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Water Withdrawals in Florida, 2012

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Abstract

In 2012, the total amount of water withdrawn in Florida was estimated to be 14,237 million gallons per day (Mgal/d). Saline water accounted for 7,855 Mgal/d (55 percent), and freshwater accounted for 6,383 Mgal/d (45 percent). Groundwater accounted for 4,167 Mgal/d (65 percent) of freshwater withdrawals, and surface water accounted for the remaining 2,216 Mgal/d (35 percent). Surface water accounted for nearly all (99.9 percent) saline-water withdrawals. Freshwater withdrawals were greatest in Palm Beach County (682 Mgal/d), and saline-water withdrawals were greatest in Pasco County (1,822 Mgal/d). Fresh groundwater provided drinking water (through either public supply or private domestic wells) for 17.699 million residents (93 percent of Florida's population), and fresh surface water provided drinking water for 1.375 million residents (7 percent). The statewide public-supply gross per capita water use for 2012 was estimated at 136 gallons per day.

Overall, agricultural self-supplied accounted for 39 percent of the total freshwater withdrawals (groundwater and surface water), followed by public supply (36 percent). Public supply accounted for 49 percent of groundwater withdrawals, followed by agricultural self-supplied (34 percent), commercial-industrial-mining self-supplied (7 percent), recreational-landscape irrigation and domestic self-supplied (5 percent each), and power generation (less than 1 percent). Agricultural self-supplied accounted for 50 percent of fresh surface-water withdrawals, followed by power generation (26 percent), public supply (11 percent), recreational-landscape irrigation (9 percent), and commercial-industrial-mining self-supplied (4 percent). Power generation accounted for nearly all (99.8 percent) saline-water withdrawals.

The largest percentage of freshwater withdrawals was from the South Florida Water Management District (46 percent), followed by the St. Johns River Water Management District (20 percent), Southwest Florida Water Management District (19 percent), Northwest Florida Water Management District (9 percent), and Suwannee River Water Management District (6 percent). The South Florida Water Management District accounted for the largest percentage of freshwater withdrawals for public-supply use (46 percent), commercial-industrial-mining self-supplied use (24 percent), agricultural self-supplied use (59 percent), and recreational-landscape irrigation use (63 percent). The Northwest Florida Water Management District accounted for the largest percentage of freshwater withdrawals for power-generation use (44 percent), and the Southwest Florida Water Management District accounted for the largest percentage of saline-water withdrawals for power-generation use (58 percent).

Introduction

Water is among Florida's most valued resources. The State has more than 1,700 streams and rivers, 7,800 freshwater lakes, 700 springs, 11 million acres of wetlands, and numerous underlying aquifers yielding substantial quantities of freshwater for human and environmental needs (Fernald and Purdum, 1998). Although renewable, these water resources are limited and continued growth in population, tourism, and agriculture will place increased demands on water sources.

The population of Florida totaled 19.074 million in 2012 (University of Florida, 2013). This number represents an increase of about 19 percent from the 2000 population of 15.981 million (U.S. Census Bureau, 2011) and a 1.5 percent increase from the 2010 population of 18.801 million (University of Florida, 2013). An additional 91.5 million people visited Florida in 2012 (http://www.visitflorida.com/en-us/media/research.html). In addition to water needed to meet public supply demands for population and tourism, the agricultural sector in Florida also depends heavily on the State's water resources. In 2012, Florida ranked first in the Nation for the value and production of oranges and grapefruit and produced 63 percent of the total citrus produced in the United States (Florida Department of Agriculture and Consumer Services, 2013). Agriculture employed nearly 750,000 people in Florida and contributed about $100 billion to the State economy in 2012. Land in farms totaled 9.548 million acres on 47,740 commercial farms in Florida for 2012 (U.S. Department of Agriculture, 2014).

Agriculture is expected to remain an important industry in the State because the subtropical climate fosters the cultivation and growth of a wide variety of crops. Demands for locally produced food for the growing population have increased accordingly (Mulkey and Clouser, 1990), and Florida's population is projected to reach nearly 20 million by 2015 and nearly 24 million by 2030 (Smith and Rayer, 2012). The availability of water to support current and future agriculture, population, and tourism is essential to the development of the State's economy and vital to the well-being of its residents and visitors. Accurate and reliable water-use data are needed to forecast water demands and help ensure future water availability throughout Florida.

Purpose and Scope

The purpose of this report is to provide water withdrawal information for 2012 for the State of Florida, including water withdrawals by water source (fresh and saline; surface and ground), county (fig. 1*A*), and the six major water-use categories. These six categories are generally defined within this report and include public supply, domestic self-supplied, commercial-industrial-mining self-supplied, agricultural self-supplied (including irrigation, livestock, aquaculture, and other farm uses), recreational-landscape irrigation (including golf-course irrigation), and power generation. These six categories are further detailed in the Glossary found in Marella (2014). Water withdrawals are also totaled and presented by water management district (WMD) for 2012 (fig. 1*A* and 1*B*).

