

Valley Water

2020 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

February 26, 2021

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Summary

Since 2014, Valley Water (formerly known as the Santa Clara Valley Water District) in California has contracted with Waterfluence to provide program services to improve irrigation efficiency at large commercial and public landscape sites. In 2020, 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 1.8 million service population.

This report summarizes the program features, results, opportunities, and multi-year trends. Key points include:

- ▶ **Site Characteristics.** In 2020, Valley Water included 2,935 sites irrigating 5,257 acres of landscape in the program. The average depth of water applied over all landscape area was 3.7 feet totaling 19,818 acre feet or about 7% of total use of Valley Water sources by retailers.
- ▶ **Stakeholder Engagement.** In 2020, stakeholders at 54% of sites actively viewed program information via the Waterfluence website; sites not online get mailed paper reports.
- ▶ **Landscape Field Surveys.** In 2020, we only completed 12 landscape field surveys at targeted sites agreeing to have our irrigation expert gather in-depth diagnostics and provide recommendations to improve irrigation efficiency. The surveys occurred prior to shutting down our field survey service for the remainder of year because of the covid pandemic. 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, especially those with less than 1 acre of landscaping, planted predominately with shrubs, and not including their landscape contractor as an online viewer. In 2020, overwatering totaled 6,264 acre feet or 33% of all water used at participating sites. Overwatering averaged 1.2 feet over all irrigated landscape but was greater than 2 feet at 36% of sites.
- ▶ **Irrigation Efficiency Trends.** Overwatering at both commercial and public sites dropped significantly after 2013, reaching a low point during a 2015-16 statewide drought. Overwatering rebounded in subsequent years but is still 29% below 2013 levels.
- ▶ **2021 Program Upgrades.** Based on interviews with users at large landscape contractor companies, we are enhancing our website dashboard to allow users to define and view a more focused list of their "favorite" sites. We will also be adding a new "irrigable not irrigated" landscape classification to our online maps to assist retail agencies with SB 606 / AB 1668 reporting requirements associated with dedicated irrigation meters.

Program Description

Waterfluence partners with urban water agencies to improve irrigation efficiency at their large 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 our irrigation-focused and 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 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

In 2020, Valley Water had 2,935 sites irrigating 5,257 acres of landscape in the program. Sites have progressively entered the program since 2014. Although the average depth of water applied over all irrigated landscape was 3.7 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 83% of sites and 71% 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, 53% 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	2,436	499	2,935
<i>< 1 Acre</i>	61%	20%	54%
<i>1-3 Acres</i>	31%	32%	31%
<i>>3 Acres</i>	8%	47%	15%
Irrigated Acres	3,036	2,220	5,257
<i>Average Acres per Site</i>	1.2	4.4	1.8
<i>Turf %</i>	31%	83%	53%
<i>Shrub %</i>	69%	17%	47%
2020 Water Use CCF	5,953,530	2,424,776	8,378,306
2020 Water Use Acre Feet	13,666	5,566	19,233
2020 Water Use %	71%	29%	100%
2020 Depth Applied Feet	4.5	2.5	3.7

Customer Engagement

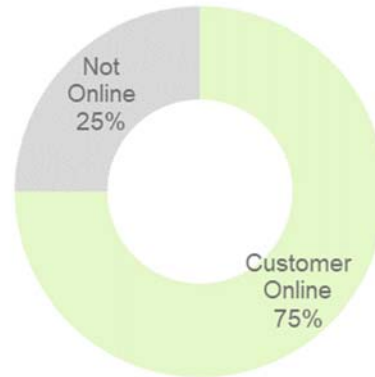
Waterfluence distributes monthly landscape reports to customers by mail or by online access to its website. The online content has more depth and allows multiple stakeholders, such as HOA board members, park staff, and landscape contractors, to view site information. In 2020, 54% of sites were viewed online by at least one stakeholder.

Public sites were highly engaged with 75% of their sites being viewed online. Commercial sites, in contrast, had 50% of sites viewed online. An important distinction with commercial sites is that their irrigation is frequently managed by independent landscape contractors. We find our program works best when landscapers are connected as a stakeholder. In 2020, 23% of commercial sites were actively being viewed by a landscaper online.

