Pilot Testing New Wi-Fi Weather-Based Irrigation Controller Technology at Stanford University

February 2014 – October 2015

Initial Pilot Study Findings

for

Water Conservation College Group

Stanford University Water Efficiency Program

Marty Laporte Jennifer Fitch Thomas Bartleman

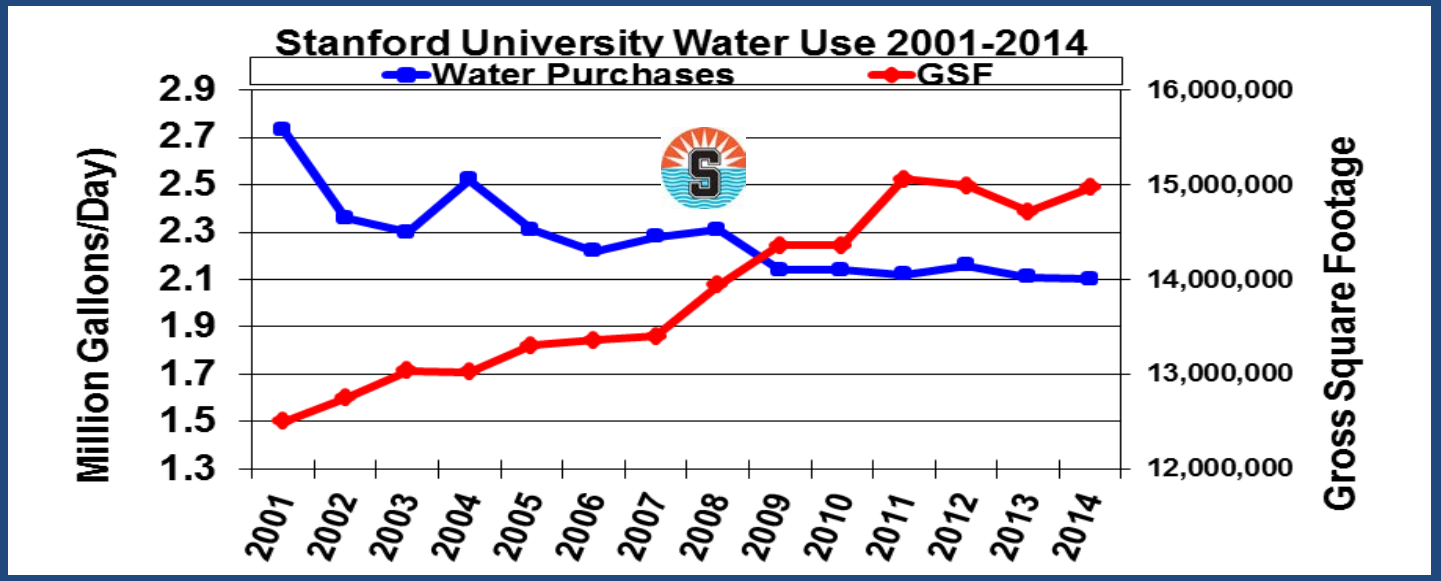
In collaboration with OnPoint EcoSystems and Santa Clara Valley Water District Water Conservation Program

Overview

Goal

Improve efficiency for single family residential landscaping irrigation, especially large lots

- **Why use Wi-Fi weather-based irrigation controller technology?**
- **What are the Pilot Study elements?**
- **Progress Report on Pilot Study – what have we learned and where are we headed?**


