Valley Water

2021 Annual Report

Large Landscape Program

Valley Water

Clean Water • Healthy Environment • Flood Protection

Participating Retail Agencies:

City of Gilroy

City of Milpitas

City of Morgan Hill

City of Mountain View

City of Palo Alto

City of Santa Clara

City of Sunnyvale

San José Municipal Water System

San Jose Water Company

May 3, 2022

Waterfluence LLC

PO Box 561 Menlo Park CA 94026

www.waterfluence.com

(800) 800-9519

Waterfluence

Summary

Since 2014, Valley Water has contracted with Waterfluence to provide program services to improve irrigation efficiency at commercial and public landscape sites. In 2021, nine retail agencies within Valley Water's service area participated in this program including the cities of Gilroy, Milpitas, Morgan Hill, Mountain View, Palo Alto, Santa Clara, Sunnyvale, and the San José Municipal Water System and San Jose Water Company. These retailers serve 91% of Valley Water's 1.9 million service population.

This report summarizes the program sites for the 2021 calendar year. Key points include:

- **Site Characteristics**. Valley Water had 3,809 sites irrigating 6,943 acres of landscape in the program at the end of 2021. In the last quarter of 2021, Valley Water expanded the program by 796 sites by lowering the annual water threshold required to qualify for the program to 500 hundred cubic feet (CCF). The average depth of water applied over all landscape area was 3.5 feet totaling 24,455 acre feet or about 8% of total use of Valley Water sources by retailers.
- **Stakeholder Engagement**. Stakeholders at 45% of sites viewed their information from the Waterfluence website. A strong correlation exists online engagement and lower overwatering. Commercial sites overwatered by 28% less and public sites overwatered by 43% less relative to sites without online stakeholders.
- **Landscape Field Surveys**. We completed 50 landscape field surveys at targeted sites agreeing to have our irrigation expert gather in-depth diagnostics and provide recommendations to improve irrigation efficiency. Since 2014, we have conducted 174 field surveys covering 567 irrigated acres.
- **Irrigation Efficiency Opportunities.** Significant reductions in overwatering can still be made with commercial sites, sites with less than 1 acre of landscaping, sites planted predominately with shrubs, and sites not engaged with the Waterfluence website. In 2021, overwatering totaled 7,395 acre feet or 30% of all water used. Overwatering averaged 1.1 feet over all irrigated landscape but was greater than 2 feet at 34% of sites.
- **Irrigation Efficiency Trends**. Overwatering is trending downwards. Overwatering dropped sharply during the 2015-16 statewide drought, rebounded, but in 2021 is still 30% below 2013 levels and 12% below 2019 levels.
- **SB606 / AB1668**. The State of California passed new legislation requiring, in part, water suppliers to annually report the total irrigated landscape areas of commercial, industrial, and institutional customers with dedicated irrigation meters starting January 1, 2024. Waterfluence has already measured about 80% of the landscape subject to the regulation. Of the remaining landscape, about

15% is in the process of being measured (largely streetscapes) and 5% is associated with small sites using less than 500 CCF per year.

Program Description

Waterfluence partners with urban water agencies to reduce overwatering at commercial and public landscape sites through monitoring, insights, and connection.

- **Monitor.** For each site, we chart how actual water use compares to our budget benchmark based on site-specific characteristics and real-time weather. Regular updates help people receive feedback and track progress. These calculations can be difficult for site stakeholders to make, so we assist with irrigation-focused, interactive metrics. Actual water use comes from monthly or bimonthly meter reads made for agency billing purposes; we also make use of hourly meter reads when advanced meter technology data are available. Our service includes mapping landscape areas; stakeholders can modify their maps online to improve water budget accuracy and to create controller maps to assist with irrigation operations.

- **Insights.** Beyond identifying potential irrigation problems, we use our irrigation expertise to recommend practical solutions. Our internal algorithms continually analyze water use at each site to identify possible leaks, poor scheduling, and ineffective irrigation equipment. For targeted sites accepting additional help, our irrigation experts conduct on-site landscape field surveys to generate detailed diagnostics. When relevant, we encourage stakeholders to tap water agency rebates to offset improvement costs.

- **Connect.** Our website provides a centralized location for stakeholders to better understand, prioritize, communicate, and act on solutions toward the non-controversial goal of improving irrigation efficiency and landscape appearance. Commercial and public irrigation sites frequently have multiple stakeholders such as property managers, property owners, HOA board members, in-house maintenance staff, and landscape contractors. Furthermore, these stakeholders are often associated with multiple sites in multiple communities. Our website has specialized customer relationship management (CRM) capabilities to enable stakeholders to securely access and interact with their portfolio of sites.

