Valley Water

2023 Annual Report

Large Landscape Program

Valley Water

Clean Water • Healthy Environment • Flood Protection

Participating Retail Suppliers:

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

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Waterfluence

Summary

Since 2014, Valley Water has partnered with Waterfluence to provide program services to reduce overwatering at commercial and public landscape sites. In 2023, nine of the 13 retail suppliers 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 Valley Water sites for the 2023 calendar year. Key points include:

- **Site Characteristics**. By the end of 2023, Valley Water had 4,178 dedicated irrigation meter (DIM) sites irrigating 7,139 acres enrolled in the program. The average depth of water applied over all landscape area was 2.9 feet totaling 20,562 acre feet or about 8% of total use of Valley Water sources by retailers.
- **Online Engagement**. Online engagement with the Waterfluence website by stakeholders (account holders, HOA board members/owners, and landscape contractors) was 43% for commercial sites and 44% for public sites. Commercial and public overwatering was 26% less for online relative to offline sites.
- **Landscape Field Surveys**. We completed 29 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, the program has conducted 281 field surveys covering 735 irrigated acres.
- **Irrigation Efficiency Opportunities.** In 2023, overwatering totaled 6,251 acre feet or 30% of all water used by program DIM sites. Overwatering averaged 0.88 feet over all irrigated landscape but was greater than 2 feet at 25% of sites. Significant reductions in overwatering can still be made with sites that are commercial, have less than 1 acre of landscaping, and do not have online stakeholders.
- **Irrigation Efficiency Trends**. Overwatering is trending downwards. Overwatering dropped sharply during the 2015-16 statewide drought, rebounded, but in 2023 is still 45% below 2013 levels and 32% below 2019 levels.
- **Program Improvements**. In 2023, Waterfluence enhanced its map functionality to assist with creating controller maps and uploading geocoded photos.
- **California Regulatory Compliance.** The State of California passed 2018 legislation (SB606 / AB1668) requiring, in part, water suppliers to annually report information for their commercial, industrial, and institutional (CII) customers. Waterfluence assists with key elements of the CII reporting including

landscape area measurements with DIM sites, identification and in-lieu water monitoring of sites irrigating over a half-acre of landscape via mixed-use meters (MUM), and offering best management practice activities required by the legislation. In 2023, the State of California additionally passed legislation (AB 1572) targeting removal of nonfunctional turf. Waterfluence assists retailers with identifying nonfunctional turf and communicating implications with site stakeholders. In 2023, Valley Water added 333 smaller landscape sites to Waterfluence to, in part, assist its retailers with future regulatory compliance reporting.

Program Description

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

- **Monitoring.** For each site, we chart how actual water use compares to a budget benchmark. Actual water use comes from supplier meter reads made for billing purposes (monthly or bimonthly). Budgeted water use is a function of site-specific characteristics (landscape areas, plant types, irrigation system) and real-time weather. We map landscape areas and then encourage stakeholders to edit the map online to improve its accuracy and to create a controller map to assist with irrigation operations. Where available (via advanced meter infrastructure (AMI)), we also monitor hourly and daily water use.

- **Insights.** Monitored water data is channeled through algorithms to generate actionable recommendations. 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 supplier rebates to offset improvement costs.

- **Connection.** 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 provides a hub to securely access and interact with all their sites.

Site Characteristics

By the end of 2023, Valley Water had 4,178 DIM sites irrigating 7,139 acres of landscape in the program. Sites have progressively entered the program since 2014. In 2023 Valley Water added 333 new DIM sites to the program by lowering the eligibility threshold from 500 to 200 CCF per year.

Although the average depth of water applied over all irrigated landscape was 2.9 feet, application rates vary widely with site type and size, among other factors. Depth applied is a two-dimensional metric and is our preferred metric for comparisons relative to three-dimensional volume metrics such as CCF. 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 65% 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, 52% of irrigated area is planted in turf grass and the remainder is in shrubs, trees, and groundcovers. Public sites tend to have a high percentage of irrigated area in turf from large playfields and parks.

