Statewide Market Survey: Landscape Water Use Efficiency

Final Report
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Executive Summary

This Executive Summary presents highlights from the Statewide Market Survey of Landscape Water Use Efficiency conducted by the Institute of Applied Research and Policy Analysis (IAR) and the Water Resources Institute (WRI) at California State University, San Bernardino (CSUSB).

Researchers surveyed homeowners and landscape property managers, those who control the irrigation water applied to managed properties, about their irrigation behaviors and attitudes about water conservation messages. Results are consistent with other recent studies done on the subject (most notably a 2006 advertising tracking study done by Metropolitan Water District of Southern California and a marketing survey done in early 2007 by the San Diego County Water Authority).

People must be convinced that water efficient urban landscapes are easy to care for, friend- and family-friendly, low-maintenance, attractive and environmentally sound. Ultimately all market segments need information, well-crafted messages, and targeted incentives to help them make the necessary changes. With the information that is being gained through this statewide project and other related marketing research projects, California should be able to shape more effective strategies to improve landscape water use efficiency.

This is an important study and reveals areas of potential promise for advancing landscape water conservation programs – both at the individual water user level and also with those professionals who manage larger urban landscapes such as those for commercial property and homeowner associations. In some cases the survey results were surprising and in others they confirmed previous study results. As with all such surveys, results should be carefully interpreted with consideration of a variety of limitations. The Project Advisory Committee believes that the consultants have done a commendable job in this work.

General Findings and Recommendations

- **Finding:** Despite different climate zones across the state, there were no statistically relevant differences in responses to questions in the statewide survey either from north to south or from coastal to inland, desert, or mountain regions.

  Recommendation: Develop a statewide marketing campaign to encourage efficient landscape water use.

- **Finding:** Cross-tabulations by various demographic variables (including age, gender, income, and education) produced some illuminating insights regarding messages which tend to be most effective for particular demographic sub-groups. A more personalized "pitch" may be more effective in transmitting conservation messages to such groups than relatively impersonal messages delivered through the mass media.

  Recommendation: Use targeted themes in marketing messages to reach demographic subgroups and complement statewide marketing efforts.

- **Finding:** Most people generally report wanting to "do the right thing" relative to water conservation or they think they already do. An overwhelming 93% of residents surveyed said that people should take responsibility for the environment, while 99% of the commercial landscape and property manager respondents believe conserving water is important to them.

  Recommendation: Emphasize the environmental benefits of water efficient landscapes in marketing campaigns, especially the reduced runoff from landscapes that pollutes rivers, steams and the ocean.

- **Finding:** Based upon the literature search and experience of the researchers, it is strongly suggested that pilot studies or focus groups be conducted to determine the efficacy of the approach for any local or regional marketing program before a full-blown effort is undertaken. A two-step flow strategy (focusing on reaching opinion leaders who then transmit the message to their constituents – students to parents, for example) may be more effective than a traditional advertising campaign.

  Recommendation: Conduct a pilot study using a two-step flow strategy to encourage changes in landscape water conservation behavior, and then evaluate it to determine effectiveness vs. a traditional advertising campaign.

Residential Survey Findings and Recommendations

- **Finding:** People underestimate or are completely unaware of the amount of water they use on their gardens: 55% have no idea how much water they use. Of the 45% who ventured a guess about their landscape water use, 68% think they use less than 50 gallons per day, and 94% indicate that their own outdoor water use is less than the statewide average of 185 gallons per day

  Recommendation: Address the disparity between consumers' perceived knowledge and their actual knowledge of water usage and conservation by providing education and training to homeowners and landscapers about their level of water use and how they could reduce it.

- **Finding:** When asked "what matters most to you about your lawn and garden", the most-often mentioned answer was "appearance" (41%), with another 23% responding "ease of care" and 22% responding "a place for kids and pets to play."

  Recommendation: Emphasize the attractiveness, ease of care, and family benefits of water smart landscapes in marketing messages.

- **Finding:** People think that rebates for automatic weather-based controllers would work or might work (87%), as would rebates for drip irrigation systems (84%) and for replacing lawns with water efficient plants (81%).

Recommendation: Provide information and incentives to facilitate the use of weather-based controllers, drip irrigation systems, water thrifty plants and other water efficient landscape components.

- **Finding:** Many people report that they already have water efficient plants in their landscaping (75%) and 76% would buy them when buying new plants while 53% strongly agree or agree that their lawns are important to them.

  Recommendation: Provide information regarding the efficient irrigation of lawns along with information and incentives for water efficient plants.

- **Finding:** People respond to the visual impact of demonstration gardens: 87% said that they would or might be motivated to change their landscapes when shown attractive, water efficient demonstration gardens.
- **Recommendation:** Highlight and support attractive, local, water-efficient demonstration gardens.

- **Finding:** Water conservation messages are deemed very effective or somewhat effective if delivered by gardeners (77%), the children in the family (72%) or a university expert (73%). These figures are significantly higher than those for actors (45%), politicians (39%), or religious leaders (30%).

  Recommendation: Feature children, gardeners, and university or water experts in landscape water conservation messages.

Landscape Property Manager Survey Findings and Recommendations

- **Finding:** While the cost of water is important to 60% of landscape property managers, those who manage public (e.g. parks, schools) properties report that the low cost of water actually discourages conservation. Of property managers surveyed, 77% said they would or might respond to low maintenance messages or environmental messages stressing that excess run off pollutes rivers, streams and oceans.

  Recommendation: Provide more cost information to landscape property managers as well as information about the environmental benefits of water efficient landscapes.

- **Finding:** Nearly two out of three landscape property managers do not have irrigation systems that shut off when it rains, however most (88.5%) reported they would be willing or may be willing to switch to such a system. More than half indicated willingness to install water saving irrigation technology and equipment even if it costs more to purchase than a traditional sprinkler system and 73.1% said they would pay more for such a system up front if a rebate were offered.

  Recommendation: Provide rebates at the local level and pursue funding for a statewide rebate program for sprinkler system upgrades.

The study found that most people generally report wanting to "do the right thing" relative to water conservation or they think they already do. Further marketing campaigns through the mass media or two-step flow of communication should attempt to address this disparity between consumers' perceived knowledge and their actual knowledge of water usage and conservation. Additionally, people must be convinced that water efficient urban landscapes are easy to care for, friend- and family-friendly, low-maintenance, attractive and environmentally sound.

This recommendation does not apply solely to homeowners and tenants in residential properties, but it applies equally well to people who pay the water bill at managed properties such as members of homeowner's association boards who may have little knowledge about water-saving landscape design possibilities, professional landscapers, etc. Ultimately all of these market segments need information, well-crafted messages, and targeted incentives to help them make the necessary changes. With the information that is being gained through this statewide project and other related marketing research projects, California should be able to shape more effective strategies to improve landscape water use efficiency.

Introduction

Assembly Bill 2717, authored by Assemblyman John Laird and signed by Governor Arnold Schwarzenegger in 2004, charged the California Urban Water Conservation Council to convene a qualified group of stakeholders to serve on a Landscape Task Force that would evaluate and recommend proposals for improving the efficiency of water use in new and existing urban irrigated landscapes in California. A comprehensive set of 43 recommendations were submitted to the Governor and Legislature in December of 2005 in a report entitled *Water Smart Landscapes for California.*

The Landscape Task Force recommended that, "DWR, in concert with CUWCC, SWRCB, local water agencies and other stakeholders, should establish a statewide public outreach, education and marketing program promoting water efficient landscapes based on a marketing survey to determine what motivates Californians in terms of the relationship between landscape choices and water use efficiency."

While water agencies have conducted local studies related to public awareness toward landscapes and landscape water use, there have been no statewide surveys in California along this line. With this information, a cost-effective and customizable statewide marketing program could be developed to move Californians from awareness through education to motivation and action.

To this end, with funding from the United States Bureau of Reclamation's Southern California Area Office, the California Urban Water Agencies, and the California Urban Water Conservation Council, a request for proposals was issued to conduct a comprehensive marketing study of landscape water use efficiency. A team of academic researchers from the Institute of Applied Research and Policy Analysis (IAR) and the Water Resources Institute (WRI) at California State University, San Bernardino were selected "to explore and analyze customer *self-reported* behavior relating to landscape water use of homeowners/tenants of *residential property* that control the tap, and public or private property managers or landscape maintenance companies that control the tap at *managed property* in the commercial, industrial, institutional and multi-family sector."

More specifically, the primary research objectives of the study were to:

- Identify barriers to reducing landscape water use;
- Identify incentives (and disincentives) that would encourage improvements in landscape water use efficiency;
- Identify the messages that would resonate with customers;
- Identify the most effective medium and messenger for disseminating landscape water use messages.

The university research team worked closely with the Council's Project Advisory Committee (PAC) in the development of the literature review, survey tools, preliminary findings, draft, and final report. The committee members represented many of the most experienced and progressive urban water suppliers throughout the state as well as staff from the California Urban Water Conservation Council and the Bureau of Reclamation. The individual members listed below provided wise counsel and direction throughout the entire process.

- Karen Arntzen, Contra Costa Water District
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- Fran Spivy Weber, Mono Lake Committee
- Warren S. Gorowitz, Ewing Irrigation Products
- Lynn Lipinski, Metropolitan Water District of Southern California;
- Steve Macaulay, California Urban Water Agencies
- Debra Whitney, U.S. Bureau of Reclamation.
- Additional direction and oversight was provided by the California Urban Water Conservation Council staff including Katie Shulte Joung and Marsha Prillwitz.

Survey Methodology

The state was divided into six urban regions, defined below, with the goal of encompassing 80% of the housing, commercial, industrial and institutional population. It was also hypothesized that the climate differences between regions would directly affect the landscaping water use behavior and selection of landscaping materials and technologies. Differences in demographic composition could be factored into the survey and the analysis.

The six regions were defined as:

1. Coastal Southern California: cooler coastal influenced areas from San Diego to Monterey
2. Inland Southern California: hotter eastern communities
3. Desert: high and low
4. Greater Bay Area: the cooler coastal zones from Santa Cruz to North Bay, including the peninsula and east bay
5. Inland California: including the hotter edge zones of the Bay Area, and the Central Valley from Bakersfield to Redding
6. Northern California: the upper reaches

As noted in the introduction to this report, there are two populations of interest to be surveyed within each of the regions defined above: homeowners/tenants of residential property and managed property decision-makers—those people who make the decisions about the landscape water usage at the property, which ranges from on-site managers, to professional management companies, to homeowners association boards, and landscaping contractors. In this section of the report, we discuss the methodology employed to elicit information from each of these designated populations.

Residential Survey – Sampling Technique and Questionnaire Construction

The sampling technique for the residential sector consisted of a telephone survey of homeowners and/or tenants of single-family homes. A telephone survey employing a probabilistic/random sampling technique to ensure a representative sampling within each region was employed. The goal was to sample a total of 200 respondents per region (1,200 completed surveys statewide), yielding a 95% level of confidence and an accuracy of +/- 7% per region (approximately +/- 2.8% for statewide results).

