

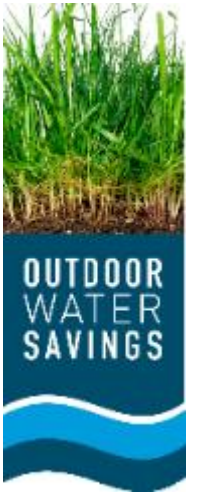


Galveston Bay Foundation youth volunteers planting shore grasses through the Foundation-funded Get Hip to Habitat program.

Galveston Bay Foundation youth volunteers planting shore grasses through the Foundation-funded Get Hip to Habitat program.



AWE Outdoor Water Savings Research Initiative




AWE: A Voice for Water Efficiency

- Our mission is to promote an efficient and sustainable water future
- 450+ member organizations in 200 watersheds delivering water to 50 million water users
- A unique network and forum for collaboration around research, policy, information sharing, education, and stakeholder engagement



Our 2030 Sustainable Water Vision

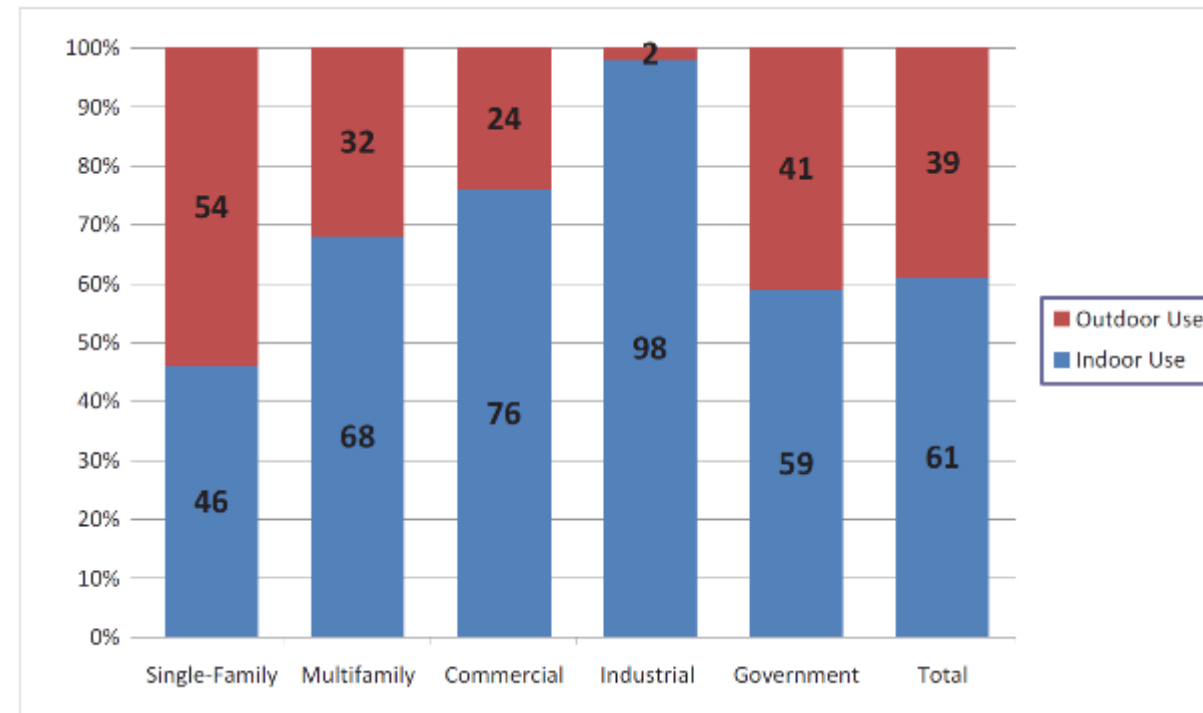
Efficiency First	Homeowners and businesses are smart water users, empowered by awareness of the value of water, real-time information, and technologies that help them save indoors and outdoors.
Water-Smart Federal, State/Provincial, and Local Policies	Governments adopt and implement policies to use limited water supplies more sustainably.
Sustainable Water Rates and Fiscally Healthy Utilities	Price signals inform customers of the value of water, and financially resilient utilities can provide reliable, safe, and affordable water service today and into the future.
Right-sized, Water-tight, and Intelligent Systems	Utility systems are built to the right capacity, proactively managed to reduce water loss, and equipped with the latest technologies to ensure safe water quality and to leverage data for efficiency.
Integrated, Systems-based Approach	Water efficiency is addressed in the context of a broader, systems-based perspective.



“A main conservation priority has to be reducing outdoor water use, which remains poorly understood, largely unregulated, and ripe for innovation and improvement at the consumer, landscape contractor and designer levels.”

Why is Outdoor Water Use Important?

- Large use of water
- Key driver of peak season water use which determines the size of water systems
- Heavy demand on water supplies when they may already be stressed by hot/dry weather
- Complex and variable compared to indoor water use (behavior, weather, lot size, plant type)
- Difficult to plan conservation programs and predict savings



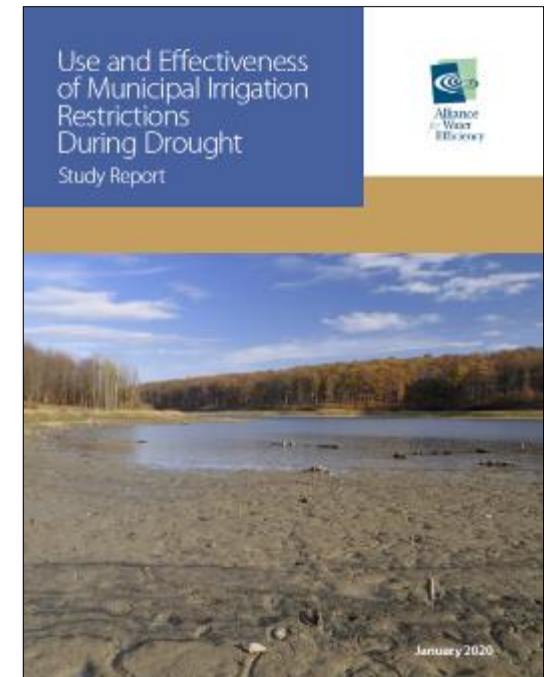
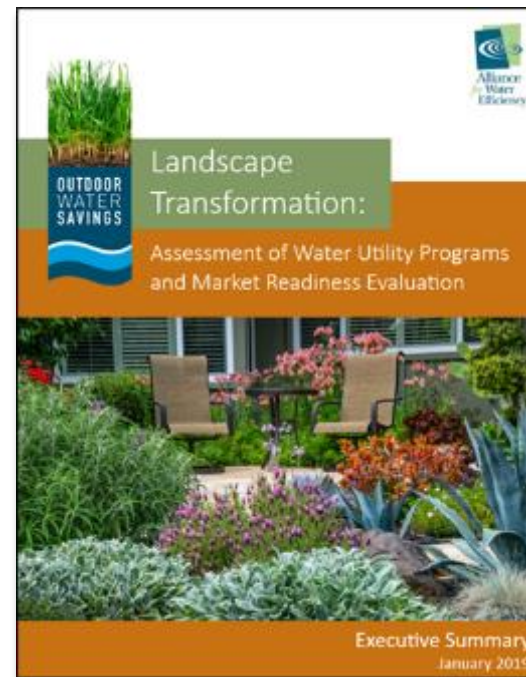
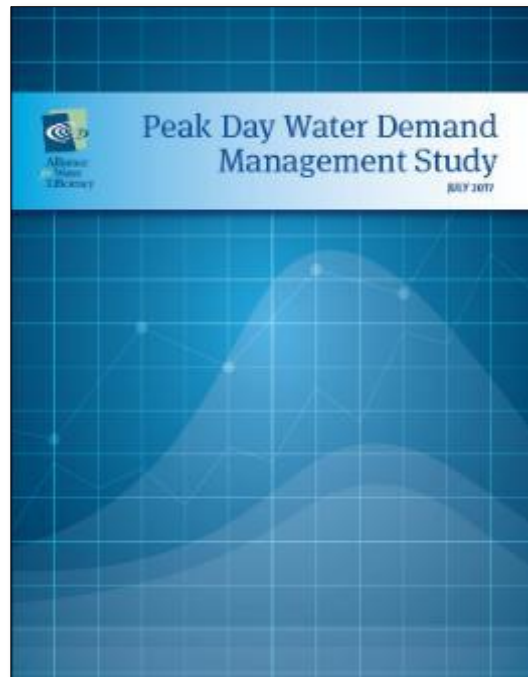
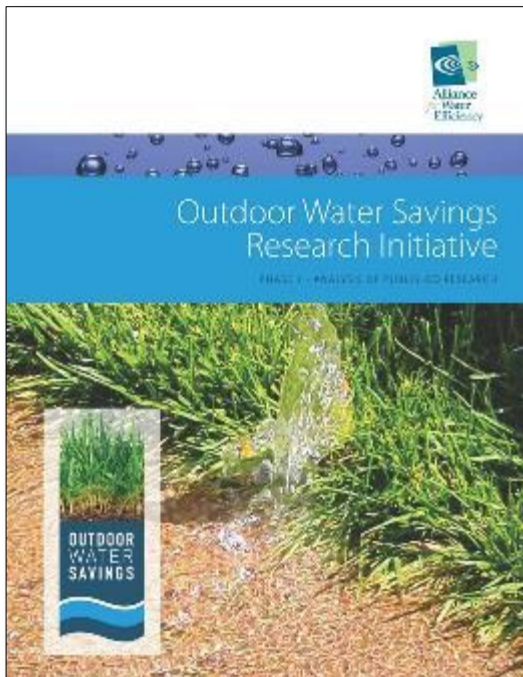
Outdoor Water Savings Studies

