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Estimating Benefits of Residential Outdoor Water Conservation: A Step-by-Step Guide[1]

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Introduction

This publication was developed to assist Extension agents, water-conservation managers, and homeowners in estimating the economic benefits of residential outdoor water conservation. Specifically, it provides guidance that can be used to report impacts related to known residential outdoor water savings: (1) financial savings households can see on their utility bills; (2) savings in water-delivery costs for Florida utilities; and (3) increased water supply for other properties in the neighborhood. This publication also offers an example of an impact statement that Extension agents can modify at the local level.

Conservation and efficiency have been important strategies for protecting Florida's critical water resources. With nearly 23 million residents, Florida is the third most populous state after California and Texas. The state's population continues to grow at a rate more than twice the average rate for the country overall, and it is projected to exceed 26 million people by 2040 (EDR 2021a). Growing population amplifies both indoor and outdoor water demands. Public water supply is currently the largest groundwater use category in the state, with domestic deliveries representing the largest component of public supply (Marella 2020).

Figure 1.
Credits: UF/IFAS Communications

In 2020, an estimated 2.2 billion gallons of water per day were withdrawn for public supply (Marella 2020). It takes approximately 50 gallons to fill a bathtub (University of Colorado Environmental Center Undated); in other words, public supply sector withdrawals are more than 50,000,000 bathtubs of water a day. Domestic per capita water use in Florida is estimated at 85 gallons per day (Marella 2020), as compared with 38 gallon in Europe (EEA 2018).

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Water conservation is one way to cut per-capita water use and offset the increases in population and water demand. Such offset is important because the water withdrawals needed to meet the growing public demand are depleting the groundwater supplies and potentially impacting spring and in-stream flows and lake levels throughout the state. As defined in the Florida Statutes, "the overall water conservation goal of the state is to prevent and reduce wasteful, uneconomical, impractical, or unreasonable use of water resources" (§ 373.227, Fla. Stat.).

Often, the main barrier for water conservation is the inadequate information about available strategies to conserve and the benefits associated with water conservation. Addressing this barrier is one goal of the UF/IFAS initiative "enhancing and protecting water quality, quantity, and supply" (2024-2029 Florida Cooperative Extension Pathway UF/IFAS 2024). Effective outreach programs implemented by UF/IFAS Extension agents and other organizations result in measurable reductions in water use that allow families and communities to contribute to Florida's water-resource protection goals.

It remains imperative to document the value of water conservation. For outreach organizations and water resource managers, estimating the benefits improves overall accountability, helps program marketing and promotion, and ensures broader engagement of community members. The demonstration of programmatic impacts also increases the likelihood of receiving new and continued program funding. For Florida residents, information about the benefits supports decision-making about water use, water conservation, and water-use-efficiency improvements.

Overview of Water Conservation Benefits

Reduction in household water and energy bills. Water use reduction translates into smaller payments for utility bills. For example, for a 5,000 square-foot yard and an in-ground sprinkler system, households can be spending from $5 to $25 for every irrigation event (Haley et al. 2015). The average US household spends more than $1,000 per year on water bills. On the other hand, families can save an average of $350 per year by switching to more water and energy-efficient fixtures (US EPA 2017). Note that water heaters are the third-largest energy user in the home after heating and cooling (Bailey Undated; US EIA 2020) and reducing water use can reduce both water and energy bills.

Ripple effects of changes in household water use. Changes in household water use multiply if one traces them through the water supply system. Specifically, household water use reduction decreases energy use needed for treating and delivering water to a residence. Running a water faucet in a house for 5 minutes requires as much energy as 14 hours of using a 60-watt light bulb (US EPA 2017). Energy can account for 40 percent of operating costs for drinking water systems, and drinking water and domestic wastewater plants are often the largest energy consumers for municipal governments, accounting for 30 to 40 percent of total energy consumed (US EPA 2020). Water conservation can translate into a significant reduction in energy use, and therefore, reduction in greenhouse gas emissions.

