2015 ANNUAL GROUNDWATER USE REPORT

Suwannee River Water Management District

Introduction

The Suwannee River Water Management District (District) is one of five regional water management districts in Florida. The District encompasses all or part of 15 counties in north-central Florida and includes 7,640 square miles with 13 river basins. The District manages water and related natural resources by providing water quality and water use monitoring, planning, research, regulation, land acquisition and management, and flood protection.

In support of water supply planning, the District incorporates data from water use monitoring programs and produces estimates of water use across six categories. The District has compiled the 2015 Annual Groundwater Use Report to provide Districtwide estimates of groundwater use. This report includes estimates of rainfall as compared to groundwater withdrawals, total groundwater withdrawals broken down by water use type and county, as well as estimates of historical groundwater use over time.

Data Sources/Methodology

Historical groundwater use data from 1965 through 2005 was obtained from the United States Geological Survey (Historical Groundwater Use Data 1965-2005). Water use estimates for 2010 came from estimates produced in support of the North Florida Regional Water Supply Plan (2015-2035) and the Water Supply Assessment (2015-2035). Estimates of 2015 groundwater use were prepared as described below and reflect the best available information available at the time the report was produced for the District.

Water Use Categories

Water use is broken down into six different categories: public supply, domestic self-supply, agriculture, commercial/industrial/institutional and mining/dewatering, landscape/recreational/aesthetics, and thermoelectric power generation. Below is a description of each water use category, along with the source and/or methodology of the data used in this report.

Public supply (PS) - The PS category includes all large municipal, public, and private systems that supply potable water to the public from a central water supply system for human consumption and other uses that have average annual permitted quantities of 0.1 million gallons per day (MGD) or more.

> Data source/Methodology. Water use in this category were obtained from the Monthly Operating Reports (MORs) submitted to the Florida Department of Environmental Protection (FDEP) by system operators. The MOR reports the amount of treated groundwater, which represents a reasonable approximation of total groundwater pumped for facilities in the District.

Domestic self-supply and small public supply (DSS) - The DSS category includes domestic water uses generally associated with residential dwellings that are not served by a central public supply

utility and water usage from small public supply systems that have average annual permitted quantities of less than 0.1 Million Gallons Per Day (MGD).

Data source/Methodology. Water use data from small public suppliers were obtained from MORs reported to FDEP by system operators. If no MORs were reported, water use was set to the permitted allocation. Domestic water use was compiled using unincorporated population estimates and estimated residential per capita water use rates.

Population Estimates. County level data from the University of Florida's Bureau of Economic and Business Research (BEBR) for total population and estimated persons per household were used to estimate DSS water use. All large and small public suppliers were contacted to determine the number of residential connections served by the utility. The population served by each large and small public supply utility was estimated by multiplying the number of residential connections by the average person per household for its respective county in 2015. The inmate population was estimated based on inmate population data provided by the Florida Department of Corrections. The unincorporated population was estimated by subtracting residents served by large and small public suppliers and inmates from the total county population estimate. DSS water use is estimated for this unincorporated population by multiplying the population times an estimate of residential per capita water use.

The statewide residential per capita value of 85 gallons per person per day (Marella, R.L., 2015) was used for all counties except Alachua, Baker, Jefferson, and Levy for which published residential per capita estimates from adjacent water management districts was used. The data used to estimate county-level DSS Population are listed in Table 3.

Agriculture - The agricultural water use category includes the irrigation of crops, water used to raise livestock, and other miscellaneous water uses associated with agricultural production. These users typically obtain water from a dedicated, on-site well or surface water withdrawal and are not connected to a central utility. Irrigated acreage and projected water demands were determined for a variety of crop rotations as well as livestock water needs.

Data source/Methodology. The Balmoral Group (Balmoral) has been contracted by the Florida Department of Agriculture and Consumer Services to develop the Florida Statewide Agricultural Irrigation Demand (FSAID) database. This data set includes base year agricultural water use estimates and agricultural water demand projections for all agricultural parcels in the state and are updated by Balmoral on a yearly basis. Water estimates for the 2015 base year of FSAIDIV were used for both livestock and irrigation water use estimates (Florida Statewide Agricultural Irrigation Demand Estimated Agricultural Water Demand, 2015-2040). Groundwater is the primary water supply for agriculture in the District, therefore over 99 percent of the agricultural demand estimate was assumed to come from groundwater (Technical Memorandum, 2018).

Commercial/Industrial/Institutional and Mining/Dewatering - The Commercial, Industrial, and Institutional (CII) category represents water use associated with the production of goods or provisions of services by CII establishments. The CII category also includes the use of water associated with mining and long-term dewatering operations (MD). This category does not include entities whose water needs are met by PS systems.

