

Where Do We Go From Here? - Water Conservation and Demand Management for the Next Decade

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Principal

WaterDM



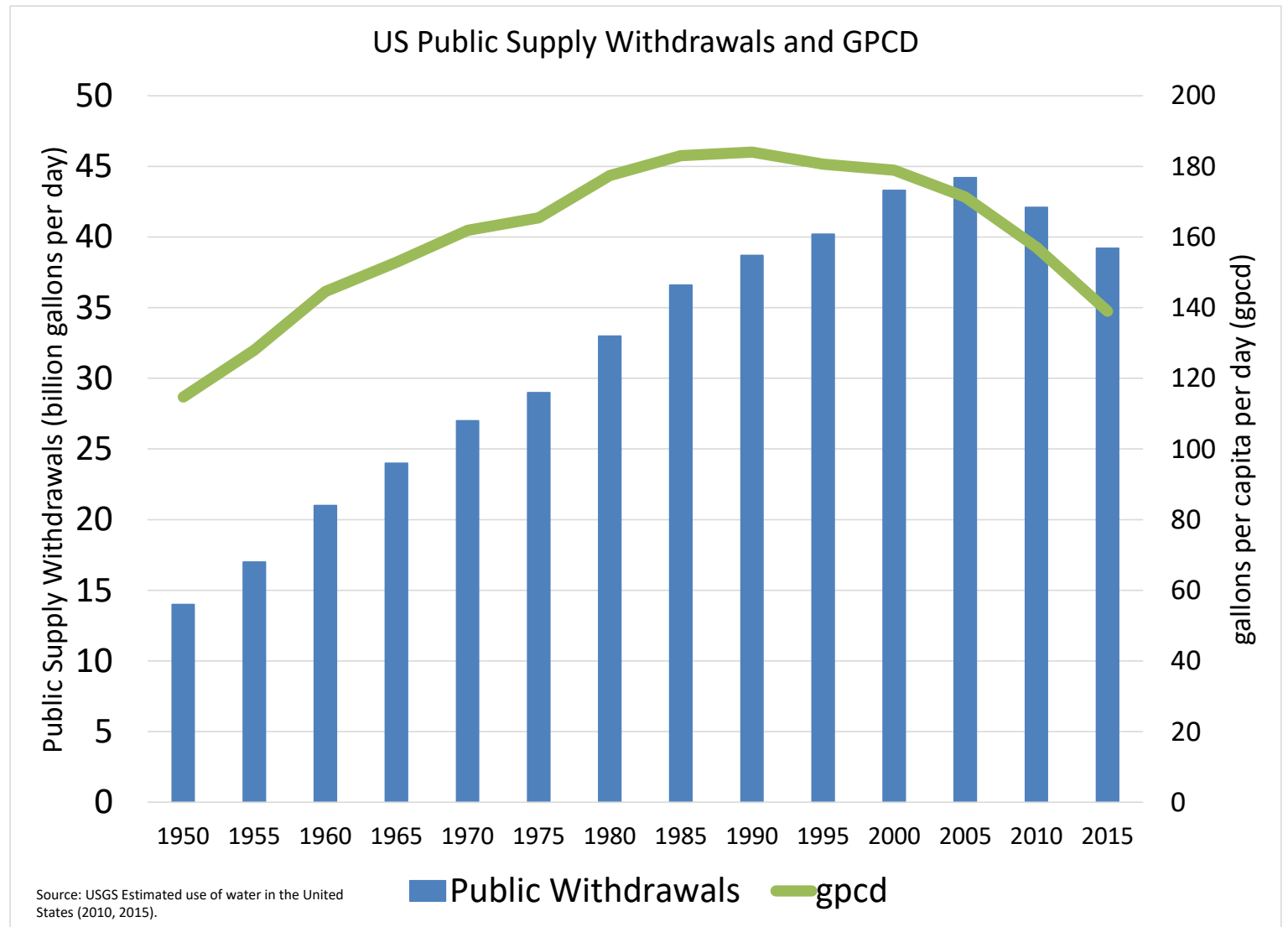
Outline

- How did we get here?
- Residential water demand trends in Texas
- Where are we going?
- Lessons learned from landscape transformation research
- Q & A

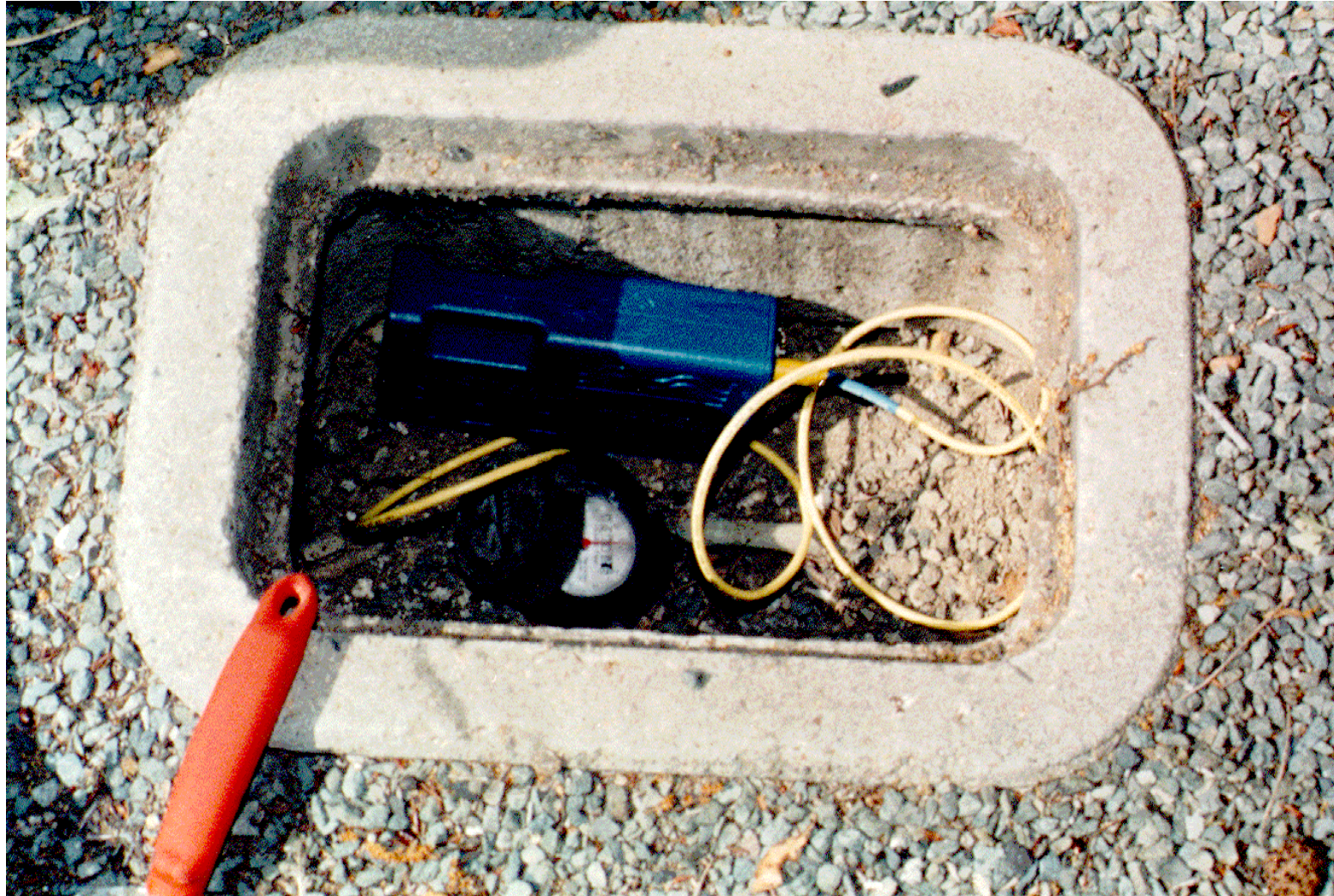


Public Withdrawals in the US 1950 – 2015

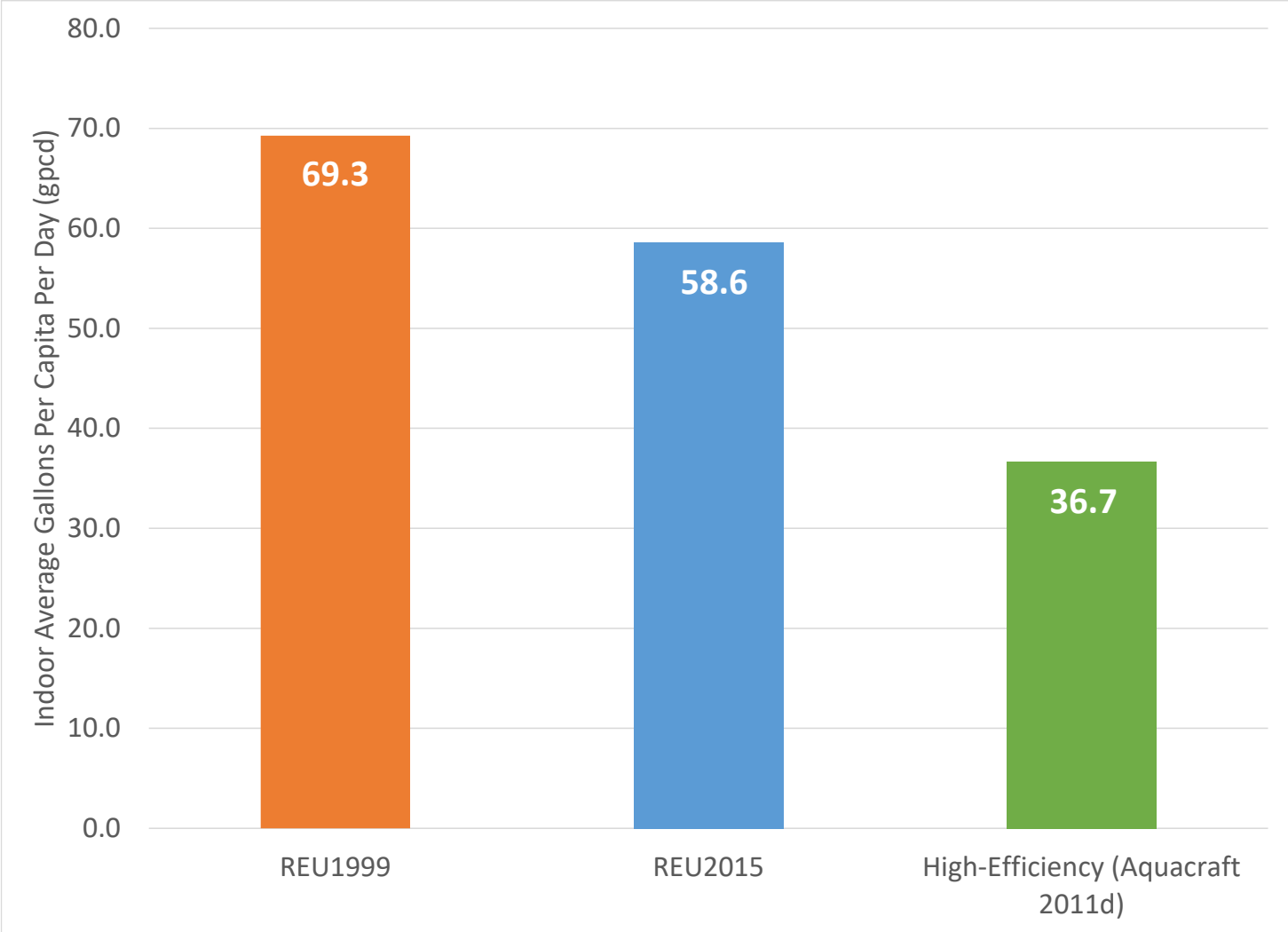
Source: USGS



Flow Recorder and Residential Water Meter



Residential Indoor GPCD



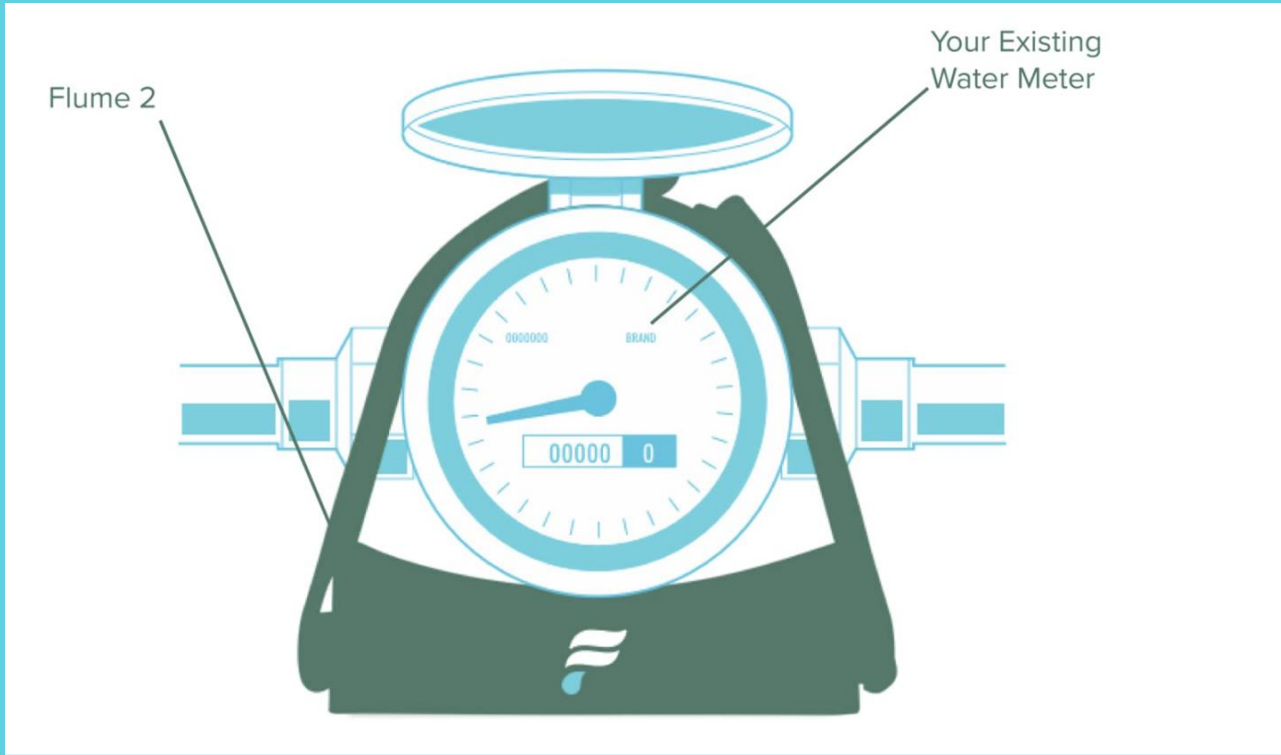
Sample sizes:

n = 1,188 (1999)

n = 762 (2016)

n = 35 (2011)

Source: Water Research Foundation (2016) Residential End Uses of Water Update – #4309. Denver, CO.



