

2011 Innovative Conservation Program

Final Project Report



Bureau of Reclamation Agreement R08AP35247
Metropolitan Water District of Southern California
December 2015

Summary

In 2008, the Metropolitan Water District of Southern California (Metropolitan) signed an agreement (08FG350247) with the United States Bureau of Reclamation (Reclamation) for the Innovative Conservation Program (ICP) for \$228,000. This agreement was amended several times in the subsequent years, including change of agreement number to the current R08AP35247 and increase of Reclamation funds to \$248,000. The ICP provided grant funding to explore the water and energy savings potential and practicality of innovative water conservation technologies. Through this agreement, seven (7) research projects were completed totaling almost \$384,500 of combined funding from Metropolitan and Reclamation. Some of the funding provided through this agreement was also used to fund projects on the subsequent 2013 ICP. Each project submitted a Final Report that includes information on project design and accomplishments including water and energy efficiency/savings.

Background

The Metropolitan Water District of Southern California (Metropolitan) released the Innovative Conservation Program (ICP) Request for Proposals (RFP) in 2011. Metropolitan staff marketed the RFP directly to the Metropolitan's 26 member agencies that cover a total of 5,200 square miles that includes six counties in southern California. In addition, Metropolitan promoted the RFP through professional associations such as WateReuse. Proposals were evaluated through a two-step competitive process. Metropolitan held a public pre-proposal workshop in April 2011 and received 78 short-form proposals. In June 2011, 47 full proposals were received for further consideration. A five-member selection committee evaluated all full proposals and recommended eight projects for award.

Metropolitan staff worked with each of the recipients to ensure that progress reports were delivered on time. One of the main obstacles was matching the research plan with deliverables. Frequently, researchers have higher expectations on their projects that can be accomplished on a fixed timeframe as established by a grant such as the ICP. Metropolitan staff worked with the ICP recipients to refine and adjust the deliverables when necessary. Although many of the funded projects received positive feedback from the water conservation community, none of them were considered for the Metropolitan Program Advisory Committee (PAC). This was due to mismatched timing of projects completion and current interest of the PAC members.

Water savings obtained through the research projects are estimates on the potential should the projects be implemented in large scale. For example, the project from UCLA Water Technology Research Center estimates that at capacity, their graywater treatment system could treat up to 560 gallons/day. However, the pilot study only treated at most 32 gallons/day, which is what was generated as graywater in the single family house where the system had been installed. The system has a potential water savings of 140 gallons/capita/day for a 4-person household working with a system at full capacity. This water could then become available for other potable uses. Also, the project from Generation Water did identify irrigation inefficiencies but did not quantify the savings from repairs. The project from Rancho Santa Ana Botanic Garden did provide water conservation education for hundreds of people.

Project Summaries and Highlights

Below is a summary of each of the eight awarded projects. Metropolitan has also posted these reports on the <http://bewaterwise.com/icp.html> website.

Grant Recipient:	Municipal Water District of Orange County
Project Title:	Large Landscape Return on Investment Education Program
Project Description:	Develop a return on investment calculator, educational materials and workshops designed to transform traditional turf intensive landscapes to California Friendly landscapes targeting landscape maintenance contractors, commercial and residential property managers, and property owners including homeowners associations, cities and counties.
Award/Invoiced:	\$56,000/\$47,747
Project Results:	Project was completed under budget. While quantification of water savings from ROI participants was limited, study estimated water savings of up to 39% for properties that convert turf-based landscapes to drought-tolerant landscapes.

Grant Recipient:	Generation Water
Project Title:	School Irrigation Optimization
Project Description:	Improve school irrigation by developing tools to rapidly audit and repair school irrigation systems.
Award/Invoiced:	\$50,000/\$14,625
Project Results:	This project completed 40 landscape audits, but was unable to complete retrofitting the sites and completion of an investment grade water audit toll as originally proposed. Instead an additional 27 landscape audits as well as electronic records for 130 sites were provided as part of the First Amendment. Water savings estimates from repairing deficiencies identified in the landscape audits were not quantified.

Grant Recipient:	Rancho Santa Ana Botanic Garden
Project Title:	Plant Selector App & Supporting Web Services
Project Description:	Develop a mobile application for smart phones and tablets on water-conserving plants that enables the user to make informed decisions on climate appropriate plants for home landscape.
Award/Invoiced:	\$36,000/\$36,000
Project Results:	This project developed the PlantQuest application to help the public evaluate and select climate appropriate plants for landscapes; held 9 workshops training over 125 people; and conducted two surveys to evaluate the effectiveness of the PlantQuest application and quantify water savings. While quantification of water savings from survey participants was incomplete, the study estimated water savings of up to 75 gallons a day per household for properties that convert turf-based landscapes to drought-tolerant landscapes.