Reduction in greenhouse gas emissions. Nationwide, generating the energy for water and wastewater sectors results in more than 45 million tons of greenhouse gases emitted annually (US EPA 2020). The energy use can be especially high for brackish or saltwater treatment systems, becoming more and more common in Florida due to increasing groundwater scarcity. Kipp et al. (2011) examined Tampa Bay Water's electricity use for treating water from different sources. They showed that in 2008/09 when Tampa Bay Water included seawater desalination in their traditional ground- and surface-water treatment water-supply mix, their electricity expenditures increased by 138 percent. This result is particularly stunning given that the desalinated water accounted for less than 20 percent of total annual production. The study also showed that, on average, indirect carbon dioxide emissions were 18 times higher for seawater desalination than for groundwater treatment (measured as carbon dioxide equivalent per million gallons of potable water produced). Overall, home water savings can reduce coal and natural gas use in power production and related greenhouse gas emissions.

Deferred need for investments in additional water-supply infrastructure. Water suppliers need to periodically invest in expensive water-supply expansions to satisfy the growing water use caused by the population growth. Such investments are often funded through increasing water rates and local taxes. The Florida Department of Environmental Protection (FDEP 2015) reported that the costs of water treatment and supply from seawater desalination are as high as $8.51 per thousand gallons in northeast Florida. This is more than 30 times higher than the costs of treating groundwater, $0.25–$0.27 per thousand gallons. Conserving water can mean reliance on groundwater, postponement of expensive treatment facility construction, and slowing the increase in our taxes and water prices.

Potential water-quality benefits. Over-irrigation and excessive use of fertilizers on residential lawns contribute to pollution problems in rivers, lakes, streams, and springs. Degraded aquatic ecosystems diminish water-based recreational opportunities and impact local businesses reliant on recreationists' spending in the region. It also alters the flow of other "services" that people receive from nature (referred to as "ecosystem services," including water purification, climate regulation, and biodiversity support). Water-use efficiency and water conservation can help reduce pollution runoff and improve water quality in nearby streams, lakes, and springs (e.g., one can implement Florida-Friendly Landscaping™ principles to avoid environmental impacts). Avoiding water quality deterioration also means that the communities do not need to invest in expensive pollution abatement projects. For example, Russel et al. (2013) use the pollution abatement cost of $8.16 per pound of nitrogen. Taxes are among the primary sources of funding for water quality improvement projects. Therefore, preventing water pollution can mean saved tax revenues (that can instead be invested in land conservation, education, medical care, or other community priorities).

Approval of permits for water suppliers. In Florida, water suppliers must submit applications for water-conservation plans—and have those plans approved—to receive "consumptive use permits" (CUPs). These CUP applications are reviewed by Florida's five Water Management Districts and are intended to balance water withdrawals with the need to protect water resources, restore spring and stream flows and lake levels, or prevent reductions in spring and stream flows and lake levels. In the absence of residential water-conservation programs and associated savings, water suppliers would face additional challenges in securing permits for their public-supply water withdrawals.

These examples show that water conservation and efficiency can result in not only immediate financial gains, but numerous other individual, household, and community benefits as well. To summarize, the benefits of water conservation are as follows:

- Financial savings for individuals, families, and communities from reduced water and energy costs and delayed need for investments in costly water infrastructure;
- Protection of drinking-water resources (aquifers, rivers, streams, and lakes) and reduced vulnerability to droughts;
- Environmental benefits from reduced pollution runoff, protection of water sources, and avoided carbon emission and natural resource extraction.

Measuring Water Conservation Benefits

Behavior changes followed by improved social, economic, and environmental status resulting from an Extension program are the most difficult to bring about, and also the most difficult to evaluate (Harder 2019; Lamm et al. 2017). However, UF/IFAS has been encouraged to focus on reporting behavior changes and associated social, economic, and environmental condition changes to improve the quality of evaluation activities (Harder 2019; Lamm et al. 2017). The impacts of UF/IFAS water-conservation programs are easily observed at the local level. Extension professionals statewide collect outcomes in the form of gallons of water saved as a result of their programs. Some may have access to actual water-use data through partnerships with local communities or utilities. Others may make estimates through known savings associated with specific behaviors (Boyer and Dukes 2018).

While there are many benefits of residential water conservation that are evident or can be measured directly, some benefits are hard to estimate. For the remainder of this publication, we focus on financial savings households can see on their *water* utility bills; savings in water-delivery costs for Florida utilities; and increased water supply for other properties in a neighborhood. Furthermore, we focus on *outdoor, residential* water savings only. In Florida, landscape irrigation typically accounts for a significant proportion of total household water use. For example, Haley et al. (2007) found that irrigation accounted for two-thirds of total water use of single-family homes in central Florida. Up to 50 percent of water used for landscape irrigation can be wasted due to inefficient irrigation systems and methods (US EPA 2015), so there is significant potential for water conservation and improving outdoor water-use efficiency. Overall, outdoor water savings can range from 15 percent to 65 percent or more (AWE 2015).