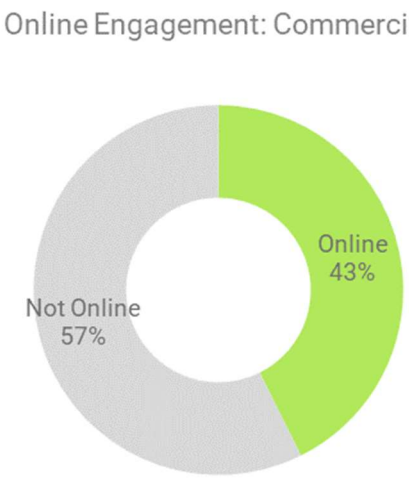
Description	Commercial	Public	Total
Number of Sites*	3,544	634	4,178
< 1 Acre	67%	28%	61%
1-3 Acres	26%	31%	27%
>3 Acres	7%	41%	12%
Irrigated Acres	4,087	3,052	7,139
Average Acres per Site	1.2	4.8	1.7
Turf %	29%	83%	52%
Shrub %	71%	17%	48%
Water Use CCF	5,842,127	3,115,381	8,957,508
Water Use Acre Feet	13,411	7,151	20,562
Water Use %	65%	35%	100%
Depth Applied Feet	3.3	2.3	2.9

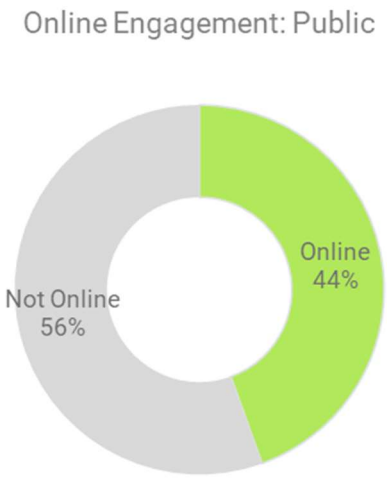
Excludes 36 sites without complete water records for 2023.

Customer Engagement

Waterfluence uses multiple tactics to onboard account holders to its website by leveraging: 1) retailer billing information, 2) account holders already in Waterfluence, 3) the landscape contractor community, and 4) interactions with account holders with other retailer programs. For sites without a known account holder, Waterfluence prints and mails reports to encourage online participation. We encourage account holders to add additional stakeholders associated with landscape irrigation at each site including property managers, property owners, HOA board members, in-house maintenance staff, and landscape contractors.

Each month, Waterfluence imports retailer water use data and notifies stakeholders that new information is available for viewing. In 2023, online engagement by stakeholders was 43% for commercial sites and 44% for public sites.





Landscape Field Surveys

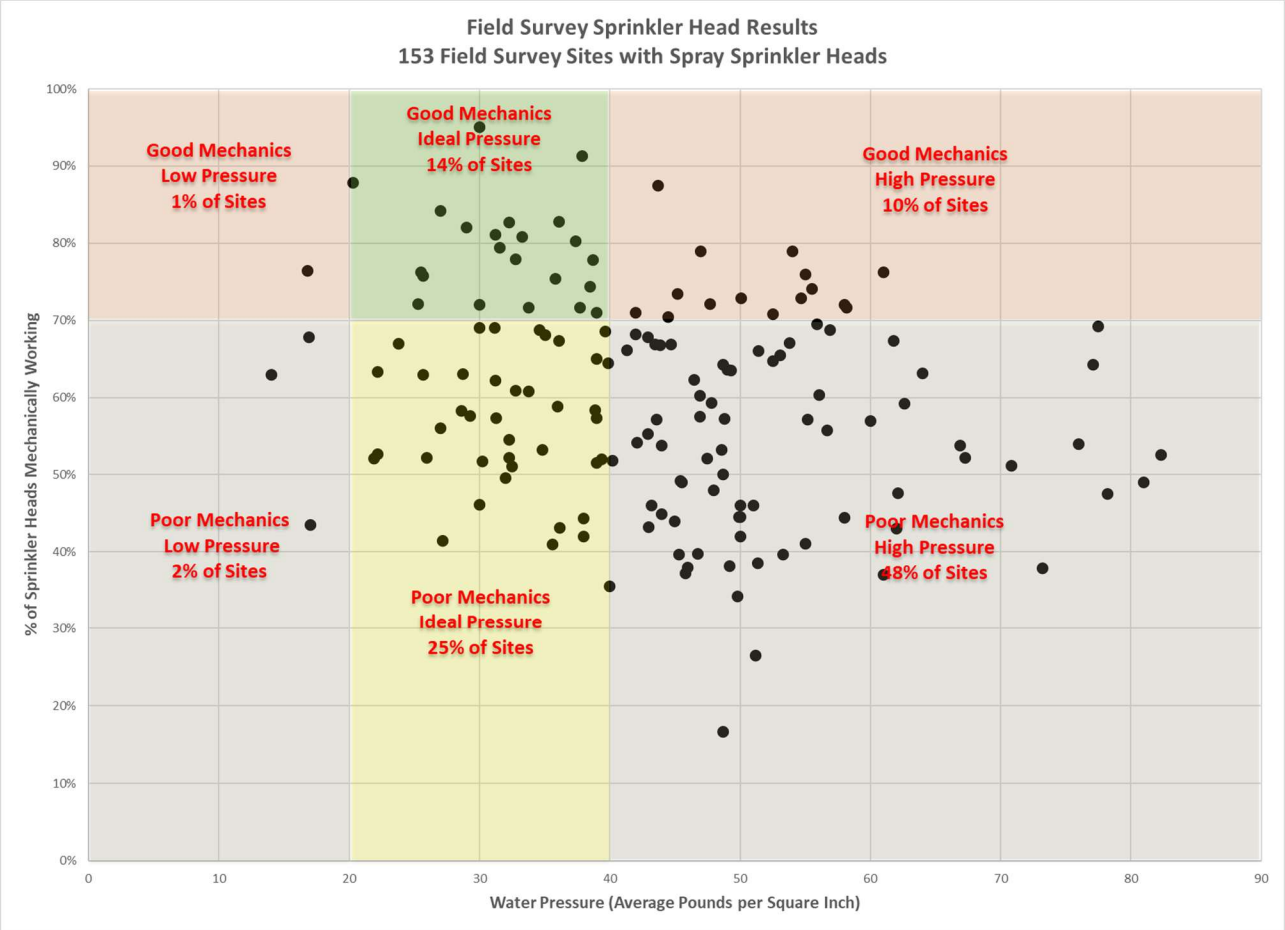
Valley Water targets landscape field surveys at sites in most need of additional help. The account holder at pre-approved sites can accept a field survey offer from the Waterfluence website. The survey is free to sites and consists of an irrigation expert visiting the site to gather in-depth diagnostics 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 2023, 281 sites received a field survey (6.7% of total sites) covering 735 irrigated acres.

