FY2024 Rainfall Signage to Reduce Residential Irrigation Project Final Report

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Southwest Florida Water Management District

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FY2026 Rainfall Signage to Reduce Residential Irrigation Phase II

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FY2021 Rainfall Signage to Reduce Residential Irrigation Phase I

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Executive Summary

Introduction

Organizations use a variety of approaches to encourage residents to reduce water use. These approaches result in varying degrees of actual water use reductions. They also can unintentionally increase water use, revealing more strategic approaches to behavior change are needed. This project assessed the strategic approach of how education about weekly rainfall and turf water requirements influenced residential irrigation water consumption.

Background

The Southwest Florida Water Management District (District) receives approximately 52.7” of rain annually, but this rainfall is not distributed equitably throughout the year. The prevailing mindset towards landscape watering is to provide a lawn’s water requirements through irrigation with minimal — or no — consideration of rainfall. Because of this mindset, overwatering can easily occur in residential landscapes when irrigation systems are not adjusted appropriately. Therefore, there is a significant opportunity to conserve water if residents are encouraged and empowered to adjust their irrigation based on local rainfall.

In researching educational outreach strategies to reduce residential water consumption in the lawn and landscape, District staff reviewed a 2016 study conducted by Felicia D. Survis of Florida Atlantic University titled, “Beyond Water Restrictions: Informing Effective Lawn Watering Behavior” (Beyond Water Restrictions). The study tested a rainfall-based water conservation strategy to determine if providing residents with information about weekly rainfall quantities could influence their motivation to apply supplemental irrigation, effectively reducing residential irrigation water consumption. The study included a control neighborhood with no weekly rainfall education and an experimental neighborhood where signage was installed educating residents of weekly turf water needs and actual weekly rainfall. The study results found that residents within the experiment community irrigated up to 61% less frequently than residents within the control group.

As part of the District’s Water Conservation Initiative Team, District staff met with local utilities to determine if they would be interested in participating in a similar study. Implementation by utilities was going to be a challenge due to their lack of staff available to physically update weekly rainfall data on the sign. As a result, this “Rainfall Signage to Reduce Residential Irrigation” (Rainfall Signage Project) project was designed to replicate the “Beyond Water Restrictions” study with the exception that staff would not physically change the rainfall data on the sign. The Rainfall Signage Project was designed to allow weekly rainfall data to be updated electronically from a remote location over one year, which significantly decreased the staff time needed to implement

the project. The sign also included cellular connectivity and solar power to avoid electrical costs to the participating homeowners' association.

The Rainfall Signage Project was originally piloted from November 2022 to November 2023 at the Hunter's Green community in Tampa, Florida. Results from the pilot project pre-/post-survey showed no changes to self-reported conservation practices or knowledge. In addition, there was no evidence to suggest the sign influenced irrigation water consumption, which did decrease in the study community but by about the same amount it decreased in the control neighborhoods.

While the pilot project did not achieve behavior change goals or a reduction in residential water use, many lessons were learned related to the solar technology (e.g., battery size, LED display color, panel angle adjustment, etc.) and educational outreach. The pilot did not include educational components beyond the sign.

As a result of the lessons learned during the Phase I pilot, the Rainfall Signage Project was repeated in the Ayersworth Glen community in Hillsborough County, Florida from July 2024 to July 2025. Updates to this Phase II pilot included battery size, solar panel angle adjustments, updating of rainfall data daily with a 7-day rolling total, and incorporating community outreach and educational components.

Project Goals and Objectives

The goal of this project was to evaluate the effect that education about weekly rainfall and turf water needs has on reducing residential water use. The following were the objectives:

1) To increase by 10% the number of residents within the experiment community who self-report reducing the amount of irrigation water they apply based on weekly rainfall from the June 2024 pre-survey to the August 2025 post-survey.
2) To reduce the experiment community's average annual water consumption by 10% from the pre-project timeframe of July 2024-July 2025 compared to the project timeframe of July 2024-July 2025.
3) To obtain a project cost below $4 per one thousand gallons of water saved by the experiment community at the end of the project timeframe of July 2024-July 2025.

Summary of Methods

This report includes the post-survey data and water use data. A pre-survey with the same core questions was conducted in June 2024 to collect baseline data of residents within the experiment community prior to sign installation. The post-survey was conducted in August 2025, one-year post-sign installation. Both surveys were distributed using a mixed-mode design which included a QR code and pre-paid return envelopes to maximize participation. The data collected included knowledge,

perceptions and behaviors related to outdoor water use and barriers to conserving water.

The water use analysis portion of this study used property-level, monthly water use data provided by the utility service provider, Hillsborough County Water Utilities. Change in water use was evaluated by the District's Water Supply Section, with respect to rainfall and a nearby comparison community, Panther Trace.

Post-Project Key Findings

- Water use per household per day was reduced by 18 gallons, totaling an annual water savings of nearly 6 million gallons for the experiment community, independent of rainfall patterns. This was a 6.1% reduction in average annual water consumption. *Our objective was 10%, but the results are still very positive.*
- Cost per thousand gallons saved was $1.51 for the refurbished sign and education in the Ayersworth Community. *The objective was to be below $4.*
- Half of respondents (49%) reported an increase in awareness of their lawns water needs compared to before sign installation.
- One-third (34%) of respondents reported adjusting their controller slightly more often to much more often compared to before sign installation.
- There was a significant increase (8%) of residents who believe adjusting their irrigation practices based on local rainfall fits within their community's landscape expectations.
- Open-ended survey response recommendations included providing rainfall data via a web link in addition to the sign.
- Future educational materials should include links to irrigation controller websites with instructions on how to set the controller, information regarding watering restrictions including days and hours based on home addresses and information on Florida-Friendly Landscaping™.

Project Location

Figure 1. Southwest Florida Water Management District Map

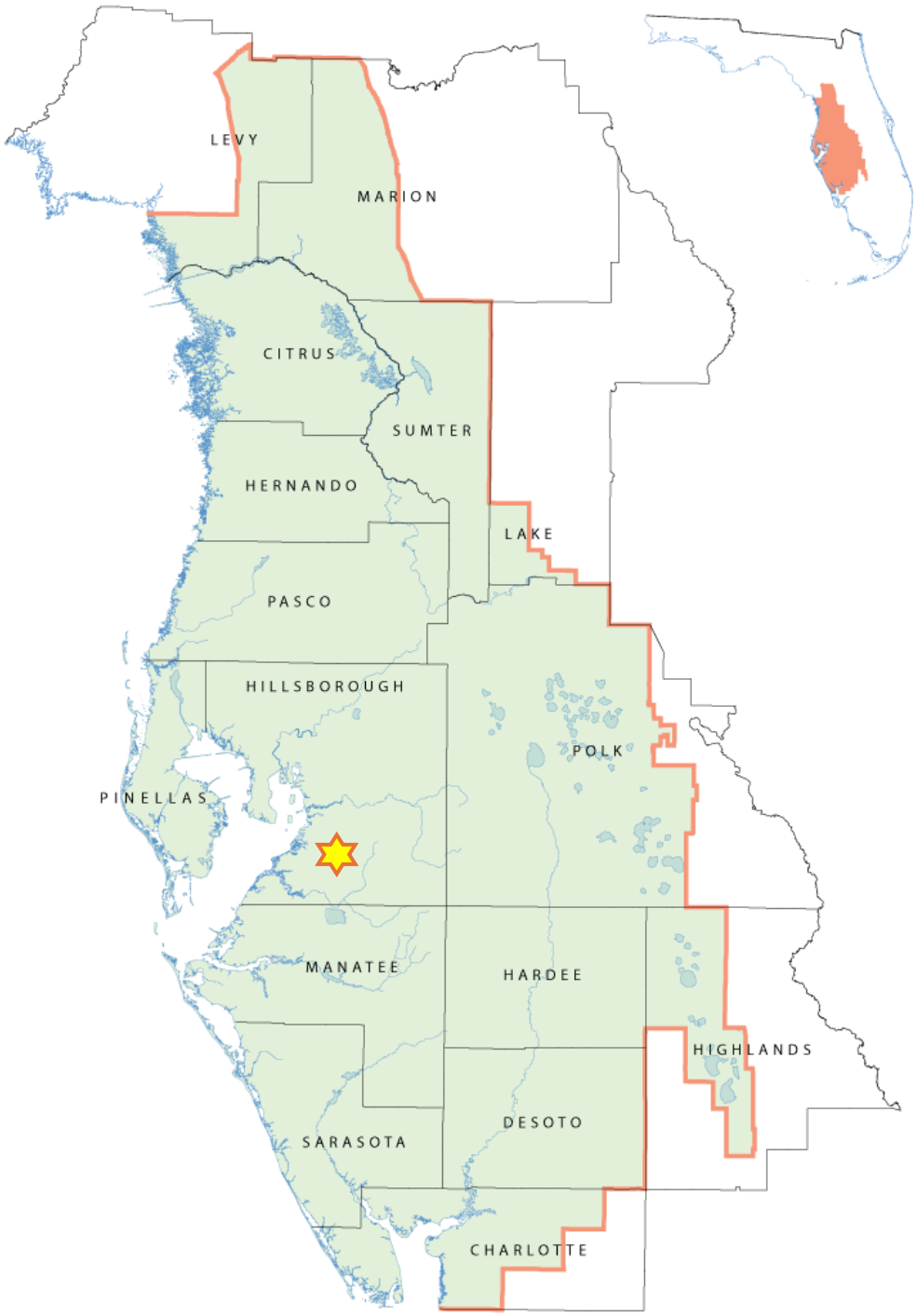
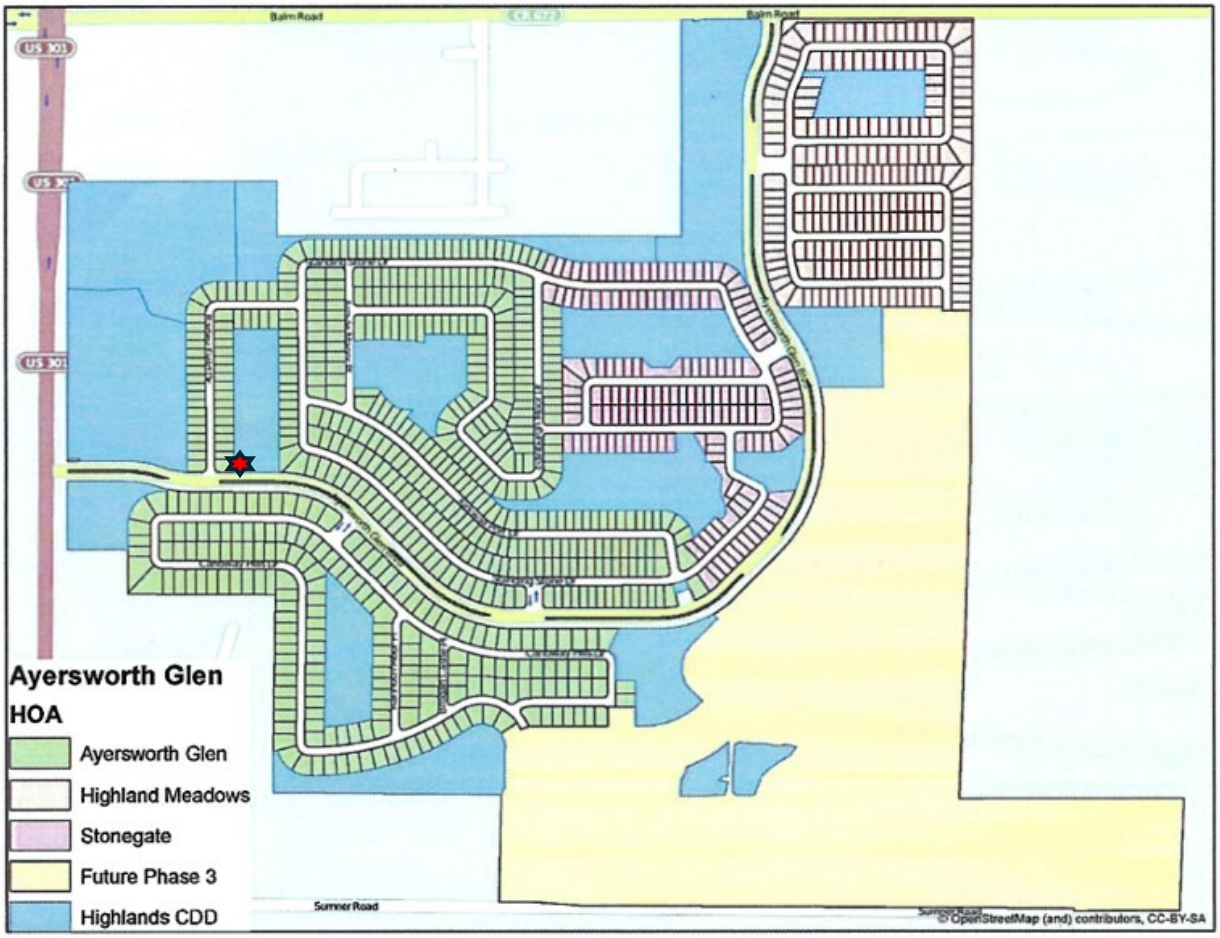


Figure 2. Ayersworth Glen Community Map



Methods

Survey Data Collection

Prior to sign installation, in coordination with Hillsborough County Utilities, the District selected Ayersworth Glen as the experimental neighborhood and presented the project to the Ayersworth Glen CDD Board and obtained the signed Participation Application and Agreement from the Highlands CDD management company to ensure community buy-in. The experiment community population was approximately 1,700 households in the Ayersworth Glen community. The post-survey was designed to parallel the baseline information collected prior to sign installation including knowledge, perceptions and behaviors related to outdoor water use and barriers to conserving water. Additional questions were added to the post-survey that were not in the pre-survey to gather residents' awareness of the project, self-reported changes in target behaviors and open-ended feedback and suggestions.

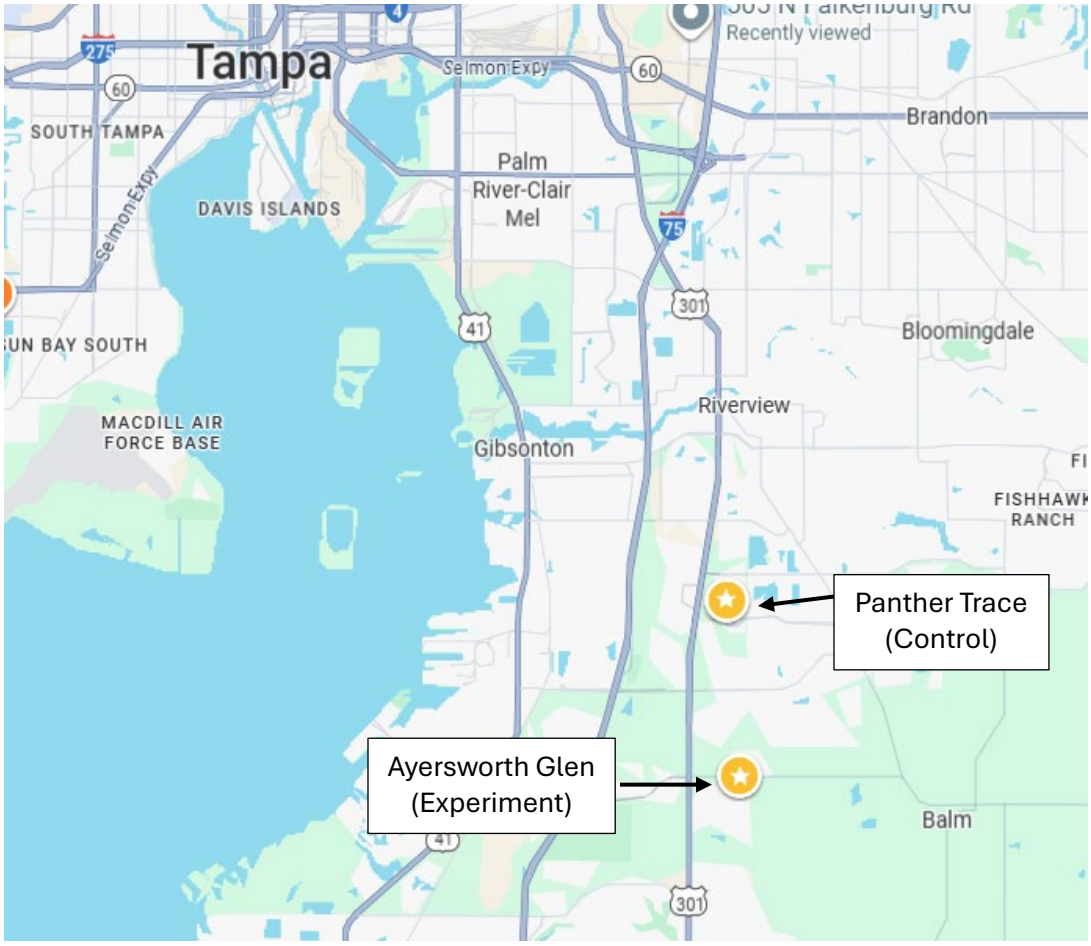
Surveys were distributed via mail with household addresses provided by the Ayersworth Glen management company. Mail surveys included a QR code link to encourage respondents to complete the survey electronically, or they could complete a hard copy of the survey and return it using a pre-paid envelope.

