

# Santa Clara Valley Water District Large Landscape Program 2018 Annual Report



## Participating Retail Agencies:

City of Gilroy, City of Morgan Hill, City of Mountain View,  
City of Palo Alto, City of Santa Clara, City of Sunnyvale, San José Municipal  
Water System and San Jose Water Company



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Waterfluence LLC

PO Box 561 Menlo Park CA 94026

[www.waterfluence.com](http://www.waterfluence.com)

(800) 800-9519



## Summary

Since 2014, the Santa Clara Valley Water District (Valley Water) in California has contracted with Waterfluence to provide program services for improving irrigation efficiency at large commercial and public landscape sites. In 2018, eight retail agencies within Valley Water's service area participated in this program including the cities of Gilroy, Morgan Hill, Mountain View, Palo Alto, Santa Clara, Sunnyvale, and the San José Municipal Water System and San Jose Water Company. In total, these retailers serve about 74% of Valley Water's population. This report summarizes the program features, characteristics of participating sites, and customer engagement. It also identifies opportunities to focus and improve the program going forward.

- **Site Characteristics.** In 2018, Valley Water had 2,524 sites irrigating 4,279 acres of landscape in the program. The average depth of water applied over all landscape area was 3.4 feet totaling 14,407 acre feet or about 4.8% of total Valley Water use.
- **Customer Engagement.** In 2018, 58% of sites actively viewed information online via the Waterfluence website.
- **Landscape Field Surveys.** In 2018, we conducted 37 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 a total of 121 field surveys.
- **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 including their landscape contractor as an online viewer. In 2018, overwatering totaled 5,337 acre feet or 37% of all water used. Overwatering averaged 1.2 feet over all irrigated landscape, but was greater than 2 feet at 41% of sites.
- **Irrigation Efficiency Trends.** Overwatering dropped significantly after 2013, reaching a low point in 2015 during a statewide drought. Overwatering has rebounded in subsequent years but in 2018 is still 20% below 2013 levels.

## Program Description

Waterfluence partners with urban water agencies to improve irrigation efficiency at large commercial and public landscape sites using a website platform. The platform helps:

- **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 track progress and receive feedback on their actions. Calculations can be difficult for customers and landscape managers to make, and so we assist. Our metrics are irrigation-focused and interactive.
- **Recommend.** 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 leaks, seasonal misapplications, and poor sprinkler performance. For targeted sites accepting additional help, our irrigation experts conduct on-site landscape field surveys to generate detailed diagnostics. When relevant, we encourage tapping water agency financial rebates to offset improvement costs.

- **Connect.** Stakeholders at commercial and public irrigation sites - water bill customers, property managers, HOA board members, maintenance staff, and landscape contractors - often oversee multiple sites in multiple communities. Our platform provides a centralized place to help stakeholders better understand, prioritize, communicate, and act on solutions toward the non-controversial goal of improving irrigation efficiency across all their sites.

## Site Characteristics

In 2018 Valley Water had 2,524 sites irrigating 4,279 acres of landscape in the program. Sites have progressively entered the program since 2014; the San José Municipal Water System and the San Jose Water Company joined the program in 2018, nearly doubling participating sites. In 2017, the program had 1,305 sites irrigating 1,752 acres. Although the average depth of water applied over all irrigated landscape in 2018 was 3.4 feet, application rates varied 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 84% of sites and 72% 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 in-house staff. Across all sites, 52% 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.

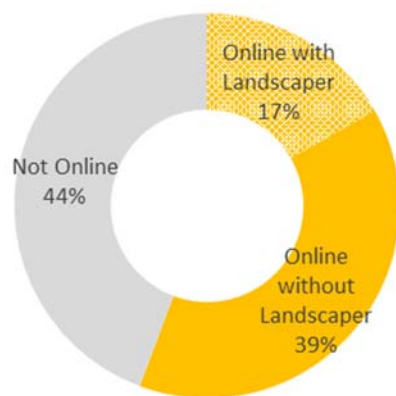
Description	Commercial	Public	Total
Number of Sites	2,124	400	2,524
< 1 Acre	63%	22%	57%
1-3 Acres	30%	32%	30%
>3 Acres	7%	46%	13%
Irrigated Acres	2,528	1,751	4,279
Average Acres per Site	1.2	4.4	1.7
Turf %	32%	82%	52%
Shrub %	68%	18%	48%
2018 Water Use CCF	4,497,748	1,778,163	6,275,910
2018 Water Use Acre Feet	10,325	4,082	14,407
2018 Water Use %	72%	28%	100%
2018 Depth Applied FT	4.1	2.3	3.4