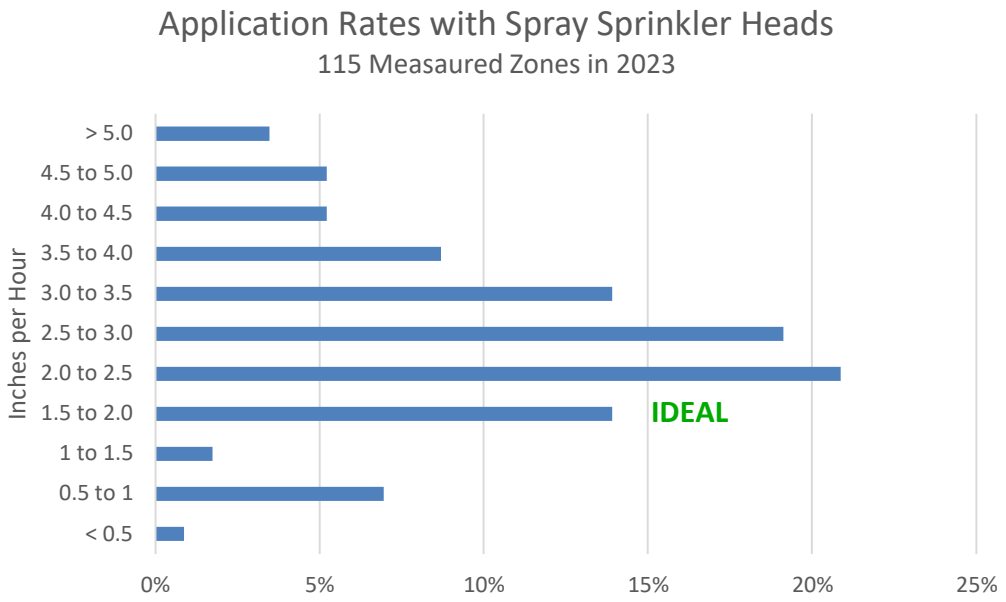
Year	Survey Count	Acres
2014	5	9.9
2015	22	55.9
2016	28	72.0
2017	29	78.0
2018	37	75.4
2019	41	260.6
2020	12	15.3
2021	50	78.9
2022	28	45.8
2023	29	43.4
Total	**281**	**735.2**

We measured both mechanical fitness and water pressure associated with 153 field surveys with standard spray sprinkler heads conducted over the last 7 years. Only 25% 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 40% of sites had average water pressures operating in their desired range (20 to 40 pounds per square inch). Only 14% of sites were both mechanically 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.