Data source/Methodology. CII/MD permits with drinking water wells were updated based on their MORs reported to FDEP. Large CII/MD users with a permitted groundwater withdrawal greater than or equal to 0.1 MGD or that have a well greater than 8 inches in diameter are required to report their water use to the District. Water use for any user that is below the threshold for reporting is set to the allocation defined in the permit. MD permits that operate under a closed loop cycle are estimated at 30% of their allocation. This is because water that is not lost to evaporation is recycled.

Landscape/Recreational/Aesthetic - The Landscape, Recreational and Aesthetic (LRA) Irrigation category represents water use associated with the irrigation, maintenance, and operation of golf courses, cemeteries, parks, medians, attractions, and other large self-supplied green areas. This category does not include entities whose water needs are met by PS systems.

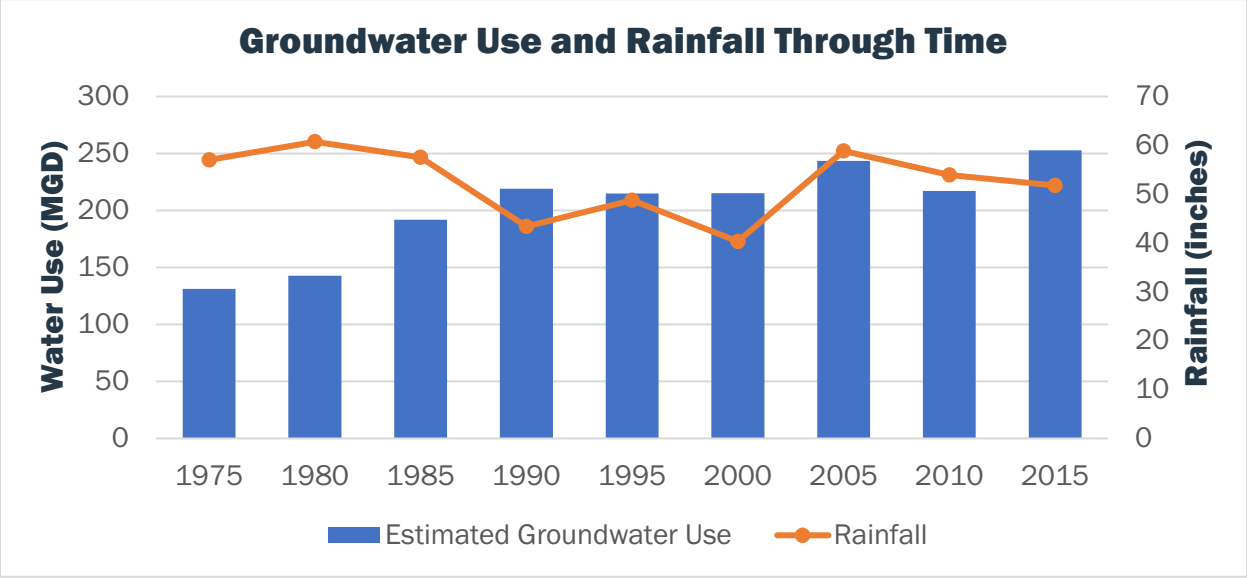
Data source/Methodology. LRA permits with drinking water wells were updated based on their MORs reported to FDEP by system operators. Large LRA users that have a reporting requirement submit their water use to the District. Water use for any user that is below the threshold for reporting is set to the allocation defined in the permit.

Thermoelectric power generation - Thermoelectric Power Generation (PG) category represents the water use associated with power plant and power generation facilities. PG water use includes the consumptive use of water for steam generation, cooling, and replenishment of cooling reservoirs.