The pre-survey was conducted in June 2024 with 223 completed surveys, and the post-survey was conducted in August 2025 with 62 completed surveys.

Water Use Analysis Methods

A comparison neighborhood, Panther Trace, was selected based on geographic proximity, average home size and average lot size. In addition, demographics such as income, age, race and household makeup (i.e., heavily parents with school-aged children) were similar between the experiment and control communities.

Figure 3. Control and Experiment Community Map



To ensure the comparison matched the treatment group, properties were removed based on the following criteria:

- Consistent Use — Households with monthly water use less than 10 gallons per household per day (gpdh) for any month were removed due to inconsistent use during the test period due to confounding factors (e.g., vacancies, data errors, etc.).
- Extreme Change — Households with a percentage change in water use greater than 100% (doubled water use) between pre-sign installation and post-sign

period were removed as this is understood to be a result of an external variation and would skew results.

The table below summarizes the number of observations removed as outliers and the remaining households used in the final analysis.

Ayersworth Glen — Treatment Group		
Disqualifier Used	Disqualified	Remaining
Neither / Full	0	905
Consistent Use	108	797
Extreme Change	31	874
Both (Analysis Sample)	129	776

Panther Trace — Control Group		
Disqualifier Used	Disqualified	Remaining
Neither / Full	0	1133
Consistent Use	259	874
Extreme Change	58	1075
Both (Analysis Sample)	291	842

Lot size and home size were components that helped determine reasonable comparison between the two communities. Average lot sizes in both communities were identical ranging from 4,500 to 6,500 square feet (0.10–0.15 acres). The comparison community, Panther Trace, has slightly larger homes averaging 2,150 square feet versus the experiment community, Ayersworth Glen, with homes averaging 1,900 square feet (250 square foot difference).

Hillsborough County Utilities provided residential water use data of the Ayersworth Glen (experiment) and Panther Trace (control) communities. Water use data was compared from one year prior to sign installation (July 2023–July 2024) to one-year post-sign installation (July 2024–July 2025), as well as compared between the experiment and control communities. The final water use analysis was conducted in February 2026.

Water savings resulting from the Rainfall Signage Project were as follows:

- Average savings per home per day: 18 gallons
- Total Ayersworth Glen savings per day: 6,617 gallons
- Total Ayersworth Glen savings per year: 5,988,792 gallons

When considering whether to fund water conservation projects, the District traditionally ranks projects high that have a cost per thousand gallons saved under $6/Kgpd. The cost per thousand gallons saved for the Rainfall Sign Project varies depending on whether the sign is new or refurbished. The cost per thousand gallons saved given a three-year service life is as follows:

- Refurbished sign with educational mailouts: $1.51
- New sign with educational mailouts: $2.65

Complete Findings

Survey Findings

- The District received 223 pre-surveys (June 2024) and 62 post-surveys (August 2025). Those who responded that they did not have or did not know if they had an inground irrigation system were disqualified from completing the survey, leaving 220 pre-surveys (margin of error 6%) and 61 post-surveys (margin of error 12%) in the analysis. While survey responses were similar between the pre-/post-surveys, it is worth noting the difference in the number of responses between the two surveys. The primary external factor that may have contributed to the lower number of post-survey responses is likely the back-to-school seasonal shift as the Ayersworth Glen community is heavily populated with families with school-aged children.

- Of those who completed the survey, nearly all respondents (95% pre-survey; 98% post-survey) control how often they run their irrigation systems.

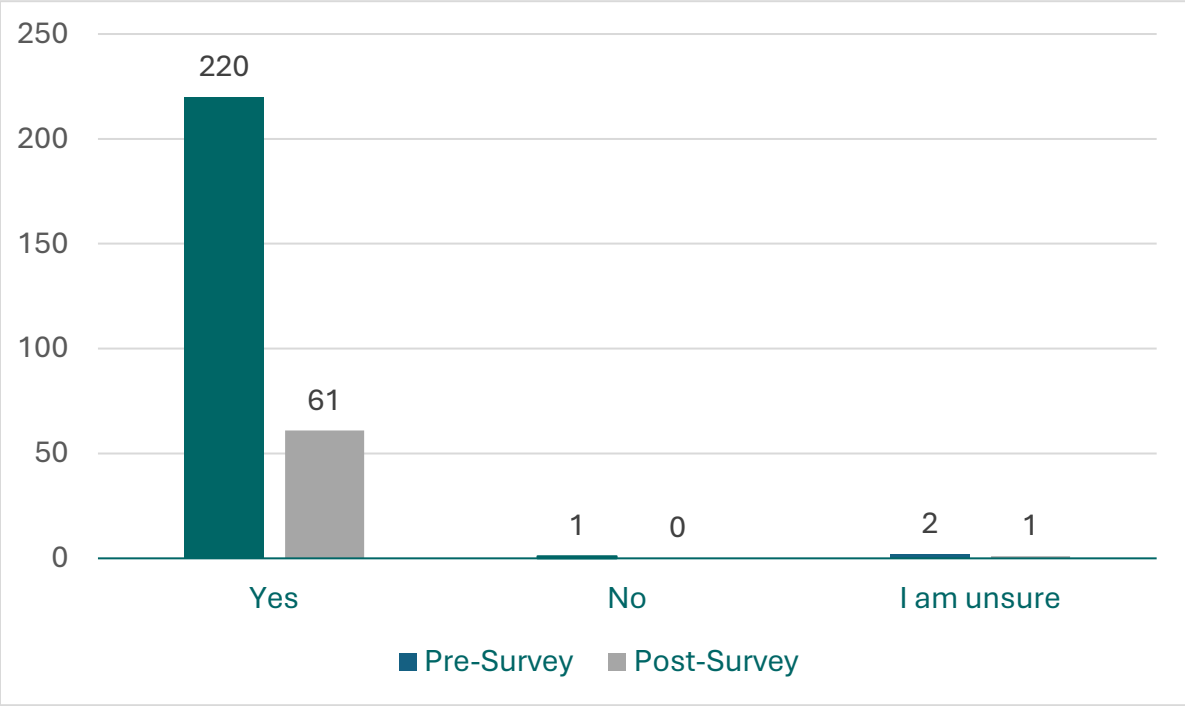
- When asked whether respondents rent or own their home, nearly all (96% pre-survey; 99% post-survey) own their homes. Just over half of respondents (56% pre-survey; 65% post-survey) have lived in Florida for more than 10 years. Just shy of a quarter of respondents (22% pre-survey; 17% post-survey) have lived in Florida for 6 to 10 years or 1 to 5 years. Lastly, less than 2% of respondents on both pre- and post-surveys have lived in Florida for less than one year.

- Respondents were provided with a list of behaviors and asked to select the response that best applies to them with options including: I am doing this regularly, I'm doing this occasionally, I'm considering doing this and not important to me. Listed below are the behaviors and the percentage of respondents stating they are regularly or occasionally practicing the behavior. The minimal change could be due to the high percentage of responses self-reporting they were already practicing the behaviors.
    - Reduce the amount of irrigation water I apply to my lawn based on weekly rainfall.
        - Pre-survey 94%; post-survey 93%. No significant change.
    - Manually adjust how often I irrigate based on how green and healthy my lawn looks.
        - Pre-survey 87%; post-survey 90%. No significant change.
    - Reduce how often I irrigate during the shorter and cooler months of fall and winter.
        - Pre-survey 91%; post-survey 96%.
        - 5% increase (+5 percentage points).
    - Adjust how long and often I irrigate based on how much water is applied when I run my sprinklers.
        - Pre-survey 86%; post-survey 92%.
        - 7% increase (+6 percentage points).

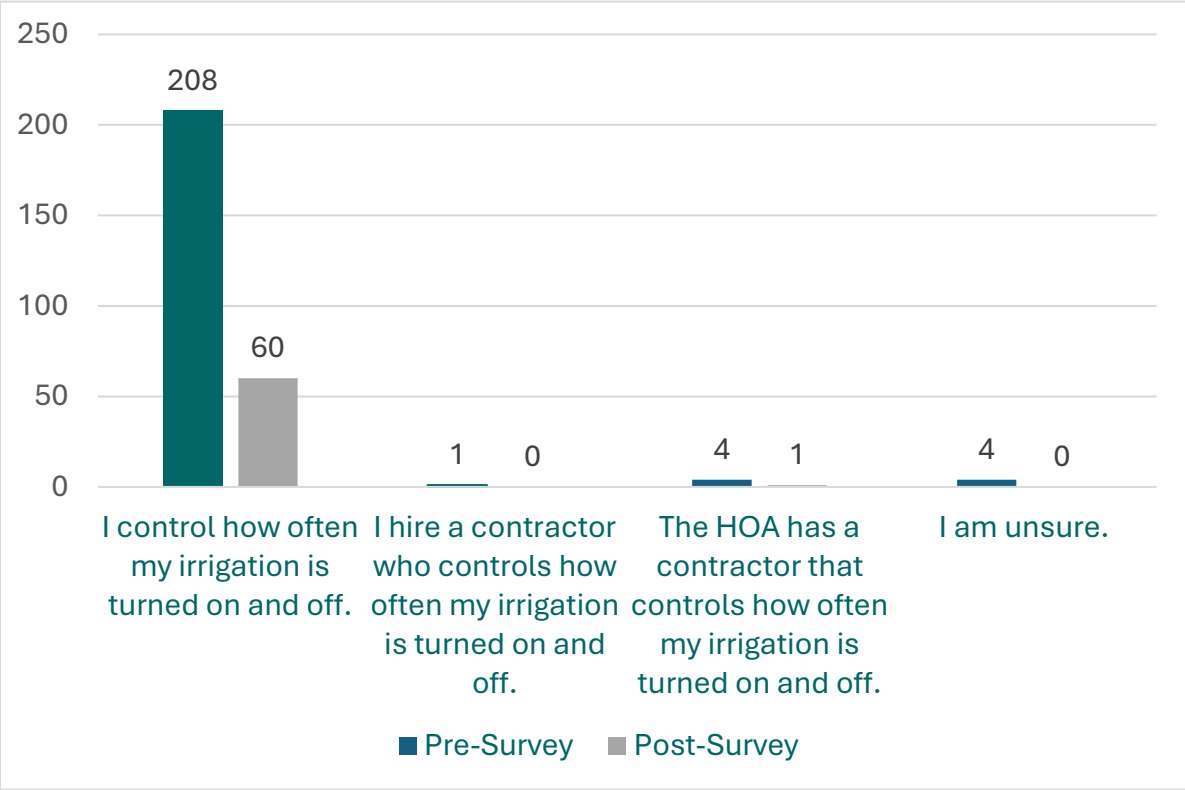
    - Reduce the amount of irrigation water I apply based on rain gauge or local rainfall reported.
        - Pre-survey 80%; post-survey 85%.
        - 6% increase (+5 percentage points).
    - Consider my HOA/CDD expectations as the primary factor when deciding whether to irrigate.
        - Pre-survey 65%; post-survey 65%. No significant change.
- Respondents were provided with a list of questions and asked to indicate their agreement on a five-point scale ranging from strongly agree to strongly disagree. Listed below are the percentage of respondents indicating they strongly agree or agree with the statement.
    - Adjusting my irrigation practices based on recent local rainfall will save money on my water bill.
        - Pre-survey 88%; post-survey 89%. No significant change.
    - There are benefits to local water resources when I adjust my irrigation practices based on local rainfall.
        - Pre-survey 80%; post-survey 85%.
        - 6% increase (+5 percentage points).
    - Adjusting my irrigation practices based on local rainfall fits within my community's landscape expectations.
        - Pre-survey 66%; 74%.
        - 12% increase (+8 percentage points).
    - It would be difficult for me to adjust my irrigation practices based on rainfall received.
        - Pre-survey 14%; post-survey 20%.
        - 43% increase (+6 percentage points).
    - I would adjust my irrigation practices based on recent rainfall if others in my community did it too.
        - Pre-survey 26%; post-survey 33%.
        - 27% increase (+7 percentage points).
    - I know how to turn my irrigation controller on or off to adjust for recent rainfall.
        - Pre-survey 96%; post-survey 92%.
        - 4% decrease (-4 percentage points).
- When provided a list of sources to get information about irrigation and water use in the yard and landscape, the top three responses on the post-survey were as follows:
    - Searching the internet: 30%.
    - District: 28%
    - Homeowner's Association: 27%. *Note this was a 127% increase (15 percentage points) from pre-survey.
- On the post-survey only, residents were asked how their awareness of their lawn's water needs has changed compared to a year ago, before the signage project. Responses were:
    - 49% reported an increase in awareness.
        - 5% an extreme increase

        - 14% a substantial increase
        - 23% a moderate increase
        - 7% a slight increase
    - 50% reported no change in awareness
- On the post-survey only, residents were asked how their considerations of local rainfall received has impacted how they adjust their irrigation controller compared to a year ago, before the signage project. Responses were:
    - 34% reported adjusting their controller more often
        - 15% much more often
        - 19% slightly more often
    - 60% reported no change in adjustment
    - 8% reported adjusting their controller less often
        - 2% somewhat less often
        - 6% much less often

Do you have an automatic sprinkler or irrigation system at your home?



Who controls how often you run your irrigation system?