Online Engagement: Commercial



Online Engagement: Public



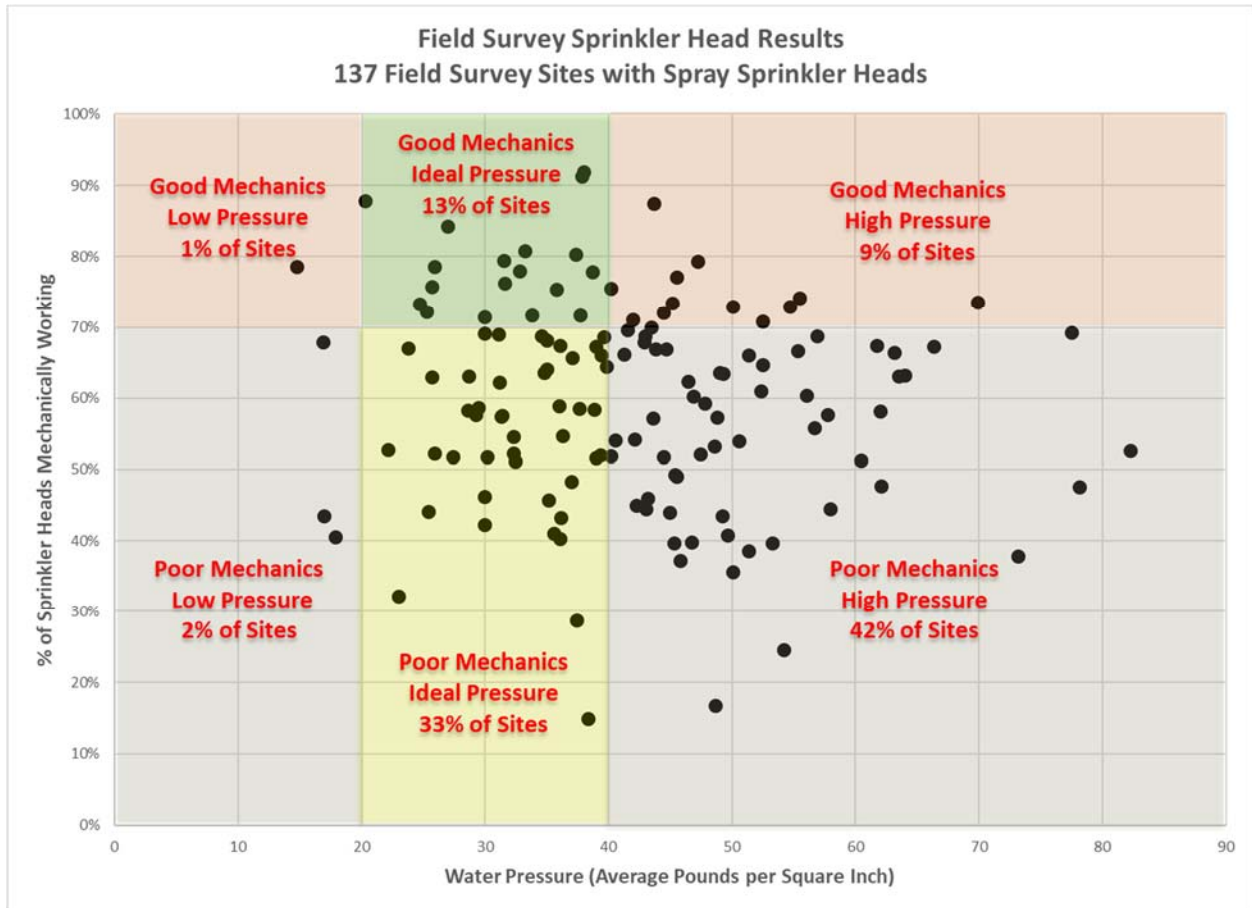
Landscape Field Surveys

Valley Water targets landscape field surveys to sites in most need of additional help based on low performance metrics and high savings potential. For sites pre-approved by Valley Water, the main stakeholder at each site must accept the survey online. 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 2020, 174 sites received a field survey (6% of total sites) covering 567 irrigated acres. All but six of the surveys have been at commercial sites, as fewer public sites qualify because of low-savings potential. In 2020, only 12 sites received a field survey before the covid pandemic paused the service.

Year	Surveys	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
Total	174	567.1

For 137 field survey sites having spray sprinkler heads, we measured both mechanical fitness and water pressure. Only 23% 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

46% of sites had average water pressures operating in their desired range (20 to 40 pounds per square inch). Only 13% 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.