Reporting Water Savings

UF/IFAS Extension programs result in a reduction in program attendees' water use and water bills. The following approach uses calculated gallons of water saved per year based on Estimated Water Savings Potential of Florida-Friendly Landscaping™ from Boyer and Dukes (2018) to calculate the financial benefits from Extension programs. Please note the following when calculating gallons of water conserved per year:

- Water-savings figures associated with the adoption of multiple behavior changes are unavailable. As a

conservative estimate, we recommend calculating savings based on the single behavior change that results in the greatest water savings.

- In Boyer and Dukes (2018), several water-savings estimates are presented in ranges. For consistency, we recommend using the mean of these ranges for reporting.
- Estimated water savings are most accurate when calculated with the known square footage of irrigated landscape. When unknown, we recommend using the average of 4,400 square feet.

Household Financial Savings (per 1000 Gallons of Water)

Water prices vary among water suppliers, and unit water prices increase with increases in water use (referred to as "inclining block rate pricing" or "inclining water-rate structures"). To accurately estimate water-bill reductions for the audiences reached by an Extension program, Extension agents need information about (1) baseline water use prior to the Extension program; (2) water-use reduction that can be attributed to the effect of the Extension program; and (3) water prices used by the water supplier. In some instances, a reduction in water bills can be estimated directly using water bills provided by attendees or water utilities (one example is UF/IFAS H2OSAV program, see Taylor et al. 2020). Extension agents and specialists can work together to collect and evaluate the information.

Example: A Florida Extension agent finds that among 200 Florida-Friendly Landscaping™ program participants, 72 reduced their irrigation from 3 days per week to 2 days per week as a result of attending a program. This change results in a savings of 10,483 gallons per 1,000 irrigated square feet per year (Boyer and Dukes 2018). The cumulative irrigated square footage of the 72 participants is 295,200 square feet. Therefore, the total water savings among the 72 participants is 3,094,582 gallons per year [(295,200 sq. ft. * 10,483 gallons per 1,000 sq. ft.) / 1,000 sq. ft.].

To simplify the task while still allowing for reasonable estimates, we suggest using a monthly water price of $5.03 per thousand gallons for the monthly water price. This figure is calculated based on monthly water bill data reported for Florida water utilities by Raftelis Financial Consultants (2022), the most comprehensive survey of Florida water rates, summarizing water bills over 220 Florida public utilities. Specifically, we use the state median water bills for 8,000 gallons per month, divided by 8, to estimate the charge per thousand gallons.

The price of $5.03 per thousand gallons recommended for impact assessment of the IFAS Extension programs is based on the assumption that Extension programs target large water users, that is, households with the monthly water use of 8,000 gallons or above. This assumption is consistent with the estimates in Boyer and Dukes (2018), that assumes an outdoor irrigation rate of 31,787 gallons per 1,000 square feet per year. Assuming a 4,400 square-foot yard, monthly outdoor irrigation for such a household is 11,655 gallons per month. With the indoor water use of 4,521 gallons per month (Davis and Dukes 2014), such a household would be using approximately 16,000 gallons per month in total. Instead of using the statewide price, the agents can also check the "Conservation Signal" in UNC and Raftelis Consulting (2020) for the water utilities in their areas and use that price in calculating the program impact.

To calculate the annual financial savings among Extension clients, divide the total gallons of water saved (per year) by 1,000, and multiply by the relevant cost per thousand gallons.

Example: A Florida Extension agent finds that the total water savings among 72 participants is 3,094,582 gallons per year. This is valued at $15,565.75 in financial savings among the 72 clients over the course of a year [(3,094,582 / 1,000) * $5.03]. This amount would translate into an average of $216.19 per household per year [$15,565.75 / 72 clients], or an average of $18.02 per household per month [$216.19 / 12 months].