Site Characteristics

By the end of 2021, Valley Water had 3,809 sites irrigating 6,943 acres of landscape in the program. Sites have progressively entered the program since 2014. In the last quarter of 2021, we added 796 new sites after Valley Water lowered program eligibility from greater than 1,000 to 500 CCF per year.

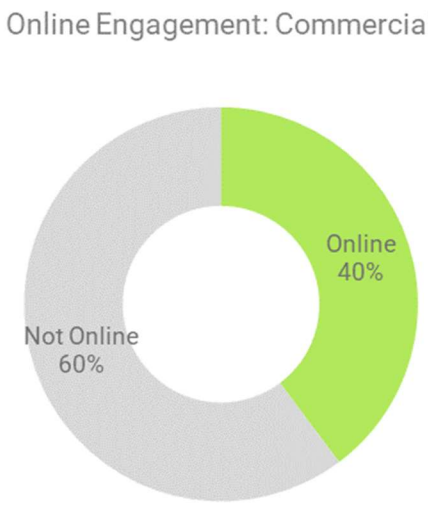
Although the average depth of water applied over all irrigated landscape was 3.5 feet, application rates vary widely with site type and size, among other factors. We segment sites into commercial and public categories because of fundamental differences in how irrigation is managed. Commercial sites, such as HOAs and offices, account for 85% of sites and 67% of water use and are often managed by landscape contractors. Public customers, primarily parks and schools, account for the rest and are often managed by their in-house staff. Across all sites, 55% of irrigated area is planted in turf grass and the remainder is in shrubs, trees, groundcovers, and pools/fountains. Public sites tend to have a large percentage of irrigated area in turf from large playfields and parks.

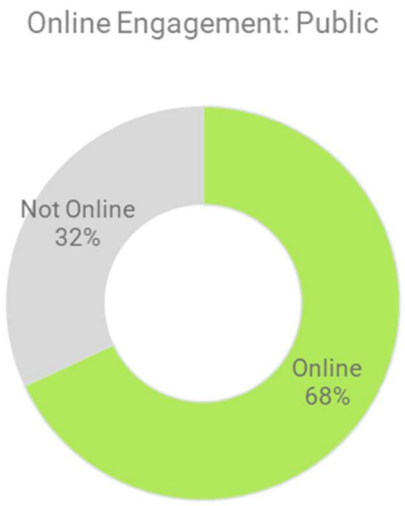
Description	Commercial	Public	Total
Number of Sites	3,245	564	3,809
< 1 Acre	65%	23%	59%
1-3 Acres	27%	32%	28%
>3 Acres	8%	45%	13%
Irrigated Acres	3,898	3,045	6,943
Average Acres per Site	1.2	5.4	1.8
Turf %	31%	85%	55%
Shrub %	69%	15%	45%
2021 Water Use CCF	7,160,808	3,492,698	10,653,506
2021 Water Use Acre Feet	16,438	8,018	24,455
2021 Water Use %	67%	33%	100%
2021 Depth Applied Feet	4.2	2.6	3.5

Customer Engagement

Waterfluence uses multiple tactics to onboard account holders to its website by leveraging: 1) agency billing phone and email addresses, 2) account holders already in Waterfluence, 3) the landscape contractor community, and 4) interactions with account holders with other agency programs. For sites without a known account holder, Waterfluence prints and mails reports to encourage online participation. Waterfluence receives and posts new water agency meter reads monthly.

In 2021, 45% of sites were viewed online by at least one stakeholder. Public sites had 68% of their sites viewed online. Commercial sites, in contrast, had 40% of sites viewed online. The addition of 796 new sites at the end of 2021 lowered our viewership rate as onboarding is still in progress.