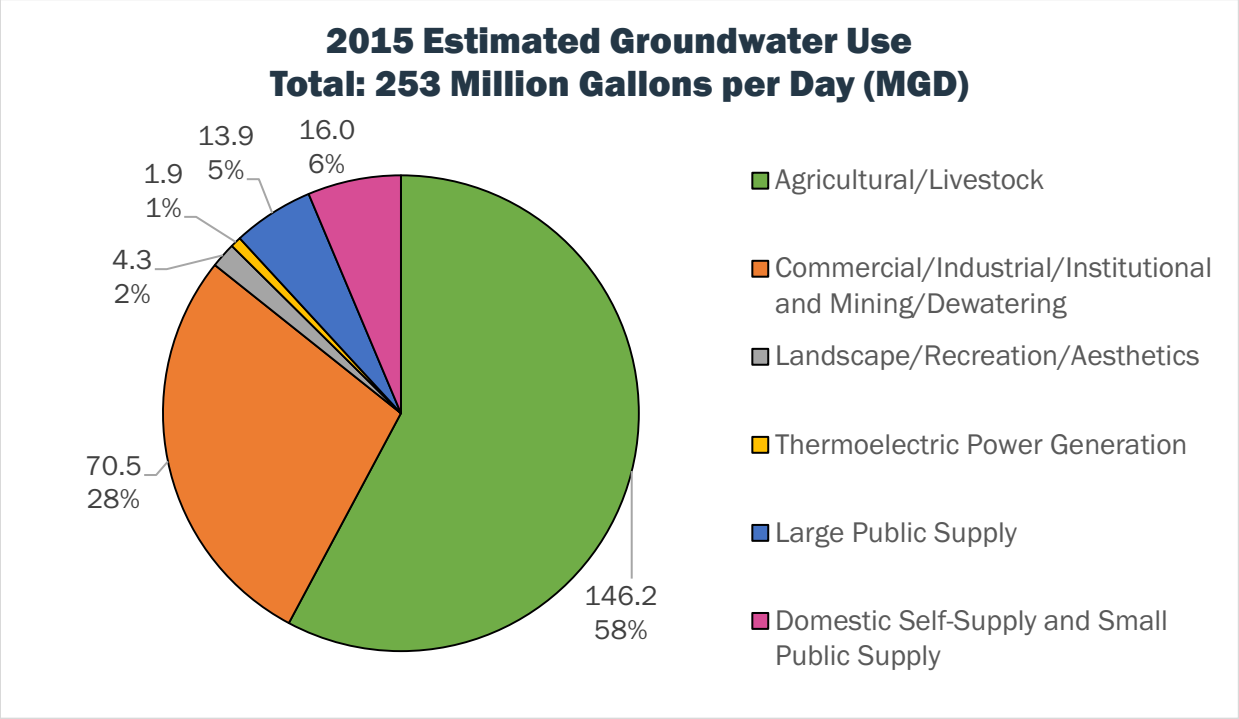
Data source/Methodology. Water use data from power plant operations is reported to the District and included in this category.

2015 Rainfall

Total rainfall throughout the District was estimated at 51.8 inches in 2015. This is slightly lower than the total rainfall in 2010, which was estimated at 54.0 inches (SRWMD Hydrologic Conditions Report, 2016).