Special Case: Reduction in Wastewater Fees for Residential Families

Water conservation can provide significant financial benefits to customers if both water and wastewater charges are reduced. Wastewater rates are generally higher than those for water. Should the reduction in wastewater fees be considered an impact of water conservation? To address this, we analyzed wastewater bill data from Raftelis Financial Consultants (2022). Of the 228 water utilities included in the report, customers of 206 companies (90.4%) could expect reductions in both water and wastewater fees due to water conservation. These included customers of 105 companies that relied on the metered water use data to charge both water and wastewater fees and 101 companies that decoupled the water and wastewater charges at a high water use level (i.e., above 15,000 gallons per month or above). Customers of the remaining 9.6% of utilities may still observe some reductions in wastewater fees, though

this depends on factors such as the utility's wastewater pricing structure, water usage patterns, and whether the same utility company provides their wastewater and water.

When deciding whether wastewater fee reductions should be included in impact assessments, Extension professionals can consider the following two factors (a) approximate water use of the audience targeted by the program and (b) wastewater fee structure in their target community (see Table 1). The wastewater fee should be included in the agents' impact statement when Table 1 reports no upper limit for the relevant utility (i.e., 'N/A' in Table 1) or the limit is very high (i.e., higher than the water use of the target audience). The estimated statewide average wastewater treatment price is $7.72 per 1,000 gallons of water use reduction. This unit price is based on average wastewater bills, as reported by Raftelis Financial Consultants (2022). Specifically, we use the state median wastewater bills for 8,000 gallons per month, divided by 8, to estimate the charges per thousand gallons of wastewater.

To calculate the annual financial savings associated with wastewater use (bill) reduction among Extension clients, divide the total gallons of water saved (per year) by 1,000, and multiply by the average cost per thousand gallons of wastewater.

Example: A Florida Extension agent finds that the total water savings among 72 participants are 3,094,582 gallons per year, valued at $15,565.75 in financial savings among the 72 clients annually, as discussed above, or $216.19 per household per year, on average. The agent observes that most of the attendees are from Okaloosa County. Based on Table 1, many water utilities in the County charge both water and wastewater fees based on metered water use (even when the water use is high - at 16,000 gallons per month or higher). Therefore, water conservation should decrease both water and wastewater fees. The wastewater fee reduction is valued at $23,890.17 in annual wastewater costs ([3,094,582 gallons saved / 1,000 gallons] * $7.72), or $331.81 per household per year ($23,890.17 / 72 clients). This value can be added to household water bill savings of $216.19, resulting in a $548 total bill reduction per household per year (or $45.67 per month per household).

Water Supply for Other Properties in the Neighborhood

To provide additional context for the value of water savings from implementation of water efficiency and conservation practices, the volume of water used in a household using best management practices for water conservation can be compared with the volume of water needed to supply a typical household. DeOreo et al. (2016) studied water use for 23,749 single-family residential houses selected from 23 utilities nationwide and found that average annual water use per household ranged from 44,000 to 175,000 gallons per household per year, with an average of 88,000 gallons per household per year (or 7,333 gallons per household per month). Using this estimate, Extension agents can calculate the number of households that could be supplied with water as a result of conservation programming efforts.

To calculate the increased water supply to other households, take the calculated annual water savings, in gallons, and divide by 88,000. The result you receive is the number of households that can be supplied with "conserved" water for one year.

Example: A Florida Extension agent finds that the total water savings among 72 participants is 3,094,582 gallons per year. This is enough water to supply 35 households with water for one year. (3,094,582 gallons saved / 88,000 gallons per household per year).

Sample Impact Statement

Despite having abundant water resources and plentiful rainfall, Florida's public water supplies are stressed by the 21.5 million people who live in the state. By 2040, Florida's population is expected to exceed 26 million residents (EDR 2021a). To meet expected demand, Florida will need 0.98 billion gallons of fresh water per day, a 15.3 percent increase from current use (EDR 2021b). Moreover, by 2070, it is expected that 15 million new residents will be living in Florida, and if the 2010 development pattern continues, development-related freshwater demand will increase by as much as 100 percent (UF GeoPlan Center 2016). Water demands already exceed existing groundwater supply in many areas of the state (EDR 2021b). Forecasted population growth and associated water demands must be addressed by the expansion of this water-supply capacity; the conservation of existing water resources is considered an important and complementary solution. UF/IFAS Extension addresses the need to conserve water by conducting educational programming statewide. For example, the Florida-Friendly Landscaping™ program helps residents conserve water by adopting and installing water-conservation practices and technologies in their home landscapes.

