

PROPOSAL PAPER

Independent Technical Panel on Demand Management Measures Final Report on California Landscape Water Use 12-11-15 Draft

Section #: 10 *(From the current draft outline)*

Section Title: Research and Documentation Needs and Support *(From the current draft outline)*

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Background:

California is currently experiencing its fourth year of a statewide drought and has resulted in the Governor issuing and extending an Executive Order that requires specific water conservation goals for each city in the state. In addition, among a number of the Governor's directives in the Executive Order required the Department of Water Resources to review and provide updates to the Model Water Efficient Landscape Ordinance (MWELo) and California Building Standards.

In January 2010, MWELo was enacted into law and one of the requirements was to reduce the Evapotranspiration Adjustment Factor (ETAF) from 0.8 to 0.7 for a new landscape over 2,500 square feet, which would result in a 12.5% reduction in the required water budget. To date, there has been no study with data to confirm the impact of the ETAF reduction. In December 2015, the ETAF will be decreased another 21.4%, again resulting in significantly less water allowable water for a "new" landscape water budget.

Given the pending reduction in ETAF along with the "newly" revised MWELo statute, there will be a significant shift in how California landscapes will be designed, implemented and maintained in the future. The fourth year of this unprecedented drought has elevated the need to conserve landscape water, since landscapes are irrigated with approximately 55% of urban water. Therefore, the need to identify and implement best management landscape practices to conserve landscape water is currently paramount importance. Thus far, there has been minimal science-based research in California (as defined by the *No Child Left Behind Act* of 2001; [see footnote](#)) to support which landscape water conservation best management practices will result in significant and institutionalized water savings. In addition, there is currently no mechanism in the state to provide annual funding for conservation research nor is there a state agency program to provide ongoing research oversight. The need for a landscape water conservation research program is critical to manage irrigation more efficiently and to educate the public on selecting and planting low water use plants. Current landscape water conservation research occurs on an "opportunistic" basis. That is, when there is a drought crisis that triggers a state mandate or if there is money available through a state water bond. In times of drought, it is challenging to capitalize on these opportunities without dedicated program staff and resources at the state agency level, such as Department of Water Resources.

With adversity (aka the drought), comes opportunity for creating and implementing a landscape water conservation research program. An example of a state agency research program is the Public Interest Energy Research (PIER) program under the California Energy Commission. This program provides annual funding for energy research and has in place a public goods charge as the funding source. While the public goods charge topic will certainly be a controversial topic, it is time for agencies, academia,

industry, and NGO's to invest in and provide leadership for a sustainable landscape water conservation research program for California.

In the last 5 years, there has not been funding by state agencies to adequately support quantitative water conservation research, including landscape related research needs. The need for California to provide funding for research is now critical to understand where investments by the state through statewide rebates are best prioritized and also have research adaptable to benefiting individual water utilities and other interested researchers and planners.

Recommendation Purpose Statement:

The Independent Technical Panel (ITP) recommends that the Department of Water Resources (DWR) collaborates with the California Urban Water Conservation Council (CUWCC) and University of California (UC) to convene stakeholder meeting(s) to identify the priority needs for research that will result in short-, medium- and long-term conservation water savings. The CUWCC currently has a research and evaluation and landscape committees that may assist in this effort. This effort could be a follow-on effort of the process used to develop the CUWCC's Market Transformation Framework for Sustainable Landscapes. It is envisioned that UC researchers would have a central role in facilitating the dialogue among stakeholders.

Prior to convening meeting(s), the Department of Water Resources or other organization will conduct a science-based literature review for identifying research conducted on best management practices for water conservation, with a key emphasis for landscape, and a synopsis of what specific research has resulted in significant landscape water conservation through best management implementation. The outcome of this research could become a part of the CUWCC's new Water Conservation Wiki and also shared and leveraged by Department of Water Resources.

Recommendation:

The ITP recommends to State Legislature that it directs the Department of Water Resources to convene a stakeholder meeting(s) to identify priority research needs that will result in water conservation. Furthermore, the ITP recommends that research money is identified for funding priority science-based research. Research projects will need to multi-year and will need to demonstrate impact of research findings with empirical data and statistical analysis.

Research topics to be considered by the stakeholder group should be from and not limited to the Alliance for Water Efficiency, California Urban Water Conservation Council, UC researchers and California landscape industry professionals. A sample list of key topics for research areas include:

Potential Topics:

1. Irrigation Technology
2. Social/Behavioral Modification (incentives)
3. Documentation
4. Programs (training and education)
5. Landscape Design (plants and hardscape)
6. Soil Technology
7. Irrigation Management

8. Gray & Treated Water

Below is a more detailed list of ideas to be discussed by the stakeholder(s) and/or committee(s) with an emphasis on landscape water conservation programs:

- Standard methods for measuring, monitoring and verifying water savings.
- Cost/benefit of conservation programs, including:
 - native & low water use, and xeriscape landscapes versus traditional turf landscapes.
 - landscape conversions (i.e., turf to low water use plant material)
 - rebate programs (turf, nozzle, smart controllers, etc.)
 - smart controllers (weather-based, soil moisture)
 - artificial turf (cost/benefit, environmental impact).
 - functioning irrigation systems (systems with matched heads, proper spacing, proper pressure, and unclogged heads)
- Native plant research, best management practices for irrigation type, establishment, maintenance)
- Water requirements and drought tolerance of landscape turfs and plants to induce dormancy
- Cost/benefit of turf dyes (environmental impact, etc.)
- Impact of landscape contractor, landscape architecture, irrigation auditors (QWEL, IA, CLCA) training, education, and certification.
- Impact of improving system efficiency through audits, tune-ups, sprinkler-head retrofits, and other measures.
- Protocol for turf conversion to low water use landscapes
- Development of a standard irrigation controller for residential landscapes to facilitate consumer education on how to program irrigation controllers.
- Smart pressure regulating systems for delivering consistent water pressure to residential landscape irrigation systems and for sensing irrigation leaks.
- Micro-climate evapotranspiration measurement for residential/urban landscapes.
- Development of smartphone application that will provide specific irrigation scheduling for a specific location, landscape and irrigation system.
- Research to analyze behavior modification methods for adopting landscape water conservation

The federal perspective on scientifically based research

The No Child Left Behind (NCLB) Act of 2001 encourages and, in some cases such as Reading First, requires the use of instruction based on scientific research. The emphasis on scientifically based research supports the consistent use of instructional methods that have been proven effective. To meet the NCLB definition of "scientifically based," research must:

- *employ systematic, empirical methods that draw on observation or experiment;*
- *involve rigorous data analyses that are adequate to test the stated hypotheses and justify the general conclusions;*
- *rely on measurements or observational methods that provide valid data across evaluators and observers, and across multiple measurements and observations; and*
- *be accepted by a peer-reviewed journal or approved by a panel of independent experts through a comparatively rigorous, objective, and scientific review.*