Within each region, phone numbers were randomly selected from a comprehensive sample frame consisting of all telephone working blocks which contain residential telephone numbers in the region. This is a standard random sampling approach for studies of this nature. Telephone interviews were conducted by the Institute of Applied Research using computer assisted telephone interviewing (CATI) equipment and software. The surveys were conducted between January 9 and February 12, 2007. The vast majority of the surveys were conducted in English (95%); however, a Spanish version of the survey was available for respondents who did not

understand English well enough to complete the survey. The final sample size for the residential survey was 1,267, broken down by regions as follows:

Region

	Frequency	Percent	Valid Percent	Cumulative Percent
Greater Bay Area	208	16.4	16.4	16.4
Coastal Southern	215	17.0	17.0	33.4
Desert (High and Low)	211	16.7	16.7	50.0
Inland California	212	16.7	16.7	66.8
Northern California	211	16.7	16.7	83.4
Inland Southern	210	16.6	16.6	100.0
Total	1267	100.0	100.0	

Each survey was further coded to place it in one of two Climate Zone groups: 1-9, that represent homeowners in cooler, wetter climates (n= 739), and 10-18, that represent homeowners in hotter drier climates (n=528).

Questionnaire items were selected on the following basis: Several questions were derived from surveys discovered during the literature review for this project. Others were suggested by PAC members and the researchers themselves. In addition, a number of standard demographic questions were included for tracking purposes and for cross-tabulation of findings. A draft copy of the questionnaire was submitted to the PAC members for their approval and modified where warranted. A Spanish version of the questionnaire was produced, the survey instrument was then pre-tested (in both languages), and some minor changes to the wording and order of some items were made. The final English questionnaire is attached as Appendix B.

Findings from Residential Survey

Following are the major findings from the statewide landscape water use residential survey. Although the reader is encouraged to review the appendix showing regional breakdowns of results, in this report findings are presented for the state as a whole since for the most part, there were few statistically significant and *practically* significant differences among the six regions. Where appropriate, the researchers include breakdowns for Climate Zones as a means of comparing differences among zones. For a full data display of the response to each question in the statewide findings, see Appendix I. For a data display of the response to each question by regional breakdown, see Appendix II. For a data display of the each response to each question by Climate Zone 1-9 or 10-18, see Appendix IV (Appendices I thru IV are available on the internet at: www.cuwcc.org).

The reader will note that the residential survey was conducted only with people who indicated that they do not live in an apartment, condominium, or mobile home park that maintains the outdoor landscape for them. Therefore the demographics of this target population are not expected to match the general demographic profile of all adult Californians. Indeed, there are fewer low-income, single, and lower-education Californians in the target population than in the general population as a whole. Thus the demographic profile of respondents which at first glance might appear to under-represent low-income, single and lower-education Californians seems to be representative of the population who must deal with their own landscape watering.

Finally, the reader will note that the actual number of respondents per survey question varies depending on respondents' willingness to answer any particular question.

Water Use Behavior and Lifestyle

The first major question on the survey (Question B1) was: "How is your lawn and garden watered? Do you have an automatic sprinkler system or do you water by hand?" Initial findings indicate that more than half of homeowners (56%) across the state have automatic sprinklers, with a smaller number (31%) reporting only watering by hand (and 12% reporting that they do both). There are large regional differences in the number of respondents who have converted to automatic sprinklers. Indeed, the regional breakdown reveals that 45% of residents in the Greater Bay Area and 48% of Northern California residents do not have automatic sprinklers (i.e. they water by hand), as opposed to only 14% in the Desert and 21% in Inland California. At first blush, these findings are "common sense" in that the discrepancies may be due to weather—cooler temperatures near the coast and in Northern California lessen the need for irrigation, whereas desert and inland landscapes require more water due to higher heat and quicker evaporation of irrigation water. Or perhaps the discrepancy may simply reflect the time period in which the homes were built (with older homes less likely to have automatic sprinklers which are commonplace in newer homes). Regardless, these findings have marketing implications for the individual water agencies throughout the state who are deciding where to put their marketing dollars.

The vast majority (89%) of respondents with a sprinkler system indicated that they have a timer that controls the watering schedule (Question B2), and most of those people (79%) set the watering schedule themselves rather than having a gardener who sets the schedule (Question B3).

About 12% of those who have sprinklers also have a timer that automatically adjusts watering with changes in weather conditions (Question B7), with the highest percentage occurring within the Desert Region (19%) and the lowest in Northern California (8%). When the 12% with a timer were asked why they have such a timer (Question B8), the most-often given response was "to reduce water cost" (36%). In addition, 23% cited environmental concerns and 23% cited convenience. These themes can be built into statewide marketing campaigns.

Perhaps a more important marketing focus is the 88% of respondents with sprinkler timers who *do not have* the type of sprinkler timer that automatically adjusts based on weather changes. These people represent an untapped market segment. The main reasons given for not having such a timer are lack of knowledge about the technology (30%) and the fact that they simply "haven't thought about it" (26%). Public education and marketing could be very important for these individuals.

Most residents (75%) indicate that their landscaping already includes water efficient plants (Question B10), and 76% say that if they were to buy new plants they would buy water efficient plants (Question B11). (There were no statistically significant zone differences in answers between coastal and inland Climate Zones). These figures are impressive at first blush in that they seem to suggest a high level of sensitivity to environmental concerns and an awareness of potential cost savings of such landscaping. When it comes time to evaluating the effectiveness of marketing campaigns designed to increase usage of water efficient landscaping, the Council and local/state water agencies are advised to look for direct measures of effect (e.g. actual purchases of water efficient plants) rather than self-reports on a survey of this type.

When asked "what matters most to you about your lawn and garden" (Question B13), the most-often mentioned answer was "appearance" (41%). Again, there was no statistically significant difference between the Climate Zones. These findings are important in that very few respondents (14%) who indicated that they would buy water efficient plants list appearance as one of the reasons to buy such plants (Question B12a); instead, they emphasize reducing water costs (62%), environmental concerns (32%), and convenience (25%). On the flip side, 35% of respondents who indicated that they would not buy water efficient plants cited appearance as the most important reason for their reluctance (Question B12b). Simply put, in more than one-third of respondents' minds there is an association between "water efficient plants" and "less attractive plants." Marketing efforts should be directed towards changing that perception.

The survey found that more than half the respondents (55%) "Don't know" how many gallons of water their family uses each day when watering their landscape (Question B15). Of those who ventured a guess, 94% indicate that their own outdoor water use is less than the statewide

average of 185[1] gallons per day – obviously their guesses must be low. Regionally, 96% of those in the coastal zones who answered the question stated that they think their families use less than 185 gallons of water daily, compared to 91% in inland zones. Clearly people are still, for the most part, unaware of the magnitude of their own outdoor water usage, and that appears especially so in the cooler coastal areas. Further, California voters have approved three bonds whose primary message was "reliable and safe drinking water." When these facts are linked together via a media campaign or two-step flow method of communication, the citizenry might finally get the point that wasting outdoor water is in fact wasting drinking water.

Barriers to Reducing Landscape Water Use

As noted above, respondents may have selected "socially acceptable" answers regarding the importance of taking responsibility for their environment and their willingness to purchase water efficient plants. Yet some researchers and practitioners expect that behavior may not necessarily follow such intentions. Often there are a variety of barriers to changing behavior. Thus, an entire section of the survey (Questions BA1 through BA8) was devoted to directly determining respondents' views regarding a variety of possible barriers to reducing landscape water use.

The first barrier is that some people overly estimate their level of knowledge regarding the water conservation. As noted above relative to Question B15, Californians are relatively unaware of the amount of outdoor water they are using. Yet they *think* they know. Statewide, 56% of respondents "strongly agree" or "agree" that they know how much water their lawn needs, and 63% "strongly agree" or "agree" with a similar question about their shrubs, trees, and other plants. More than 3 out of 4 respondents (76%) indicate that they know where to get water efficient plants. So the bottom line is: do they *really* have the knowledge necessary to be active participants in water conservation? IAR/WRI recommends that future studies address the possible disconnect between a respondent's perception of knowledge and actual knowledge. Until this is done, any marketing campaign must tread lightly on the "knowledge" issue, since many people could "turn off" from the media message if they interpret it as trying to teach them something they think they already know.

Lifestyle considerations can also be major barriers to water conservation. The following table shows the percentage of respondents who either "strongly agree" or "agree" with four lifestyle questions.

	Strongly Agree or Agree
L1: I enjoy showing friends around the yard	59%
L2: The yard is an important place for my leisure activities	67%
L4: I really haven't thought much about cutting down my use of water	24%
L5: Having a lawn is very important to me	53%

[1] Gleick, Peter, Ph.D., et al, *Waste Not, Want Not: The Potential for Urban Water Conservation in California* (November 2003), p. 4

The above table demonstrates how important respondent's yards (especially lawn) are to them -- such an attitude can definitely be a barrier to conserving water. However, it might be possible to convince people to reduce the size of their lawn (thus saving water) as long as their yard is still inviting for their leisure activities. Notably, 47% were either neutral on the subject or did not agree that lawns were very important to them.

Two other lifestyle questions may provide marketing insights whereby some of the barriers can be overcome. Specifically, the vast majority of respondents (93%) recognize that they do play a role in preserving their environment. Marketing efforts, therefore, should specifically address the theme that individuals play a significant role in conservation, and conservation starts in their own back yards. Further, such a theme can be presented showing people enjoying their water-efficient landscaped yards, mentioning how easy and carefree their lives are with such landscaping, and emphasizing through scenes of showing friends around the yard that conserving water does not mean that you jeopardize the beauty of your surroundings.

	Strongly Agree or Agree
L3: Individuals should take responsibility for the environment around them	93%
L6: It is important to me that my yard is easy to care for	82%

The literature suggests that there are other barriers to conserving water, including lack of caring about the environment, fear of technology, lack of appreciation of the look of water efficient plants, etc. Are these barriers acknowledged by our survey respondents? No.

Very few people were willing to acknowledge in a survey that simple "lack of caring" is a barrier to water conservation. Only 10% of respondents were in agreement with the statement "Lots of people waste water, so it doesn't matter if I conserve," and 8% agreed or strongly agreed that "As long as my landscaping looks good, I do not care how much water I use." Further, only 20% of those who water by hand agreed that they do not have an automatic sprinkler timer because they "aren't good with gadgets like that." Finally, only 14% indicated that water-efficient plants do not look as good as other types of landscaping.

Although IAR/WRI clearly recognizes that there are substantial barriers to conserving water, at the same time these barriers are not insurmountable. Good marketing efforts (such as those mentioned above), as well as the incentives discussed in the next section of the report, should help mitigate these barriers.

Incentives That Would Encourage Improvements in Landscape Water Use Efficiency

When asked about potential incentives for water conservation, most residential survey respondents (81%) said that a program which offered cash for reducing lawn size and replacing it with more water efficient plants (Question IM1) *would work* (38%) or *might work* (43%).

Another 1% said that "it depends on the amount of money offered." Even more (87%), said that offering rebates for weather-based sprinkler timers (Question IM2) *would work* (59%) or *might work* (28%). Support was also expressed for rebates for putting in a drip irrigation system (Question IM3) as a method of encouraging people to conserve water: a little more than half (54%) said such a rebate *would work*, while 29% said it *might work*.

Messages That Will Resonate With Customers (Including Who Should Deliver the Messages and Best Sources of Media for Disseminating Information)

Respondents were presented with several possible themes to be used in media campaigns attempting to encourage people to conserve water, and were asked whether they thought the messages "would work," "might work," "wouldn't work," or "would depend on how good the message is." The following table summarizes respondents' views relative to those messages.