In the sample county, the target audience is residents who use irrigation in the home landscape. The popular quarterly Micro-Irrigation Field Day and the Florida-Friendly Home Irrigation Lab reached 200 households in 2022. In

2022, 50 percent (n = 100) of the sample county landscape water-conservation program participants (n = 200) adopted new best management practices for water conservation. These behavior changes will result in the conservation of 5,800,000 gallons of water annually. This is enough water to supply nearly 66 households with water per year; this water savings is valued annually at $29,174, or $442.03 per household per year (based on the statewide median water price of $5.03).

Details may be added to the above impact statement based on local activities in accordance with the guidelines available in UF/IFAS (Undated (a)), Harder and Borger (2019), and the UF/IFAS Priority Work Groups (UF/IFAS Undated(b)). A calculator is forthcoming to assist with conducting the above described calculations.

Other Considerations in Water Conservation Assessments

Prices and the Value of Water

Water suppliers set water prices primarily based on their financial costs. Because of this, price is a poor indicator of the total value (or benefits) that people derive from using water. However, prices have been increasing and are directly related to the financial savings for the families associated with water conservation. Water prices used in this publication should be treated as conservative estimates. The price of bottled water has been suggested as a comparable metric for estimating the value (opportunity cost) of water saved (consumed). For example, in 2019, the Beverage Marketing Corporation reported the average wholesale price for domestic non-sparkling bottled water as $1.18 per gallon (or $1,180 per thousand gallons, compared with $3.74 per thousand gallons for tap water estimated in this publication) (IBWA 2019). Note that the actual cost consumers are paying at retail locations is even higher. For example, in 2013, an article in *Business Insider* reported an estimate of $7.50 per gallon (or $7,500 per thousand gallon), based on the retail price of 16.9-oz (500 mL) bottles (Boesler 2013).

Well Water/Reclaimed Water for Irrigation

Some Extension agents work with individuals or families who rely on private wells or reclaimed water to irrigate their landscapes. For such Extension clients, financial savings from outdoor water conservation can be modest. However, water conservation is still an important programming goal because it results in environmental benefits and allows for more water in the aquifers, streams, springs, and lakes for environmental, agricultural, or other important uses. In such cases, agents can focus on reporting water savings in terms of water available for future water supply or alternative uses (see Water Supply for Other Properties in the Neighborhood, above).

Other Water Conservation Benefits

This document does not report important energy-use reduction, water-quality improvements, or other benefits associated with water conservation. The publication will be revised as better data become available.

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Table 1. Water use at which water and wastewater charges decouple, by county and water utility.*

County	Utility Name	Rates Effective Date	Water Use (Gal)**
Alachua	Gainesville Regional Utilities	10/1/2021	N/A
Alachua	City of Alachua	10/1/2021	N/A
Alachua	City of High Springs	4/1/2022	15,000
Alachua	City of Newberry	9/27/2021	Seasonal
Baker	City of Macclenny	10/1/2019	N/A
Bay	Bay County	10/1/2021	N/A
Bay	City of Callaway	-	12,000
Bay	City of Lynn Haven	10/1/2019	N/A
Bay	City of Mexico Beach	10/1/2021	12,000
Bay	City of Panama City	10/1/2021	N/A
Bay	City of Panama City Beach	10/1/2021	N/A
Bay	City of Parker	10/1/2021	12,000
Brevard	Brevard County	2/1/2021	N/A
Brevard	City of Cape Canaveral	10/1/2020	12,000
Brevard	City of Cocoa	10/1/2021	N/A
Brevard	City of Melbourne	10/1/2021	10,000
Brevard	City of Palm Bay	10/1/2021	15,000
Brevard	City of Titusville	10/1/2021	N/A
Brevard	City of West Melbourne	-	15,000
Broward	Broward County	10/1/2020	10,000
Broward	City of Coconut Creek	4/1/2017	10,000
Broward	City of Cooper City	10/1/2021	N/A
Broward	City of Coral Springs	10/1/2020	N/A
Broward	City of Dania Beach	-	12,000
Broward	City of Deerfield Beach	3/1/2008	N/A
Broward	City of Fort Lauderdale	10/1/2021	N/A
Broward	City of Hallandale Beach	-	11,220
Broward	City of Hollywood	11/1/2021	N/A
Broward	City of Margate	10/1/2020	N/A
Broward	City of Miramar	9/18/2019	N/A
Broward	City of North Lauderdale	-	15,000
Broward	City of Oakland Park	10/1/2021	N/A
Broward	City of Pembroke Pines	10/1/2021	N/A
Broward	City of Plantation	-	10,000
Broward	City of Pompano Beach	1/1/2020	16,000
Broward	City of Sunrise	10/1/2018	12,000
Broward	City of Tamarac	10/1/2014	15,000
Broward	City of Wilton Manors	-	15,000
Broward	Town of Davie	10/1/2021	N/A
Broward	Town of Hillsboro Beach	2/2/2016	10,000
Charlotte	Charlotte County	4/1/2021	10,000
Charlotte	City of Punta Gorda	10/1/2021	10,000
Citrus	Citrus County Utilities	10/1/2021	6,000
Citrus	City of Crystal River	10/1/2020	N/A
Citrus	City of Inverness	10/1/2021	15,000