This report presents a general overview of 2012 water use by category and water management district. A detailed analysis of current or past water-use trends is not provided. Additional tables of water use by category for 2012 as well as historical water-use tables by category and water management district may be obtained by contacting the U.S. Geological Survey (USGS), Caribbean-Florida Water Science Center offices in Lutz, Orlando, Davie, or San Juan, or by visiting the USGS Water Use in Florida Web site at http://fl.water.usgs.gov/infodata/wateruse.html.

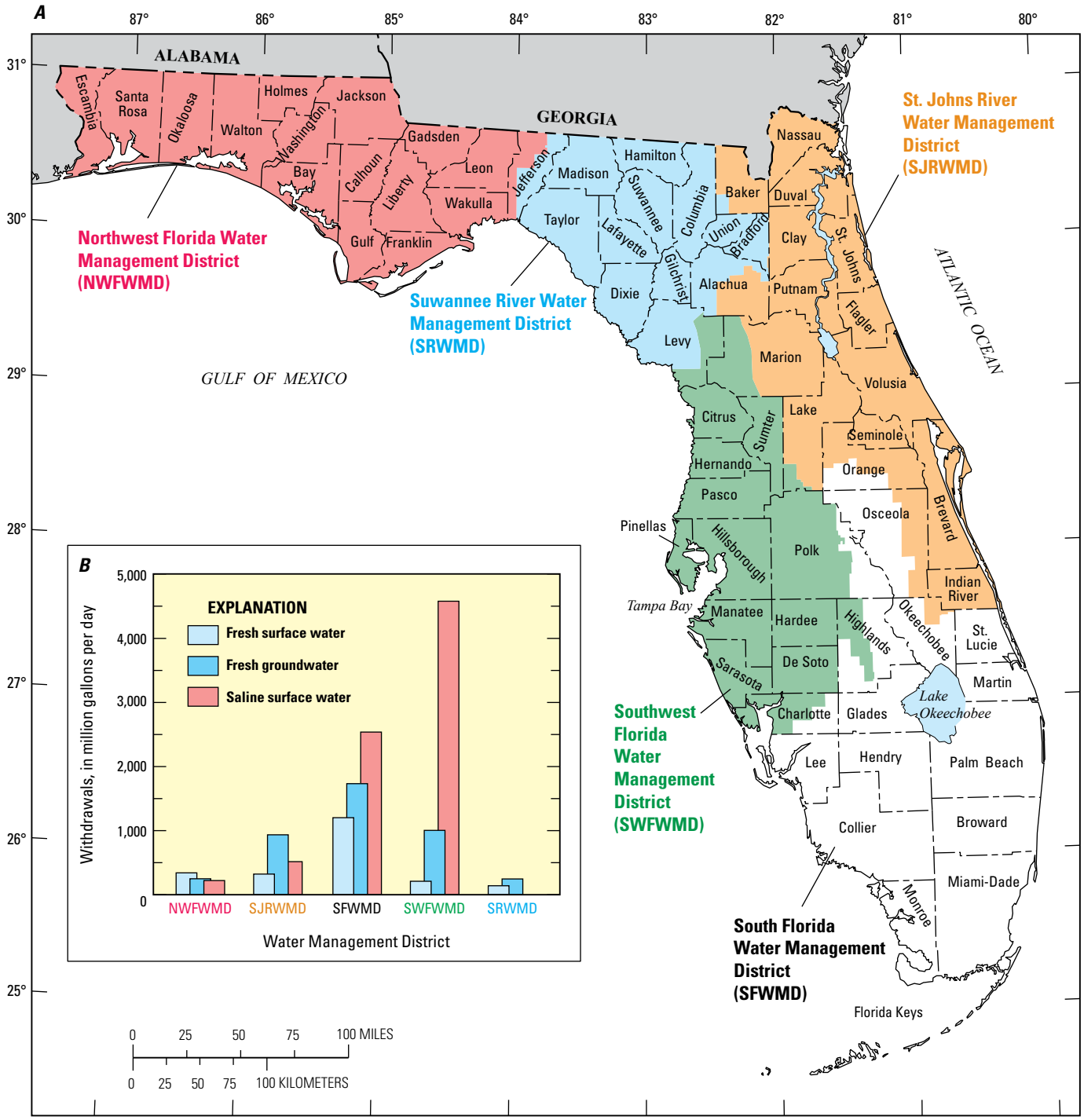


Figure 1. *A*, Counties and water management districts in Florida. *B*, Freshwater and saline-water withdrawals in Florida by water management district, 2012.

Data Sources

Data for 2012 were collected under the nationwide guidelines specified by the USGS (Hutson, 2007) using the same data sources, methodology, and terminology used for the 2005 and 2010 water-use compilations recently published for Florida (Marella, 2009, 2014). Water-use data for this project were compiled through an ongoing cooperative program with the Florida Department of Environmental Protection (FDEP), with collaboration from the Northwest Florida Water Management District (NWFWMD), St. Johns River Water Management District (SJRWMD), South Florida Water Management District (SFWMD), Southwest Florida Water Management District (SWFWMD), and Suwannee River Water Management District (SRWMD). Specific data for the counties within the SJRWMD and the SWFWMD were obtained from each district's 2012 water-use compilations and reports (St. Johns River Water Management District, 2013; Ferguson, 2014). Data also were obtained from the FDEP Drinking Water Program (monthly operating reports), as well as from various utilities, industries, and power companies throughout the State.