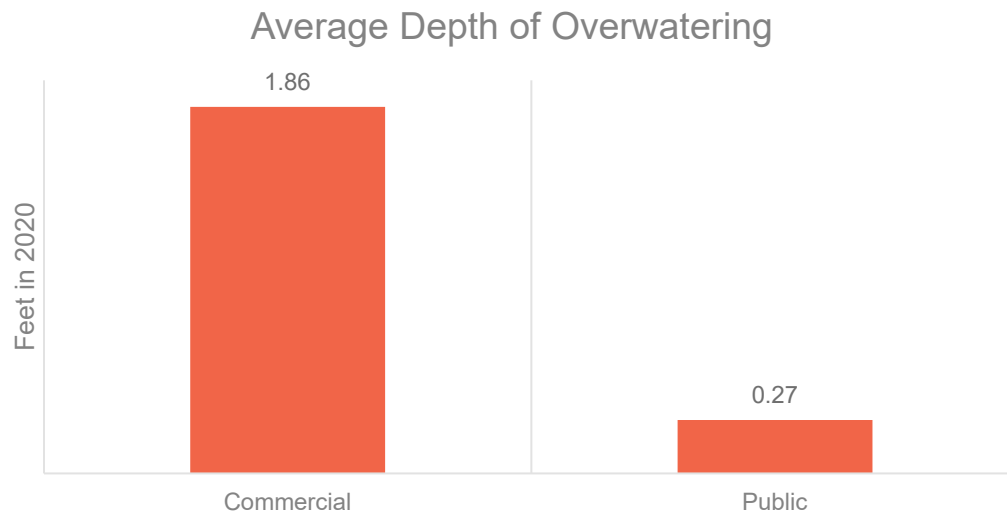


Irrigation Efficiency Opportunities

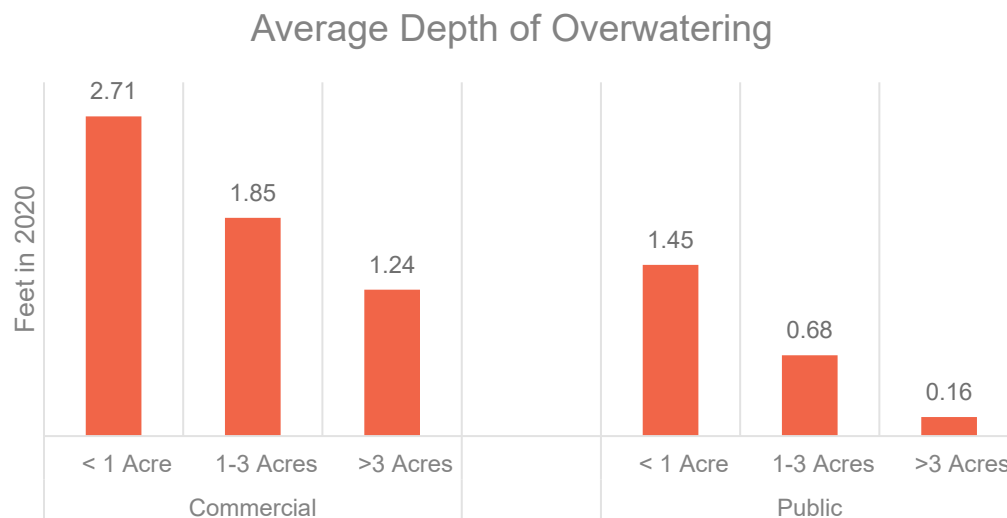
The program’s key performance metric is minimizing the depth of overwatering—defined as the volume of water used above our calculated water budget divided by irrigated area. This metric is weather-normalized enabling year-to-year comparisons. As a benchmark, overwatering averaged 1.2 feet over all irrigated landscape in 2020.

To guide future efforts to improve the program, we analyzed 2020 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.