County	Utility Name	Rates Effective Date	Water Use (Gal)**
Clay	City of Green Cove Springs	1/1/2022	14,800
Clay	Town of Orange Park	11/1/2018	12,000
Clay	Town of Penney Farms	9/21/2021	N/A
Collier	City of Marco Island	5/1/2020	6,000
Collier	City of Naples	10/1/2021	10,000
Collier	Collier County	10/1/2021	15,000
Collier	Immokalee Water and Sewer District	10/1/2021	15,000
Columbia	City of Lake City	10/1/2021	16,000
De Soto	City of Arcadia	10/1/2021	N/A
De Soto	DeSoto County	10/1/2019	N/A
Duval	Beaches Energy Services (City ofJacksonville Beach)	-	15,000
Duval	City of Neptune Beach	10/1/2018	N/A
Duval	JEA (City of Jacksonville)	10/1/2012	20,000
Escambia	Emerald Coast Utilities Authority	10/1/2019	N/A
Flagler	City of Palm Coast	-	8,000
Gadsden	City of Chattahoochee	1/1/2007	12,000
Gulf	City of Port St. Joe	10/1/2021	N/A
Hardee	City of Bowling Green	10/1/2019	N/A
Hardee	Town of Zolfo Springs	4/27/2021	N/A
Hendry	City of Clewiston	10/1/2010	N/A
Hernando	City of Brooksville	-	N/A
Hernando	Hernando County	10/1/2021	10,000
Highlands	Town of Lake Placid	10/1/2018	N/A
Hillsborough	City of Plant City	10/1/2021	15,000
Hillsborough	City of Tampa	10/1/2021	Seasonal
Hillsborough	Hillsborough County	10/1/2021	8,000
Indian River	City of Vero Beach	10/1/2010	10,000
Indian River	Indian River County	11/9/2021	N/A
Jefferson	City of Monticello	10/31/2021	N/A
Lake	City of Clermont	10/1/2021	16,000
Lake	City of Eustis	6/1/2021	10,000
Lake	City of Groveland	1/1/2020	N/A
Lake	City of Leesburg	11/1/2021	15,708
Lake	City of Mascotte	8/4/2020	10,000
Lake	City of Minneola	-	15,000
Lake	City of Mount Dora	10/1/2020	8,976
Lake	City of Tavares	10/1/2020	14,000
Lake	City of Umatilla	10/1/2017	20,000
Lake	Town of Lady Lake	10/1/2021	N/A
Lake	Town of Montverde	4/1/2021	N/A
Lee	Bonita Springs Utilities, Inc.	-	16,000
Lee	City of Cape Coral	10/1/2013	N/A
Lee	City of Fort Myers	10/1/2021	N/A
Lee	City of Sanibel	10/1/2021	N/A