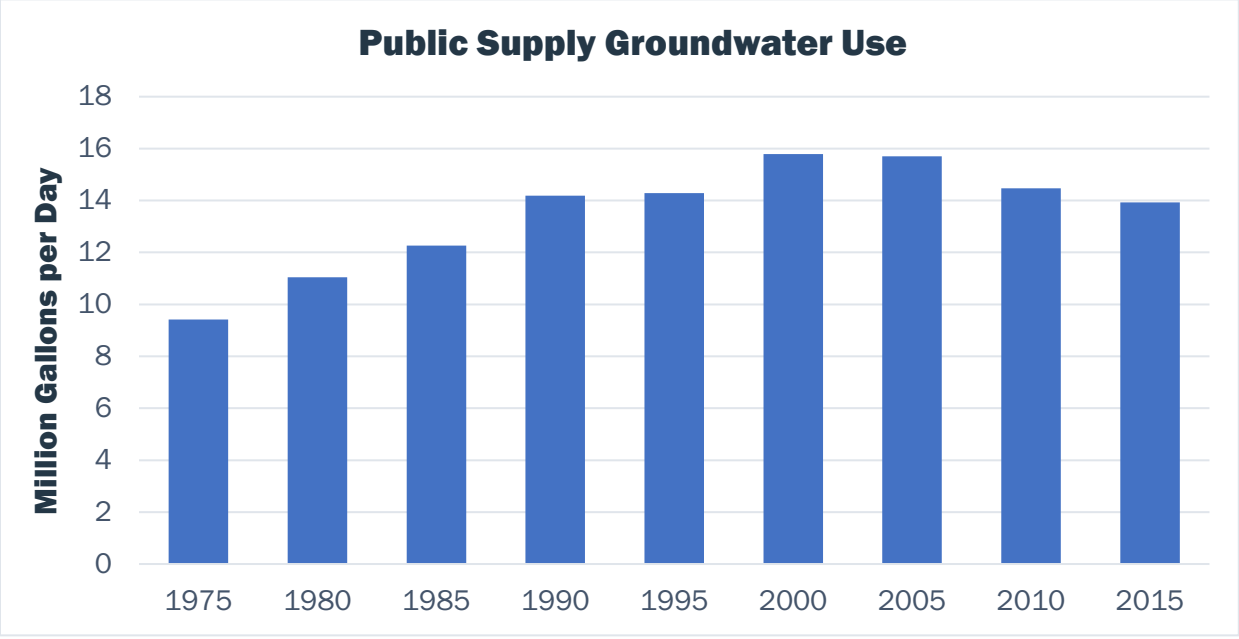


2015 Total Districtwide Groundwater Use



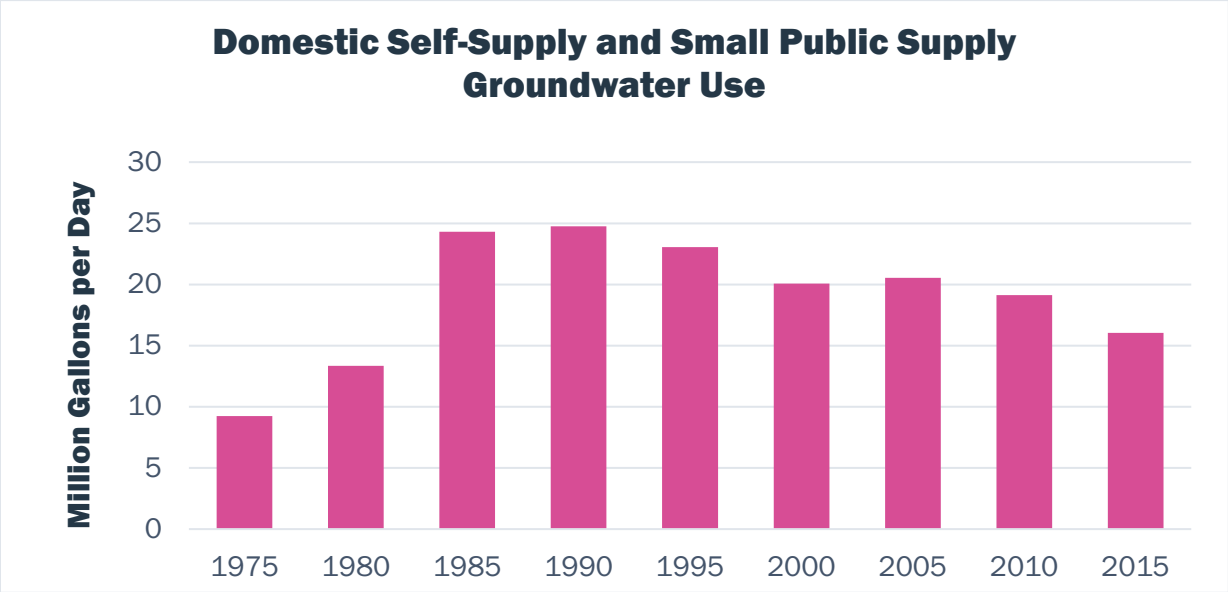
2015 Public Supply

Between 1975 and 2000, public supply groundwater use increased by just over 6 MGD. Between 2000 and 2015, public supply groundwater use decreased from about 16 MGD to just under 14 MGD.



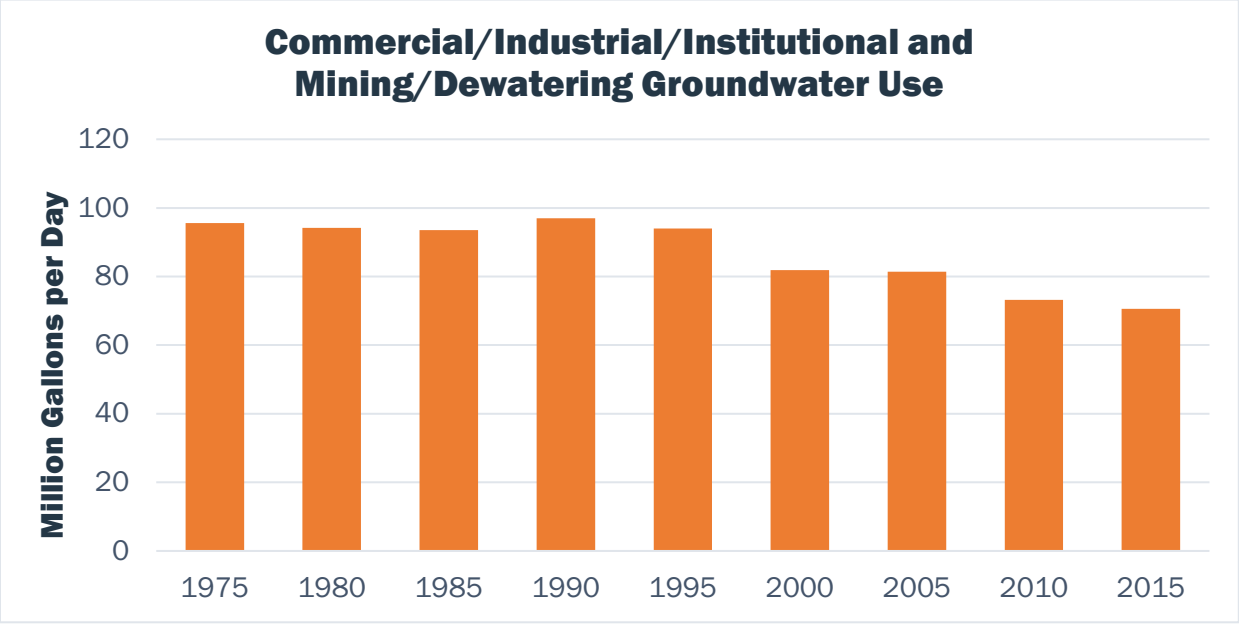
2015 Domestic Self-Supply and Small Public Supply