In 2023, we also used the flow-area method to measure spray sprinkler station (zone) precipitation rates in inches per hour. Sprays are by far the most common irrigation distribution method encountered in the field. Waterfluence uses automated techniques to measure flow per zone (gallons per minute) which when divided by zone area (square feet) captured on our online irrigation maps, generates the precipitation rate. Ideally, we would expect precipitation rates for standard sprays to be about 1.5 to 1.7 inches per hour. We found, however, rates exceeded 2 inches per hour at 77% of the irrigation zones tested. Causes for high precipitation rates include high pressure, tight head spacing, and leaks, among other factors. Knowing a zone's precipitation rate is a key factor in irrigation scheduling. Underestimating station precipitation rates often causes excessive scheduling and overwatering.



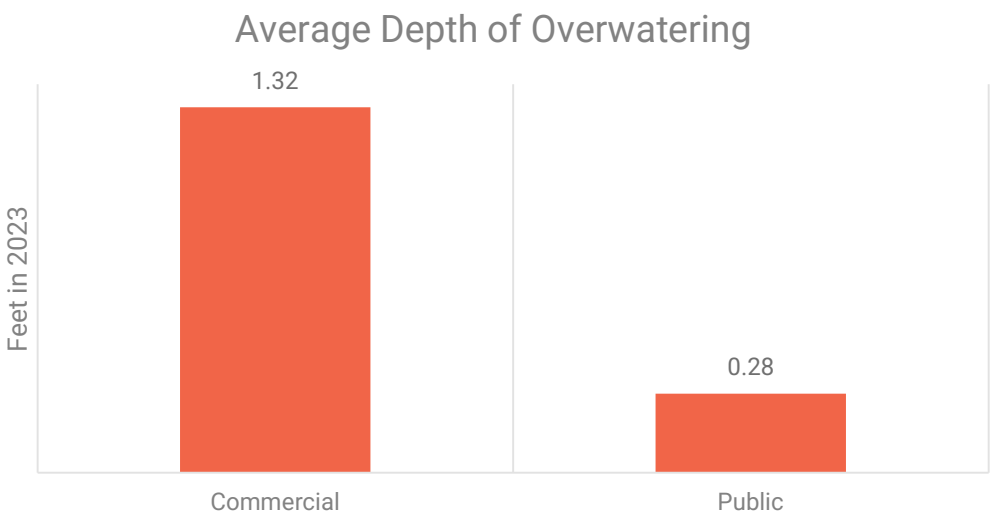


Irrigation Efficiency Opportunities

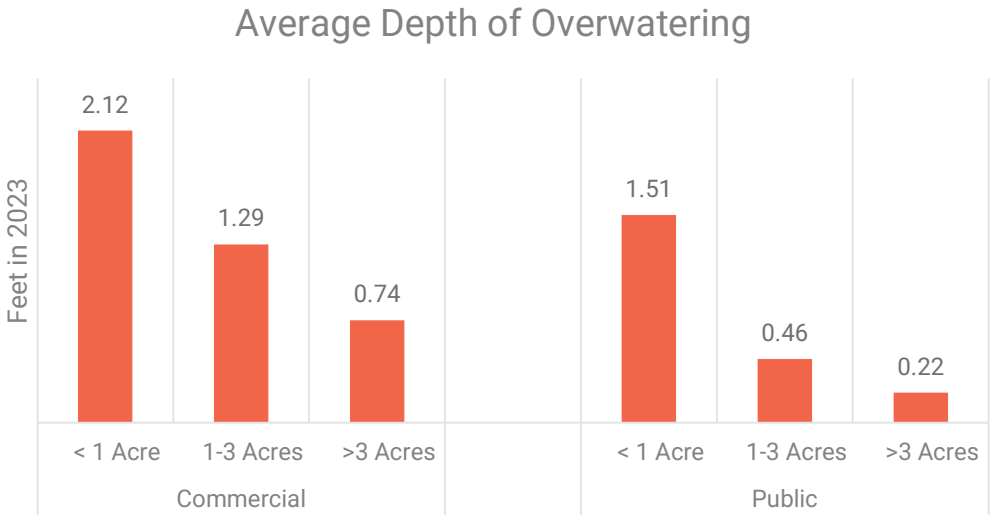
The program's key performance metric is minimizing the depth of overwatering—defined as the volume of water used above our calculated water budget divided by irrigated area. This metric is weather-normalized enabling year-to-year comparisons. As a benchmark, overwatering averaged 0.88 feet over all irrigated landscape in 2023.