MESSAGE	Would Work	Might Work	Would not Work	Depends on how good the message is
IM4: Messages that stress the cost of water	31%	32%	36%	1%
IM5: Environmental messages that show how excess water running off lawns and gardens pollute rivers, streams, & oceans	43%	34%	22%	2%
IM6: Messages that stress being a good citizen by conserving water	37%	34%	27%	2%
IM7: Messages that emphasize that water efficient plants can also be low maintenance	50%	38%	12%	1%
IM8: Messages that show a demonstration garden with attractive water efficient landscaping	54%	33%	13%	1%
IM9: Messages that say that 60% of all drinking water in CA. is used for outdoor irrigation	49%	29%	20%	2%

* NOTE: percentages may not sum to 100% due to rounding differences

The data above show that media messages should emphasize that water efficient plants are low maintenance. Even more effective might be media messages that illustrate how *attractive* water efficient landscaping appears – seemingly, a picture of an attractive water-wise garden would be worth thousands of words about conservation. Further, a large portion of residential respondents thought that an effective message would show how outdoor irrigation has a direct impact on the amount of available drinking water. Finally, respondents felt that messages that show how excess run-off pollutes rivers and streams are effective. Least effective appears to be messages that stress the cost of water.

Cross-tabulations by various demographic variables (including gender, age, income, marital status, and education) produced some illuminating insights regarding messages which tend to be most effective for particular demographic sub-groups. The following tables show cross-tabulations of the effectiveness of media messages with those demographic variables.

IM4: Media messages that stress the cost of water

	Percent saying "would work"			
More effective with females	**Males**		**Females**	
	27% (n=491)		34% (n=718)	
More effective with people whose household income is less than $80,000 (and especially income < $25,000)	**< $80,000**		**$80,000 or above**	
	37% (n=472)		24% (n=351)	
More effective with people with a low level of education (some high school or less).	**HS grad or less**	**Some college**	**BA/BS**	**Grad work +**
	40% (n=251)	28% (n=367)	29% (n=364)	29% (n=194)
No difference by age group	**18 to 34**	**35 to 54**	**55 +**	
	35% (n=167)	33% (n=499)	28% (n=471)	
No difference by marital status	**Single, Never Married**	**Married**	**Divorced Widowed, Separated**	
	32% (n=213)	31% (n=803)	33% (n=154)	

M5: Media Environmental messages that show how excess water running off lawns and gardens pollute rivers, streams, & oceans

	Percent saying "would work"			
More effective with females	**Males**		**Females**	
	39% (n=489)		46% (n=742)	
More effective with people whose household income is less than $80,000 (and especially income < $36,000)	**< $80,000**		**$80,000 or above**	
	48% (n=481)		36% (n=361)	
More effective with people with a low level of education (high school graduate or less) OR high level of education (graduate work)[2]	**HS grad or less**	**Some college**	**BA/BS**	**Grad work +**
	49% (n=257)	42% (n=372)	37% (n=373)	48% (n=195)
No difference by age group	**18 to 34**	**35 to 54**	**55 +**	
	42% (n=168)	45% (n=508)	43% (n=485)	
Most effective with divorced, widowed, and separated	**Single, Never Married**	**Married**	**Divorced Widowed, Separated**	
	44% (n=212)	41% (n=824)	52% (n=158)	

[2] The reader should note that this finding may be an anomaly or may reflect an underlying difference in level of environmental awareness between the 2 extremes of the educational continuum. Further focus group analysis could be undertaken to investigate this phenomenon.

IM6: Messages that stress being a good citizen by conserving water

	Percent saying "would work"			
More effective with females	**Males**		**Females**	
	33% (n=494)		40% (n=738)	
More effective with people whose household income is less than $80,000 (and especially income < $25,000)	**< $80,000**		**$80,000 or above**	
	43% (n=482)		27% (n=360)	
More effective with people with a low level of education (high school graduate or less)	**HS grad or less**	**Some college**	**BA/BS**	**Grad work +**
	50% (n=262)	35% (n=371)	32% (n=373)	31% (n=193)
No difference by age group	**18 to 34**	**35 to 54**	**55 +**	
	37% (n=170)	37% (n=509)	38% (n=483)	
More effective with divorced, widowed, and separated	**Single, Never Married**	**Married**	**Divorced Widowed, Separated**	
	36% (n=213)	35% (n=820)	48% (n=161)	

IM7: Messages that emphasize that water efficient plants can also be low maintenance

	Percent saying "would work"			
More effective with females	**Males**		**Females**	
	43% (n=500)		54% (n=744)	
More effective with people whose household income is less than $80,000 (and especially income < $25,000)	**< $80,000**		**$80,000 or above**	
	53% (n=491)		44% (n=360)	
More effective with people with a low level of education (high school graduate or less)	**HS grad or less**	**Some college**	**BA/BS**	**Grad work +**
	56% (n=263)	47% (n=378)	46% (n=376)	51% (n=196)
No difference by age group	**18 to 34**	**35 to 54**	**55 +**	
	45% (n=171)	51% (n=515)	51% (n=489)	
More effective with divorced, widowed, and separated	**Single, Never Married**	**Married**	**Divorced Widowed, Separated**	
	46% (n=214)	48% (n=832)	60% (n=162)	

IM8: Messages that show a demonstration garden with attractive water efficient landscaping

	Percent saying "would work"			
No gender difference	**Males**		**Females**	
	50% (n=495)		56% (n=747)	
More effective with people whose household income is less than $80,000 (and especially income < $25,000)	**< $80,000**		**$80,000 or above**	
	57% (n=488)		49% (n=362)	
More effective with people with a low level of education (high school graduate or less)	**HS grad or less**	**Some college**	**BA/BS**	**Grad work +**
	60% (n=260)	52% (n=378)	52% (n=375)	51% (n=196)
No difference by age group	**18 to 34**	**35 to 54**	**55 +**	
	56% (n=171)	54% (n=512)	54% (n=490)	
No difference by marital status	**Single, Never Married**	**Married**	**Divorced Widowed, Separated**	
	59% (n=212)	52% (n=831)	56% (n=163)	

IM9: Messages that say that 60% of all drinking water in CA. is used for outdoor irrigation

	Percent saying "would work"			
No gender difference	**Males**		**Females**	
	46% (n=492)		51% (n=718)	
More effective with people whose household income is less than $80,000 (and especially income < $25,000)	**< $80,000**		**$80,000 or above**	
	52% (n=472)		44% (n=353)	
More effective with people with a low level of education (high school graduate or less)	**HS grad or less**	**Some college**	**BA/BS**	**Grad work +**
	57% (n=254)	48% (n=371)	45% (n=363)	46% (n=189)
More effective with younger age group than older group	**18 to 34**	**35 to 54**	**55 +**	
	57% (n=170)	51% (n=504)	46% (n=467)	
More effective with single, never married, divorced, widowed, separated	**Single, Never Married**	**Married**	**Divorced Widowed, Separated**	
	55% (n=213)	46% (n=807)	56% (n=153)	

So what does this cross tabulation add to our understanding of the effectiveness of various media message with different market segments? First, the obvious…gender counts, income counts, education counts, and marital status counts. That doesn't mean that men, people with higher incomes, people with more education, and married couples are less interested in water conservation. That just means that they appear to be less amenable to media advertising as a vehicle for changing their behavior and practices.

For these subgroups, a more personalized "pitch" may be more effective in transmitting conservation messages than relatively impersonal messages delivered through the mass media. For example, in marketing terms, the message can be presented via the media toward an opinion leader such as a master gardener who reads specialized literature, and who in turn takes the message and transmits it to his/her customers. The literature survey indicated that children may play a key role in modifying behavior, but media messages can first be directed toward education decision makers and teachers who in turn deliver the message to the children (and who, in turn, deliver the message to their parents). The social science literature terms this the "two-step flow" of communication, a process which may be a more effective way of disseminating information in a way that will result in a change in water conservation behavior.

Reinforcing the need for "thinking outside the box" about how to successfully change people's water conservation behavior is the fact that for the most part, respondents did not recall hearing any recent ads about conservation. Indeed, nearly 70% of the residential survey respondents reported that they had *not* heard any ads about outdoor water conservation in the past few months (Question IM10). In Climate Zones 1-9, 71% of respondents said they did not recall any ads, compared to 68% of those in Climate Zones 10-18. This may be a result of the timing of the surveys in January and February, rather than during the summer, when water agencies typically ramp up their outdoor conservation messages. Most of what people recalled from the conservation ads was general and abstract: "Conserve water" (27%). 11% of respondents said that although they remember hearing an ad, they could not remember the specific message. The specific messages remembered by most people were: "Drainage pollution" (8%), "General environmental concerns" (7%), "Use water efficient plants (6%) and "Do not waste water" (5%).

The ads appeared to be only partially successful, even if people remembered hearing them, since only 47% of those who remembered the ads reported that the ads had caused them to change their outdoor water usage. Broken down according to Climate Zones, nearly half (49%) of those who had heard the ads in Climate Zones 1-9 reported that they had changed their behavior, compared to 44% in Climate Zones 10-18. Regionally, 58% of Desert respondents reported the advertisements caused a change in outdoor water usage compared to only 30% in Inland California.

Once a conservation media campaign is conceived, the next logical issue is to determine who would be the best (most effective) type of person to deliver it. A series of six questions (O1 through O6) asked respondents to indicate whether various categories of people would be "very effective," "somewhat effective," or "not effective" at delivering the messages (whether they be media messages or, in the case of children, messages delivered in everyday conversation).

CATEGORY	Very Effective	Somewhat Effective	Not Effective	Depends
O1: Expert from a university	28%	45%	22%	5%
O2: An actor	17%	28%	47%	8%
O3: Political leader	14%	25%	53%	8%
O4: A child in your family	37%	35%	24%	4%
O5: A gardener	43%	34%	20%	3%
O6: A religious leader	11%	19%	65%	5%

The above table seems to indicate that a gardener, a child in the family, or a university expert would all be relatively effective at delivering the message. They were less inclined to think that about an actor, political leader, or religious leader.

Residential respondents still rely on traditional media for information about community issues, with respondents placing newspapers (53%) as most important, followed by television (38%) and radio (15%). Internet, community newsletter and local cable were less popular, with 13%, 8% and 6% of respondents, respectively, citing them as their main source of news.

Findings from Managed Property Survey
(Includes Some Comparisons with Residential Survey)

The target population for the managed property sector survey consisted of property owners and managers, commercial landscape designers and maintenance contractors, and homeowner associations, based on the PAC and others' recommendations.

A judgmental sampling technique was used to select participants for the survey. This is a standard non-probabilistic approach used in surveys of this nature. As part of this approach, the Water Resources Institute contacted various water and landscaping industry groups, homeowners associations, Chambers of Commerce and professional organizations asking them to identify individuals who would be knowledgeable about landscape water use in managed properties.

The managed property questionnaire reflected both closed-item and open-ended questions designed to elicit information relative to outdoor water use and attitudes of those that irrigate larger properties.

A Web-based survey posted online at Surveymonkey.com was conducted. Using a web-based format allowed respondents some flexibility as to when and where to take the survey. Those who preferred a one-on-one survey were interviewed by WRI staff who then entered the responses on-line. Respondents were contacted personally, or via professional associations related to either landscaping or property management. When necessary, numerous follow-up phone calls were made in order to obtain the minimum of 72 irrigated properties (twelve per region) throughout the state. The process yielded a final sample size of 112 respondents.

