals of water for construction activities, some mining operations, and minor uses such as exploratory testing, short-term remedial action plans, and aquifer performance tests. Water from dewatering activities normally is required to be retained on-site such that losses are limited to evaporation, which are considered minimal compared to the volumes pumped. Furthermore, permits for dewatering are not given allocations (although General permits must comply with daily and annual withdrawal limits), and permittees generally are not required to report water use to the District.

The 390 permits classified as industrial that utilize wells for their geothermal properties are not included in this report. These "closed-loop" applications include air conditioning as well as swimming pool temperature regulation, which extract groundwater, pass it through a heat exchange unit, and then reinject the warm or cool water back into the ground. The result of the

closed-loop system operation effectively is a zero balance withdrawal. Recent changes to water use rules have made these type systems a “no notice” permit such that they are no longer issued a permit or tracked.

Diversion and Impoundment (D&I) permits usually are for large parcels of land that contain smaller users within their boundaries. These permittees divert surface water through pumps or control structures, or divert a combination of surface water and groundwater into a conveyance canal network system, to provide for the demands of secondary users and consumptive and non-consumptive uses. There are 23 D&I permits outside of the EAA that exclusively serve agriculture, and two permits that partially serve agriculture. The estimated volumes are included in the AGR category. In addition, there are nine D&I permits within the EAA whose water use is accounted for in the EAA estimate later in this report. Finally, twelve D&I permits primarily for recharging aquifer and canal networks, hydrating wetlands, maintaining salinity barriers along the coast, or providing fire protection were not included in the water use estimates of this report.

2015 WEATHER

Average historical (1915 to 2015) annual rainfall within the District is 52.75 inches. **Figure 2** presents the annual deviation from average rainfall over the past century. From 2005 to 2015, average annual rainfall within the District varied by 19 inches; the driest year was 2006 with 40.74 inches (23 percent below average), and the wettest year was 2005 with 60.04 inches (14 percent above average). In 2015, the Districtwide average annual rainfall was 49.73 inches, slightly lower than the historic average year. However, a Districtwide average number does not tell the whole story as rainfall varies not only by year but also by month and location. The District typically receives two-thirds of its annual rainfall between May and October (**Figure 3**). **Figure 4** presents the rainfall amounts received by each basin within the District for 2015.

DATA SOURCES

The primary sources of data for this report are permittee-reported monthly pumpage volumes recorded in the SFWMD’s regulatory database (RegDB). Quarterly and semi-annually reporting of monthly data generally is required for all permittees with permit quantities exceeding 0.1 mgd. Monthly pumpage data are collected using calibrated flowmeters or other approved water use accounting methods. Estimates of water use were made for permittees who had not reported based on the assumptions described in the methodology section earlier and in the specific use category sections that follow. Rainfall data were provided by the District’s Operations Section.

For this report, water use estimates are based on RegDB queries initially performed on May 5, 2016. Data for all use categories were obtained for active permits through December 31, 2015. Analysis of reported water use was performed by specialists within the District’s Water Supply Development Section to compile the best available data. However, the SFWMD cannot guarantee the validity of the reported data or that permittees have used consistent measurement techniques or quality control standards in their data collection and reporting. Additionally, sources of data used for this report may be updated after publication.

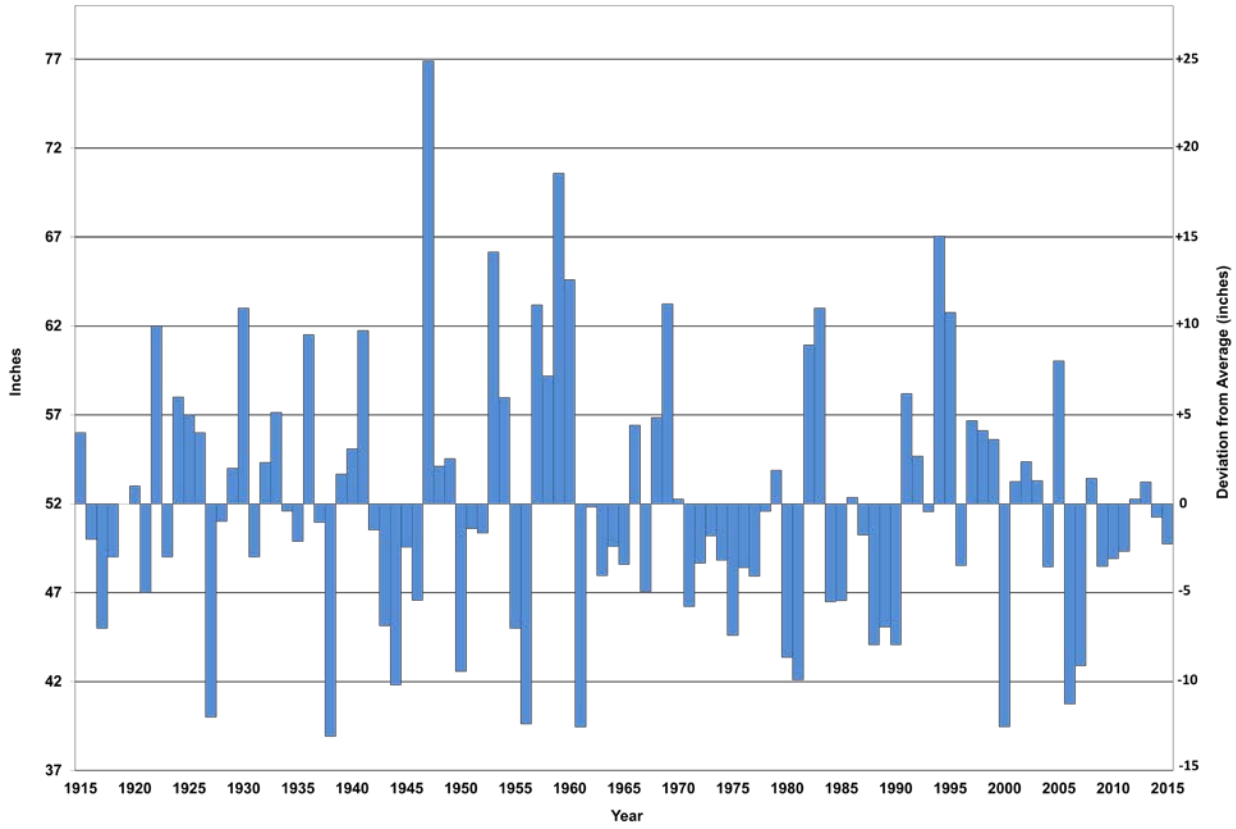


Figure 2. SFWMD Annual Difference from Average Rainfall (1915-2015)

