

This presentation premiered at WaterSmart Innovations

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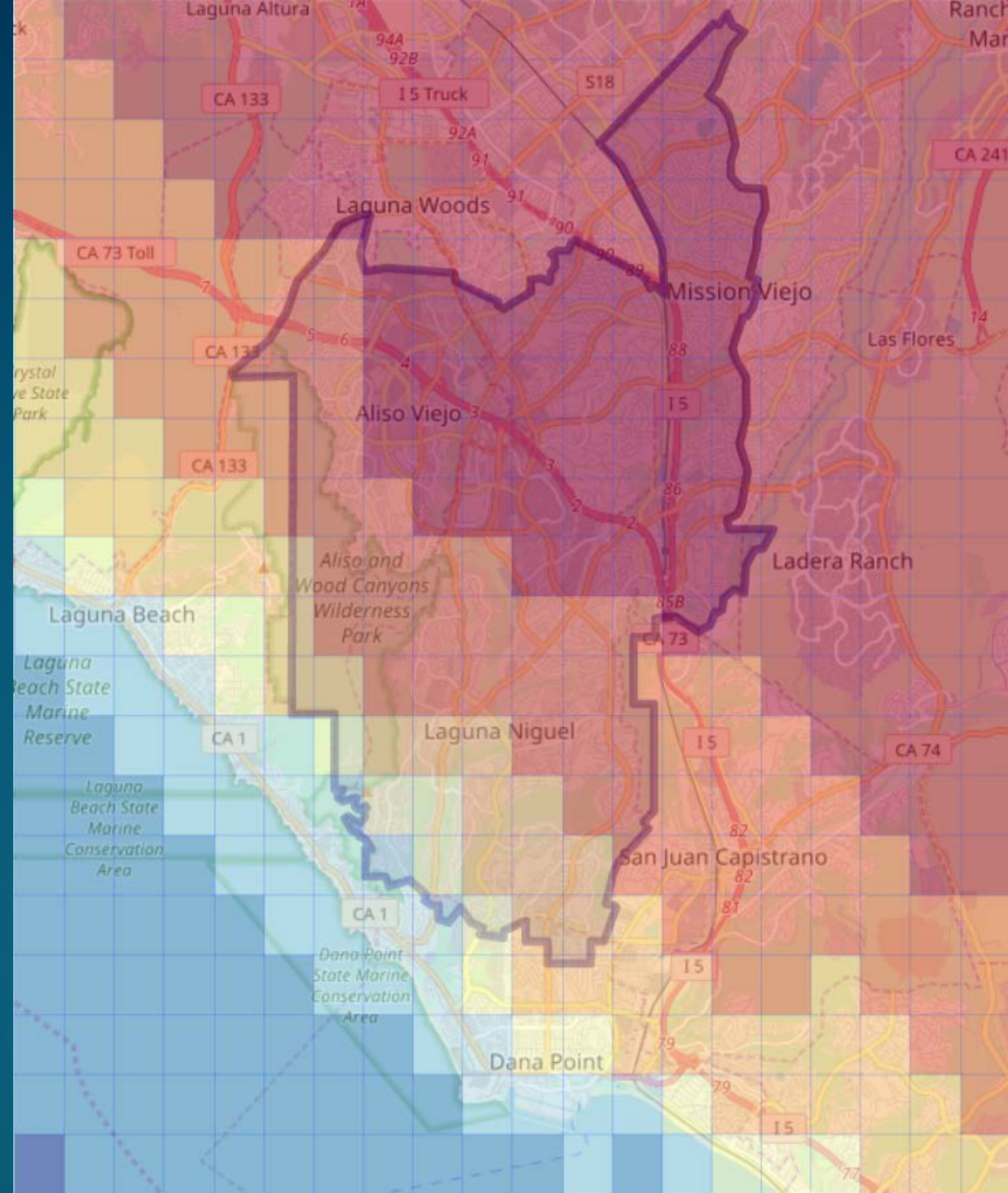
moulton niguel water district

Open-Source Evaluation Tool Leads to Data-Driven Program Development

Rhonda Himley
October 3, 2019

Moulton Niguel Water District

- Serve 6 cities in south Orange County
- Water, Wastewater, & Recycled Water
- Water Budget Based Rate Structure
- Data-driven utility
- Early adopters of tech, open-source tools
- One of the founding agencies of the California Data Collaborative