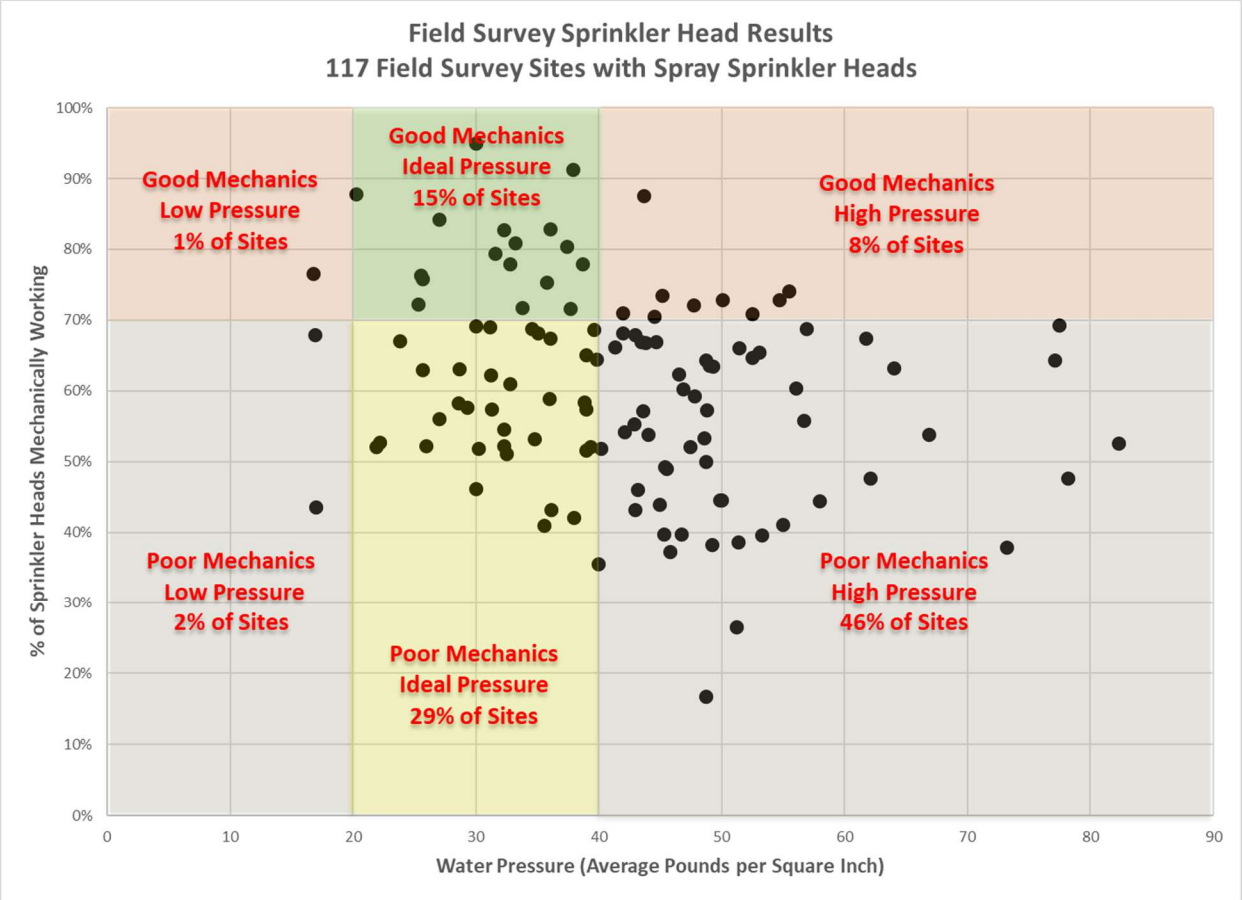
Landscape Field Surveys

Valley Water targets landscape field surveys at sites in most need of additional help. The account holder at pre-approved sites can accept the field survey offer from the Waterfluence website. The survey is free to sites and consists of an irrigation expert visiting the site to gather in-depth diagnostics and provide recommendations to improve efficiency. Field surveys complement water use monitoring by troubleshooting complicated irrigation issues and improving the accuracy of water budget inputs with "boots-on-the-ground" observations. Between 2014 and 2021, 224 sites received a field survey (6% of total sites) covering 646 irrigated acres. In 2020 surveys were curtailed due to the covid pandemic, but in 2021 the service was back to normal with 50 field surveys completed.

Year	Survey Count	Acres
2014	5	9.9
2015	22	55.9
2016	28	72.0
2017	29	78.0
2018	37	75.4
2019	41	260.6
2020	12	15.3
2021	50	78.9
Total	**224**	**646.0**

We measured both mechanical fitness and water pressure associated with 117 field surveys with standard spray sprinkler heads conducted over the last 5 years. Only 24% of sites had greater than 70% of their spray heads in good mechanical condition (delivering water to intended rootzones via non-leaking,

properly-aligned spray bodies and nozzles). Only 44% of sites had average water pressures operating in their desired range (20 to 40 pounds per square inch). Only 15% of sites were both mechanical fit and operating at desired pressures; poor irrigation scheduling and/or inaccurate landscape area measurements caused these sites to be targeted for a field survey. Because field surveys are targeted toward low performing sites, these findings are not representative of all sites in the program.