Stanford University Water Use 2001-2014
Water Purchases
GSF
Million Gallons/Day)
Gross Square Footage
2.9
2.7
2.5
2.3
2.1
1.9
1.7
1.5
1.3
16,000,000
15,000,000
14,000,000
13,000,000
12,000,000
2001
2002
2003
2004
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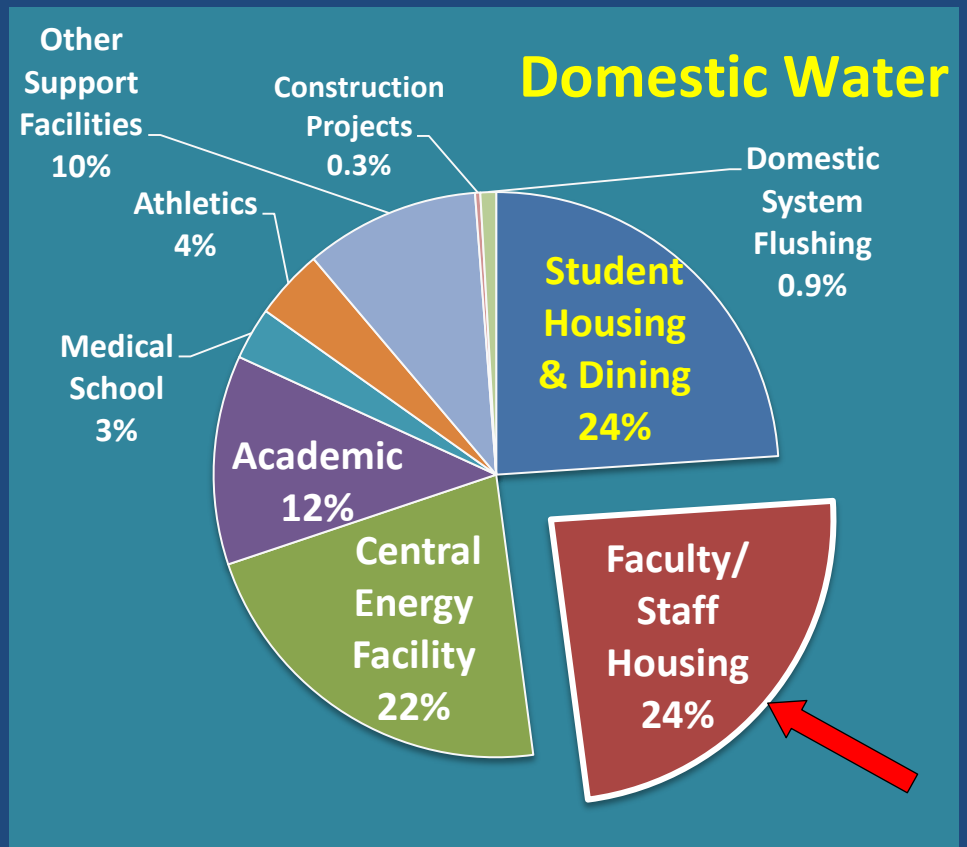
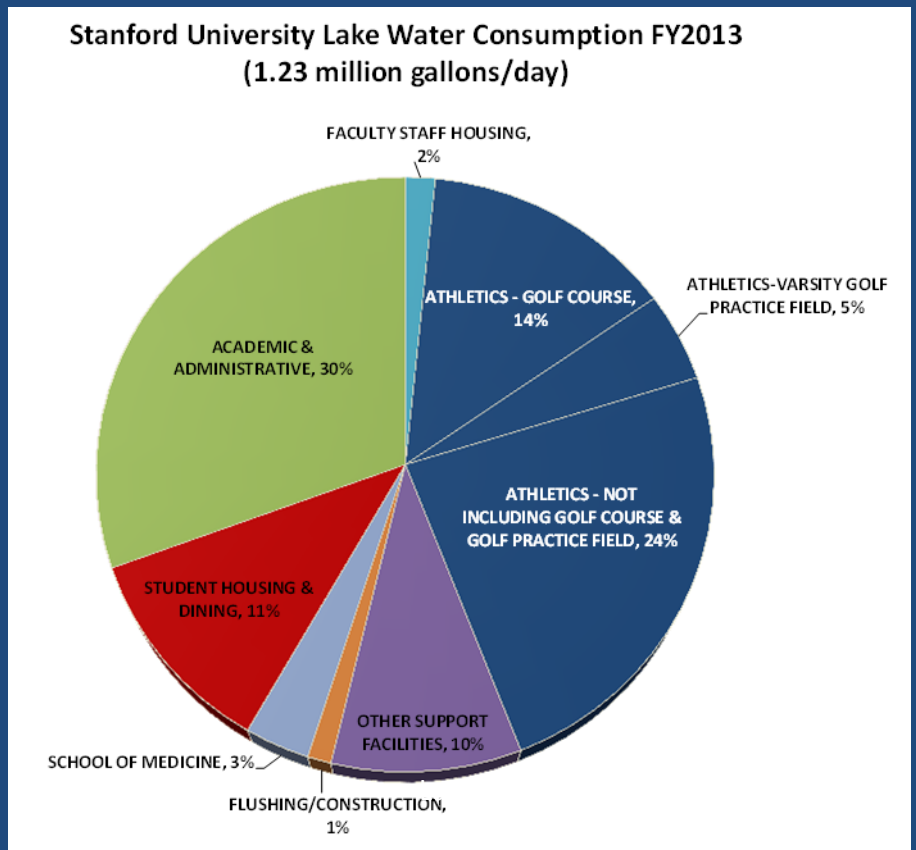
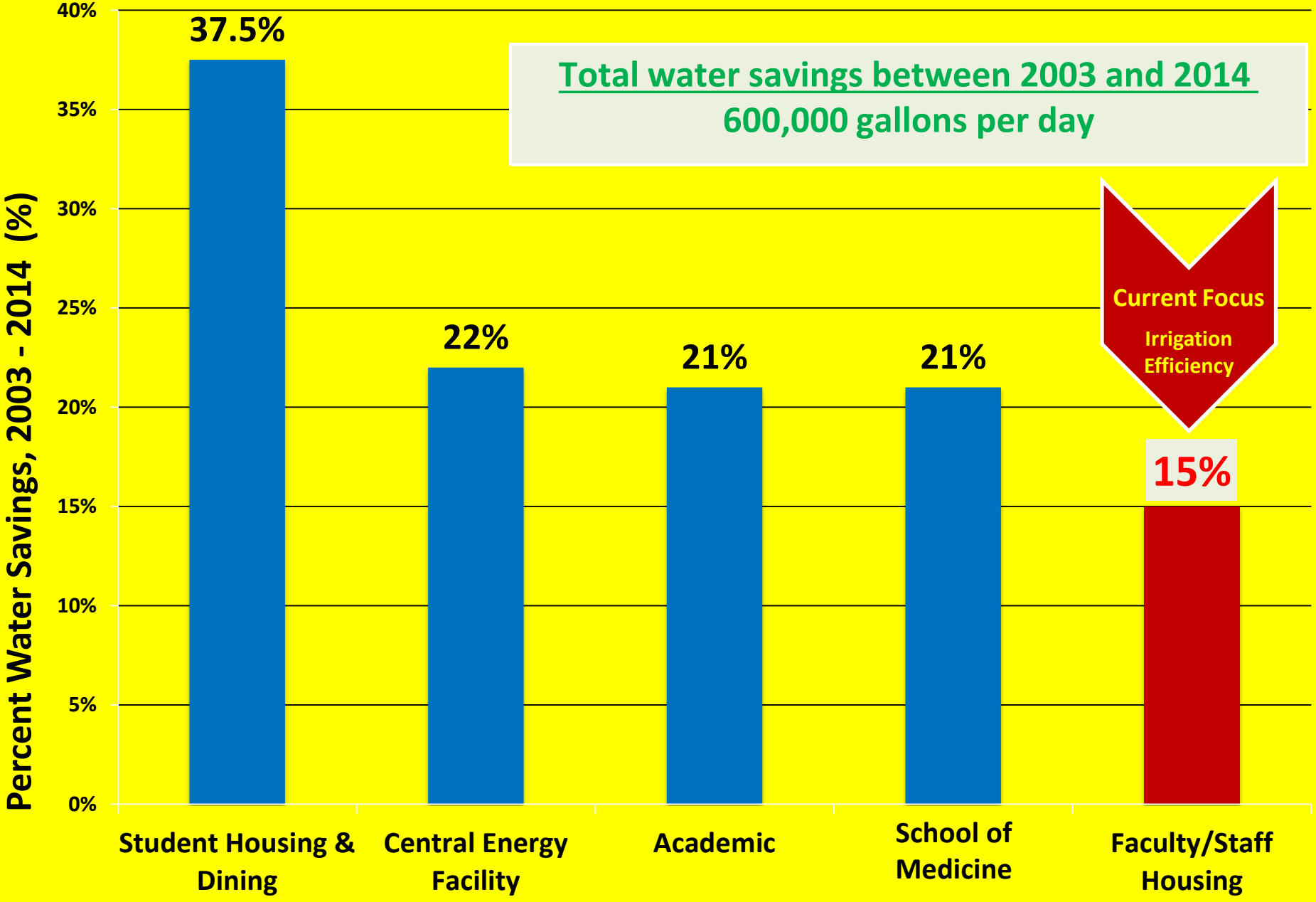
2012
2013
2014