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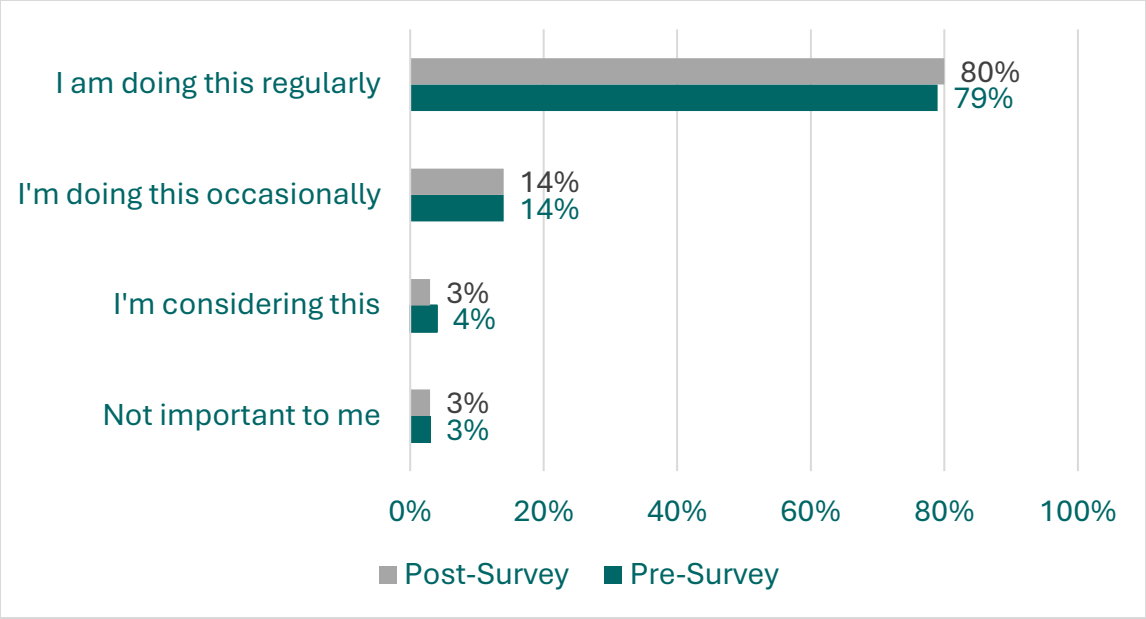
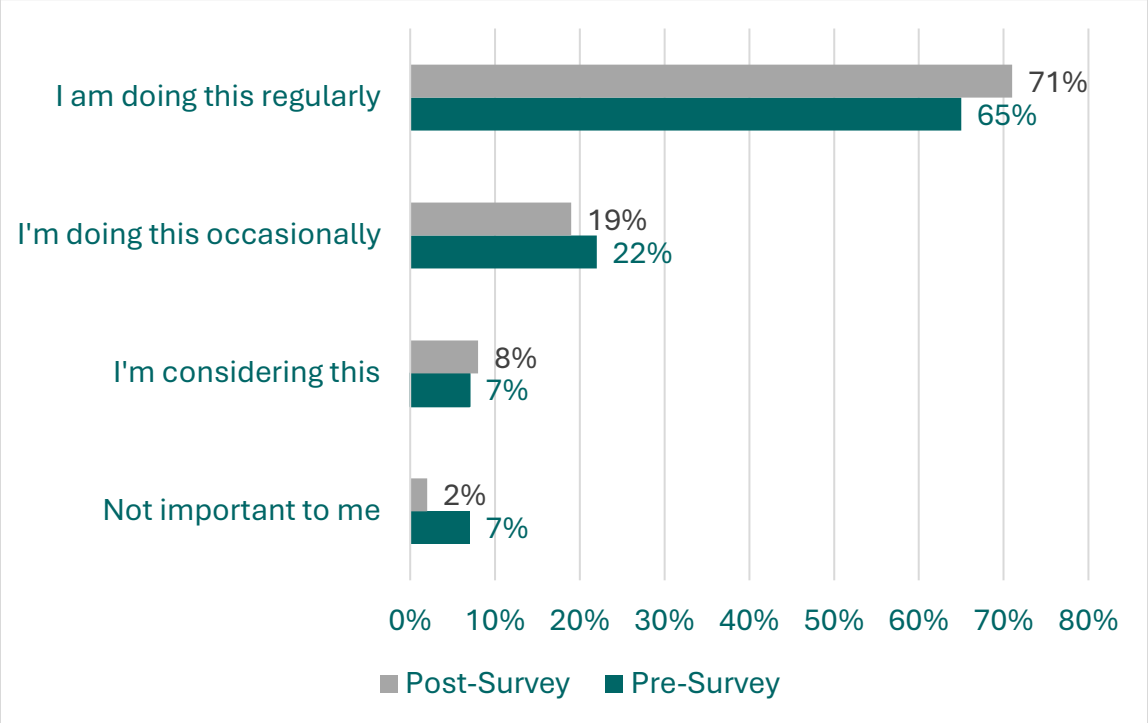
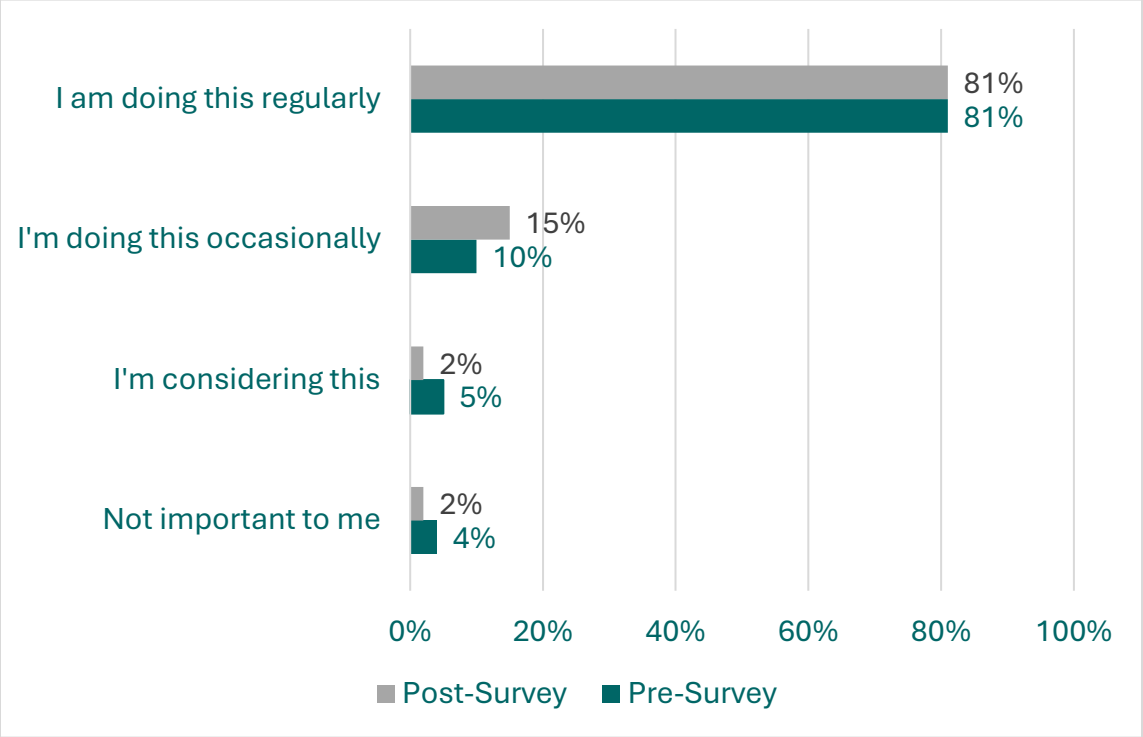


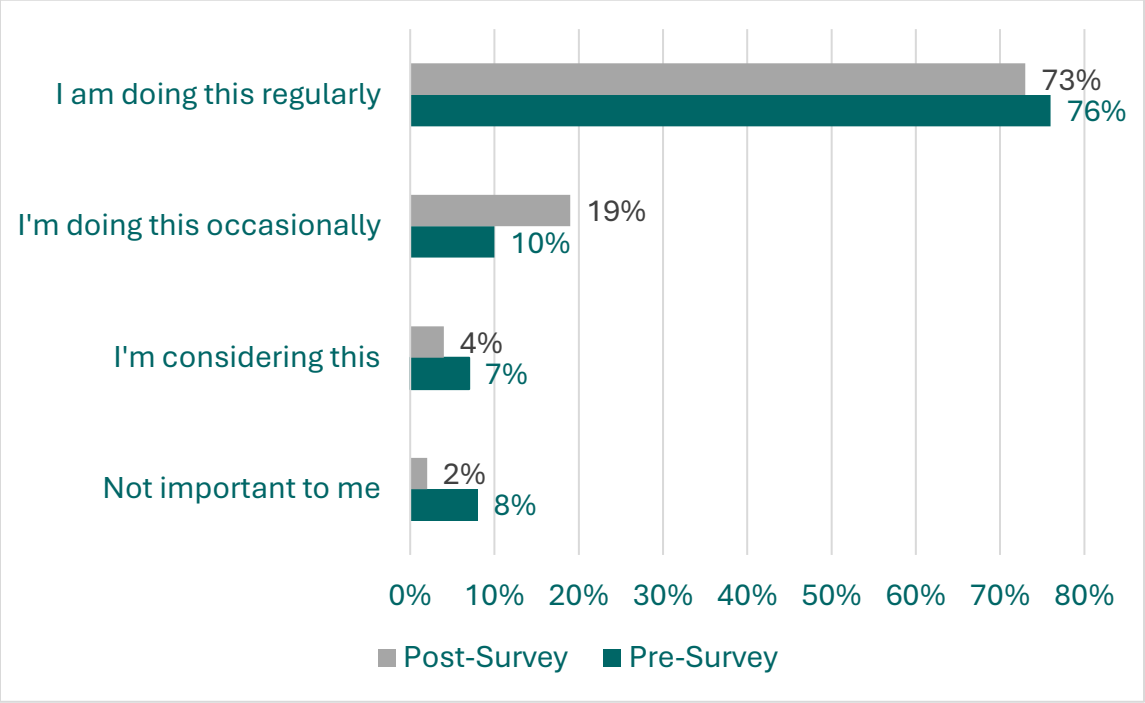
Manually adjust how often I irrigate based on how green and healthy my lawn looks.



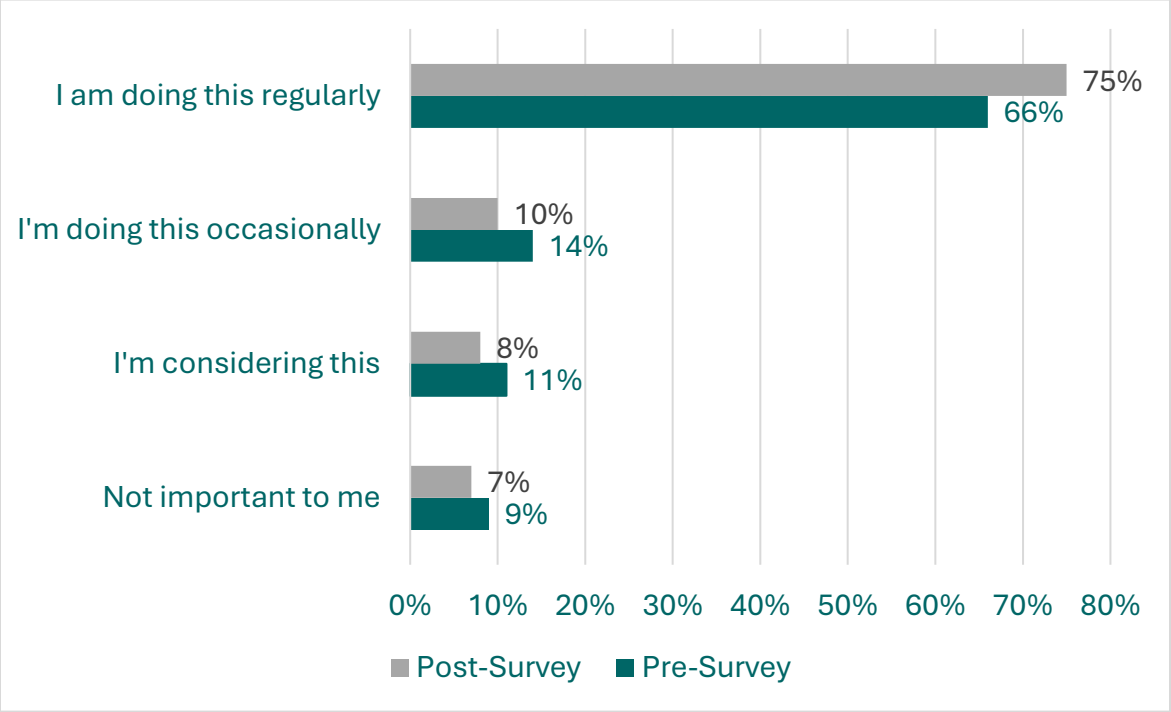
Reduce how often I irrigate during the shorter and cooler months of fall and winter.



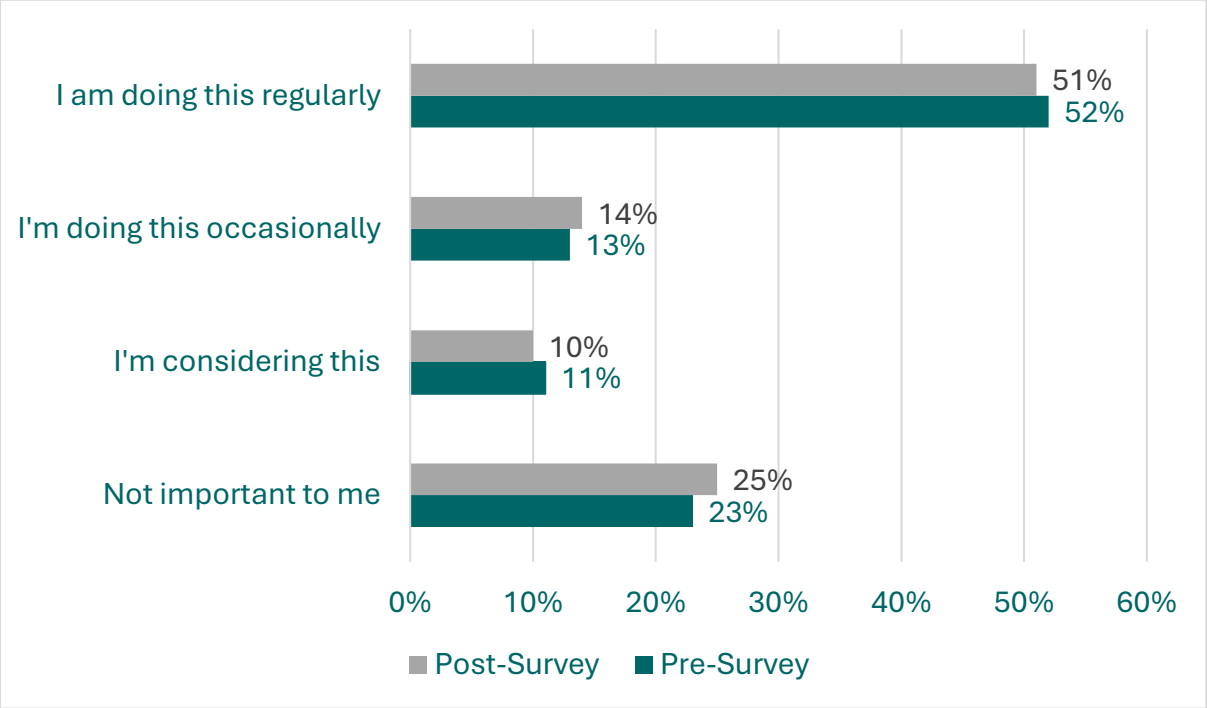
Adjust how long and how often I irrigate based on how much water is applied when I run my sprinklers.



Reduce the amount of irrigation water I apply based on rain gauge or local rainfall reported.