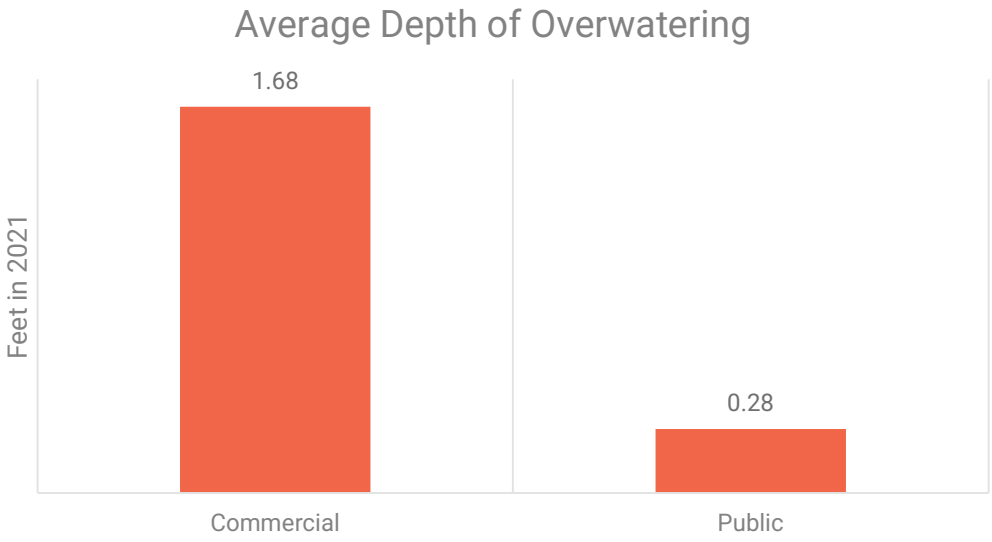


Irrigation Efficiency Opportunities

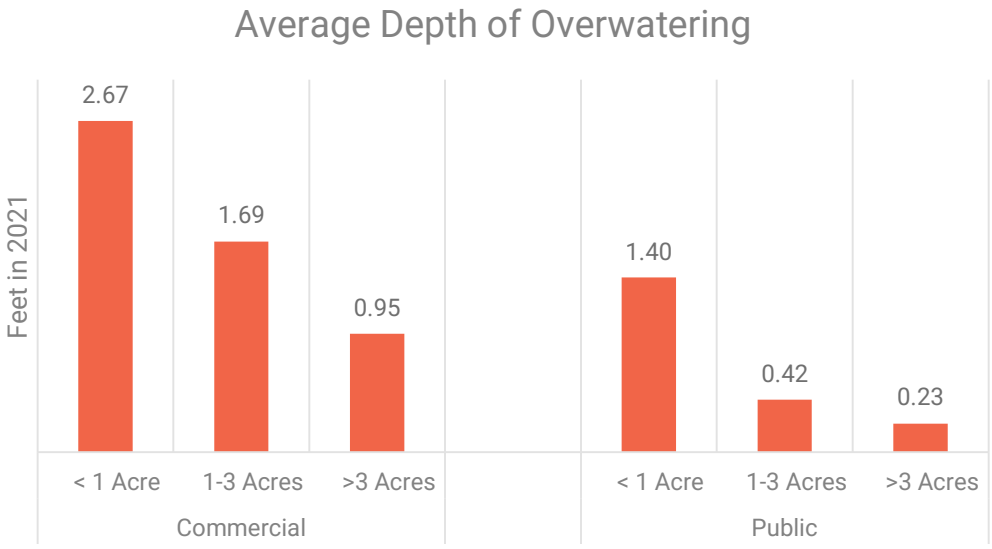
The program's key performance metric is minimizing the depth of overwatering—defined as the volume of water used above our calculated water budget divided by irrigated area. This metric is weather-normalized enabling year-to-year comparisons. As a benchmark, overwatering averaged 1.1 feet over all irrigated landscape in 2021.

To guide future efforts to improve the program, we analyzed 2021 overwatering with respect to five elements: customer type, site size, plant type, engagement mode, and frequency of site overwatering.

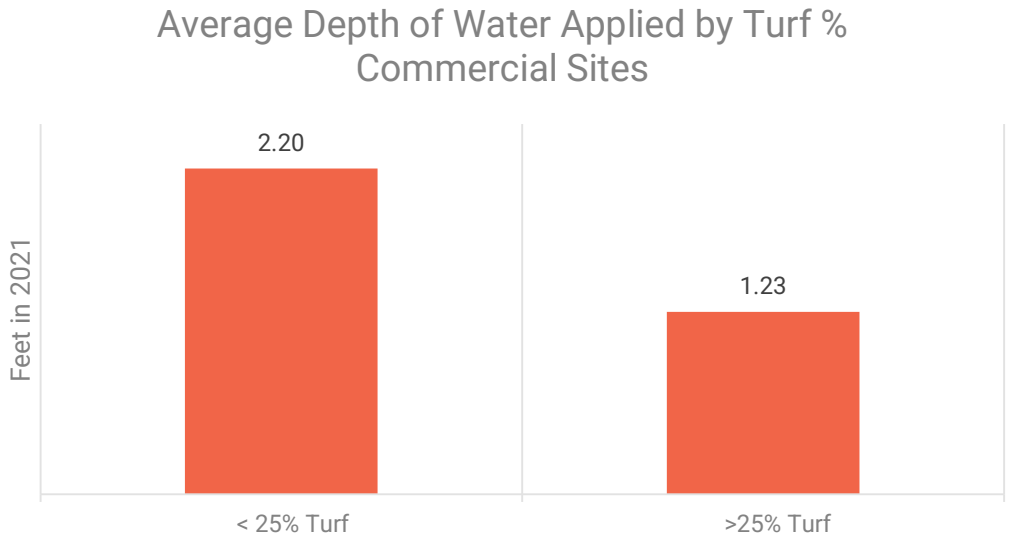
Customer Type. Commercial sites have made progress but still have significant potential for improvement. Public sites are operating closer to optimal levels. Additional engagement efforts targeted toward commercial stakeholders can help close this gap, such as improved customer relationship management and improved tools to create irrigation controller maps.