## Customer Engagement

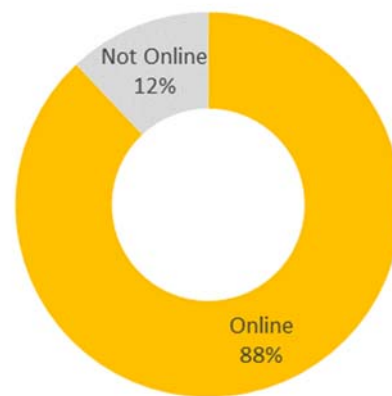
Waterfluence distributes monthly landscape reports to customers by mail or by online access. The online content has more depth and allows multiple stakeholders, such as HOA board members, park staff, and landscape contractors, to view site information. In 2018, 58% of sites were viewed online by at least one contact.

Public sites were highly engaged with 88% of their sites being viewed online. Commercial sites, in contrast, had 56% 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 to the platform. In 2018, 17% of commercial sites were actively being viewed by a landscaper online. To improve engagement in the future, Waterfluence is looking into ways to more effectively meet needs of landscape contractors, such as upgrading its site mapping capabilities to facilitate creation of controller maps.

Online Engagement: Commercial

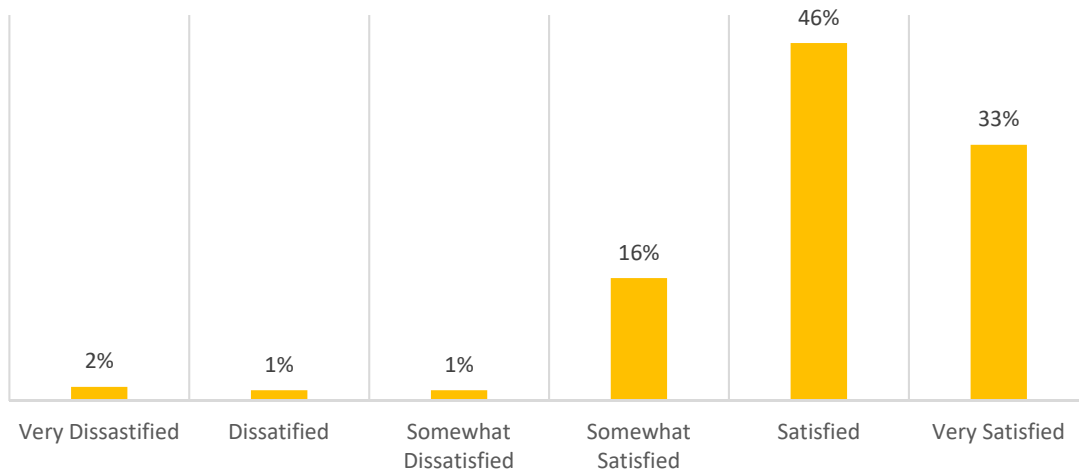


Online Engagement: Public



In December 2018, we surveyed our online viewers and 79% reported to be satisfied or very satisfied with the program. Satisfied contacts typically described the reports as an easy tool for tracking water use and potential problems. Dissatisfied contacts usually desired more timely reporting, clarification of report information, or adjustments to their water budgets.