Residential Water Sensor



flume
DATA LABS™

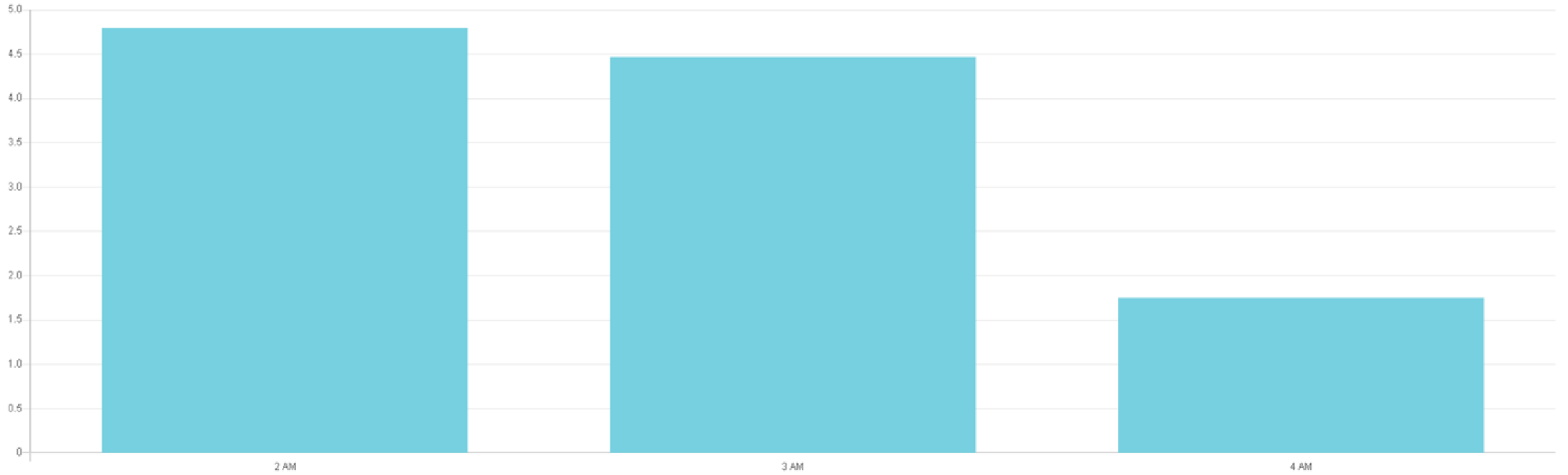
**1 Minute Data is Great;
5 Second Data is Game
Changing**



Hour Data



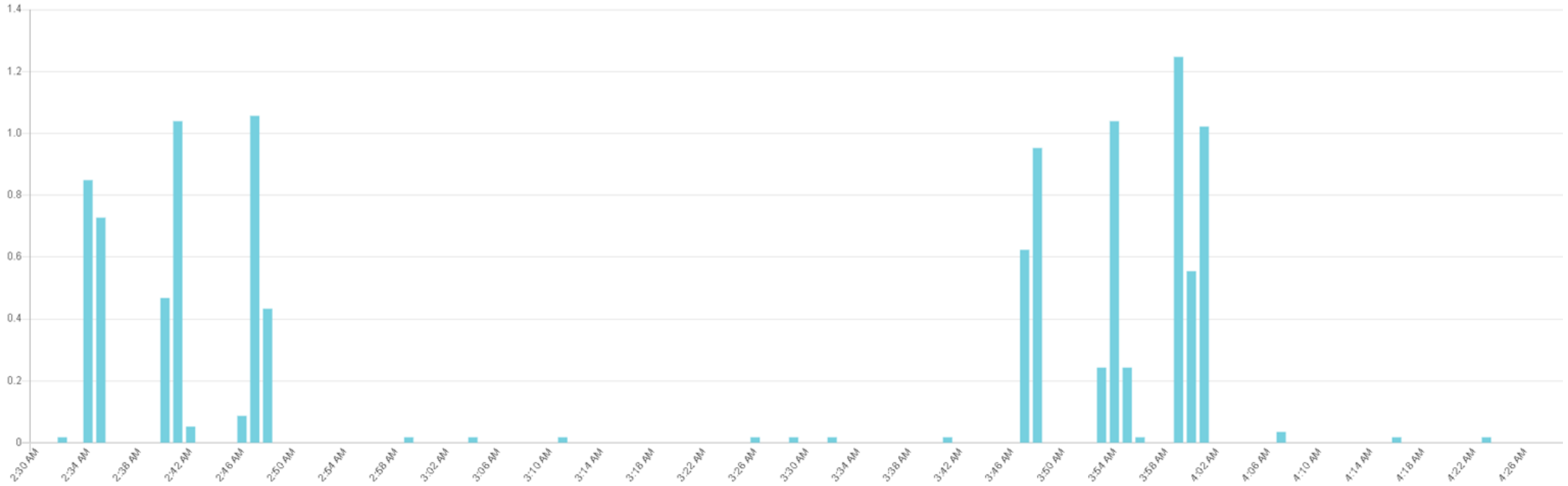
6/26/2020, 2:00 AM - 6/26/2020, 4:00 AM



Minute Data



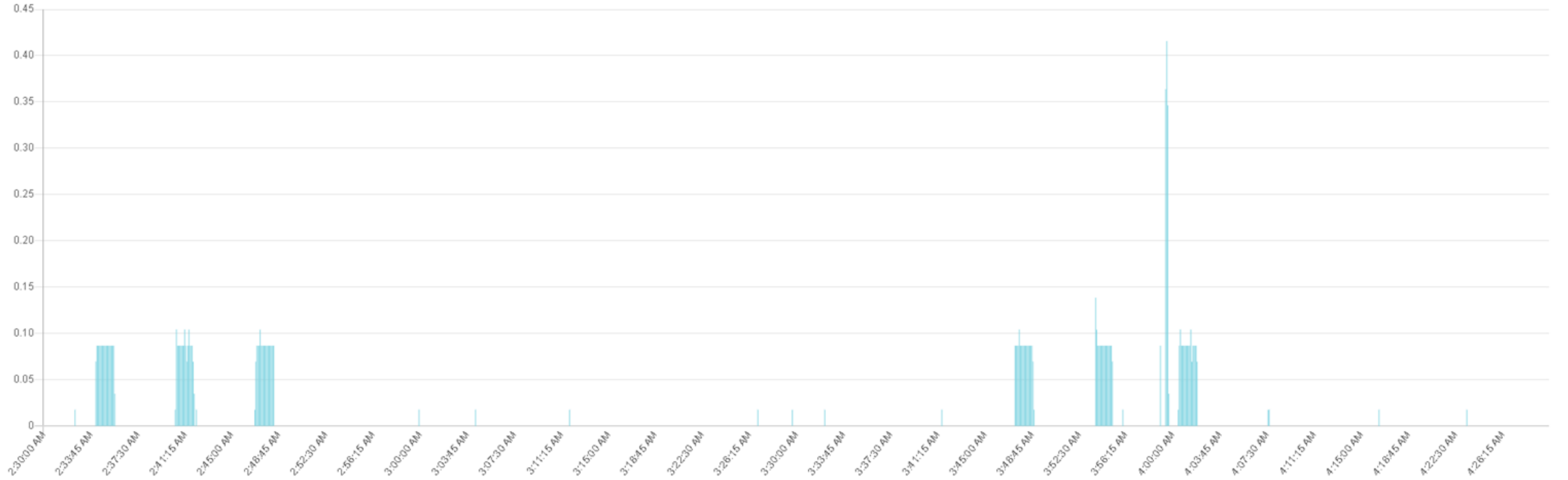
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5s Data