The Water Resources Institute conducted the web-based survey between February 1, 2007 and March 8, 2007. The questionnaire is attached as Appendix C. Following are the major findings from the managed property survey. A full data display of statewide findings is available in Appendix III.

Water Use Behavior and Lifestyle

Initial findings indicate that most homeowners (56.1%) across the state use automatic sprinklers with a smaller number (31.5%) reporting only watering by hand. A small percentage (12.3%) used a combination of both methods. In contrast, the managed property survey found 72% of respondents using sprinklers, hardly any watering solely by hand (2.7%), but nearly one in four (24.3%) using a combination.

Slightly less than half of the respondents (49.5%) in the managed property survey reported irrigating properties that were 19 acres or smaller while 45% managed properties that are 40 acres or larger. Most of the properties (84.7%) report landscapes that are a combination of grass, groundcover, trees and shrubs, and annul flowers. About 43% of the respondents reported landscaping on more than 30% of the property. While one in three respondents (30.9%) said turf

accounted for less than one-fourth of the landscape, 90.1% said that grass was either very important (66.7%) or somewhat important (23.4%) to their landscape.

Barriers to reducing landscape water use

Commercial properties varied widely from residential customers and each other in their reasons for not reducing landscape water use.

But, like homeowners/tenants, managed property decision makers like turf too. The key in changing behaviors for this segment is their pocketbook; the top concern for those who work with managed properties is money—whether they will need to spend it to save water, whether they can get some back in rebates for saving water, or how long it will take to recoup costs of updated technology. To change behavior among this segment, the survey suggests that people want to see the monetary benefits. As long as prices remain low for irrigation water, there is little incentive to lower use.

Additionally, some felt that competition dictates water usage, especially in housing developments. “The value of the homes in the community compared to the competition will always outweigh the social consciousness of using plants and irrigation controllers that save water,” wrote one managed property survey-taker.

Another barrier among managed properties, particularly among golf course managers, is their apparent disconnect in the definition of landscaping versus turf. They view turf as a necessity for their business, while “landscaping” is the decorative part around the edges. The respondents in this category watch their water use very closely, and are open to proven technologies that can save their investment. Several reported, however, that the weather based controllers that they had used put too much water on the landscape, depending on wind and other conditions.

Those who work with homeowners associations cited needing approval by the HOA board before switching to ET controllers, offering possibly another market segment to be targeted, but also placing the water decisions on a group of volunteers with questionable landscape irrigation knowledge.

Incentives (and disincentives) in landscape water use efficiency

Price is the most important factor to property managers that irrigate large properties, whether they are publicly or privately owned. When asked to rate the importance of the amount of the water bill on a scale of 1 to 10, with 10 being the highest (Q15), two in three of the managed property respondents indicated it is highly important, ranking it at an 8 or above. Of those, the highest level of response was a ranking of 10, which 30.4% of the respondents reported. Nearly all (99.1%) also reported that conserving water is important to them (Q#16) and 78.4 reported using water efficient plants in their landscape (Q#18). However, two- thirds of the properties (64.9%) do not have irrigation system that shuts off during the rain (Q#19), or one that adjusts water according to changes in weather conditions (63.1%). Most, however, reported being

willing (60.4%), or *maybe willing* (28.1%) to switch to such a system (Q21). The prospects of saving time, money, and the health and appearance of the landscapes would be a factor in switching to such system for 73.3% of the respondents, although 17.1% said saving money was their top reason for switching. About half (48%) expressed interest in finding a landscaper knowledgeable about water saving techniques and plants; 45.8% of the respondents said they would expect to get that kind of information from their local water district (Q24). And nearly half (45.9%) said they would be most likely to listen to their local water district when making decisions about water conservation.

Slightly more than half (55%) said they would be willing to attend a free weekend workshop. The rest were split fairly evenly among those who would not be willing (20.7%) and those who didn't know if they would be willing (24.3%). The majority (57.9%) said that a convenient time and location would inspire them to attend a workshop, and many stated that a weekend is ***not*** a convenient time for them. The next most common responses were receiving a credit on their water account (14%) and a coupon for a water-saving sprinkler controller (8.4%).

More than half (57.8%) reported being willing to install water saving technology even if it cost more to purchase than a traditional sprinkler system, and a larger group (79.4%) said they would be willing to pay more if such a system would save them time and money in the future. And 73.1% said they would pay more for a system up front if a rebate were offered. Most (57.6%) said the rebate would need to be 30% of the purchase price, while 19.2% said a 20 percent rebate would entice them, and 9.1% said a 10 percent rebate would be sufficient to entice them to make such a purchase. About 14% said a rebate would not make them switch.

Two in three (66.7%) said they are willing to send their landscaper to such a class.

More than half (56%) reported having installed *indoor* water saving features at the property, perhaps indicating further a willingness to conserve outdoors (Q#29)

Managed property respondents said that conservation measures would be more effective if water agencies somehow linked conservation to finances. Some suggested raising rates; others suggested tiered pricing systems or financial incentives for conserving. These latter respondents reported little incentive to conserve when they face rising rates even if they do conserve.

Q15. Is amount of water bill concern for you on scale 1-10? 8 or above	59.7% (8 or above)
Q16. Is conserving water important to you?	99.1% YES
Q18. Does landscape include water-efficient plants?	78.4% YES
Q19. Does your irrigation system shut off when it rains?	64.9% NO
Q20. Does sprinkler automatically adjust to weather conditions?	63.1% NO
Q21. Would you be willing to switch to "smart" sprinkler system?	88.5% (willing or maybe willing)

Messages that will resonate with landscape property managers

Interestingly, 63.3% of the residential survey respondents reported that they had not heard any ads about outdoor water conservation in the past few months. A similarly high (61.6%) of the managed property survey respondents reported the same. This may be a result of the timing of the surveys in January and February, rather than during the summer, when water agencies typically ramp up their outdoor conservation messages.

When asked to rank a series of possible media messages and comment about whether they would, might or would not work, respondents to the two surveys differed significantly.

Among residential customers, a combined 62.4% responded that stressing the cost of water *would work* (30.9%) or *might work* (31.5%), but 36.2% of respondents said such a message would not work. A larger percentage of managed property respondents, 89.4%, reported that stressing the cost of water *would work* (56.8%*)* or *might work* (32.6%). Differences in attitude about water costs varied, with some business owners calling water their most costly expense, while others, especially those who manage public properties, claiming that low water costs are the biggest barrier to widespread conservation.

A large portion of residential survey respondents thought that environmental messages that stress run-off and pollution issues would help conservation, with 76.8% reporting that such messages *would work* (43.3%) or *might work* (33.5%). A comparable 77% of those who took the managed property survey thought messages that show how excess run-off pollutes rivers and streams *would work* (39.6%) or *might work* (37.4%).

More residential survey respondents, 70.8%, felt that media messages that tie conservation into good citizenship *would work* (37.2%) or *might work* (33.6%). In comparison, 54% of the managed property survey respondents felt that tying conservation to good citizenship would be effective, with 15.7% reporting such a message *would work*, and 38.2% stating it *might work*.

Most residential survey respondents were moved by the idea that low water plants could also be low maintenance and said that media message stressing that water efficient plants could save them work as well as water *would work* (49.8%) or *might work* (37.5%). Less work also appealed to the managed property sector, with 35.7% reporting that a media message stressing low maintenance *would work* and 45.2% reporting it *might work*.

For some, a picture of an attractive water-wise garden would be worth thousands of words about conservation. Nearly nine in ten of the residential survey respondents (86.7%) said a media message that showed an attractive water efficient garden *would work* (53.7%) or *might work* (32.9%) to encourage people to conserve water. Nearly the same percentage of those in the managed property sector thought that attractive demonstration gardens in media messages *would work* (45.6%) or *might work* (42.2%).

While nearly half of the residential survey respondents (49.2%) believed that media messages that say “60% of all drinking water in California is used for outdoor conservation” would be effective in encouraging conservation, only 22% of those in the managed property survey agreed.

A common theme among the managed property respondents was that people do not differentiate between drinking water and that for other uses. Tying that message to drought-proofing might significantly improve the message with both sectors.

Once a conservation campaign is conceived, the next logical question is to determine who best to deliver it. Again, the two sectors differed somewhat in their views.

In describing who would be *very effective* at encouraging water conservation, 42.8% of residential survey respondents said a gardener, while 36.9% said a child in their family and 28.2% said a university expert. They were less inclined to think that about an actor (17.5%), political leader (14.1%) or religious leader (11%). In comparison, when asked who they would be most likely to listen to when making decisions about subjects like water conservation, 45.9% of the managed property survey respondents said they would look to their water agency and 27.5% said a gardening expert. Those who cited a member of clergy or a neighbor with a water saving garden were very few.

People still rely overwhelmingly on traditional media for information about community issues, and among those who took the managed property survey; half reported that a newspaper is the most important source for news about community issues, followed by television, community newsletter, Internet, radio and local cable channel, in descending order of importance.

MESSAGE	**Would work**	**Might work**	**Would not work**	**Do not know**
Q35A.Messages that stress the cost of water?	56.8%	32.6%	7.4%	3.2%
Q35B. Messages that stress runoff pollutes rivers, streams and oceans	39.6%	37.4%	14.3%	8.8%
Q35C. Messages that tie conservation with good citizenship	15.7%	38.2%	38.2%	7.9%
Q35D. Messages that emphasize water-efficient plants are low maintenance	35.7%	42.5%	10.7%	8.3%
Q35E. Messages with attractive demonstration gardens with water-efficient landscaping	45.6%	42.2%	8.9%	3.3%
Q35F. Messages stressing 60% of drinking water is used on outdoor irrigation	22%	34.1%	29.7%	14.3%

Marketing Recommendations

Following is a list of marketing recommendations derived from survey data, literature review, and experience in the field of water conservation. Some of these recommendations involve possible vignettes of media ads. The reader should be aware that before any such marketing efforts are undertaken, "mock-ups" of the marketing strategies should be confirmed through focus group analysis.

1. Develop a statewide marketing campaign to encourage landscape water use conservation behavior of California residents. Possible themes include:

a) Positives of Water Smart Landscapes

The two-step approach to marketing, however, does not refute the fact that under certain circumstances mass marketing can have the desired effects as long as it appropriately takes into account relevant market segments, e.g. age, class, personality traits. IAR/WRI recommends that a statewide marketing campaign be developed illustrated by the following "vignettes" touting the attractiveness/ease of care of Water Smart Landscapes and the personal pride/ sense of responsibility that may come from having such a landscape. The four lifestyle "vignettes" involve multiple influences on behavior which offer the greatest potential for changes toward drought-tolerant landscaping and irrigation technologies.

- Perhaps Bob could be entertaining some neighbors in his back yard, lounging around the gazebo. Someone compliments Bob on the changes he's made and comments that his landscape is always the envy of everyone in the neighborhood. "How do you do it Bob, with the dental practice, the volunteering, and the after school soccer games?" He replies that his landscape is important to him—but that time for the important things (kids? Entertaining? Relaxing in the garden) is even more so, and then tells them how he used to spend X time on his landscape, but now spends half that time. (A Metropolitan survey found that saving water on plants was not of interest to a group of 50 homeowners questioned about their landscapes, although they would be interested in water conserving landscapes--especially if they maintenance needs decreased). This suggested "marketing strategy" is derived from the literature and initial data analysis which indicated that appearance and ease of maintenance are important factors.