To guide future efforts to improve the program, we analyzed 2023 overwatering with respect to four elements: site type, site size, engagement mode, and magnitude.

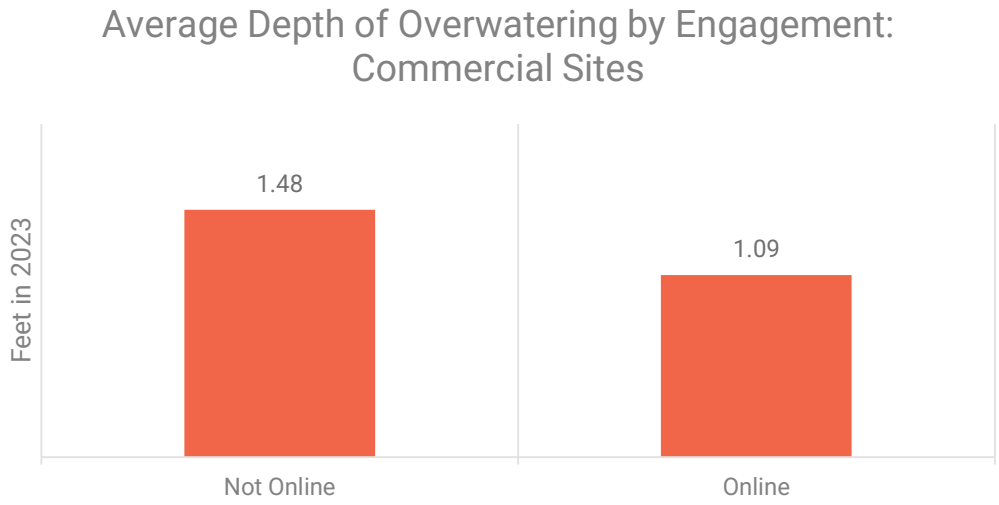
Site Type. Commercial sites overwater significantly more than public sites. Additional engagement efforts targeted toward commercial stakeholders can help close this gap, such as improved customer relationship management.

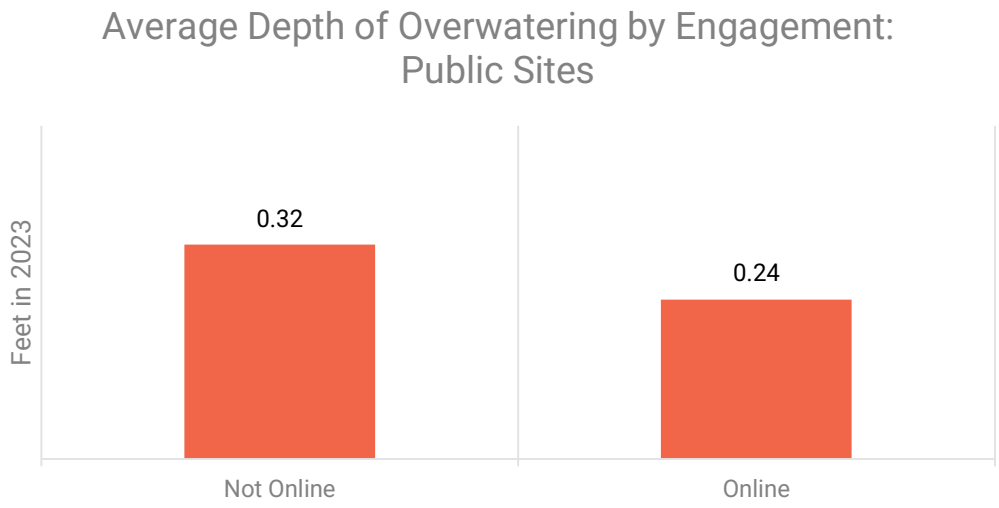


Site Size. Larger landscapes tend to be more efficiently irrigated. Although smaller sites use less water by volume, their potential to reduce overwatering on a percentage basis is greater. Small sites with less than one acre of landscape also make up 61% of total sites in the program.