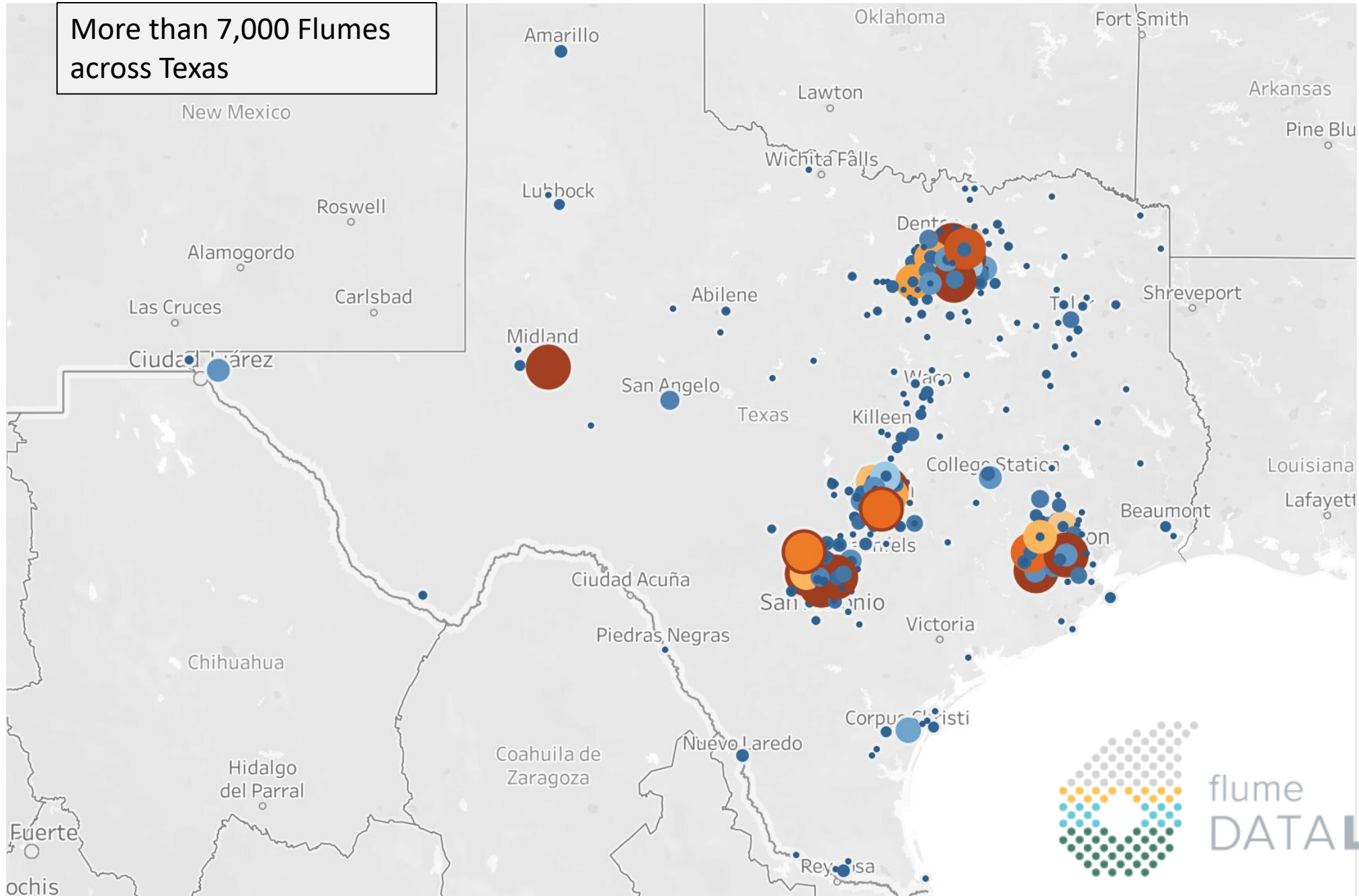


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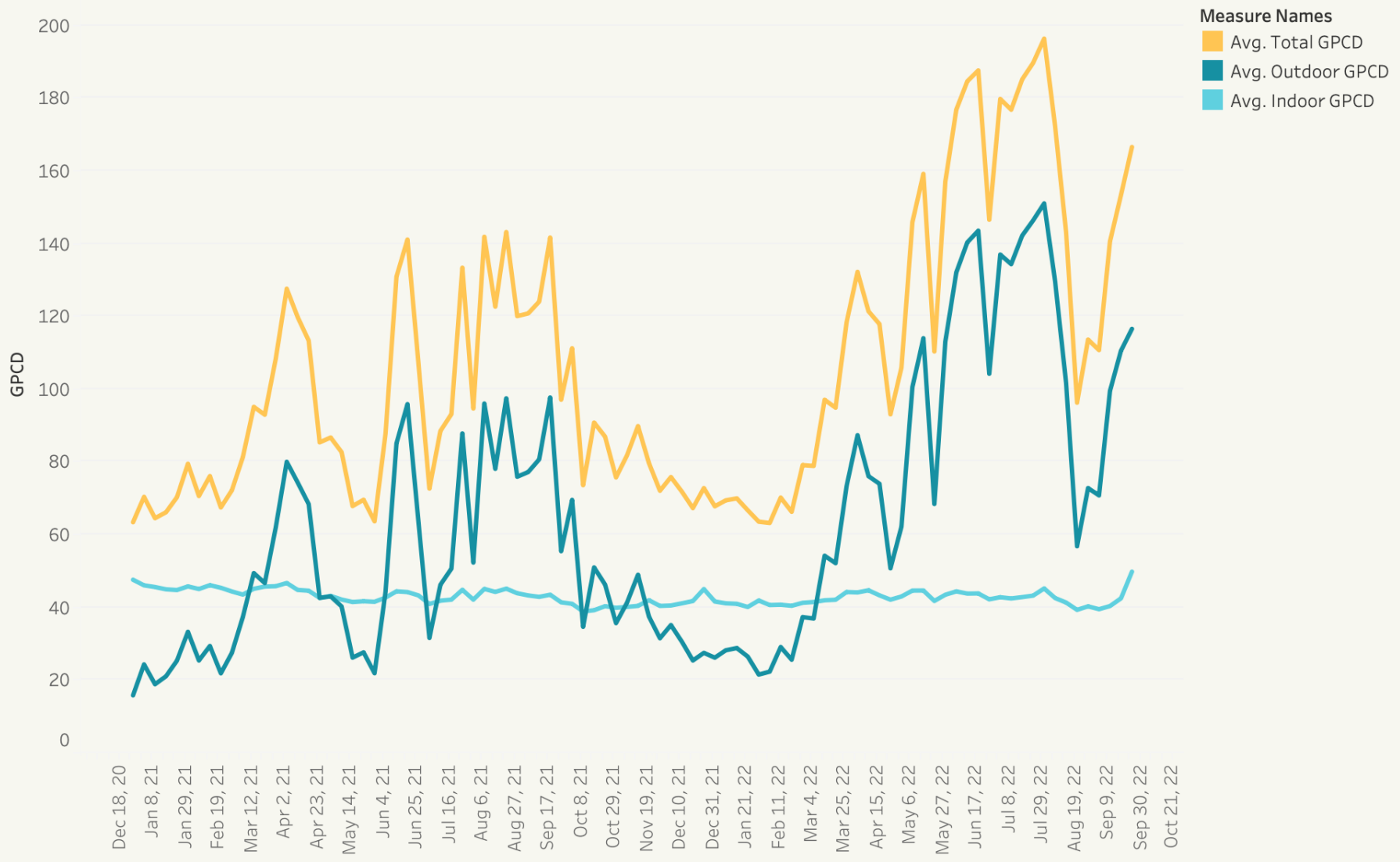


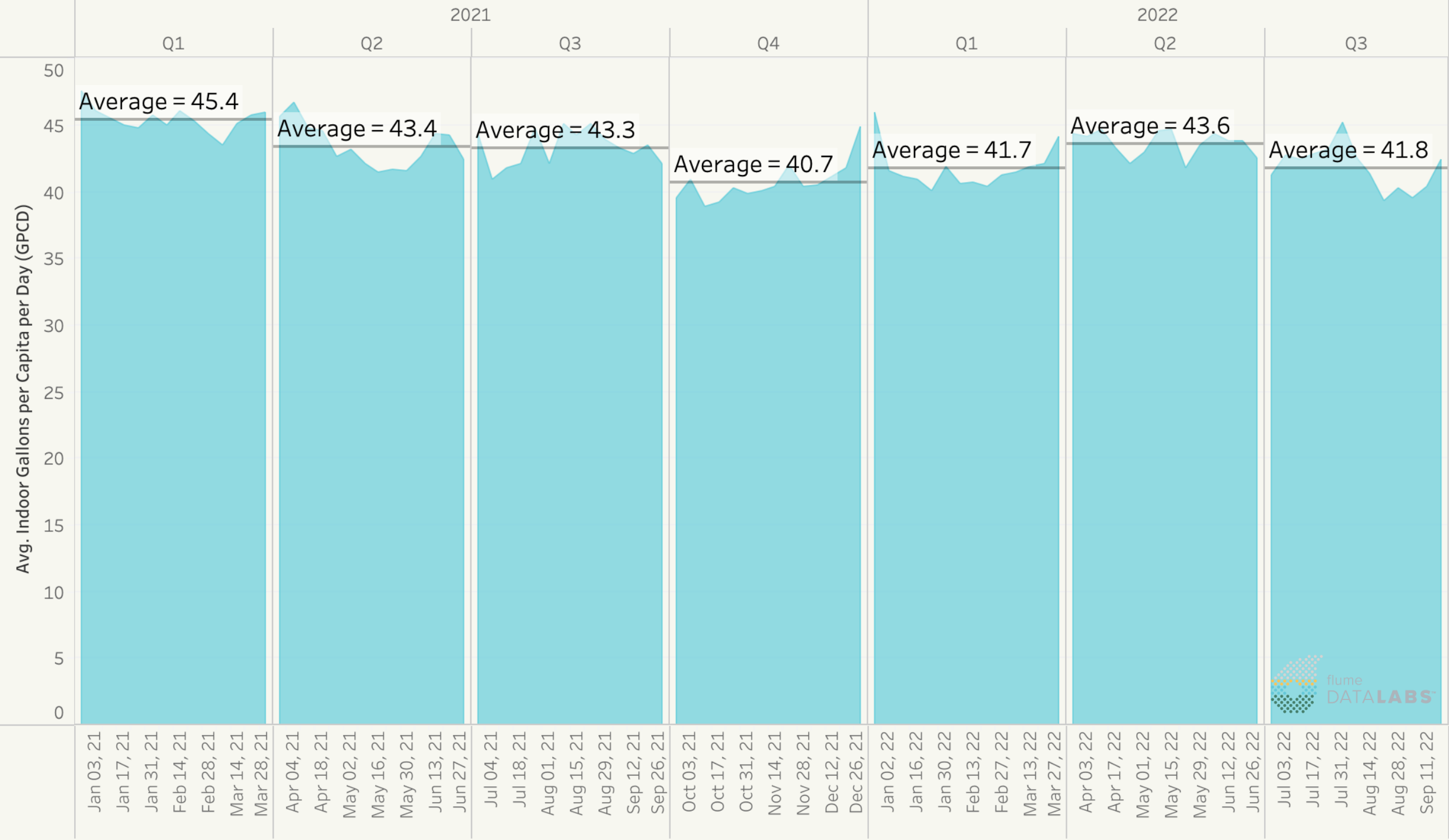
Distribution of Flume Devices Installed Texas as of September 30, 2022

