

Residential Weather Based Irrigation Controller Fact Sheet: Pilot Study, Phase 2



Project Overview: What and Why

Stanford University has one of the most progressive water efficiency programs in the Bay Area. Throughout the years, the Water Planning & Stewardship (WP&S) team has completed many promising and successful water efficiency projects with different groups on campus.

In 2014, the WP&S team collaborated with OnPoint EcoSystems (OPE) on a pilot study to determine if the WaterSage, Weather Based Irrigation Controller (WBIC) would achieve long term water savings in a residential environment. The WBIC technology proved itself valuable, as pilot study participants in Phase 1 (PSP1) saved 27% in their monthly water use compared to their 2013 consumption. The WP&S team decided to continue their investigation with a different group of Stanford Campus Residential Leaseholder residents in Pilot Study Phase 2 (PSP2). Following on PSP1's conservation goals, PSP2 aimed to have each participant's water consumption decrease by 20% compared to the 2013 baseline.



Photo 1

Photo 1: Installed OPE WaterSage Controller and Hunter Rain-Click Receiver



Photo 2

Photo 2: Installed Hunter Rain-Click Sensor

PSP2 Compared to PSP1

Pilot Study Phase 2 (PSP2) seeks to replicate and improve on Pilot Study Phase 1 (PSP1) results. Just as in PSP1, WP&S staff tracked each participant's monthly water use data as well as collected participant opinions through monthly surveys for PSP2. Based on the feedback received via the PSP1 participant surveys, the WP&S team wanted to use PSP2 to focus on helping new participants program their controllers properly. While the pilot study controller is user friendly and easy for the average individual to set up, the WP&S team discovered that expertly tuned settings would save more water overall. In the new study, the WP&S team with each participant used the post inspection to review the controller settings for each zone. By taking this extra step, the WP&S team was able to help each participant begin PSP2 with the appropriate settings. Additionally, PSP2 had more thorough and consistent monthly surveys and gave participants the option to have check-ins with the WP&S team intermittently throughout the pilot study. Because of this, the WP&S was able to proactively reach out to participants when questions about the controller arose.

This WBIC controller was eligible for a rebate from the Santa Clara Valley Water District (SCVWD). As with PSP1, the WP&S team worked with the SCVWD to provide a joint rebate covering the upgrade from a standard "clock" irrigation controller to the OPE controller and the installation of a rain sensor (provided by Stanford at no cost as part of the Pilot Study). The rebate covered all but \$99 + tax of the controller cost.

What is a Weather Based Irrigation Controller?



Photo 3: OPE WaterSage Controller

The technology prior to WBICs was a standard "clock" irrigation controller. Unless manually changed, a "clock" controller follows the same irrigation schedule and settings regardless of changing weather conditions, making it at times inefficient. WBIC settings automatically adjust to changing weather conditions to more efficiently irrigate landscapes. This newer technology takes into account daily weather patterns, using evapotranspiration (which combines temperature with the amount of sunlight, humidity, and wind) and site characteristics (plant type, slope, soil type, and type of irrigation equipment) to automatically adjust the amount of water applied to meet actual plant needs for each zone.

Since irrigation sessions are frequently modified to meet the plants' daily needs, WBICs are able to keep the landscape healthy while using less water. The greatest amount of water savings from a WBIC compared to a clock controller usually occur in the spring and fall months.



Features of the OnPoint EcoSystems WaterSage Controller

- Lacks monthly fees
- Local weather data
- User friendly
- Achieves water savings

WBICs have been used on campus for many years and new installations have shown water savings of 26% from standard “clock” controllers. The WaterSage WBIC is an easy to use internet-based irrigation controller that allows users to manage their irrigation system from almost anywhere by using a smartphone or computer. Settings can be manually adjusted if needed. The WP&S team chose the WaterSage WBIC for the pilot study because it is user friendly, uses local weather data to update irrigation watering amounts, and does not have any ongoing subscription fees.