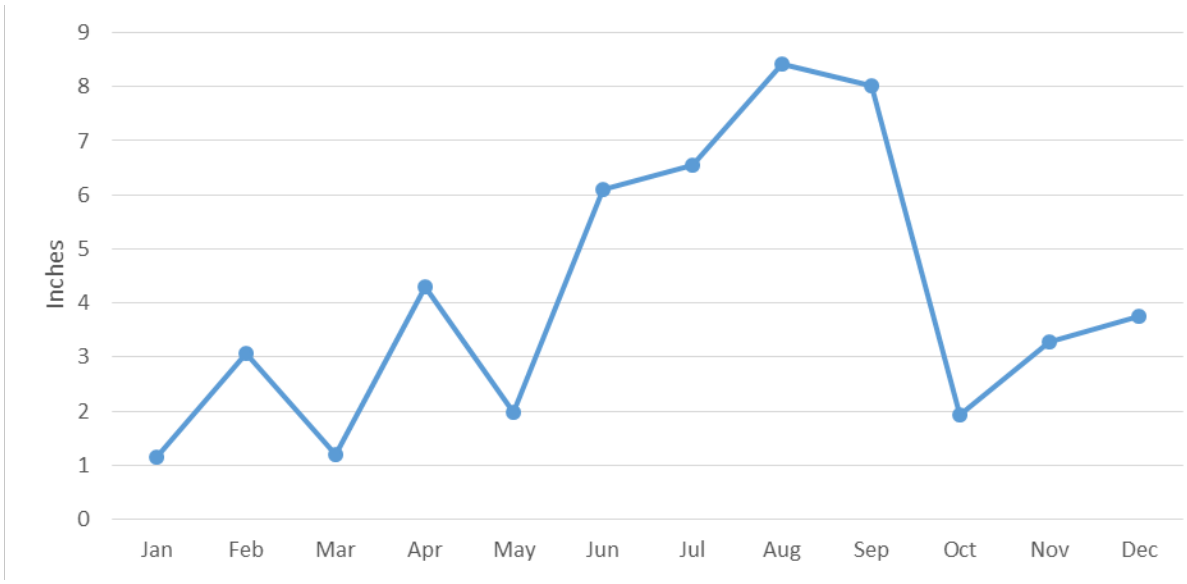


Figure 3. 2015 Average District Monthly Rainfall Distribution

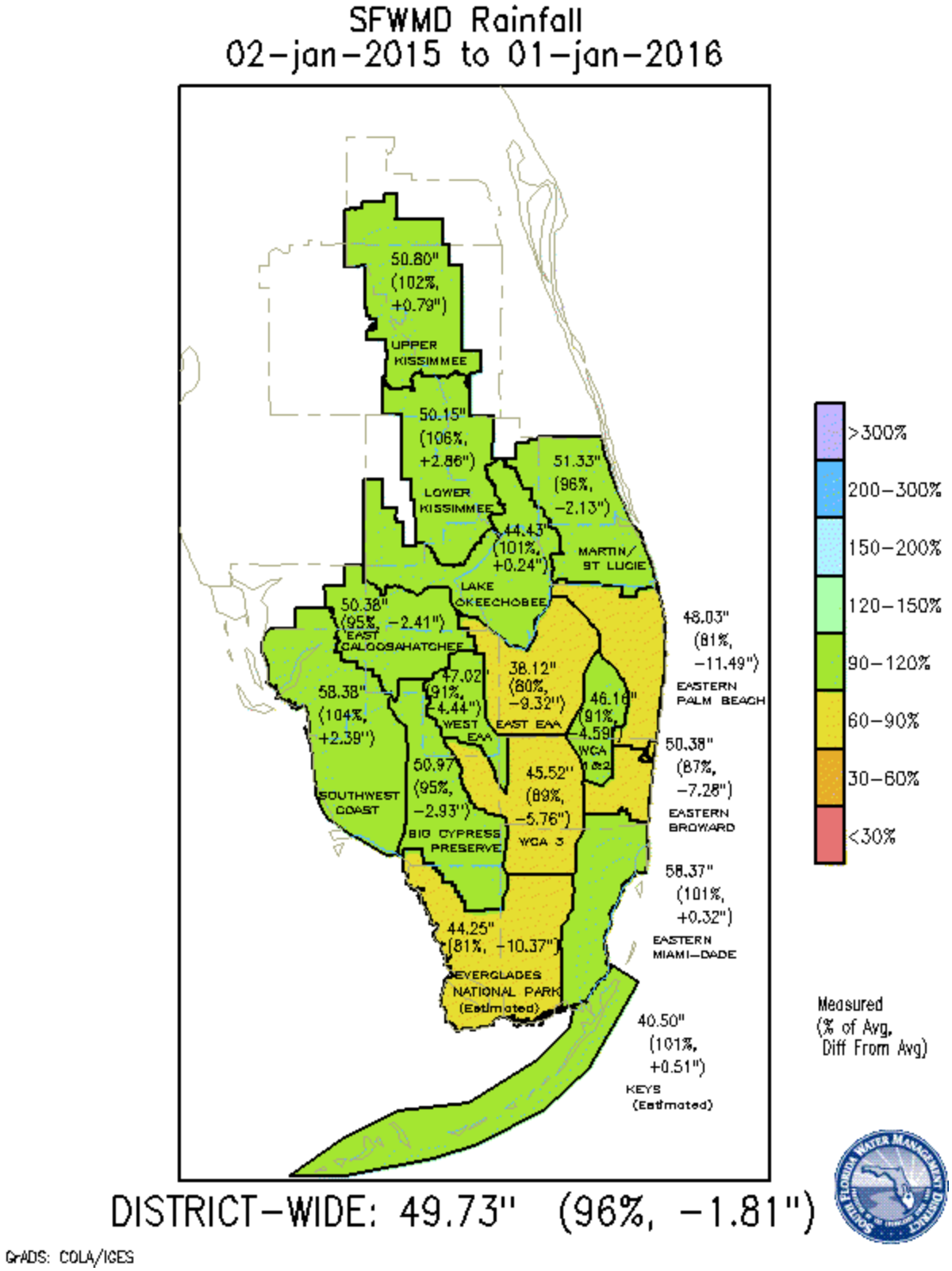


Figure 4. SFWMD 2015 Rainfall Distribution Map

2015 ESTIMATED WATER USE BY CATEGORY

Water use was estimated by category from fresh, saline, and reclaimed water sources and reported as an average (in mgd unless noted otherwise).

Public Water Supply

Water withdrawn, treated, and delivered to service areas within the SFWMD by privately and publicly owned water supply utilities (or systems) is defined as public water supply (PWS). This encompasses water supplied by water treatment facilities for potable use (i.e., drinking quality) with projected average pumpage rates greater than 0.1 mgd. The volumes reported represent gross (raw) water withdrawn before treatment and distribution losses. In 2015, there were 118 active PWS permits (greater than 0.1 mgd) serving an estimated 7.72 million people (94 percent of the total population within the District). PWS utilities and users classified as PWS using less than 0.1 mgd are included in the Domestic self-supply section below. PWS water use demand often fluctuates during the year in response to seasonal rainfall and variations in temperature as well as seasonal and tourist populations. For 2015, the total water use for PWS was 1,117.89 mgd, with 86 percent coming from freshwater sources and 14 percent coming from saline water sources. Groundwater contributed 96.5 percent of the water, and surface water accounted for the remaining 3.5 percent. **Table 1** presents total water use Districtwide and by county from groundwater and surface water sources for fresh and saline water in the PWS category.

Table 1. Public Water Supply (in mgd)[1]

County	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Number of Permits
Broward	221.28	12.38	0.00	233.65	**233.65**	26
Charlotte	0.00	0.00	0.00	0.00	**0.00**	2
Collier	17.51	34.31	5.57	46.25	**51.82**	9
Glades	0.51	0.00	0.00	0.51	**0.51**	2
Hendry	0.58	2.73	0.00	3.31	**3.31**	3
Highlands	0.00	0.26	0.00	0.26	**0.26**	2
Lee	25.88	38.67	1.51	63.04	**64.55**	13
Martin	7.24	8.36	0.00	15.61	**15.61**	8
Miami-Dade	338.89	13.04	0.00	351.92	**351.93**	7
Monroe*	0.00	0.00	0.00	0.00	**0.00**	0
Okeechobee	2.55	0.17	1.98	0.74	**2.72**	2
Orange	80.64	0.00	0.00	80.64	**80.64**	5
Osceola	42.19	0.00	0.00	42.19	**42.19**	6
Palm Beach	211.50	27.23	29.24	209.49	**238.73**	19
Polk	2.60	0.00	0.00	2.60	**2.60**	5
St. Lucie	8.19	21.17	0.00	29.37	**29.37**	9
Total	**959.57**	**158.31**	**38.30**	**1,079.59**	**1,117.89**	**118**

[1] Values are only for the portions of the county located within the SFWMD.
*The Florida Keys Aqueduct Authority (FKAA) serves the Florida Keys in Monroe County. Because the FKAA's wellfields are located in Miami-Dade County, the volume delivered to Monroe County (17.96 mgd of groundwater [17.20 mgd fresh and 0.76 mgd saline]) is included in the Miami-Dade County totals.

Domestic Self-Supply

Domestic self-supply (DSS) is primarily for individual residences located in rural areas without access to a PWS system, and often is provided by small shallow private wells. Domestic consumption at single-family and duplex residences is exempt from water use permitting and reporting. Landscape irrigation at a single-family dwelling or duplex is granted a General permit by rule. For reporting purposes, the DSS category includes PWS utilities and users classified as public water supply withdrawing less than 0.1 mgd. These typically serve a limited number of households (e.g., a small subdivison or mobile home park). Other small self-supply permits classified as PWS are for domestic indoor use (and possibly landscape irrigation) at a single structure such as a sales trailer, small office, or convenience store. There were 1,019 permits for PWS with an allocation less than 0.1 mgd in 2015. All water volumes reported under the DSS category are considered fresh groundwater.

Because DSS residential users are not required to report their use, estimations for the DSS category are based on county population data and the PWS per capita use within each county. The DSS demand estimate was calculated by multiplying the 2015 DSS county populations by the 2015 PWS Districtwide uniform residential per capita use rate (PCUR). The 2015 PWS Districtwide uniform residential PCUR was derived from water use reported by utilities to the District as part of their annual reporting required pursuant to Section 373.709(6), Florida Statutes. **Appendix A** contains further information regarding population, PCURs, and self-supplied use calculations.

The 2015 total water use for DSS (and small PWS systems) was estimated to be 37.51 mgd, with 100 percent coming from fresh groundwater sources. **Table 2** presents total water use by county from groundwater and surface water sources for fresh and saline water in the DSS category.

Table 2. Domestic Self-Supply (in mgd)[1]

County	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Number of Permits[2]
Broward	0.64	0.00	0.00	0.64	**0.64**	22
Charlotte	0.01	0.00	0.00	0.01	**0.01**	5
Collier	3.96	0.00	0.00	3.96	**3.96**	68
Glades	0.48	0.00	0.00	0.48	**0.48**	85
Hendry	1.06	0.00	0.00	1.06	**1.06**	27
Highlands	0.50	0.00	0.00	0.50	**0.50**	66
Lee	11.46	0.00	0.00	11.46	**11.46**	26
Martin	0.45	0.00	0.00	0.45	**0.45**	126
Miami-Dade	2.07	0.00	0.00	2.07	**2.07**	104
Monroe	0.00	0.00	0.00	0.00	**0.00**	0
Okeechobee	1.26	0.00	0.00	1.26	**1.26**	84
Orange	0.56	0.00	0.00	0.56	**0.56**	15
Osceola	6.00	0.00	0.00	6.00	**6.00**	89
Palm Beach	6.25	0.00	0.00	6.25	**6.25**	151
Polk	1.30	0.00	0.00	1.30	**1.30**	24
St. Lucie	1.52	0.00	0.00	1.52	**1.52**	127
Total	**37.51**	**0.00**	**0.00**	**37.51**	**37.51**	**1,019**

[1] Values are only for the portions of the county located within the SFWMD.
[2] PWS permits less than 0.1 mgd included.

Industrial/Commercial/Institutional Self-Supply

Industrial/commercial/institutional self-supply (ICI) consists of self-supplied water consumed by business operations. Industrial facility uses include processing and manufacturing, dust control, maintenance, cleaning, and washing. Groundwater remediation projects also are classified as an industrial use. Commercial facilities under the ICI category include office complexes, hotels, restaurants, gas stations, car washes, laundromats, and theme parks and zoos, among others. Some larger institutions such as schools, hospitals, and prisons also are included in the ICI category primarily for heating, ventilation, and cooling (HVAC) system operations. Water use for ICI facilities receiving water from PWS utilities (i.e., not self-supplied) are included in the PWS category.

Mining is included in the ICI use category. The mining uses reported herein include dust suppression, non-recycled water use as part of on-site mining processes, water entrained within commercial products, and minor volumes for potable/sanitary use by on-site employees. The volumes reported do not include recycled surface water or dewatering volumes, which are separately permitted under the dewatering use class and not included in this report.

The estimated water volumes were based on the ratio of reported pumpage to allocation for permittees who did report (in this case, 35 percent for mining and 24 percent for ICI), multiplied by the allocation of the permits that did not report. Permittees reporting no water use were included in the dataset when determining the percentage pumpage rate to apply to the estimated permits.

The ICI category includes 26 mining and 60 industrial permits that have an allocation of greater than 0.1 mgd, and 539 permits with an allocation less than 0.1 mgd. ICI does not include water used for power generation or mining dewatering. The total 2015 water use for ICI was 105.57 mgd, with fresh groundwater contributing 47 percent and fresh surface water contributing 53 percent. Industrial use accounted for 26.70 mgd (25 percent) and mining use accounted for 78.87 mgd (75 percent) of the total ICI use. **Table 3** presents total water use Districtwide and by county from groundwater and surface water sources for fresh and saline water in the ICI category. Further detail is provided in **Appendix B**.