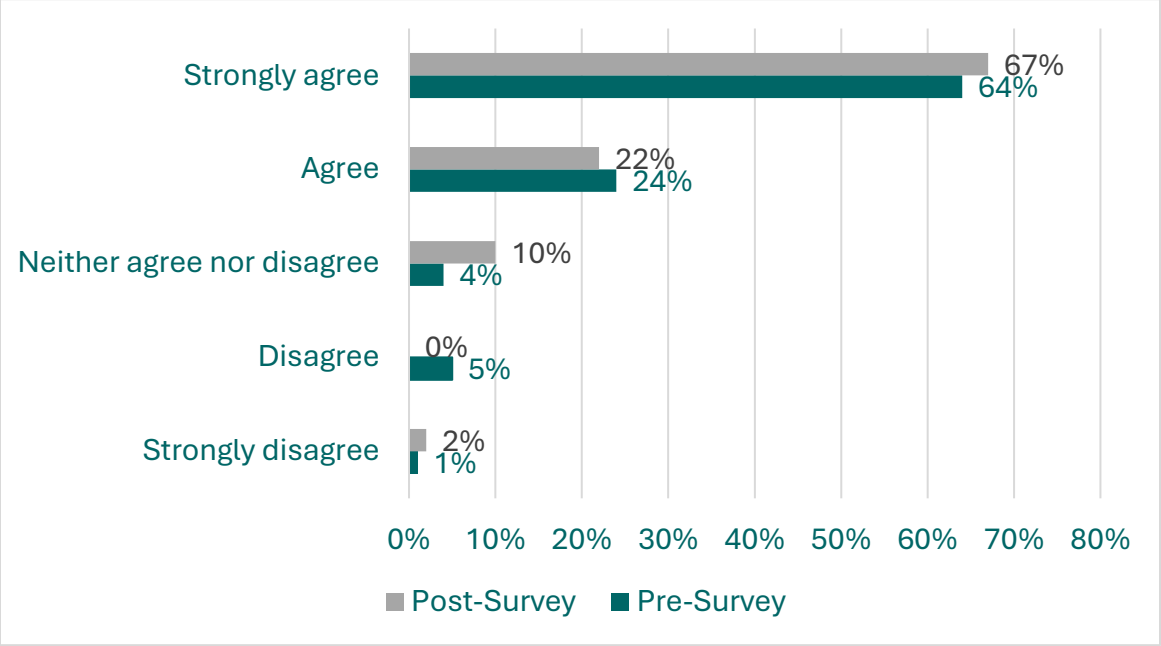


Consider my HOA/CDD expectations as the primary factor when deciding whether to irrigate.

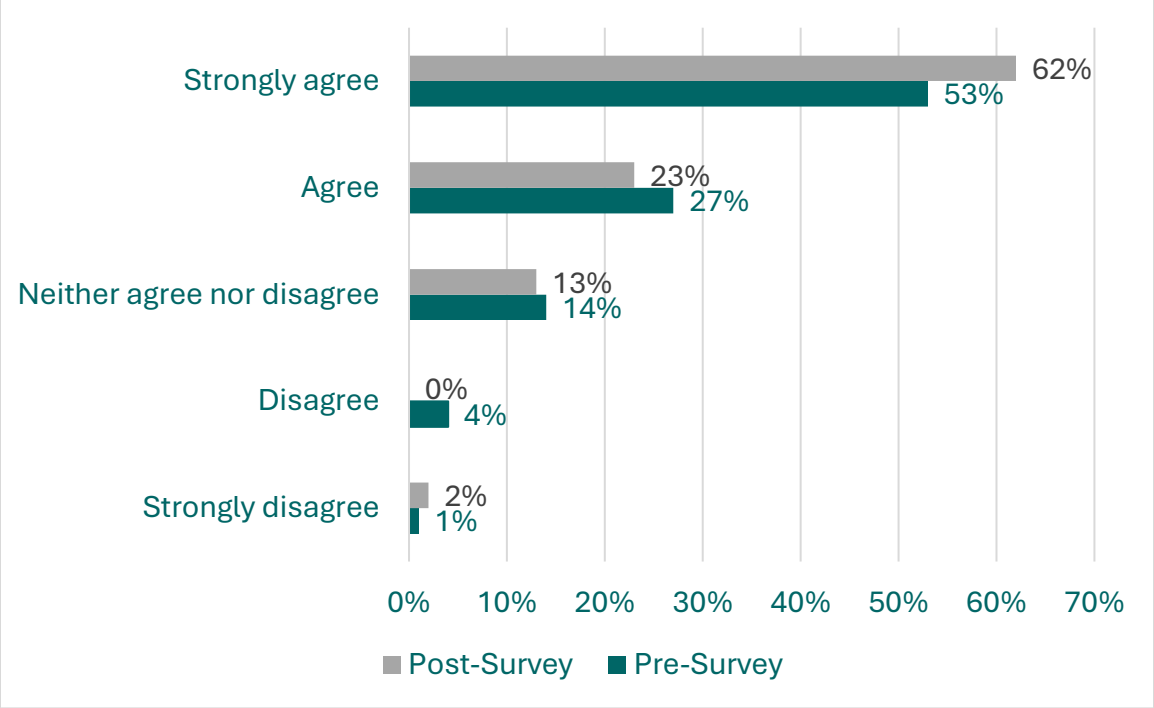


On the following questions, respondents were asked to indicate their agreement or disagreement.

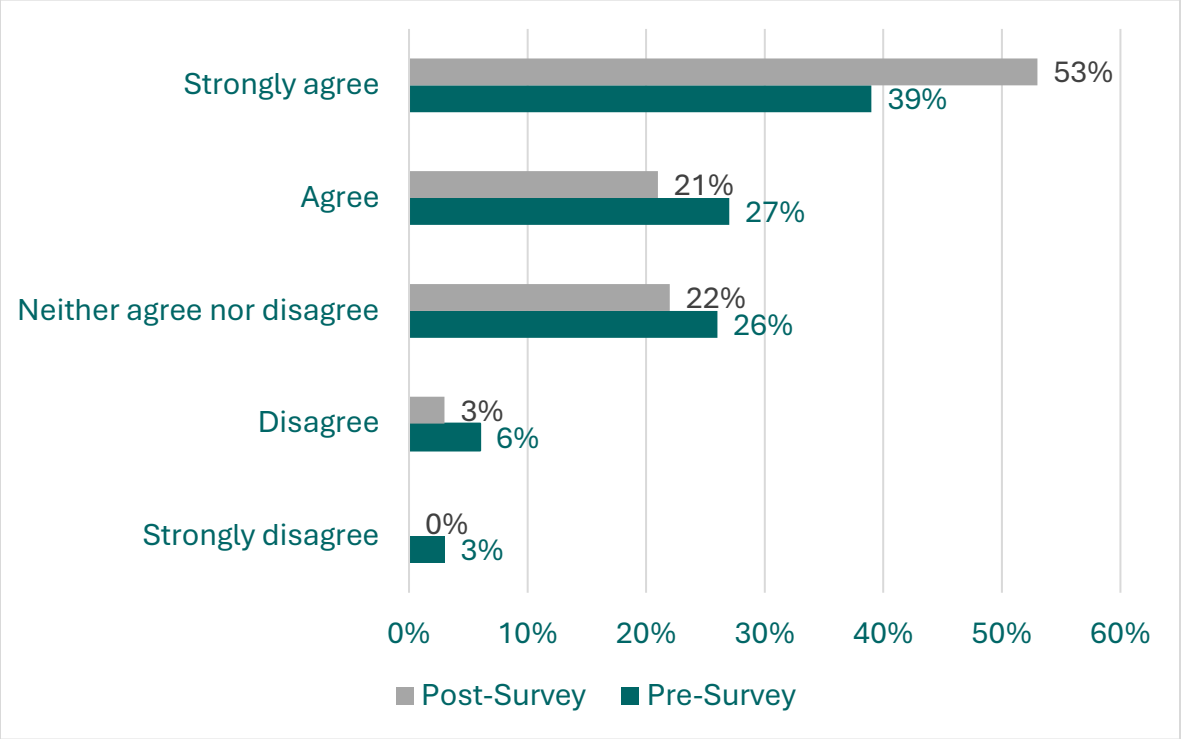
Adjusting my irrigation practices based on recent local rainfall will save money on my water bill.



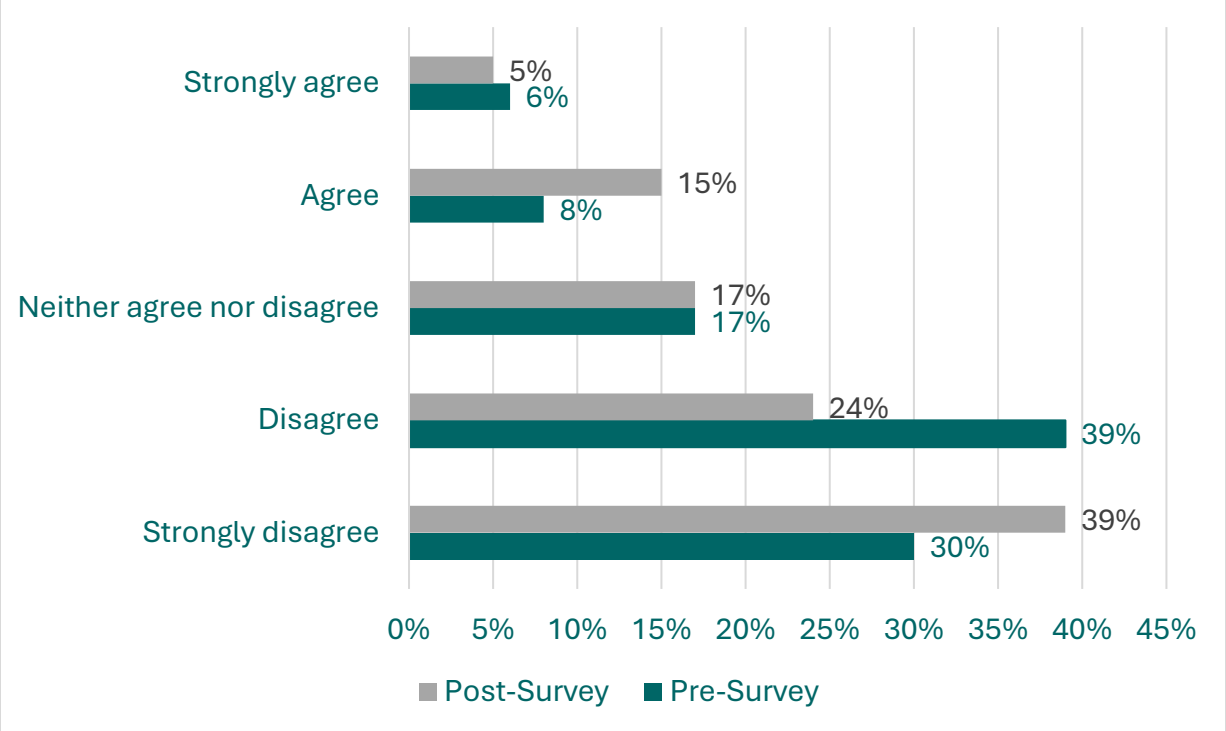
There are benefits to local water resources when I adjust my irrigation practices based on local rainfall.



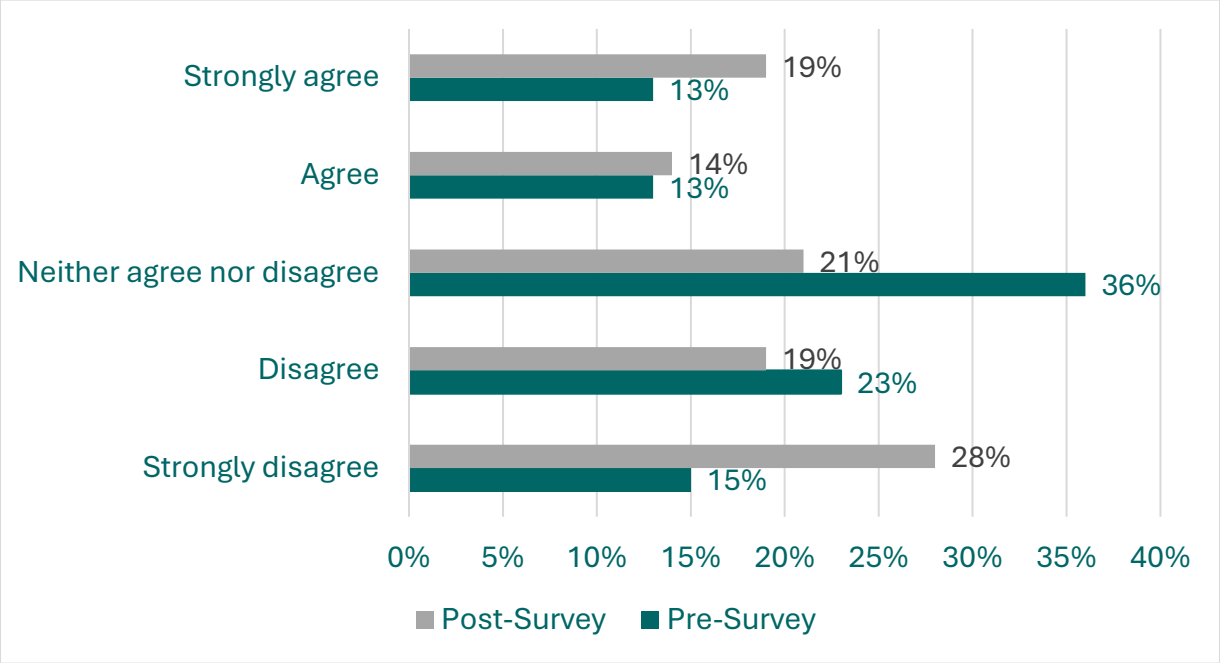
Adjusting my irrigation practices based on recent local rainfall fits within my community's landscape expectations.



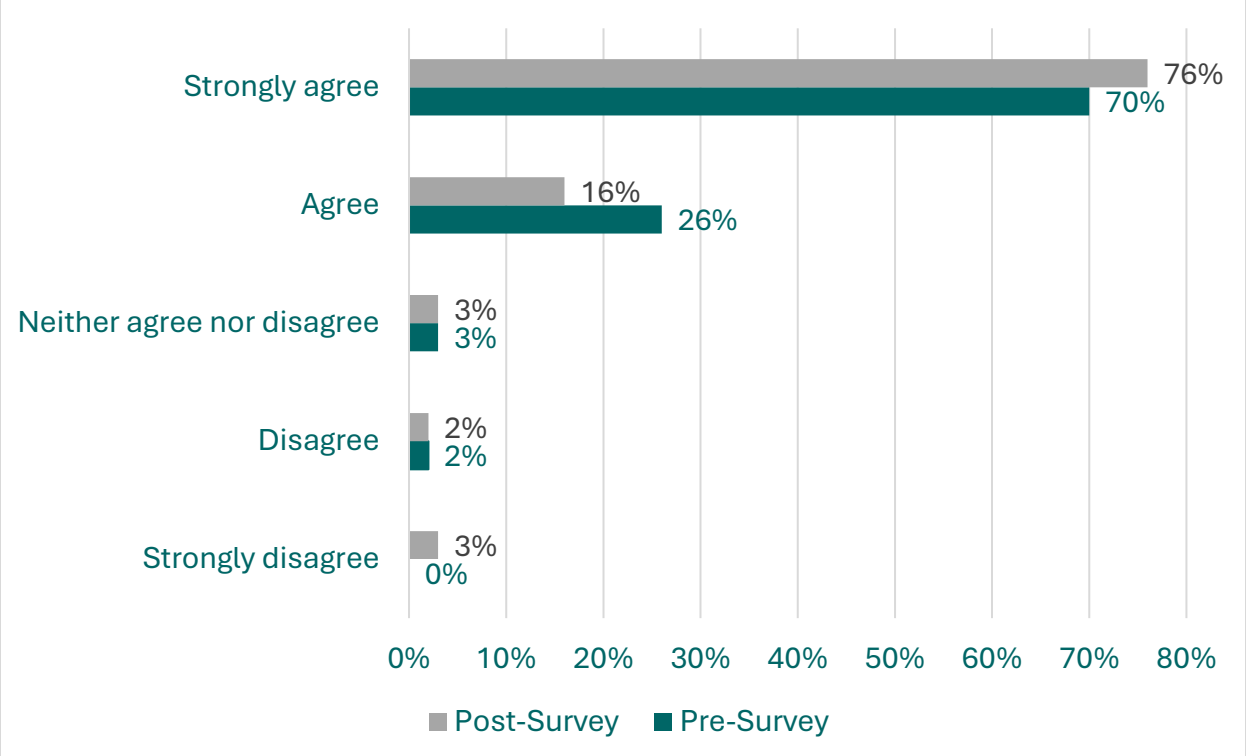
It would be difficult for me to adjust my irrigation practices based on rainfall received.