Domestic Water
Other Support Facilities 10%
Construction Projects 0.3%
Domestic System Flushing 0.9%
Athletics 4%
Medical School 3%
Student Housing & Dining 24%
Academic 12%
Central Energy Facility 22%
Faculty/ Staff Housing 24%


Stanford University Lake Water Consumption FY2013
(1.23 million gallons/day)
FACULTY STAFF HOUSING, 2%
ATHLETICS - GOLF COURSE, 14%
ATHLETICS-VARSITY GOLF PRACTICE FIELD, 5%
ACADEMIC & ADMINISTRATIVE, 30%
ATHLETICS - NOT INCLUDING GOLF COURSE & GOLF PRACTICE FIELD, 24%
STUDENT HOUSING & DINING, 11%
OTHER SUPPORT FACILITIES, 10%
SCHOOL OF MEDICINE, 3%
FLUSHING/CONSTRUCTION, 1%

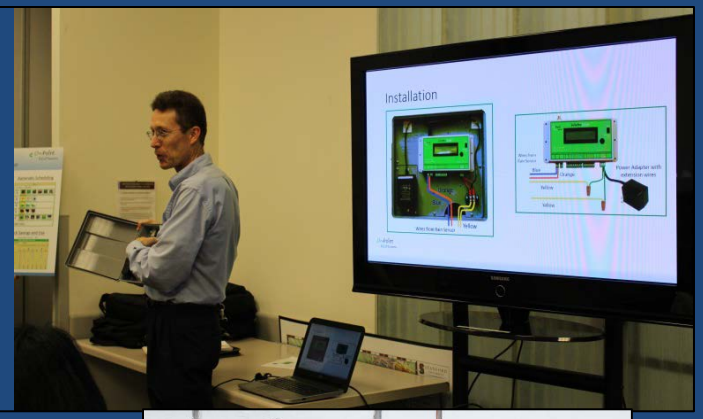
Campus Groups at Stanford with Successful Water Savings between 2003 and 2014 - *Source of data*: Stanford University UMD

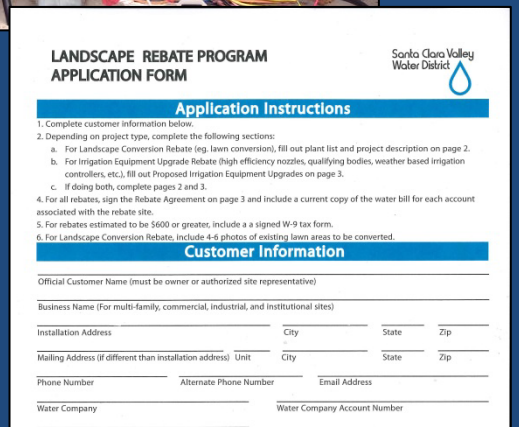


Why use Wi-Fi weather-based irrigation controller technology ?

- Mobile technology – view from anywhere, anytime
- Visual, clear interface
- No monthly or annual fees
- Ease of use … we think…
- Improved potential to SAVE WATER

What are the Pilot Study elements?