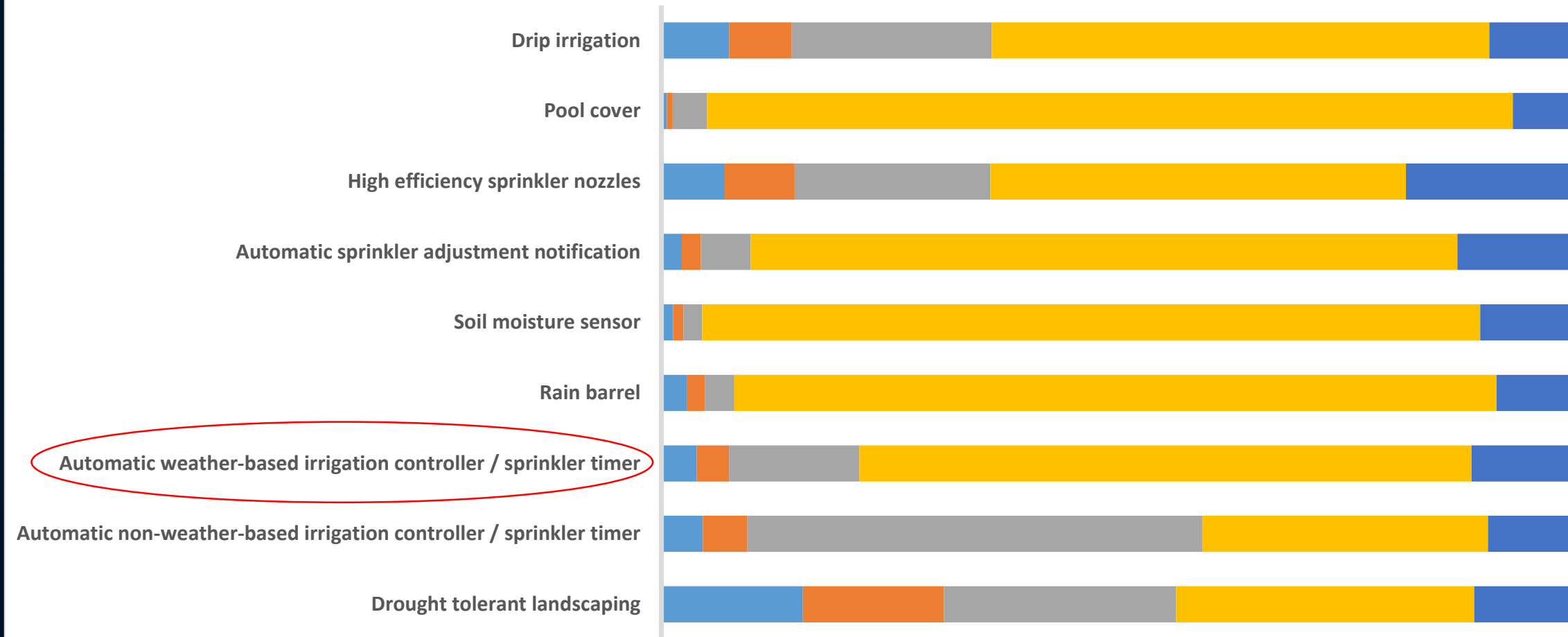
UC Riverside Study on MNWD's Efficiency Programs



UCR Study – Adoption of Outdoor Efficiency Programs

Q9- Please indicate when you started using each of the following outdoor technologies/services.

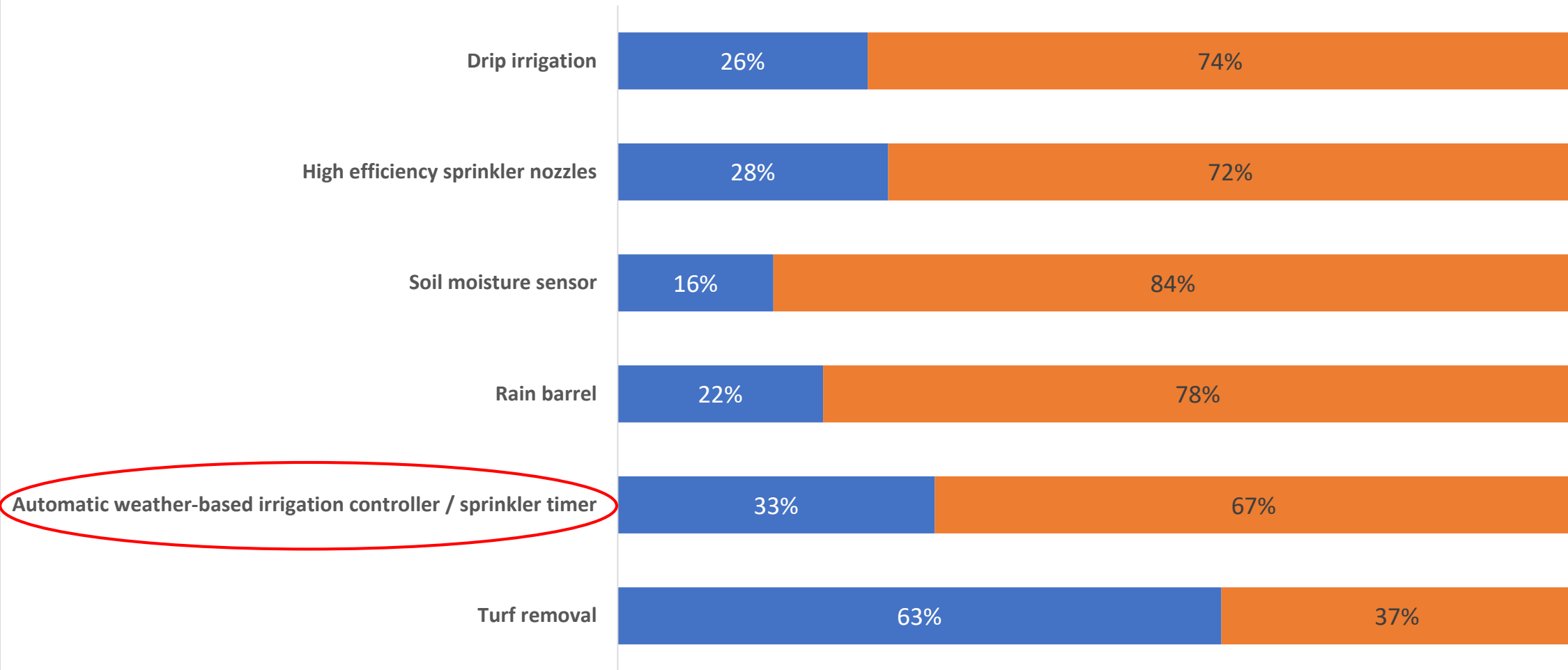
■ Approximately 1 year ■ Between 1 and 2 years ■ More than 2 years ■ I do not currently use this technology/service ■ Unsure whether we have this



UCR Study – Awareness of Outdoor Rebate Programs

Q10- Please indicate if you were aware of the rebate programs offered by MNWD.