## How satisfied are you with Program?



### Landscape Field Surveys

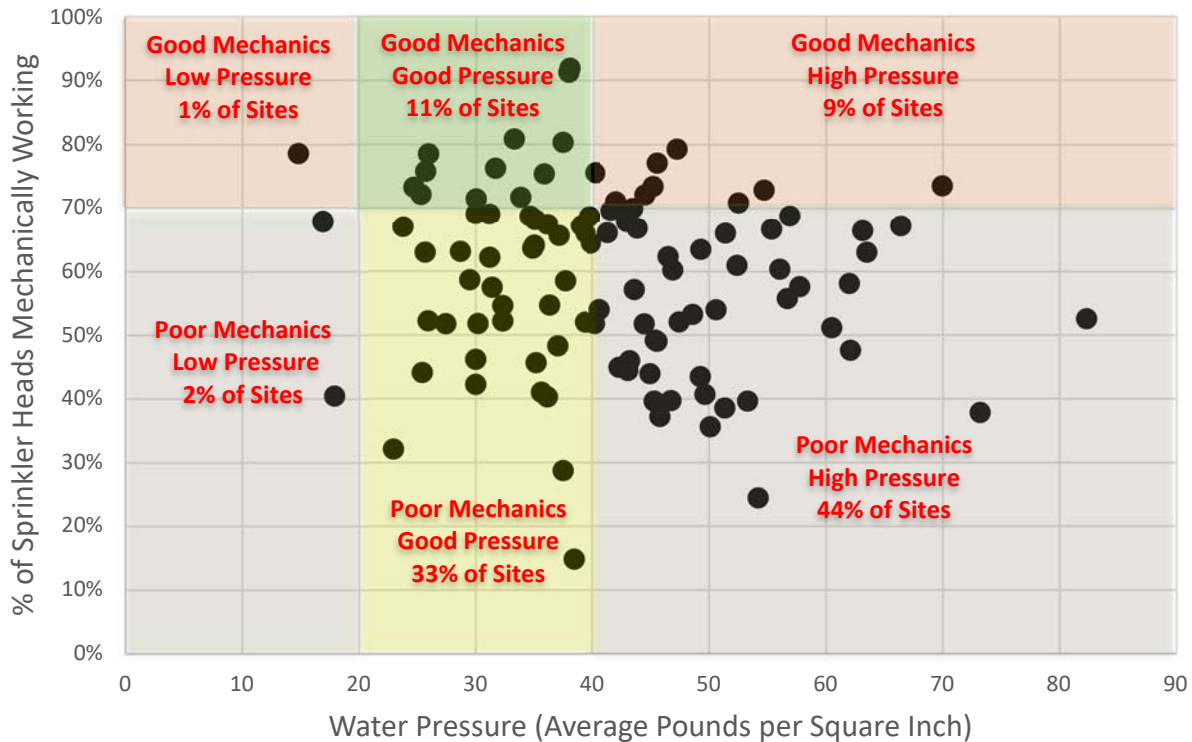
Valley Water targets landscape field surveys to sites in most need of additional help based on low performance metrics and high savings potential. For sites pre-approved by Valley Water, the main contact at each site must accept the survey online with its conditions that include granting Valley Water permission to view their site information. The survey is free to customers and consists of an irrigation expert visiting the site to gather in-depth diagnostics and provide recommendations to improve efficiency. Field surveys compliment water use monitoring by troubleshooting complicated irrigation issues and improving the accuracy of water budget parameters with “boots-on-the-ground” observations. Between 2014 and 2018, 121 sites in the program (5%) accepted and received field surveys. All but one of the surveys have been at commercial sites, as few public sites qualify because of low-saving potential.

Year	Sites	Acres
2014	5	9.9
2015	22	55.9
2016	28	72.0
2017	29	78.0
2018	37	75.4
<b>Total</b>	<b>121</b>	<b>291.2</b>

For 106 field survey sites having spray sprinkler heads, we measured both mechanical performance and water pressure. Only 21% 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 the desired 20 to 40 PSI (pounds per square inch) range. We define good working sites as meeting both these criteria, for which only 11% of sites met. Because field surveys are targeted toward low performing sites, these findings are not

representative of all sites in the program. For the 11% of field survey sites having good mechanics and pressure, poor irrigation scheduling and/or inaccurate landscape area measurements led to the site being targeted for the field survey.

### Field Survey Spray Sprinkler Head Performance 106 Sites



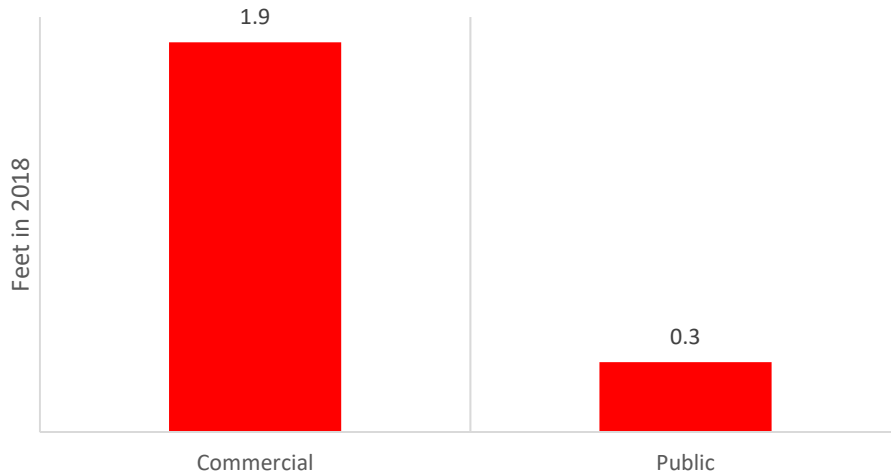
### Irrigation Efficiency Opportunities

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 2018.