More than 7,000 Flumes across Texas

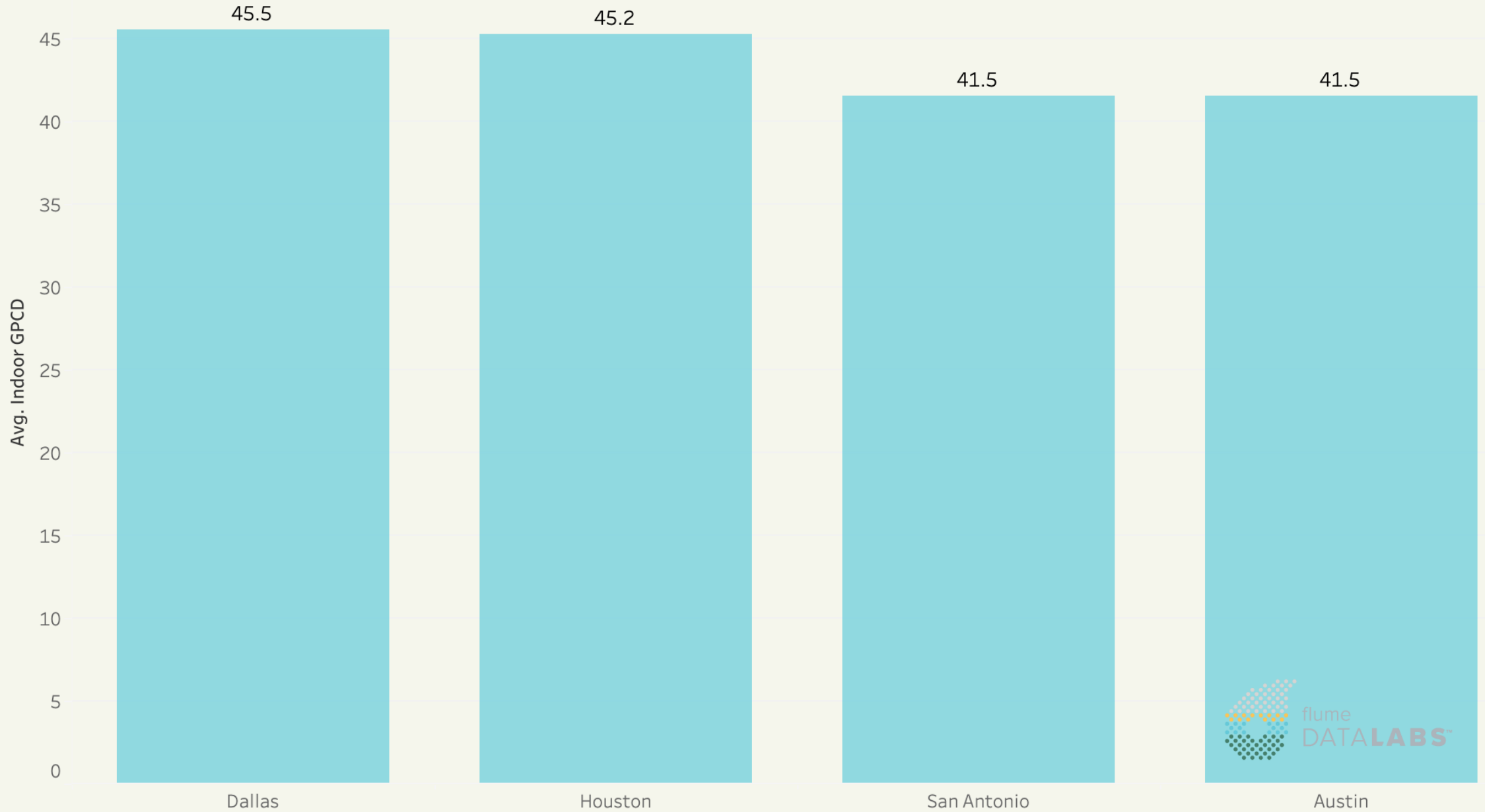


Per Capita Use - Texas

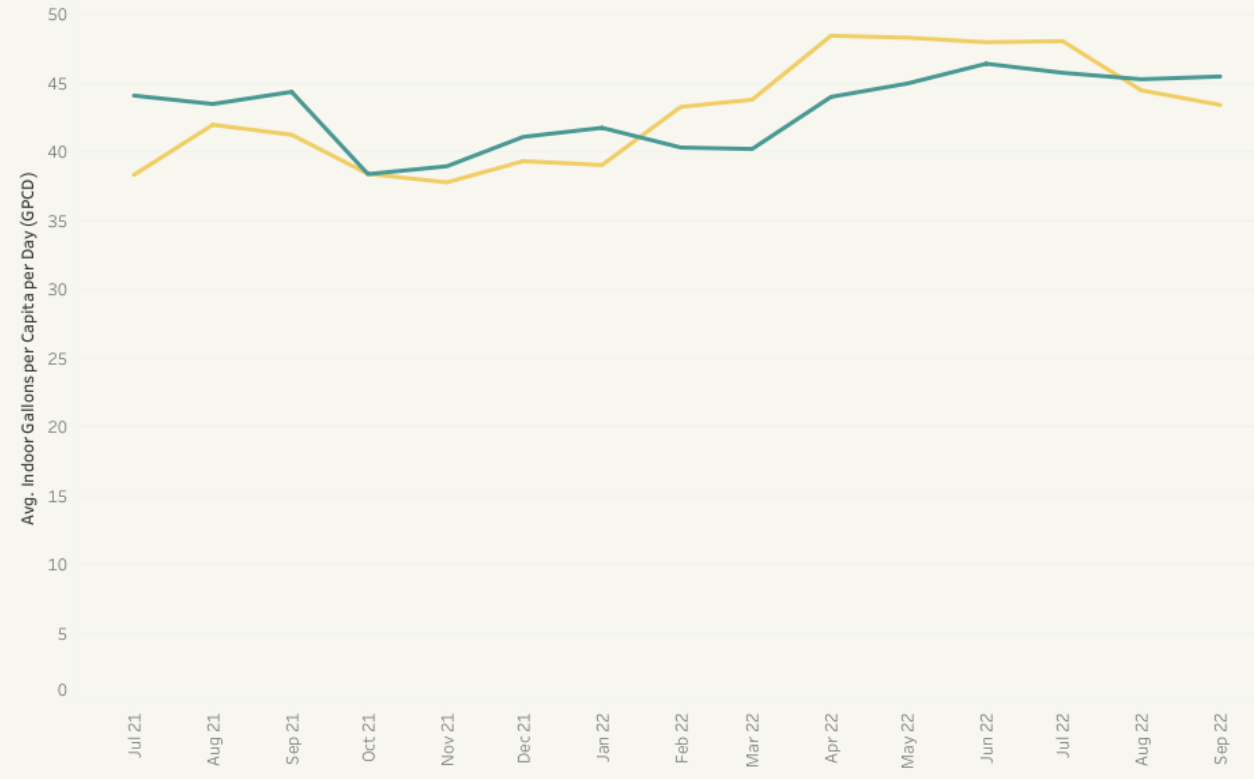
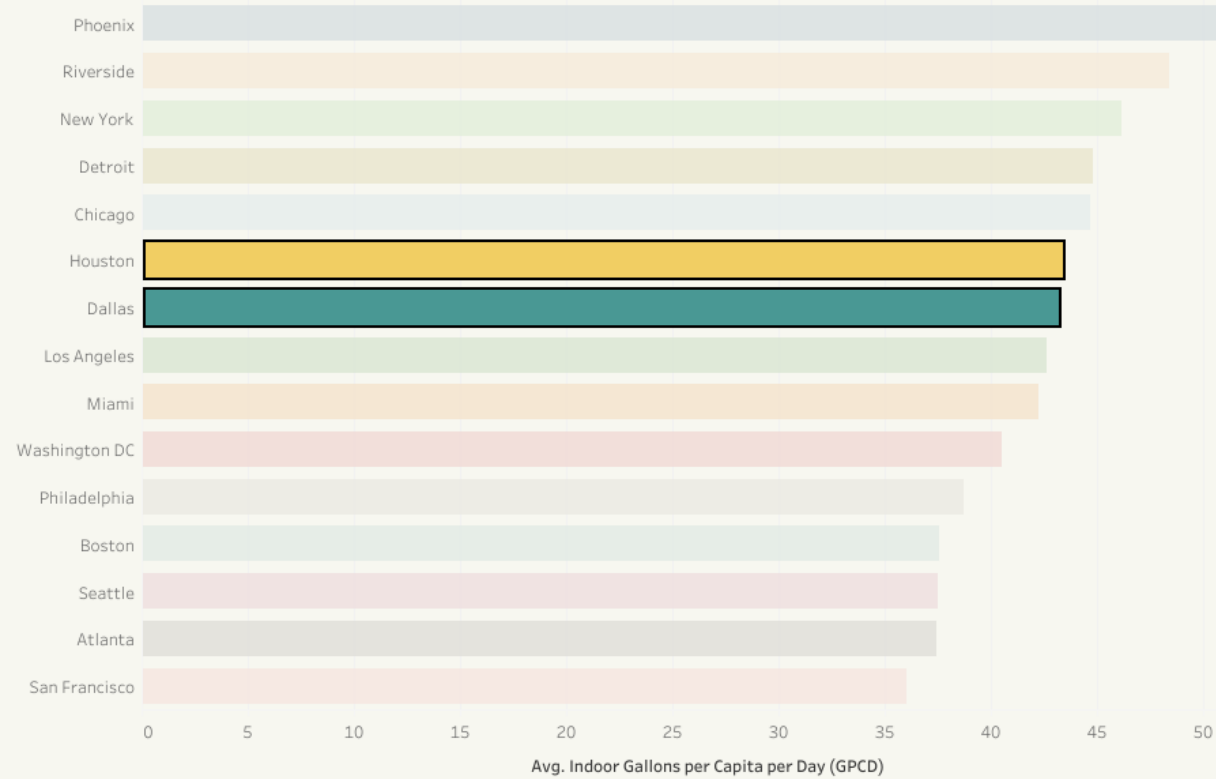




Indoor Water Use by Metro Service Area - Q3 2022

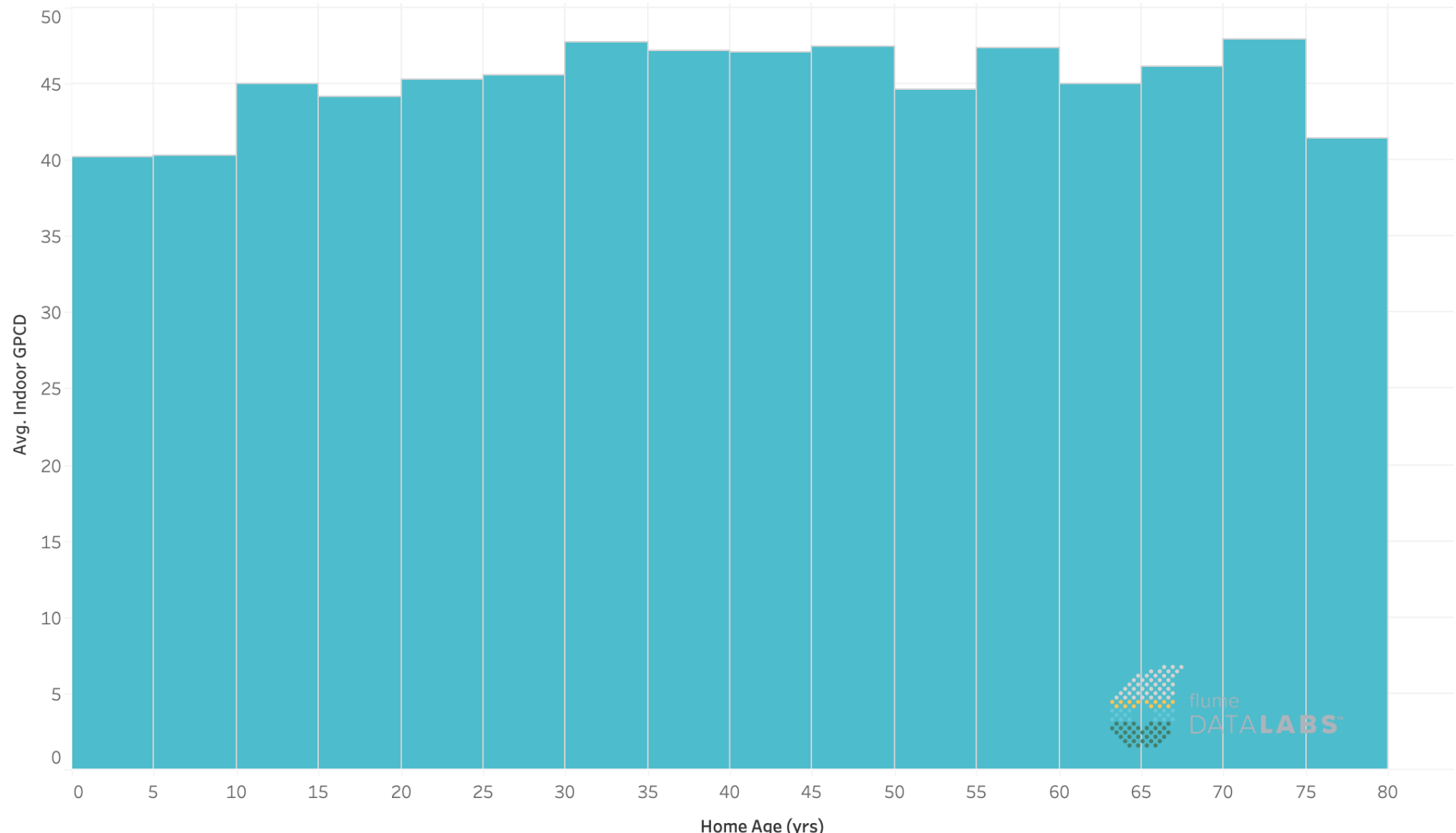


Indoor Water Use by Metro Area *Q3 2021 thru Q3 2022*



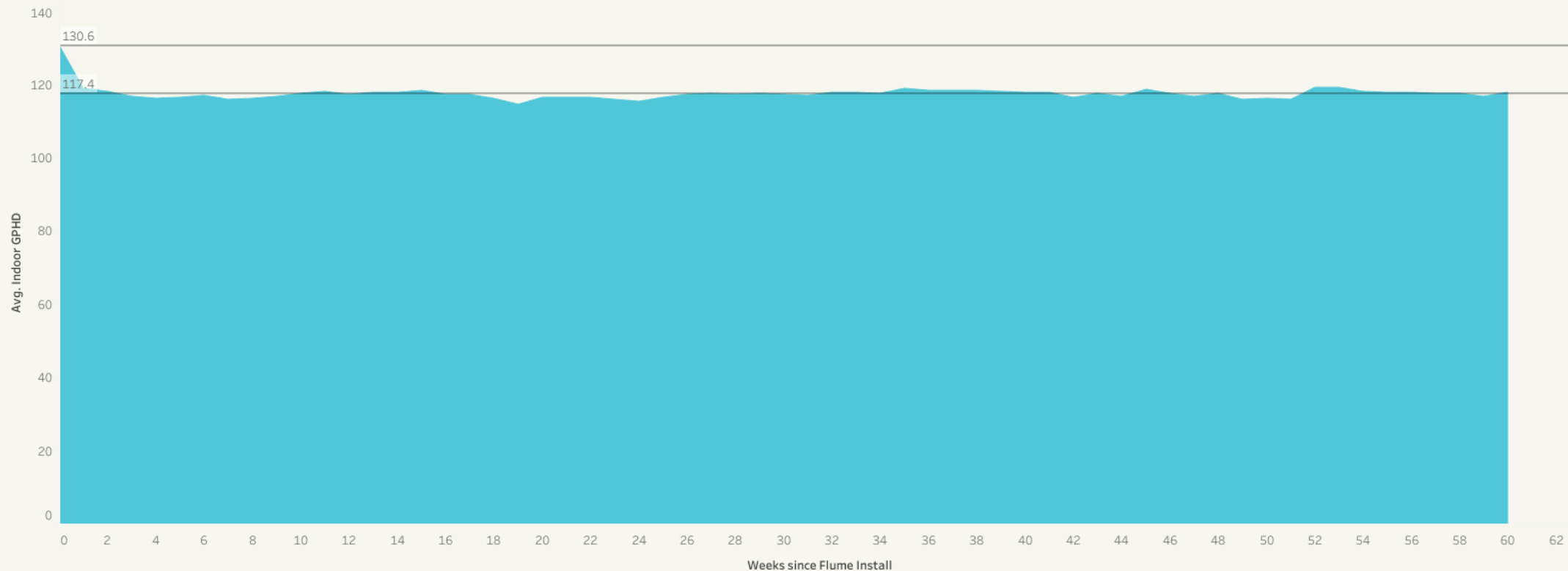
From Flume Household Water Use Index Q3 2022
<https://www.flumedatalabs.com/water-index>

Indoor Water Use and Age of Home - Texas



Indoor Water Use Savings since Flume Installation

To examine the impact of owning a Flume on indoor household water use, Flume aligned water use data by installation date. The chart shows average per household indoor use over 60 weeks of using a Flume. Indoor use starts at 130.6 GPHD and within the first four weeks is reduced by 10% (13.2 GHPD). The indoor reductions are then maintained over time, saving Flume customers an average of 4,800 gallons per year. Flume swiftly reduced indoor use by an average of 10% and then helped maintain those savings over time.