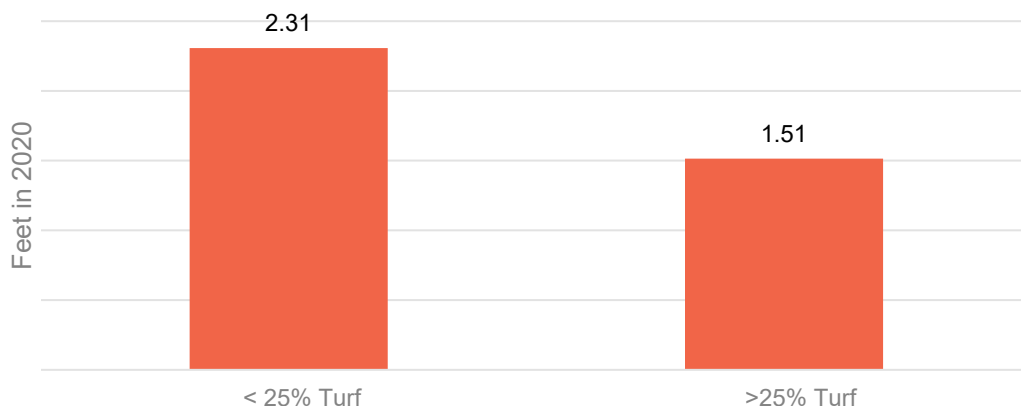
Site Size. Larger landscapes tend to be more efficiently irrigated. Although smaller sites use less water by volume, their potential to reduce overwatering on a percentage basis is greater. Small sites with less than one acre of landscape also make up 54% of total sites in the program.



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 2020, 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.

Average Depth of Water Applied by Turf % Commercial Sites



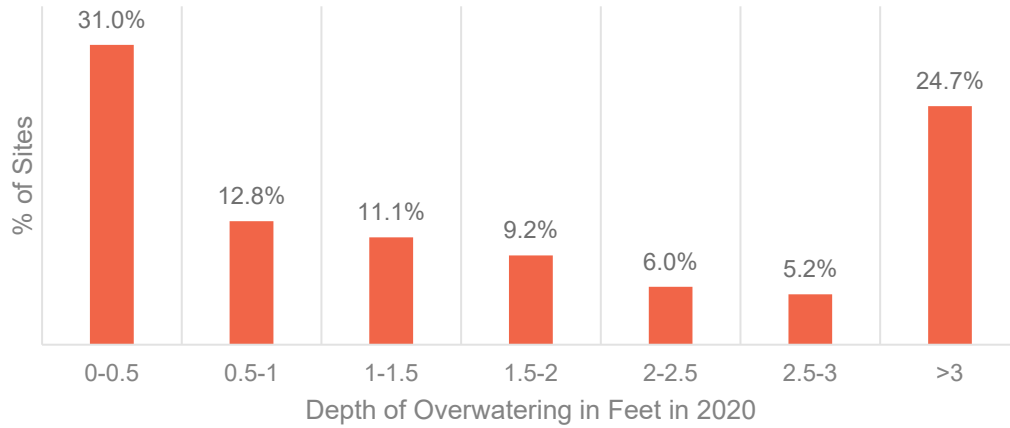
Engagement Mode. For commercial sites, those accessing the Waterfluence website overwater less than sites mailed paper reports. We find overwatering is 30% less when landscape contractors are actively included as stakeholders, relative to sites mailed reports.

Average Depth of Overwatering by Engagement: Commercial Sites



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 36% 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.