Phase 1

- Analyzed Published Research (2015)

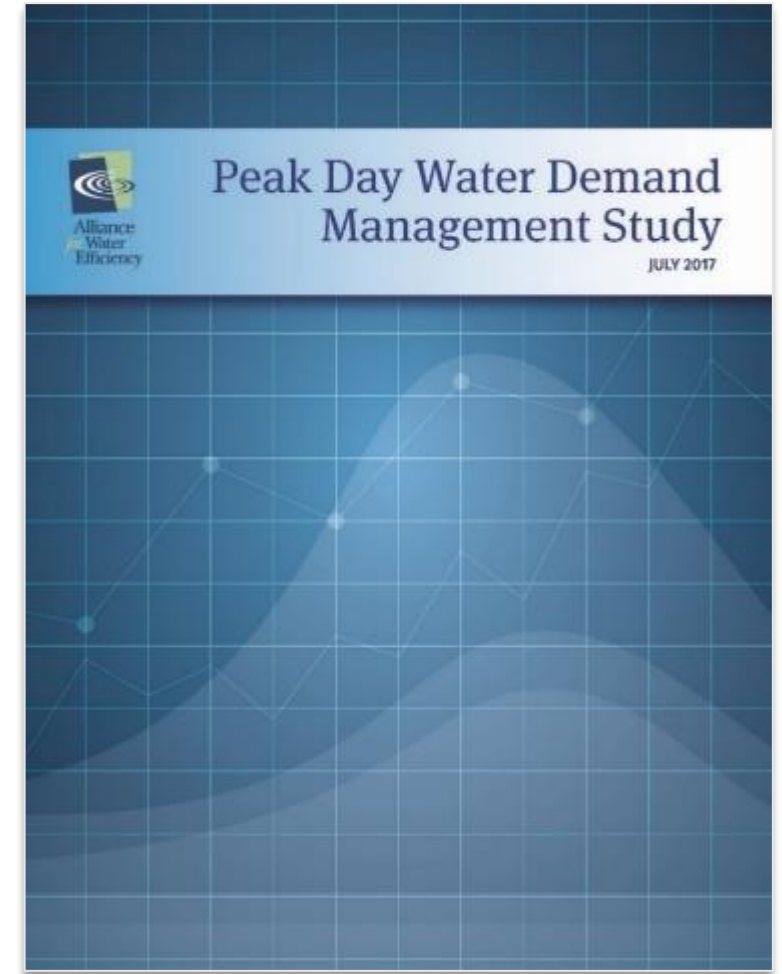
Phase 2

- Peak Day Water Demand Management (2017)
- Landscape Transformation Study (2019)
- Drought Restrictions Study (2020)



Peak Day Water Demand Management Study

- Tested remote control of irrigation systems to manage peak demand
- Rachio Controllers used
- Peak shaving experiments conducted in July and August
- 15 residential study sites in Bruce Springsteen's neighborhood
- Remote shifting was found to successfully occur in 14 of the 15 sites (the 15th owner manually overrode the settings)



Landscape Transformation Study

Landscape Program Water Savings

- What **range of water savings** can be expected from reducing landscape water requirements?

Customer Motivations & Market Readiness

- What **motivates people** to change their landscape and irrigation practices to reduce the overall water requirement and usage?
- What are the **reasons and rationale** for their landscape choices?
- What **barriers exist** to landscape transformation and to utility-sponsored programs?

Research Team:

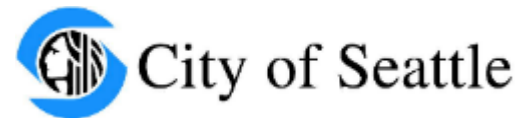
- A&N Technical Services, Inc.
- Maureen Erbeznik & Associates
- Sligo Creek Resources

Project Manager:

Peter Mayer, AWE Technical Advisor and Principal, Water DM

Additional support from AWE Staff and Project Advisory Committee

Partners and Participants



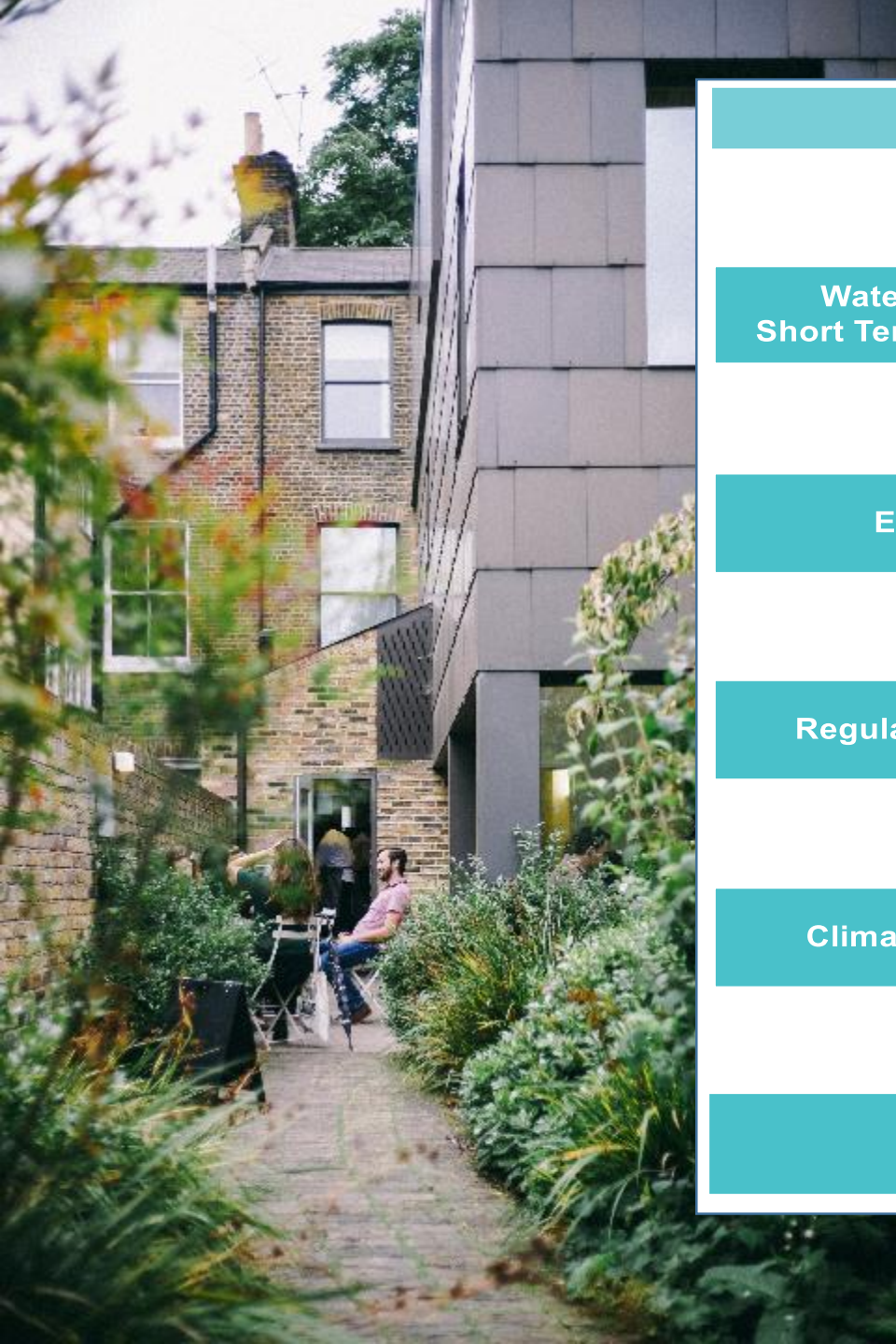
LANDSCAPE TRANSFORMATION

Landscape transformation is the act of customers transitioning from traditional high-water use landscape designs and products to water-efficient and sustainable landscapes, reducing the irrigation water requirement and outdoor water use.



SUSTAINABLE LANDSCAPES

- Feature climate-appropriate landscape designs and efficient technologies
- Are maintained through efficient irrigation practices
- Support homeowner goals, community water objectives, and healthy watersheds



Motivations for Landscape Transformation Programs

01

Water Supply Issues – Long Term Goals
Sufficiency and Sustainability

Water Supply Reliability--
Short Term Drought Management

02

03

Water Supply as Growth Inducer (good or bad)

Economic Cost of Water

04

05

Stormwater Runoff/Water Quality

Regulatory Mandate/Legal Requirement

06

07

Energy Use reduction

Climate Change/ Greenhouse gas emissions

08

09

Public Perception

Customer Benefits/Customer Demand

10

Impact Analysis

Evaluated savings of nine landscape transformation programs from diverse geographies and climates; described fourteen diverse programs



Rebates for efficient irrigation technology



Free distribution of mulch



Customer site audits and education

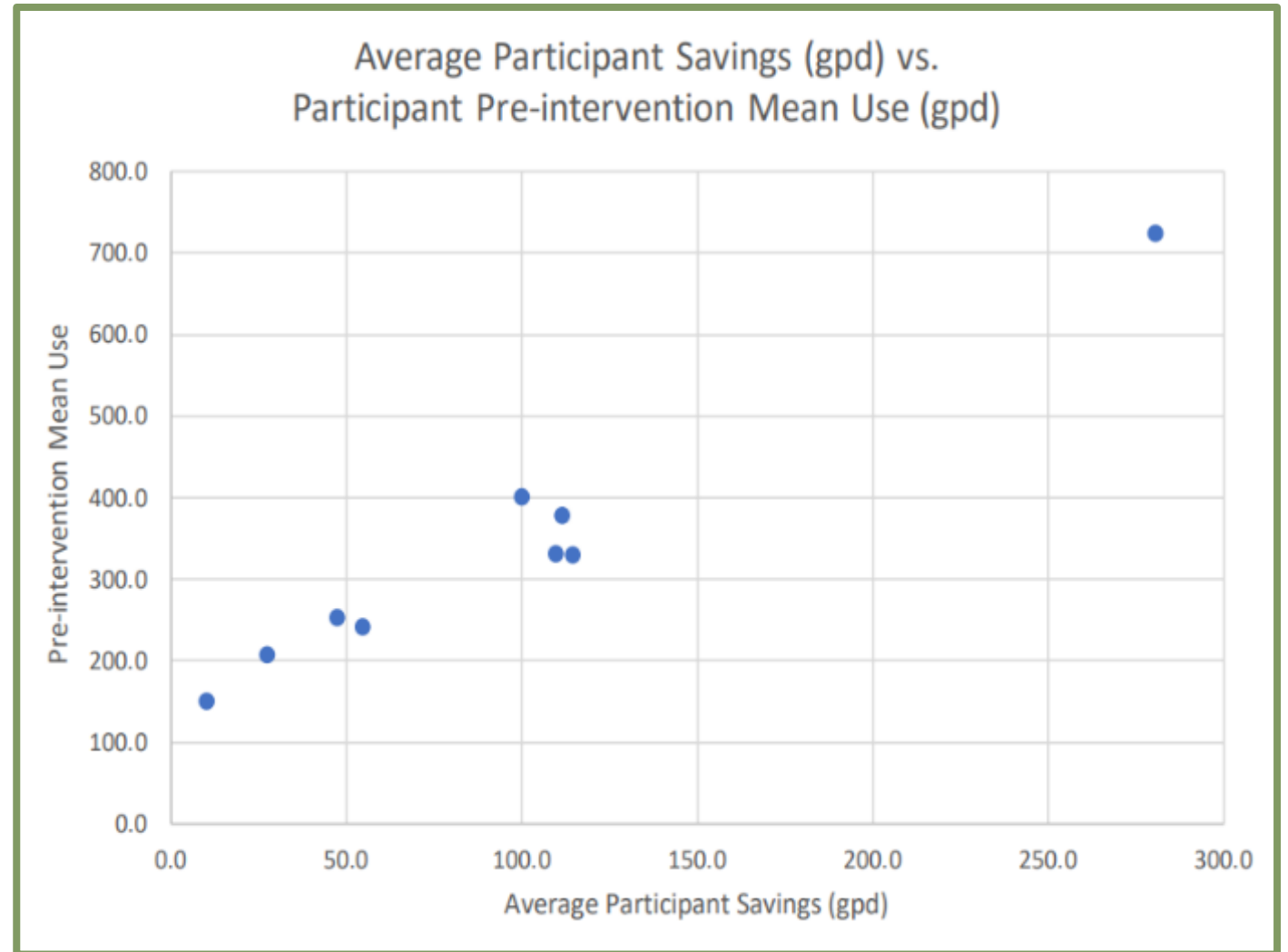


Turf removal and re-landscaping

All programs, of every type,
generated meaningful
water savings

Average participant water
savings ranged from **7%**
(Outreach & Support) to
39% (Turf Removal)

Higher pre-intervention
water use was associated
with higher savings





Population served: 928,000

Average annual precipitation: 32.1 in.

Program type: Turf removal and replacement

Average participant savings: 18.9%



Population served: 3,200,000

Average annual precipitation: 10.0 in.

Program type: Education, technology rebates, technical assistance

Average participant savings: 34.8%



Population served: 60,200

Average annual precipitation: 25.0 in.