To guide future efforts to improve the program, we analyzed 2018 overwatering with respect to five elements: customer type, site size, plant type, engagement mode, and frequency of site overwatering.

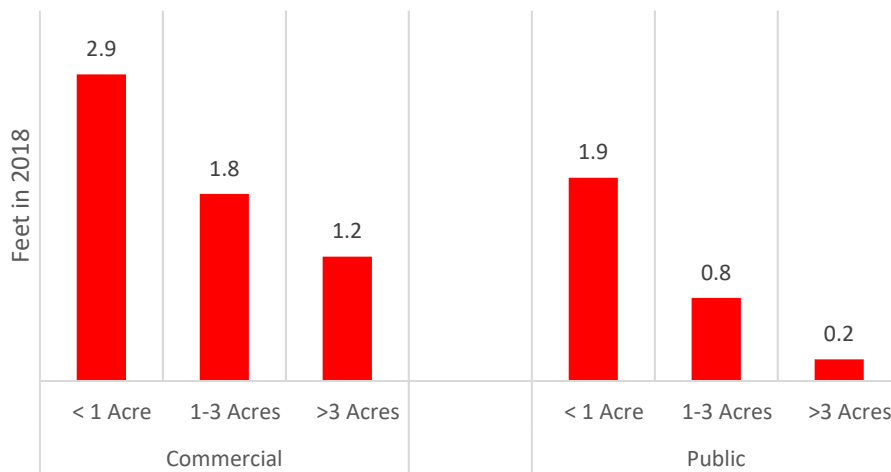
**Customer Type.** Commercial sites have made progress but still have significant potential for improvement. Public sites are closer to optimal levels. Additional engagement efforts targeted toward commercial site managers can help close this gap, such as providing improved mapping features to help with irrigation management.

### Average Depth of Overwatering



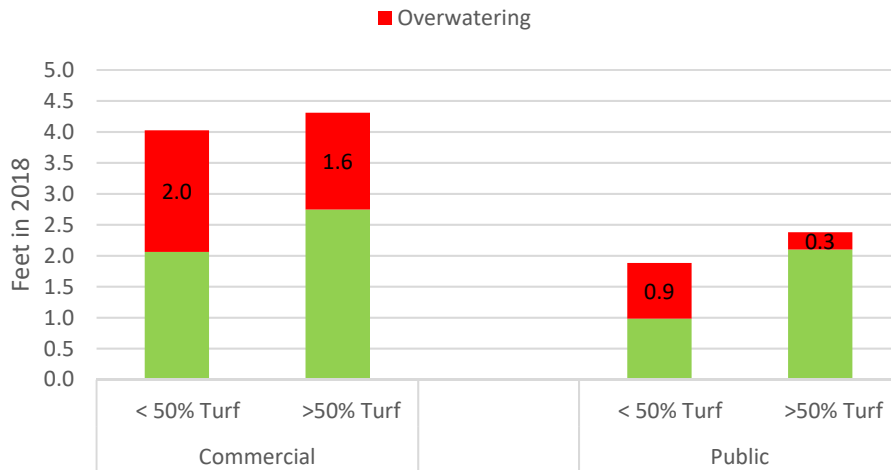
**Site Size.** Larger landscapes tend to be more efficiently irrigated. Although smaller sites use less water by volume, their potential to reduce overwatering on a percentage basis is greater. Small sites with less than one acre of landscape also make up 57% of total sites in the program.