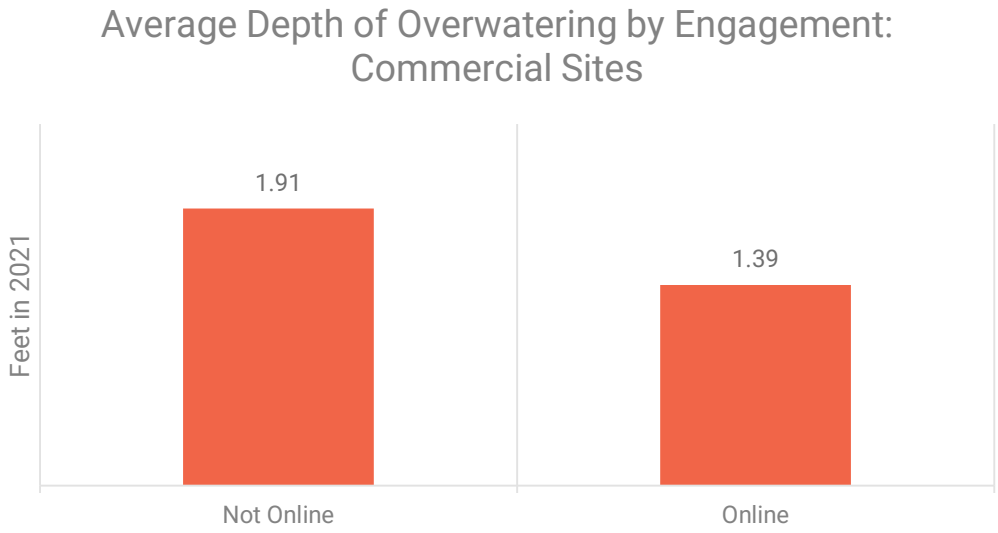
Site Size. Larger landscapes tend to be more efficiently irrigated. Although smaller sites use less water by volume, their potential to reduce overwatering on a percentage basis is greater. Small sites with less than one acre of landscape also make up 54% of total sites in the program.

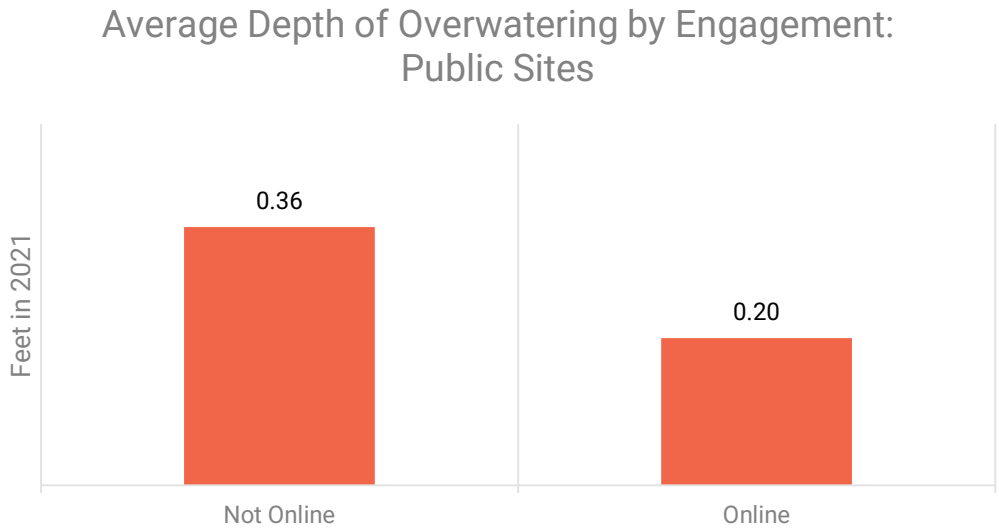


Plant Type. Half of commercial sites have less than 25% of their irrigated landscapes planted in cool season turfgrass with the remainder in shrubs, trees and groundcovers. In 2021, sites with less turf overirrigated more. Shrubs have different irrigation system and scheduling considerations, and our data suggest they have more potential for future efficiency improvements. We do not make a similar comparison with public sites because they are largely planted in turf.