- Ted, however, has different issues. He doesn't have much interest in gardening, but is looking for an attractive landscape nonetheless. First you see him mowing the grass, fertilizing it, watering it. He's obviously not at peace, but doing what is expected of him in the neighborhood. He knows there must be a better way. Next you see him in the hammock in the small, but well designed attractive (and attainable) back yard. He talks (conspiratorially perhaps) about how he's getting one over on the neighbors (who can still be seen mowing the grass next door)—

his landscape is beautiful, he has time to lounge, AND he's purchased patio furniture with the money he'll be saving over the coming years. This suggested "marketing strategy" is derived from findings that cost is an important factor.

- Jenna is as Californian as gridlock on the 405. She's young, athletic; she's a surfer. She talks about her connection to the ocean and to the environment. And she talks about how she gets sick after rains (or has to avoid the water) because of the polluted run-off and the effects on the coral reefs. This message could be a simple testimonial. Or it could be expanded into a plea for "California Natives for the health of California natives." This suggested "marketing strategy" is derived from findings that over 80% of respondents think messages that stress runoff from irrigation pollutes rivers, streams and oceans would work or might work.

- Fred exits a gridlocked freeway at the end of a day at the office, tie loosened and looking weary, and drives past a series of vibrant colorful California friendly gardens outside the bank, on the median, and two homes. He pulls into his driveway surrounded by a vast expanse of nothing but grass as the voiceover says, "Isn't it time you enjoyed a California Friendly Garden too?" This suggested "marketing strategy" is derived from findings that 87% of respondents think messages that stress attractive demonstration gardens with water-efficient landscaping would work or might work.

b) "The cost of doing nothing"

Develop a statewide marketing campaign on the costs of not doing anything. This is where we consider the human, ecological, environmental and financial costs of California's water situation, and this is where we use news footage to bolster the message. Perhaps in a "COPS" sort of feel, we could bust the "bad boys" of urban run-off (images of flooding); climate change (empty ski slopes/dying trees in the Sierras?) and drought (fish dying?) This suggested "marketing strategy" is also derived from findings from residential and managed property owners that over 80% of respondents think messages that stress runoff from irrigation pollutes rivers, streams and oceans would work or might work.

c) Use images of children

Develop a statewide marketing campaign using images of children – in the water, on a playground, at a school, as children's voices discuss the importance of water reliability and quality for them. A statewide campaign to enlist California's children to become "ambassadors" for Water Smart Landscapes in the same fashion as recycling in the 80's and 90's should be considered. This suggested "marketing strategy" is derived from finding that 72% of respondents report a child in their family would be a very effective or somewhat effective person to deliver a conservation message to them.

d) Responsibility for the environment

Develop a statewide media message to homeowners that "We Can All Do Our Part." This would be a three-part series of messages. One will be homeowner-to-homeowner (look, it only takes small steps—an ET controller, drought tolerant plants); One will be a farmer who has installed water saving measures on his farm to the homeowner (I grow turf for a living, and if I can practice conservation, you can too); one will be child and their parents (we're doing what we can to secure a reliable supply for their future; now you do your part). This suggested "marketing strategy" is derived from the finding that 93% of respondents strongly agree or agree that individuals should take responsibility for the environment around them.

2. Provide more cost-information to consumers

Develop a software program for all retail agencies to place price information on the retail water bills so consumers can make their use decisions based on the cost of the resource. This "marketing strategy" is based on a 2006 analysis of the informational content of sample water bills collected from 383 utilities across the USA found price elasticity increased by 30% or more when price information was given on the bill (Gaudin, S. 2006).

3. Conduct a pilot study using the two-step flow of communication as a strategy to encourage changes in landscape water conservation behavior.

One of the key results of the residential survey was that most people do not recall recent media ads about outdoor water conservation, and even those who recall the ads do not remember much about the content. As noted earlier in this report, this may have been a result of the timing of the surveys in January and February, rather than during the summer when water agencies typically ramp up their outdoor conservation messages. Regardless, questions still persist as to whether the mass media messages are remembered and whether they are the most effective tool for changing the landscape water use behavior of homeowners/tenants and managed property representatives.

Consequently, IAR/WRI's first recommendation is that a portion of future marketing efforts should be based on the two-step flow of communication rather than direct mass marketing (as has been tried in the past). Essentially, the two-step flow first focuses on opinion leaders who serve, in turn, to transmit the message to their constituents. As discussed in the section of findings of the residential survey, there is a rich body of sociological literature which supports the effectiveness of such a marketing approach for transmitting a message to the general public or to specific market segments.

What does this mean in concrete terms? IAR/WRI suggests that organizations seeking to promote greater conservation should put a large amount of advertising dollars into preparing informational materials (brochures, internet designs, etc.) that can be transmitted to specific opinion-leaders such as water suppliers who influence their customers; or teachers within the

school system who then influence their students, who in turn influence families "in control of the tap." Similarly, this procedure could work with environmental organization leadership, heads of organizations frequented by seniors, etc. Since these individuals are embedded in social circles as opinion leaders, the literature suggests that they are more likely to "get the message across" and actually monitor changing behavior than are abstract ads delivered by the mass media. Moreover, this approach is highly cost-effective as opposed to TV and radio time. Further, it is extremely difficult to disseminate highly technical information via the mass media (TV, radio, or billboards) which rely on brief snapshots and/or sound bites to motivate people. In contrast, the two-step flow approach is a much more effective way of communicating more technical information since an opinion leader such as a gardener who reads technical information can then transmit the information in everyday language to the "end user."

IAR/WRI recommends that a pilot study be conducted which evaluates the relative effectiveness of the two-step flow approach and mass media marketing in changing self-reported and actual behavior.

4. Develop targeted training and education programs

a) Educate the population regarding the ET controller

Develop a series of marketing materials to "introduce" the new kid on the block—the ET controller-- to the neighborhood (perhaps a typical development) could overcome the lack of knowledge of the technology that many homeowners cited. These ads could be print—newspapers, billboards, or posters designed to be hung in gardening centers. This suggested "marketing strategy" is derived from the finding that only 12% of respondents are familiar with sprinklers that adjust watering with changes in weather conditions.

b) Educate consumers about the level of water waste

Develop a statewide education program to inform Californians that they are both using and wasting a lot more water on their outdoor landscaping than they ever imagined. Most respondents thought they were using less than 50 gallons a day on irrigation. This "market strategy' is based on the finding that of the 43.4% of residential respondents that think they know how many gallons are used per day when watering the landscape, a startling 94% of homeowners/tenants think they use less landscape water than the statewide average of 185 gallons per day. Given that California voters have approved five water bonds in eight years, PROP 13, 40, 50 and 84 whose primary message was "reliable and safe drinking water," illustrating the level of waste seems prudent.

c) Train landscapers and homeowners/tenants about water-conserving landscapes

Develop a statewide program similar to Metropolitan's Protector Del Agua program statewide to provide funding to water suppliers to set up local programs to train professional landscapers and homeowners about water conserving landscapes and techniques. The California Urban Water Conservation Council should target industry

groups, such as the California Community Association Managers, with classes at convenient times and locations and offer them a substantial rebate if they purchase and install ET controllers. This "marketing strategy" is based on consistent patterns resembling MWD's 2006 tracking study that one in three have heard the phrase "California Friendly," but only 24% know what it means.

5. Seek funding for standardized rebate programs across the state

Residential respondents believe rebates would work but they vary between service areas throughout the state making it impossible to develop a universal marketing strategy for California. The Council should consider taking the lead working with local agencies with seeking state and federal funding acquiring funding to administer a statewide rebate program for all residential consumers with standardized rebates for all water use efficiency actions.

Closing Comments

In conclusion, the study found that most people generally report wanting to "do the right thing," or they think they already are doing so. Further marketing campaigns through the mass media or two-step flow of communication should attempt to address this disparity between consumers' perceived knowledge and their actual knowledge of water usage and conservation. Additionally, people must be convinced that water efficient urban landscapes are easy to care for, friend- and family-friendly, low-maintenance, attractive and environmentally sound.

This recommendation does not apply solely to homeowners and tenants in residential properties, but it applies equally well to people who control the tap at managed properties such as members of homeowner's association boards who may have little knowledge about water-saving landscape design possibilities, professional landscapers, etc. Ultimately all of these market segments need information, well-crafted messages, and targeted incentives, to help them make the necessary changes. With the information that is being gained through this statewide project and other related marketing research projects, California should be able to shape more effective strategies to improve landscape water use efficiency.

Appendix A

Literature Review

Literature Review Summary

An exhaustive review of the literature regarding outdoor conservation was conducted utilizing standard web-enabled research tools to review academic studies, surveys, reports and training tools. Materials from public agencies in California and the western states were collected from water districts, conservation districts and resource conservation districts that have undertaken programs to improve the efficiency of water use in new and existing irrigated landscapes throughout the nation in digital or in hard copy. Marketing materials from manufacturers of irrigation technology, retail and wholesale water efficient landscape marketing materials to the residential and managed property sector and similar materials from landscape architects, contractors and service providers were also collected digitally or in hard copy.

Highlights gleaned from academic journals, water agencies, environmental groups and irrigation supply retailers and wholesalers are summarized below by topics and are referenced to the source material contained in the bibliography.

Landscape Water Use Studies and Surveys

1) A 2006 Public Policy Institute of California (PPIC) report, *Lawns and Water Demand in California*, found that price sensitivity is higher when customers face increasing block rates rather than uniform rates; however, increasing block rates are most prevalent in the coastal and inner coastal zones, where water authorities have been more active in statewide conservation programs because uniform rates have long been abolished. This report also found that housing size, not climate, accounts for the higher usage inland compared to coastal communities.

2) A field study conducted by Southern Nevada Water Authority (SNWA) of 472 residents who converted at least 500 square feet of traditional turfgrass to a combination of desert-adapted shrubs, trees, some ornamental grasses, and mulch. Homeowners were required to plant sufficient vegetation so that the xeric landscape would at a minimum have 50% canopy coverage at maturity to avoid the creation of unattractive landscapes composed exclusively of rocks, which could potentially act as urban heat islands. The average area converted was 2,162 square feet. The study found that the SNWA's Water Smart Landscape Program brought in $1.58 for each $1.00 spent on rebate incentives, freeing up local water resources. There was an average savings of 30% (96,000 gallons) annually for those who converted from turf to xeriscape, with savings most pronounced in summer. However, over the long timeframe of this study, total yearly savings have neither eroded nor improved across the years. On average, household consumption drops immediately and quickly stabilizes. There was an

average savings in landscape management of 2.2 hours per month and $206 per year in maintenance expenditures. (Sovocool, 2005)

3) An Irvine Ranch Water District (IRWD) ET study found that weather-based irrigation controllers reduced water consumption by 41 gallons per household per day but the total cost of the conversion was not recouped by what homeowners saved on their water bills. This could limit the opportunity to promote conversions to such systems as a way to save money. Other studies suggest that this problem could be mitigated through rebate programs because the study group reported that the controllers were convenient. (IRWD, 2001)

4) Based on the SNWA and IRWD studies, the PPIC pointed to the potential benefits of a broad-based landscape irrigation efficiency campaign designed to replace high-water using turf with more drought tolerant landscapes, supported with the latest in irrigation technology.