Program type: Free distribution of mulch

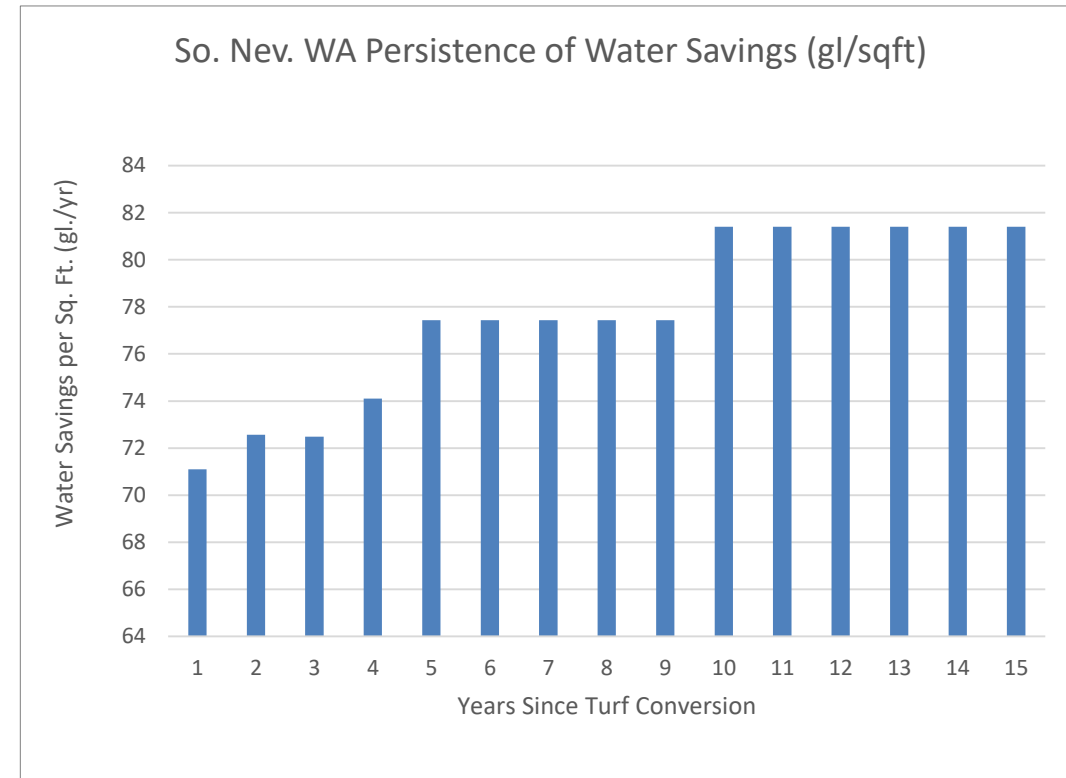
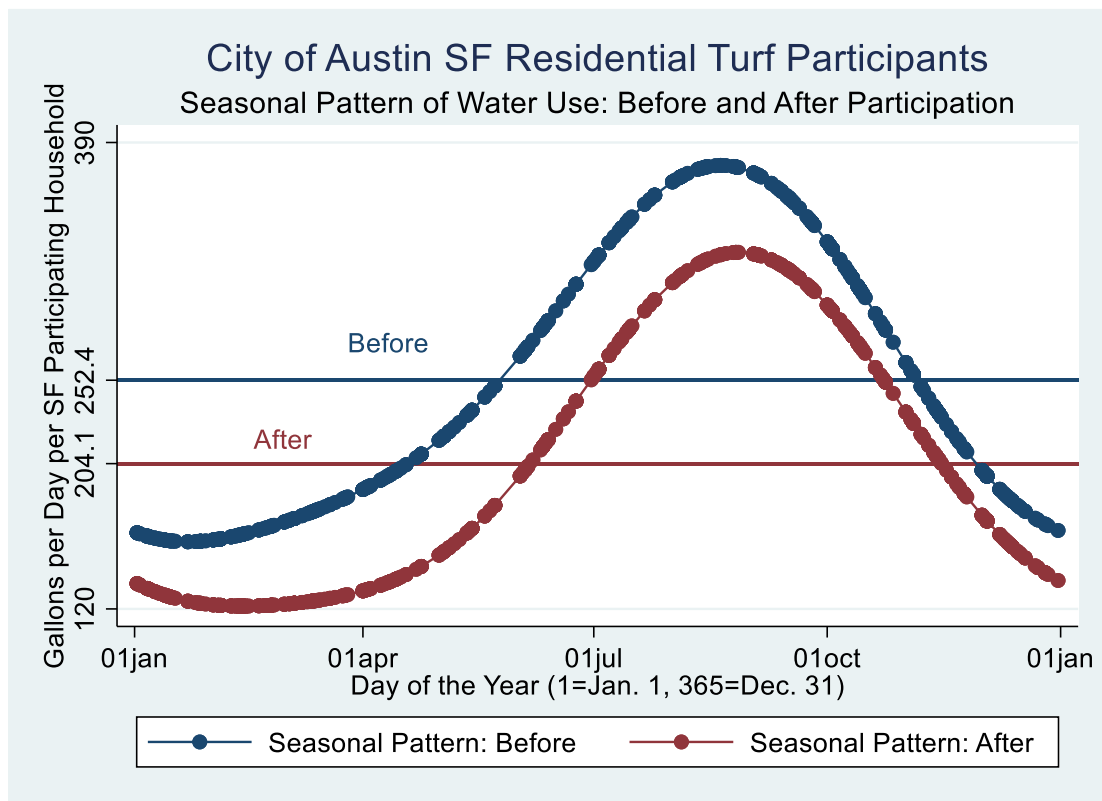
Average participant savings: 13.3%



42,000 gallons annually per participant

Meets the needs of a **four-person SD household** for nearly 100 days

Landscape programs effectively reduced peak demand



Water savings were observed to persist and increase over time

Market Analysis


AWE surveyed 3,390 water customers across the United States and Canada.

1,655 participated in a landscape transformation program.

We also conducted interviews with supply chain participants and analyzed industry reports.



TIME TO EDUCATE CONSUMERS



Consumers are
generally
disconnected from
their outdoor water
use

53%

believe they use **10-30 percent** of their water outdoors. (Truth: Most use **30 to 60 percent**)

56%

believe they have a smart controller (**31%** are interested in getting one)

41%

believe they own water-efficient sprinklers (Truth: **less than 20%** of equipment sold is efficient)

92%

state they have a timer on their system; about **25%** say they adjust based on season and weather; **89%** say they check regularly for leaks

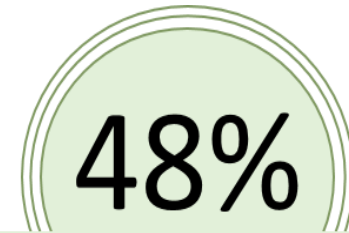
They want
landscapes that
are beautiful, easy,
**and water-
efficient.**

Beauty doesn't
necessarily mean
all green, all the
time.

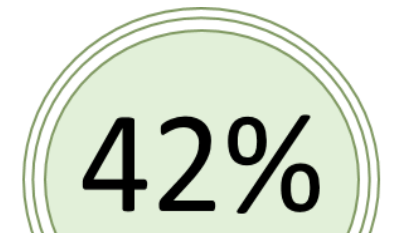
Beauty is important, but nearly half of respondents also wanted their landscapes to be water-conscious – indicating awareness is growing.



of respondents identified
beauty and appearance as one of
their top three landscape aspects.



of respondents identified
easy care as one of their top three
landscape aspects.



of respondents identified
low water use as one of their top
three landscape aspects.



87% would like
trees and shrubs



79% would like
flowers



73% would like an
entertaining space



69% would like
lawn

Are you satisfied with your landscape?