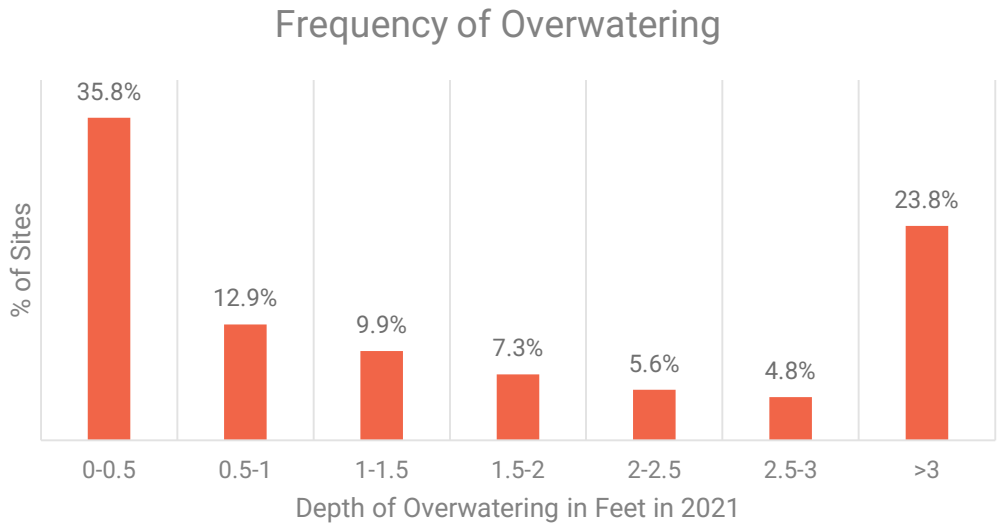


Engagement Mode. A strong correlation exists between lower overwatering and online engagement on Waterfluence. Online commercial sites overwater by 28% less. Online public sites overwater by 43% less.



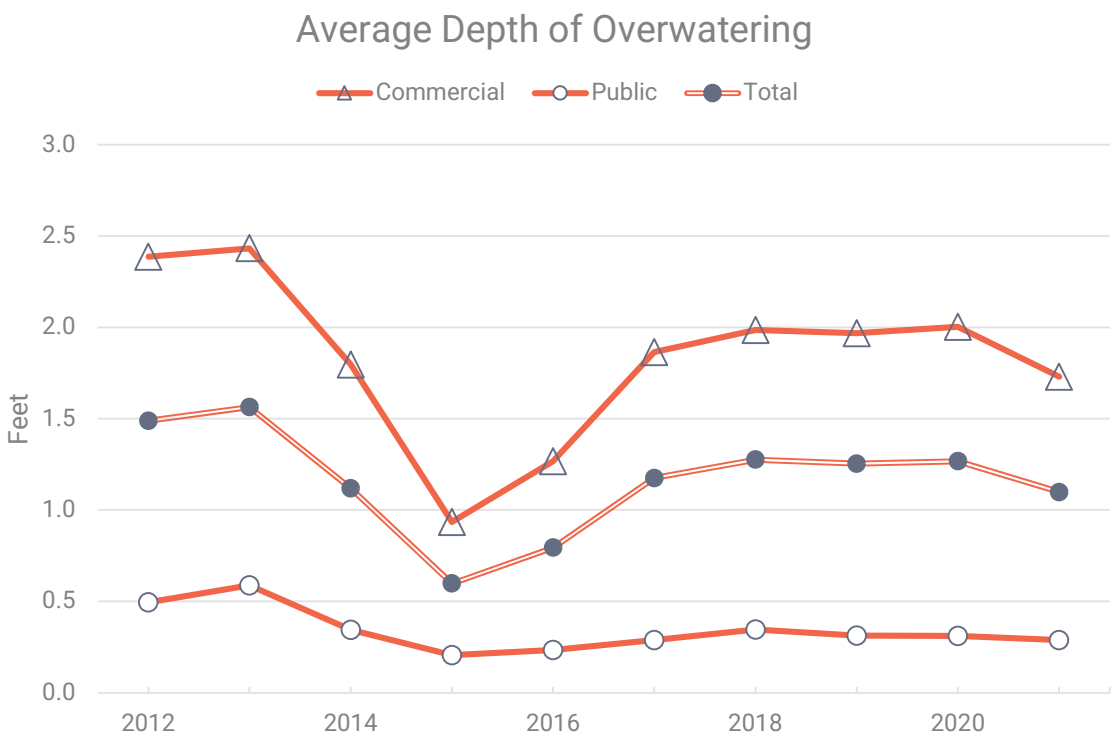


Frequency of Site Overwatering. A benefit of this program is that problem sites can be readily identified with respect to irrigation efficiency. Overwatering by more than 2 feet occurred at 34% of sites, predominately small and commercial. These sites are targeted for verification of water budget assumptions, landscape field surveys, online engagement, and financial incentives, among other tactics to improve performance.