Total Water Withdrawals

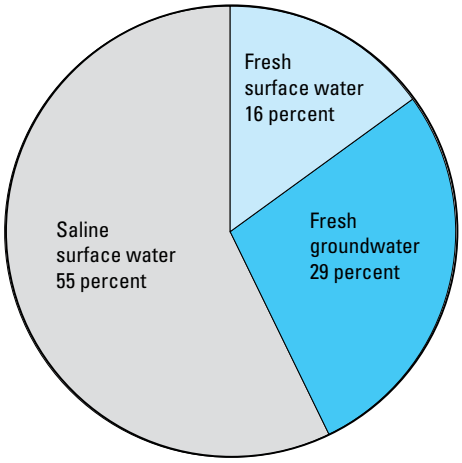
In 2012, the total amount of water withdrawn in Florida was estimated to be 14,237 million gallons per day (Mgal/d) (table 1). Saline water accounted for 7,855 Mgal/d (55 percent), and freshwater accounted for 6,383 Mgal/d (45 percent) of total water withdrawals in 2012 (fig. 2) (values presented in the text may not equal those in the tables due to rounding). Groundwater accounted for 4,167 Mgal/d (65 percent) of freshwater withdrawals, and surface water accounted for the remaining 2,216 Mgal/d (35 percent) (fig. 3; table 1). Surface water accounted for nearly all (99.9 percent) saline-water withdrawals (table 1). An additional 725 Mgal/d of reclaimed wastewater was used in Florida during 2012 (Florida Department of Environmental Protection, 2013).

Freshwater withdrawals were greatest in Palm Beach County (682 Mgal/d), and saline water withdrawals were greatest in Pasco County (1,822 Mgal/d) during 2012 (table 2). Substantial withdrawals (more than 200 Mgal/d) of fresh groundwater were made in Miami-Dade, Palm Beach, Polk, Orange, Broward, and Collier Counties. Substantial withdrawals (more than 200 Mgal/d) of fresh surface water occurred in Palm Beach, Hendry, and Escambia Counties.

Water Withdrawals by Source

Florida has consistently been one of the largest users of groundwater in the Nation over the past decade (Hutson and others, 2004; Kenny and others, 2009, Maupin and others, 2014). Fresh groundwater is available throughout most of the State and generally needs little or no treatment prior to use (Vecchioli and Foose, 1985). Overall, groundwater sources provided drinking water to 17.699 million residents or 93 percent of Florida's 2012 population from either a public water-supply system or from a private domestic well.

Groundwater withdrawals in Florida for 2012 totaled 4,173 Mgal/d, of which 4,167 was freshwater and 6 Mgal/d was saline water (table 1). Of the fresh groundwater withdrawn, 146 Mgal/d (4 percent) was nonpotable. This nonpotable water is considered saline by the USGS but is retained within the freshwater category for this report. Additional detail on nonpotable water is provided in the Glossary found in Marella (2014).



Note: Saline groundwater was less than 0.1 percent

Figure 2. Total water withdrawals in Florida by water source, 2012.

Saline surface water is abundant throughout Florida in the numerous coastal rivers and bays along the State's 1,200-mile coastline (Fernald and Purdum, 1998), whereas fresh surface water is available throughout most of the State from rivers, lakes, springs, or in the countless freshwater canals. However, a large percentage of fresh surface water in Florida is considered nonpotable, and typically needs treatment of some sort for uses other than irrigation or cooling (Marella, 2014). Fresh surface water provided drinking water to 1.375 million residents or 7 percent of Florida's 2012 population in 2012, and all of it was from public water-supply systems.

Surface-water withdrawals in Florida totaled 10,064 Mgal/d in 2012. Saline surface water accounted for 7,848 Mgal/d (78 percent), and freshwater accounted for 2,216 Mgal/d (22 percent) of the total surface-water withdrawals in 2012 (table 2). Nearly all saline withdrawals (99.8 percent) are used as once-through cooling water for power generation, and these withdrawals typically are returned immediately to the source (Marella, 2014). Fresh surface water in Florida is primarily used for irrigation and power generation; however, fresh surface water is also used for public supply in several counties across the State. Nearly 78 percent of the total surface water withdrawn (fresh and saline) in Florida for 2012 was for power generation cooling water.

Withdrawals by Water-Use Category

Overall, agricultural self-supplied was the largest user of freshwater in 2012, accounting for 39 percent of total freshwater withdrawals, followed by public supply at 36 percent (fig. 3). Public supply (49 percent) and agricultural self-supplied (34 percent) accounted for the largest amount of fresh groundwater withdrawals in 2012, followed by commercial-industrial-mining self-supplied (7 percent),

Table 1. Total water withdrawals in Florida by category, 2012.