LANDSCAPE REBATE PROGRAM
APPLICATION FORM

Santa Clara Valley Water District

Application Instructions

1. Complete customer information below.
2. Depending on project type, complete the following sections:
   a. For Landscape Conversion Rebate (eg. lawn conversion), fill out plant list and project description on page 2.
   b. For Irrigation Equipment Upgrade Rebate (high efficiency nozzles, qualifying bodies, weather based irrigation controllers, etc.), fill out Proposed Irrigation Equipment Upgrades on page 3.
   c. If doing both, complete pages 2 and 3.
4. For all rebates, sign the Rebate Agreement on page 3 and include a current copy of the water bill for each account associated with the rebate site.
5. For rebates estimated to be $600 or greater, include a a signed W-9 tax form.
6. For Landscape Conversion Rebate, include 4-6 photos of existing lawn areas to be converted.

Customer Information

Official Customer Name (must be owner or authorized site representative)

Business Name (For multi-family, commercial, industrial, and institutional sites)

Installation Address | City | State | Zip

Mailing Address (if different than installation address) Unit | City | State | Zip

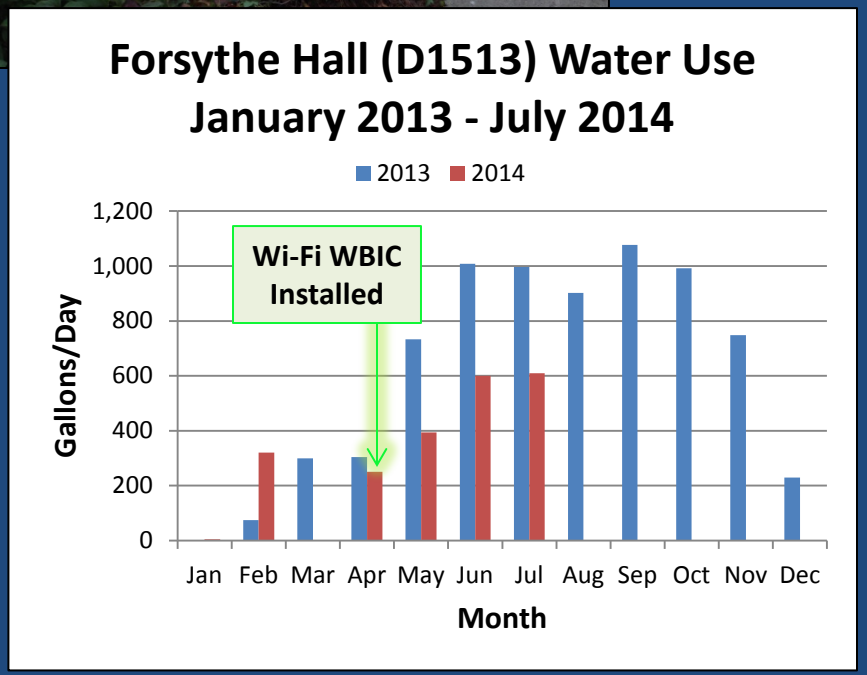
Phone Number | Alternate Phone Number | Email Address

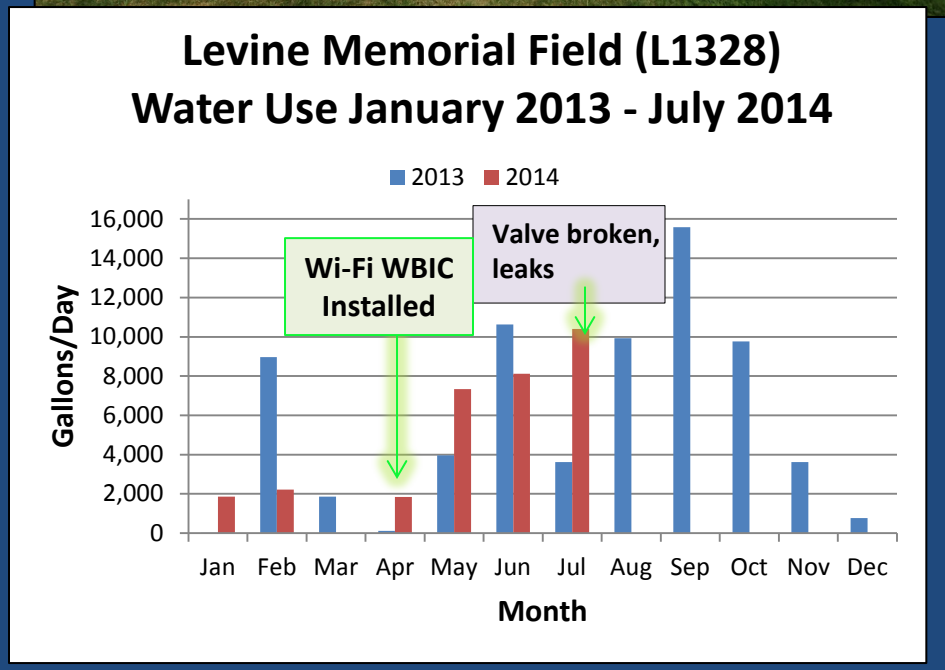
Water Company | Water Company Account Number