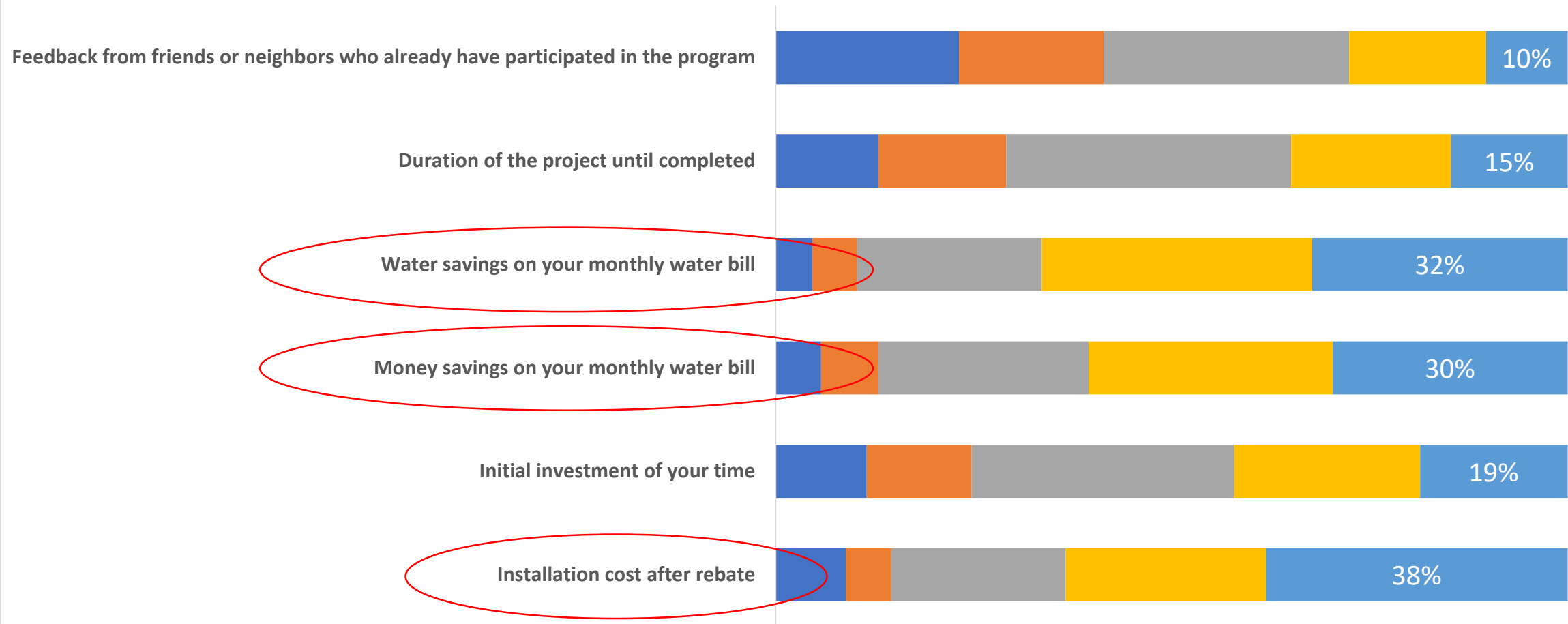
■ Yes ■ No



Factors Affecting Program Participation

Q37- For each characteristic please choose the box that represents the importance of each factor in your decision to participate in a water conservation program.

■ Very Low ■ Low ■ Moderate ■ High ■ Very High



Water Budget Based Rate Structure

- Outdoor Budget calculation elements:
 - Irrigable Area
 - Evapotranspiration (ET)
 - Plant Factor
 - Conversion Factor(s)
- Variation driven by changes in ET



Potable
Water
Budget

=



×



×

0.7 × 0.62 ÷ 748



0.7 Plant Factor



0.62 Conversion
Factor



748 Conversion
Factor

Smart Timer Program

- Provides a free landscape and irrigation assessment
- Provides up to 2 free Rachio Gen 2 timers
- Targeted large lots and high users
- Reduced Flat rate for direct installation @ \$165 per controller



The banner features a background image of a lawn with a tree on the left and a sprinkler system in operation. At the top, the Rachio logo is on the left, followed by the text "In partnership with:" and the logos for Moulton Niguel Water District and Valley Soil Inc. The main headline is "Free Rachio Smart Sprinkler Controller!". Below this, a paragraph explains the program: "Receive premium smart watering technology while supplies last! In partnership with Moulton Niguel Water District, this limited-time program encourages homeowners to maximize watering efficiency at no cost to you."

 rachio

In partnership with:

 moulton niguel water district

 Intelligent Water Valley Soil Inc.

Free Rachio Smart Sprinkler Controller!

Receive premium smart watering technology while supplies last! In partnership with Moulton Niguel Water District, this limited-time program encourages homeowners to maximize watering efficiency at no cost to you.

Targeted Marketing & Education

TOTAL WATERING CONTROL AT YOUR FINGERTIPS.

Manage watering on your smartphone, and start saving money and water with a Rachio Smart Sprinkler Controller.

Upgrade to the latest smart watering technology - apply online today:
www.rachio.com/mnwd



IRRIGATION WORKSHOPS

Ready to tune up your sprinklers?

Workshop attendees are eligible to win a FREE Rachio smart controller!



May through October!

Moulton Niguel is hosting FREE interactive irrigation classes to help customers identify and resolve common irrigation issues, learn ways to avoid over-watering in the hot summer months, and to learn about monthly water budgets.

**Light snacks will be provided.*

Our “All Things Irrigation” workshops are interactive and offer education on the following topics:

- How to increase the efficiency of your sprinkler system
- Retrofitting your irrigation system
- How to calculate your water budget
- Where your water comes from



Hands-on experience



Participants will gain hands-on experience with sprinkler timers and learn how to:

- Set the timer
- Set multiple start times
- Use multiple programs for hydrozoning
- Use the seasonal adjust feature
- Manually run stations and more!