Table 3. Industrial/Commercial/Institutional Self-Supply (in mgd)[1]

County	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Number of Permits
Broward	2.51	0.00	0.01	2.51	**2.51**	84
Charlotte	0.46	0.00	0.39	0.07	**0.46**	10
Collier	3.42	0.00	2.28	1.14	**3.42**	76
Glades	10.36	0.00	6.65	3.71	**10.36**	10
Hendry	4.40	0.00	1.67	2.73	**4.40**	40
Highlands	0.11	0.00	0.00	0.11	**0.11**	15
Lee	23.98	0.01	22.15	1.84	**23.99**	92
Martin	2.86	0.00	1.17	1.69	**2.86**	36
Miami-Dade	44.98	0.00	13.18	31.79	**44.98**	73
Monroe	0.00	0.00	0.00	0.00	**0.00**	1
Okeechobee	8.03	0.00	7.91	0.12	**8.03**	23
Orange	2.15	0.00	0.00	2.15	**2.15**	15
Osceola	0.05	0.00	0.00	0.05	**0.05**	17
Palm Beach	2.00	0.00	0.31	1.69	**2.00**	105
Polk	0.02	0.00	0.00	0.02	**0.02**	2
St. Lucie	0.23	0.00	0.13	0.10	**0.23**	26
Total	**105.56**	**0.01**	**55.87**	**49.70**	**105.57**	**625**

[1] Values are only for the portions of the county located within the SFWMD.

Agricultural Self-Supply

Agricultural self-supply (AGR) includes water used for commercial crop irrigation, nurseries, livestock watering, pasture, and aquaculture. AGR estimates were based on the methodology described in the Water Use Estimation Methodology section of this report, with the following exceptions:

- For the agriculture and nursery permitting use classes, reported water use to permitted allocation ratios were determined by water supply planning regions to take regional weather effects into account.
- For the aquaculture permitting use class, only one permittee reported. All others were estimated using that permittee's ratio of use multiplier (50 percent).
- For the livestock permitting use class, only users in two regions reported. All other regions were estimated using that region's ratio of use multiplier (56 percent).

The AGR category included 3,855 permits, including 2,305 agriculture; 855 nursery; 471 livestock; and 81 aquaculture permits. The AGR category includes water used by 23 D&I permits that exclusively serve agricultural operations, and 2 D&I permits that partially serve agricultural operations. Additionally, the AGR category includes 118 permits within the Everglades Agricultural Area (EAA).

Everglades Agricultural Area (EAA)

The EAA is located south of Lake Okeechobee and was created from drainage of the northern Everglades. The EAA encompasses approximately 700,000 acres (1,158 square miles) of highly productive agricultural land and land used by the District for water storage and treatment (the Stormwater Treatment Areas or STAs). The agricultural land is mostly sugar cane interspersed with crops such as winter vegetables, sod, and rice making up the remainder. The EAA extends south from Lake Okeechobee to the northern levee/boundary of Water Conservation Area 3A, from its eastern boundary at the L-8 canal to the western boundary along the L-1, L-2, and L-3 levees (**Figure 5**). Four major canals (West Palm Beach, Hillsboro, North New River, and Miami) pass through the EAA and supply agricultural irrigation, mainly through gravity release from Lake Okeechobee. The primary irrigation method in the EAA is seepage irrigation. Farmers utilize a set of secondary and tertiary canals to distribute surface water from gated culverts and pumps to their respective fields. Flows from Lake Okeechobee into the canals are from structures S-351, S-352, and S-354. Runoff (outflow from the EAA) from the four canals to the Stormwater Treatment Areas are discharged through pump structures S-5A, S-6, G-370, G-372, G-434, and G-435. Daily records of the water volumes into and out of these structures are kept such that a surface water demand volume of the EAA can be estimated using a water balance method. A total volume of 493.51 mgd was calculated for water demands within the EAA for 2015 by the Engineering Support Unit of the District's Everglades Technical Support Bureau. Within the EAA, there are 8 agricultural permits in Hendry County and 88 permits in Palm Beach County, serving 359,485 acres (562 square miles) of agriculture. There is one D&I permit in the EAA in Hendry County and eight D&I permits in Palm Beach County, serving 99,290 acres (155.1 square miles) of primarily agricultural land. Also included in this surface water delivery volume are 22 permits for industrial, golf, and landscape areas that utilize surface water. Agricultural permits within the EAA that only utilize groundwater sources are not included in this estimated volume but are

included in the overall agricultural water use estimates. For simplification, all permits located within the EAA are reported as being in Palm Beach County.

The total 2015 water use for AGR, including the EAA, was 1,379.60 mgd. Of this total volume, agriculture (crop irrigation) outside the EAA accounted for 662.52 mgd (48 percent); agriculture in the EAA was 493.51 mgd (36 percent); agriculture within D&I areas was 193 mgd (14 percent); and aquaculture, livestock, and nursery combined were 30.48 mgd (2 percent). The water was derived from fresh surface water sources (75 percent) and fresh groundwater sources (25 percent). **Table 4** presents total water use Districtwide and by county from groundwater and surface water sources for fresh and saline water in the AGR category. Further detail is provided in **Appendix B**.

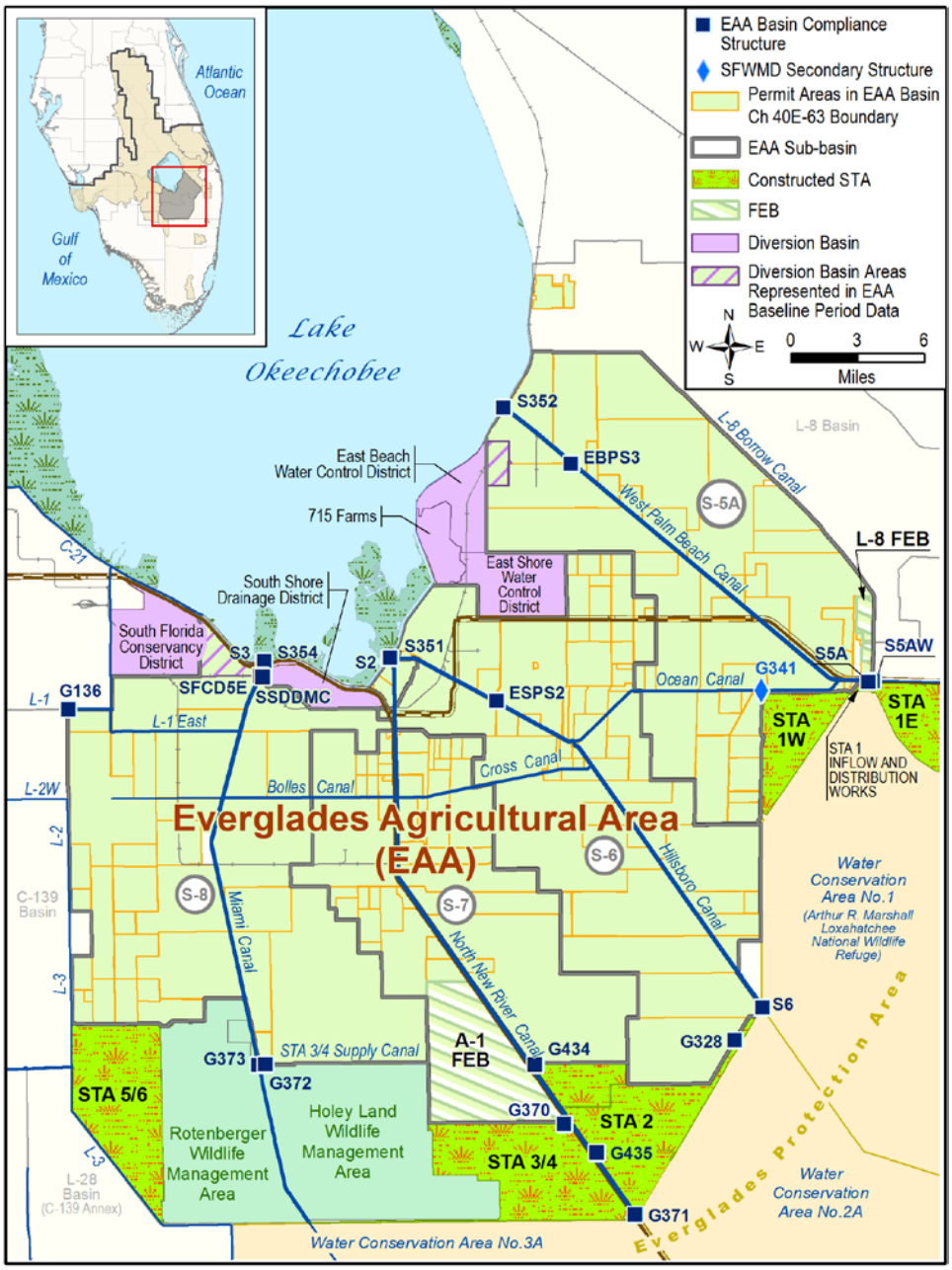


Figure 5. Map of the Everglades Agricultural Area

Table 4. Agricultural Self-Supply (in mgd)[1]

County	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Number of Permits
Broward	2.88	0.00	2.23	0.65	**2.88**	120
Charlotte	5.74	0.00	3.33	2.41	**5.74**	18
Collier	101.88	0.00	4.67	97.21	**101.88**	164
Glades	121.14	0.00	112.39	8.76	**121.14**	139
Hendry	379.17	0.00	256.51	122.66	**379.17**	279
Highlands	41.66	0.00	8.91	32.74	**41.66**	189
Lee	19.32	0.00	5.15	14.18	**19.32**	312
Martin	100.37	0.00	93.55	6.82	**100.37**	206
Miami-Dade	24.50	0.00	0.18	24.32	**24.50**	1,120
Monroe	0.00	0.00	0.00	0.00	**0.00**	0
Okeechobee	12.75	0.00	1.85	10.90	**12.75**	197
Orange	0.32	0.00	0.10	0.22	**0.32**	25
Osceola	11.57	0.00	2.22	9.35	**11.57**	141
Palm Beach	517.27	0.00	512.52	4.75	**517.27**	568
Polk	1.91	0.00	0.68	1.23	**1.91**	30
St. Lucie	39.13	0.00	26.71	12.41	**39.13**	347
Total	**1,379.60**	**0.00**	**1,030.99**	**348.61**	**1,379.60**	**3,855**

[1] Values are only for the portions of the county located within the SFWMD.