[Source: U.S. Geological Survey, Caribbean-Florida Water Science Center (http://fl.water.usgs.gov/infodata/wateruse.html); all values in million gallons per day]

Florida 2012	Freshwater			Saline water			Total water
	Ground	Surface	Total	Ground	Surface	Total	
Public supply	2,026.03	255.09	2,281.12	0.00	4.15	4.15	2,285.27
Domestic self-supplied	211.35	0.00	211.35	0.00	0.00	0.00	211.35
Commercial-industrial-mining self-supplied	296.27	84.10	380.37	0.00	3.06	3.06	383.43
Agricultural self-supplied	1,400.36	1,104.94	2,505.30	0.00	0.00	0.00	2,505.30
Recreational-landscape irrigation	196.18	197.62	393.80	0.00	0.00	0.00	393.80
Power generation	36.59	573.95	610.54	6.46	7,841.13	7,847.59	8,458.13
State totals	4,166.78	2,215.70	6,382.48	6.46	7,848.34	7,854.80	14,237.28

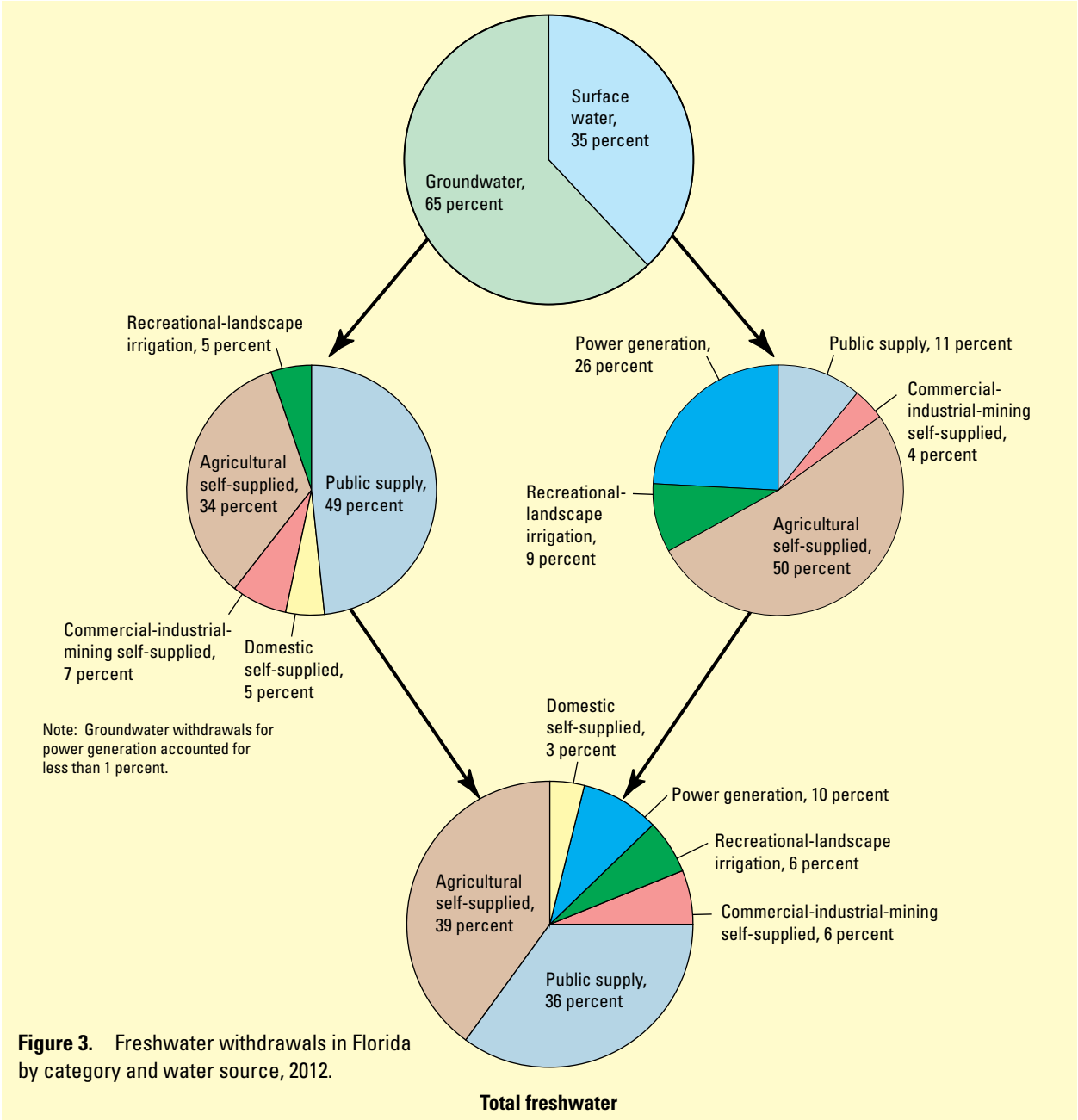


Figure 3. Freshwater withdrawals in Florida by category and water source, 2012.

domestic self-supplied and recreational-landscape irrigation (5 percent each), and power generation (less than 1 percent) (fig. 3). Agricultural self-supplied (50 percent) accounted for the largest amount of fresh surface-water withdrawals in 2012, followed by power generation (26 percent), public supply (11 percent), recreational-landscape irrigation (9 percent), and commercial-industrial-mining self-supplied (4 percent) (fig. 3). Power generation accounted for nearly all (99.8 percent) of the saline-water withdrawals in 2012.