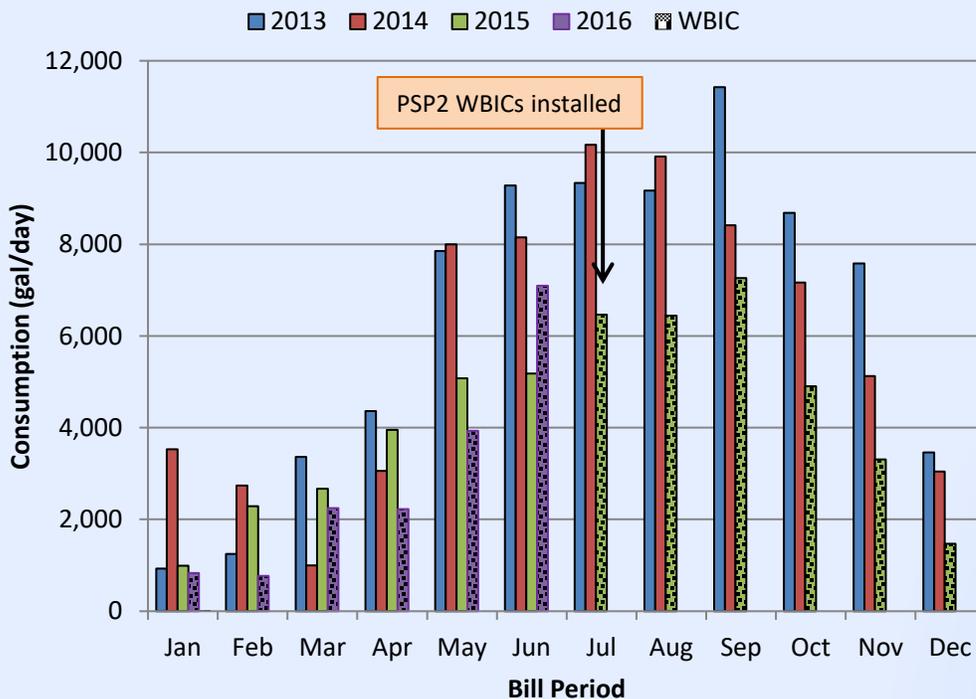
For residents on campus, the controller gathers the previous day’s weather data from Stanford’s weather station and uses it along with landscape site information (input by the user) to automatically calculate how much water each specific watering zone needs each day. Since the sensor uses the prior day’s weather data to calculate watering needs, a rain sensor is installed with each WBIC to shut off the irrigation system if rain is detected.

Phase 2 Survey Results and Participant Feedback

The pilot study’s Phase 2 began in July 2015 and had 6 residential participants, all of whom were asked to complete monthly surveys regarding the controller’s performance (including its ease of use, problems, quality of landscape, and related information). The monthly feedback was a great way for the WP&S team to track participants’ experience with the controller, events that could cause water savings or high use, the amount of time that was being spent fine tuning the settings, and landscape aesthetics through the course of the pilot study. After a couple weeks of use, PSP2 participants were able to identify features on the controller that they wanted to have changed. OPE was flexible and able to incorporate some of the suggestions into their software updates.

Based on the monthly results during the pilot study, most participants strongly agreed that the pilot program was well run and strongly preferred the WBIC over their previous controller. Results showed that the pilot program met their expectations and that throughout the pilot study all participants became more confident with modifying or adjusting the controller’s irrigation settings (when needed). The monthly survey also revealed that participants were more attentive to their irrigation systems and checked them for maintenance purposes each month.

Participants Monthly Water Consumption



Conclusions Drawn

During the unprecedented drought, Stanford University followed the State mandate and limited all domestic irrigation to a maximum of 2 days per week. With the mandate and the WBICs in place, PSP2 participants saw a 38% reduction in water use during the study’s first year (July 2015 - June 2016 compared to the baseline of July 2013 - June 2014). Because of the smart water application algorithms, once the pilot study is over and the 2-day per week watering restriction is lifted, the PSP2 participants are expected to continue to save water.

Have any questions?

Contact the Water Planning & Stewardship team at suwater.stanford.edu/wps