Recreational/Landscape Self-Supply

Recreational/landscape self-supply (REC) is water used for irrigation of golf courses, parks, cemeteries, large common areas (such as homeowners' associations and commercial developments), and other self-supplied irrigation uses with demands of greater than0.1 mgd. The volumes reflect those reported plus an estimated volume based on the ratio (percentage) of reported pumpage to allocation for permittees who did report multiplied by the allocation of the permits that did not report. A percentage was calculated for each planning area to take regional weather effects into account.

There were 12,774 permits for landscape irrigation and 356 permits for golf courses in 2015. An additional 10 permits, classified as PWS, were used for augmentation of reclaimed water (or other water sources) for landscape irrigation use and are included in the REC category. Total water use for REC was 263.00 mgd for 2015. Of this, landscape irrigation accounted for 170.62 mgd (65 percent), golf course irrigation was 89.53 mgd (34 percent), and reclaimed water supplementation for irrigation use was 2.84 mgd (1 percent). Fifty-seven percent of the total water use was surface water and 43 percent was groundwater. There were seven golf and six landscape permits utilizing a total of 3.41 mgd of saline water. **Table 5** presents total water use Districtwide and by county from groundwater and surface water sources for fresh and saline water in the REC category. Further detail is provided in **Appendix B**.

Table 5. Recreational/Landscape Self-Supply (in mgd)[1]

County	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Number of Permits
Broward	44.53	0.51	30.76	14.30	**45.05**	2,814
Charlotte	0.15	0.00	0.08	0.07	**0.15**	6
Collier	40.39	0.21	24.84	15.76	**40.60**	881
Glades	0.13	0.00	0.08	0.05	**0.13**	14
Hendry	0.54	0.00	0.20	0.34	**0.54**	100
Highlands	0.14	0.27	0.11	0.30	**0.41**	12
Lee	41.97	0.29	22.27	19.99	**42.26**	2,415
Martin	8.36	0.46	4.05	4.77	**8.82**	710
Miami-Dade	16.14	0.00	5.27	10.87	**16.14**	1,020
Monroe	0.43	0.64	0.42	0.65	**1.07**	3
Okeechobee	0.35	0.00	0.10	0.26	**0.35**	131
Orange	9.47	0.00	3.56	5.91	**9.47**	209
Osceola	6.82	0.00	2.27	4.55	**6.82**	189
Palm Beach	80.06	1.24	49.54	31.78	**81.32**	3,759
Polk	4.87	0.00	3.79	1.08	**4.87**	37
St. Lucie	5.00	0.00	1.91	3.09	**5.00**	847
Total	**259.36**	**3.62**	**149.24**	**113.76**	**263.00**	**13,147**

[1] Values are only for the portions of the county located within the SFWMD.

Power Generation Self-Supply

Power generation self-supply (PWR) is water consumed by power plants for use in the production of electricity. The volume reported is for a variety of on-site uses and does not include once-through cooling water. It can include both fresh and saline water but excludes the use of seawater and reclaimed water sources. The total 2015 water use for PWR was 39.68 mgd, with 85 percent coming from freshwater sources and 15 percent coming from saline water sources. Groundwater contributed 33 percent of the water, and surface water contributed the remaining 67 percent. **Table 6** presents total water use Districtwide and by county from groundwater and surface water sources for fresh and saline water in the PWR category.

Table 6. Power Generation Self-Supply (in mgd)[1]

County	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Number of Permits[2]
Lee	0.25	0.00	0.00	0.25	**0.25**	1
Martin	26.18	0.00	25.90	0.28	**26.18**	2
Miami-Dade	3.31	5.54	0.00	8.85	**8.85**	3
Osceola	0.12	0.00	0.00	0.12	**0.12**	1
Palm Beach	2.76	0.32	0.74	2.34	**3.08**	4
St. Lucie	1.20	0.00	0.00	1.20	**1.20**	1
Total	**33.82**	**5.86**	**26.64**	**13.04**	**39.68**	**12**

[1] Values are only for the portions of the county located within the SFWMD.
[2] Power generation facilities are permitted by the FDEP under the Power Plant Siting Act ss.403.501-.518, F.S.

A substantial volume of saline/ocean water is used for once-through cooling at power plants primarily in coastal areas of the District. The once-through cooling volumes are considered non-consumptive and are being provided for informational purposes only. The total 2015 water use reported to the District for once-through cooling for PWR was 2,837 mgd. Of this volume, 2,834 mgd was saline water and the remaining approximately 3 mgd was fresh water. Only 2.7 mgd of the total water was derived from groundwater.

Reclaimed Water

Reclaimed water is water flowing out of a domestic wastewater treatment facility that has received at least secondary treatment as well as basic disinfection and is reused for some beneficial purpose. The SFWMD requires all applicants for water use permits proposing to irrigate with more than 0.1 mgd of water and applicants within a municipal mandatory reuse zone to use reclaimed water if feasible. However, reclaimed water is not a regulated source for consumptive use. Annual wastewater and reclaimed water volumes are compiled by the FDEP and are reported here for informational purposes. In 2015, 283.02 mgd of reclaimed water were used in the District. Of this, 232.21 mgd were reused for four of the six water supply categories, and 50.81 mgd were reused for groundwater recharge and other non-consumptive water use purposes. **Tables 7** to **9** as well as **Figures 6** and **7**, present reclaimed water use by county and use category.

Table 7. Reclaimed Water Use (in mgd) by County and Use Types (From: FDEP 2016)

County	Reclaimed Water Flow[1]	Industrial/ Commercial/ Institutional Self-Supply[2]	Agricultural Irrigation Self-Supply[3]	Recreational/ Landscape Self-Supply[4]	Power Generation Self-Supply[5]
Broward	**17.05**	7.74	0.00	8.71	0.60
Charlotte	**0.13**	0.13	0.00	0.00	0.00
Collier	**23.23**	0.00	0.28	22.95	0.00
Glades	**0.08**	0.00	0.08	0.00	0.00
Hendry	**1.40**	0.00	1.40	0.00	0.00
Highlands	**0.00**	0.00	0.00	0.00	0.00
Lee	**48.10**	0.39	0.01	46.77	0.93
Martin	**3.76**	0.17	0.02	3.40	0.17
Miami-Dade	**12.75**	12.65	0.00	0.10	0.00
Monroe	**0.40**	0.01	0.00	0.39	0.00
Okeechobee	**0.62**	0.00	0.62	0.00	0.00
Orange	**44.72**	5.44	2.26	37.02	0.00
Osceola	**17.23**	0.01	0.02	14.81	2.39
Palm Beach	**58.73**	1.50	0.43	41.54	15.26
Polk	**0.07**	0.00	0.07	0.00	0.00
St. Lucie	**3.94**	0.16	0.00	3.78	0.00
Total	**232.21**	**28.20**	**5.19**	**179.47**	**19.35**

Note: Reclaimed water was not used for PWS or DSS.
[1] Reclaimed water flows as reported in the FDEP 2015 Reuse Inventory, not including 50.81 mgd for groundwater recharge and other non-water-use purposes.
[2] Industrial reuse (excluding power generation).
[3] Edible and other crops.
[4] All public access areas and landscape irrigation.
[5] Reclaimed water flow to power generation facilities based on "at other facility" use type in the FDEP 2015 Reuse Inventory.