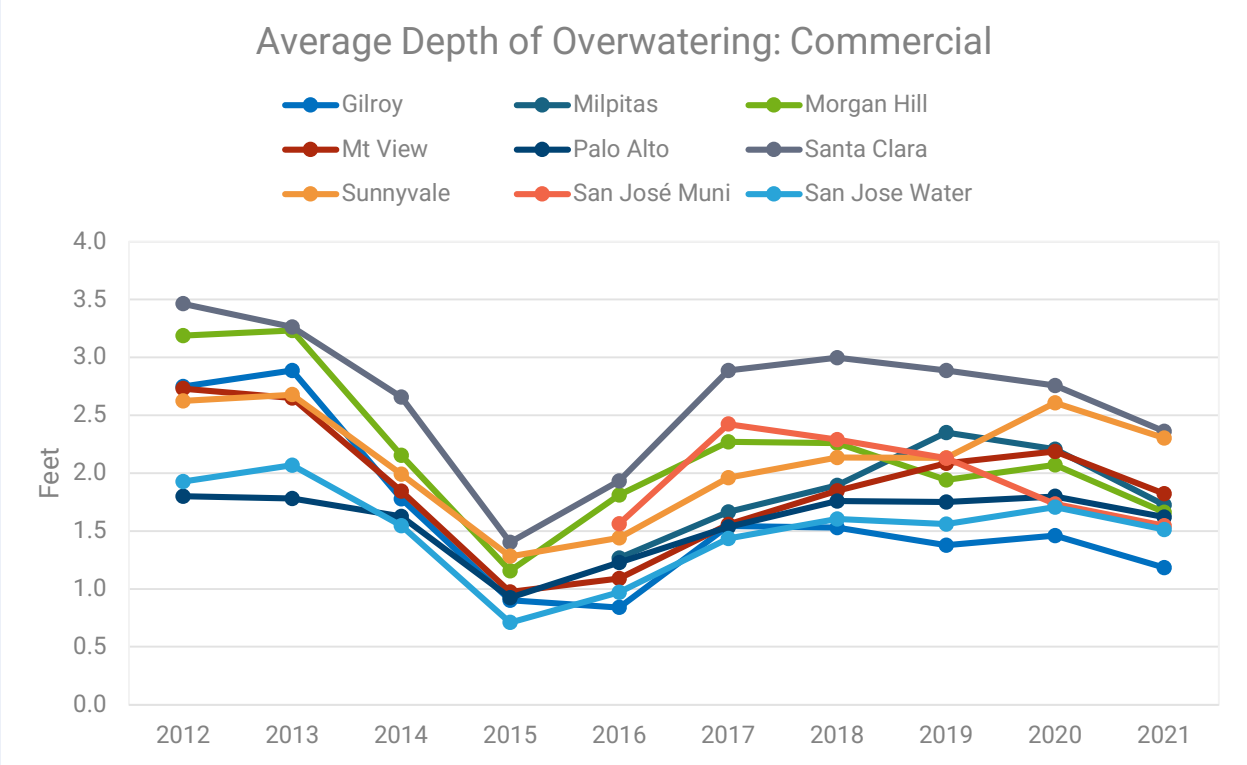


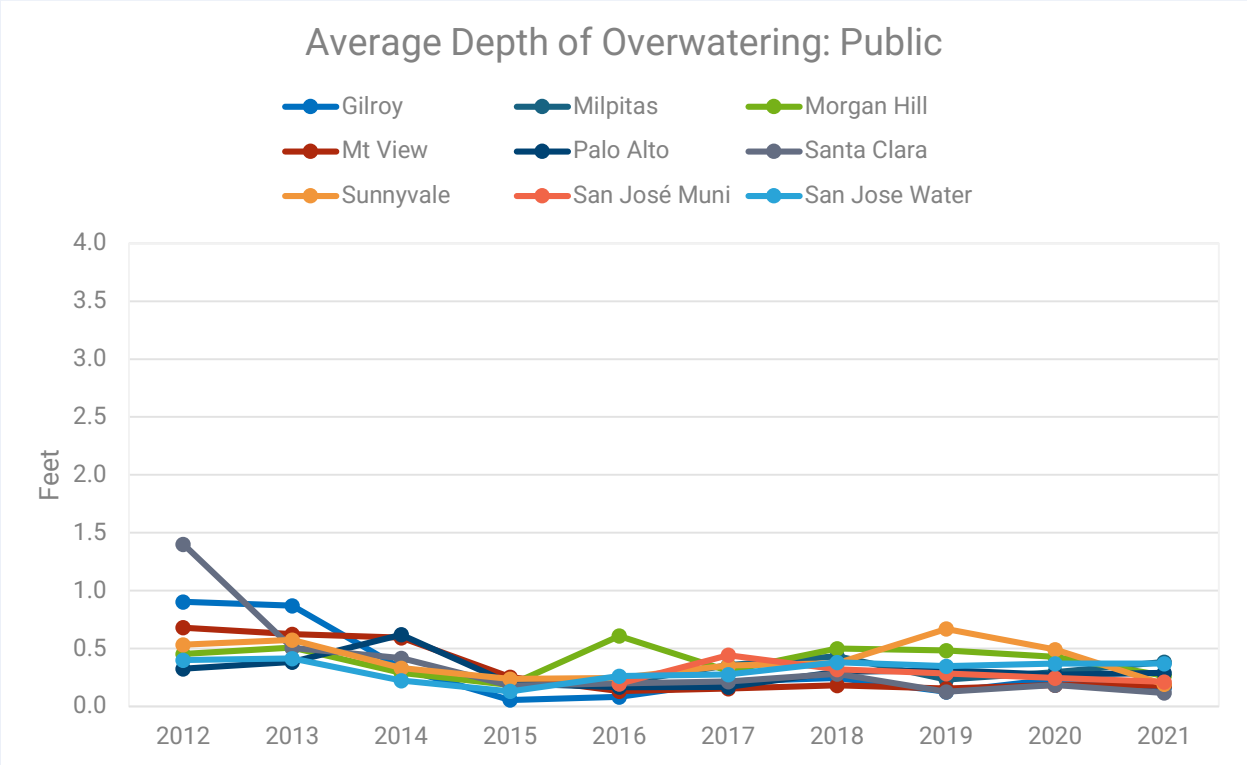
Irrigation Efficiency Trends

Overwatering is trending downwards. Overwatering at both commercial and public sites dropped significantly after 2013, reaching a low point during the 2015-16 statewide drought. Overwatering rebounded in subsequent years but is still 30% below 2013 levels and 12% below 2019 levels.



All retailers generally followed these overall trends between 2012 and 2021.


Average Depth of Overwatering: Commercial
Gilroy
Milpitas
Morgan Hill
Mt View
Palo Alto
Santa Clara
Sunnyvale
San José Muni
San Jose Water
Feet
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021


Average Depth of Overwatering: Public
Gilroy
Milpitas
Morgan Hill
Mt View
Palo Alto
Santa Clara
Sunnyvale
San José Muni
San Jose Water
Feet
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

SB606 / AB 1668 Legislation

The State of California passed new legislation requiring, in part, water suppliers to annually report the total irrigated landscape areas of commercial, industrial, and institutional customers with dedicated irrigation meters. Final reporting requirements are still being set by the State Water Resources Control Board with annual reporting to begin January 1, 2024.

