

Using Smart Controllers to Reduce Urban Runoff in the City of Newport Beach

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Background

The City of Newport Beach is known for miles of beach and a sparkling bay. The cities coastal setting draws at least 8 million visitors per year. For residents, Newport has an ideal year-around climate and sports homes from the beachfront on up through the hills of the Newport Coast where new home prices can start at \$5 million.

Newport Beach, with miles of shoreline, is ground-zero for an all too common problem for the landscape and irrigation industry...urban runoff coming from home and commercial landscapes. Newport is well aware of where polluted runoff is coming from...home landscapes in the Newport beach and bay watersheds. Excess or improperly applied landscape irrigation easily runs off of thousands of landscapes. The runoff carries nitrates, phosphates, herbicides and pesticides directly to water of the bay and beach. The State of California Regional Water Quality Control Board, who acts to enforce the Clean Water Act, is driving Newport Beach and other communities to take action to reduce and eliminate polluted urban runoff.

This image shows continuous runoff coming from a Newport watershed, as much as 20 million gallons per month.



How does a City, who does not control the irrigation on home landscapes, stop the daily flow of polluted runoff?



The first action the City of Newport Beach is taking is to conduct a free smart controller program. The City contacted HydroPoint Data Systems for help. HydroPoint owns the patents and licenses the WeatherTRAK smart controller technology. The City selected this technology because **WeatherTRAK is the only smart controller ever tested by public agencies for water runoff reduction** (www.mwdoc.com), and is the first smart controller to record perfect SWAT scores (100% Adequacy, 0% Excess). The City asked HydroPoint to develop a turn-key program to install smart controllers in high runoff areas of the City.

The keys to the development of a successful program to reduce urban runoff were the following:

- Use a smart controller that has proven runoff abilities
 - Published public agency studies
 - Published runoff study (www.mwdoc.com)
 - Automated scheduling engine (*soil type, plant type, exposure, precipitation rate, slope settings*) that calculates the efficient **minutes, days, cycles and soak time** for each irrigation station (*no user schedule or guessing of irrigation run times*)
- Provide the City with a full turn-key program (no additional City time or staff needed) that included:
 - Grant writing
 - Program design
 - Contractor/installer training
 - Marketing
 - Scheduling installations
 - Report and paperwork administration
- Provide customer service for the city/agency
 - Train and/or respond to customer needs
 - Field customer follow-up calls

- Select and manage trained landscape contractor(s) for installations
- Provide residents with sources for quality irrigation system upgrades
 - Find, train and monitor landscape contractors with knowledge of smart controller technology, new sprinkler technologies, expertise in retrofitting

The Program

Funding for the runoff reduction program came from existing City funds for water quality efforts. The City expanded the program through a grant to match City funds. The funding covered the cost of the smart controller, installation, irrigation system audit and two years of real-time daily ET data broadcasted to the controllers. The City was therefore able to offer a “free” smart controller for 650 homes. As an added bonus to the City, regional rebates for smart controllers “reimbursed” the City approximately ½ the total cost of the program.

Outreach to customers focused on the high water runoff areas in the city. With newspaper articles, direct letters, city signage, and local cable TV reports. Residents quickly called the “runoff hotline” 800# set up to screen and schedule customers wanting the “free” smart controller offer.

Images from the Field:

Installing contractor meeting homeowner, filling out paperwork and educating the customer on the process.



Installing contractor conducting an irrigation system audit.



Typical observations of irrigation systems at Newport Beach homes



Program Details:

The process of installing smart controllers into homes in Newport Beach revealed both the major difficulties and the major opportunities for the landscape and irrigation industry. Program details include:

Total controllers installed - 640

Average time – 1.2 hours (including ET service activation, irrigation audit, paperwork, customer education w/ 2 person crew)

Average # stations – 9

Average # installations per day – 5

Average water savings per home – 37% (first 3 months compared to previous year)

Monitored runoff reduction – 20%+

Homes denied for installation – 5% (due to extremely poor irrigation systems)

Wait list of residents wanting to participate (after program funds ran out) - 177

Irrigation System Findings:

- 31% of all homes had at least 1 leak in the irrigation system
- 89% of homes had “easy to see” inefficiencies
 - Overspray
 - Blocked heads (by plants)
 - Clogged heads
 - Mis-matched heads (24% of homes had rotors and spray heads mixed on the same station)
- 55% of all homes had high pressure
- All home contracted gardeners needed smart controller training/education

Landscape Irrigation Industry Opportunity:

- 89% of the homes required some level of irrigation system fixes and/or upgrades
- 25% of program participants asked for referrals for irrigation specialists
- Others needing irrigation assistance suggested they would use their current gardeners

Opportunity #1: Finding Irrigation System Inefficiencies

It was clear that even in relatively new, high-end homes irrigation systems are inefficient across the board. All of the irrigation “**auditing**” was performed from a “**visual inspection**” by simply turning each station on for 2 minutes. **Every landscaper, gardener and/or homeowner could have discovered every irrigation system problem found by the installing team.** It is clear that irrigation system “**maintenance**” is simply not being performed, even in an area where the water costs are high (\$2.05/ccf).