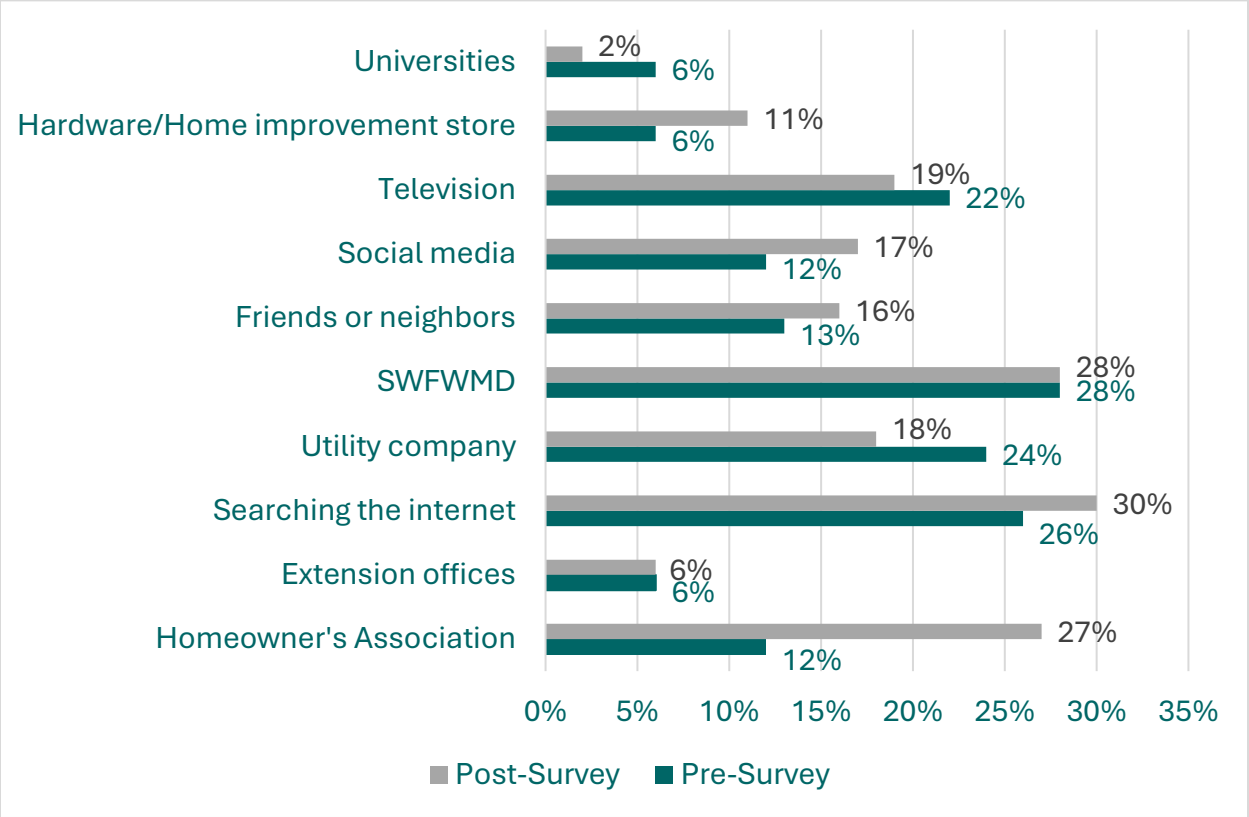
I would adjust my irrigation practices based on recent local rainfall if others in my community did too.



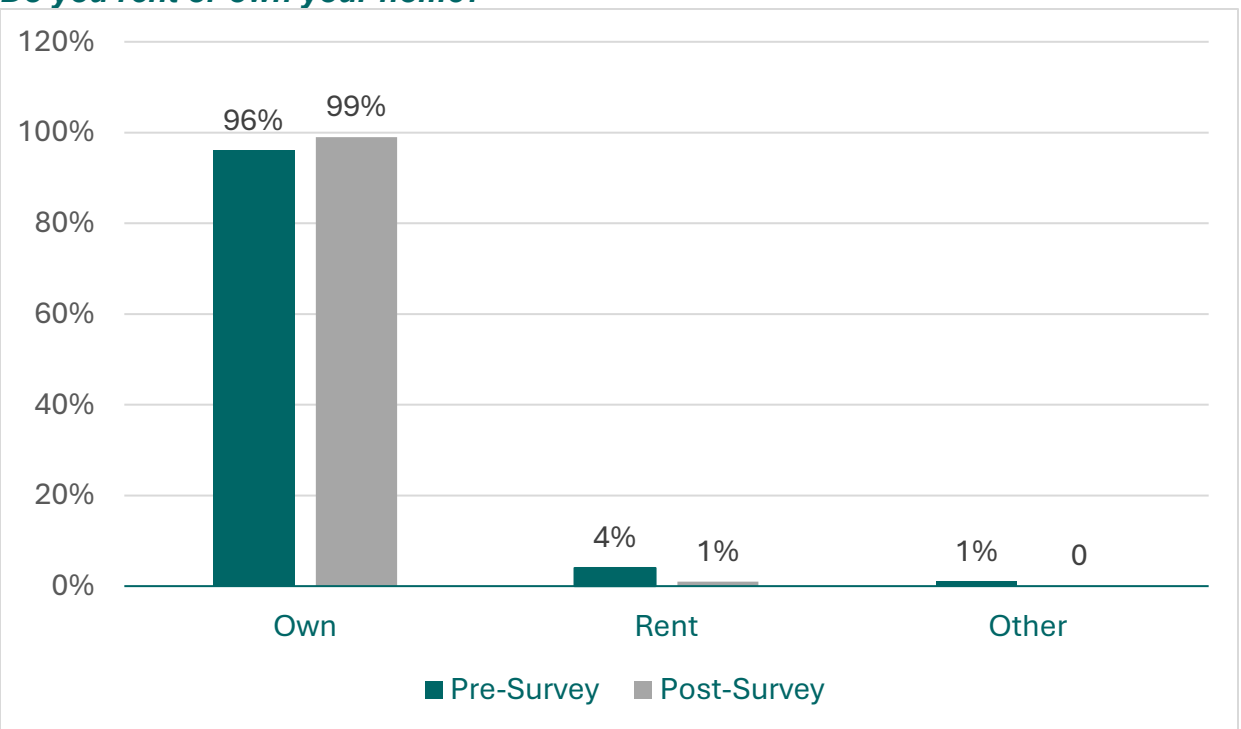
I know how to turn my irrigation controller on or off to adjust for recent rainfall.



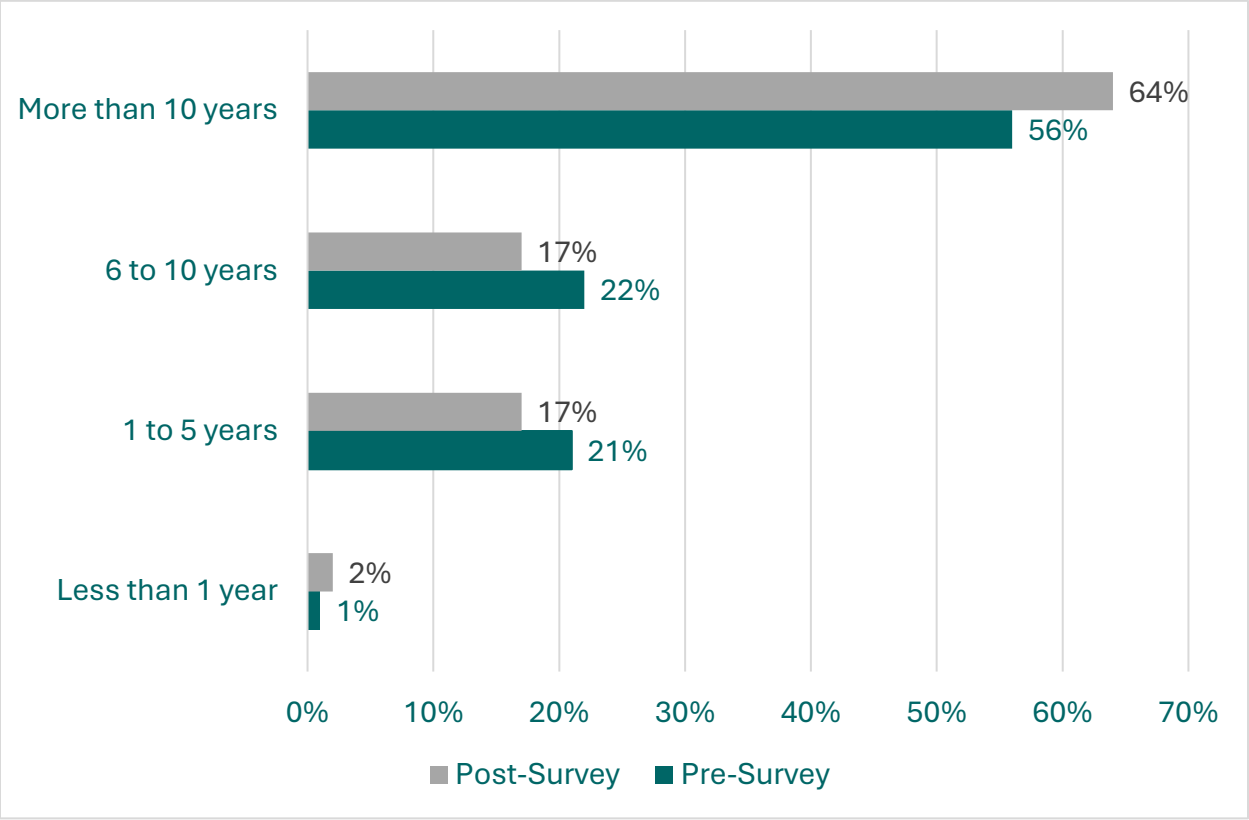
How often do you use the sources below to get information about irrigation and water use in your lawn and landscape? Responses include about half the time, most of the time and always.



Do you rent or own your home?

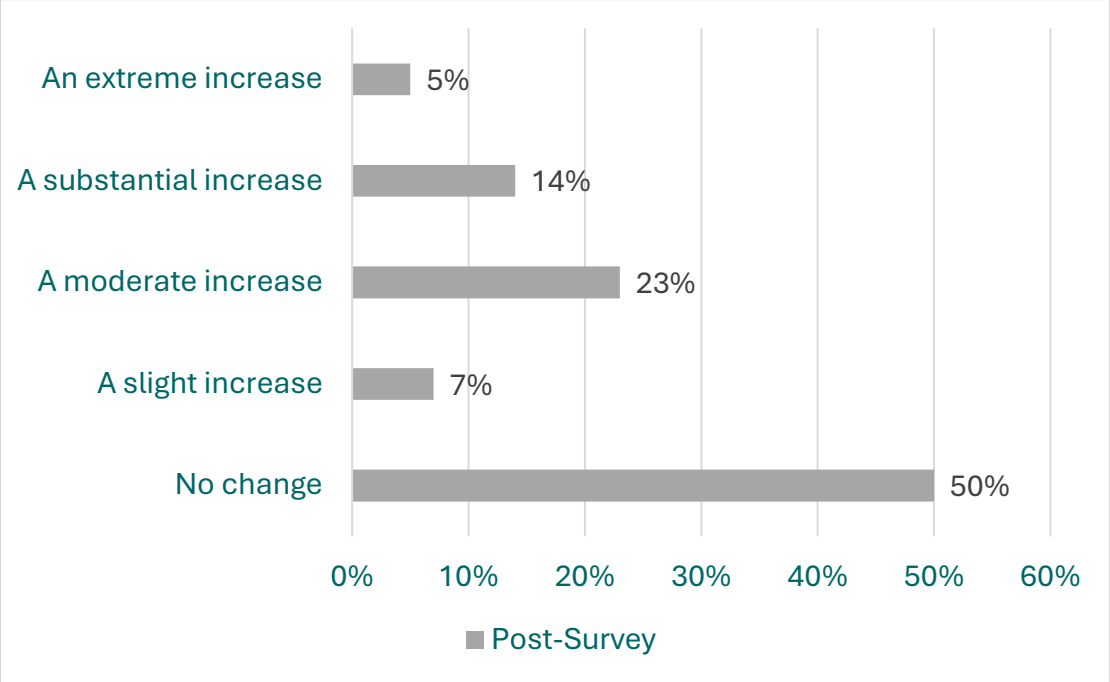


How many years have you lived in Florida?

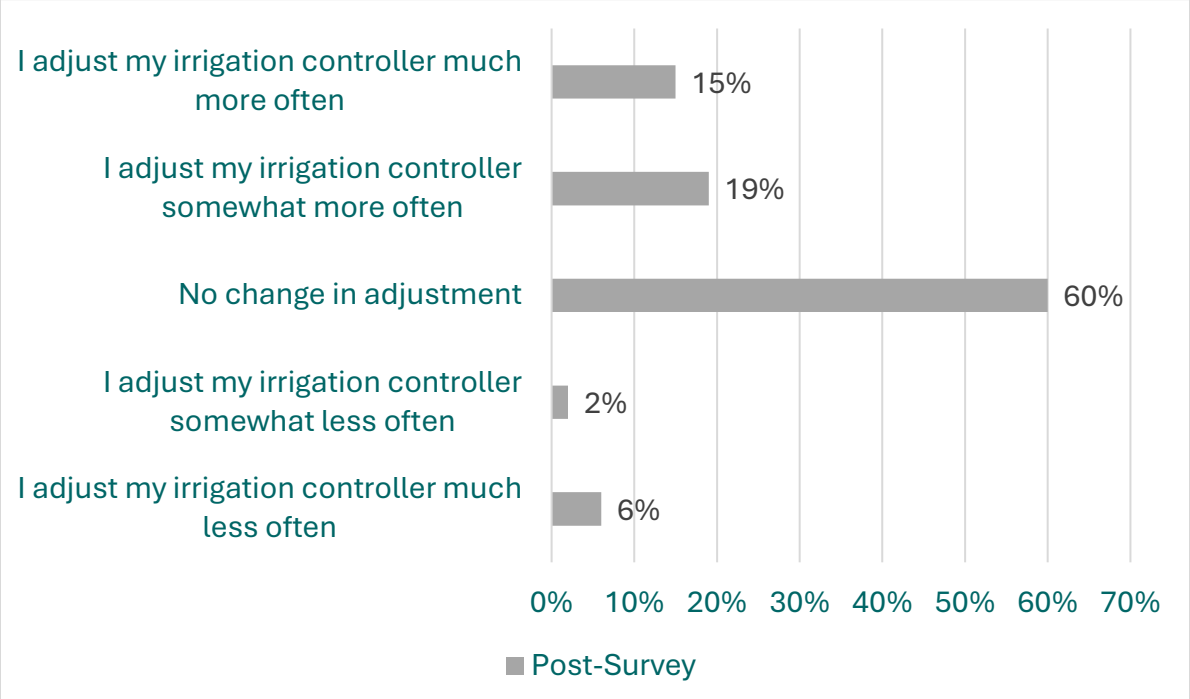


The remaining questions were only asked in the post-survey.

Compared to a year ago, before the Highland's Community rainfall signage project, how would you say your awareness of your lawn's water needs has changed?



Compared to a year ago, before the Highland's Community rainfall signage project, how has your considerations of local rainfall received impacted how you adjust your irrigation controller?



Qualitative Feedback

The pre- and post-survey contained two questions asking respondents to share feedback about their irrigation and water conservation practices. Due to responses on the pre- and post-surveys being virtually identical, the below responses are pulled from both surveys.

Please briefly share the key factors you consider when deciding how often and how long to irrigate.

