

Advanced Water Conservation Strategies at California State University Northridge (CSUN)

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CSUN Quick Facts:

- 1 of 23 CSU's across the state
- Founded in 1958
- 353-acre campus located in the San Fernando Valley, 15 miles from Los Angeles.
- Bachelors and Masters Programs
- Enrolment: 36,123



CSUN's Drought Response

In response to these ongoing drought conditions and answering the call from the state/city, CSUN developed 3 main strategies for permanently reducing water consumption:

- Irrigation Improvements
- Drought Tolerant and Native Re-Landscaping
- Hydrogel Turf Injection

Irrigation Improvement

Project Summary

Irrigation makes up more than 50% of CSUN's water consumption and was a prime area to target for water conservation. The existing irrigation controller system was 20+ years old and did not allow us to operate our irrigation system in the most optimal way.

Goals:

Improve Irrigation Controllers

Leak detection and automatic shut-off

Evapotranspiration (ET)

Zone mapping

Zone level water consumption

Quick Facts:

- 60+ Irrigation Controllers
- 353 acre campus
- In-house grounds shop

Phase 1 (FY16-17)

Due to the significant cost in replacing irrigation controllers at the time (\$500k), we focused on increasing the usability and effectiveness of our existing Rain Master irrigation system.

Mapping

- This involved pairing our irrigation techs up with our in-house GIS tech to map the valves boxes, POC's, and zones. In some cases we mapped heads.

Flow Sensors and Master Valves

- This involved trenching, digging, laying wire and installing these two devices.
- These devices along with the controller enabled Leak detection and automatic shut-off



Phase 2 (FY21-22)

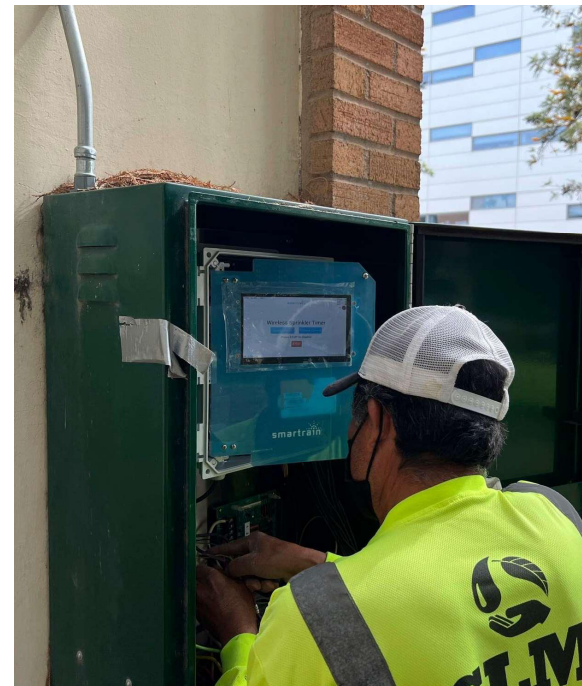
Continual challenges with the existing irrigation system and lack of support due to age forced us to upgrade. We found a solution called SmartRain that was easily retrofitted into existing enclosures.