From Flume Household Water Use Index – <https://www.flumedata.com/water-index>

2021

2022

Q1

Q2

Q3

Q4

Q1

Q2

Q3



Avg. Outdoor GPCD

140
120
100
80
60
40
20
0

Average = 31.2

Average = 55.3

Average = 71.8

Average = 38.8

Average = 35.1

Average = 95.7

Average = 111.7

Jan 03, 21
Jan 17, 21
Jan 31, 21
Feb 14, 21
Feb 28, 21
Mar 14, 21
Mar 28, 21

Apr 04, 21
Apr 18, 21
May 02, 21
May 16, 21
May 30, 21
Jun 13, 21
Jun 27, 21

Jul 04, 21
Jul 18, 21
Aug 01, 21
Aug 15, 21
Aug 29, 21
Sep 12, 21
Sep 26, 21

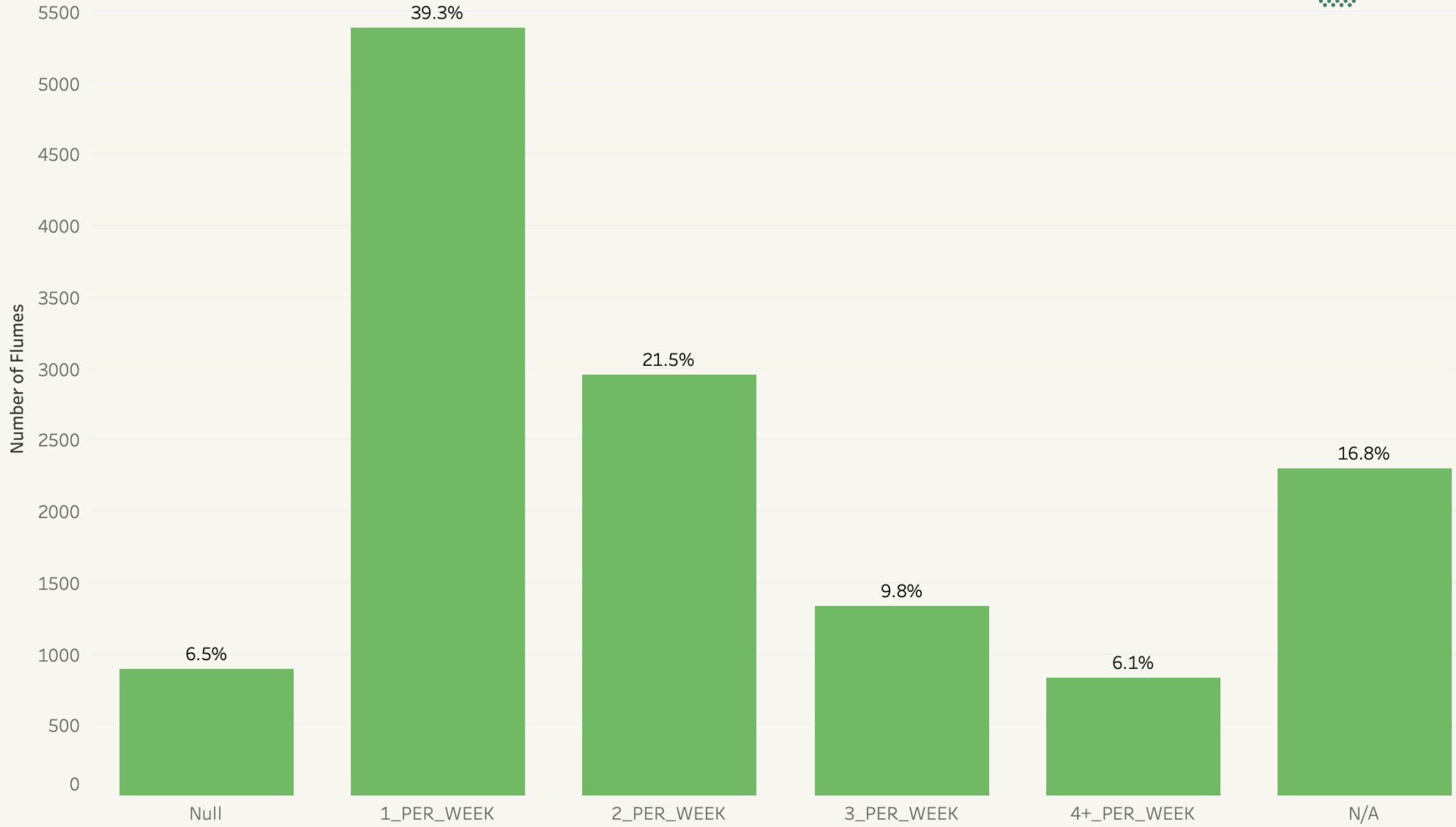
Oct 03, 21
Oct 17, 21
Oct 31, 21
Nov 14, 21
Nov 28, 21
Dec 12, 21
Dec 26, 21

Jan 02, 22
Jan 16, 22
Jan 30, 22
Feb 13, 22
Feb 27, 22
Mar 13, 22
Mar 27, 22

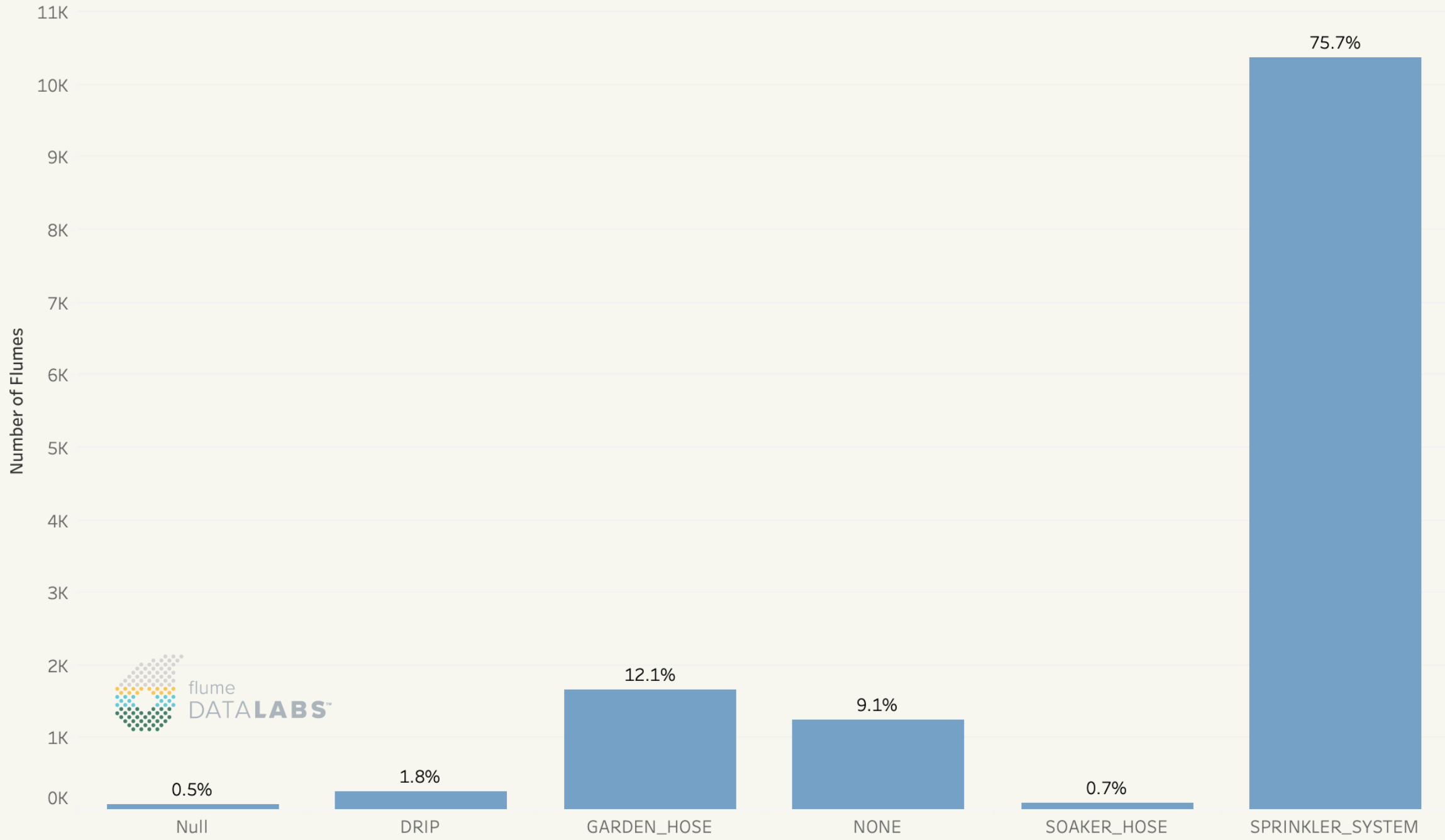
Apr 03, 22
Apr 17, 22
May 01, 22
May 15, 22
May 29, 22
Jun 12, 22
Jun 26, 22

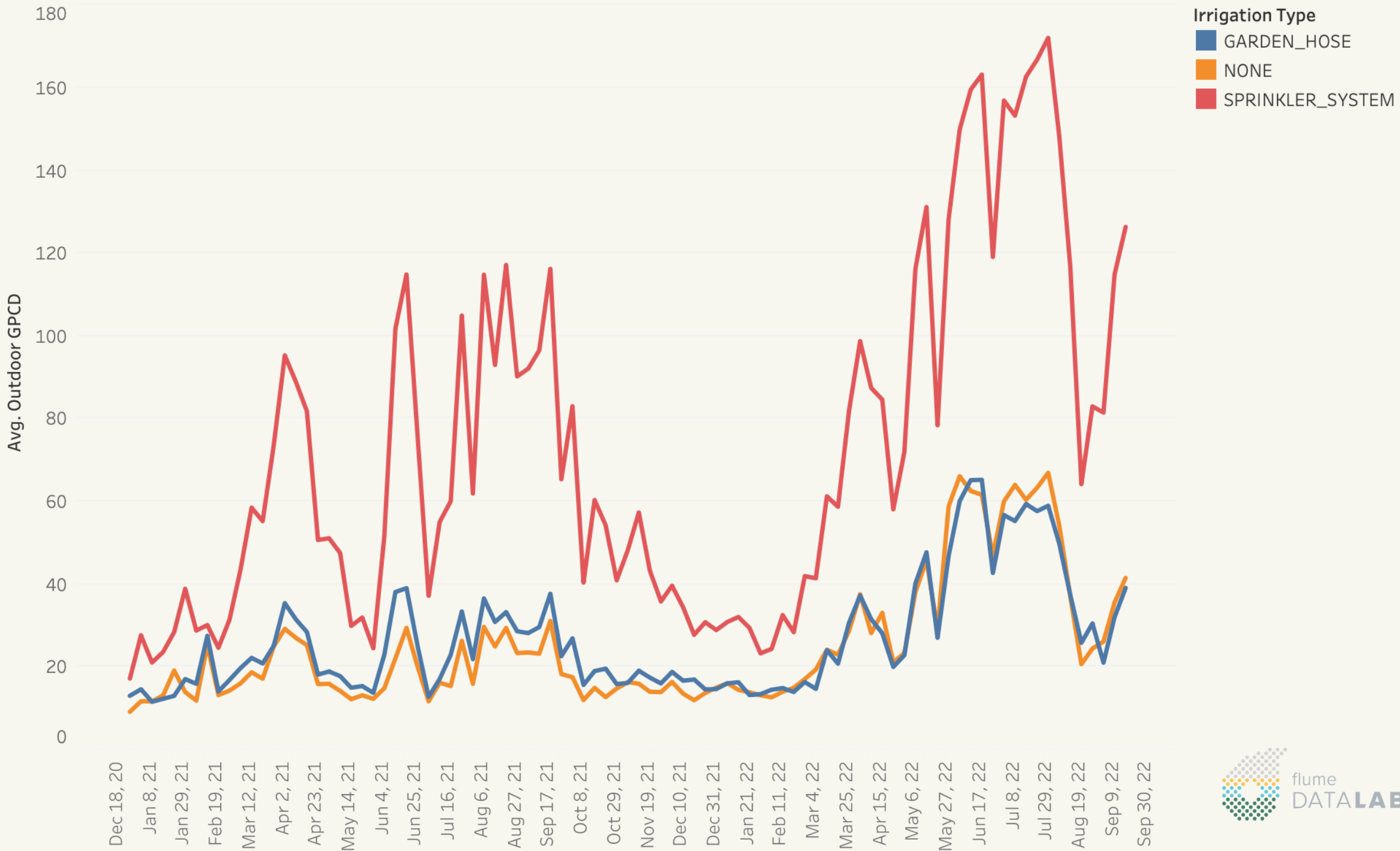
Jul 03, 22
Jul 17, 22
Jul 31, 22
Aug 14, 22
Aug 28, 22
Sep 11, 22