- First, tested controller on campus sites
- Selected study group – highest water users
- Working with partners: OPE, SCVWD, Ragno Landscaping
- Process:
  - detailed site audit (conducted >50)
  - sent reports
  - require fix problems
  - require attend training
  - purchase controller, receive rain sensor
  - install, program, start to fine tune
  - require post-installation inspection
  - SCVWD processes rebate
  - continue to fine tune

Main Campus Wi-Fi WBICs

Installed on April 2, 2014





Residential Pilot Study Sites

Selection criteria

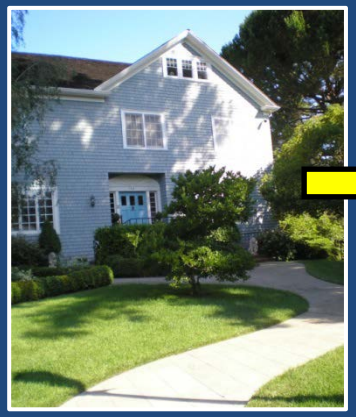
- **>1,000 gpd, main irrigation months: June – Sept 2013**
- **Must have survey completed and fixed required irrigation issues**
- **Must have Wi-Fi at controller location**
- **Must attend training session on WBIC controller**
- **Willing to take time to provide monthly feedback**

Training

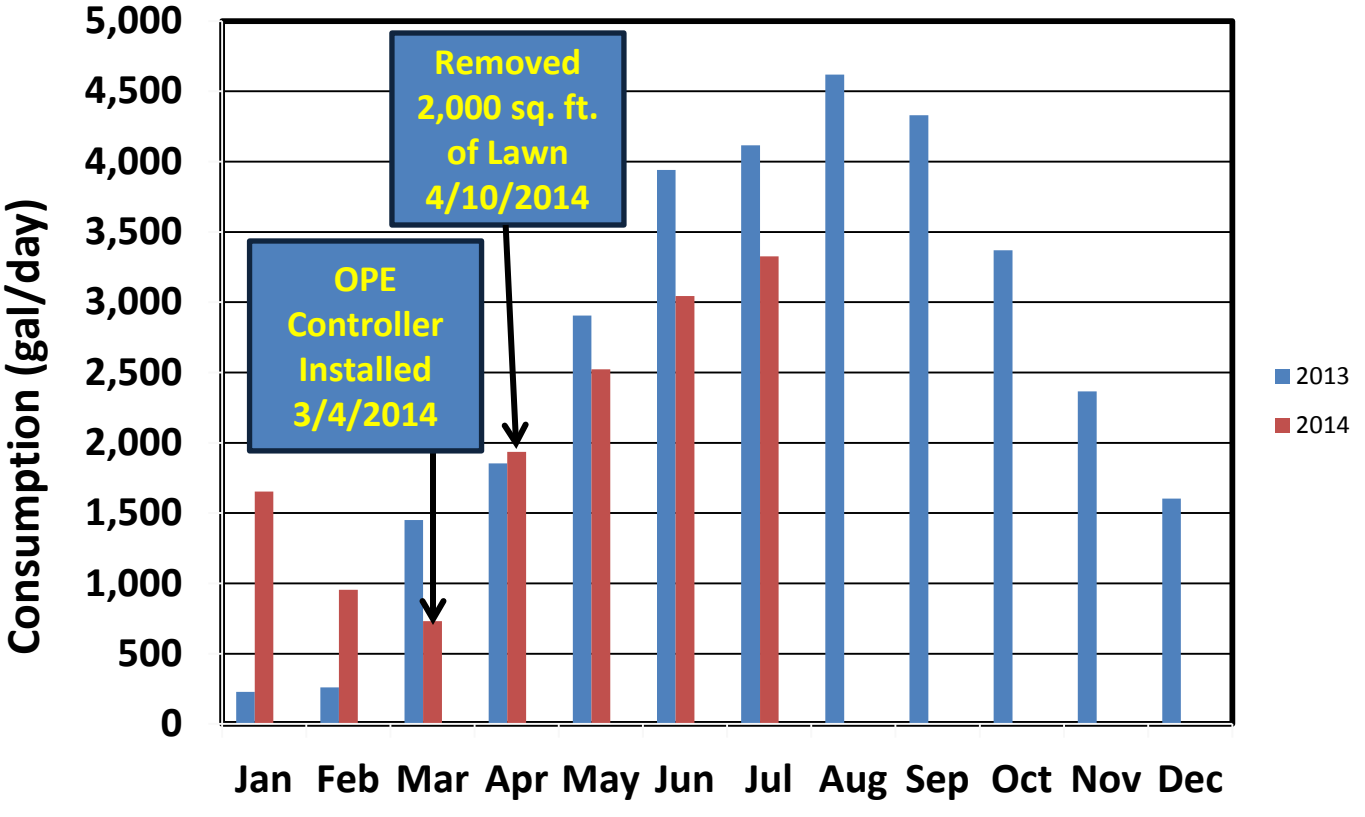
(Maximum participants: 10 people per training)

- Instructional Videos
- Hands-on computer practice (programming)
- SCVWD Rebate Forms/ Assistance
- Participants purchased OPE controllers
- Experienced Landscape Contractor available

OPE Wi-Fi Weather-Based Controller Study Initial Results



Participant #19 Monthly Water Consumption



Stanford University Water Efficiency and SCVWD Program Support

Rebate from SU Water Efficiency Program and SCVWD

- Cost of OPE controllers: small (8-stn) = **$549**, large (16-stn) = **$799**
- Cost of Cover for outdoor controllers: **$50**
- Cost of Hunter rain sensor: **$65**
- SCVWD Water Conservation rebate:

  1-12 stations = **$300**, 13-24 stations = **$1000**, 25+ stations = **$2000**