21 %

Very Satisfied

54 %

Somewhat Satisfied

19 %

Somewhat Dissatisfied

5 %

Very Dissatisfied

**Most Customers are Not Fully Satisfied
with their Current Landscape**



NEARLY ALL CUSTOMERS NEED SOME ASSISTANCE

THEY ARE LOOKING TO THEIR WATER PROVIDERS TO HELP THEM MAKE CHANGES

85%

believe they need moderate to full assistance to
change out their landscape

45%

will need a financial
incentive

22%

want help with plant
selection and layout

**When they do transform
their landscapes, they're
pleased with the results**



91%

**Were satisfied or very satisfied
with new landscape**

85%

**Thought the conversion was
worth the investment**

63%

Would not do anything differently

Barriers

Customers



- High costs
- Lack of knowledge
- Misperceptions of outdoor use
- Worries about new look
- Ease of lawn maintenance
- Lack ability to DIY
- Indifference to the offer

Programs



- Numerous or complicated requirements
- Complex process
- Low financial incentives compared to total project cost
- Low customer response

Supply Chain



- Efficient products hard to identify
- Limited testing, certifications, labeling
- Product performance issues
- Plant availability

Contractors



- Specific knowledge base needed to support sustainable landscapes
- Unclear business case to drive service for small residential clients

Recommendations

Programs



- Correct misperceptions about water use
- Educate customer from the start and address emotions
- Find the optimal design balance
- Balance program requirements
- Expand, segment, and tailor program messaging

Supply Chain



- Connect better with the water efficiency industry (and vice versa)
- Create additional testing and certification standards beyond smart controllers
- Improve plant availability at nurseries and stores

Contractors



- Lead with technology – data driven insights and better customer engagement
- Consider industry initiative to produce an on-line landscape design software tool
- Make the shift to Big Data and Predictive Analytics to personalize customer experience

Landscape Transformation: The Long Game



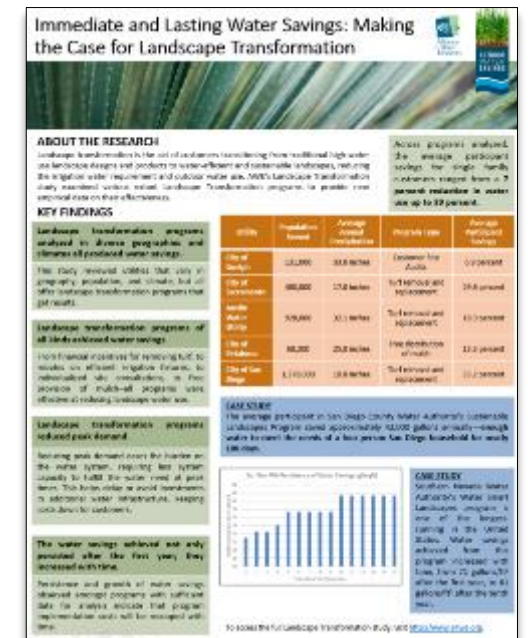
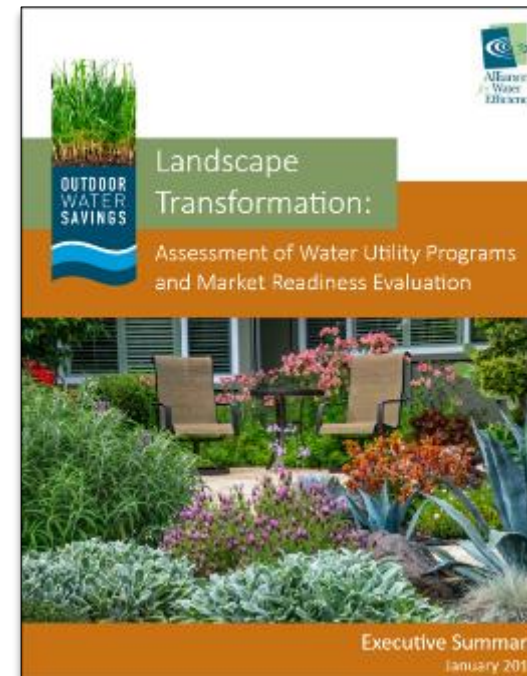
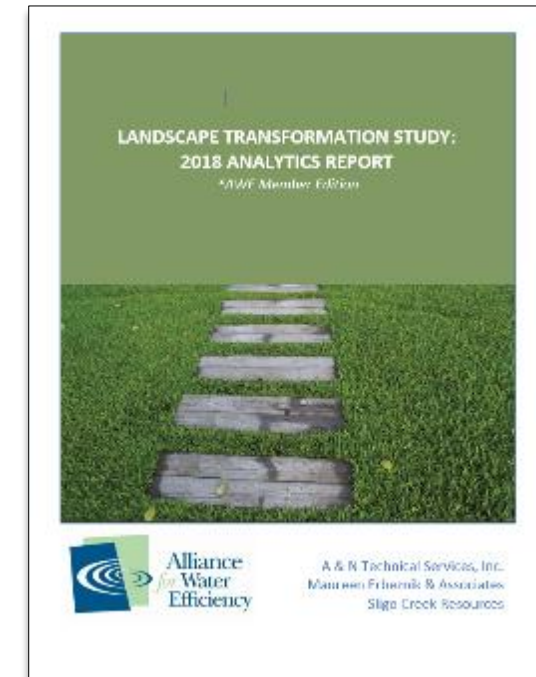
Signs of Success

- 1 No Incentives Required
- 2 Water/Energy Savings Are Observable and Significant
- 3 Customers Accept and Prefer Efficiency
- 4 Manufacturer / Supplier / Distributor Satisfaction and Innovation

Learn More

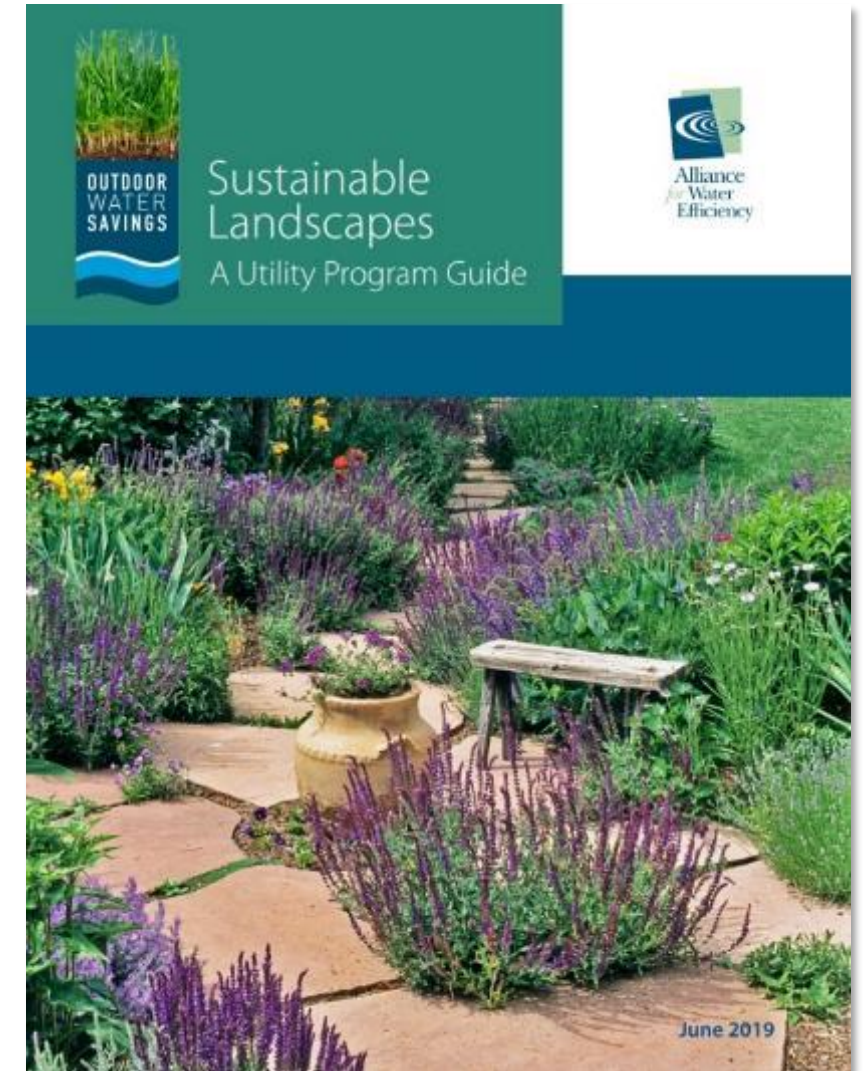
Visit www.allianceforwaterefficiency.org to access:

- Executive Summary
- Impact Analysis Report
 - **Member Version** with Expanded Program Descriptions
- Process Evaluation Report
 - **Member Version** with Expanded Program Descriptions
- Fact Sheet: Making the Case for Landscape Transformation (Member-Only)
- Infographic



Sustainable Landscapes Guide

- Based on the findings of the AWE Landscape Transformation Study Report
- Targeted to utilities just getting started or those enhancing existing programs
- Organized into two sections:
 1. General considerations
 2. Considerations for specific types of outdoor landscape programs
- Features program examples with lessons learned
- Launched June 2019 (printed, electronic)
- AWE member resource
- Thank you to The Scotts Miracle-Gro Foundation for funding this project!



Use and Effectiveness of Municipal Drought Restrictions Study

1. What are the different forms of mandatory and voluntary irrigation restrictions typically implemented by North American water providers?
2. How do mandatory and voluntary irrigation restrictions vary across water providers?
3. What demand reduction impacts can be achieved through different levels of mandatory and voluntary irrigation restrictions?
4. During times of drought, what can water providers do to maximize outdoor irrigation demand reductions?
5. How does media coverage impact drought response, and what are the comparative impacts of local vs. state and regional drought messaging?
6. What is the longevity of demand reductions during and after a drought?

Research Team:

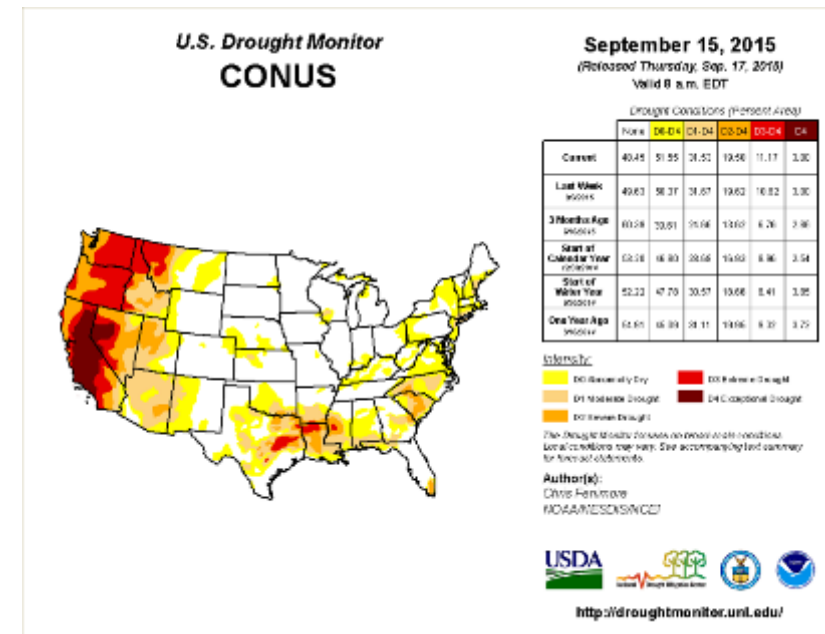
- Western Policy Research
- Maddaus Water Management

Project Manager:

- Peter Mayer, AWE Senior Technical Advisor and Principal, Water DM
- Additional support from AWE Staff and Project Advisory Committee

What Information Gap Does this Study Fill?

- Guidance documents to assist in design of drought response strategies are available:
 - AWWA Manual of Practice, M60 Drought Preparedness and Response, 2nd Edition (AWWA, 2019)
 - National Drought Mitigation Center
<https://drought.unl.edu/droughtplanning/PlanningHome.aspx>
- Historical accounts of past droughts are also available
- *The Use and Effectiveness of Municipal Irrigation Restrictions During Drought* report offers very detailed descriptions of each case study's experience
- This study includes results from quantified data analysis on how messaging, restrictions and enforcement actions achieved demand reductions



Project Partners

Retail Agencies

- Austin Water, TX
- Hayward, CA
- Los Angeles Department of Water & Power, CA
- Plano, TX
- Sacramento, CA
- Sacramento Suburban Water District, CA
- Santa Cruz, CA
- California Water Service/Visalia, CA

Regional Agencies and Organizations

- Arizona Municipal Water Users Association, AZ
- Bay Area Water Supply and Conservation Agency, CA
- California Urban Water Agencies, CA
- Lower Colorado River Authority, TX
- Metropolitan Water District of Southern California
- Regional Water Authority, CA
- Southern Nevada Water Authority, NV

Partner Funding Support

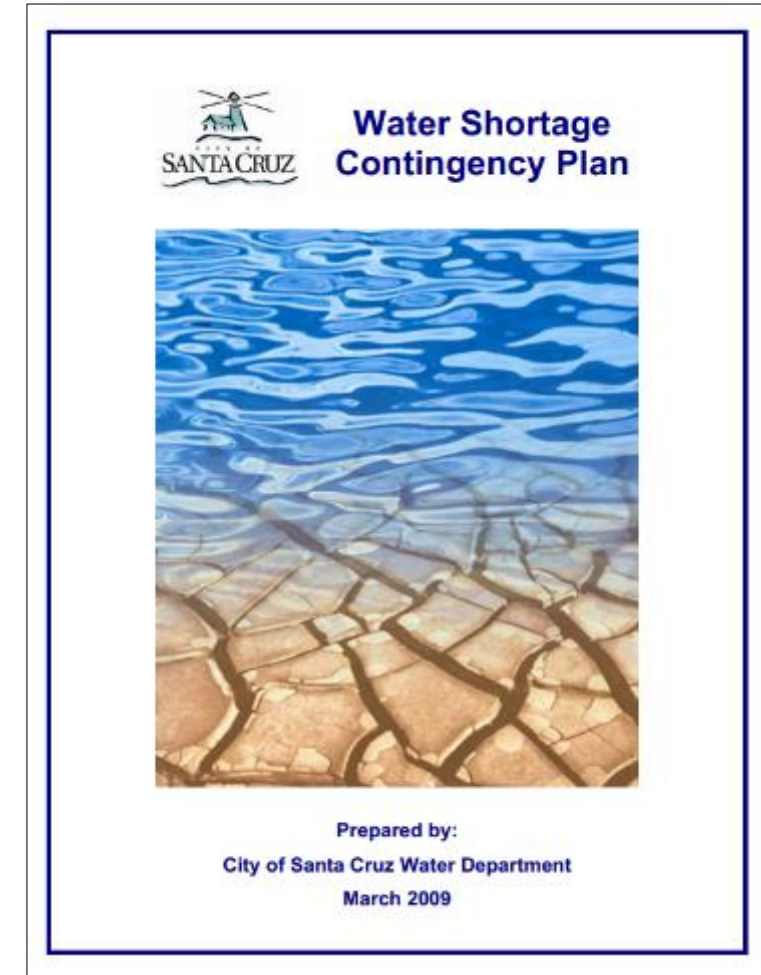
- The Scotts Miracle-Gro Foundation



Drought Restrictions Example – Santa Cruz, CA

Santa Cruz has 5 drought stages in its water shortage contingency plan.

- Stage 1 - Water Shortage Alert: Savings Goal = 0-5%
- Stage 2 - Water Shortage Warning: Savings Goal = 5-15%
- Stage 3 - Water Shortage Emergency: Savings Goal = 15-25%
- Stage 4 - Severe Water Shortage Emergency:
Savings Goal = 25-35%
- Stage 5 - Critical Water Shortage Emergency:
Savings Goal = 35-50%



What demand reductions can be achieved through different levels of mandatory and voluntary usage restrictions?