Upcoming
Workshop Dates
and Times

Wednesday, May 8th	6pm
Wednesday, June 5th	6pm
Saturday, June 15th	9am
Wednesday, July 10th	6pm

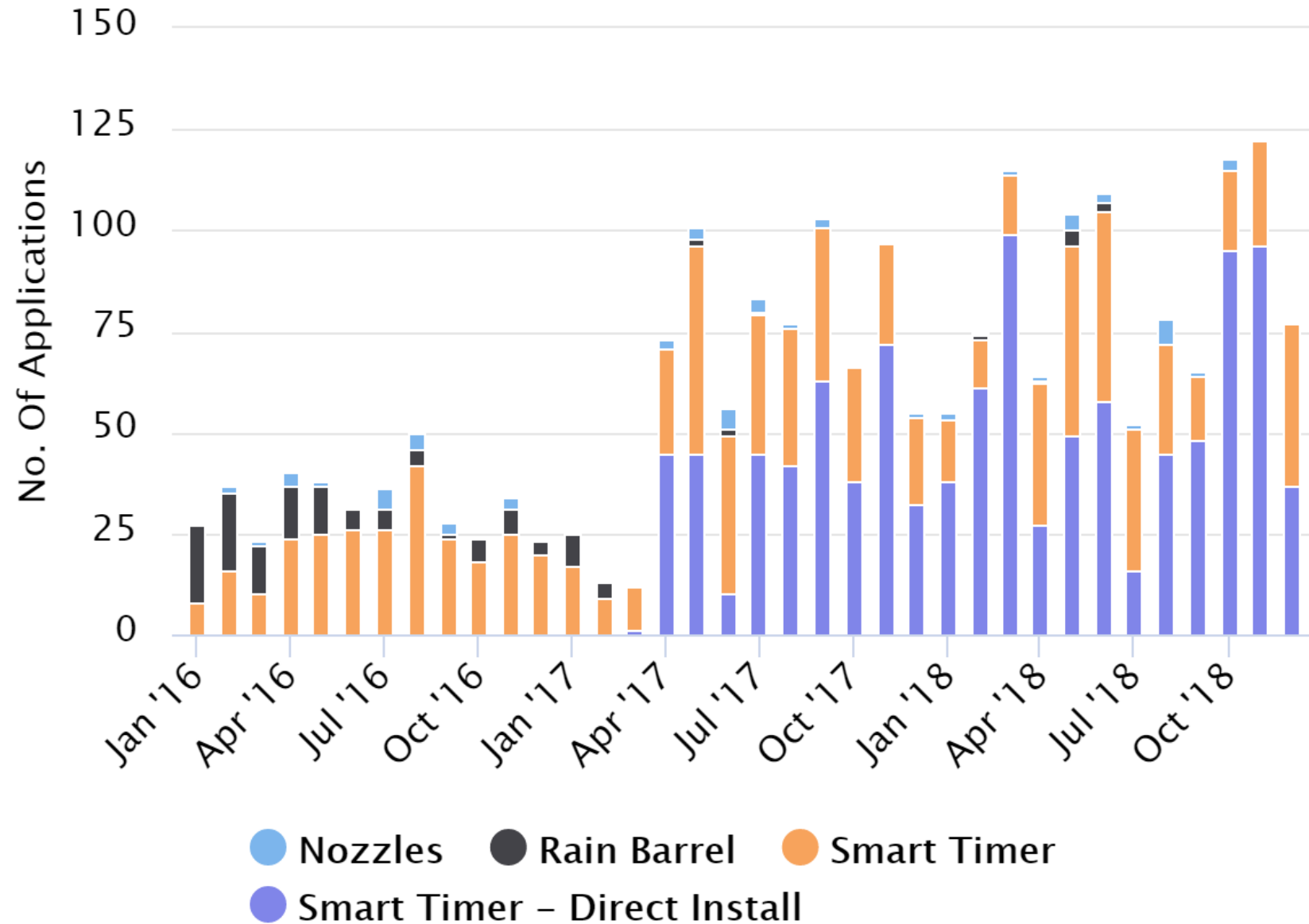
**Registration is required*

Register by visiting mnwd.com/workshops

Smart Timer Program Activity

Residential Outdoor Devices

Moulton Niguel Water District

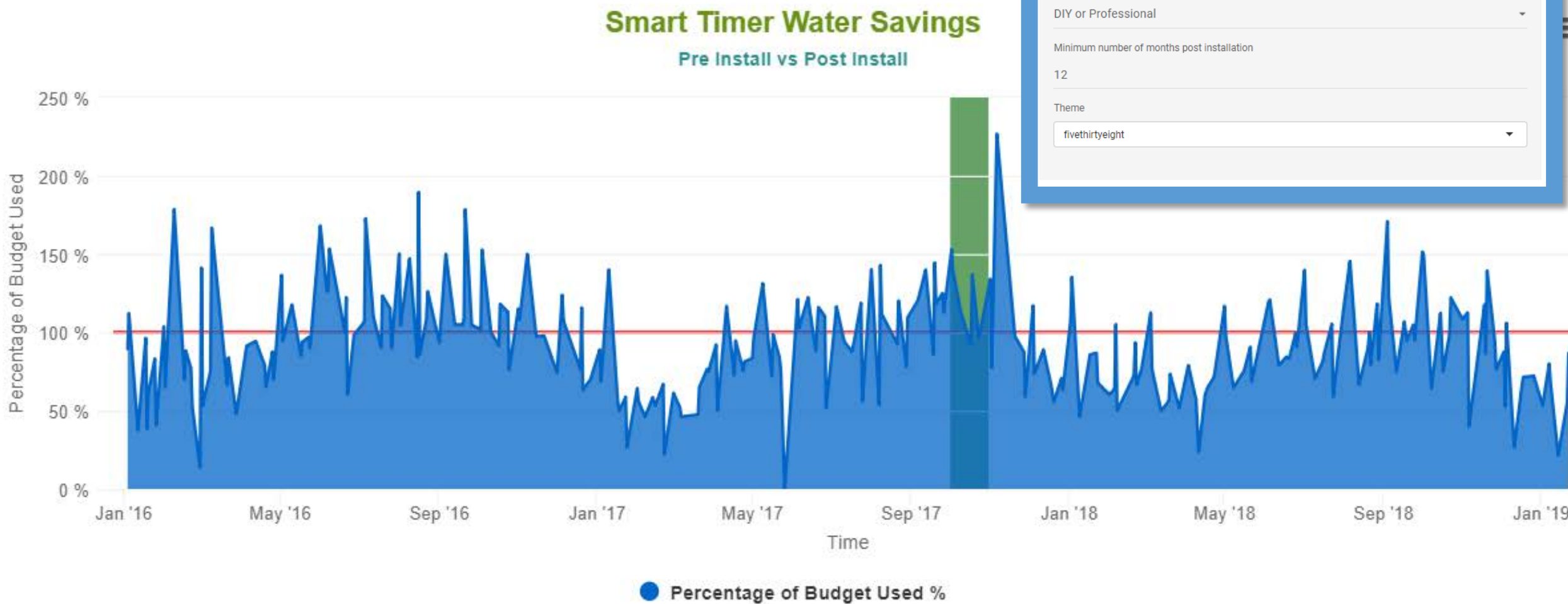


Open-Source Tools

- Non-proprietary and free programming languages and tools
- R and Python: programming languages
- R-Shiny: data visualization program
- Github: code sharing site where others can adapt and redeploy
- Best advice: Get a data science intern



