

This presentation premiered at WaterSmart Innovations

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Lessons Learned from Field Monitoring of Customer-led Programming of SMART Irrigation Controllers

Jon Bauer

Water Conservation Representative

East Bay Municipal Utility District

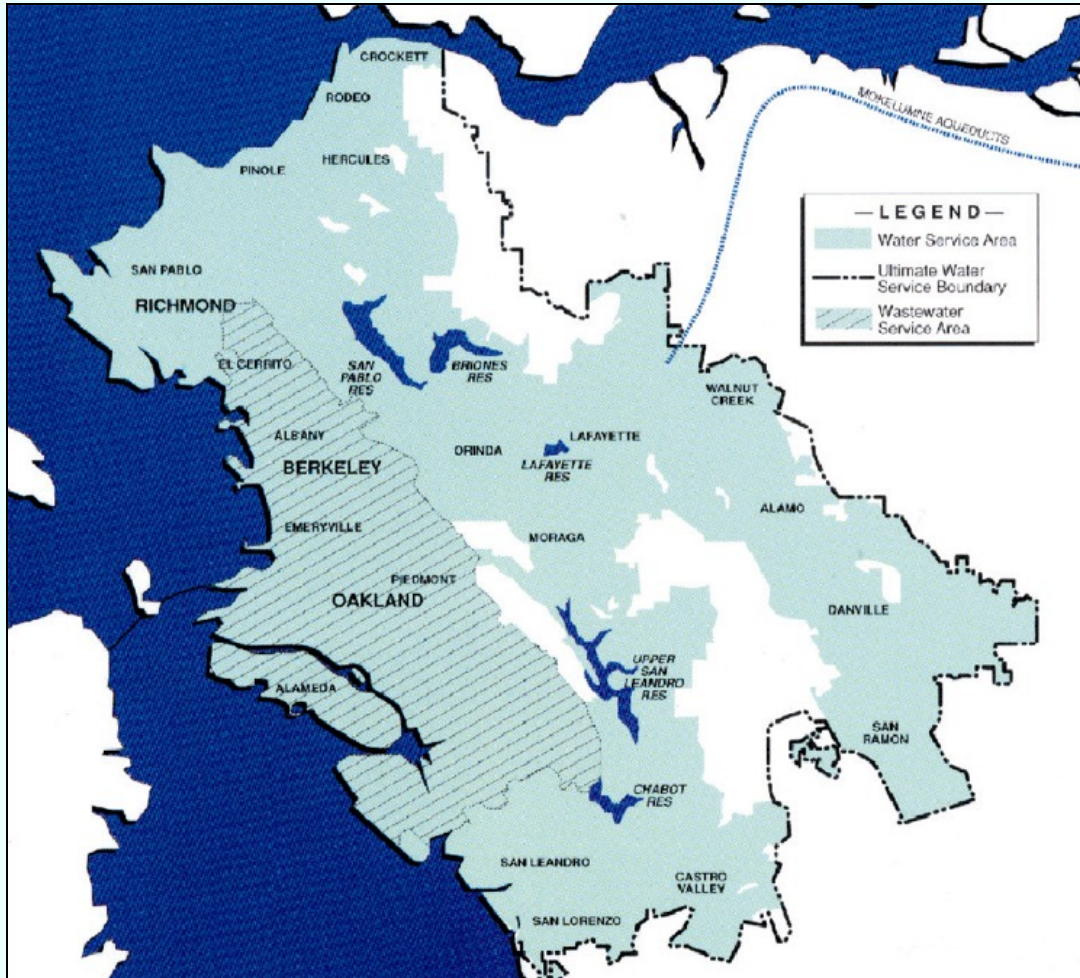
jbauer@ebmud.com



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EBMUD

Water and Wastewater Service Areas



- 💧 1.34 million customers
- 💧 85 % residential
- 💧 ~ 212 mgd demand
- 💧 35 communities
- 💧 Distinct microclimates
- 💧 330 sq.mi service area
- 💧 >4,000 miles of pipe
- 💧 400,000 meters
- 💧 385,000 accounts
- 💧 Mediterranean Climate
 - Dry summers
- 💧 Three climate zones

Presentation Overview

- 💧 Overview of Regional Program and Research Questions
- 💧 EBMUD's First Incentive Program
- 💧 EBMUD's Second Incentive Program
- 💧 Study of Controller Programming
- 💧 Lessons Learned

CA Department of Water Resources Grant-funded program

- 💧 Weather-based irrigation controller incentive program (state-wide)
- 💧 Five Northern California water agencies
- 💧 EBMUD is lead agency for Northern California
- 💧 Self-install only (not direct-install)

Some Questions the DWR Grant asks are...