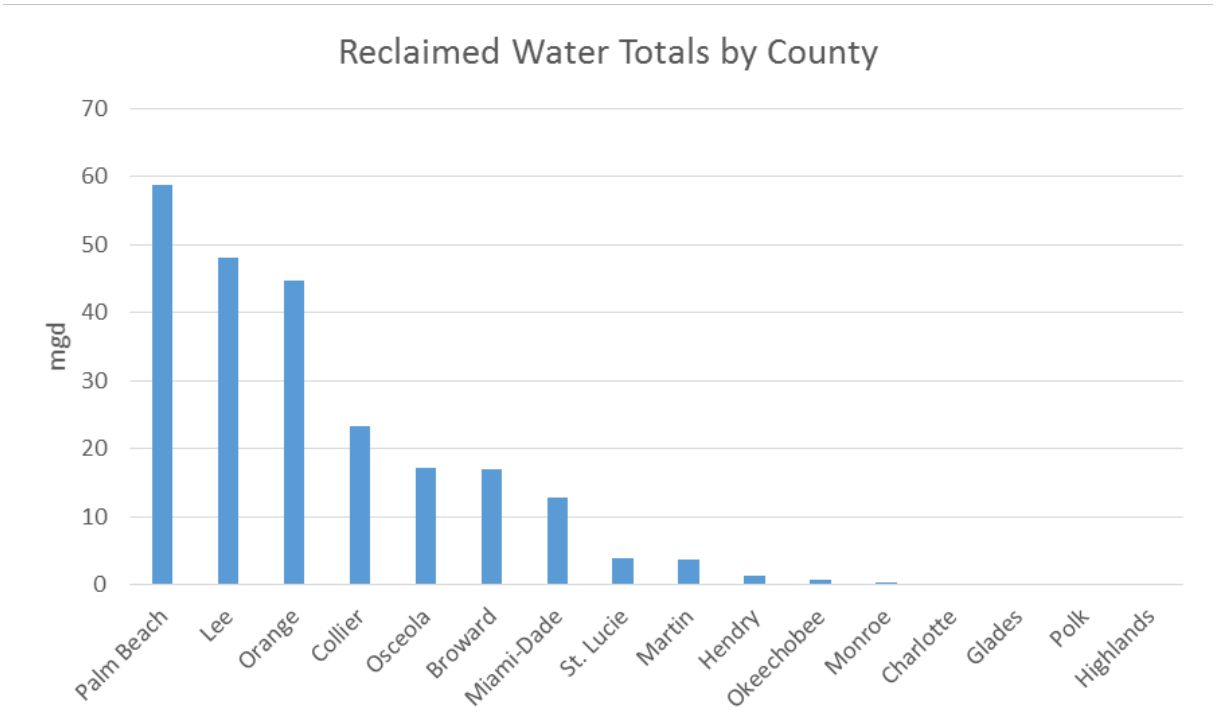


Figure 6. Reclaimed Water Reused by County

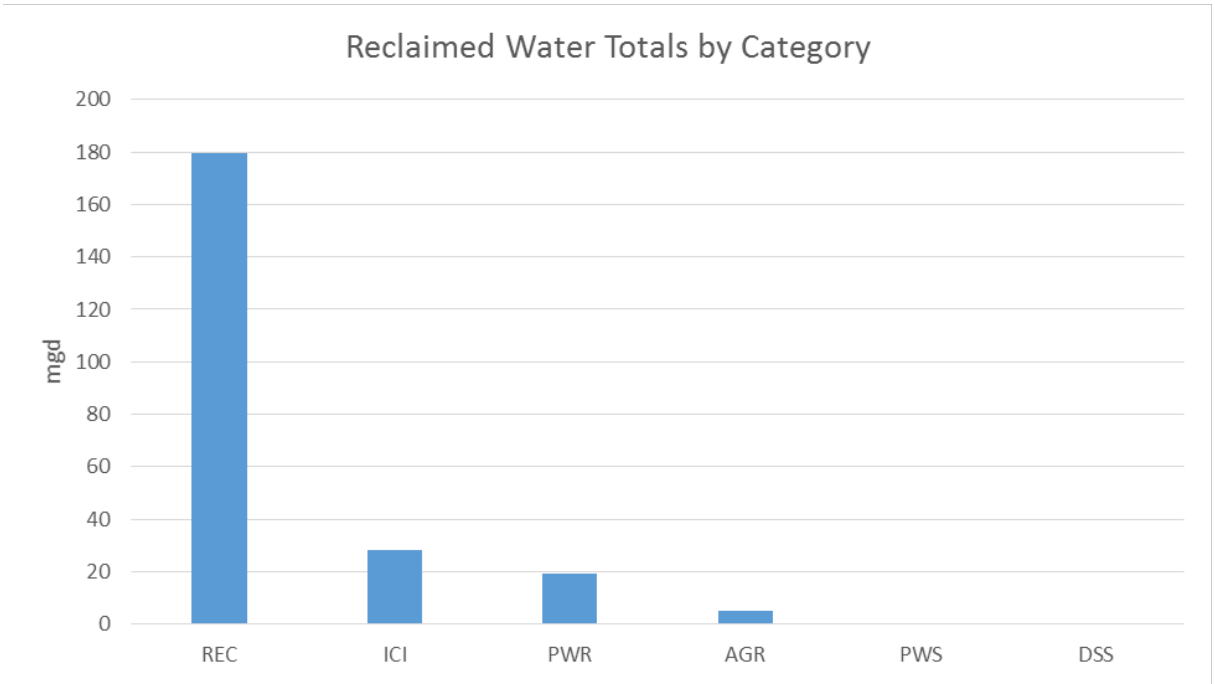


Figure 7. Reclaimed Water Reused by Category

SUMMARY OF 2015 ESTIMATED WATER USE

The total amount of water withdrawn from groundwater and surface water resources in 2015 within the District was approximately 2,943 mgd (**Table 8**). The two largest water use categories were AGR and PWS, using 1,380 mgd and 1,118 mgd, respectively. These two categories constitute 85 percent of the total water use. Of the total use, 1,642 mgd (56 percent) came from groundwater and 1,301 mgd (44 percent) came from surface water sources (**Figure 8**). Approximately 2,775 mgd (94 percent) were withdrawn from fresh water sources and 168 mgd (6 percent) were derived from saline water sources. In addition, reclaimed water totaled almost 232 mgd in 2015. Of the total 2,943 mgd, 32 percent (947 mgd) was estimated and 68 percent (1,996 mgd) was derived from reported pumpage (**Appendix C**). PWS is largest in Miami-Dade County, while Palm Beach County has the largest estimated AGR volume. Palm Beach County also has the greatest use of reclaimed water by volume.

Figure 9 depicts the percentage of total water use by category. **Table 9** presents the breakdown of water use by county of fresh, saline, surface, and groundwater. **Figure 10** depicts fresh water versus saline water use by county. **Figure 11** depicts surface water versus groundwater by county. **Table 10** presents the breakdown of water used by county and by use category (excluding reclaimed water).

Table 8. Total Water Use by Category and Source – Including Reclaimed Water – (in mgd)[1]

Water Use Category	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Reclaimed Water	**Total Use with Reclaimed Water**
Agricultural Self-Supply	1,379.60	0.00	1,030.99	348.61	**1,379.60**	5.19	**1,384.79**
Public Water Supply	959.57	158.31	38.30	1,079.59	**1,117.89**	0.00	**1,117.89**
Recreational/Landscape Self-Supply	259.36	3.62	149.24	113.76	**263.00**	179.47	**442.47**
Industrial/Commercial/ Institutional Self-Supply	105.56	0.01	55.87	49.70	**105.57**	28.20	**133.77**
Power Generation Self-Supply	33.82	5.86	26.64	13.04	**39.68**	19.35	**59.03**
Domestic Self-Supply	37.51	0.00	0.00	37.51	**37.51**	0.00	**37.51**
Total	**2,775.42**	**167.80**	**1,301.04**	**1,642.21**	**2,943.25**	**232.21**	**3,175.46**

[1] Values are only for the portions of the county located within the SFWMD.
Note: Minor discrepancies in table totals are due to rounding.

Figure 8. Water Use by Source and Category

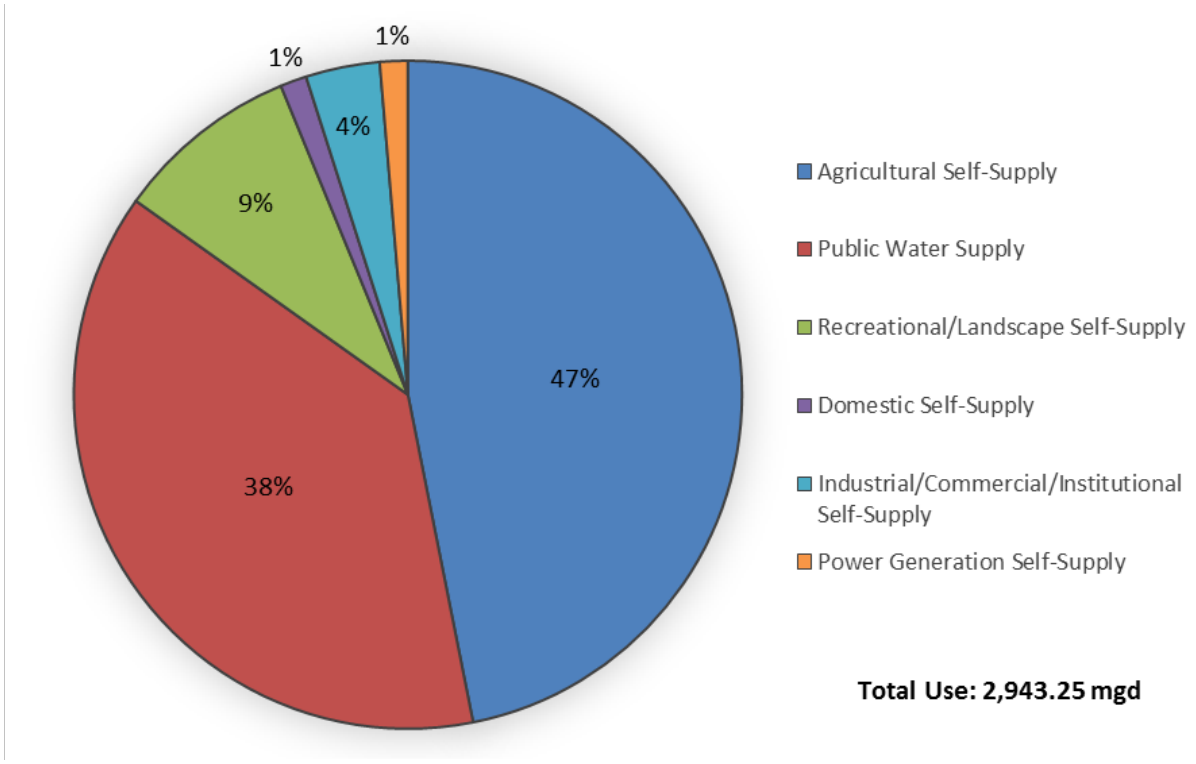


Figure 9. Percentage Water Use by Category

Table 9. Total Water Use by County and Source (in mgd)[1]

County	Fresh Water	Saline Water	Surface Water	Groundwater	**Total Use**	Reclaimed Water	**Total Use with Reclaimed Water**
Broward	271.85	12.89	32.99	251.75	**284.74**	17.05	**301.79**
Charlotte	6.35	0.00	3.80	2.55	**6.35**	0.13	**6.48**
Collier	167.15	34.52	37.35	164.32	**201.66**	23.23	**224.89**
Glades	132.63	0.00	119.12	13.51	**132.63**	0.08	**132.71**
Hendry	385.74	2.73	258.38	130.10	**388.47**	1.40	**389.87**
Highlands	42.40	0.53	9.03	33.90	**42.93**	0.00	**42.93**
Lee	122.87	38.97	51.08	110.76	**161.84**	48.10	**209.94**
Martin	145.46	8.82	124.68	29.61	**154.29**	3.76	**158.05**
Miami-Dade	429.88	18.58	18.63	429.83	**448.46**	12.75	**461.21**
Monroe	0.43	0.64	0.42	0.65	**1.07**	0.40	**1.47**
Okeechobee	24.95	0.17	11.83	13.29	**25.12**	0.62	**25.74**
Orange	93.13	0.00	3.66	89.47	**93.13**	44.72	**137.85**
Osceola	66.76	0.00	4.50	62.26	**66.76**	17.23	**83.99**
Palm Beach	819.84	28.79	592.35	256.29	**848.64**	58.73	**907.37**
Polk	10.71	0.00	4.46	6.24	**10.71**	0.07	**10.78**
St. Lucie	55.27	21.17	28.75	47.69	**76.44**	3.94	**80.38**
Total	**2,775.42**	**167.80**	**1,301.04**	**1,642.21**	**2,943.25**	**232.21**	**3,175.46**

[1] Values are only for the portions of the county located within the SFWMD.
Note: Minor discrepancies in table totals are due to rounding.