- *Irrigation restrictions (most common theme)*
  - I abide by Hillsborough County water restrictions. I also adhere to HOA requirements. As a result, the lawn often looks dry and lifeless.
  - With county water restrictions, my considerations are limited.
  - Hillsborough County said we can only water one day per week for the last year. 15 minutes per stations and I have 6 stations. My grass is not doing well.
  - I try as much as possible to comply with water restrictions, but as times get really dry my grass gets discolored.
  - I think we should switch to Florida-friendly grass. We are under water restrictions but are still expected to keep our grass green.
  - Hillsborough County dictates how often I am able to water. Water restrictions limit me to once a week or face a fine. I would prefer to water twice a week and have a healthy green lawn. It adds to the aesthetic of the neighborhood.
- *Rainfall received or forecasted*
  - We check the hydration gauge. If it's good we don't water the grass that much. If it's dry and turning brown we water more often.
  - If it rained the day before or predicted to rain that day I turn if off. During rainy season if we get rain it stays off.
  - If it rains before my lawn watering day, I turn off my sprinklers.
  - Rainfall amounts during each week regulate how much and how long I need to water. My yard is being treated so I have to water frequently.
  - Depending on rainfall. If we're in a drought I will only irrigate once a week to conserve water. If we're getting a lot of rain, I will cut off my irrigation.
- *Condition of lawn*
  - Does my lawn look brown?
  - I only water my yard when the grass is parching to conserve water and water bill.
  - How my lawn looks. That's it.
  - Depends on if the grass needs it. Plus if I fertilize.
  - I don't want my grass to die so I try to keep it green. I don't do it every day. Maybe every other day.
  - Based on the aspect of the grass/lawn.
  - Health of my lawn. Neither the county or HOA will pay to restore my lawn.
  - How green my grass looks.

- *Utility/Water bill*
    - My monthly H2O bill.
    - It would be great if we all have the grass that can survive during the hottest weather then we can afford the water bill.
    - My water bill is usually very high due to the factor that I am using the same water for inside as well as my lawn maintenance. Why are you not giving us separate connections for lawn care?
    - I try to keep my watering to a minimum to save money.
    - How much it will cost me.
- *HOA requirements — Responses below are from the pre-survey only. Due to the water shortage order at the time of the post-survey, HOAs were not permitted to enforce deed restrictions or community standards that increased water demand.*
    - Need to keep up maintenance in order not to receive a letter from the HOA so we must water our lawn.
    - HOA serves us fines when our yard is brown.
    - HOA letters are not taking into consideration drought.
    - During drought and water restrictions are implemented to one time per week the grass begins to die. However, the HOA will still expect the lawn to be green or else will fine you and make you replace your entire lawn with new sod which is thousands. County water restrictions and HOA are contradictor – can't please both.
    - The fines that will be given based on the county regulation. My HOA does not care and expects my grass to be green during a drought and heat water. I am being asked to replace my grass. The HOA and the county need to get on the same page.
    - My HOA not coming after me for a less green lawn.
    - Enough water so my dreaded HOA doesn't send me a letter telling me to water my dead grass.

Share any feedback you would like to provide regarding your irrigation practices or water conservation in the lawn and landscape.

- *HOA pressure*
    - Too much pressure from HOA about lawn watering. FL has two seasons, the grass will turn brown then green again every year.
    - Don't ticket me for watering outside my days when grass needs it and then try to ticket me for having dead grass.
    - Please get the HOAs to give us a break during the times when we are on watering restrictions.
    - Homeowners shouldn't feel forced to water their lawns against water restrictions because of the fear for HOA fining the homeowner.
- *Cost of water*
    - It's too expensive to water your grass, but if you don't your grass dies.
    - We can hardly afford to water at all.
    - Reduce the tariff as you are not supplying water for irrigation use only.
- *Reclaimed water*

    - It would be great to have a reclaimed water system for lawn watering as the cost is astronomically high on the water bills.
    - Would be nice if we had recycled water to water lawns.
- *Drought-tolerant turf/plants*
    - It seems it would be best to end green grass requirements by HOA. Artificial turf or fill with native plants.
    - Push for common requirement or practice in HOA rules to do landscaping that is more suited for the type of environment we live in.
    - A different type of grass that is good for drought type weather is what we need to be allowed to do.
- *Restrictions*
    - County restrictions to once a week are futile.
    - We need water irrigation more than once a week.

The post-survey contained one additional question asking feedback from respondents about how the pilot project could have been improved.

How could the rainfall signage project have been improved to better inform residents about turfgrass irrigation practices.

- *Sign location*
    - Can't see it if you come up Barley Field Drive. The placement of the sign is in the wrong spot.
    - Sign should be bigger and located closer to entrance.
    - Put it at both entrances/exits. I never use the front entrance/exit and therefore never benefitted from your sign.
- *Additional education*
    - Send info on water scheduling for days/hours/house ending numbers.
    - Having information sent to residents about signage and its purpose.
    - More detailed info – soil type, turfgrass, visual aids, irrigation techniques/tips
    - Just providing more education on best practices for residents
    - Update on a website.

Water Use Findings

Rainfall Signage Project — 1 Year Post-Sign

R Regression Analysis by Kristi Bono

Overview

A sign displaying daily rainfall levels and home irrigation best practices was installed in a Hillsborough County community, Ayersworth Glen. This sign was intended to improve saliency and awareness of rainfall to promote households to skip or reduce watering on days with sufficient rainfall.

The monthly water use data for Ayersworth Glen was recorded for 14 months prior to sign install and 13 months post install. The impact of the rainfall sign on Ayersworth Glen will be compared to a similarly characterized neighborhood nearby, Panther Trace, to account for confounding variables. Hillsborough County rainfall data was included in the model to further reduce seasonality effects and observe reactivity.

Research Questions

1. Did the installation of the rainfall sign reduce water usage in Ayersworth Glen, as compared to Panther Trace?
    - How many gallons per day per household (GPDH) were saved on average due to the rainfall sign?
    - What were the total one-year water savings across Ayersworth Glen?
2. Did Ayersworth Glen's water savings decay in the months following installation?
    - At what point were the effects no longer noticeable?
3. How strongly is rainfall correlated with water use?
    - Did rainfall reactivity diminish in Ayersworth Glen in the months following installation?

Results Snapshot

The installation of the rainfall sign in the Ayersworth community resulted in water savings of 18 gallons per day per household (GPDH). This equates to an annual savings of 6,617 gallons per household, and a total one-year water savings of approximately 6 million gallons across the 905 observed households in Ayersworth Glen.

Water Savings due to Rainfall Sign

Daily Household Savings:

18 GPDH

Annual Household Savings:

6,617 gallons

Total 1-Year Savings:

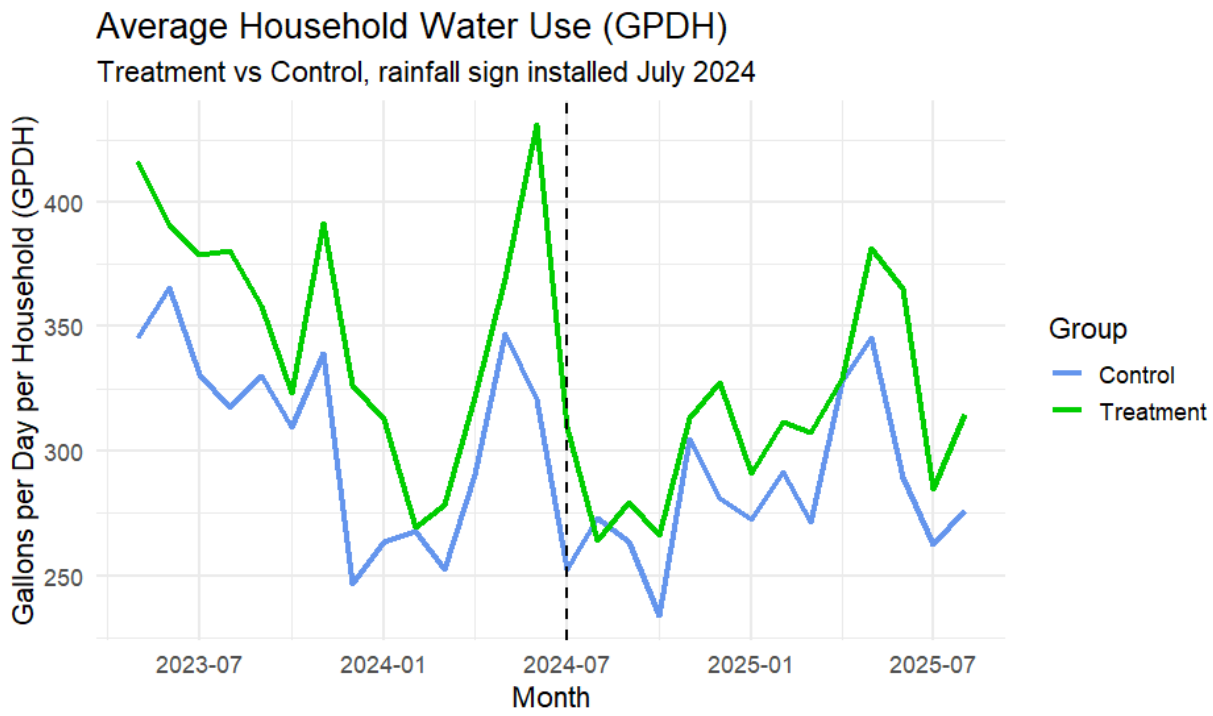
5,988,792 gallons

Method—Difference-in-Difference Fixed Effects Regressions

The following analysis primarily uses Difference-in-Difference (DiD) Fixed-Effects (FE) regressions. DiD allows us to compare the difference first between water use before and after the sign was installed, and second to the control community to account for any external factors that impacted both communities — climate, economy, local watering restrictions, etc. Pairing DiD with FE further accounts for unobservable heterogeneity by treating any household-specific characteristics as fixed and comparing pre-sign and post-sign water use on a household-by-household basis.

1. Water Savings

To initially visualize the relationship between the two communities and their overall water use trends, I calculated a monthly average GPDH for both communities and plotted them in the graph below.



The extreme variation we see initially is a result of seasonal and environmental changes and their resulting impact on water use. Ayersworth Glen (treatment) had higher baseline usage than Panther Trace (control) before the sign was installed. After the sign is put up, Ayersworth Glen's average water use falls slightly, closer to Panther Trace's use level. This is our first indication of potential water savings resulting from the sign.

Model A—DiD FE Regression of Treatment on Water Use

GPDH = *Post* + (*Post * Treatment Group*) + *Rainfall*, with household and month FE

```
[did_fe_month <- feols(GPDH ~ Post * Treatment_Group | Location + month(Date), cluster = ~Location, data = Data)]
[did_fe_rain <- feols(GPDH ~ Post * Treatment_Group + Rainfall | Location + month(Date), cluster = ~Location, data = Data)]
```

This model examines how water use changed after the installation of the rainfall sign, comparing the treatment and control communities while accounting for household- and month-specific differences. By including *Post*, *Treatment Group*, and their interaction, the model isolates the effect of the sign on daily household water use in the treatment community.

- Location and month fixed effects ensure comparison is fixed to a particular household and month to account for individual and seasonal variance.
- *Post* represents the y-intercept in this model and captures the average GPDH change in water use in both communities after the sign was installed (*Post*=1), as compared to before the sign was installed (*Post*=0).
- *Post * Treatment Group* serves as an interaction term between the binary indicators of *Post* and *Treatment Group*. It essentially compares (*Post*=1,*Treatment Group*=1) observations to everything else (0,0), (0,1), and (1,0). This allows us to observe the water use trends of specifically the Ayersworth treatment community after the sign has been installed.
- The variable *Rainfall* tracks the impact of monthly rainfall on water use, to isolate changes in water use trends due to environmental factors and remove these from the impact observed solely from the installation of the sign.

The following shows the results of the time and location fixed effects regression on water use (GPDH), with and without the addition of county rainfall data:

	Model A (no Rainfall)	**Model A (with Rainfall)**
Post (Overall use trend)	– 17.91 ***	– 10.77 ***
Post * Treatment (Sign effect)	– 18.13 ***	– 18.13 ***
Rainfall (Environmental effect)		– 5.71 ***
Observations	43,686	43,686
Adjusted R^2	52.95%	53.15%
Within R^2	0.66%	1.08%

Significance codes (robust SE): '***' 0.001 '**' 0.01 '*' 0.05

Model A (without rainfall) and Model B (with rainfall) both estimate a treatment effect of –18.13 GPDH, meaning households in the treatment group used about 18 gallons per day less than the control group after the rainfall sign was installed. Adding *Rainfall* to the model does not change this treatment effect, which suggests that *Rainfall* influences overall water use trends but does not bias the comparison between our treatment and control groups. Including *Rainfall* does, however, explain additional variation in water use and improves model fit, as reflected in the higher R^2 value.

The negative coefficient on *Post* in the presented models reflects an overall decline in water use across both communities in the post-signage period, independent of the treatment effect. Rainfall data shows that average rainfall was higher and more extreme in the post-sign period, which likely contributed to this overall downward use trend.

	Year	Period	Rainfall (inches)	Average Daily
Pre	2023	Jan - June	16.14	0.11
	2023	July - Dec	23.73	
Post	2024	Jan - June	19.03	0.15
	2024	July - Dec	45.44	
	2025	Jan - June	18.11	

The rainfall sign produced measurable savings of about 18 gallons per day per household, independent of rainfall patterns. While both communities saw a general decline in water use following installation — partly attributable to higher rainfall — the additional reduction observed in Ayersworth Glen is directly attributable to the sign.

2. Savings Time Decay

Model B—DiD FE Regression of Months Post on Water Use

GPDH = *Post* + *Rainfall* + *MPost* + (*Post* * *Treatment Group*) + (*Post* * *MPost*) + (*Treatment Group* * *MPost*) + (*Post* * *Treatment Group* * *MPost*), with household and month FE

```
[did_fe_decay <- feols(GPDH ~ Post * Treatment_Group * MPost + Rainfall | Location + month(Date), cluster = ~Location, data = Data)]
```

This model is designed to identify any potential decay in the observed treatment effect over time, as this boomerang effect can be a common factor in human intervention studies. This effect is isolated using a three-way interaction term between *Post*, *Treatment Group*, and *MPost* to identify how the initial treatment effect trends during the post-sign period. Like Model A, Model B utilizes location and

month fixed effects to minimize variance caused by household- or month-specific patterns.

The table below summarizes the resulting coefficients and interpretations for each component of Model B:

	Coefficient	Interpretation
Post	28.98 ***	Immediate change in GPDH across both communities after install
Rainfall	– 5.46 ***	Rainfall reactivity on GPDH, across both communities and periods
Mpost	– 3.65 ***	Negative time trend in GPDH across both communities and periods
Post * Treatment	– 38.13 ***	Additional immediate change in GPDH for treatment group after install
Post * MPost	1.89 **	Softening of the negative time trend on GPDH (-3.65 * Mpost) in the post-sign period, across both communities
Treatment * MPost	0.13	Additional time trend in GPDH for treatment group, insignificant/small
Post * Treatment * MPost	2.59 **	After initial savings of 38 GPDH, the treatment effect of the sign wore off at a rate of 2.59 GPDH/month post-sign for the treatment group
Observations	43,686	Each observation lists a household's water use for a given month, July 2024 removed (installation month, split data)
Adjusted R^2	53.31%	53.31% of the variation between groups and periods is explained by our model, standard for models on human behavior
Within R^2	1.43%	Our model, including the impact of the sign, explains 1.43% of overall use behavior within a given household

Significance codes (robust SE): '***' 0.001 '**' 0.01 '*' 0.05

Model B utilizes a linear regression with interaction terms to quantify both the immediate treatment effect and how it changes over time. As shown above, the installation of the rainfall sign is associated with an immediate reduction of roughly 38 gallons per day per household in Ayersworth Glen compared to Panther Trace (captured by the Post × Treatment coefficient). At the same time, the triple interaction (Post × Treatment × MPost) indicates that this effect diminished at a rate of about 2.6 GPDH each month. Together, these coefficients suggest that the substantial water savings initially produced by the rainfall sign gradually wore off over the following year. Overall, the linear model demonstrates the clear conservation effect of the treatment, which steadily eroded over time but remained meaningful for more than a year.