5) *Waste Not, Want Not: The Potential for Urban Water Conservation in California*, a study by the Pacific Institute, suggests that consumers would find it cost effective to implement water conservation methods because of decreases in other costs, such as decreased sewage bills, less polluted landscape runoff, decrease in energy consumption and improvements in air quality. Residential landscape use plays a large role in driving the need for increases in system capacity and reliability yet much of this water is lost to evaporation and transpiration and is thus no longer available for capture and reuse, unlike most indoor use. Proper management of outdoor water use is the most effective way to reduce water waste. Properly designed rate structures combined with public outreach to help customers understand why they fall into higher categories and how to reduce their use are suggested (Gleick 2003).

6) A 1995 joint survey by the Los Angeles Department of Water and Power (LADWP) and the East Bay Municipal Utility District (EBMUD), linked drought scenarios to questions about possible rebates for water saving technology found that half of the respondents reported a willingness to install high priced water saving devices with high rebate rates. These two agencies serve more than 5 million consumers in the two most populous areas of the state.

7) A 2004 Santa Clara County Residential Water Use Baseline Survey studied single- and multi-family residences in Santa Clara County to determine the distributions of water-using appliances, fixtures, and landscapes in the residential sector. The survey showed that most households do not consider water to be a major household expense. The study also assessed Santa Clara County residential customer knowledge and attitudes about water use and conservation. The survey found that automatic, in-ground, systems with pop-up spray heads are the most common type of system for both single- and multi-family housing. Most irrigation systems inspected had at least one problem affecting its water use efficiency. Study results indicate that most households believe they can save

more water indoors than outdoors. However, households knowledgeable about their water use tend to believe the opposite.

8) A 2006 Metropolitan Water District of Southern California (MWD) study found 34% have purchased drought tolerant plants in the previous 6 months, 40% have heard of water saving products, 16% knew of rebates; and while 22% know about smart sprinklers (up 7% from 2005) and only 4% know of rebates attached to them. While one in three have heard the phrase "California Friendly," in connection with the Metropolitan's conservation advertising, only 24% know what it meant. These results show that there is growing awareness of water conserving landscapes, but that many homeowners are still unaware of the choices of drought tolerant plants, where to get them, or the rebates attached to landscape water use efficiency.

9) A 2006 Outdoor Water Usage survey by Metropolitan found that saving water on plants was not of interest to a group of 50 homeowner couples questioned about their landscapes, although they would be interested in water conserving landscapes--especially if their maintenance needs decreased.

10) An earlier Metropolitan study found respondents had virtually no awareness of weather-based irrigation controllers or rebates for them. Many respondents reported a willingness to use drought tolerant plants if it were easier to find and learn about, but only 6% reported awareness of bewaterwise.com, the District's web site devoted to water efficient landscapes.

11) 2003 telephone public opinion survey of water conservation for the San Diego County Water Authority (SDCWA) found that residential water conservation practices had not changed much from the 2000 survey, with one-half of residents conserving water regularly through reduction of lawn area or replacement of plants with more water efficient varieties to lower water bills and/or easier maintenance. The one-half of the residents with landscaping that are not moved toward reducing lawn size or replacing plants by lower bills or easier maintenance are unlikely to be induced by further financial considerations. (Richard A. Parker, Ph.D., of San Diego State University, and principal in Rea & Parker Research, joined with Mr. Coe and Catherine Happersett of SSRL).

Studies related to price or price awareness

12) Water providers nationwide are implementing non-price conservation measures such as education, public information, appliance retrofit and ordinances, with the expectation that these programs will reduce residential water demand. However, econometric studies done before 2000 indicate these programs had minimal impact on residential water demand. (Michelsen, McGuckin, and Stumpf, 2000).

13) A 2006 analysis of the informational content of sample water bills collected from 383 utilities across the USA found price elasticity increased by 30% or more when price information was given on the bill (Gaudin and Mion, S. 2006). In other words, demand falls when consumers are aware of the price of their water.

14) Non-price conservation programs in seven cities in the southwestern United States were analyzed to investigate the effectiveness of such programs in reducing water demand. They found reductions in use ranging between 1.1% and 4% per program. (Michelsen, McGuckin, and Stumpf, 2000)

15) Well-informed consumers, aware of issues of water conservation and of techniques for water efficient use, may be more inclined to reduce their water consumption. A 2005 study indicated that, while informed households were more responsive to average and marginal price signals and also use less water, this is due to difference among the respondents rather than price knowledge. Controlling for those differences, price knowledge actually increases monthly water usage, possibly because customers overestimated the price of service. While this may be surprising, it is consistent with electricity use experiments in which information and self-monitoring programs resulted in downward revision of the estimated costs thereby increasing consumption (Carter and Milon 2005).

16) Regulators could design an incentive compatible pricing system using estimates of ungrouped or disaggregated demand to attain conservation goals with minimal enforcement costs and welfare loss (Kraus, Chermak, Brookshire 2003).

17) Renwick and Green (2000) used a model that incorporated alternative demand side management (DSM) policy instruments (such as water allocations, use restrictions, public education) and increasing block pricing schedules and found that price, combined with alternative DSM policies, were effective in reducing demand.

18) The Texas Water Development Board created a Water Conservation BMP guide that includes suggestions that utilities should move toward adopting billing software that allows customers to compare water use on their bill with average water use for their customer class as well as their individual water use for the last 12 months. (Report 362, Texas Water Development Board, 2004).

19) The California Bay Delta Authority sponsored a study of urban water conservation potential conducted by the Council as part of its comprehensive review of the Water Use Efficiency Element of the CALFED Bay-Delta Program. The study found that reducing water use through conservation can benefit urban water users because costs associated with water development, transmission, treatment, storage, distribution, and disposal can be avoided. (CBDA 2005)

20) *The California Water Plan, Volume 2*, details urban water use efficiency efforts and potential benefits of further efficiencies and sets out recommendations for attaining them. (California Water Plan Update 2005). Recommendations include standardized, baseline data about water use; field testing and evaluation of new technologies; and public education. The report also recommended funding to support incentive programs; collaboration among entities to build water efficient homes and communities, and rate structures that encourage conservation.

Behavioral Studies and Attitudes

21) There are substantial disparities between survey responses and manifested actions. They also indicate that well-accepted patterns of conservation response ascribed to various demographic segments in the survey format need to be more precisely qualified before equating them to performance (de Oliver 1999).

22) Stern (2005) posits that the best way to change behavior depends on the behavior and its context. Interventions in the context are more effective than targeting individuals directly and because a variety of factors influence behavior, creative approaches involving multiple influences on behavior offer the greatest potential for change.

23) Social science literature suggests that there is a two-step flow of communication in marketing studies. Specifically, information should be first marketed to opinion leaders (including children) who, in turn, transmit the information to others in their social circle. These studies also conclude that different opinion leaders are effective in different market segments. (Weimann, 1991), (Crispell, 1989), (Leiss, 1992), (Poltrack, 1985), (Katz & Lazarsfeld, 1955), (Schiffman & Kanuk, 2004)

24) Social science literature suggests that class and culture are critical components for delineating market segments regarding environmental issues. (Lazarsfeld, Berelson, and Gaudet, 1944), (DeFleur & Lowery, 1995), (Nisbet, 2007)

25) Some studies show that conservation efforts should transcend nature-versus-landscape arguments because in most real-world contexts, both contextual and personal factors are involved in shaping environmental behavior, so a variety of factors are potentially available for bringing about behavior change. (Corral-Verdugo, V., et al. 2003), (Corral-Verdugo, V., et al. 2002), (Stern 2005).

Public Policy Studies and Recommendations

26) A 2001 statewide review of implementation of Assembly Bill 325 (The California Model Water Efficient Landscape Ordinance) found virtually nonexistent monitoring or enforcement of maximum water use. Lack of awareness among developers and contractors also erodes the effectiveness of the ordinances. (Bamezai, 2001)

27) A lack of qualified personnel was the most commonly cited reason for lack of compliance with and enforcement of ordinances. (Bamezai, 2001)

28) Municipalities with ordinance-making powers should consider adopting ordinances that require all new apartment complexes and commercial buildings to install a water conserving landscape. (Report 362, Texas Water Development Board, 2004)

29) The findings for the Council's Best Management Practices 5 Preliminary Needs Survey for large landscape conservation programs indicate that if agencies had access to easy-to-use tools or assistance, then they could implement a BMP5 program; there was positive response for an online Web-based tool.

Retail Tidbits

30) The corporate environmental coordinator for Lowes said in an interview that the store devotes no space to water conservation education in the store because it is "useless." (Interview conducted December 2006 with coordinator from Lowe's North Wilkesboro, NC headquarters).

31) A perusal of the Rainbird site found algebraic equations seemingly too intricate for the average homeowner looking for basic information, although useful in determining total water usage needed.

Notable Water District Education and Training Programs

32) Metropolitan's Protector Del Agua, a bi-lingual landscape training program, began for professional landscapers in 1994 and for homeowners in 1997. There have been a total of 40,789 participants across 1,896 classes.

33) Eastern Municipal Water District's Web site offers $185 per household for efficient landscape irrigation technology, in a program funded by a Bureau of Reclamation grant.

34) Contra Costa Water District offers a free garden CD-ROM tailored to Contra Costa County conditions as well as landscape water use efficiency tips, videos for loan, and large landscape rebate programs for multi-family housing.

35) The Garden in Every School Program sponsored by the Inland Empire Utility District provides the materials and technical assistance to install water use efficiency gardens but partners schools with local civic groups (Kiwanis, Rotary, etc.) to maintain and sustain them.

36) Santa Clara Valley Water District offers a virtual Web-based tour of native plant gardens, a landscape rebate program that offers up to $1,000 for turf replacement, free Saturday landscaping workshops and water-wise house calls.

37) Marin Municipal Water District offers conservation programs that range from using the district's suggested weekly watering runtimes to improving landscapes and irrigation systems with "Bay-Friendly Landscaping" rebates on purchases of efficient irrigation equipment and supplies. The district web site discusses area-appropriate plants, irrigation design and offers links to a variety of other useful sources, including the California Native Plant Society, weather reports, and an irrigation scheduling tutorial.

38) Sonoma County Water Agency offers free water efficient landscaping classes to train professional landscapers, rebates on weather based irrigation controllers, tips for saving water outdoors, and links to CIMIS for information about area watering needs.

39) East Bay Municipal Utility District produced a book, *Plants and Landscapes for Summer Dry Climates*, which it offers for sale on its web site. It also offers vouchers for irrigation controllers and weather sensors and rebates up to $1,000 for single-family homeowners who convert their high-water-use gardens into water-conserving landscapes. On-site water use surveys are offered, as well as conservation workshops and events such as garden tours and plant sales.

40) The City Makeover grant from Metropolitan Water District and the Bureau of Reclamation supports the city of Santa Monica's garden/garden project, a side-by-side comparison of a traditional landscape with that of a water efficient one. The results are readily displayed, so visitors can see the water saving, maintenance and green-waste-reduction benefits of a water conserving landscape.

41) Since 1980, more than 14,500 people have undergone Master Gardener training. Beyond a textbook required of class participants, the Master Gardener program does not offer a curriculum or tips for the general public; individual master gardeners, however, can provide those via community talks, gardening columns in local newspapers, or by teaching community workshops.

APPENDIX B

Residential Survey Questionnaire

Landscape Water Use Efficiency Survey

SHELLO Hello, I am calling from the Institute of Applied Research at Cal State University, San Bernardino. We're conducting a statewide scientific study of landscape water use, and I'd like to talk with an adult in the household who is familiar with your outdoor watering system.