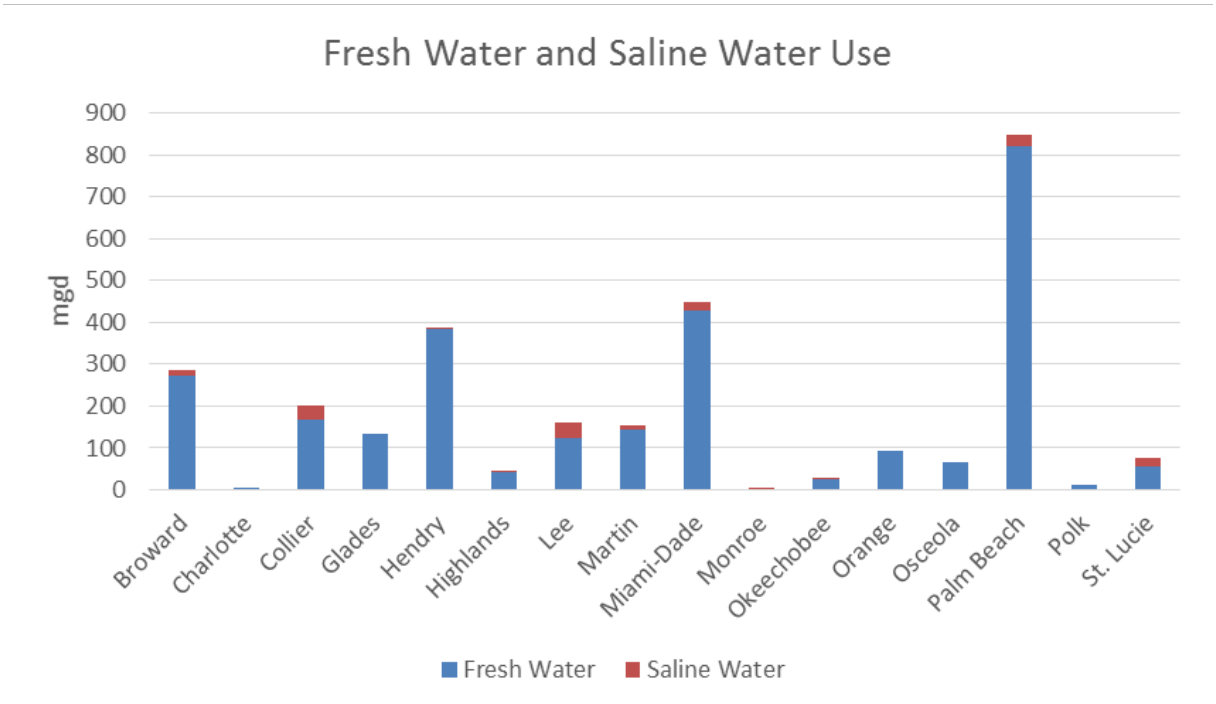


Figure 10. Fresh Water and Saline Water Use by County for All Use Categories

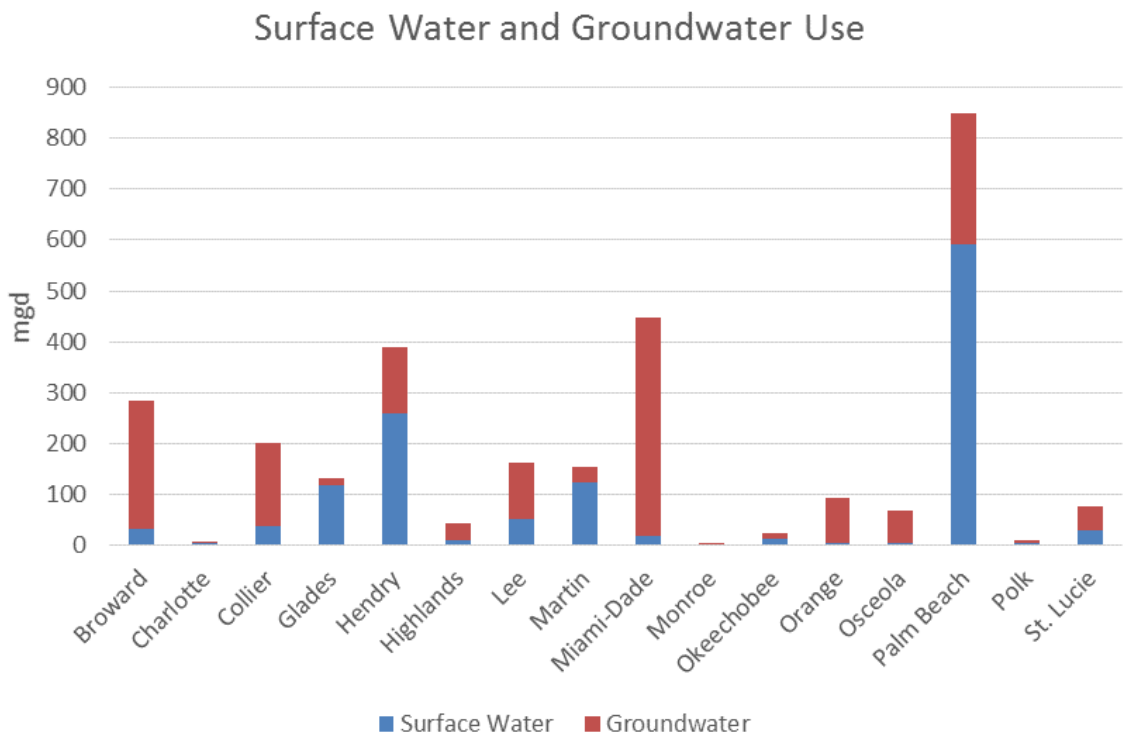


Figure 11. Surface Water and Groundwater Use by County for All Use Categories

Table 10. Total Water Use by County and Category – Excluding Reclaimed Water – (in mgd)[1]

County	Agricultural Self-Supply	Industrial/ Commercial/ Institutional Self-Supply	Domestic Self-Supply	Recreational/ Landscape Self-Supply	Power Generation Self-Supply	Public Water Supply	**Total**
Broward	2.88	2.51	0.64	45.05	0.00	233.65	**284.74**
Charlotte	5.74	0.46	0.01	0.15	0.00	0.00	**6.35**
Collier	101.88	3.42	3.96	40.60	0.00	51.82	**201.66**
Glades	121.14	10.36	0.48	0.13	0.00	0.51	**132.63**
Hendry	379.17	4.40	1.06	0.54	0.00	3.31	**388.47**
Highlands	41.66	0.11	0.50	0.41	0.00	0.26	**42.93**
Lee	19.32	23.99	11.46	42.26	0.25	64.55	**161.84**
Martin	100.37	2.86	0.45	8.82	26.18	15.61	**154.29**
Miami-Dade	24.50	44.98	2.07	16.14	8.85	351.93	**448.46**
Monroe	0.00	0.00	0.00	1.07	0.00	0.00	**1.07**
Okeechobee	12.75	8.03	1.26	0.35	0.00	2.72	**25.12**
Orange	0.32	2.15	0.56	9.47	0.00	80.64	**93.13**
Osceola	11.57	0.05	6.00	6.82	0.12	42.19	**66.76**
Palm Beach	517.27	2.00	6.25	81.32	3.08	238.73	**848.64**
Polk	1.91	0.02	1.30	4.87	0.00	2.60	**10.71**
St. Lucie	39.13	0.23	1.52	5.00	1.20	29.37	**76.44**
Total	**1,379.60**	**105.57**	**37.51**	**263.00**	**39.68**	**1,117.89**	**2,943.25**

[1] Values are only for the portions of the county located within the SFWMD.
Note: Minor discrepancies in table totals are due to rounding.

DISCUSSION OF RESULTS

This is the second year that the SFWMD has compiled an estimated water use report. Caution should be exercised when comparing water use estimates between this report and its predecessor as adjustments were made to the water use estimation method. Notable changes to the methodology include the following:

- 390 industrial permits for geothermal heating/cooling were removed from water use calculations. Permits of this kind were included in last year's estimates.
- Several permits located within the EAA that rely solely on groundwater were estimated independently of permits that rely solely on surface water.
- The reported monthly data, particularly in AGR, were examined thoroughly to account for missing records.
- Neither reported pumpage over the allocation nor permits with no pumpage removed (as was done last year).

Refinements in the methodology likely will continue for future reports in an effort to improve the accuracy of water use estimates.

When considering water use estimates and changes between years, it is important to recognize that the quantity and quality of reported water use data can vary over time and between water use categories. The PWS use category is unique in that nearly 100 percent of permittees submit monthly water use reports; however, estimates for other categories are calculated based on a much smaller proportion of permittees. Relying on a small and potentially non-representative portion of users inhibits the ability to make some conclusions with a high degree of confidence. The impacts of non-universal reporting are further complicated by non-uniform compliance from year to year. A greater proportion of permittees submitted data in 2015 compared to 2014. Errors in data, inaccurate measurements, and the complexity of some permitted water systems introduce inaccuracy and biases that often are undetected (or extremely difficult to measure) hindering better analysis.

Water use within the District increased by 12 percent (from 2,593 to 2,943 mgd) between 2014 and 2015. A general comparison of changes in water use between 2014 and 2015 is provided in **Figure 12.** A more detailed analyses of inter-year changes for use categories, water sources, and/or geographical areas are not provided due to the caveats mentioned above. Generally, more supplemental water is expected to be required to meet water demands when rainfall levels are lower. The difference in the amount of rainfall (1.5 inches less Districtwide in 2015 than 2014) could explain some of the increase in water use.