“How effective are the different programs / intervention methods in gaining the participation of customers?”

“What is the net change attributable to each weather-based irrigation controller and installation method?”

These questions are addressed later today in the panel discussion led by Aquacraft!
Please join us at 3:00 in Sonoma-C.

My Research Question...

*How necessary, and how effective,
is water agency intervention
in the programming and monitoring
of the controllers to achieve successful
water savings and customer satisfaction?*



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Self-Adjusting Irrigation Controller Incentive Programs

Quick Background





Voucher Program (7/06 – 12/07)

Incentive offer based on the account's average IRRIGATION water use over the past three years.

Irrigation Use (gpd)	Max Voucher Amount
750 to 2,999	\$300
3,000 to 5,999	\$600
6,000 and above	\$1,200

Many steps to participation by customer, vendor, landscape contractor, and water agency.

The postcard

	WaterSmart Irrigation Controller Program Installation Complete
I have installed my WaterSmart Irrigation Controller at:	
Installation Address: _____	
Contact Name: _____	
Contact Phone Number: _____	
Email Address: _____	
Date of Installation: _____	
Signature: _____	
 www.ebmud.com 1-866-403-2683	

Greater than 17% of those who used a voucher did not return a postcard.

Rebate Program (1/08 -->)

-  Moved to a fixed rebate amount.

Irrigation Use (gpd)	Rebate Amount
250 to 749	\$100
750 to 2,999	\$250
3,000 to 5,999	\$350
6,000 and above	\$500

-  Rebate is approved *after* inspection.
-  Streamlined the entire application process.



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Controller Programming Study

Background for this study

- The decision-making process
 - Which controller to purchase?
 - Driven by the customer
- The installation process
 - Who installs/programs/monitors the controller?
 - Customer or their representative
- District involvement
 - Minimal until after controller is programmed and operational

Who programmed the controller (program-wide)?

- 💧 47% were customer programmed
- 💧 19% were programmed by the gardener
- 💧 33% were professionally programmed

Sample Size

- Approximately 285 single-family accounts participated
- About 235 sent in postcards
- The rest (50 or 17.5%) proceeded without assistance from the District

The Study group...

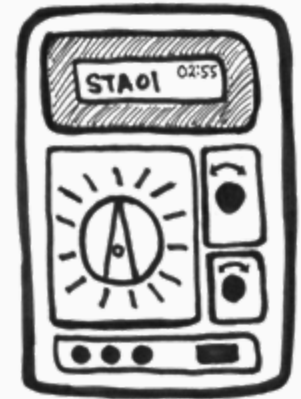
- The other 50 were tracked down by:
 - Reviewing invoices sent in by distributors.
 - Stumbling upon them when doing requested audits.
 - Sending multiple letters indicating we would bill them
- These customers were contacted to schedule an inspection.
- We intended to see how they did with no water agency intervention.
- One year of usage available for forty (40).

Study Group research

- 💧 Was controller installed prior to our contact?
- 💧 Which controller was purchased?
- 💧 Who installed it?

Inspection:

- 💧 How well programmed was it?
- 💧 Were there water savings?
- 💧 How did the landscape look?



Control Group	No Inspection*	Installation 7/06 - 6/07	Installation after Intervention
40 (50)	9	17 good bad	14
Customer		7 (41%) 2 5	9
Gardener		3 (18%) 0 3	2
Contractor		7 (41%) 5 2	3