County	Utility Name	Rates Effective Date	Water Use (Gal)**
Lee	Gateway Community Development	1/1/2022	N/A
Lee	Greater Pine Island Water Association	10/1/2020	N/A
Lee	Island Water Association	3/1/2009	N/A
Lee	Lee County	10/1/2014	9,000
Lee	Lehigh Acres	10/1/2021	6,000
Lee	North Fort Myers	10/1/2021	6,000
Lee	Town of Fort Myers Beach	10/1/2021	N/A
Leon	City of Tallahassee	1/1/2022	N/A
Levy	City of Williston	2/1/2020	N/A
Liberty	Liberty County	10/1/2020	N/A
Manatee	City of Bradenton	10/1/2019	N/A
Manatee	City of Palmetto	10/1/2019	12,000
Manatee	Manatee County	10/1/2021	10,000
Manatee	Town of Longboat Key	10/1/2021	10,000
Marion	City of Belleview	11/1/2019	N/A
Marion	City of Dunnellon	-	N/A
Marion	City of Ocala	-	9,724
Marion	Marion County	1/1/2016	6,000
Martin	City of Stuart	10/1/2021	12,000
Martin	Martin County	6/1/2019	10,000
Martin	South Martin Regional Utility	10/1/2021	10,000
Miami	City of Hialeah	10/1/2020	N/A
Miami	City of Hialeah Gardens	10/1/2021	N/A
Miami	City of Homestead	10/1/2021	N/A
Miami	City of Miami Beach	10/1/2021	N/A
Miami	City of North Miami	12/1/2021	N/A
Miami	City of North Miami Beach	10/1/2021	N/A
Miami	Miami-Dade County	10/1/2021	N/A
Monroe	City of Key West	-	N/A
Monroe	City of Marathon	10/1/2018	12,000
Monroe	Florida Keys Aqueduct Authority	10/1/2021	10,000
Monroe	Key Largo Wastewater TreatmentDistrict	1/1/2020	12,000
Monroe	Key West Resort Utilities Corp.	-	10,000
Monroe	Village of Islamorada	12/1/2020	12,000
Okaloosa	City of Crestview	10/1/2020	16,000
Okaloosa	City of Fort Walton Beach	-	16,000
Okaloosa	City of Mary Esther	10/1/2020	N/A
Okaloosa	Destin Water Users	1/1/2022	20,000
Okaloosa	Okaloosa County	10/1/2019	10,000
Okeechobee	Okeechobee Utility Authority	4/1/2020	N/A
Orange	City of Apopka	10/1/2019	12,000
Orange	City of Maitland	10/1/2019	N/A
Orange	City of Ocoee	10/1/2019	12,000

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Orange	City of Orlando	10/1/2019	14,000
Orange	City of Winter Garden	-	10,000
Orange	City of Winter Park	10/1/2021	14,000
Orange	Orange County Utilities	-	14,000
Orange	Orlando Utilities Commission	4/1/2021	N/A
Orange	Reedy Creek Improvement District	9/20/2021	8,000
Orange	Town of Oakland	-	N/A
Osceola	City of St. Cloud	1/1/2021	N/A
Osceola	Toho Water Authority	10/1/2021	N/A
Palm Beach	City of Boca Raton	10/1/2021	N/A
Palm Beach	City of Boynton Beach	10/1/2021	7,000
Palm Beach	City of Delray Beach	10/1/2016	12,000
Palm Beach	City of Lake Worth Beach	10/1/2021	12,000
Palm Beach	City of Riviera Beach	10/1/2021	10,000
Palm Beach	City of West Palm Beach	10/1/2020	11,968
Palm Beach	Loxahatchee River District	4/1/2020	N/A
Palm Beach	Palm Beach County	10/1/2021	10,000
Palm Beach	Seacoast Utility Authority	10/1/2021	10,000
Palm Beach	Town of Jupiter	10/1/2021	N/A
Palm Beach	Town of Lake Clarke Shores	10/1/2021	10,000
Palm Beach	Town of Lantana	10/1/2021	10,000
Palm Beach	Village of Palm Springs	10/1/2021	8,000
Palm Beach	Village of Tequesta	10/1/2021	N/A
Palm Beach	Village of Wellington	10/1/2021	15,000
Pasco	Aloha Gardens	10/1/2019	10,000
Pasco	City of Dade City	10/1/2019	N/A
Pasco	City of New Port Richey	10/1/2021	15,000
Pasco	City of Zephyrhills	10/1/2021	N/A
Pasco	Pasco County	2/1/2020	10,000
Pasco	Seven Springs	10/1/2019	10,000
Pinellas	City of Clearwater	10/1/2021	N/A
Pinellas	City of Dunedin	10/1/2021	10,000
Pinellas	City of Gulfport	10/1/2021	N/A
Pinellas	City of Largo	10/1/2021	10,000
Pinellas	City of Oldsmar	10/1/2019	N/A
Pinellas	City of Pinellas Park	10/1/2021	N/A
Pinellas	City of Safety Harbor	10/1/2020	15,000
Pinellas	City of St. Petersburg	10/1/2021	N/A
Pinellas	City of Tarpon Springs	10/1/2021	20,000
Pinellas	City of Treasure Island	12/1/2021	N/A
Pinellas	Pinellas County	10/1/2021	10,000
Pinellas	Town of Belleair	10/1/2021	N/A
Polk	City of Auburndale	10/1/2021	N/A
Polk	City of Bartow	10/1/2015	10,000
Polk	City of Davenport	10/1/2021	10,000