Installing Controllers

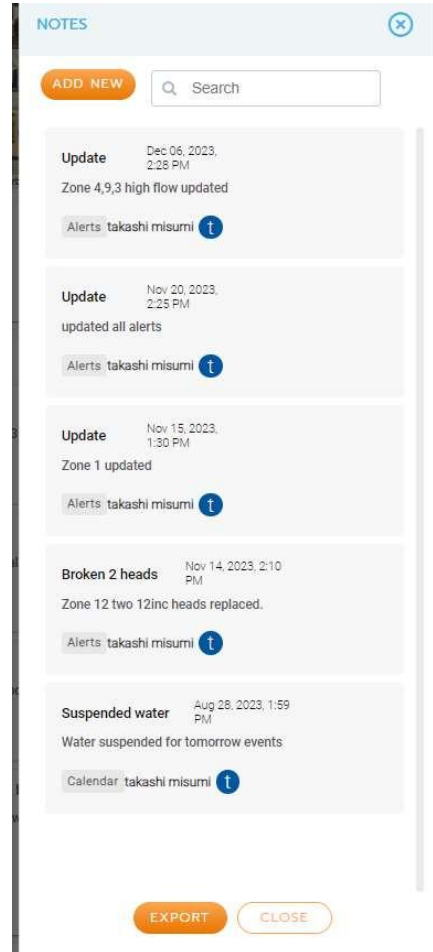
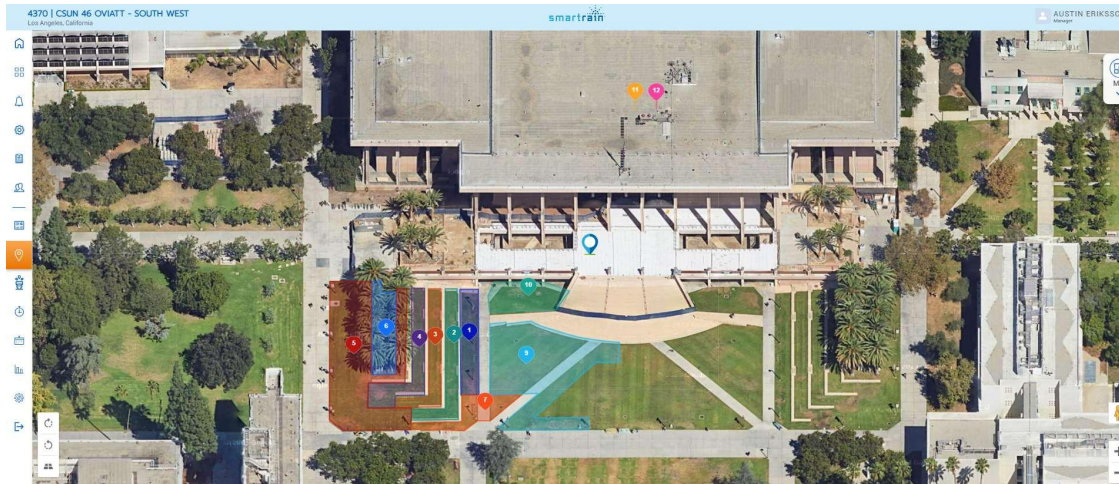
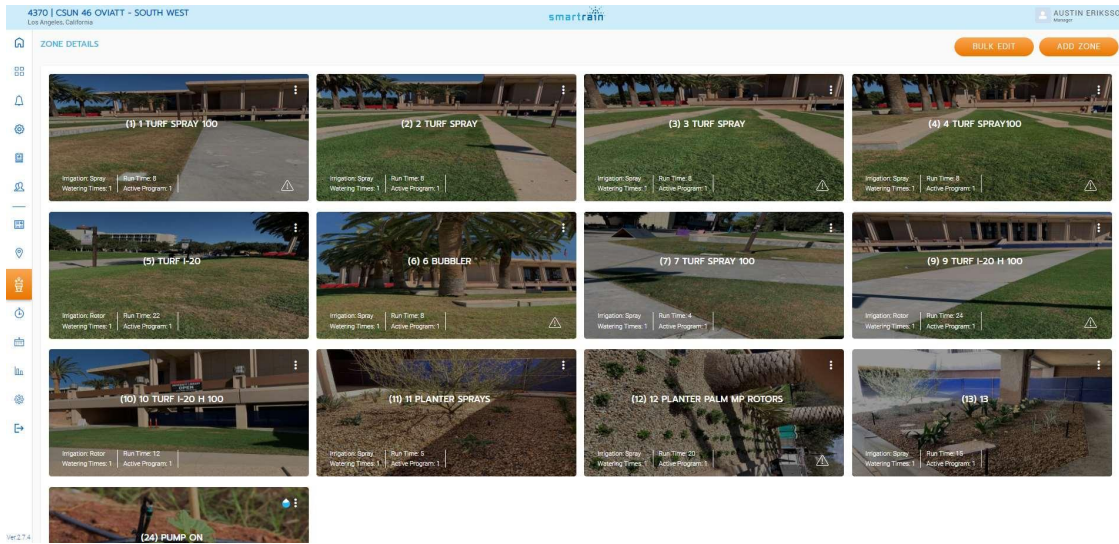
- Utilized contractor to install and took ~3 months
- Able to reuse existing equipment (enclosures, FS, MV) and import existing mapped areas into new system.
- Enabled controller & zone level water consumption info