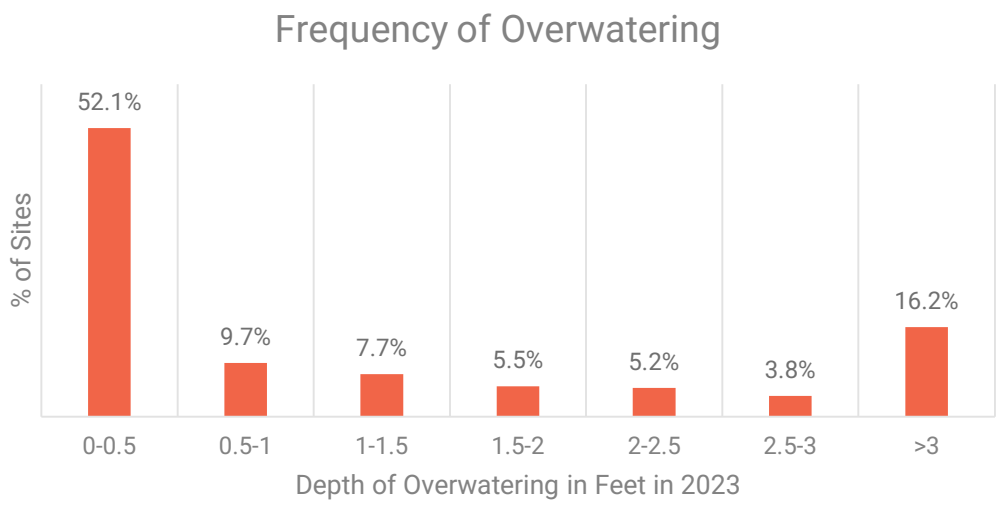


Online Engagement. Sites with online stakeholders overwater less. Both commercial and public sites overwatered by 26% less with online stakeholders.



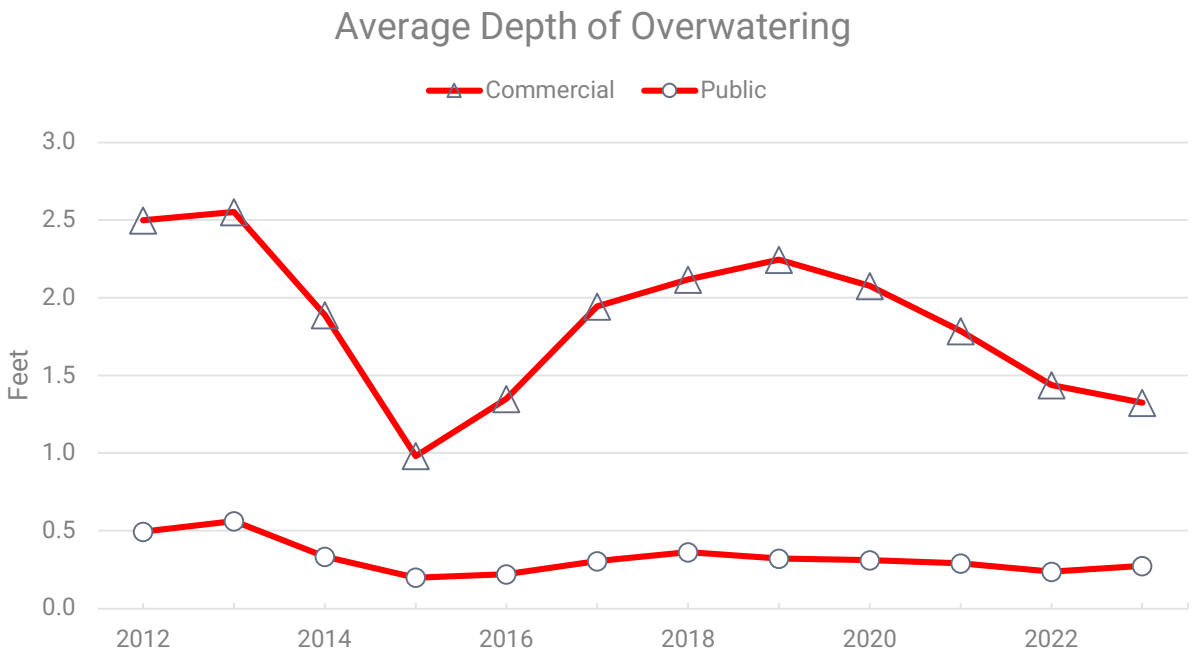


Magnitude of Overwatering. A key program benefit is that the problem sites in a community can be readily identified. Looking at the frequency of overwatering by magnitude, overwatering of more than 2 feet occurred at 25% of sites, predominately small and commercial. These sites are targeted for verification of water budget assumptions, landscape field surveys, program engagement, and financial incentives, among other tactics to improve performance.