None of the water providers in this study reached the maximum stage of their contingency plan when irrigation would be completely banned.

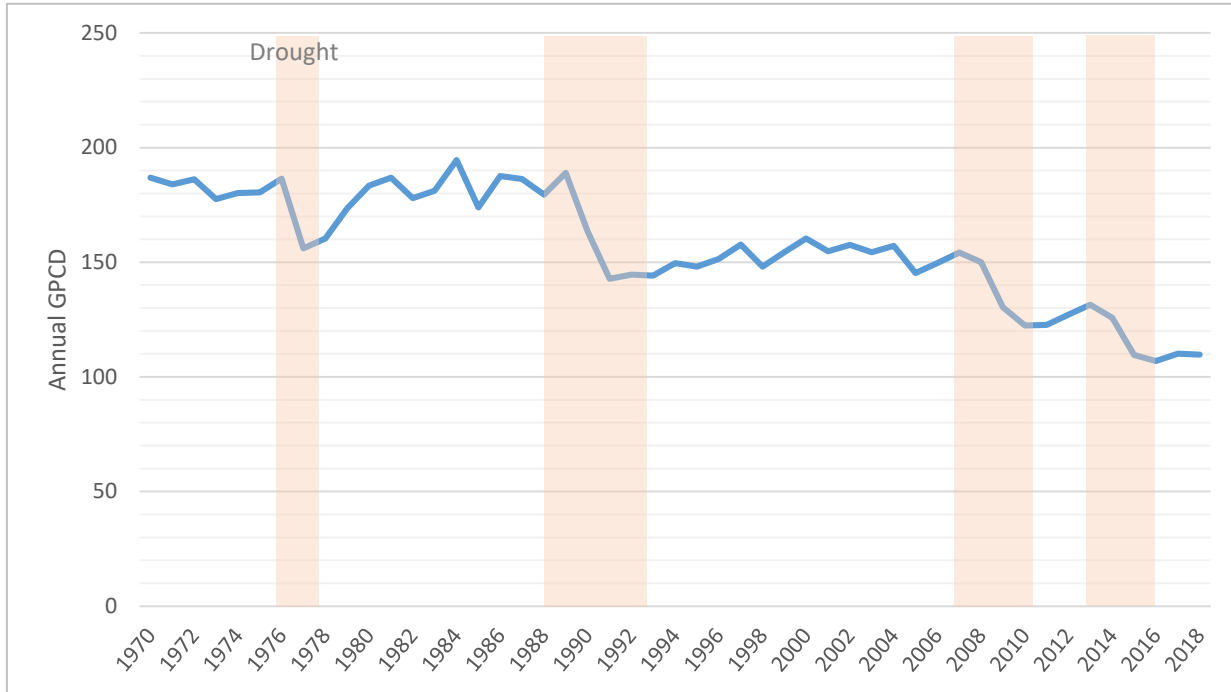


Case study participants successfully reduced annual demand by 18%-30% and peak monthly demand by 20%-42% through a combination of mandatory demand management measures.

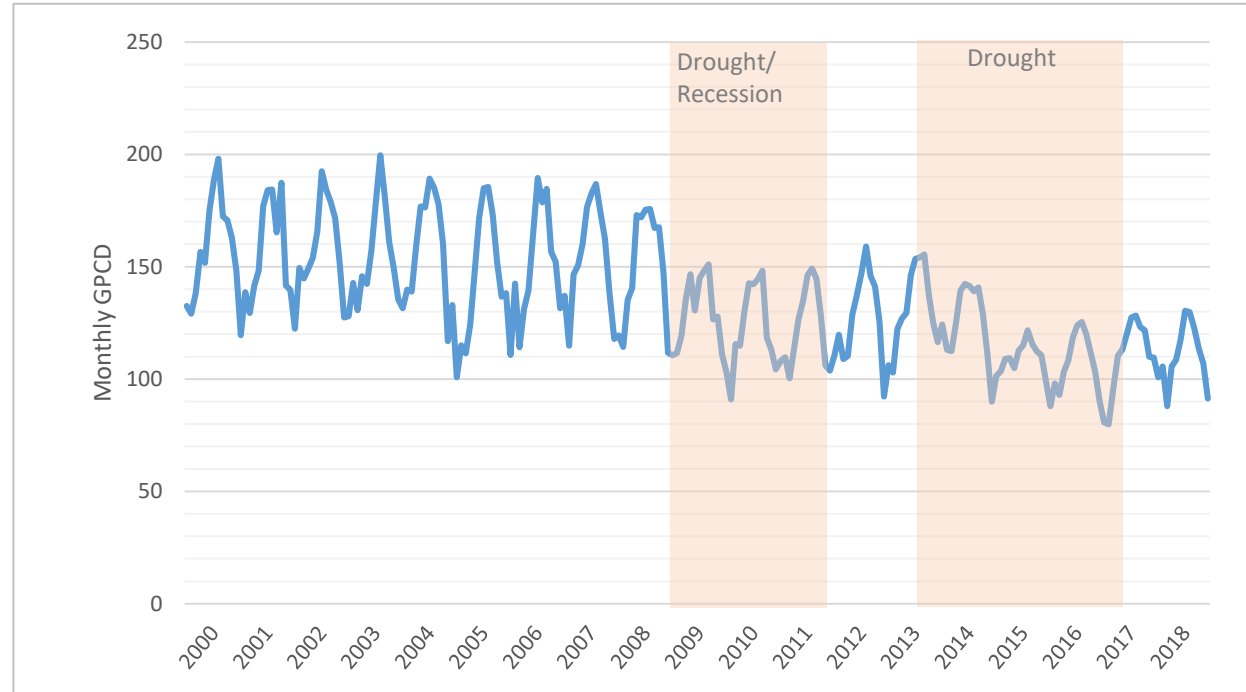


Within this study, voluntary conservation did not generate statistically significant savings (i.e., estimated savings are indistinguishable from zero).

Case Study Approach - LADWP



Los Angeles Department of Water & Power Annual GPCD Trend



Los Angeles Department of Water & Power Monthly GPCD Trend



What is the longevity of demand reductions after the end of a drought?



Per capita water use has declined across North America since the 1990s because of pricing, plumbing codes and standards, and investments in long-term efficiency.



Due to declining demand trends, demand rebounds after a drought toward a long-term declining trendline, not the pre-drought level.



In two case studies, demand reductions achieved during the drought were maintained with little rebound through the on-going implementation of restrictions.

During times of drought, what can water suppliers do to maximize effectiveness of outdoor restrictions?



Preparedness is key. In the planning process, the careful design of irrigation restrictions needs to be customized to the local region.



Voluntary conservation alone did not generate significant water savings in this study.



During a shortage, the water provider is an important source of reliable information.

How do messaging and enforcement programs influence effectiveness of restrictions?



Messaging and enforcement are viewed as best practices and essential components of a successful drought response.



WSCPs should include all of these components: messaging, enforcement, irrigation day-of-week and/or time-of-day restrictions, drought surcharges, and implementation strategies.



To be effective, WSCPs need codified rulemaking to include provisions that are enforceable on non-compliant customers.



The level of messaging and enforcement employed across the case studies was quite different.



In two case studies, drought surcharges linked with customer-specific water budgets were found to be highly effective in achieving desired demand reductions.