Domestic self-supply and small public supply groundwater use has declined since the 1990s and has decreased about 29%. Since 2010, domestic self-supply water use has decreased almost 8% from 19 MGD to about 16 MGD. Some of the decrease in water use estimated since 2010 is the result of improved estimates of self-supply population.



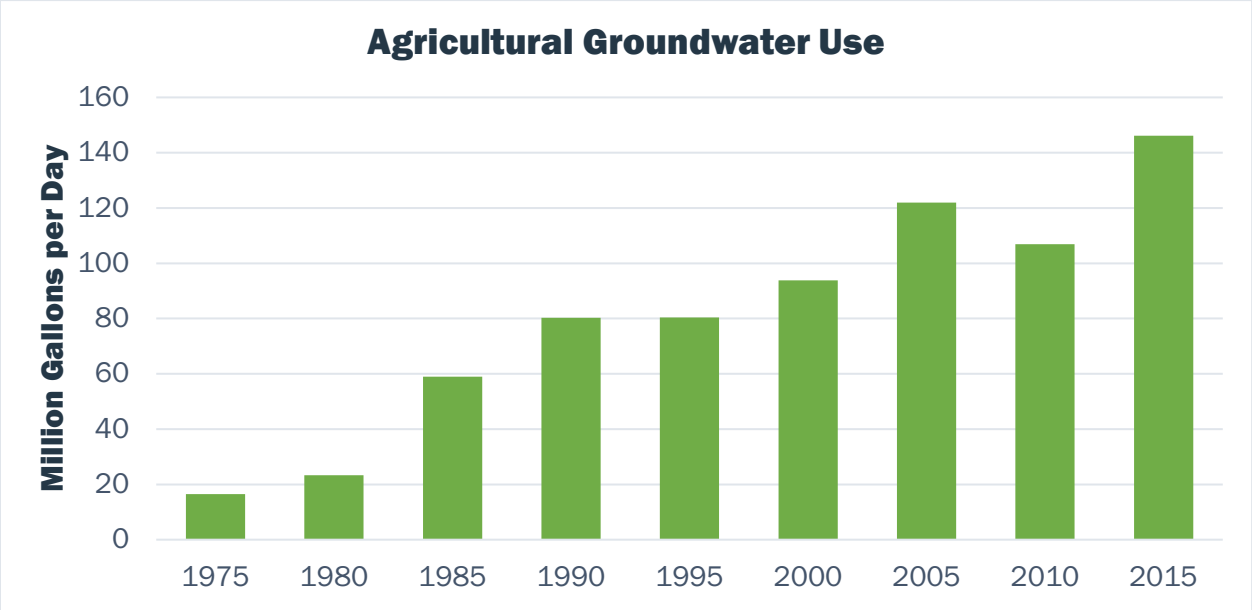
2015 Commercial/Industrial/Institutional and Mining/Dewatering (CII/MD)

CII/MD groundwater use has been slowly declining since 1975. Estimated groundwater use for this category is approximately 25 MGD lower than estimated groundwater use in 1975.