Evapotranspiration and Programming

- Contractor was responsible for inputting all landscape variables into the system, (plant type, slope, shade, soil, etc.)



System Screen Shots



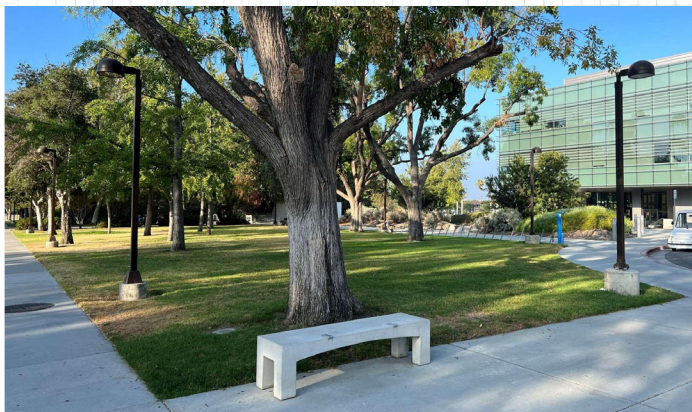
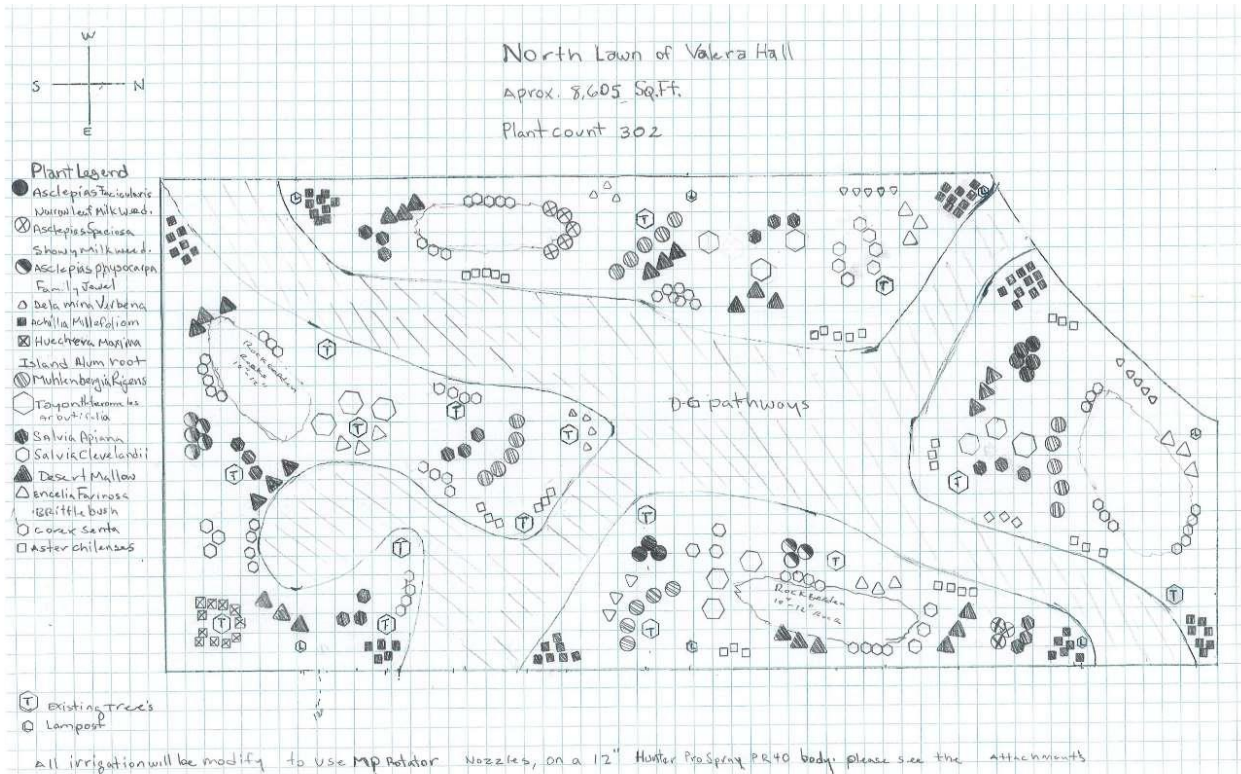
Drought Tolerant Native Relandscaping