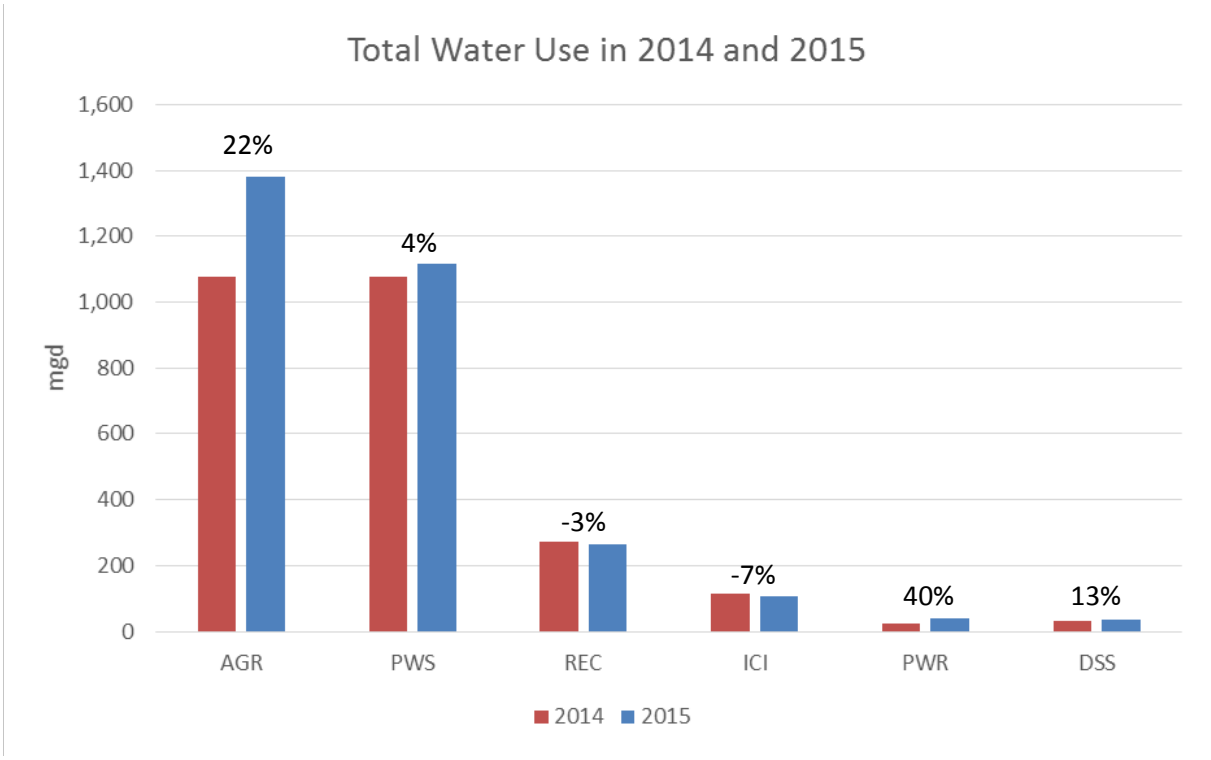


Figure 12. Comparison of 2014 to 2015 Total Estimated Water Use by Use Category

CONCLUSIONS

For 2015, 2,943 mgd of water were estimated to have been used throughout the District, distributed among the six water use categories. Approximately 1,642 mgd were derived from groundwater and 1,301 mgd were derived from surface water sources, with 2,775 mgd being freshwater and 168 mgd considered saline water. This is 350 mgd more than was used in 2014. The District will continue to prepare an estimation of water use on an annual basis.

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APPENDIX A: DSS POPULATION AND DEMAND METHODOLOGY

Population

Population estimates are intended for planning purposes only; 2015 county population estimates of permanent residents are from the Bureau of Economic and Business Research (BEBR 2016). For counties located within more than one water management district, the 2015 estimates within the South Florida Water Management District (SFWMD) were derived by using percent breakdown from the 2010 U.S. Census. Domestic Self-Supply (DSS) population was estimated by multiplying the county population by the percentage of the population self-supplied as contained in the latest water supply plan.

Demand Estimates

The DSS water use estimates were calculated by multiplying the 2015 DSS population by the 2015 Public Water Supply (PWS) Districtwide uniform residential per capita use rate (PCUR). The 2015 PWS Districtwide uniform residential PCUR was derived from uniform residential PCURs (treated water) voluntarily reported by utilities to the District as part of their annual reporting required pursuant to Section 373.709(6), Florida Statutes. Based on the reported submissions the District has calculated a 2015 Districtwide, population weighted, residential PCUR of 82.06 gallons (treated water). Minimal treatment and distribution losses are anticipated in DSS and smaller scale utility systems such that the uniform residential per capita use rate and domestic self-supplied per capita use rates are comparable. **Table A-1** provides the PWS and DSS populations and estimates of the DSS demands.

Table A-1. Domestic Self-Supply Population and Demand by County

County	PWS Total Population	DSS Total Population	Total Population	% DSS/ Total	2015 County Total Population BEBR	PWS Population for Report	DSS Population for report (% × County BEBR)	2015 Uniform Residential Per Capita (Weighted Avg.)	DSS (mgd)
Broward	1,802,103	7,778	1,809,881	0.4%	1,827,367	1,819,514	7,853	82.06	0.64
Charlotte	1,975	72	2,047	3.5%	2,068	2,000	68	82.06	0.01
Collier	295,108	48,128	343,236	14.0%	343,802	295,595	48,207	82.06	3.96
Glades	7,029	5,905	12,934	45.7%	12,853	6,985	5,868	82.06	0.48
Hendry	23,318	11,961	35,279	33.9%	38,096	25,180	12,916	82.06	1.06
Highlands	3,230	7,258	10,488	69.2%	8,725	2,687	6,038	82.06	0.50
Lee	529,759	140,660	670,419	21.0%	665,845	526,145	139,700	82.06	11.46
Martin	145,928	5,473	151,400	3.6%	150,062	144,638	5,424	82.06	0.45
Miami-Dade	2,585,749	24,777	2,610,526	0.9%	2,653,934	2,628,745	25,189	82.06	2.07
Monroe	72,143	-	72,143	0.0%	74,206	74,206	-	82.06	0.00
Okeechobee	23,327	15,161	38,488	39.4%	39,027	23,653	15,373	82.06	1.26
Orange	331,634	6,529	338,163	1.9%	351,673	344,883	6,790	82.06	0.56
Osceola	201,922	63,238	265,160	23.8%	306,755	233,597	73,158	82.06	6.00
Palm Beach	1,324,667	77,434	1,402,101	5.5%	1,378,417	1,302,291	76,126	82.06	6.25
Polk	13,830	13,333	27,163	49.1%	32,286	16,438	15,847	82.06	1.30
St. Lucie	274,852	18,948	293,800	6.4%	287,749	269,191	18,558	82.06	1.52
Total	**7,636,574**	**446,655**	**8,083,228**	**5.5%**	**8,172,863**	**7,715,747**	**457,116**	**82.06**	**37.51**

BEBR = Bureau of Economic and Business Research; DSS = Domestic Self-Supply; mgd = million gallons per day; PWS = Public Water Supply.

References

Rayer, S. and Y. Wang. 2016. *Projections of Florida Population by County, 2020–2045, with Estimates for 2015*. Bureau of Economic and Business Research. Gainesville, FL. Bureau of Economic Business and Research, Florida Population Studies 49(174). https://www.bebr.ufl.edu/sites/default/files/Research%20Reports/projections_2016.pdf

APPENDIX B: WATER USE CATEGORY BREAKDOWN BY PERMIT USE CLASS

Table B-1. Agricultural Self-Supply by Use Class Quantity (in mgd)

County	Agriculture		Aquaculture		Livestock		Nursery		Agriculture D&I		Agriculture-EAA		**Total**
	SW	GW	SW	GW	SW	GW	SW	GW	SW	GW	SW	GW	
Broward	1.79	0.25	0.00	0.08	0.02	0.03	0.42	0.29	0.00	0.00	0.00	0.00	**2.88**
Charlotte	3.33	2.30	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	**5.74**
Collier	4.62	96.91	0.00	0.05	0.00	0.01	0.05	0.24	0.00	0.00	0.00	0.00	**101.88**
Glades	87.79	8.52	0.00	0.00	0.00	0.22	0.00	0.01	24.60	0.00	0.00	0.00	**121.14**
Hendry	132.70	121.93	0.00	0.33	0.02	0.22	0.04	0.18	123.75	0.00	0.00	0.00	**379.17**
Highlands	8.81	30.53	0.03	0.12	0.01	0.54	0.06	1.55	0.00	0.00	0.00	0.00	**41.66**
Lee	0.66	13.62	0.00	0.09	0.00	0.18	0.74	0.29	3.74	0.00	0.00	0.00	**19.32**
Martin	70.81	6.17	0.00	0.04	0.00	0.16	0.22	0.22	22.51	0.22	0.00	0.00	**100.37**
Miami-Dade	0.11	10.42	0.00	0.62	0.00	0.01	0.07	13.27	0.00	0.00	0.00	0.00	**24.50**
Monroe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Okeechobee	1.78	6.84	0.01	0.11	0.01	3.72	0.05	0.23	0.00	0.00	0.00	0.00	**12.75**
Orange	0.10	0.20	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	**0.32**
Osceola	2.22	8.65	0.00	0.26	0.00	0.13	0.00	0.30	0.00	0.00	0.00	0.00	**11.57**
Palm Beach	1.94	1.89	0.00	0.05	0.01	0.01	1.56	2.79	15.49	0.00	493.51	0.00	**517.27**
Polk	0.68	1.09	0.00	0.01	0.00	0.05	0.00	0.08	0.00	0.00	0.00	0.00	**1.91**
St. Lucie	23.89	11.94	0.00	0.01	0.00	0.35	0.05	0.11	2.77	0.00	0.00	0.00	**39.13**
Total	**341.25**	**321.28**	**0.05**	**1.77**	**0.07**	**5.64**	**3.26**	**19.69**	**192.86**	**0.22**	**493.51**	**0.00**	**1,379.60**
% of Total	25%	23%	0%	0%	0%	0%	0%	1%	14%	0%	36%	0%	**100%**

GW = groundwater; SW = surface water.