Correlating the data

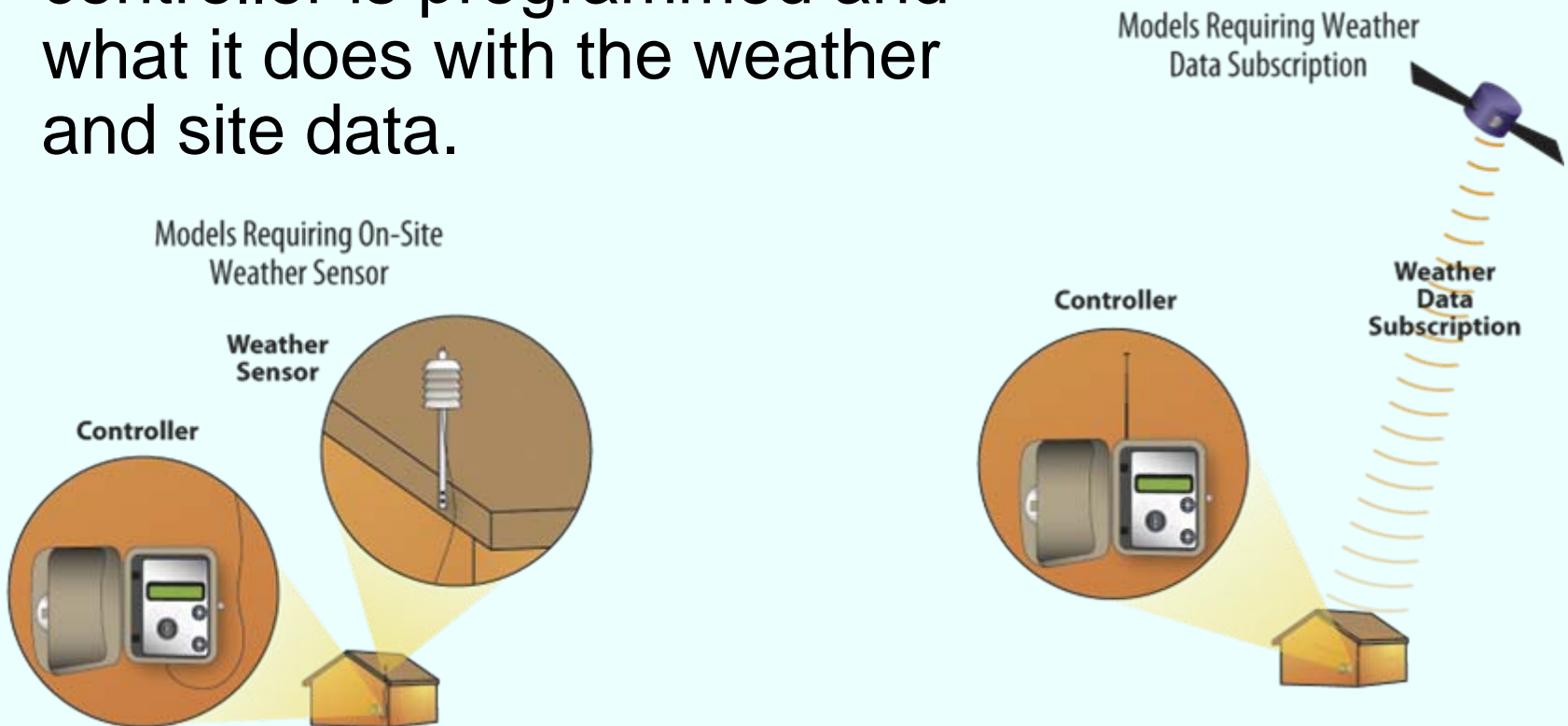
- *Contractors* tended to do the programming well enough, but often did not come back to do 'fine-tuning'.
- *Customers and gardeners* more often did the programming with errors.
- Researcher bias as to what constitutes a 'job well done' could skew the data.
- Relationship to *water consumption...*
- *Controller brand* is possibly a factor...

Brand influence

- Many customers bought one of the simplest models, so that they could understand how to program it.
 - Yet did not use Multiple Programs (A,B,C) to achieve efficiency.
- Many customers have historically irrigated to encourage shallow rooting.
 - Yet, many controllers don't have an adjustment for soil depth or new plantings.

“Weather” to use on-site or off-site weather data?

- ❖ Irrelevant?
- ❖ What matters is how well the controller is programmed and what it does with the weather and site data.



Inspection Findings

- 💧 *Scheduling engines* calculate programming but can be difficult for customers and contractors to manipulate.
- 💧 Customers do not always interact successfully with the products.
- 💧 Meeting with customers after start-up can help correct for the rest.

More Findings

- 💧 Some customers will supplement with manual cycles rather than adjust the programming (controller doesn't learn)
- 💧 Some contractors are less careful about programming than the customers themselves
- 💧 But, as contractors become more familiar with the technology, there has been an increase in competent programming

Lessons Learned

- 💧 Pre-payment of incentive removes some ability to monitor or influence outcomes.
- 💧 Create incentives for contractors to adapt to the technology.
- 💧 Consider direct-install if you want greater control over outcomes.

Future plans

- 💧 Determine if it is still necessary to do inspections at all, or approve rebates based on faith. Compare to labor cost.
- 💧 More in-depth studies of water use normalized for weather and other water conservation measures
- 💧 Direct Install self-adjusting controllers at single family accounts equipped with Automated Meter Reading (AMR) equipment to assist with monitoring.

Final thought...

Smart Controllers *“will not eliminate human interaction in landscape irrigation management.”*

Pittenger et al. 2004. Evaluation of Weather-sensing Landscape Irrigation Controllers. University of California Cooperative Extension. p. 14.



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Jon Bauer
jbauer@ebmud.com
(510) 287-0393