Recommendations: Before a Drought or Water Shortage

- Prepare or seek to update your water shortage contingency plan (consider multiple scenarios).
- Plan should include response stages with action to achieve targeted savings, messaging, and enforcement, and which reflects local conditions and values.
 - The design of day-of-week restrictions should be specific to the region.
 - The tighter the level of irrigation restrictions, the greater the savings, especially during summer months when irrigation is typically at its highest.
 - Mandatory conservation measures were found to generate statistically significant savings, where voluntary measures did not.
- Prepare and pass ordinances necessary to implement and enforce the plan when the time comes.
 - Actions enforceable on non-compliant customers need to target water waste, such as irrigation runoff and excessive use.
- Educate the community.
 - In this study, statistically significant savings were only detected in the presence of effective and persistent messaging and enforcement programs.



Recommendations: During a Drought or Water Shortage

- All shortage conditions are different.
 - Monitor conditions closely leading up to and during a drought.
 - Be prepared to respond to shortage emergencies (e.g., natural disaster).
- Effective outreach and messaging programs must be updated and as real-time as possible to help educate residents about emerging drought conditions
- Design specific measures for reducing short-term demand, and provide residents the resources needed to help them reduce demand in a more direct and permanent manner.
- Adopt surcharges without delay.
 - Increasing rates is often the most effective tool for achieving water savings. In addition, it may be useful to be flexible regarding when and how drought surcharges are separately adopted as part of a multi-layered approach to drought-stage declaration.
- Adapt the response as necessary. Water providers should be prepared to respond as required to changes in conditions.



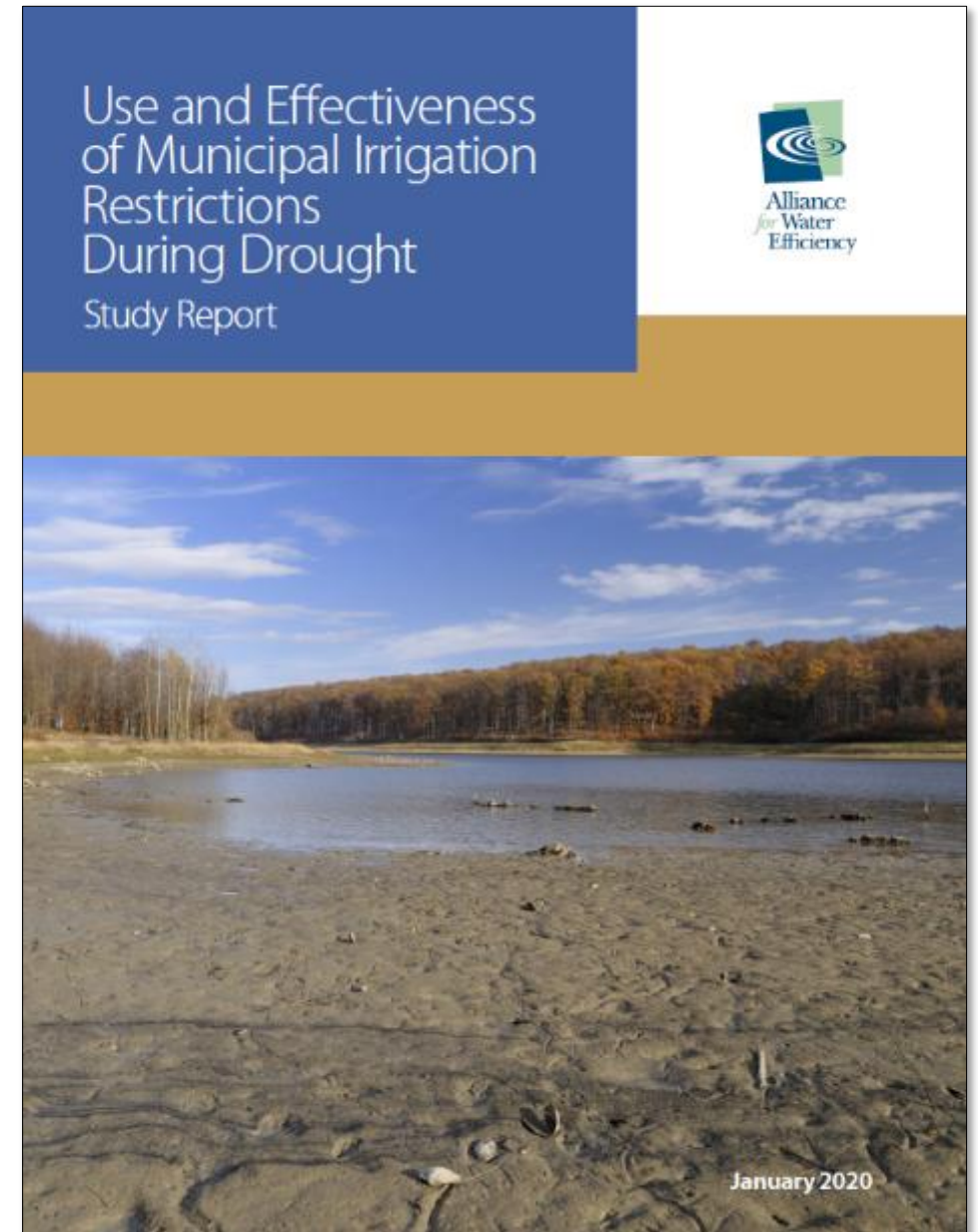
Recommendations: After a Drought or Water Shortage

- Publicly announce and clearly communicate to the public the end of the drought or shortage event and the lifting of restrictions.
- Lift any surcharges imposed promptly.
- Thank the community for participation and compliance.
- Monitor on-going demand trends
 - Watch overall total production, gallons per capita per day and also demand per sector (gpd/account)
 - Don't be surprised if demand doesn't fully rebound.
 - Because of ongoing long-term efficiency investments, demands can rebound toward a long-term downward trendline, not back to pre-shortage levels.

Learn More

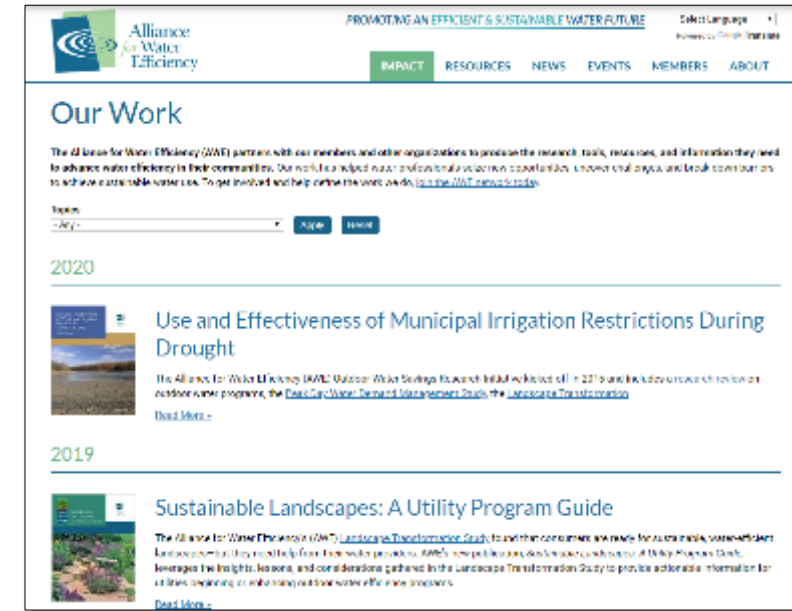
www.allianceforwaterefficiency.org

- Executive Summary
- Final report – *AWE member resource*
- Press release
- Webinar



What Can Conservation Districts Do?

1. Partner with local water providers and governments
2. Recognize outdoor water use and drought preparedness as priorities
 - Create an understanding of local water supplies, water systems, and outdoor water use
 - Identify opportunities for outdoor water use conservation and efficiency
 - Create an understanding of local water systems vulnerabilities to drought
 - Identify opportunities to improve drought preparedness



Tap into these resources to learn more!

<https://www.allianceforwaterefficiency.org/impact/our-work>

Thank you!

Questions?

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