### Average Depth of Overwatering



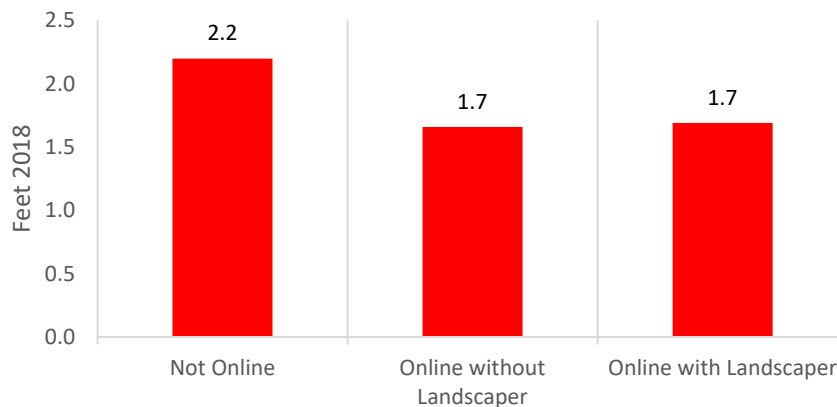
**Plant Type.** Within both the commercial and public groups, we find modest differences in average depth of water applied between sites predominantly planted with turf grass and sites predominantly planted with shrubs, trees and groundcovers. Theoretically turf’s water requirements are significantly higher. Shrubs have different irrigation system and scheduling considerations, and our data suggest they have significant potential for future efficiency improvements.

### Average Depth of Water Applied by Turf %



**Engagement Mode.** For commercial sites, those online overwater by 23% less than sites only mailed paper reports. We conclude adding relevant property managers and landscape contractors as viewers to our platform is the single most important factor to its success.

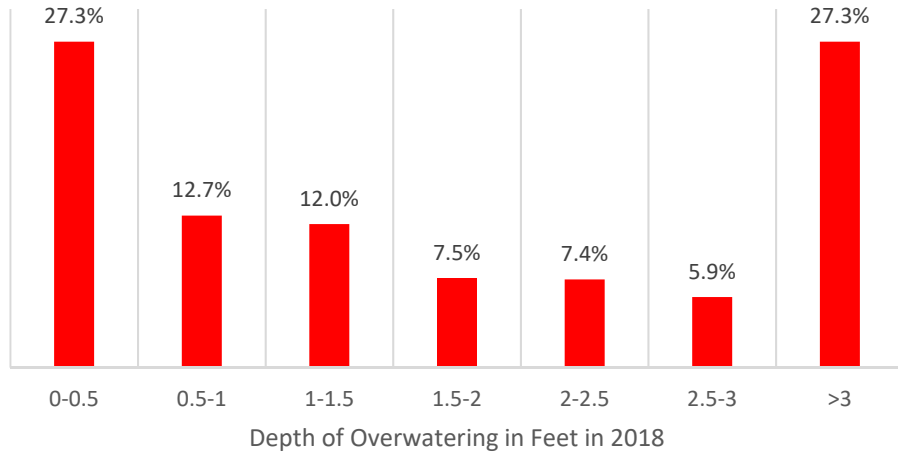
### Average Depth of Overwatering by Engagement: Commercial Sites



**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 in 2018 occurred at 41% of sites, predominately small and commercial. These sites could be targeted for verification of water budget assumptions, landscape field surveys, program engagement, and financial incentives, among other tactics to improve performance.