Alternative Approach—Log/Exponential Decay

As a comparison, we also explored a log-form savings decay model — a research approach commonly used when studying human behavior. Log-form regressions naturally represent a sharp initial impact that levels off over time, which often mirrors

how behavioral interactions are received in the real world. However, there are a few important considerations and assumptions to note when comparing these models. Firstly, the log-form regression is estimated on only the post-sign data (when log(MPost+1) is defined), meaning we lose precision and the ability to benchmark against pre-installation patterns. More importantly, the log model predicts that savings would diminish and even reverse within six to seven months — a pattern not consistent with the raw data or the nature of the intervention.

For these reasons, the analysis relies primarily on the linear model to assess persistence of water savings due to the rainfall sign. While both models did predict a rate of decay in savings, the linear form reflects a more reasonable, gradual erosion of attention and motivation rather than a rapid drop-off. A linear model may also be a better fit for the effects of the rainfall sign due to the intervention being persistent, visible, and updated daily, unlike a one-time campaign that can quickly fade from memory and experience extreme decay.

3. Rainfall Reactivity

Model C—DiD FE Regression of Rainfall on Water Use

GPDH = *Post* + *Rainfall* + *MPost* + (*Rainfall * Treatment Group)* + (*Post * Treatment Group*) + (*Post * MPost*) + (*Treatment Group * MPost*) + (*Post * Treatment Group * MPost*), with household and month FE

```
[did_fe_rain_interaction <- feols(GPDH ~ Post * Treatment_Group * MPost + Rainfall * Treatment_Group | Location + month(Date), cluster = ~Location, data = Data)]
```

The rainfall sign was designed to encourage households to align irrigation practices with actual lawn needs by showing daily rainfall and a watering benchmark. If the sign worked primarily in this way, we would expect treatment households to be more responsive to rainfall, cutting back more in wetter months. Testing this assumption helps us see whether savings came from rainfall awareness specifically, or from broader shifts in conservation habits.

The table below summarizes the results of this regression:

	Model B	Model C
Post	28.98 ***	32.96 ***
Rainfall	– 5.46 ***	– 1.99
Mpost	– 3.65 ***	– 2.99 ***
Post * Treatment	– 38.13 ***	– 23.70 **
Post * MPost	1.89 **	2.27 **
Treatment * MPost	0.13	1.85 **
Post * Treatment * MPost	2.59 **	1.03
Post * Rainfall		– 4.07 ***
Treatment * Rainfall		8.13 ***
Post * Treatment * Rainfall		– 7.56 ***
Observations	43,686	43,686
Adjusted R^2	53.31%	53.48%
Within R^2	1.43%	1.78%

Significance codes (robust SE): '***' 0.001 '**' 0.01 '*' 0.05

To isolate the impact of the sign on rainfall reactivity, we will compare reactivity between groups in the pre-sign period and post-sign period. Before the sign, water use in the control group fell about 2 GPDH per inch of rainfall.[1] This is the baseline rainfall responsiveness. Ayersworth Glen, before the sign, actually *increased* water use relative to the control group when rainfall rose. For each additional inch of rainfall in the pre-sign period, the treatment group saw an increase in water use of about 6 GPDH.[2]

After the rainfall sign was installed, the control group became more responsive to rainfall, reducing an extra 4 GPDH. For the control group, an inch of rainfall in the post-sign period is associated with a 6 GPDH reduction in water use.[3]

The critical term to consider here is our three-way interaction term, *Post * Treatment * Rainfall*, which tells us the additional rainfall responsiveness observed in the treatment group after the sign was installed. This effect resulted in an additional 8 GPDH reduction (per inch of rainfall) in water usage across Ayersworth Glen. Paired with the baseline

[1] Control group, pre-sign = – 1.99 (*Rainfall*)
[2] Treatment group, pre-sign = – 1.99 (*Rainfall*) + 8.13 (*Treatment * Rainfall*) = 6.14
[3] Control group, post-sign = – 1.99 (*Rainfall*) – 4.07 (*Post * Rainfall*) = – 6.06

Post rainfall reactivity of –4 GPDH, our treatment group observed an overall rainfall reactivity of –5.5 GPDH per inch of rainfall — a roughly 12 GPDH decrease from their previous response[4]. The magnitude of this effect compared to the control group is captured in the rainfall interaction term.

These results indicate that the rainfall sign effectively increased rainfall responsiveness in Ayersworth Glen, as intended. While the treatment group initially showed little to no conservation response to rainfall, after the sign was introduced, they shifted to reducing use by roughly 5.5 GPDH per inch of rainfall. This demonstrates that the intervention of the rainfall sign corrected the atypical pre-sign behavior in the treatment group and brought their response much closer to that of the control group. Further analysis on the irrigation system differences between the two communities could be pursued for a possible explanation of this initial disparity.

Final Model Implications

When rainfall interactions are introduced in Model C, the interpretation of treatment decay changes noticeably. In Model B, the treatment effect decayed by about 2.6 GPDH per month, but once rainfall responsiveness is explicitly modeled, the monthly decline shrinks to about 1 GPDH and is no longer statistically significant. This shift suggests that part of what looked like gradual erosion in savings was actually explained by how households responded to varying rainfall. In other words, controlling for rainfall dynamics shows that the treatment's conservation effect was more stable than it initially appeared, with much of the month-to-month variation driven by environmental conditions rather than a true behavioral fade-out.

Conclusion

Across all models, the rainfall sign produced a clear and meaningful conservation impact in the treatment community. In the simplest specification (Model A), water use declined by roughly 18 gallons per household per day after installation, equivalent to over 6,500 gallons saved per household annually. With 905 households in Ayersworth Glen, this translates to nearly 6 million gallons of water savings in the one year following installation of the rainfall sign.

More detailed models confirmed this effect while exploring how savings changed over time. In the linear decay model (Model B), the initial reduction of 38 GPDH eroded by about 2–3 gallons per month, suggesting households slowly relaxed their conservation efforts but continued to save water well over a year later. Model C offered a more

[4] Treatment group, post-sign = – 1.99 (*Rainfall*) + 8.13 (*Treatment* * *Rainfall*) – 4.07 (*Post* * *Rainfall*) – 7.56 (*Post* * *Treatment* * *Rainfall*) = – 5.56

complex picture, indicating that while some evidence of ongoing decay remained, it was smaller in magnitude and not always statistically significant. This suggests the possibility that savings may have stabilized to some extent rather than continuing to diminish month after month.

Finally, Model C also examined rainfall responsiveness, showing that after installation, the treatment group became more sensitive to rainfall than before, better aligning irrigation with environmental conditions.

Taken together, the rainfall sign is associated with an immediate water savings of 38 GPDH followed by a gradual rebound to a long-term savings rate of 18 gallons per day per household in Ayersworth Glen. The results demonstrate that the rainfall sign worked as a persistent behavioral nudge: large, measurable reductions in household water use, minimal rebound effects or decay, and improved responsiveness to rainfall. While the precise mechanisms may extend beyond rainfall awareness alone, the intervention clearly supported meaningful and lasting conservation at the community scale.

Supplemental Data and References

To provide additional context and confirm robustness of the analysis, supplemental environmental data were reviewed. The applied methodology for selecting and removing outliers prior to analysis is detailed below. The following figures present rainfall statistics, water use differences between communities, and average temperature trends.

Outlier Methodology

Before the analysis was performed in R, the data underwent two screens for outliers:

1. **Consistent Use**

   Households with monthly water use less than 10 gpdh for any month were removed due to inconsistent use during the test period. These observations indicate higher likelihood of confounding factors (vacancies, data errors, etc.) and have been removed from the sample to reduce bias.

2. **Extreme Change**

   Any household with a percentage change in water usage greater than 100% between the pre-sign and post-sign period were also removed from the dataset for analysis. In other words, if a household doubled their water usage after the installation of the sign, this is understood to be a result of external variation not

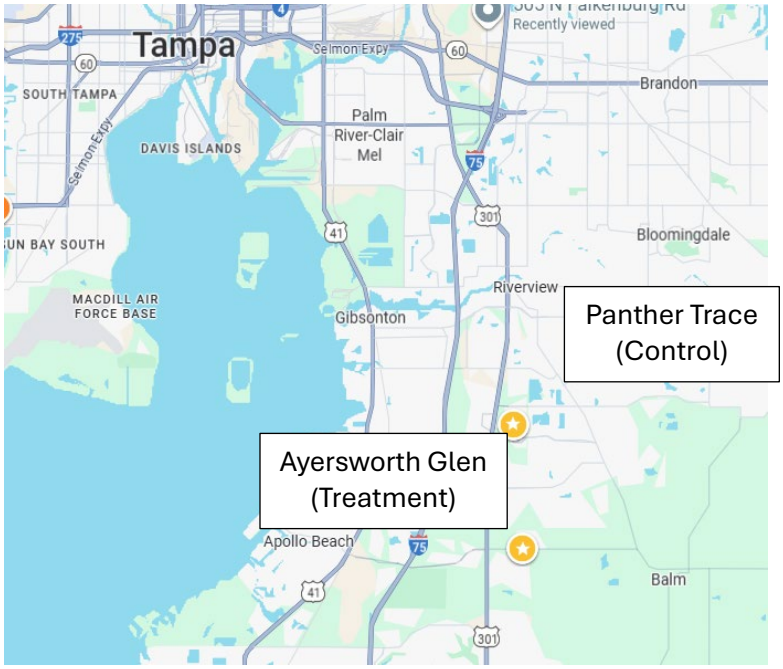
captured in our model. Therefore, excluding these extreme changes will improve the model fit and reduce any skew resulting from these observations.

The table below summarizes the number of observations removed as outliers and the remaining households used in the final analysis:

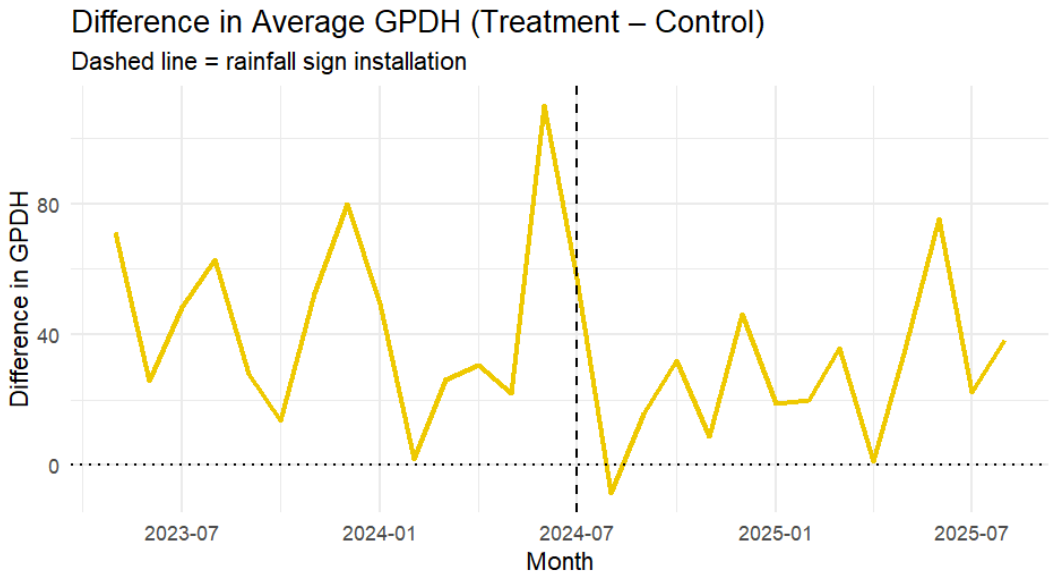
Ayersworth Glen — Treatment Group		
Disqualifier Used	Disqualified	Remaining
Neither / Full	0	905
Consistent Use	108	797
Extreme Change	31	874
Both (Analysis Sample)	129	776

Panther Trace — Control Group		
Disqualifier Used	Disqualified	Remaining
Neither / Full	0	1133
Consistent Use	259	874
Extreme Change	58	1075
Both (Analysis Sample)	291	842

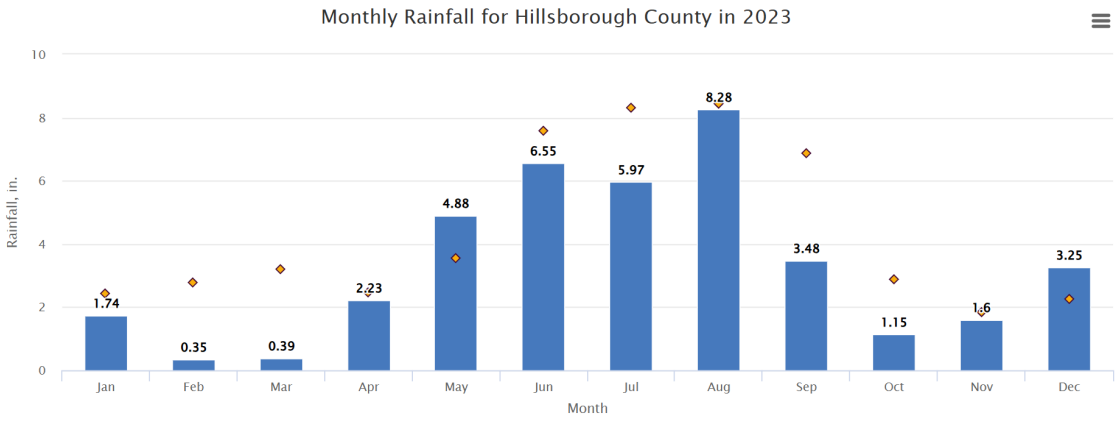
Hillsborough County Map (Google Maps): Locations of Ayersworth Glen (treatment group) and Panther Trace (control group), illustrating their geographic and environmental similarities.

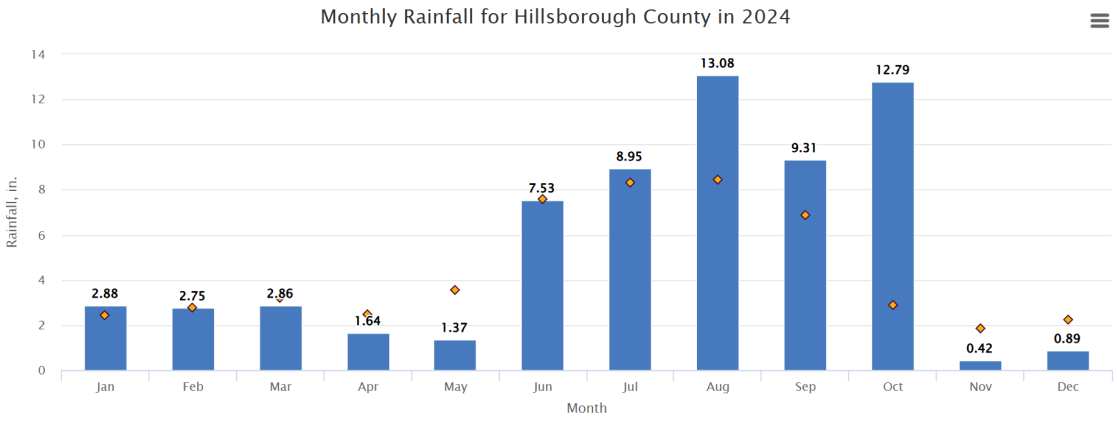


Average Difference in Water Use: Average monthly gap in household water use (GPDH) between Ayersworth Glen and Panther Trace, highlighting relative conservation trends.