SHEAD Are you that person?
1. Yes [SKIP TO HOUSEQUAL]
2. No, our gardener takes care of it [SKIP TO HOUSEQUAL]
3. No, we live in an apartment/condo/mobile home with no landscaping [TERMINATE]
4. No, someone else in the house does [CONTINUE TO SHEAD2]
8. DON'T KNOW/NO RESPONSE [TERMINATE]
9. REFUSED [TERMINATE]

SHEAD2 Is that person at home?
1. Yes [SKIP TO HOUSEQUAL]
2. No [CONTINUE]
8. DON'T KNOW/NO RESPONSE [DISPOSITION A CALL-BACK]
9. REFUSED [DISPOSITION A CALL-BACK]

CALLBK Is there a better time I could call back to reach that person?
1. YES [SKIP TO APPT]
2. NO [TERMINATE]

HOUSEQUAL First, do you live in an apartment, condominium or mobile home park that maintains the outdoor landscape for you? **[IF YES….. TERMINATE: "Thank you but we are only surveying single family homeowners with a yard."]-SKIP TO THANKS2**

INTRO This survey only takes about 10 minutes to complete, and your answers will be used by local water agencies to learn more about how homeowners water their lawn and garden. Your identity and your responses will remain completely anonymous, and of course, you are free to decline to answer any particular survey question. I should also mention that this call may be monitored by my supervisor for quality control purposes only. Is it alright to ask you these questions now**?**
1. YES [SKIPTO AGEQAL]
2. NO [CONTINUE]

APPT Is it possible to make an appointment to ask you the survey questions at a more convenient time?
YES (SPECIFY)_____
NO [ENDQUEST]

AGEQAL First, I'd like to verify that you are at least 18 years of age.
1. YES [SKIP TO B1]
2. NO

QSORRY I'm sorry, but currently we are interviewing people 18 years of age and older. Thank you for your time. Is there someone available who is 18 or over 18 who takes care of the watering?
1. Yes (back to SHEAD 2)
2. No (skip to Thank2)

B1 Now, how is your lawn and garden watered? Do you have an automatic sprinkler system or do you water by hand?
1. Automatic sprinkler **[CONTINUE]**
2. Water by hand **[CONTINUE]**
3. Both **[CONTINUE]**
4..Neither -- no need to water **[GO TO THANK YOU SCREEN]**
9. REFUSED **[CONTINUE]**

TRANS1 I'm going to read you some possible ways of encouraging people to conserve water. Please tell me whether you think each of them WOULD work, MIGHT work, or WOULDN'T WORK AT ALL.

THE FOLLOW "IM" QUESTIONS DEAL WITH INCENTIVES AND MESSAGES

IM1. First… a program which would offer cash for reducing the size of your lawn and replacing it with more water efficient plants. Do you think that ***would*** work, ***might*** work, or would not work at all?

1. Would work
2. Might work
3. Wouldn't work at all?
4. Depends on the amount of money offered
8. DON'T KNOW
9. REFUSED

IM2. How about rebates for sprinkler timers that adjust watering with changes in weather conditions? Do you think rebates ***would*** work, ***might*** work, or would not work at all?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on the amount of money offered
8. DON'T KNOW
9. REFUSED

IM3. How about rebates for putting in a drip system?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on the amount of money offered
8. DON'T KNOW
9. REFUSED

IM4. Media messages that stress the cost of water….would they work?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on how good the message is
5. DON'T KNOW
6. REFUSED

IM5. How about environmental messages that show how excess water running off lawns and gardens pollute rivers, streams and oceans?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on how good the message is
8. DON'T KNOW
9. REFUSED

IM6. Media messages that stress being a good citizen by conserving?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on how good the message is
8. DON'T KNOW
9. REFUSED

IM7. Media messages that emphasize that water efficient plants can also be low maintenance? Do you think that ***would*** work, ***might*** work, or wouldn't work at all?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on how good the message is
8. DON'T KNOW
9. REFUSED

IM8. How about messages that show a demonstration garden with attractive water efficient landscaping…would that work?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on how good the message is
8. DON'T KNOW
9. REFUSED

IM9. And finally, how about a media message that says that 60% of all drinking water in California is used for outdoor irrigation? Would that work?

1. Would work
2. Might work
3. Wouldn't work at all
4. Depends on how good the message is
8. DON'T KNOW
9. REFUSED

IM10. Do you recall seeing or hearing any ads or advertising messages about outdoor water conservation in the past few months?

1. Yes
2. No
8. DON'T KNOW
9. REFUSED

IM11. **[IF YES TO IM10]** What messages do you recall from the ads? **[OPEN ENDED QUESTION]**

IM12. **[IF YES TO IM10]** Did the messages cause you to change your behavior?

1. Yes
2. No
8. DON'T KNOW
9. REFUSED

IM13. **[IF YES TO IM12]** What behavioral changes did you make? **[OPEN ENDED QUESTION]**

IM14. So overall, what is the most effective thing water agencies could do to convince people to conserve more water? **[OPEN ENDED QUESTION]**

THE FOLLOW "O" QUESTIONS DEAL WITH OPINION LEADERS

TRANS Now, I have a pretty good idea of which messages you think would work or not work, but the question is who would be the most effective at delivering them?

O1. What about an expert from a university? Would that be very effective, somewhat effective or not effective?
1. Very effective
2. Somewhat effective
3. Not effective
4. Depends on who the expert is.
8. DON'T KNOW
9. REFUSED

[RANDOMIZE THE NEXT 4 QUESTIONS….]

O2 What about an actor? How effective would that be?
1. Very effective
2. Somewhat effective
3. Not effective
4. Depends on who the actor is.
8. DON'T KNOW
9. REFUSED

O3 What about a political leader? How effective would that be?
1. Very effective
2. Somewhat effective
3. Not effective
4. Depends on who the political leader is.
8. DON'T KNOW
9. REFUSED

O4. A child in your family talking to you about information they have received?
1. Very effective
2. Somewhat effective
3. Not effective
4. There is no child in the family
8. DON'T KNOW
9. REFUSED

O5. A gardener?
1. Very effective
2. Somewhat effective
3. Not effective
4. Depends on who the gardener is
8. DON'T KNOW
9. REFUSED

O6. Finally, how about a religious leader? How effective would that be?
1. Very effective
2. Somewhat effective
3. Not effective
4. Depends on who the religious leader is.
8. DON'T KNOW
9. REFUSED

O7. So overall, who do you rely on most when making decisions about environmental issues like water use? **[OPEN ENDED QUESTION]**
1. Actor
2. Political leader
3. Expert

4. Child
5. Gardener
6. Religious leader
7. Other
8. DON'T KNOW
9. REFUSED

THE FOLLOW "ME" QUESTIONS DEAL WITH MEDIA SOURCES

ME1 What media sources do you rely on most for information about community issues? **[OPEN ENDED – MULTIPLE RESPONSE QUESTION]**

1. Newspaper
2. Radio
3. Television
4. Local cable channel
5. City/community newsletter
6. Internet
7. Other (Specify) _____
8. DON'T KNOW
9. REFUSED

THE FOLLOW "L" QUESTIONS DEAL WITH LIFESTYLE VARIABLES

L1. Now, I'm going to read you a list of statements. Please rate each one on a scale from 1 to 5, 1 meaning "strongly agree" and 5 meaning "strongly disagree". First…I enjoy showing friends around the yard.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

L2. The yard is an important place for my leisure activities.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

L3. Individuals should take responsibility for the environment around them.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

L4. I really haven't thought much about cutting down my use of water.

1. Strongly agree
2. Agree
3. Neutral

4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

L5. Having a lawn is very important to me.
1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

L6. It is important to me that my yard is easy to care for.
1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

TRANS And now I have some questions about your landscape water use.

THE FOLLOWING "B" QUESTIONS ARE BEHAVIORAL
B2 **[ASK IF B1 = 1 OR 3]** Earlier you said that you have a sprinkler system. Does the system have a timer that controls the watering schedule?
1. Yes
2. No **[SKIP TO B4]**
8. DON'T KNOW **[SKIP TO B4]**
9. REFUSED **[SKIP TO B4]**

B3 **[ASK IF B1 = 1 OR 3]** Do you have a gardener who sets the watering schedule for your sprinkler timer?
1. Yes
2. No
8. DON'T KNOW
9. REFUSED

B4. **[ASK IF B1 = 1 OR 3]** In the past year has your sprinkler system been checked for breaks or leaks?
1. Yes
2. No
8. DON'T KNOW
9. REFUSED

B5. **[ASK ONLY IF THEY CHECK THEIR SYSTEM FOR BREAKS/LEAKS]** Why was it checked? … **[OPEN ENDED -- MULTIPLE RESPONSE QUESTION]**
1. To reduce water costs
2. Don't want to waste water
3. A leak could ruin the landscape
4. I only check when I see brown spots or water coming out
5. I saw water leaking and running down the gutter
6. Other (specify) _____
8. DON'T KNOW
9. REFUSED

B6. **[ASK IF B1 = 1 OR 3]** How many times a year do you adjust the watering schedule of your sprinkler system? Would you say it is once a year, twice a year, seasonally, monthly just when it rains?

1. Once a year
2. Twice a year
3. Seasonally
4. Monthly
5. Just when it rains
8. DON'T KNOW
9. REFUSED

B7. **[ASK IF B1 = 1 OR 3 AND B2 = 1]** Do you have a sprinkler timer that automatically adjusts watering with changes in weather conditions?

1. Yes
2. No
3. Don't know what that is **[SKIP TO B9]**
4. DON'T KNOW IF I HAVE ONE **[SKIP TO B9]**
8. DON'T KNOW **[SKIP TO B9]**
9. REFUSED **[SKIP TO B9]**

B8a. **[IF YES TO #7]** Please tell me the reason why. **[OPEN ENDED --MULTIPLE RESPONSE QUESTION]**

1. To reduce water costs
2. Environmental concerns
3. Helps make the yard look nice
4. Convenience
5. Had a good rebate
6. House came with the automatic system
7. Other (specify)
8. DON'T KNOW
9. REFUSED

B8b. **[IF NO TO #7]** Why not? **[OPEN ENDED -- MULTIPLE RESPONSE QUESTION]**

1. Costs too much
2. Haven't thought about it
3. I'm not good at mechanical things
4. Don't want to pay a monthly fee
5. Don't trust technology
6. Don't know about the technology
7. Other (specify)
8. DON'T KNOW
9. REFUSED

B9. And about what percentage of your landscaping is lawn?

1. Less than 25%
2. 25 to about 50%
3. 51 to about 75%
4. 76% or more
8. DON'T KNOW
9. REFUSED

B10. Does your landscaping include water efficient plants?