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Polk	City of Eagle Lake	10/1/2018	N/A
Polk	City of Fort Meade	10/1/2020	10,000
Polk	City of Frostproof	-	N/A
Polk	City of Haines City	10/1/2021	10,000
Polk	City of Lake Alfred	10/1/2021	10,000
Polk	City of Lake Wales	10/1/2021	15,000
Polk	City of Lakeland	10/1/2021	12,000
Polk	City of Winter Haven	10/1/2021	N/A
Polk	Polk County	10/1/2019	7,000
Polk	Town of Dundee	4/1/2019	N/A
Santa Rosa	City of Gulf Breeze	10/1/2021	N/A
Santa Rosa	City of Milton	-	N/A
Sarasota	City of North Port	10/1/2021	12,000
Sarasota	City of Sarasota	9/1/2021	N/A
Sarasota	City of Venice	10/1/2021	N/A
Sarasota	Sarasota County	10/1/2021	10,000
Seminole	City of Altamonte Springs	10/1/2021	N/A
Seminole	City of Casselberry	10/1/2021	N/A
Seminole	City of Longwood	1/1/2020	N/A
Seminole	City of Oviedo	-	10,000
Seminole	City of Sanford	10/1/2021	12,000
Seminole	City of Winter Springs	10/1/2021	10,000
Seminole	Seminole County	1/1/2022	15,000
St. Johns	City of St. Augustine	10/1/2021	10,000
St. Johns	St. Johns County - Main System	10/1/2021	10,000
St. Johns	St. Johns County - Ponte VedraSystem	10/1/2021	10,000
St. Lucie	City of Port St. Lucie	10/1/2019	8,000
St. Lucie	Fort Pierce Utilities Authority	11/1/2021	10,000
St. Lucie	St. Lucie County Utilities	2/1/2022	10,000
St. Lucie	St. Lucie West Services District	10/1/2009	N/A
Sumter	City of Wildwood	11/20/2021	N/A
Sumter	Little Sumter Service Area	10/1/2021	10,000
Sumter	Village Center Service Area	10/1/2021	N/A
Volusia	City of Daytona Beach	10/1/2021	N/A
Volusia	City of DeLand	10/1/2021	10,000
Volusia	City of Deltona	12/1/2021	10,000
Volusia	City of Edgewater	10/1/2021	N/A
Volusia	City of Orange City	1/1/2020	9,000
Volusia	City of Ormond Beach	10/1/2021	N/A
Volusia	City of Port Orange	9/1/2017	12,000
Volusia	City of South Daytona	10/1/2021	N/A
Volusia	Town of Pierson	7/1/2021	N/A
Volusia	Town of Ponce Inlet	10/1/2015	12,000
Volusia	Utilities Commission of New Smyrna Beach	10/1/2021	N/A

County	Utility Name	Rates Effective Date	Water Use (Gal)**
Volusia	Volusia County - Softened	1/1/2021	14,000
Volusia	Volusia County - Unsoftened	1/1/2021	14,000
Wakulla	City of St. Marks	-	N/A
Walton	City of DeFuniak Springs	10/1/2021	N/A
Walton	Regional Utilities - Walton County	-	N/A
Walton	South Walton Utility Company	10/1/2021	12,000
Washington	City of Chipley	9/11/2021	N/A

* Based on Raftelis Financial Consulting (2022)
** N/A stands for "not applicable" and implies that wastewater fees are charged based on water meter readings; Seasonal refers to the calculations of wastewater fees based on water use in a specific season (e.g., winter months).