Program Analysis Tool



Select an Installation Date Range

2017-07-01 to 2017-07-07

Choose a starting Year for Usage

2013

Choose one:

☒ Difference from Budget

☐ Percentage of Budget Used

Choose method of Installation

DIY or Professional

Minimum number of months post installation

12

Theme

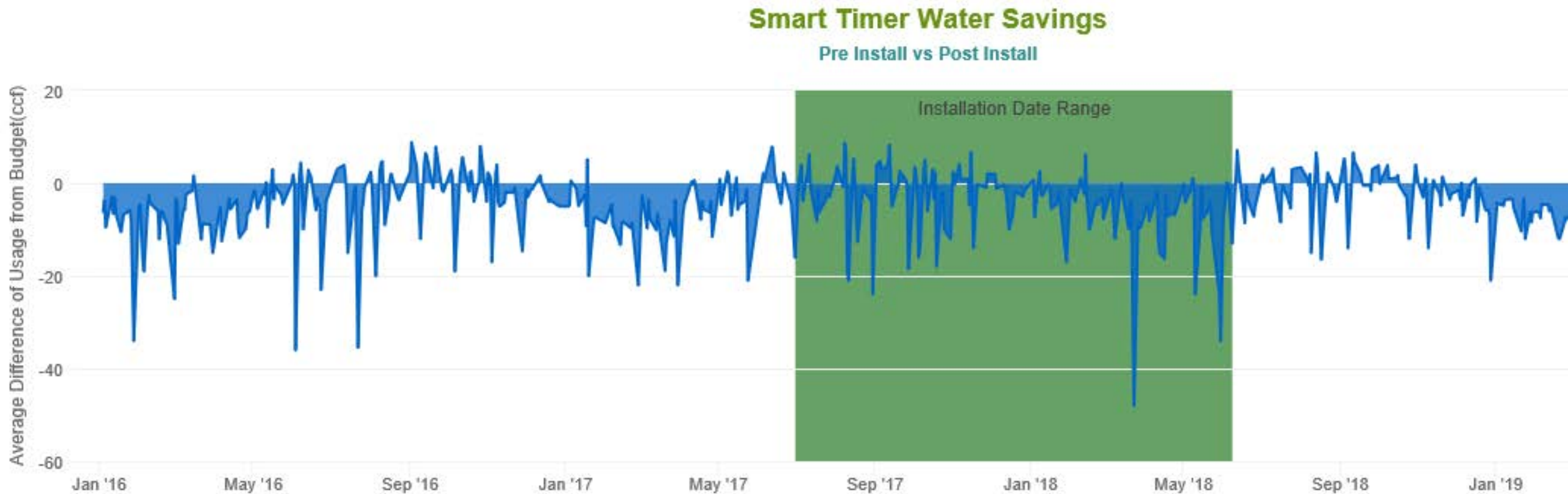
fivethirtyeight

Program Analysis Tool

Choose one:

☒ Difference from Budget

☐ Percentage of Budget Used



Smart Timer Program – Analysis Summary

Select an Installation Date Range

2017-07-01

to

2017-12-31

Choose a starting Year for Usage

2013

Choose one:



Difference from Budget



Percentage of Budget Used

Choose method of Installation

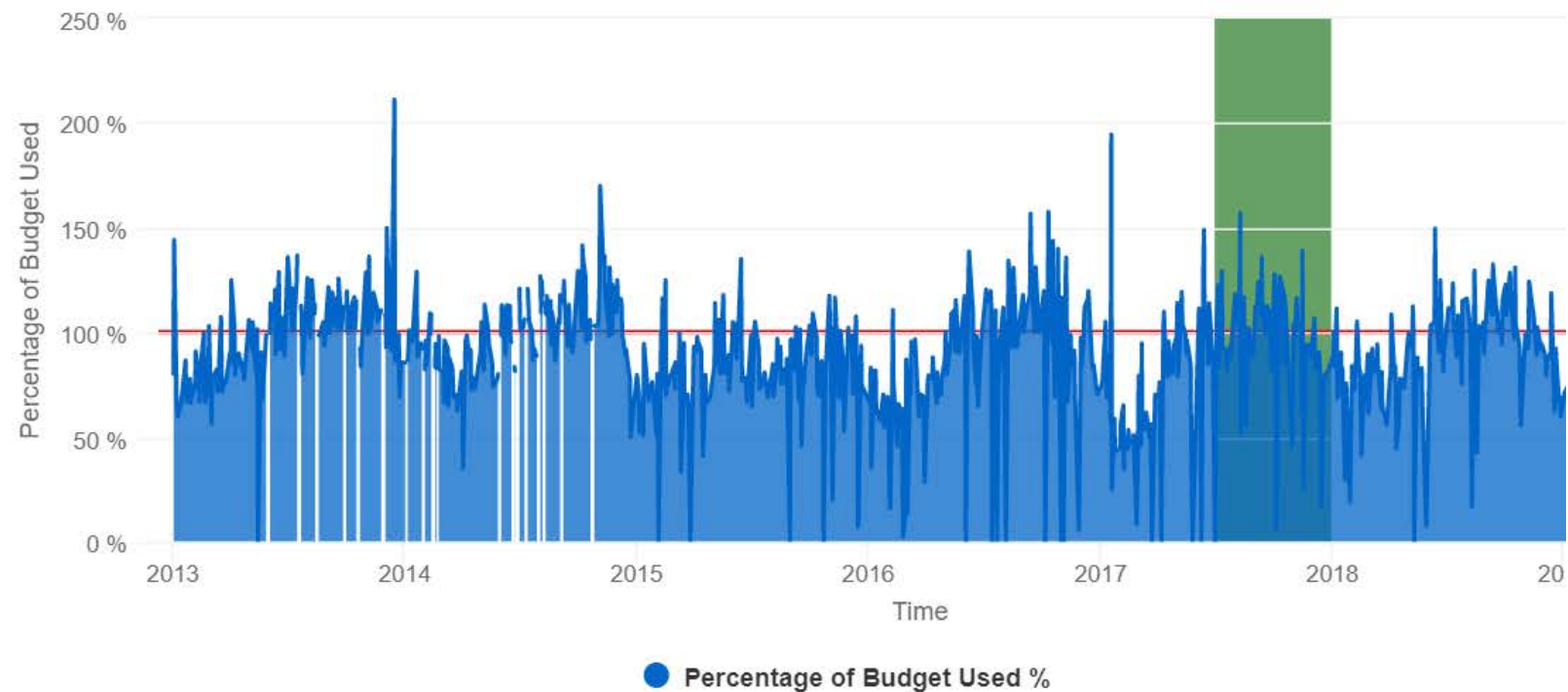
DIY or Professional

Minimum number of months post installation

12

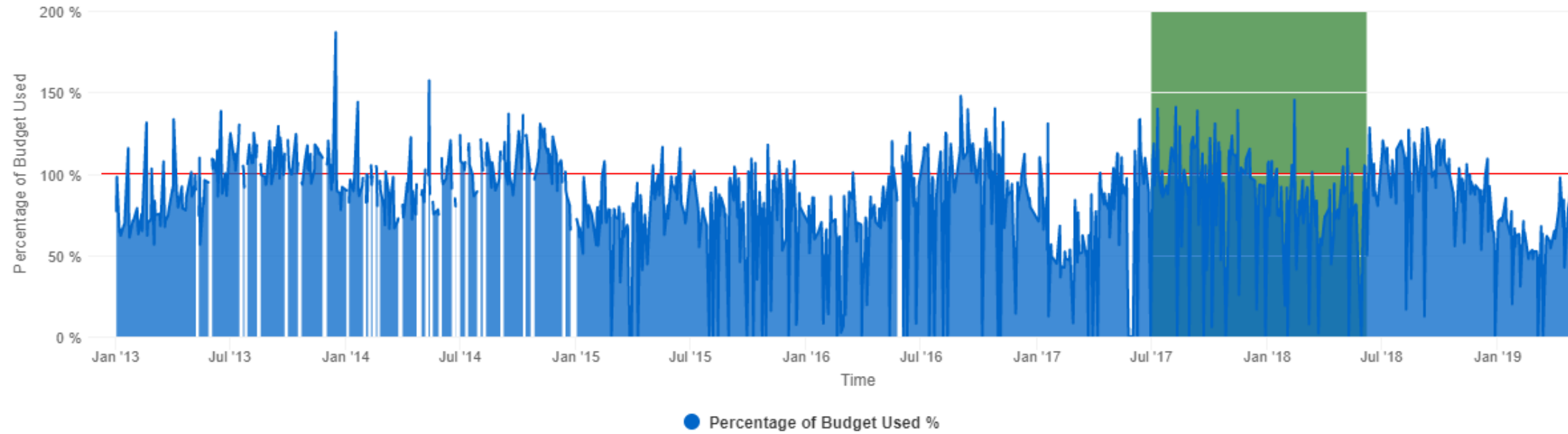
Smart Timer Water Savings

Pre Install vs Post Install



* Smart Timer Water Savings

Pre Install vs Post Install



Number of Accounts in the chosen installation date range: 413

Average Usage per bill period before Installation (ccf): 22.6

Average Usage per bill period after Installation (ccf): 19.29

Average Water Savings per bill period (ccf): 3.31

% of Budget used before installation on average: 89.42 %

% of Budget used after installation on average: 84.25 %

*Installations
between 7.1.17 –
6.9.18 with 12
months post-
installation data

Program Analysis – Phase 2

- Accounts must have 12 months post-install data
- Regression analysis of several program variables
 - Landscape condition
 - Irrigation condition
 - DIY v. Professional Installation
- Professional Installation had greatest effect on program outcome