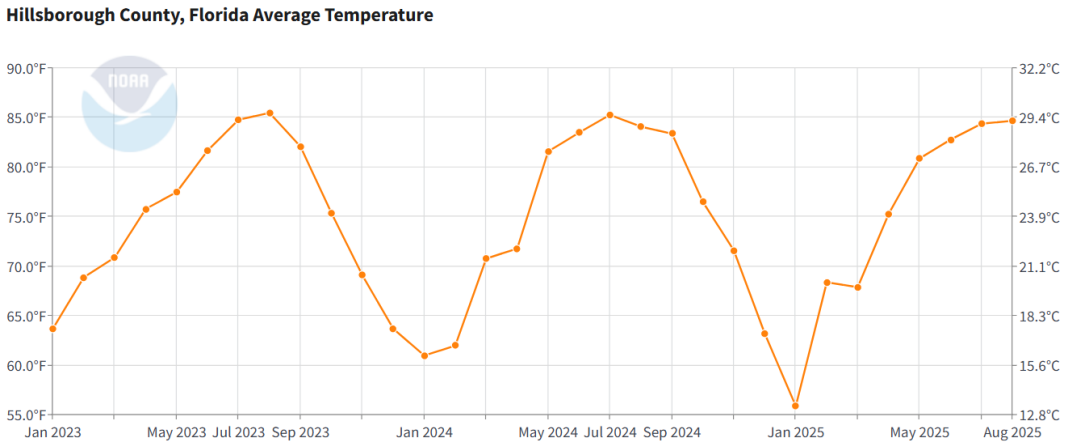


Monthly Rainfall (UF/Hillsborough County): Monthly rainfall totals for Hillsborough County, showing environmental context and increased rainfall in the post-sign period.





Monthly Temperature (NOAA): Average monthly temperature for Hillsborough County across the study period; tested in regressions but found to have no substantive effect on treatment results.



Cost Effectiveness Calculations

Project / Components	Water Savings (gpd)	Total Estimated Cost*	Service Life	$/kgal	% of Total Savings	Weighted $/Kgal	Weighted Average $ Kgal
total cost for completed project at Ayer	16,407	$41,475	1	$7.48	0.25	$1.87	$3.68
signage at Ayer for 3 years	16,407	$47,475	3	$3.08	0.25	$0.77	
future new sign and education	16,407	$40,877	3	$2.65	0.25	$0.66	
future refurb sign and education	16,407	$23,349	3	$1.51	0.25	$0.38	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
				$0.00	0	$0.00	
Total	**65,628**	**$153,176**					

*** Total Estimated Cost - Include all elements that apply, such as:**
Program administration (may include consulting fees)
Devices/materials (may include advertising materials, but not including staff time or equipment purchased by the cooperator, such as printers or office space
Data analysis (may include consultant fees, but not cooperator staff time)
Reporting (costs of report production)
Promotion/Marketing/Education (any print work must be done through an outside vendor to qualify for reimbursement)

The Highlands Community Development District is working with the Southwest Florida Water Management District to conduct a short survey that will help us better educate residents about water resources. This survey will take less than 10 minutes of your time. Your answers will remain anonymous, meaning responses will not be connected to your name or contact information.

You can complete the survey by scanning the QR code above (preferred) or completing the paper survey and return using the paid return addressed envelope.

Please complete the survey by July 3. The paper survey begins here:

1. Do you have an automatic sprinkler or irrigation system at your home?
   - ○ Yes
   - ○ No (This survey pertains to residents who have an automatic irrigation/sprinkler system; please stop here if you do not.)
   - ○ I am unsure (This survey pertains to residents who have an automatic irrigation/sprinkler system; please stop here if you are unsure).

2. Who controls how often you run your irrigation system?
   - ○ I control how often my irrigation is turned on and off.
   - ○ I hire a contractor who controls how often my irrigation is turned on and off.
   - ○ The HOA has a contractor that controls how often my irrigation is turned on and off.
   - ○ I am unsure.

3. Please review the list of practices below and select the response that best applies to you.

	I'm doing this regularly	I'm doing this occasionally	I'm considering this	Not important to me
Reduce the amount of irrigation water I apply to my lawn based on weekly rainfall.	○	○	○	○
Manually adjust how often I irrigate based on the condition of my yard.	○	○	○	○
Reduce how often I irrigate during the shorter and cooler months of fall and winter.	○	○	○	○
Adjust how long and how often I irrigate based on how much water is applied when I run my sprinklers.	○	○	○	○
Reduce the amount of irrigation water I apply based on a rain gauge or local rainfall reported.	○	○	○	○

Consider my HOA/CDD expectations as the primary factor when deciding whether to irrigate.	○	○	○	○

4. Please indicate your agreement or disagreement with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Adjusting my irrigation practices based on recent local rainfall will save money on my water bill.	○	○	○	○	○
There are benefits to local water resources when I adjust my irrigation practices based on recent local rainfall.	○	○	○	○	○
Adjusting my irrigation practices based on recent local rainfall fits within my community's landscape expectations.	○	○	○	○	○
It would be difficult for me to adjust my irrigation practices based on rainfall received.	○	○	○	○	○
I would adjust my irrigation practices based on recent local rainfall if others in my community did too.	○	○	○	○	○
I know how to turn my irrigation controller on or off to adjust for recent local rainfall.	○	○	○	○	○

5. Please briefly share the key factors you consider when deciding how often and how long to irrigate.

6. How often do you use the sources below to get information about irrigation and water use in your lawn and landscape?

	Never	Sometimes	About half the time	Most of the time	Always
Universities	○	○	○	○	○
Hardware/Home improvement store	○	○	○	○	○
Television	○	○	○	○	○
Social media	○	○	○	○	○
Friends or neighbors	○	○	○	○	○
Southwest Florida Water Management District	○	○	○	○	○
Utility company	○	○	○	○	○
Searching the internet (e.g., Google)	○	○	○	○	○
Extension offices	○	○	○	○	○
Homeowner's Association	○	○	○	○	○

Other (please specify): _____

7. Do you rent or own your home?
   - ○ Rent
   - ○ Own
   - ○ Other. Please specify. _____

8. How many years have you lived in Florida?
   - ○ Less than 1 year
   - ○ 1 to 5 years
   - ○ 6 to 10 years
   - ○ More than 10 years

9. Share any feedback you would like to provide regarding your irrigation practices or water conservation in the lawn and landscape.

_____

That concludes our survey. For questions, please email *Robin.Grantham@WaterMatters.org*. Thank you for your time!

As you likely know, the Highlands Community Development District has worked with the Southwest Florida Water Management District for a year on a project focusing on evaluating the influence of a sign located at the Highland's Community exit that reports weekly rainfall data.

As this project nears conclusion, they are conducting a short survey to gauge residents' experiences over the past year and help inform future water conservation efforts.

This survey will take less than 10 minutes to complete, and your answers will remain anonymous, meaning responses will not be connected to your name or contact information.

You can complete the survey by scanning the QR code above (preferred) or by completing the paper survey and return using the paid return addressed envelope.

Please complete the survey by August 31. The paper survey begins here:

1. Do you have an automatic sprinkler or irrigation system at your home?
    - ○ Yes
    - ○ No (This survey pertains to residents who have an automatic irrigation/sprinkler system; please stop here if you do not.)
    - ○ I am unsure (This survey pertains to residents who have an automatic irrigation/sprinkler system; please stop here if you are unsure).

2. Who controls how often you run your irrigation system?
    - ○ I control how often my irrigation is turned on and off.
    - ○ I hire a contractor who controls how often my irrigation is turned on and off.
    - ○ The HOA has a contractor that controls how often my irrigation is turned on and off.
    - ○ I am unsure.

3. Please review the list of practices below and select the response that best applies to you.

	I'm doing this regularly	I'm doing this occasionally	I'm considering this	Not important to me
Reduce the amount of irrigation water I apply to my lawn based on weekly rainfall.	○	○	○	○
Manually adjust how often I irrigate based on how green and healthy my lawn looks.	○	○	○	○
Reduce how often I irrigate during the shorter and cooler months of fall and winter.	○	○	○	○
Adjust how long and how often I irrigate based on how much water is applied when I run my sprinklers.	○	○	○	○
Reduce the amount of irrigation water I apply based on a rain gauge or local rainfall reported.	○	○	○	○
Consider my HOA/CDD expectations as the primary factor when deciding whether to irrigate.	○	○	○	○

4. Please indicate your agreement or disagreement with the following statements:

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Adjusting my irrigation practices based on recent local rainfall will save money on my water bill.	○	○	○	○	○
There are benefits to local water resources when I adjust my irrigation practices based on recent local rainfall.	○	○	○	○	○

Adjusting my irrigation practices based on recent local rainfall fits within my community's landscape expectations.	○	○	○	○	○
It would be difficult for me to adjust my irrigation practices based on rainfall received.	○	○	○	○	○
I would adjust my irrigation practices based on recent local rainfall if others in my community did too.	○	○	○	○	○
I know how to turn my irrigation controller on or off to adjust for recent local rainfall.	○	○	○	○	○

5. Please briefly share the key factors you consider when deciding how often and how long to irrigate.

6. How often do you use the sources below to get information about irrigation and water use in your lawn and landscape?

	Never	Sometimes	About half the time	Most of the time	Always
Universities	○	○	○	○	○
Hardware/Home improvement store	○	○	○	○	○
Television	○	○	○	○	○
Social media	○	○	○	○	○
Friends or neighbors	○	○	○	○	○
Southwest Florida Water Management District	○	○	○	○	○
Utility company	○	○	○	○	○
Searching the internet (e.g., Google)	○	○	○	○	○
Extension offices	○	○	○	○	○
Homeowner's Association	○	○	○	○	○

Other (please specify):

7. Do you rent or own your home?
    - Rent
    - Own
    - Other. Please specify. _____

8. How many years have you lived in Florida?
    - Less than 1 year
    - 1 to 5 years
    - 6 to 10 years
    - More than 10 years

As you know, the Highland's Community (Ayersworth Glen) participated in a rainfall signage project over the course of the last year. The last few questions in this survey will gather your thoughts about this project.

9. Compared to a year ago, before the Highland's Community rainfall signage project, how would you say your awareness of your lawn's water needs has changed?
    - No change
    - A slight increase
    - A moderate increase
    - A substantial increase
    - An extreme increase

10. Compared to a year ago, before the Highland's Community rainfall signage project, how has your consideration of local rainfall received impact how you adjust your irrigation controller?
    - I adjust my irrigation controller much less often
    - I adjust my irrigation controller somewhat less often
    - No change in adjustment
    - I adjust my irrigation controller somewhat more often
    - I adjust my irrigation controller much more often

11. How could the rainfall signage project have been improved to better inform residents about turfgrass irrigation practices?

_____

12. Please share any feedback you would like to provide regarding your irrigation practices or water conservation in the lawn and landscape.

_____

Turn Off Your Irrigation When Rainfall is Enough

At the end of July, a new sign was installed near the US Hwy 301 exit for the Ayersworth Glen community. The sign:

- Displays the weekly rainfall total (a rolling 7-day total).
- Helps you determine if you can turn off your irrigation system.
- Is updated daily by the Southwest Florida Water Management District.

During the summer, lawns typically need about 1.25 inches of water per week due to increased evaporation from the heat. However, summer usually brings more rainfall, reducing the need for irrigation. Before running your system, check the weekly rainfall totals. You may be able to reduce the irrigation time or skip it altogether if there's been sufficient rainfall.

Please turn off your irrigation when rainfall is enough to save water and money.

Adjust your irrigation run times based on these recommendations from the University of Florida Institute of Food and Agricultural Sciences OR follow the instructions on the reverse to determine the amount of water your sprinklers apply for more accurate run times.

Run Time Recommendations

HEAD TYPE	SUMMER	FALL	WINTER	SPRING
SPRAY	23-30	10-20	0-10	15-20
ROTOR and ROTARY NOZZLE	40-60	20-40	0-20	35-55

For more water conservation tips, visit *WaterMatters.org/Water101.*

For questions about the rainfall data sign, email *Robin.Grantham@WaterMatters.org.*

AYERSWORTH

Southwest Florida Water Management District

Learn How Long to Run Your Sprinklers

Measuring the application rate will help you determine how long to run your sprinklers. Complete the steps below or follow the "Run Time Recommendations" chart by September 30, and answer the brief survey on the QR code to participate in a raffle to win a free micro-irrigation kit ($45 value).

STEPS	EXAMPLE
1 Place at least 5–7 short, straight-sided containers like tuna cans in a grid pattern throughout one irrigation zone (3–6” in diameter of the same size). Place cans 1 to 3 feet from sprinklers for accuracy.	
2 Turn on water to the zone you are testing for 15 minutes. If possible, run the zone during the time you would normally irrigate.	
3 Measure the amount of water collected in each can up to the nearest 1/8" and convert fractions to decimals (divide numerator by denominator). Add all measurements together.	0.6” + 0.5” + 0.4” + 0.6” + 0.5” + 0.6” = 3.2” Total Water Applied 
4 Divide the total water applied by the number of cans.	3.2” ÷ 6 cans = 0.53” Average Water Depth 
5 To calculate run times for 1/2" of water applied per zone, divide 7.5 by the average water depth.	To apply 1/2” of water: 7.5 ÷ 0.53” = 14 minutes

Repeat steps 1–5 for each zone.

University of Florida recommends turf receive no more than 1/2 to 3/4” of water per irrigation day. Adjust your system to apply 1/2" of water and increase run times only if needed.

AYERSWORTH

Southwest Florida Water Management District

Turn Off Your Irrigation When Rainfall is Enough

Last summer, the Ayersworth Glen Community had a new sign installed near the US Hwy 301 exit. The sign shares the number of inches of rainfall we receive each week using an approximate 7-day rolling total.

The sign plaque was updated in early December showing that most lawns only need about 0.2" of water each week during the winter months as opposed to 1.25" of water each week during the summer.

During the cooler winter months, most lawns need about 0.2" of water per week. When the weather is cold, water doesn't evaporate as quickly, allowing grass to retain water longer. In addition, grass grows slower during the winter. You can consider reducing the amount of time you run your irrigation system, or don't run it at all if enough rainfall was received.

Please turn off your irrigation when rainfall is enough to save water and money.

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The Highlands Community Development District volunteered to partner with the Southwest Florida Water Management District in this unique sign project to reduce water use. The hope is that the project will showcase how education about local rainfall amounts and turf water needs will help lead to water conservation and expand this project to additional high water use communities.

For more water conservation tips, visit *WaterMatters.org/Water101.*

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The sign plaque was updated in April showing that most lawns need about 1.25" of water during the summer months.

During the summer months, lawns typically need about 1.25" of water per week due to increased evaporation from heat. However, summer usually brings more rainfall, reducing the need for irrigation. Before running your system, check the weekly rainfall totals. You may be able to reduce the irrigation time or skip it altogether if there's been sufficient rainfall. While April and May are typically dry in Florida, be sure to watch the weather and wait to water when the rainy season arrives.

For more water conservation tips, visit *WaterMatters.org/Water101.*

For questions about the rainfall data sign, email *Robin.Grantham@WaterMatters.org.*

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Water Conservation Mini Expo!

Join us for a water mini expo at the Ayersworth Glen Clubhouse on **Saturday, May 10,** anytime from **3–6 p.m.** The expo will feature educational booths focused on water conservation for both adults and children.

- Enter raffles for a free micro-irrigation kit ($40 value)!
- Learn about water savings achieved from the rainfall sign.
- Make muddy buddies — a fun activity for kids!
- Find out about rebates for toilets, irrigation system upgrades and more!
- Learn about water conservation and Florida-Friendly Landscaping!

Vendors include the Southwest Florida Water Management, Tampa Bay Water, the Hillsborough County Extension Office and Hillsborough County Utilities.

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Southwest Florida Water Management District
Florida-Friendly Landscaping™ PROGRAM
Hillsborough County Florida
TAMPA BAY water wise
UF IFAS Extension UNIVERSITY of FLORIDA

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From December 10, 2025, to January 14, 2026, the sign read 1.07" in error and has been corrected.

Please turn off your irrigation when rainfall is enough to save water and money.

Adjust your irrigation run times based on these recommendations from the University of Florida Institute of Food and Agricultural Sciences OR for more accurate runtimes, follow the instructions on the reverse to determine the amount of water your sprinklers apply.

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