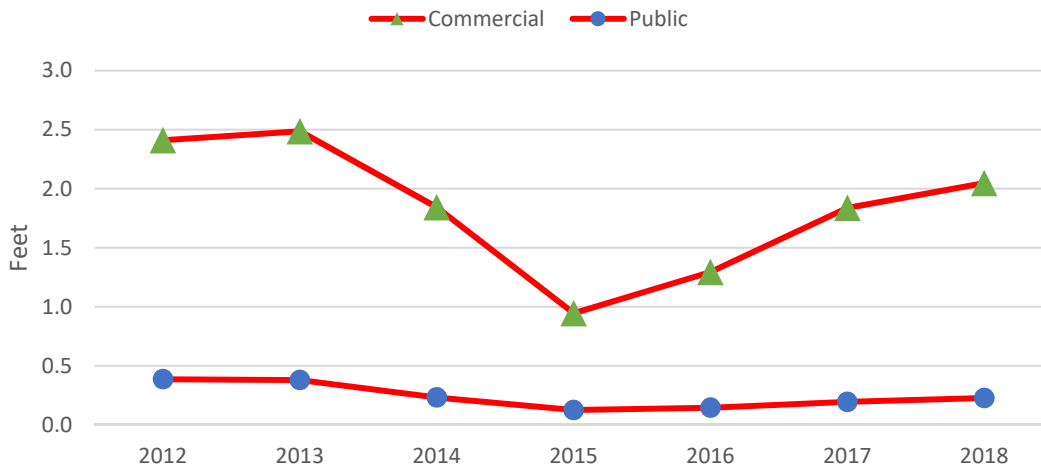
### Frequency of Overwatering



### Irrigation Efficiency Trends

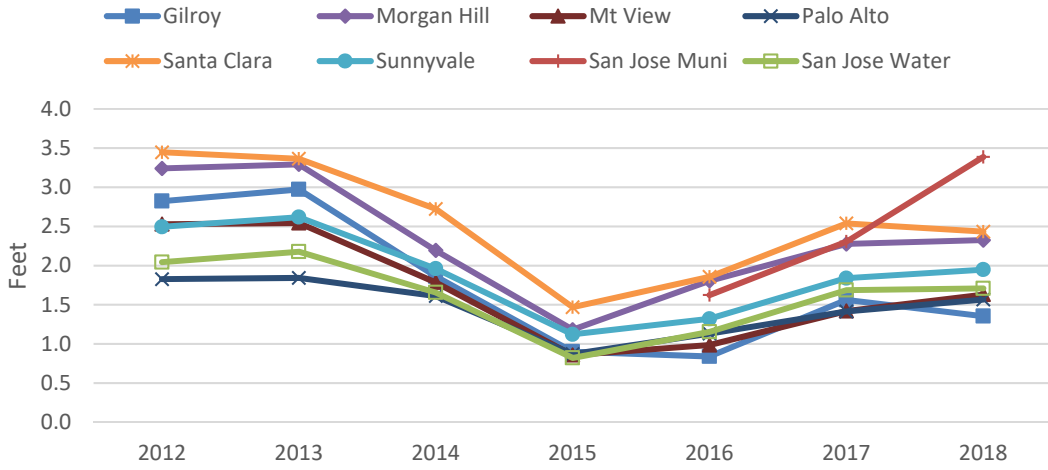
For program sites, commercial sites overwater significantly more than public sites. Overwatering trended lower after 2013, reaching a low point in 2015 during a statewide drought. Overwatering has rebounded since, but 2018 overwatering is still 20% lower than in 2013.

### Average Depth of Overwatering

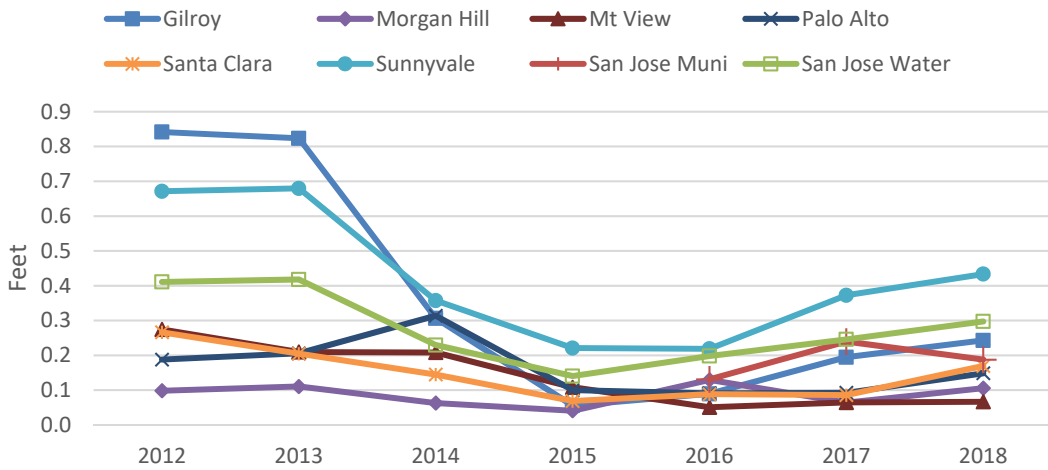


Overwatering has followed a consistent pattern among all retailers over time. San José Municipal System commercial overwatering was uncharacteristically high in 2018; we expect it to go down in 2019 after more time in the program. Gilroy public sites have made the most improvement reducing overwatering since 2013.

### Average Depth of Overwatering: Commercial



### Average Depth of Overwatering: Public



## Exhibit A. Public Site Count and Irrigated Acres by Retailer

Agency	Type*	Site Count	Acres
Gilroy	Park	10	38
	School	7	40
Morgan Hill	School	12	42
Mt View	Park	35	102
	School	5	11
	Other	7	13
Palo Alto	Park	11	63
	School	7	14
	Other	2	1
San José Muni	Park	15	41
	School	17	73
	Other	2	77
San Jose Water	Park	91	284
	School	77	443
	Other	33	249
Santa Clara	Park	6	10
	School	5	15
	Other	9	4
Sunnyvale	Park	31	175
	School	16	53
	Other	2	3
Total		400	1,751

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