Program Analysis – DIY v. Professional Installation

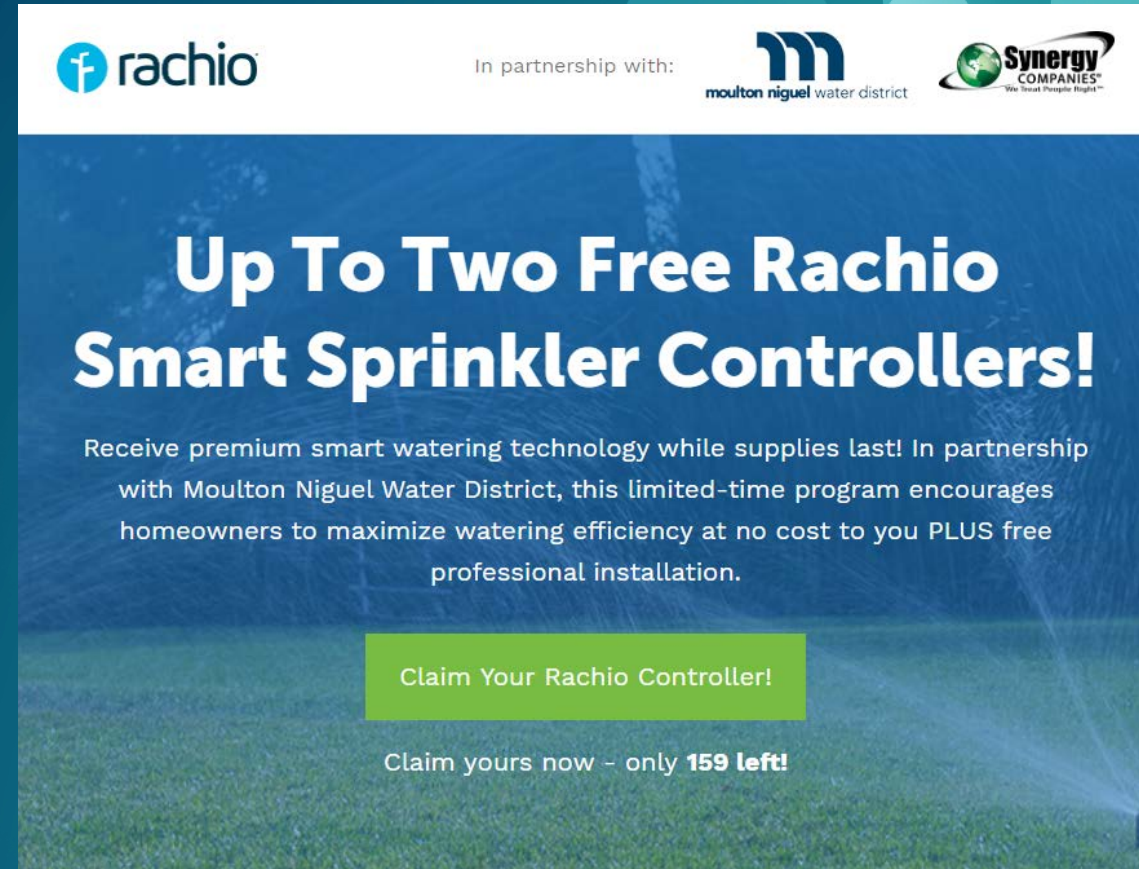
	DIY Installation	Professional Installation
Number of accounts in installation date range	303	110
Average use per bill before installation (CCF)	22.25	23.57
Average use per bill after installation (CCF)	19.24	19.44
Average water savings per bill period (CCF)	3.01	4.13
Average % of Budget used before installation	86.69%	96.98%
Average % of Budget used after installation	82.81%	88.17%

Program Analysis – DIY vs. Professional Installation

Smart Timer Program Results						
DIY or Professional	Min Pre history (months)	Min Post History (months)	Avg Water Savings per Bill Period	%of budget used before installation on avg	%of budget used after installation on avg	Improvement
DIY or Professional	12	12	2.01	88.89%	86.13%	2.76%
DIY or Professional	12	24	2.44	90.50%	86.48%	4.02%
DIY	12	12	1.78	86.53%	84.53%	2.00%
DIY	12	24	2.16	88%	85%	2.43%
Professional	12	12	2.57	95%	90%	4.76%
Professional	12	24	3.10	96.24%	88.62%	7.62%

Smart Timer Program 2.0

- Provides up to 2 free Rachio Gen 3 timers
- Targeted large lots and high users
- Free professional installation for each controller
- Continue to offer \$330 rebate on smart controllers



The banner features a background image of a green lawn with a sprinkler system in operation. At the top, the Rachio logo is on the left, followed by the text "In partnership with:" and the logos for Moulton Niguel Water District and Synergy Companies. The main headline reads "Up To Two Free Rachio Smart Sprinkler Controllers!". Below this, a paragraph explains the program: "Receive premium smart watering technology while supplies last! In partnership with Moulton Niguel Water District, this limited-time program encourages homeowners to maximize watering efficiency at no cost to you PLUS free professional installation." A green button with the text "Claim Your Rachio Controller!" is centered below the paragraph. At the bottom, the text "Claim yours now - only 159 left!" is displayed.

rachio

In partnership with:

moulton niguel water district

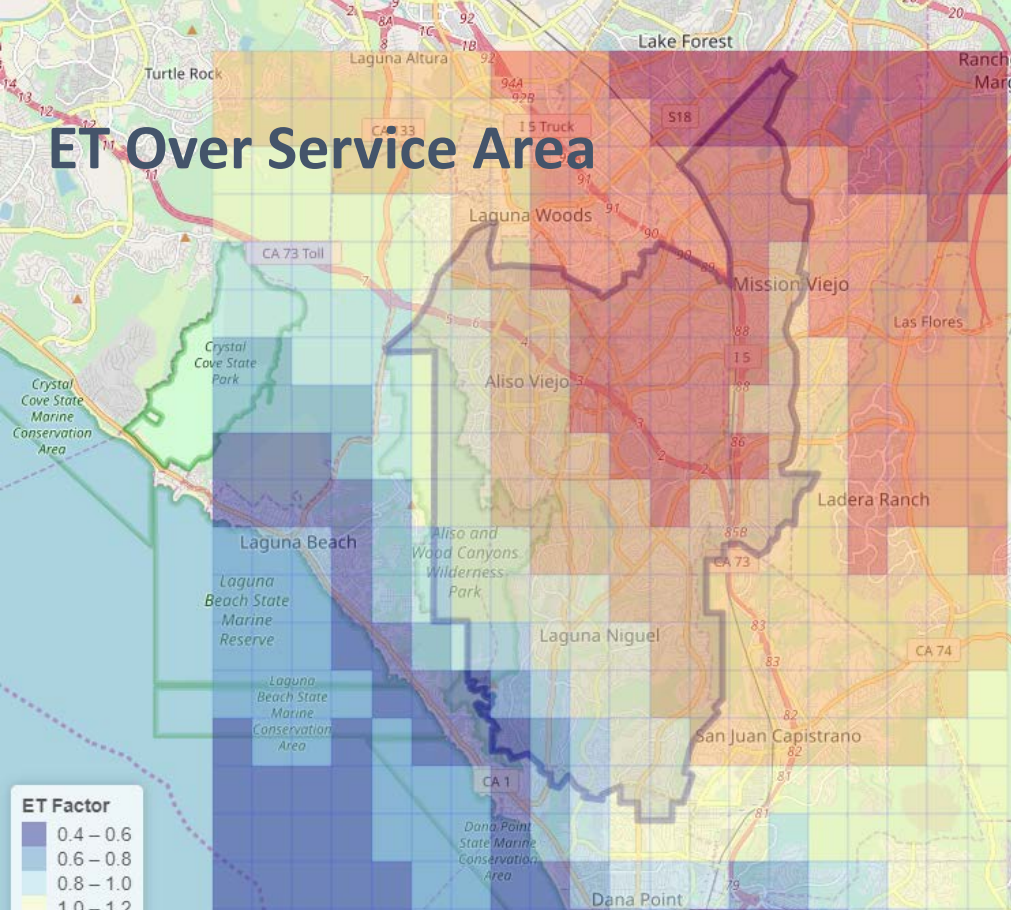
Synergy COMPANIES™
We Treat People Right™