Public Supply

Public supply refers to water distributed by a publicly or privately owned water system that supplies water to the public for drinking and other purposes (Marella, 2014). Water withdrawn for public supply totaled 2,285 Mgal/d (table 1) and served 16.823 million residents in 2012. Groundwater supplied 2,026 Mgal/d (89 percent) of the public-supply water withdrawn in 2012 and provided drinking water to 15.448 million residents. Surface water supplied 259 Mgal/d (11 percent) of the public-supply water withdrawn in 2012 and provided drinking water to 1.375 million residents. Of the surface water withdrawn, 4 Mgal/d was saline water and was treated through a desalination process for public-supply use (Ferguson, 2014; Tampa Bay Water, 2014). Several public supply-water systems in Florida rely solely on nonpotable groundwater and others augment their freshwater supply with nonpotable groundwater. This nonpotable water is treated through either desalination or dilution with fresh water to meet drinking-water standards (Florida Department of Environmental Regulation, 1990; Marella, 2014). In 2012, nonpotable groundwater withdrawn for public supply totaled 146 Mgal/d.

The statewide gross per capita water use for public supply in Florida was 136 gallons per day (gal/d) in 2012. This value is calculated as the total public-supply water withdrawal (2,285 Mgal/d) divided by the total population served by public supply (16.823 million residents). Gross per capita water use calculated in this manner includes water delivered for all uses of public-supply water that include domestic (household indoor and outdoor uses), commercial, industrial, public uses and losses, and other uses (Marella, 2014). This differs from a domestic per capita water use value, which is based on the amount of water used at the household level only (including indoor and outdoor uses). A domestic per capita water use value was not calculated on a county or state level for 2012. Additional detail on per capita use is available in the Glossary found in Marella (2014).

Domestic Self-Supplied

Domestic self-supplied use includes water withdrawals from individual private domestic wells that serve one or more households and the small water systems not inventoried under public supply. An estimated 2.251 million residents in Florida were included in this category for 2012. Water withdrawn for domestic self-supplied in 2012 was estimated at 211 Mgal/d (table 1). It is assumed that water withdrawals for this category were derived exclusively from groundwater because of its good quality and widespread availability throughout the State (Marella, 2014).

This withdrawal was based on an estimated domestic per capita of 87 gal/d used for the counties within the NWFWMD, SFWMD, and the SRWMD (fig. 1) multiplied by the population not served by public supply. The 87 gal/d value was based on the 2010 calculated statewide domestic per capita value of 85 gal/d (Marella, 2014) increased by the same percent (2 percent) as the overall public-supply gross per capita between 2010 (134 gal/d) and 2012 (136 gal/d). The domestic self-supplied withdrawal values for the counties within the SJRWMD and the SWFWMD (fig. 1) were calculated by these districts using a different per capita value (103 gal/d and 81 gal/d, respectively) as published by these two districts for 2012 (St. Johns River Water Management District, 2013; Ferguson, 2014).

Commercial-Industrial-Mining Self-Supplied

Commercial-industrial-mining self-supplied use refers to water withdrawn directly by commercial, industrial, and mining facilities. This category includes self-supplied military facilities, schools, prisons, hospitals, recreational facilities, processing and manufacturing facilities, and mining facilities (including conveyance, extraction, milling, washing, and sometimes dewatering). Water withdrawals by the inventoried commercial-industrial-mining self-supplied systems in Florida totaled 383 Mgal/d in 2012 (table 1). Groundwater supplied 296 Mgal/d (77 percent) and surface water supplied 87 Mgal/d (23 percent). Of the total surface water withdrawn, 3 Mgal/d was saline surface water.

Agricultural Self-Supplied (Irrigation and Nonirrigation)

Agricultural self-supplied use refers to water withdrawn for crop irrigation and for nonirrigation uses associated with agricultural and farming operations. Agricultural self-supplied was the largest freshwater use category in Florida, accounting for 39 percent of the statewide total freshwater withdrawals in 2012 (fig. 3). Water withdrawals for agricultural self-supplied use in Florida totaled 2,505 Mgal/d for 2012 (table 1). All water withdrawals for irrigation in Florida were assumed to be freshwater. Groundwater supplied 56 percent (1,400 Mgal/d) and surface water supplied 44 percent (1,105 Mgal/d) of the water withdrawn for this water-use category (table 1). An additional 73 Mgal/d of reclaimed wastewater was used for irrigation purposes in Florida during 2012 (Florida Department of Environmental Protection, 2013). Overall, the water used for crop irrigation accounted for 99 percent (2,480 Mgal/d) of the water withdrawn in this category for 2012, and the nonirrigation uses (livestock and fish farming) accounted for the remaining 1 percent (25 Mgal/d). Total cropland statewide in 2012 was 2.744 million acres, of which 1.493 million acres (54 percent) were estimated as irrigated (U.S. Department of Agriculture, 2014).