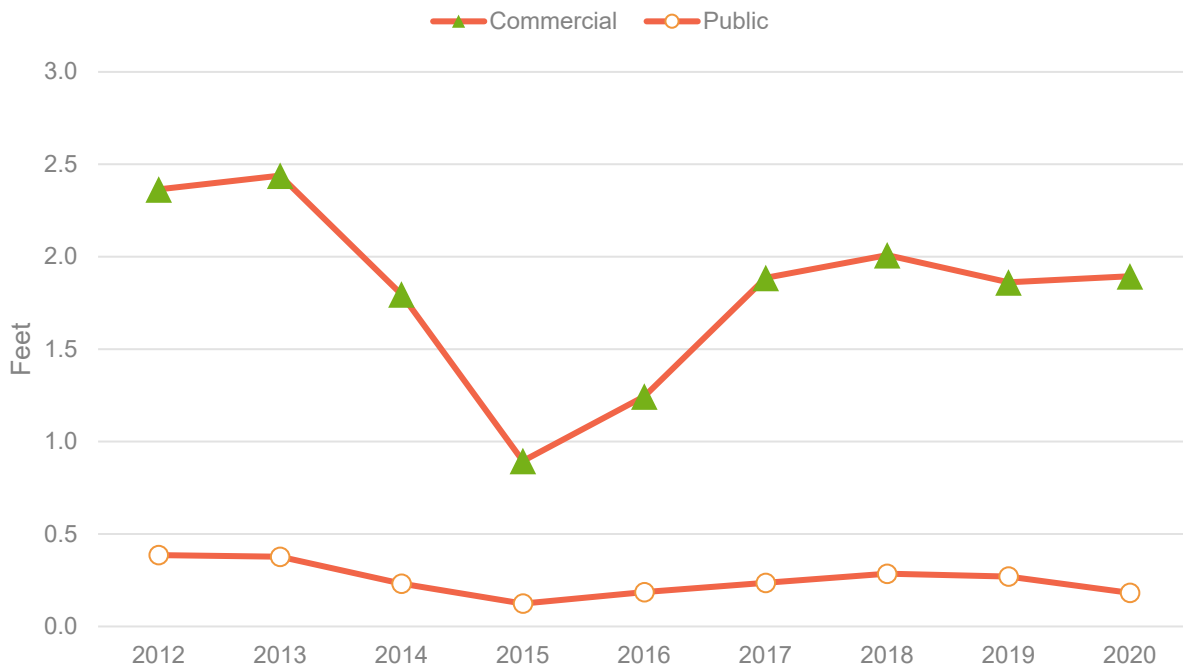
Frequency of Overwatering



Irrigation Efficiency Trends

Overwatering at both commercial and public sites dropped significantly after 2013, reaching a low point during a 2015-16 statewide drought. Overwatering rebounded in subsequent years but is still 29% below 2013 levels.

Average Depth of Overwatering



All retailers generally followed these overall trends between 2012 and 2020.