Waterfluence has already measured approximately 80% of the landscape areas subject to this component of the legislation for the Valley Water participating retailers. About 15% of landscape areas are awaiting to be measured. Most of the unmeasured areas are associated with streetscapes managed by public agencies; we have been seeking and require their input given the challenging nature of accurately measuring irrigated landscape along roadways. The remaining 5% of landscape areas unmeasured are associated with small sites using less than 500 CCF per year.

Additional SB606 / AB1668 issues include segmenting landscape areas into new categories (e.g., special landscape areas) and by landscape installation date. The details have not been finalized.

Exhibit A. Public Site Count and Irrigated Acres by Retailer

Retailer	Type	Sites	Acres
Gilroy	Park	17	55.8
	School	7	39.9
Milpitas	Park	18	50.3
	School	14	58.5
Morgan Hill	Park	1	0.5
	School	12	42.4
Mt View	Park	43	100.2
	School	5	10.7
	Streetscape	12	19.1
Palo Alto	Park	12	65.9
	School	15	24.3
	Streetscape	2	0.8
San Jose Muni	Golf	2	157.1
	Park	18	51.0
	School	20	74.4
	Streetscape	5	10.8
San Jose Water	Cemetery	3	133.1
	Golf	3	220.7
	Park	102	334.4
	School	103	545.7
	Streetscape	32	76.0
Santa Clara	Cemetery	1	24.1
	Golf	2	96.8
	Park	26	85.4
	School	19	75.1
	Streetscape	9	4.4
Sunnyvale	Golf	3	134.9
	Park	33	180.8
	School	21	61.2
	Streetscape	2	3.0
Grand Total		**564**	**3045.2**