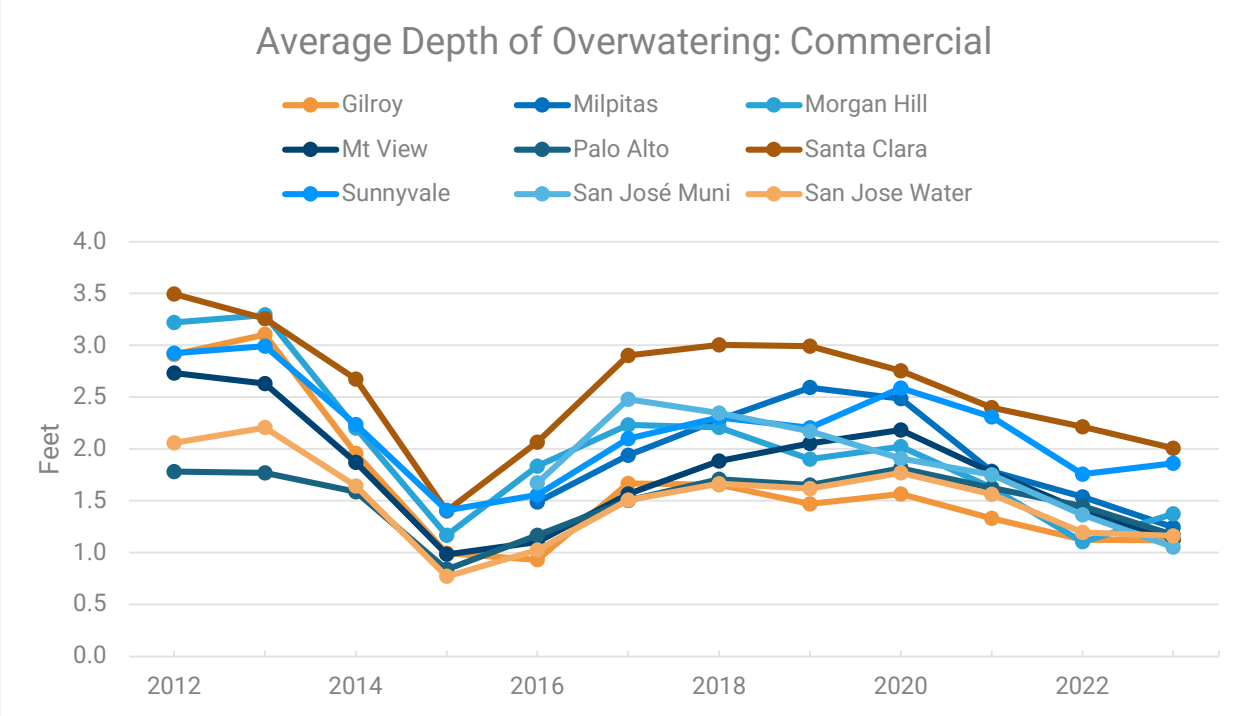


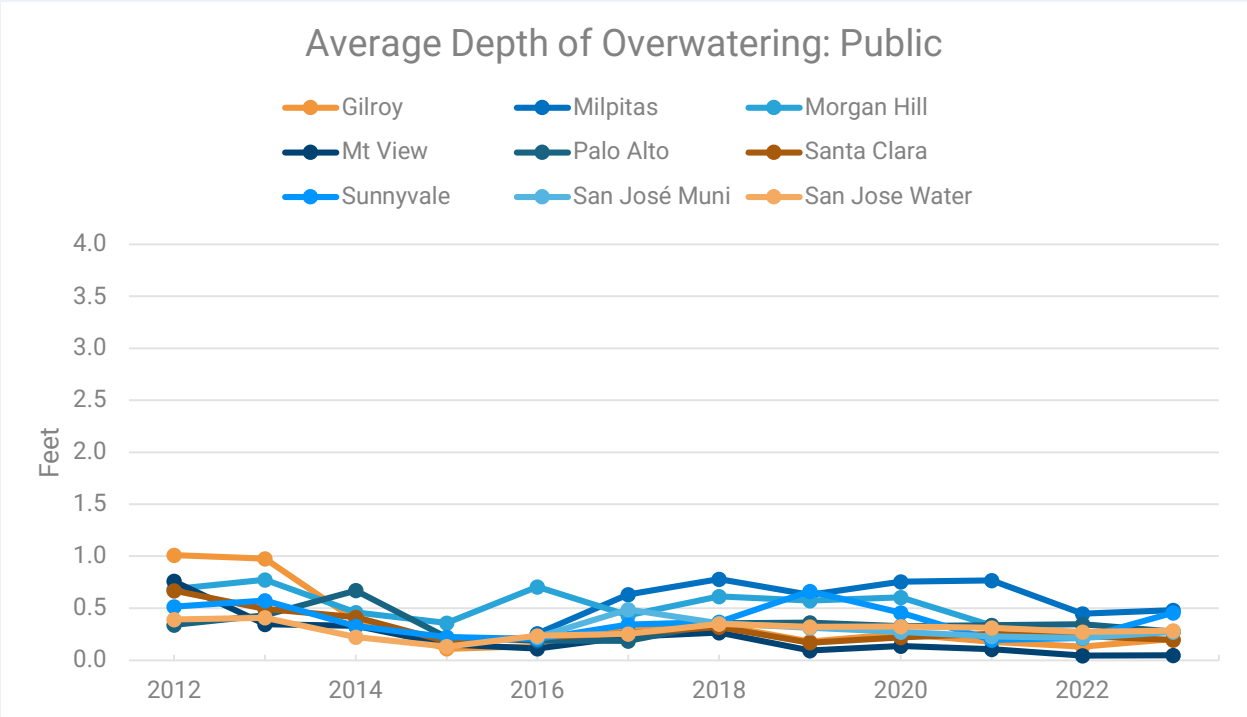
Irrigation Efficiency Trends

Overwatering is trending downwards. Overwatering dropped sharply during the 2015-16 statewide drought, rebounded, but in 2023 is still 45% below 2013 levels and 32% below 2019 levels. 2012 and 2013 are before the program start in 2014.



All retailers generally followed these overall trends between 2012 and 2023


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
2014
2016
2018
2020
2022


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
2014
2016
2018
2020
2022

California Regulatory Compliance

In 2018, the State of California passed legislation (SB606 / AB1668) requiring, in part, water suppliers to annually report information for their commercial, industrial, and institutional (CII) customers. In 2023, the State of California additionally passed legislation (AB 1572) targeting the removal of nonfunctional turf.

Waterfluence assists with key elements of the CII reporting including landscape area measurements with sites irrigated by dedicated irrigation meters (DIM), identification and in-lieu water monitoring of sites irrigating over a half-acre of landscape via mixed-use meters (MUM), and offering select best management practice activities required by the legislation. Waterfluence also assists retailers with identifying nonfunctional turf and communicating implications with site stakeholders.