1. Yes
2. No
8. Don't know
9. REFUSED

B11. If you were to buy new plants, would you buy water efficient plants?
1. Yes
2. No
3. It depends
8. DON'T KNOW
9. REFUSED

B12a. **[IF B11 = 1]** What are your reasons why? **[OPEN ENDED -- MULTIPLE RESPONSE QUESTION]**
1. To reduce water costs
2. Environmental concerns
3. Attractiveness or aesthetic value
4. Convenience
5. Had a good rebate
6. Gardener suggested it
7. Other (specify)

B12b. **[IF B11 = 2]** Why not? **[OPEN ENDED -- MULTIPLE RESPONSE QUESTION]**
1. Costs too much
2. Haven't thought about it
3. Don't like the look of the plants
4. I leave it up to the gardener…he didn't get them
5. Other (specify)

B12c. [IF **B11 = 3**] What do you mean by "it depends?" **[OPEN ENDED -- MULTIPLE RESPONSE QUESTION]**
1. Appearance
2. Cost
3. Low maintenance
4. Other (specify) _____
8. DON'T KNOW
9. REFUSED

B13. What matters most to you about your lawn and garden? Is it appearance, ease of care, availability, cost, water efficiency, or a place for kids and pets to play? **[IF THEY SAY MORE THAN 1, PROMPT THEM FOR WHAT MATTERS *MOST*]**
1. Appearance
2. Ease of care
3. Availability
4. Cost
5. Water efficiency
6. A place for kids and pets to play
7. OTHER (specify)_____
8. DON'T KNOW
9. REFUSED

B14. Do you consider that you are very knowledgeable, somewhat knowledgeable, or not knowledgeable about your water use for landscaping and ways it could save water?
1. Very knowledgeable
2. Somewhat knowledgeable
3. Not knowledgeable
8. DON'T KNOW
9. REFUSED

B15. Surveys show that most people don't have any idea about how many gallons of water they use each day. How about you….how many gallons of water do you think your family uses each day when watering your landscaping? _____ gallons. **[INTERVIEWER: DON'T READ CODING CATEGORIES. IF THEY ASK ABOUT "WHAT SEASON", SAY "SUMMER"]**

1. < 50 gallons
2. 50 – 99 gallons
3. 100 – 199 gallons
4. 200 – 299 gallons
5. 300 gallons or more
8. DON'T KNOW
9. REFUSED

B16. Are you the person who pays the household water bill?

1. Yes/sometimes
2. No
9. REFUSED

THE FOLLOWING "BA" QUESTIONS DEAL WITH BARRIERS Please rate each of the following statements on a scale from 1 to 5, with 1 meaning strongly agree and 5 meaning strongly disagree.

BA1. I know how much water my lawn needs.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
6. Don't have a lawn
8. DON'T KNOW
9. REFUSED

BA2. I know how much water my shrubs, trees and other plants need.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

BA3. Lots of people waste water, so it doesn't matter if I conserve.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

BA4. I know where to get water efficient plants.

1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

BA5. As long as my landscaping looks good, I don't care how much water I use.
1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

BA6. Water efficient plants don't look as good as other types of landscaping.
1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

BA7. Conserving water won't save me much money.
1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

BA8. **[ASK IF B1 = 2]** I don't have an automatic sprinkler timer because I'm not good with gadgets like that.
1. Strongly agree
2. Agree
3. Neutral
4. Disagree
5. Strongly disagree
8. DON'T KNOW
9. REFUSED

DEMOGRAPHIC DATA (INCOME, EDUCATION, OCCUPATION, ETHNICITY, ETC.)
DEMOG Now, I have just a few questions about you and your background...

D4. What city do you live in?

D4A What is your zip code?

D5. What was the last grade of school that you completed?
1. Some high school or less
2. High school graduate
3. Some college
4. College graduate (BA or BS degree)
5. Some graduate work
6. Post-graduate degree
9. REFUSED

D6. What is your current marital status?
1. Single, never married
2. Married
3. Divorced
4. Widowed
5. Separated
6. Other (Specify)
9. REFUSED

D7. How would you describe your race or ethnicity? **SELECT ALL THAT APPLY**
1. ASIAN (SPECIFY)
2. BLACK OR AFRICAN AMERICAN
3. CAUCASIAN OR WHITE
4. HISPANIC
5. OTHER (SPECIFY)

D8. What is your age?
DON'T KNOW [ENTER 998]
REFUSED [ENTER 999]

D9. What is your occupation**? [OPEN ENDED QUESTION]**

D10. Which of the following categories best describes your total household or family income from all sources before taxes for 2006? Let me know when I get to the correct category.
1. Less than $25,000
2. $25,000 to $35,999
3. $36,000 to $49,999
4. $50,000 to $65,999
5. $66,000 to $79,999
6. $80,000 to $110,000
7. Over $110,000
8. DON'T KNOW
9. REFUSED

Well, that's it. Thank you very much for your time.

INTERVIEWER QUESTIONS

GENDER: The respondent was...
1. Male
2. Female
3. Couldn't tell

COOP: How cooperative was the respondent?
1. Cooperative
2. Uncooperative
3. Very Uncooperative

UNDSTD: How well did the respondent understand the questions?
1. Very easily
2. Easily
3. Some difficulty
4. Great deal of difficulty

LNG: In what language was the interview conducted?

1. English
2. Spanish

NAME: Interviewer name?

APPENDIX C

Managed Property Questionnaire

Managed Property Questionnaire

1. Are you the person who make decisions about the outdoor landscaping and water use on this property?
   Yes
   No, our landscaper takes care of it
   No, there is no landscaping at this site
   No, someone else in the business does
   Don't know
   Other (please specify)

2. Please describe the property. Is it:
   1. Commercial
   2. Industrial
   3. Multi-family
   4. Public sector (parks, schools, etc.)

3. How many acres of this property are irrigated?
   1. Less than 1 acre
   2. 1 – 4 acres
   3. 5-9 acres
   4. 10-19 acres
   5. 20-39 acres
   6. 40 or more acres

4. How is the landscape watered?
   1. Automatic sprinkler system
   2. By hand
   3. Both
   4. Neither -- no need to water
   5. Refused

5. Do you manage the landscape watering yourself, or have you hired a landscaper to do it? (Response box)

6. If a landscaper is employed to manage your landscape watering, did you select the landscaper? If not you, who does? How can we reach them? (Response box)

7. What is the most important factor for you in selecting a landscaper?
   1. Reputation
   2. Reliability
   3. Price
   4. Expertise
   5. Other

8. Is the landscaper
   1. A property manager located on site
   2. A contractor
   3. An employee
   4. Other

9. How many times per month/year do they check the irrigation system and reset the controllers? (Response box)

10. What kind of landscaping does the property have?
    1. Trees and shrubs
    2. Grass
    3. Groundcover
    4. Annual flowers
    5. Combination
    6. Other

11. What portion of the property is devoted to landscaping?
    1. 10 percent
    2. 20 percent
    3. 30 percent
    4. more than 30 percent
    5. Other (please specify)

12. What percentage of the landscape is dedicated to turf?
    1. 0-25
    2. 26-50
    3. 51-75
    4. 76-100
    5. Don't know
    6. Refused to answer

13. How important is the presence of grass in your managed property's landscape?
    1. Very Important
    2. Somewhat Important
    3. Not important at all

14. Do you track how much water the property uses monthly? Annually?

15. Is the amount of the water bill a concern for you? (On a scale of 1-10, with 1 the lowest and 10 the highest concern)

16. Is conserving water important to you?
    1. Yes
    2. No
    3. Don't know
    4. Refused

17. In what ways do you conserve water on the property? (Response box)

18. Does your landscape include water efficient plants?
    1. Yes
    2. No
    3. Don't know

19. Does the property have an irrigation system that shuts off automatically when it rains?
    1. Yes
    2. No
    3. Don't know

20. Does the property have a sprinkler timer that automatically adjusts watering with changes in weather conditions?
    1. Yes
    2. No
    3. Don't know

21. Would you be willing to switch to such a system?
    1. Yes
    2. No
    3. Maybe
    4. Don't know

22. What would inspire you to change to such a system?
    1. Saving money
    2. Saving time
    3. Health and appearance of the landscape
    4. All of the above
    5. Don't know
    6. Nothing
    7. Other (specify)

23. Do you have any interest in finding a landscaper knowledgeable about water saving techniques and plants?
    1. Yes
    2. No
    3. Don't know

24. Who would you expect to have this kind of information?
    1. My water district
    2. The city where the property is located
    3. The Chamber of Commerce
    4. University
    5. Don't know
    6. Other (specify)

25. Who would you be most likely to listen to when making decisions about subjects like water conservation ?
    1. A family member
    2. A well-known gardening expert
    3. A member of the clergy
    4. My water agency
    5. A neighbor with a water saving garden
    6. Other (please specify)

26. Would you attend a free weekend workshop about water efficient landscaping and its maintenance?
    1. Yes
    2. No
    3. Don't know

27. What would entice you to attend such a workshop?
    1. A coupon for a water-saving sprinkler controller
    2. A credit on my water account
    3. If it were held at a convenient time and location
    4. Nothing
    5. Other (Please specify)

28. Would you send your landscaper to attend such a workshop if it were offered?
    1. Yes
    2. No
    3. Don't know

29. Have you installed indoor water saving features at your property?
    1. Yes
    2. No

30. Would you be willing to install water saving technology in your landscape if it cost more than a traditional sprinkler system to purchase?
    1. Yes
    2. No
    3. Don't know

31. Would you be willing to pay more up front for such a system if it saved you time or money in the coming years?
    1. Yes
    2. No
    3. Don't know

32. Would you do so if there were a rebate offered?
    1. Yes
    2. No
    3. Don't know

33. How much does the rebate need to be to be enticing to you?
    1. 10 percent of purchase price
    2. 20 percent of purchase price
    3. 30 percent of purchase price
    4. A rebate would not make me switch

34. What media sources do you rely on most for information about community issues? Please rate each of the following sources on a scale from 1 to 6, with 1 being "most important" and 6 being "least important."
    1. Newspaper
    2. Radio
    3. Television
    4. Local cable channel
    5. City/community newsletter
    6. Internet

35. Please comment on whether you think the following media messages could be effective in changing people's irrigation behaviors: Media messages that stress the cost of water....would they work?
    1. Would work
    2. Might work
    3. Wouldn't work at all
    4. DON'T KNOW
    5. REFUSED

* How about environmental messages that show how excess water running off lawns and gardens pollute rivers, streams and oceans?
    1. Would work
    2. Might work
    3. Wouldn't work at all
    4. DON'T KNOW
    5. REFUSED

* Media messages that stress being a good citizen by conserving?
    1. Would work
    2. Might work
    3. Wouldn't work at all
    4. DON'T KNOW
    5. REFUSED

* Media messages that emphasize that water efficient plants can also be low maintenance? Do you think that would work, might work, or wouldn't work at all?
    1. Would work
    2. Might work
    3. Wouldn't work at all
    4. DON'T KNOW
    5. REFUSED

* How about messages that show a demonstration garden with attractive water efficient landscaping...would that work?
    1. Would work
    2. Might work
    3. Wouldn't work at all
    4. DON'T KNOW
    5. REFUSED

* And finally, how about a media message that says that 60% of all drinking water in California is used for outdoor irrigation? Would that work?
    1. Would work
    2. Might work
    3. Wouldn't work at all
    4. DON'T KNOW
    5. REFUSED

36. Do you recall seeing or hearing any ads or advertising messages about outdoor water conservation in the past few months?
    1. Yes
    2. No
    3. DON'T KNOW
    4. REFUSED

37. [IF YES TO 36] What messages do you recall from the ads? [OPEN ENDED QUESTION]

38. [IF YES TO 36] Did the messages cause you to change your behavior?
    1. Yes
    2. No
    3. DON'T KNOW
    4. REFUSED

39. [IF YES TO 36] What behavioral changes did you make? [OPEN ENDED QUESTION]

40. So overall, what is the most effective thing water agencies could do to convince people to conserve more water? [OPEN ENDED QUESTION]

41. Please provide your name, phone number and affiliation.

APPENDIX D

Map of Survey Regions

CUWCC Survey Regions
2007 Survey Regions

APPENDIX E

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