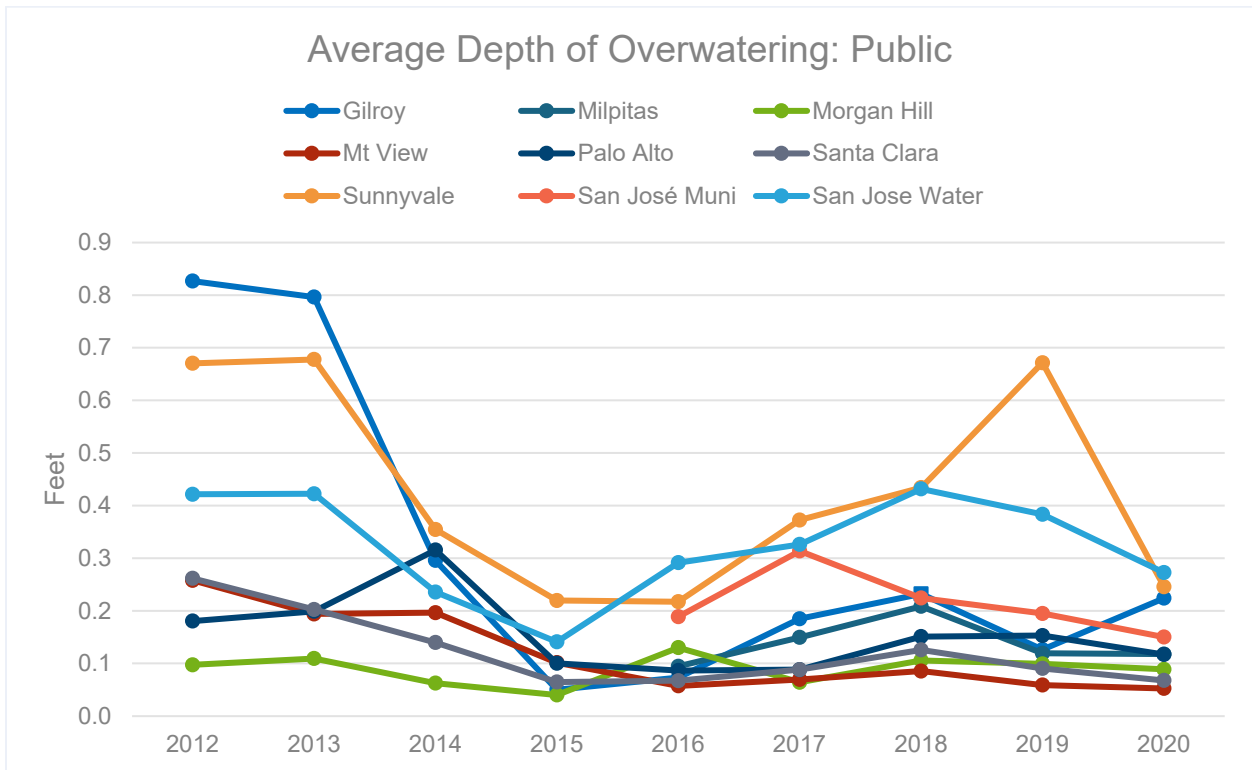
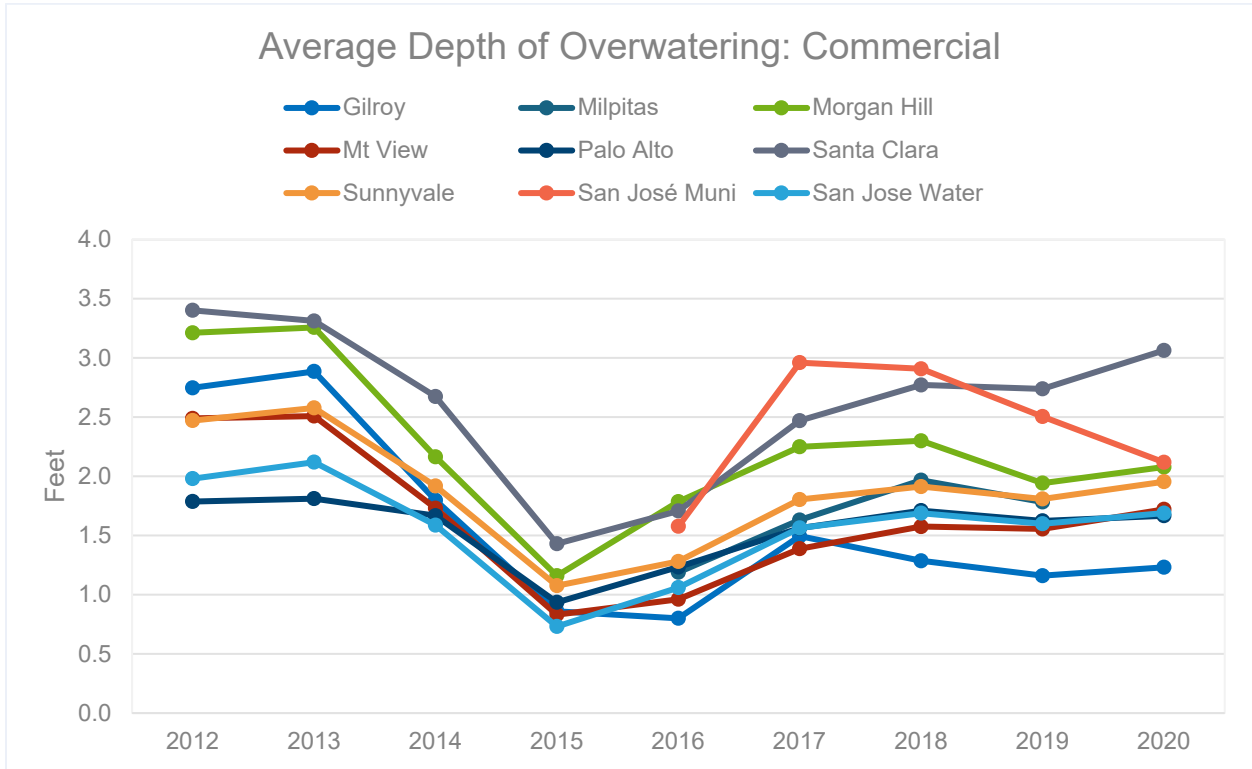


Exhibit A. Public Site Count and Irrigated Acres by Retailer

Agency	Type*	Site Count	Acres
Gilroy	Park	13	43
	School	7	40
Milpitas	Park	18	50
	School	12	57
Morgan Hill	Park	12	42
Mt View	Park	44	108
	School	4	10
	Other	3	9
Palo Alto	Park	12	64
	School	10	19
	Other	2	1
San José Muni	Park	15	41
	School	17	73
	Other	7	171
San Jose Water	Park	113	413
	School	90	492
	Other	26	203
Santa Clara	Park	23	78
	School	16	51
	Other	9	27
Sunnyvale	Park	30	174
	School	16	53
Total		499	2,220

*Other type includes streetscapes, golf courses, and Caltrans.