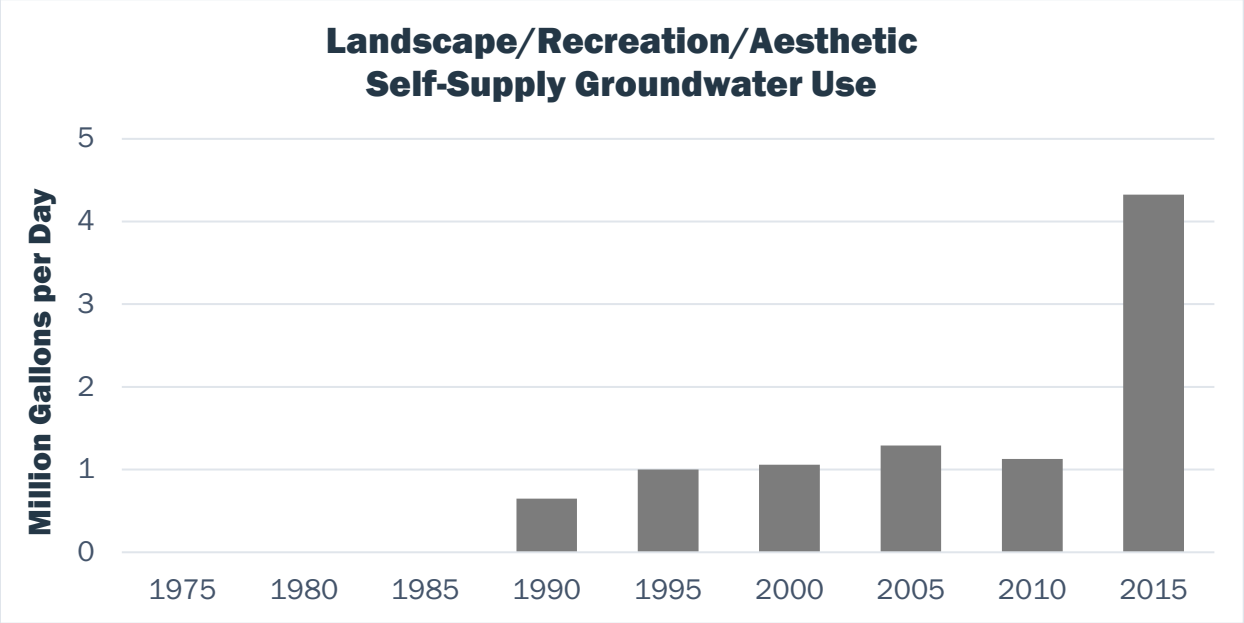
2015 Agricultural Irrigation/Livestock Use

Agricultural groundwater use has greatly increased since 1975, from around 16 MGD to 146 MGD in 2015.



2015 Landscape/Recreation/Aesthetics (LRA)

LRA groundwater use accounts for just under 2% of groundwater use in the District. The increase in estimated groundwater use between 2010 and 2015 for this category is in part due to a change in the estimation process for LRA water use. For 2015, permits with water use below the reporting threshold were estimated at allocation.



2015 Power Generation Water Use

Thermoelectric power generation groundwater use has declined by less than 1 MGD since 2005. This category represents less than 0.6% of groundwater withdrawals.