Recreational-Landscape Irrigation

Recreational irrigation includes golf-course irrigation, including all grass and landscape associated with golf courses; landscape irrigation includes the irrigation of turf grass and other vegetation associated with athletic fields, cemeteries,

Table 2. Total water withdrawals in Florida by county, 2012.

[Source: U.S. Geological Survey, Caribbean-Florida Water Science Center (http://fl.water.usgs.gov/infodata/wateruse.html); all values in million gallons per day]

County	Groundwater			Surface water			Total water		
	Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total
Alachua	47.36	0.00	47.36	0.39	0.00	0.39	47.75	0.00	47.75
Baker	7.98	0.00	7.98	2.00	0.00	2.00	9.98	0.00	9.98
Bay	7.79	0.00	7.79	45.60	221.46	267.06	53.39	221.46	274.85
Bradford	6.30	0.00	6.30	0.03	0.00	0.03	6.33	0.00	6.33
Brevard	68.85	0.00	68.85	39.53	0.00	39.53	108.38	0.00	108.38
Broward	246.30	0.00	246.30	23.85	914.30	938.15	270.15	914.30	1,184.45
Calhoun	3.99	0.00	3.99	0.22	0.00	0.22	4.21	0.00	4.21
Charlotte	22.31	0.00	22.31	35.62	0.00	35.62	57.93	0.00	57.93
Citrus	30.98	0.00	30.98	0.52	712.61	713.13	31.50	712.61	744.11
Clay	19.44	0.00	19.44	0.31	0.00	0.31	19.75	0.00	19.75
Collier	213.21	0.00	213.21	45.20	0.00	45.20	258.41	0.00	258.41
Columbia	16.71	0.00	16.71	0.18	0.00	0.18	16.89	0.00	16.89
DeSoto	75.85	0.00	75.85	31.78	0.00	31.78	107.63	0.00	107.63
Dixie	3.74	0.00	3.74	0.01	0.00	0.01	3.75	0.00	3.75
Duval	143.82	0.00	143.82	5.13	509.17	514.30	148.95	509.17	658.12
Escambia	76.82	0.00	76.82	245.11	0.00	245.11	321.93	0.00	321.93
Flagler	18.85	0.00	18.85	2.23	1.97	4.20	21.08	1.97	23.05
Franklin	2.01	0.00	2.01	0.28	0.00	0.28	2.29	0.00	2.29
Gadsden	8.55	0.00	8.55	2.45	0.00	2.45	11.00	0.00	11.00
Gilchrist	10.15	0.00	10.15	0.08	0.00	0.08	10.23	0.00	10.23
Glades	39.92	0.00	39.92	121.38	0.00	121.38	161.30	0.00	161.30
Gulf	1.37	0.00	1.37	1.37	0.00	1.37	2.74	0.00	2.74
Hamilton	45.66	0.00	45.66	0.12	0.00	0.12	45.78	0.00	45.78
Hardee	59.55	0.00	59.55	1.13	0.00	1.13	60.68	0.00	60.68
Hendry	106.29	0.00	106.29	299.00	0.00	299.00	405.29	0.00	405.29
Hernando	36.71	0.00	36.71	0.32	0.00	0.32	37.03	0.00	37.03
Highlands	93.66	0.00	93.66	12.65	0.00	12.65	106.31	0.00	106.31
Hillsborough	161.22	0.00	161.22	108.35	1,548.69	1,657.04	269.57	1,548.69	1,818.26
Holmes	3.76	0.00	3.76	0.07	0.00	0.07	3.83	0.00	3.83
Indian River	63.07	0.00	63.07	95.12	3.77	98.89	158.19	3.77	161.96
Jackson	22.73	0.00	22.73	43.49	0.00	43.49	66.22	0.00	66.22
Jefferson	9.26	0.00	9.26	0.19	0.00	0.19	9.45	0.00	9.45
Lafayette	11.36	0.00	11.36	0.07	0.00	0.07	11.43	0.00	11.43
Lake	102.44	0.00	102.44	12.80	0.00	12.80	115.24	0.00	115.24

Table 2. Total water withdrawals in Florida by county, 2012.—Continued

[Source: U.S. Geological Survey, Caribbean-Florida Water Science Center (http://fl.water.usgs.gov/infodata/wateruse.html); all values in million gallons per day]