Grant Recipient:	ReWater Systems
Project Title:	Legal Greywater Irrigation
Project Description:	Measures greywater, by seasonal use, on landscapes for existing, legally-permitted systems and identify the amount of fresh water use it off-sets.
Award/Invoiced:	\$32,000/\$32,000
Project Results:	This study found that such systems reuse water mainly depending on the number of people in the building producing greywater and the amount of landscape available for reuse. At commercial properties, there was always more greywater available than landscape to use it. Use of drip irrigation, required for greywater irrigation uses water 25% more efficiently than typical irrigation sprinklers.

Grant Recipient:	Cucamonga Valley Water District
Project Title:	AMI Data Consumer Web Presentation Project
Project Description:	Evaluate advanced metering infrastructure (AMI) that combines real time, interval data measurement with continuously available remote communications to capture detailed water usage readings and time-based information for customers/consumers in an effort to educate, conserve and better manage water use and reduce water loss.
Award/Invoiced:	\$50,000/\$0
Project Results:	Project was terminated after experienced significant unexpected delays in development of the web portal necessary for customers to obtain real-time water use data to and evaluate water savings. Proponent plans to continue pursuing project internally and reapply in the future when software issues are resolved.

Grant Recipient:	UCLA Water Technology Research Center
Project Title:	Pilot Evaluation of Compact and Modular System for Point-of-Use Graywater Treatment
Project Description:	Evaluate a compact, modular system for low-cost, low-energy treatment of residential greywater based on a recently developed modular recirculating, vertical flow constructed wetland concept providing secondary treatment of the water (biodegradation and nanofiltration), with the ability to easily upgrade to tertiary treatment (ultrafiltration and UV disinfection).
Award/Invoiced:	\$36,000/\$36,000
Project Results:	The final report described the innovative modular graywater treatment system and estimated water savings capacity of up to 560 gallon a day.

Grant Recipient:	Cyber-Rain, Inc.
Project Title:	Maximizing Landscape Water Efficiency In Commercial Settings
Project Description:	Evaluate web-based WBIC with remote access, failure alerts and expanded reporting. Incorporates local water rate structure and dollar savings, also compares pilot irrigation activity to historical water use.
Award/Invoiced:	\$25,000/\$22,000
Project Results:	This study shows that for the 10 properties with 18 months of data, it was observed savings from 25% to 53% of the watering times.

Grant Recipient:	Alliance for Water Efficiency
Project Title:	Demand Elasticity and Revenue Stability Project
Project Description:	Analyze the impact on demand elasticity during droughts to optimize urban area water shortage contingency plans to provide drought policy resilience.
Award:	\$35,000/\$35,000
Project Results:	Project concluded that water conservation, inclining tiered rates, cost of water and sewer, and plumbing codes and standards have significantly influenced long-term water use trends and that long-term economic cycles such as recession appear to have minor influence on per-capita water use in the last two decades.

WATER CONSERVATION FIELD SERVICES PROGRAM PROJECT BENEFITS

Please check the appropriate water management benefits for agricultural or urban measures that you anticipate addressing in your proposal. Where available, please provide an estimate of the benefit to units (i.e. Acre Feet, Dollars, Percentages)

It is essential to establish benefits of the Program. Please help us with your best estimate.

Reduces Leaks and Seepage	_____	Acre Feet/Year
Reduces System Spills	_____	Acre Feet/Year
Makes More Water Available	_____	Acre Feet/Year
Reduces Operation Costs	_____	\$ /Year
Reduces Energy Costs	_____	\$ /Year
Reduces Waste Treatment Costs	_____	\$ /Year
Improves Crop Yield	_____	Percent/Year
Reduces On-Farm Costs	_____	\$ /Year
Reduces Per Capita Use	__140__	Gallons/Capita/Day
Provides Technical Training	_____	# of People
Provides Water Conservation Education	__100s__	# of People
Improves Water Supply Reliability	_____	Frequency (Years)*
* Estimate of how often the improvement will occur (i.e. 1 = each year)		
Delays Construction of New Supplies	_____	Years
Reduces Drainage/Erosion	_____	Tons
Improves Water Quality	_____	% reduction of _____
Enhances Aquatic/Riparian Habitat	_____	Years