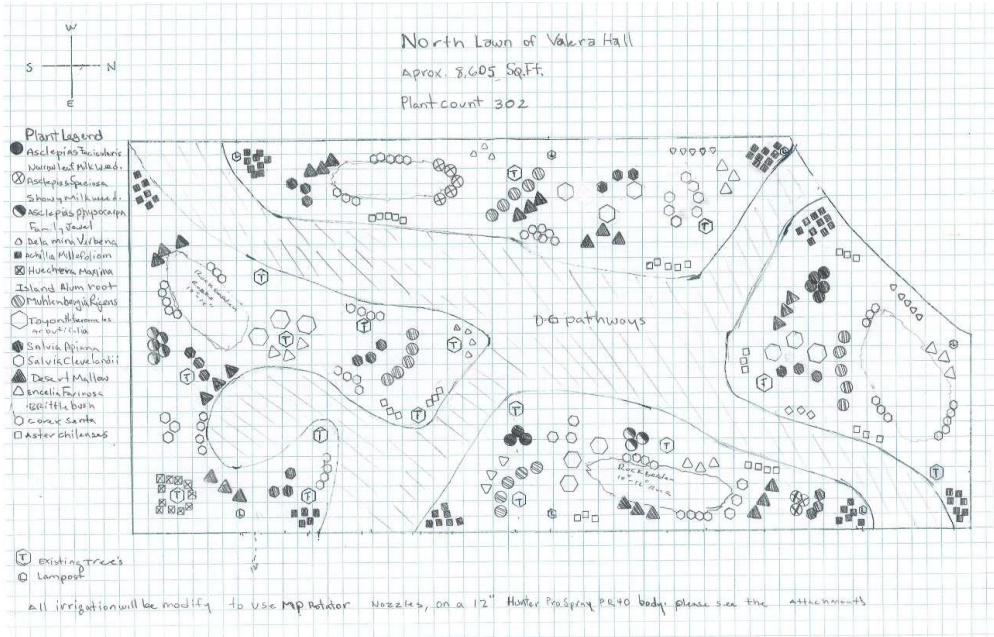
Project Summary

Facing ongoing drought conditions and ever more restrictive irrigation mandates CSUN wanted to reevaluate our landscaping. Over the course of 8 years we have dramatically altered the campus aesthetic for the better by using drought tolerant native landscaping and reduced water consumption significantly. To-date we have renovated nearly 1 million sqft.

Goals:

- Determine landscape use types: Programmatic or Non-programmatic
- Develop plant pallet
- Take advantage of local incentives – reinvest into program
- Renovate as much non-programmatic space as possible
- Bee Campus USA - Expand pollinator habitat across campus







Hydrogel Turf Injection

Project Summary

After identifying what landscapes on campus could not be removed (programmatic) we needed to determine a strategy for these spaces. We piloted a technology called hydrogel on a single field and saw 50-70% reduction in water consumption. We began expanding these efforts to a total of over 600,000 sqft.