Irrigation Frequency

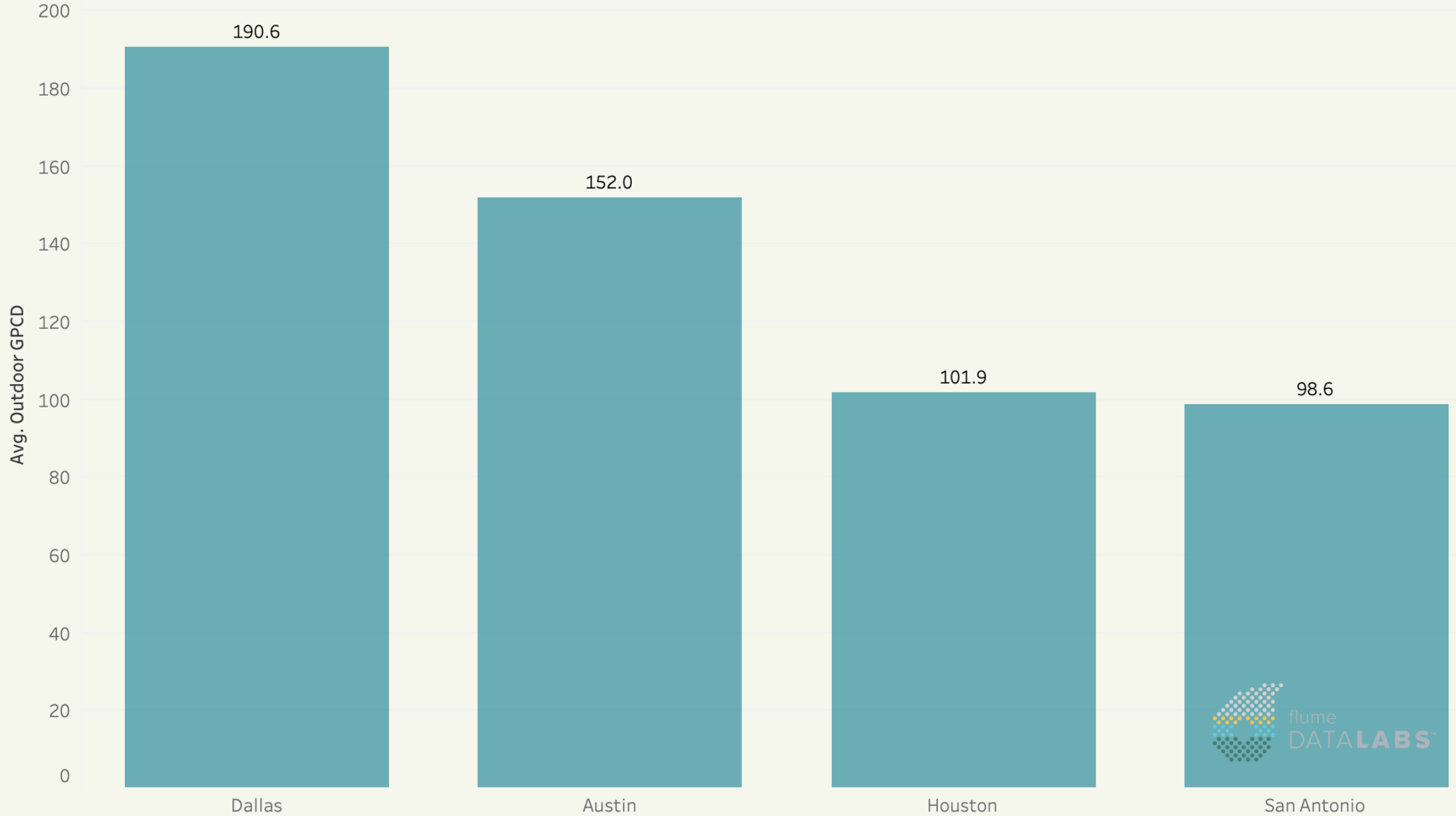


Irrigation Type

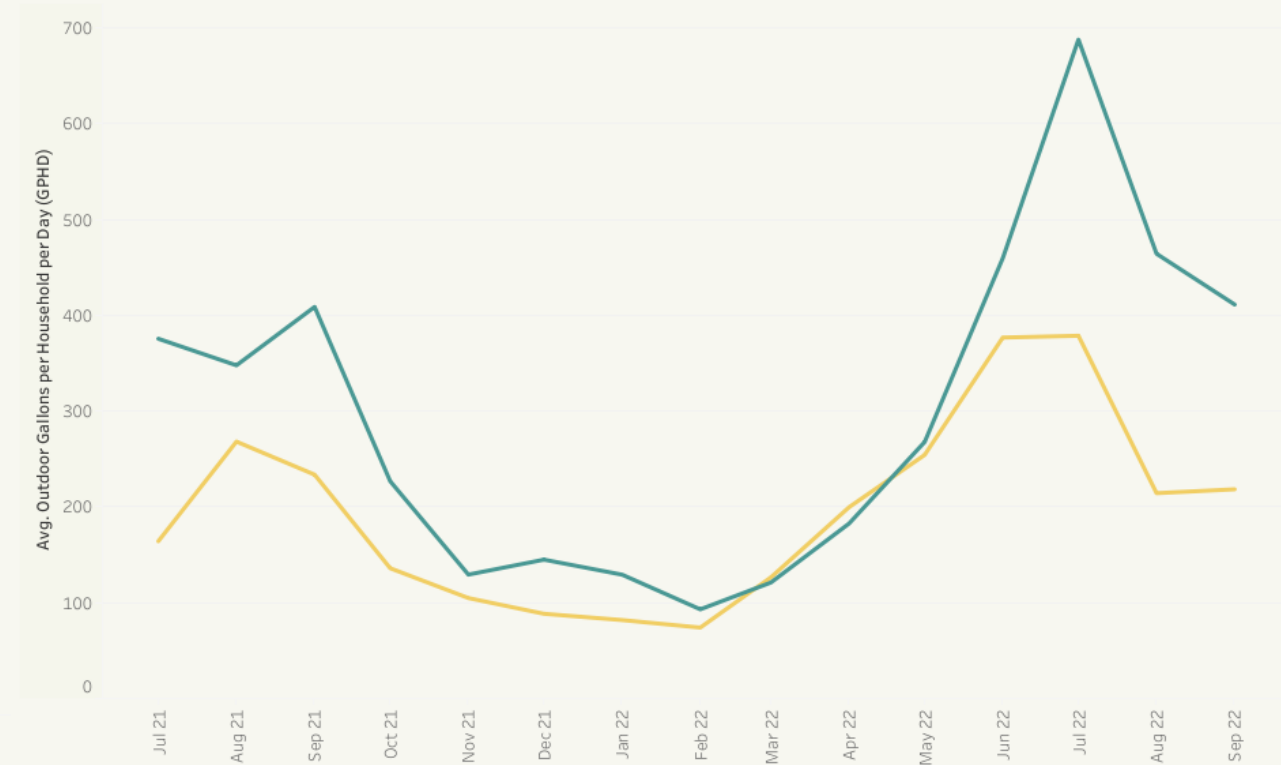
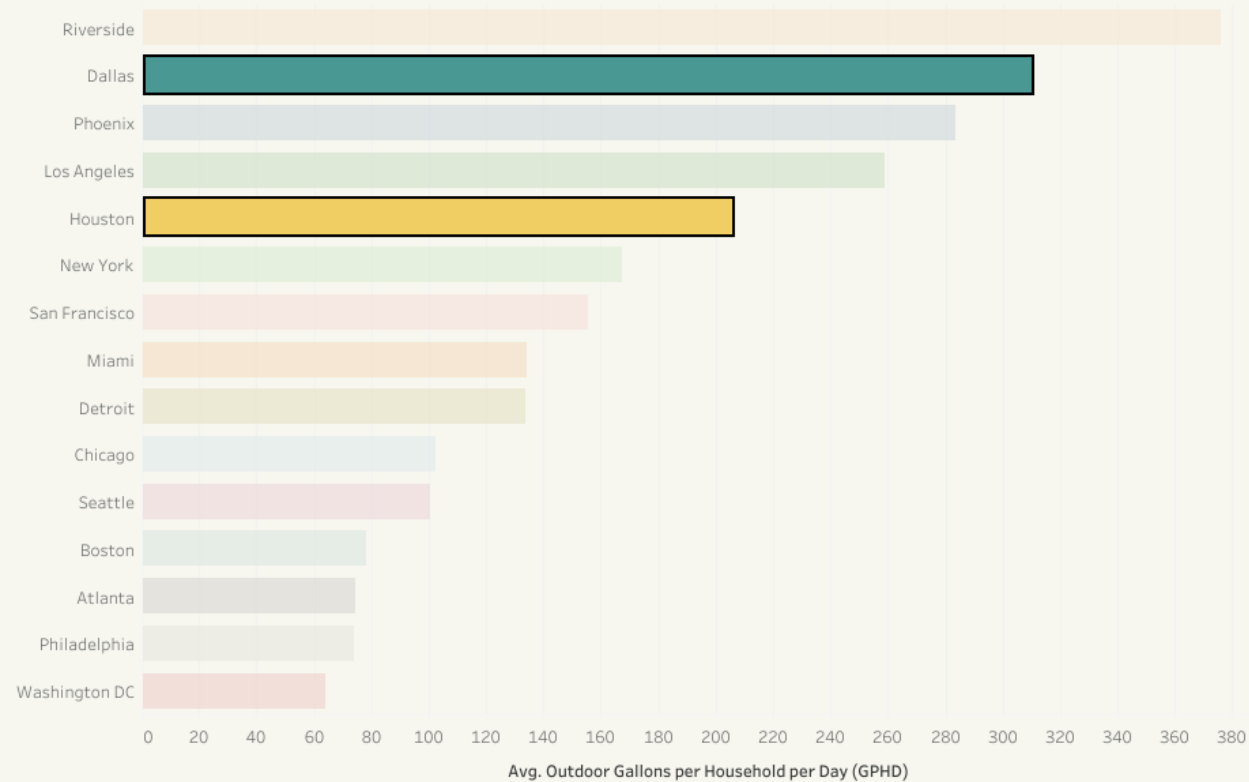




Outdoor Water Use by Metro Service Area - Q3 2022



Outdoor Water Use by Metro Area Q3 2021 thru Q3 2022

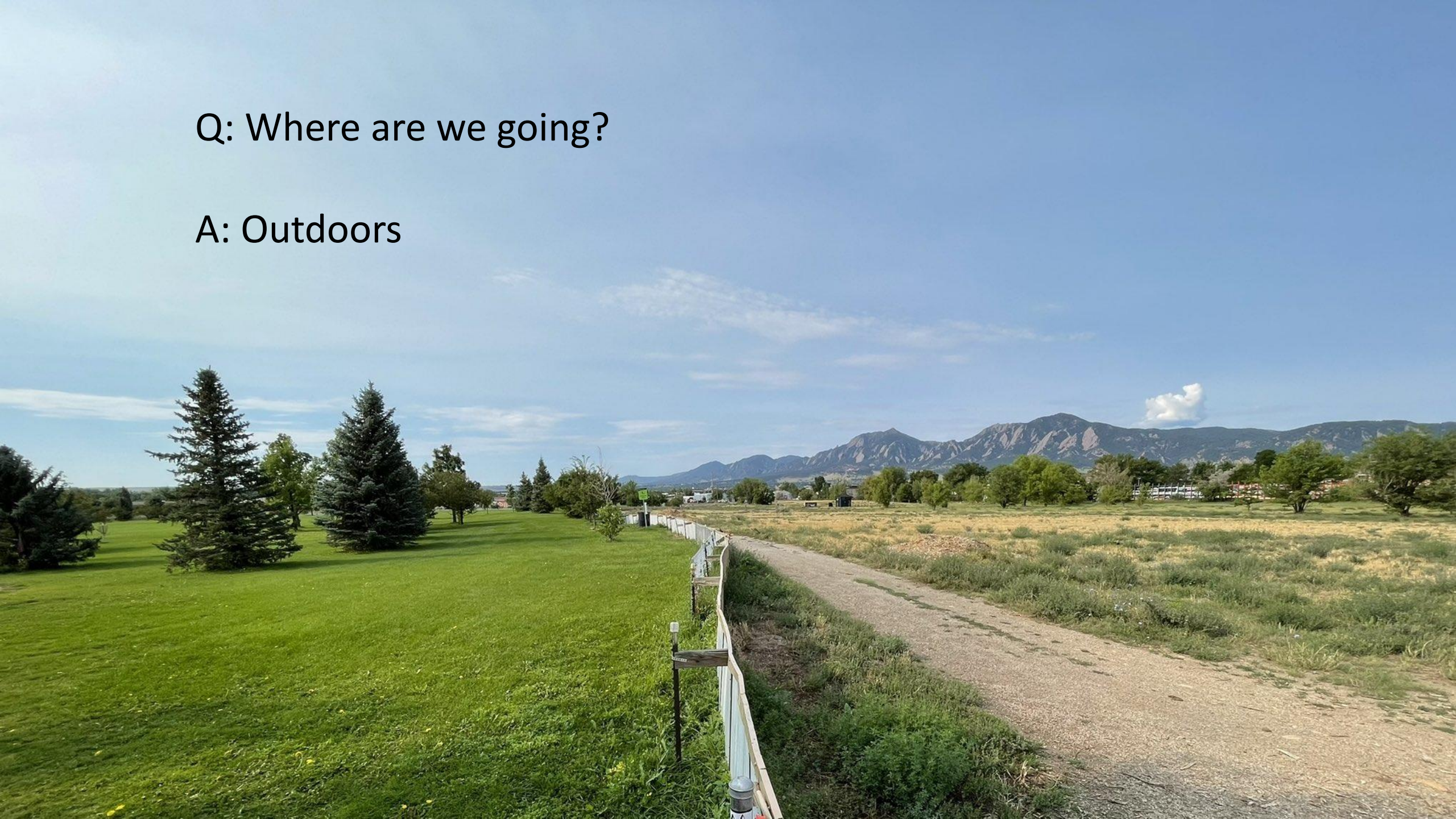



From Flume Household Water Use Index Q3 2022

<https://www.flumedatalabs.com/water-index>

Q: Where are we going?

A: Outdoors





Why Outdoor Savings?