County	Groundwater			Surface water			Total water		
	Fresh	Saline	Total	Fresh	Saline	Total	Fresh	Saline	Total
Lee	131.10	0.00	131.10	64.93	585.90	650.83	196.03	585.90	781.93
Leon	38.36	0.00	38.36	0.81	0.00	0.81	39.17	0.00	39.17
Levy	32.31	0.00	32.31	0.61	0.00	0.61	32.92	0.00	32.92
Liberty	1.93	0.00	1.93	0.00	0.00	0.00	1.93	0.00	1.93
Madison	12.17	0.00	12.17	0.12	0.00	0.12	12.29	0.00	12.29
Manatee	109.81	0.00	109.81	28.99	0.00	28.99	138.80	0.00	138.80
Marion	56.89	0.00	56.89	2.22	0.00	2.22	59.11	0.00	59.11
Martin	29.58	0.00	29.58	65.62	0.00	65.62	95.20	0.00	95.20
Miami-Dade	429.37	5.00	434.37	24.52	0.00	24.52	453.89	5.00	458.89
Monroe	0.79	0.00	0.79	0.45	0.00	0.45	1.24	0.00	1.24
Nassau	51.88	0.00	51.88	1.03	1.09	2.12	52.91	1.09	54.00
Okaloosa	27.79	0.00	27.79	0.00	0.00	0.00	27.79	0.00	27.79
Okeechobee	41.63	0.00	41.63	14.34	0.00	14.34	55.97	0.00	55.97
Orange	252.63	0.00	252.63	7.80	0.00	7.80	260.43	0.00	260.43
Osceola	83.15	0.00	83.15	6.77	0.00	6.77	89.92	0.00	89.92
Palm Beach	247.78	0.00	247.78	434.44	0.00	434.44	682.22	0.00	682.22
Pasco	88.89	0.00	88.89	1.53	1,822.43	1,823.96	90.42	1,822.43	1,912.85
Pinellas	27.70	0.00	27.70	0.66	495.45	496.11	28.36	495.45	523.81
Polk	256.25	0.00	256.25	18.83	0.00	18.83	275.08	0.00	275.08
Putnam	27.79	0.00	27.79	34.50	0.00	34.50	62.29	0.00	62.29
St. Johns	45.55	0.00	45.55	3.56	0.00	3.56	49.11	0.00	49.11
St. Lucie	41.84	1.46	43.30	62.42	1,031.50	1,093.92	104.26	1,032.96	1,137.22
Santa Rosa	26.35	0.00	26.35	0.98	0.00	0.98	27.33	0.00	27.33
Sarasota	32.90	0.00	32.90	2.70	0.00	2.70	35.60	0.00	35.60
Seminole	60.16	0.00	60.16	1.76	0.00	1.76	61.92	0.00	61.92
Sumter	35.77	0.00	35.77	1.53	0.00	1.53	37.30	0.00	37.30
Suwannee	40.22	0.00	40.22	138.55	0.00	138.55	178.77	0.00	178.77
Taylor	45.68	0.00	45.68	0.04	0.00	0.04	45.72	0.00	45.72
Union	4.20	0.00	4.20	0.03	0.00	0.03	4.23	0.00	4.23
Volusia	73.00	0.00	73.00	118.53	0.00	118.53	191.53	0.00	191.53
Wakulla	6.02	0.00	6.02	0.27	0.00	0.27	6.29	0.00	6.29
Walton	15.04	0.00	15.04	0.47	0.00	0.47	15.51	0.00	15.51
Washington	4.24	0.00	4.24	0.11	0.00	0.11	4.35	0.00	4.35
State totals	4,166.78	6.46	4,173.24	2,215.70	7,848.34	10,064.04	6,382.48	7,854.80	14,237.28

common public or highway areas, parks, playgrounds, school grounds, and nonresidential lawns and grasses primarily associated with commercial establishments. Aesthetic uses are associated with water used to fill or maintain non-agricultural lakes, ponds, and fountains (Marella, 2014). Water withdrawals for recreational-landscape irrigation in Florida totaled 394 Mgal/d in 2012 (table 1). All water withdrawals for recreational-landscape irrigation in Florida were assumed to be freshwater. Surface water and groundwater each supplied about 50 percent of the total water withdrawn for this water-use category in 2012 (198 Mgal/d and 196 Mgal/d, respectively) (table 1). An additional 203 Mgal/d of reclaimed wastewater was used for recreational-landscape irrigation purposes in 2012 (Florida Department of Environmental Protection, 2013).

Power Generation

Water used for power generation includes water withdrawn for once-through cooling, recirculating tower cooling, augmenting on-site water bodies, boiler make-up and domestic purposes at power facilities. Water withdrawals for power generation in Florida in 2012 totaled 8,458 Mgal/d, of which 7,848 Mgal/d was saline water (93 percent) and 611 Mgal/d was freshwater (7 percent) (table 1). Nearly all (99.9 percent) of the saline-water withdrawals were from surface-water sources; the remaining 0.1 percent was from saline groundwater sources. Of the freshwater withdrawals, 94 percent were from surface-water sources and 6 percent were from groundwater sources. Overall, fresh- and saline-water withdrawals for power generation represent 59 percent of all water withdrawals in Florida for 2012 (table 1).

Withdrawals by Water Management District

The five water management districts (fig. 1*A*), which encompass the entire State, were created as part of the 1972 Florida Water Resource Act to better manage Florida's water resources at a local level (Fernald and Patton, 1984). Of the 19.074 million residents in Florida during 2012, nearly 41 percent (7.823 million) resided in the SFWMD; 25 percent resided in each of the SWFWMD and SJRWMD (4.793 million and 4.753 million, respectively); 7 percent (1.380 million) resided in the NWFWMD; and the remaining 2 percent (0.325 million) resided in the SRWMD.