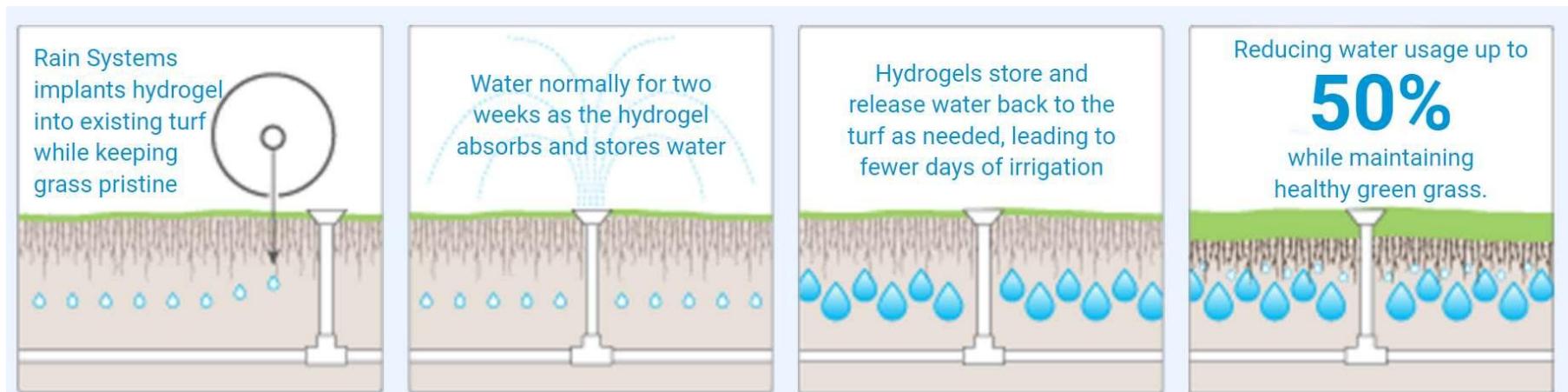
Goals:

- Pilot the technology and track savings
- Determine incentive opportunity
- Expand to as much programmatic space as possible

What are Hydrogels

Hydrogels are three-dimensional polymer network structures able to hold and release large amounts of water. They exist naturally in the form of polymer networks such as collagen or gelatin, or can be made synthetically.

- EPA Tested, Non-Toxic
- Environmentally Safe
- 100% Biodegradable
- Effective for 3-5 years*





Hydrogel Turf Injection

CSUN worked with our local utility, LADWP, on the first hydrogel project in their territory that would be incentivized. This was heavily involved including multiple site visits, additional metering, hosting other local business and schools during the install, data reporting, etc.

Actual results from pilot project:

CSU Northridge Aqua Cents Projects											
Project	Incentive Calculation			Project	Incentive Calculation			Project	Incentive Calculation		
East Field	Area	147,098	sf	North Field	Area	159,242	sf	Sierra/Oviatt Quad	Area	70,224	sf
	LWM Allowance Rate	40	Gal/sf/yr		LWM Allowance Rate	40	Gal/sf/yr		LWM Allowance Rate	40	Gal/sf/yr
	LWM Annual Allowance	5,883,920	Gal/yr		LWM Annual Allowance	6,369,680	Gal/yr		LWM Annual Allowance	2,808,960	Gal/yr
	Savings Rate	69.02%			Savings Rate	45.35%			Savings Rate	49.49%	
	Estimated Savings	<u>4,061,164</u>	Gal/yr		Estimated Savings	<u>2,888,884</u>	Gal/yr		Estimated Savings	<u>1,390,249</u>	Gal/yr
	Incentive	\$14,214.07			Incentive	\$10,111.09			Incentive	\$4,865.87	