Up To Two Free Rachio Smart Sprinkler Controllers!

Receive premium smart watering technology while supplies last! In partnership with Moulton Niguel Water District, this limited-time program encourages homeowners to maximize watering efficiency at no cost to you PLUS free professional installation.

[Claim Your Rachio Controller!](#)

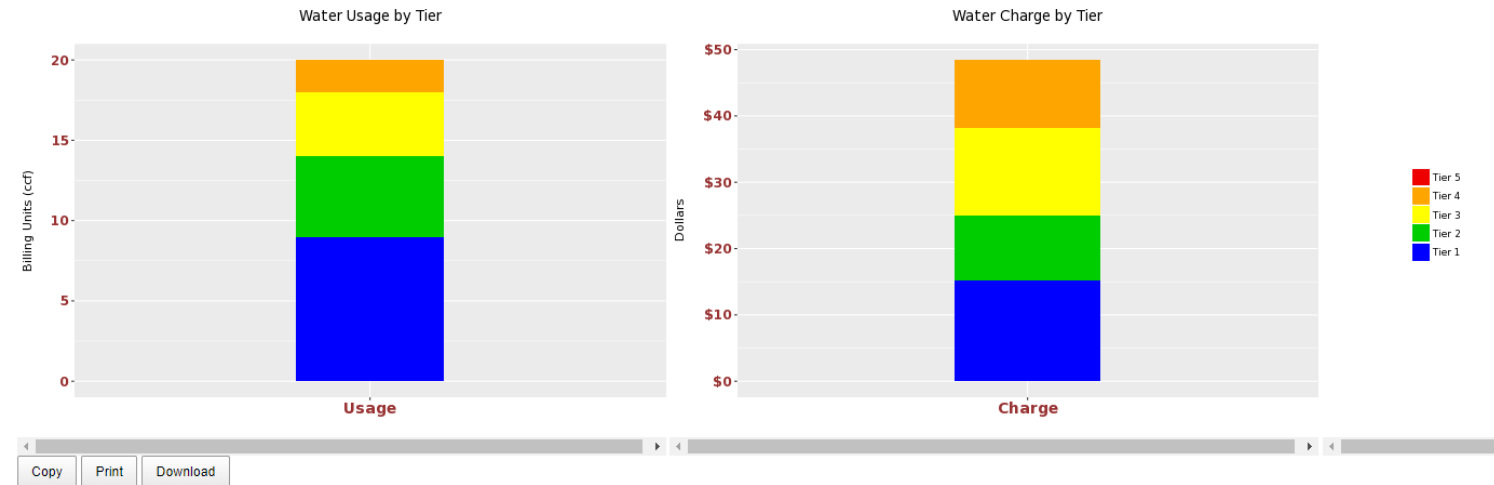
Claim yours now - only **159 left!**



Water Budget Bill Calculator

Use the bill calculator to see how changes in your water usage will affect your bill. For more information on our water budget based rate structure, visit www.mnwd.com/waterbudgetbasedrates/. To determine the Evapotranspiration amount for your microzone, refer to your bill statement or go to our [water saving tools page](#) and use the Evapotranspiration Map.

Please note: The bill calculator is to be used for informational purposes only. Billed amounts may vary based on actual water usage, actual evapotranspiration rates, any changes in household size or irrigable area and/or days in the billing cycle. For Single Family and Multi Family Residentials, Tier 1 and Tier 2 account to Indoor and Outdoor Budgets respectively.



Usage Tier	Usage Per Tier (ccf)	Price	Charge
Tier 1	9	\$1.69	\$15.21
Tier 2	5	\$1.94	\$9.70
Tier 3	4	\$3.32	\$13.28
Tier 4	2	\$5.12	\$10.24
Tier 5	0	\$9.59	\$0.00

Outdoor Water Budget

Moulton Niguel Account Number

Date

 to

Get Outdoor Budget

Please enter your account number and a date range to get estimated Outdoor Water Budget. Note: Only enter dates prior to current date

Account Number	12345
Service Address	107924
Weather Region	10530727
Current Outdoor Water Budget	2.51 BU
Outdoor Water Budget 1 year ago	2.25 BU
Outdoor Water Budget 2 years ago	2.1 BU

Showing 1 to 6 of 6 entries

Previous **1** Next

Please note that this is for informational purposes only. Actual billing amounts are rounded to the nearest whole number. The calculator uses the latest irrigable area and may vary from past values based on variances. All budgets are in ccf. ccf = 1 BU = 748 gallons.

Open-Source Customer Tools

Data Science Team



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