Table B-2. Agricultural Self-Supply by Use Class Quality (in mgd)

County	Agriculture		Aquaculture		Livestock		Nursery		Agriculture D&I		Agriculture-EAA		**Total**
	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Saline	
Broward	2.04	0.00	0.08	0.00	0.04	0.00	0.71	0.00	0.00	0.00	0.00	0.00	**2.88**
Charlotte	5.63	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	**5.74**
Collier	101.53	0.00	0.05	0.00	0.01	0.00	0.29	0.00	0.00	0.00	0.00	0.00	**101.88**
Glades	96.32	0.00	0.00	0.00	0.22	0.00	0.01	0.00	24.60	0.00	0.00	0.00	**121.14**
Hendry	254.63	0.00	0.33	0.00	0.25	0.00	0.22	0.00	123.75	0.00	0.00	0.00	**379.17**
Highlands	39.33	0.00	0.16	0.00	0.55	0.00	1.62	0.00	0.00	0.00	0.00	0.00	**41.66**
Lee	14.29	0.00	0.09	0.00	0.18	0.00	1.03	0.00	3.74	0.00	0.00	0.00	**19.32**
Martin	76.98	0.00	0.04	0.00	0.16	0.00	0.45	0.00	22.74	0.00	0.00	0.00	**100.38**
Miami-Dade	10.54	0.00	0.62	0.00	0.01	0.00	13.34	0.00	0.00	0.00	0.00	0.00	**24.50**
Monroe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Okeechobee	8.62	0.00	0.12	0.00	3.73	0.00	0.28	0.00	0.00	0.00	0.00	0.00	**12.75**
Orange	0.30	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	**0.32**
Osceola	10.88	0.00	0.26	0.00	0.13	0.00	0.30	0.00	0.00	0.00	0.00	0.00	**11.57**
Palm Beach	3.83	0.00	0.05	0.00	0.02	0.00	4.35	0.00	15.49	0.00	493.51	0.00	**517.27**
Polk	1.77	0.00	0.01	0.00	0.05	0.00	0.08	0.00	0.00	0.00	0.00	0.00	**1.91**
St. Lucie	35.84	0.00	0.01	0.00	0.36	0.00	0.15	0.00	2.77	0.00	0.00	0.00	**39.13**
Total	**662.52**	**0.00**	**1.82**	**0.00**	**5.71**	**0.00**	**22.95**	**0.00**	**193.09**	0.00	**493.51**	**0.00**	**1,379.60**
% of Total	48%	0%	0%	0%	0%	0%	2%	0%	14%	0%	36%	0%	**100%**

Table B-3. Industrial/Commercial/Institutional Self-Supply by Use Class Quantity (in mgd)

County	Industrial		Mining		**Total**
	Surface Water	Groundwater	Surface Water	Groundwater	
Broward	0.01	2.51	0.00	0.00	**2.51**
Charlotte	0.00	0.07	0.39	0.00	**0.46**
Collier	0.01	1.14	2.27	0.00	**3.42**
Glades	0.02	0.02	6.63	3.69	**10.36**
Hendry	1.67	2.73	0.00	0.00	**4.40**
Highlands	0.00	0.11	0.00	0.00	**0.11**
Lee	0.07	0.33	22.09	1.51	**23.99**
Martin	0.69	1.69	0.49	0.00	**2.86**
Miami-Dade	0.03	3.14	13.15	28.66	**44.98**
Monroe	0.00	0.00	0.00	0.00	**0.00**
Okeechobee	7.91	0.12	0.00	0.00	**8.03**
Orange	0.00	2.15	0.00	0.00	**2.15**
Osceola	0.00	0.05	0.00	0.00	**0.05**
Palm Beach	0.31	1.69	0.00	0.00	**2.00**
Polk	0.00	0.02	0.00	0.00	**0.02**
St. Lucie	0.13	0.10	0.00	0.00	**0.23**
Total	**10.85**	**15.85**	**45.02**	**33.86**	**105.57**
% of Total	10%	15%	43%	32%	**100%**

Table B-4. Industrial/Commercial/Institutional Self-Supply by Use Class Quality (in mgd)

County	Industrial		Mining		**Total**
	Fresh	Saline	Fresh	Saline	
Broward	2.51	0.00	0.00	0.00	**2.51**
Charlotte	0.07	0.00	0.39	0.00	**0.46**
Collier	1.15	0.00	2.27	0.00	**3.42**
Glades	0.04	0.00	10.32	0.00	**10.36**
Hendry	4.40	0.00	0.00	0.00	**4.40**
Highlands	0.11	0.00	0.00	0.00	**0.11**
Lee	0.38	0.01	23.60	0.00	**23.99**
Martin	2.37	0.00	0.49	0.00	**2.86**
Miami-Dade	3.17	0.00	41.81	0.00	**44.98**
Monroe	0.00	0.00	0.00	0.00	**0.00**
Okeechobee	8.03	0.00	0.00	0.00	**8.03**
Orange	2.15	0.00	0.00	0.00	**2.15**
Osceola	0.05	0.00	0.00	0.00	**0.05**
Palm Beach	2.00	0.00	0.00	0.00	**2.00**
Polk	0.02	0.00	0.00	0.00	**0.02**
St. Lucie	0.23	0.00	0.00	0.00	**0.23**
Total	**26.69**	**0.01**	**78.87**	**0.00**	**105.57**
% of Total	25%	0%	75%	0%	**100%**

Table B-5. Recreational/Landscape Self-Supply by Use Class Quantity (in mgd)

County	Golf Course		Landscape		PWS-Irrigation Supplement		**Total**
	Surface Water	Groundwater	Surface Water	Groundwater	Surface Water	Groundwater	
Broward	6.61	3.64	24.15	10.66	0.00	0.00	**45.05**
Charlotte	0.00	0.00	0.08	0.07	0.00	0.00	**0.15**
Collier	8.47	6.89	14.91	8.58	1.46	0.29	**40.60**
Glades	0.03	0.02	0.05	0.03	0.00	0.00	**0.13**
Hendry	0.00	0.00	0.20	0.34	0.00	0.00	**0.54**
Highlands	0.11	0.27	0.00	0.03	0.00	0.00	**0.41**
Lee	6.36	6.29	15.91	13.49	0.00	0.21	**42.26**
Martin	2.07	2.05	1.99	2.72	0.00	0.00	**8.82**
Miami-Dade	2.42	1.77	2.85	9.10	0.00	0.00	**16.14**
Monroe	0.42	0.64	0.00	0.01	0.00	0.00	**1.07**
Okeechobee	0.02	0.01	0.08	0.25	0.00	0.00	**0.35**
Orange	2.50	4.52	1.06	0.95	0.00	0.44	**9.47**
Osceola	1.98	3.15	0.30	1.25	0.00	0.15	**6.82**
Palm Beach	16.66	9.73	32.87	21.75	0.00	0.30	**81.32**
Polk	0.18	0.73	0.00	0.06	0.00	0.00	**0.97**
St. Lucie	0.88	1.13	4.64	2.24	0.00	0.00	**8.89**
Total	**48.70**	**40.83**	**99.07**	**71.55**	**1.46**	**1.38**	**263.00**
% of Total	19%	16%	38%	27%	1%	1%	**100%**

Table B-6. Recreational/Landscape Self-Supply by Use Class Quality (in mgd)

County	Golf Course		Landscape		PWS-Irrigation Supplement		**Total**
	Fresh	Saline	Fresh	Saline	Fresh	Saline	
Broward	10.25	0.00	34.29	0.51	0.00	0.00	**45.04**
Charlotte	0.00	0.00	0.15	0.00	0.00	0.00	**0.15**
Collier	15.36	0.00	23.49	0.00	1.54	0.21	**40.60**
Glades	0.05	0.00	0.09	0.00	0.00	0.00	**0.13**
Hendry	0.00	0.00	0.54	0.00	0.00	0.00	**0.54**
Highlands	0.11	0.27	0.03	0.00	0.00	0.00	**0.41**
Lee	12.65	0.00	29.11	0.29	0.21	0.00	**42.26**
Martin	3.65	0.46	4.71	0.00	0.00	0.00	**8.82**
Miami-Dade	4.19	0.00	11.95	0.00	0.00	0.00	**16.14**
Monroe	0.42	0.64	0.01	0.00	0.00	0.00	**1.07**
Okeechobee	0.03	0.00	0.33	0.00	0.00	0.00	**0.35**
Orange	7.01	0.00	2.02	0.00	0.44	0.00	**9.47**
Osceola	5.12	0.00	1.55	0.00	0.15	0.00	**6.82**
Palm Beach	25.51	0.87	54.25	0.37	0.30	0.00	**81.30**
Polk	0.91	0.00	0.06	0.00	0.00	0.00	**0.97**
St. Lucie	2.01	0.00	6.88	0.00	0.00	0.00	**8.89**
Total	**87.29**	**2.24**	**169.44**	**1.17**	**2.63**	**0.21**	**262.98**
% of Total	33%	1%	64%	0%	1%	0%	**100%**

Note: Minor discrepancies in or between table totals are due to rounding.

APPENDIX C: METADATA TABLES

Table C-1. Reported Versus Estimated Use (in mgd) by County

County	Reported	Estimated	% Estimated	**Total**
Broward	258.03	26.72	9%	**284.74**
Charlotte	0.32	6.03	95%	**6.35**
Collier	91.73	109.93	55%	**201.66**
Glades	16.96	115.67	87%	**132.63**
Hendry	31.41	357.06	92%	**388.47**
Highlands	1.28	41.65	97%	**42.93**
Lee	124.20	37.64	23%	**161.84**
Martin	49.62	104.67	68%	**154.29**
Miami-Dade	432.15	16.32	4%	**448.46**
Monroe	1.06	0.01	1%	**1.07**
Okeechobee	12.91	12.21	49%	**25.12**
Orange	89.85	3.28	4%	**93.13**
Osceola	48.67	18.09	27%	**66.76**
Palm Beach	794.45	54.19	6%	**848.64**
Polk	3.45	3.36	49%	**6.82**
St. Lucie	40.41	39.92	50%	**80.34**
Total	**1,996.50**	**946.75**	**32%**	**2,943.25**

Table C-2. Reported Versus Estimated Use (in mgd) by Water Use Category

Water Use Category	Reported	Estimated	% Estimated	**Total**
Agricultural Self-Supply	565.94	813.66	59%	**1,379.60**
Industrial/Commercial/Institutional Self-Supply	98.97	6.60	6%	**105.57**
Domestic Self-Supply	-	37.51	100%	**37.51**
Power Generation Self-Supply	39.68	-	0%	**39.68**
Public Water Supply	1,117.89	-	0%	**1,117.89**
Recreational/Landscape Self-Supply	174.02	88.98	34%	**263.00**
Total	**1,996.50**	**946.75**	**32%**	**2,943.25**