- Landscape irrigation is a significant component of water demand.
- Excessive irrigation is routinely practiced.
- Outdoor use is discretionary and can be influenced.
- Outdoor use = consumptive use.





Reducing Landscape Water Demand



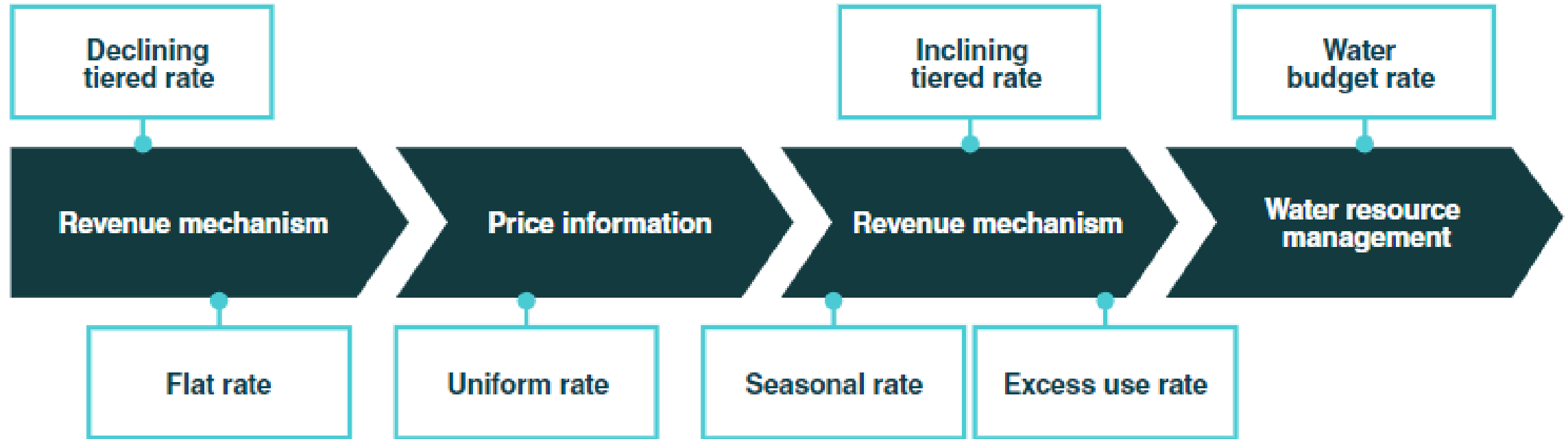
- Gradual culture change – from turf to Texascape
- Codes for new landscapes
- Education of residents
- Training and certification of landscape professionals
- Tiered water rates
- Water budgets
- Water provider sponsored landscape programs



Landscape Codes for New Landscapes

- Many towns, cities, and water providers have landscape codes for new development (and occasionally re-development)
- The codes may include:
 - Soil amendments
 - Tree canopy requirements
 - Irrigation limits/requirements
 - Turf limits
 - Water budgets
 - Rain gardens and on-site stormwater detention

Water Rate Structure Evolution

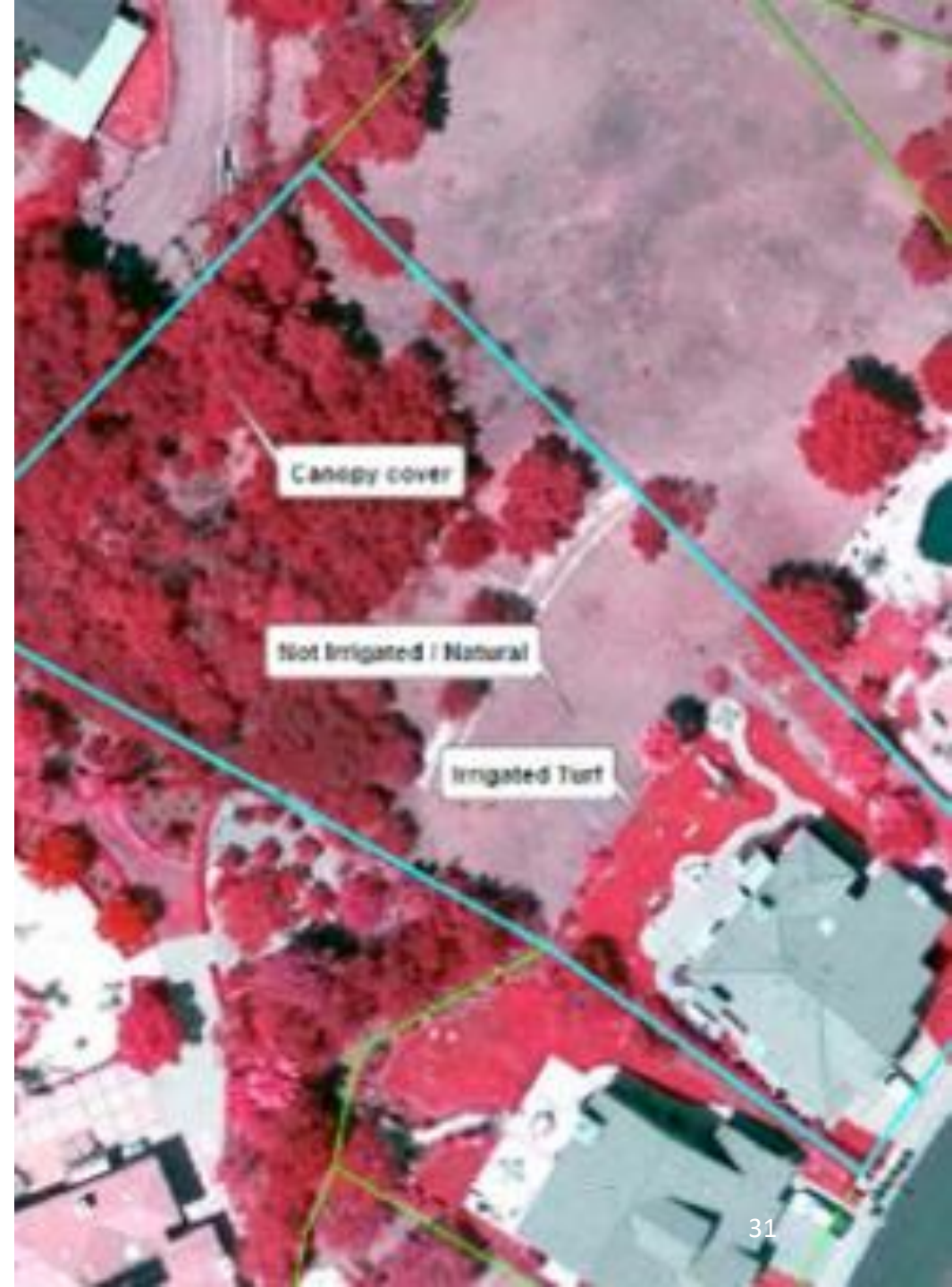


Of the many common rate structures, the one with the greatest effect on water usage—that encourages the highest level of efficiency—is water budgets.

Figure 4

What Are Water Budgets?

- A tool to estimate the volume of water a site and/or a landscape will reasonably require through the year
- Landscape water budget:
 - size of the landscape,
 - water requirement,
 - climate, and other factors
- Indoor water budget:
 - number of people, and other factors
- Used informationally to communicate with customers or connected to an inclining block rate billing structure



Customer No.: 0035179 Account No.: 0000086169 Service Location: 1339 Hawthorn Ave
 Customer Class: Single Family Inside/Outside City: Inside Meter Size: 3/4" Days Billed: 29
 Previous Reading Date: 08/09/22 Present Reading Date: 09/07/22 Previous Meter Reading: 1350 Present Meter Reading: 1365

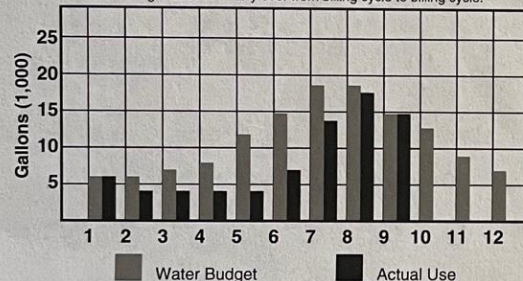
Service	Rate/ 1,000 gal	Used 1,000 gal	Cost
Water Svc Charge			16.11
0 - 9,000 gal	4.22	9	37.98
9,001 - 15,000 gal	5.63	6	33.78
15,001 - 23,000 gal	11.26		0.00
23,001 - 30,000 gal	16.88		0.00
30,001 +	28.14		0.00
Wastewater Svc Charge			13.51
Wastewater	6.95	5	34.75
Stormwater/Flood Svc			3.53
Stormwater/Flood			18.47

Total Water \$87.87
 Total Wastewater 48.26
 Total Stormwater/Flood 22.00
Total Current Charges \$158.13
 Prior Balance 170.79
 Payment Received -170.79

Please Pay This Amount \$158.13

Water Budget VS. Actual Use

Water Budget does not carry over from billing cycle to billing cycle.



Account Summary

(1,000 Gallons)

Current use: 15 Use last year: 14

Budget this bill cycle: 15

Estimated water budget next bill cycle: 13

Average Winter Consumption (AWC): 5

Please Note:

PLEASE DO NOT PAY
 TOTAL AMOUNT DUE WILL BE TRANSFERRED
 AUTOMATICALLY ON OR AFTER 09/27/22

Have you experienced financial hardship due to COVID? Apply for Emergency Rent Asst Program and Amer Rescue Plan Act funds. Visit boulderwater.net or call 303.441.3260 to learn more. Modifying your irrigation schedule to supplement natural rainfall can help you stay within your water budget this fall. Your outdoor water budget is reduced in Sep and Oct. Don't be caught off guard with a higher than expected water bill.

** THANK YOU FOR YOUR PROMPT PAYMENT **

Billing Questions: 303-441-3260
 Emergencies: 303-441-3200

For more details about your bill:
bouldercolorado.gov/water

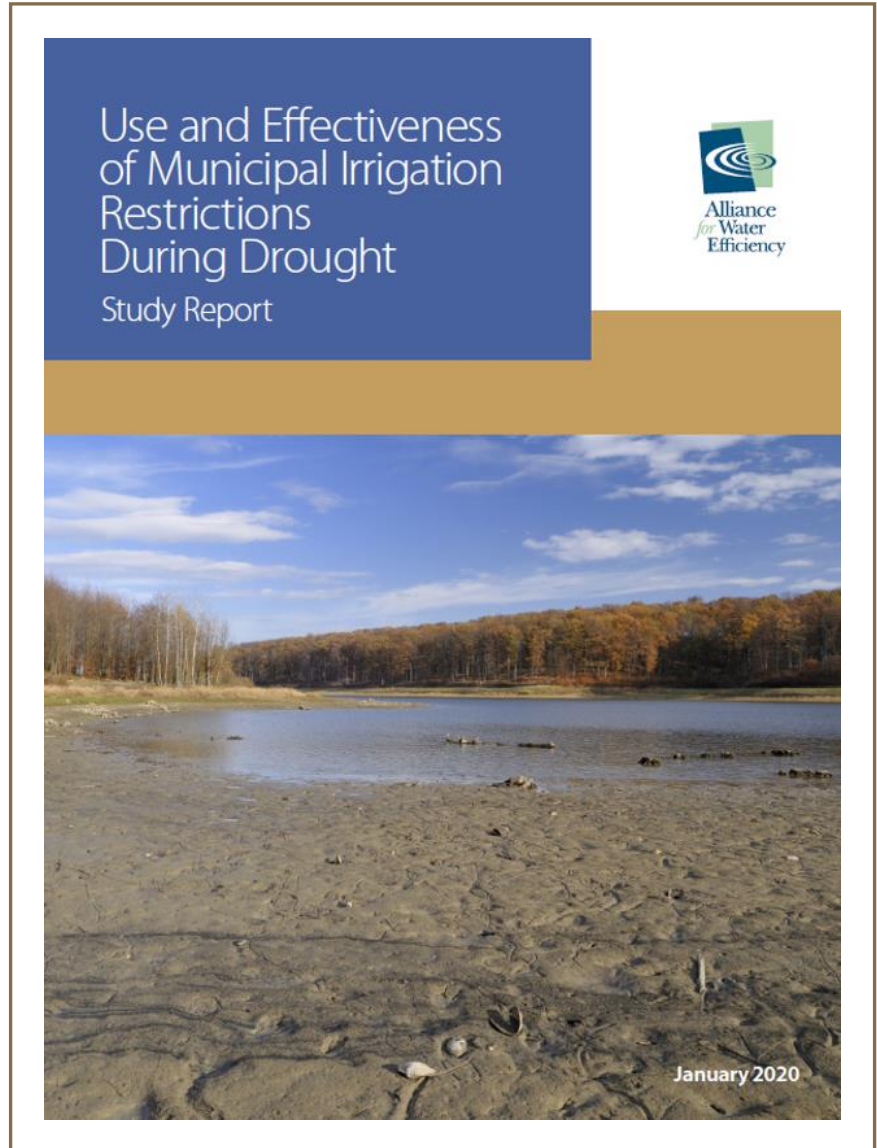
For automatic payment, visit bouldercolorado.gov/water
 To view your account and pay your bill visit bouldercolorado.gov/water
 Esta es informacion importante. Si no la pueden leer, necesitan que alguien se la traduzca.