- Stanford Water Efficiency Program rebate/cost: average of **$300**
- Resident's cost: **$99**/controller (includes "free" rain sensor)

- Annual OPE service fee = $0/controller
- Free OPE software upgrades
- Five year warranty on OPE controllers for Pilot Study
- On line and phone assistance from OPE

What we have learned so far ?

- Participants MUST be willing to fine-tune controller settings
- Extreme value of integrated and strong problem-solving working partnership – SU, OPE, SCVWD, Ragno Landscape
- "Peak" water times are not intuitive for the "non-initiated"
- Cycle and Soak is a new concept for most participants
- Different drip and potted plant options needed
- Don't underestimate the amount of "hand holding" necessary to get started
- Encourage customer involvement (include landscapers/landscape managers in addition to homeowners) - improves Pilot process and controller technology

Summary and Conclusions

- Collaboration is essential; Handholding to the max
  - 1:1 ratio of staff to participants during training session
- Make it easy!!
  - Participants are more likely to follow through if it is easy for them
  - Take advantage of a captive audience – training, purchase & rebate all at once
- Select sites with high potential for savings and engaged users
  - Some participants gave constructive feedback within the first week, a few participants have not yet installed their controllers (after almost 2 months).

Save   

Questions?

Contact: Marty Laporte

MartyL@bonair.stanford.edu

Phone: 650-725-7864

http://lbre.stanford.edu/sem/Environmental_WaterEfficiency