The SFWMD accounted for the largest amount of freshwater withdrawals (2,935 Mgal/d or 46 percent) in 2012 (fig. 1*B*; table 3), followed by the SJRWMD (1,256 Mgal/d or 20 percent), SWFWMD (1,215 Mgal/d or 19 percent), NWFWMD (591 Mgal/d or 9 percent), and SRWMD (385 Mgal/d or 6 percent). The SFWMD accounted for the largest percentage of freshwater withdrawals for public-supply use (1,047 Mgal/d or 46 percent), commercial-industrial-mining self-supplied use (92 Mgal/d or 24 percent), agricultural self-supplied use (1,473 Mgal/d or 59 percent), and recreational-landscape irrigation use (249 Mgal/d or 63 percent). The NWFWMD accounted for the largest percentage of freshwater withdrawals for power-generation use (271 Mgal/d or 44 percent), and the SWFWMD accounted for the largest percentage of saline-water withdrawals for power-generation use (4,575 Mgal/d or 58 percent) (table 3). The SWFWMD accounted for the largest amount of saline-water withdrawals, and the SFWMD accounted for the largest amount of fresh groundwater and fresh surface-water withdrawals in 2012 (fig. 1*B*; table 3).

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Table 3. Water withdrawals by water-use category and water management district in Florida, 2012.

[Sources: U.S. Geological Survey, Caribbean-Florida Water Science Center (http://fl.water.usgs.gov/infodata/wateruse.html), St. Johns River Water Management District (2013), and Ferguson (2014); all values in million gallons per day. District totals may not be identical to data reported or published by the water management districts because of differences in data-collection procedures and categories of use or revisions in reported values. General locations of water management districts are shown in figure 1*A*]

Category	Fresh ground	Fresh surface	Total freshwater	Total saline water	Total water
Northwest Florida Water Management District (NWFWMD)					
Public supply	132.81	46.95	179.76	0.00	179.76
Domestic self-supplied	20.20	0.00	20.20	0.00	20.20
Commercial-industrial-mining self-supplied	39.18	21.93	61.11	0.00	61.11
Agricultural self-supplied	38.53	2.86	41.39	0.00	41.39
Recreational-landscape irrigation	13.65	3.63	17.28	0.00	17.28
Power generation	5.17	265.91	271.08	221.46	492.54
Totals	249.54	341.28	590.82	221.46	812.28
St. Johns River Water Management District (SJRWMD)					
Public supply	524.63	15.44	540.07	0.00	540.07
Domestic self-supplied	64.72	0.00	64.72	0.00	64.72
Commercial-industrial-mining self-supplied	68.85	16.13	84.98	3.06	88.04
Agricultural self-supplied	244.02	128.32	372.34	0.00	372.34
Recreational-landscape irrigation	23.88	36.45	60.33	0.00	60.33
Power generation	8.19	125.63	133.82	512.94	646.76
Totals	934.29	321.97	1,256.26	516.00	1,772.26
South Florida Water Management District (SFWMD)					
Public supply	1,014.80	32.10	1,046.90	0.00	1,046.90
Domestic self-supplied	48.62	0.00	48.62	0.00	48.62
Commercial-industrial-mining self-supplied	51.60	40.59	92.19	0.00	92.19
Agricultural self-supplied	517.69	955.43	1,473.12	0.00	1,473.12
Recreational-landscape irrigation	97.12	151.49	248.61	0.00	248.61
Power generation	3.59	22.21	25.80	2,538.16	2,563.96
Totals	1,733.42	1,201.82	2,935.24	2,538.16	5,473.40
Southwest Florida Water Management District (SWFWMD)					
Public supply	339.65	160.60	500.25	4.15	504.40
Domestic self-supplied	57.80	0.00	57.80	0.00	57.80
Commercial-industrial-mining self-supplied	59.79	5.45	65.24	0.00	65.24
Agricultural self-supplied	468.57	16.95	485.52	0.00	485.52
Recreational-landscape irrigation	60.44	5.69	66.13	0.00	66.13
Power generation	17.89	21.99	39.88	4,575.03	4,614.91
Totals	1,004.14	210.68	1,214.82	4,579.18	5,794.00
Suwannee River Water Management District (SRWMD)					
Public supply	14.14	0.00	14.14	0.00	14.14
Domestic self-supplied	20.01	0.00	20.01	0.00	20.01
Commercial-industrial-mining self-supplied	76.85	0.00	76.85	0.00	76.85
Agricultural self-supplied	131.55	1.38	132.93	0.00	132.93
Recreational-landscape irrigation	1.09	0.36	1.45	0.00	1.45
Power generation	1.75	138.21	139.96	0.00	139.96
Totals	245.39	139.95	385.34	0.00	385.34
State totals	4,166.78	2,215.70	6,382.48	7,854.80	14,237.28

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