Opportunity #2: Finding Irrigation System Inefficiencies

The installation process for the WeatherTRAK smart controller technology (Toro, Irritrol and HydroPoint models) **requires** that every station be turned on, site characteristics noted (for inserting into the controllers’ scheduling engine) including soil type, plant type, root depth, sun/shade, slope, and sprinkler type (precip rate). At the same time any irrigation system problems are identified and noted for the homeowner. This **process** enabled irrigation system inefficiencies to be “**discovered**”. (Note: In contrast, weather based controllers without a scheduling engine, receiving a basic “user schedule” would not have “discovered” any irrigation system problems.) The process of turning on stations and using a critical eye toward the irrigation system was only being done at these homes due to the City-initiated program. While runoff and high water bills (and some site damages) were occurring due to poor irrigation systems and over-watering, no effort was being made by residents and/or landscapers to keep systems efficient.

Opportunity #3: Turning Irrigation System Findings into Business

When irrigation system inefficiencies were found and shown to homeowners, the owners wanted to pay for those fixes to be made. For the landscape contractors referred as

irrigation system “experts” by the City program, irrigation retrofit business increased by more than 50% with one contractor increasing revenues by 300%.

Opportunity #4: Using WeatherTRAK to Reveal More Irrigation System Opportunity

With the installation of a smart controller that calculates an efficient schedule for the site conditions, water is likely to be turned down. If there is low irrigation uniformity (less than 70%) it will show-up in the landscape as “hot spots” within weeks. (Note: With controllers that require installers to insert a starting schedule, irrigation uniformity weaknesses are not likely to be revealed. Why? Each landscape will be over-watered up to the point of “**no hot spots**” that masks irrigation system uniformity. With the WeatherTRAK technology over-watering typically does not occur and this reveals more irrigation system weaknesses.) This process and technology revealed significant irrigation system uniformity problems, in both home and in large homeowner association landscapes in the city.

An example of The City program/WeatherTRAK technology driving new irrigation system retrofit business was at least 5 HOA’s retrofit approximately 200 acres of landscape with new sprinkler nozzle technology to increase uniformity. The HOA’s were willing to spend money to (1) reduce water bills, (2) reduce runoff and (3) use improved technology to protect their community landscapes.

Opportunity #5: Making Existing Landscapes Water Efficient to Avoid Water Restrictions

The Newport Beach program found that the 1st 100 homes retrofit with smart controllers saved 458,000 gallons in the first comparison billing period.

One HOA, who first retrofit with smart controllers and then retrofit for irrigation system uniformity, saved 1.3 million gallons in the first comparison billing period.

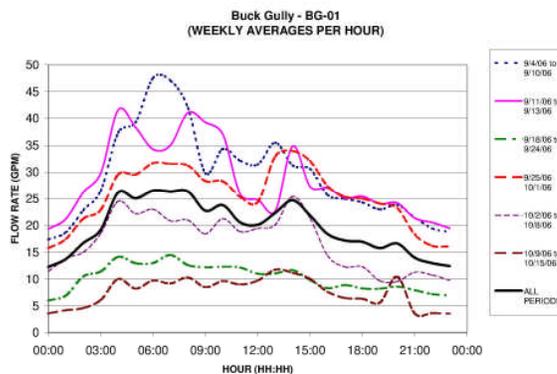
By making every landscape water efficient, the landscape and irrigation industry certainly increase business opportunity. As well, making every landscape water efficient helps reduce the need for local water restrictions to be implemented by the water provider. In this case, making landscapes more water efficient is reducing polluted urban runoff. This helps the City of Newport and water use customers avoid potential **water quality fines** that can be imposed by regulatory agencies.

Conclusions from the City of Newport Beach Smart Controller Runoff Reduction Program:

- Cities may need outside landscape and irrigation experts to design and conduct water efficiency programs
- Finding qualified and committed landscape contractors to (1) install smart controllers, (2) evaluate irrigation systems and (3) become referrals was more difficult than expected
- Significant water is being wasted in home landscapes due to general over-watering and inefficient irrigation systems

- Home gardeners did not have the expertise to find and fix irrigation system problems
- Home gardeners did not find or fix leaks with any consistency
- Installing smart controllers revealed irrigation system inefficiencies
- Educating and training was imperative for the home gardeners
- Education and training was imperative for homeowners
- Significant runoff can be reduced with proven smart controllers and irrigation system repairs
- Significant business opportunity exist for the landscape and irrigation industry in finding irrigation system problems, offering expert irrigation system repairs and installing smart controllers

Runoff Reduction Monitoring Example



Post-script:

The City of Newport Beach is developing a series of ordinances designed to reduce/eliminate non point source water pollution. Those ordinances could include:

- *Tiered water budget rate structure based on the local ET*
- *Business license and/or certification for gardeners and contractors*
- *Tickets or fines for water runoff coming from the property*
- *Any remodel or new home is required to have a certified smart controller*
- *Rogers Gardens, the #1 Nursery in the US has retrofit their retail site with the WeatherTRAK smart controller and MP Rotator nozzles to eliminate runoff and be a local example for water efficiency. The City is funding a runoff display at the Rogers retail site.*