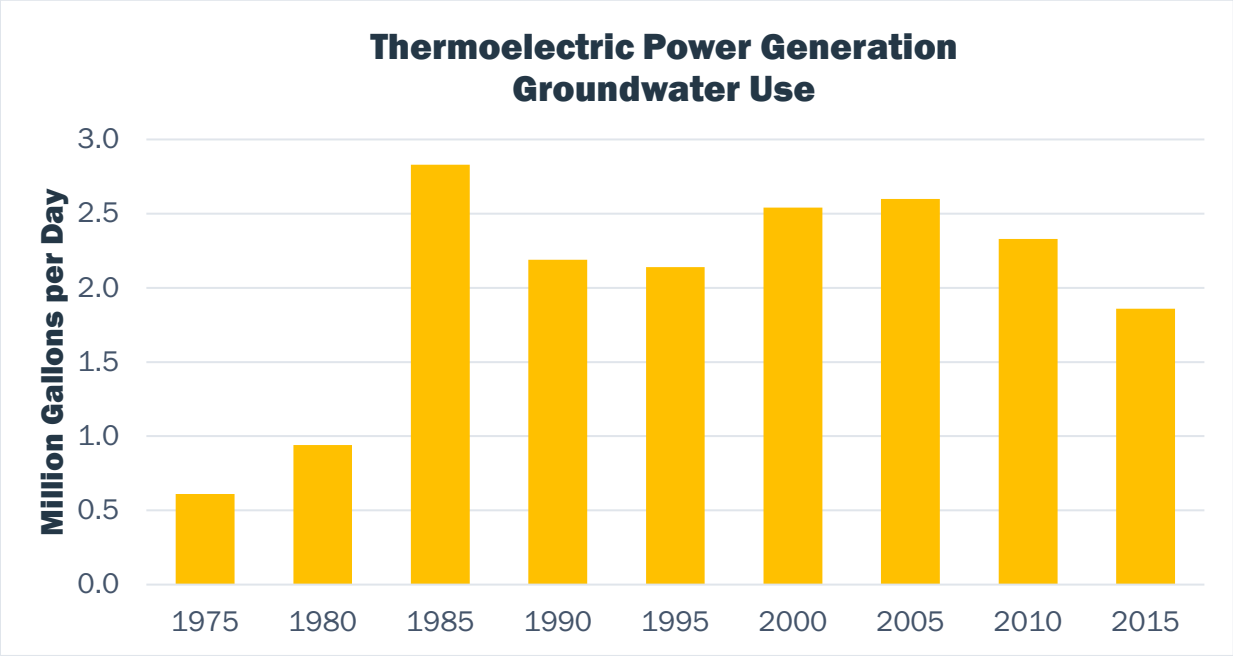


TABLE 1: Total Water Use and Rainfall by County in 2015

County	2015 Water Use (MGD)	Rainfall (inches)
Alachua	19.57	51.95
Baker	0.27	41.17
Bradford	5.12	47.68
Columbia	12.84	44.99
Dixie	8.64	63.54
Gilchrist	21.17	52.13
Hamilton	40.30	50.24
Jefferson	3.54	46.72
Lafayette	12.74	49.79
Levy	16.43	57.40
Madison	24.12	52.40
Suwannee	42.34	48.28
Taylor	42.87	53.61
Union	2.90	44.23
District Total	252.84	51.80

*County rainfall estimates incorporate the total annual rainfall for whole counties.
**The District total rainfall estimates include only the SRWMD portion of counties.

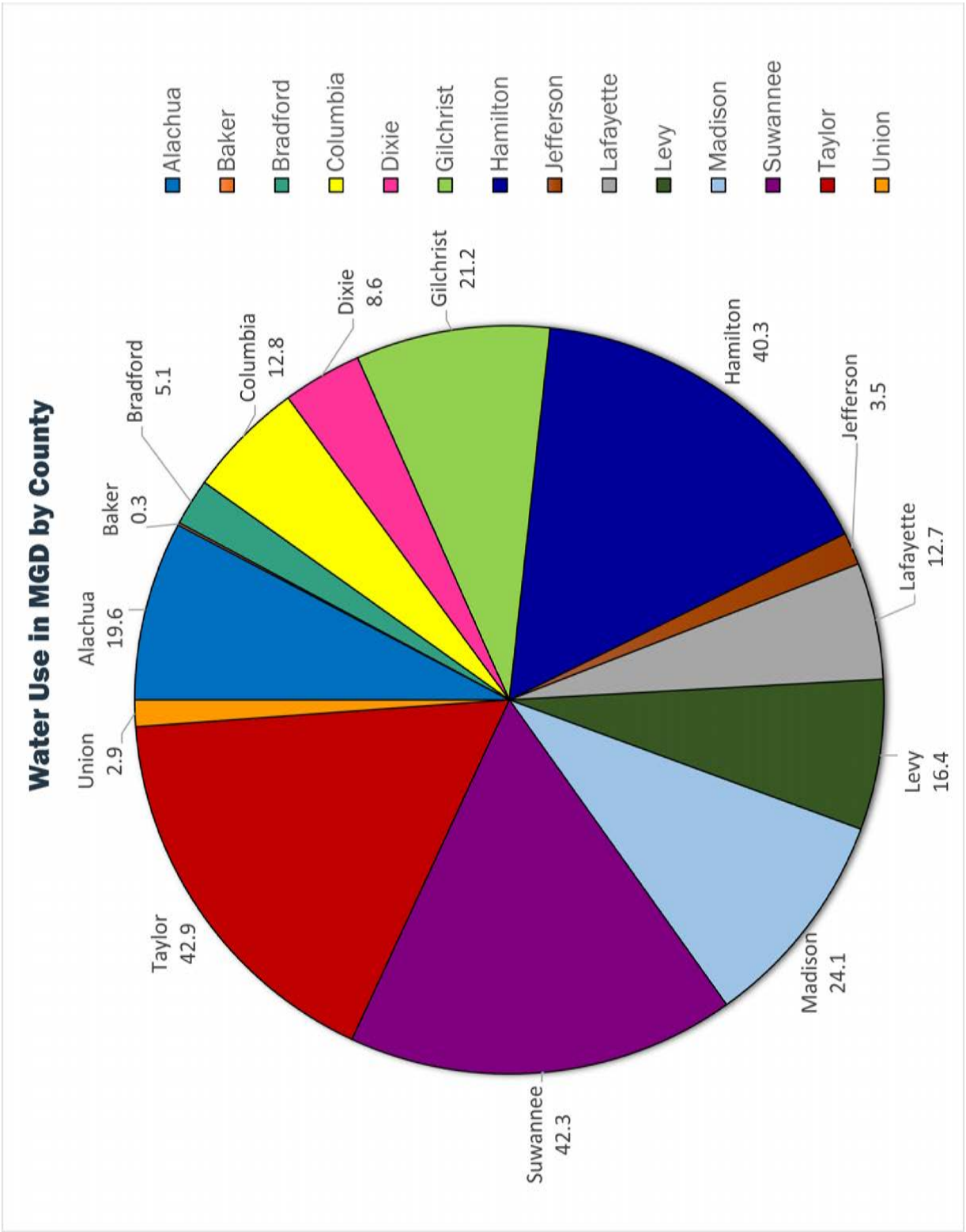

Water Use in MGD by County
Alachua
Baker
Bradford
Columbia
Dixie
Gilchrist
Hamilton
Jefferson
Lafayette
Levy
Madison
Suwannee
Taylor
Union
Alachua 19.6
Baker 0.3
Bradford 5.1
Columbia 12.8
Dixie 8.6
Gilchrist 21.2
Hamilton 40.3
Jefferson 3.5
Lafayette 12.7
Levy 16.4
Madison 24.1
Suwannee 42.3
Taylor 42.9
Union 2.9