In recent years Valley Water has incrementally lowered the annual water use threshold required for inclusion in the program to include more DIM sites. In 2023 Valley Water approved 333 new sites from six retailers using greater than 200 CCF per year. More DIM sites (550) are joining the program in 2024. Waterfluence estimates that 98% of total DIM water use by all nine retailers now has its landscape areas measured. Inclusion of the smaller sites will assist retailers with future regulatory compliance reporting where 100% of DIM landscape needs to be measured.

Exhibit A. Public Site Count and Irrigated Acres by Retailer

Retailer	Type	Sites	Acres
Gilroy	Park	17	56.0
	School	7	39.9
	Streetscape	1	0.2
Milpitas	Park	34	97.0
	School	14	56.3
	Streetscape	28	25.5
Morgan Hill	Park	2	11.6
	School	13	40.8
	Streetscape	2	0.6
Mt View	Park	46	99.6
	School	5	10.8
	Streetscape	12	19.2
Palo Alto	Park	12	64.3
	School	15	23.4
	Streetscape	2	0.7
San Jose Muni	Golf	3	159.2
	Park	19	51.4
	School	22	84.4
	Streetscape	7	11.8
San Jose Water	Cemetery	3	133.4
	Golf	3	221.2
	Park	100	325.9
	School	105	556.7
	Streetscape	32	76.1
Santa Clara	Cemetery	1	24.2
	Park	27	84.8
	School	19	79.5
	Streetscape	15	6.6
Sunnyvale	Golf	3	135.2
	Park	33	181.2
	School		
	Streetscape	22	62.1
Valley Water	Golf	2	308.4
Grand Total	Cemetery	4	157.6
	Golf	11	824.0
	Park	290	971.7
	School	222	953.9
	Streetscape	107	144.8
	All	**634**	**3052.0**