Some providers designate revenue from upper tiers to support conservation

Water Budgets and Drought Response

- During a Drought.....
- Landscape water budgets can be reduced as necessary (10%, 20%,)
- Percent reduction impacts large landscapes and small landscapes differentially and equitably.
- The monthly water budget (indoor & outdoor) becomes a method for monitoring compliance with drought response for every customer, every month.
- 2020 research from the Alliance for Water Efficiency shows utilities with water budgets had among the most effective drought response.



Lessons learned from landscape transformation research



Alliance for Water Efficiency Landscape Transformation Study - 2018



A&N Technical Services Inc.



Alliance
for Water
Efficiency



**Smart
Irrigation**

GOOD

*Smart irrigation
technology installed*

**Some Lawn
Conversion**

BETTER

*Partial reduction of
irrigation needs*

**Smart
Irrigation & Lawn
Conversion**

BEST

*Greatly reduced irrigation/
No irrigation required*



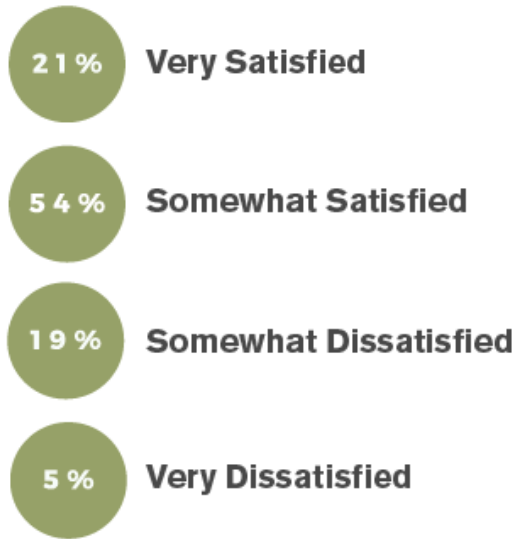
Customer Survey + Impact Analysis with Billing Data

- Survey of program participants and non-participants
 - **Austin, TX**
 - Fort Collins, CO
 - Marin, CA
 - Sacramento, CA
 - San Diego, CA
 - Sonoma, CA
 - Southern Nevada
 - Seattle, WA
 - Guelph, Canada
 - Peel Region, Canada
 - **3,390 survey respondents**
- Impact analysis of water savings in select cities
- Data collected in 2017



Most Customers are Not Fully Satisfied with Their Current Landscaping

Less than a quarter of customers stated that they were completely satisfied with the state of their current landscape. A balance of those surveyed, to a varying degree, believed that their lawn had deficiencies.

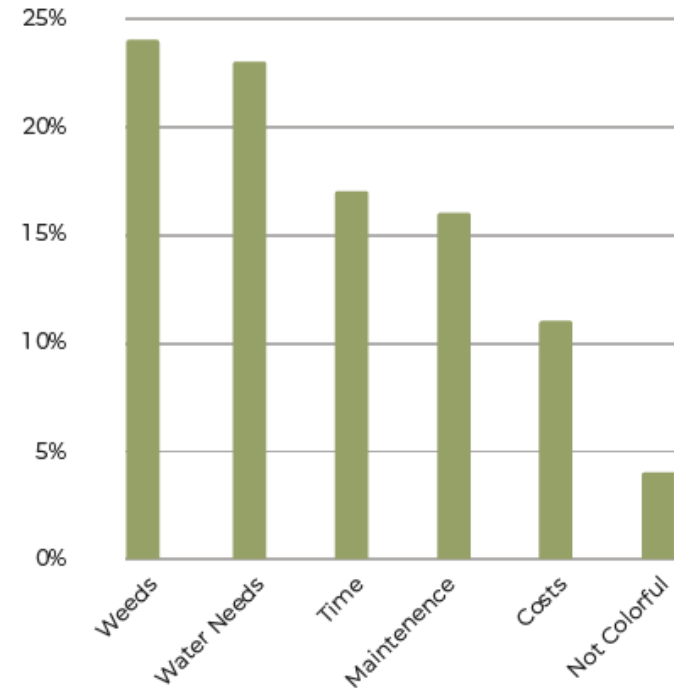


The response shows there is an opportunity with 78% of customers who are less than very satisfied.

Knowing that most customers aren't fully satisfied with their lawns, water agencies have an opportunity to market alternative water-efficient options.

More than half of customers state their lawns are unhealthy or only partially healthy.

Customers identified two main issues with their landscapes. They stated that weeds (24%) were a concern and their landscaping requires too much water (23%).



Customers Have Considered Taking Out Their Lawns

69%

Have considered replacing some or all of my lawn

31%

Never considered it

Not only have customers stated that they're aware of water efficient landscape designs, most customers have considered, at one time or another, removing their lawn. This indicates a shift in attitude away from turf as the only option for landscape design.

It's logical that customers are most comfortable taking out a portion of their lawns. Market transformation is a gradual process and this illustrates the customers' desire to find a practical balance between the old and the new.

Which of the following do you prefer?

Replace part of my yard 39%

More efficient sprinkler system 17%

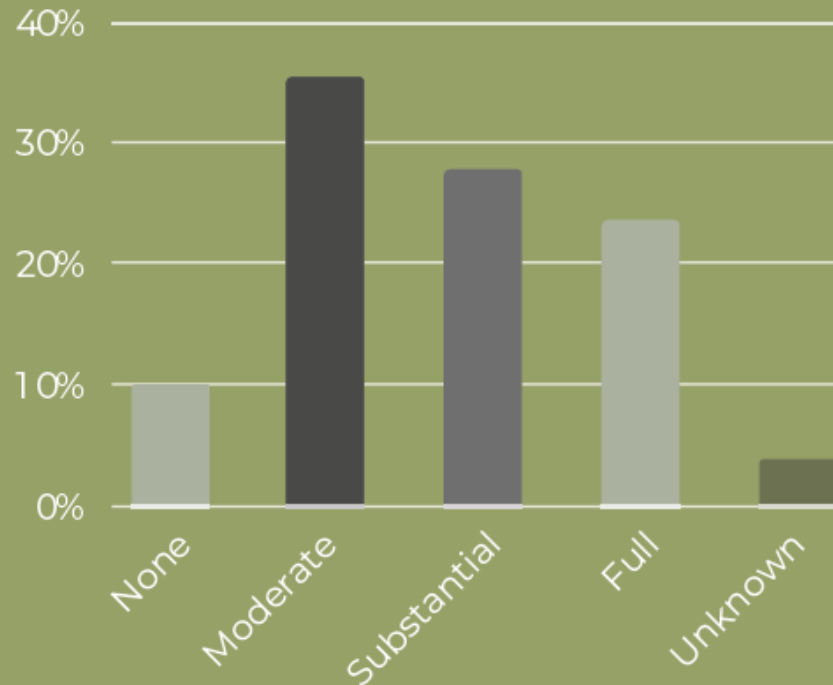
Replace all of my lawn 17%

Make no changes 15%

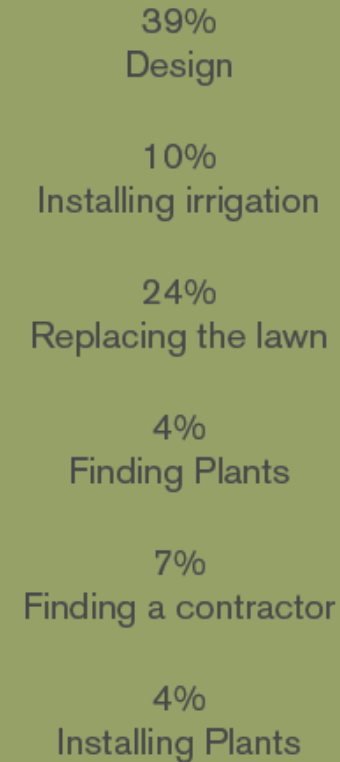
These statistics show the market is shifting.

Customers Need Help with Design and Installation

If you were to change your landscape, what level of assistance would you need?

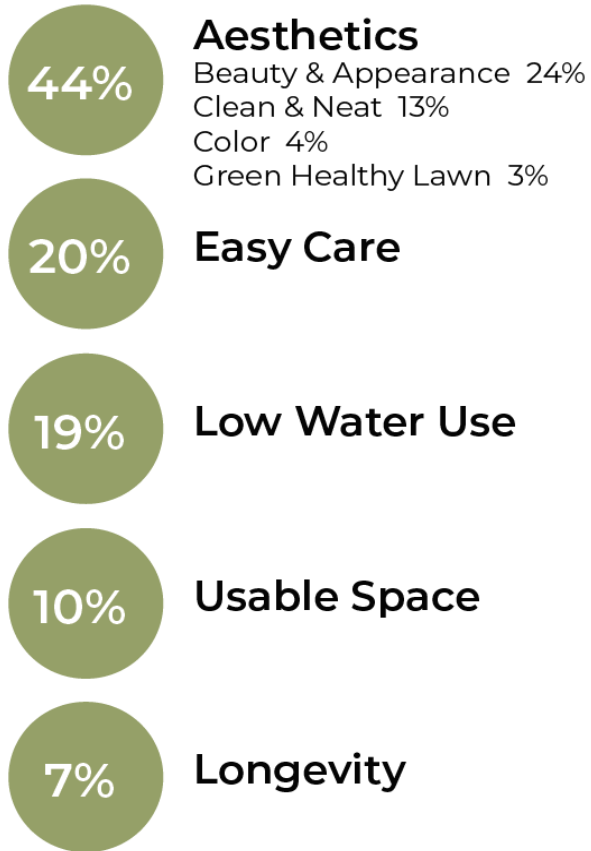


What Area Could You Use the Most Assistance With?

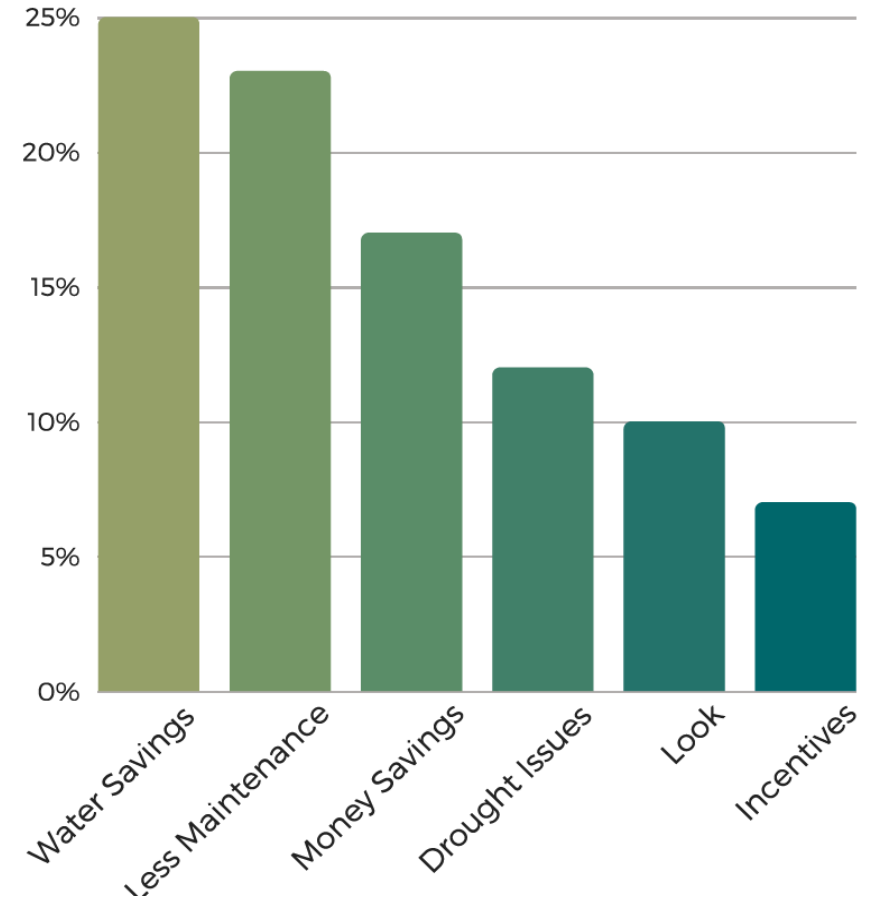


Nearly all customers (90%) need some level of assistance. They predominately need help with landscape design (39%), followed by actual installation (10% installing irrigation + 24% removing the lawn).

What are the most important aspects of your landscape?



What's the main reason you changed your landscape?



Plan Today for the Waterwise Landscape of Tomorrow

- Long-term project
- Develop a Texas landscape ethos
- Minimize outdoor water use
- Leverage \$\$ incentives to motivate culture change
- Educate – customers and landscape professionals
- Codes and standards
- Trees become more and more important
- Tiered rates
- Water budgets
 - Each provider should understand the “minimum” acceptable water requirement to maintain healthy trees and landscape.





Future Conservation Potential

- A lot.
- We're about ... halfway there!
- Codes and standards
- Rates
- Leak detection
- Advanced metering
- Customer engagement through data and information
- Landscape water savings

Thank you!

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