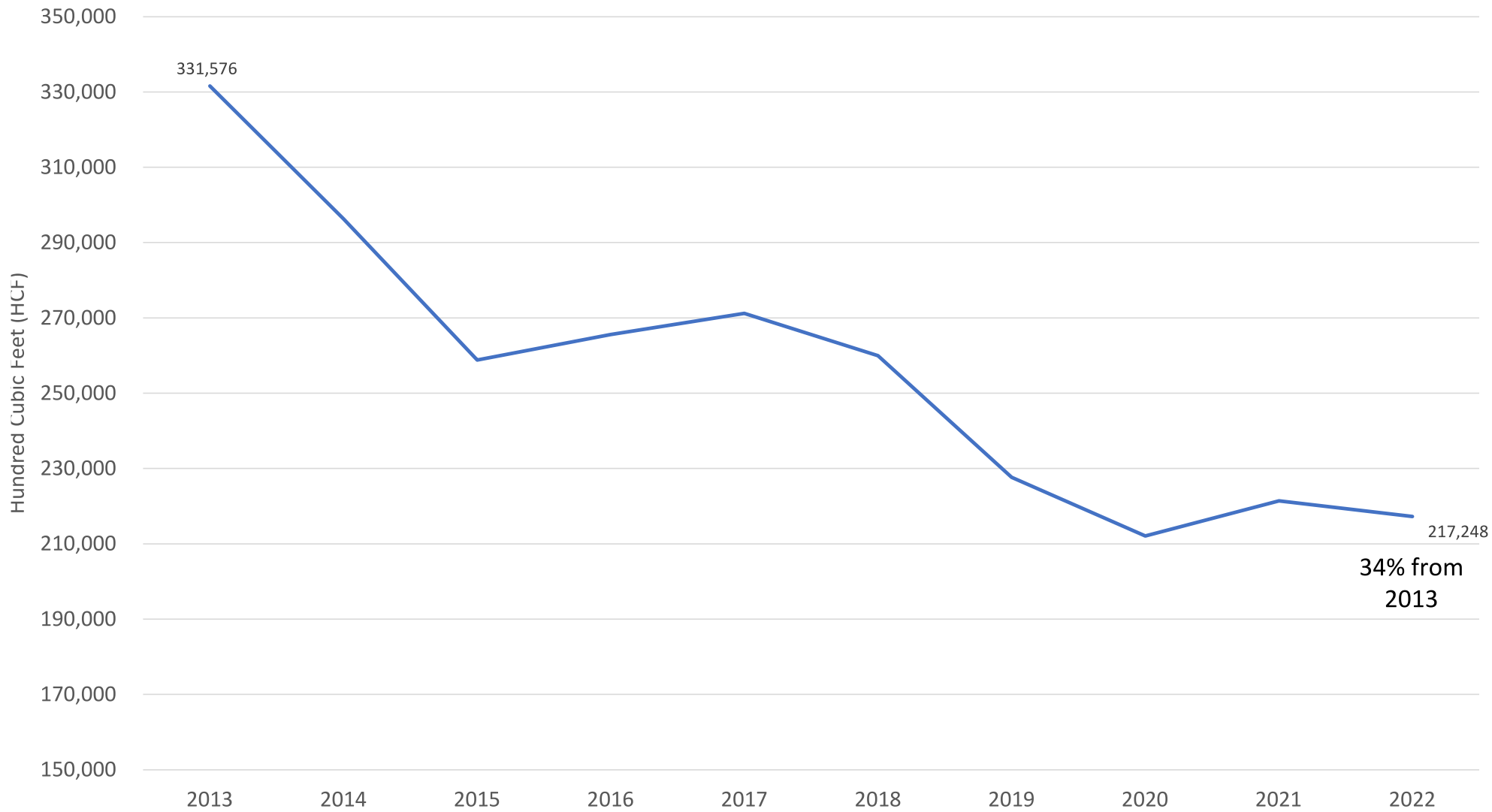
Campus Water Conservation Results

Summary

The campus has been working on water conservation pretty aggressively since 2014/15 and our efforts have continued to show returns. By being intentional about our projects and goals – the outcome was a better looking and more water efficient campus.

- 60+ Irrigation Controllers
- Nearly 1M sqft of Drought Tolerant Landscaping
- Over 600k sqft of Hydrogel Injection
- Majority of campus plumbing fixtures retrofitted – working on the last ~250 this year.

CSUN Total Water Consumption



Questions?

Thank You!

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