TABLE 2: Total Groundwater Use (MGD) by County and Category in 2015

County	Agricultural Irrigation and Livestock	Public Supply	Commercial/ Industrial/ Institutional and Mining/ Dewatering	Thermoelectric Power Generation	Landscape/ Recreation/ Aesthetics	Domestic Self-Supply and Small Public Supply	Total
Alachua	12.06	2.34	0.35	1.76	1.23	1.81	19.57
Baker	0.00	0.02	0.19	0.00	0.00	0.06	0.27
Bradford	1.70	0.94	1.03	0.00	0.29	1.15	5.12
Columbia	4.66	3.39	0.33	0.00	0.75	3.71	12.84
Dixie	6.85	0.64	0.21	0.00	0.10	0.85	8.64
Gilchrist	19.13	0.35	0.35	0.00	0.10	1.24	21.17
Hamilton	15.90	0.90	22.64	0.00	0.14	0.72	40.30
Jefferson	3.16	0.02	0.15	0.00	0.09	0.13	3.54
Lafayette	11.79	0.15	0.33	0.00	0.06	0.41	12.74
Levy	14.51	0.86	0.14	0.00	0.15	0.77	16.43
Madison	20.89	1.14	0.99	0.00	0.33	0.77	24.12
Suwannee	33.87	1.18	3.73	0.09	0.71	2.75	42.34
Taylor	0.45	1.75	39.57	0.00	0.35	0.75	42.87
Union	1.21	0.25	0.50	0.00	0.03	0.91	2.90

TABLE 3: Population by County in 2015

County	Total County Population	Percent of County in District	Estimated District Population	Inmate Population in District	Large Public Supply Population in District	Small Public Supply Population in District	Domestic Self-Supply Population in District	Residential Per Capita Used to Estimate DSS
Alachua	254,893	34.79%	60,904	0	34,807	0	26,097	68*
Baker	27,017	2.27%	2,319	1,745	0	0	574	105*
Bradford	27,310	88.77%	24,243	3,323	8,556	991	12,364	85
Columbia	68,163	100.00%	68,163	3,940	26,026	759	38,197	85
Dixie	16,468	100.00%	16,468	1,282	5,917	0	9,269	85
Gilchrist	16,839	100.00%	16,839	679	2,691	0	13,469	85
Hamilton	14,630	100.00%	14,630	2,500	5,026	0	7,104	85
Jefferson	14,519	24.98%	3,627	1,113	1,190	0	1,324	89**
Lafayette	8,664	100.00%	8,664	2,739	1,142	0	4,783	85
Levy	40,448	38.64%	15,629	0	6,786	978	8,843	54***
Madison	19,200	100.00%	19,200	1,463	8,883	0	8,854	85
Suwannee	44,452	100.00%	44,452	2,901	9,788	0	31,763	85
Taylor	22,824	100.00%	22,824	3,044	13,610	0	6,170	85
Union	15,918	100.00%	15,918	4,586	1,678	0	9,654	85
Total	**591,345**	**NA**	**333,880**	**29,316**	**126,100**	**2,728**	**178,464**	**NA**

*Alachua and Baker – St. John's River Water Management District
**Jefferson - https://www.nwfwater.com/Water-Resources/Water-Supply-Planning/Water-Supply-Assessments
***Levy - https://www.swfwmd.state.fl.us/sites/default/files/medias/documents/EWUR-2015.pdf

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Marella, R.L., 2015, Water withdrawals in Florida, 2012: U.S. Geological Survey Open-File Report 2015–1156, 10 p., http://dx.doi.org/10.3133/ofr20151156.

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Technical Memorandum, February 2018. Distributing FSAID IV ILG to GROBINSO.WUP Stations, Yassert A. Gonzalez, Water Use Analyst, Water Use Planning Bureau; George Robinson, Water Use Analyst, Water Use Planning Bureau

Water Supply Assessment (2015-2035). http://www.srwmd.state.fl.us/DocumentCenter/View/15162/2015-2035-Water-Supply-Assessment-PDF.