Return on Investment Educational Program

Program Evaluation Report
Return on Investment Educational Program
Program Evaluation

Executive Summary
The Return on Investment Educational Program provides a tool for use by property owners and managers to evaluate an array of landscape and irrigation management improvements customized to site, climate, and historic water use. It provides for both cost-based improvements, such as installation of new equipment or plant palate changes, as well as management techniques. It is a business case decision-making tool that has not yet been employed by water agencies and complements existing incentive based programs offered by water agencies.

The process evaluation details the Program’s methodology and format, including a pictorial description of the impact and utilization plans though, three models: (1) a logic model; (2) an impact theory model; and (3) a process theory model. The impact evaluation for this Program primarily focuses on the accuracy of the tool through two components: (1) an analysis of water savings results provided by the ROI Calculator through a sensitivity analysis approach and (2) real site examples (case studies) comparing the water savings estimates results to actual water use following the proposed project.

The sensitivity analysis performed on the model illustrates that the variable that results in the greatest deviation of model output (projected water savings) is the Management Multiplier. This is also the variable with the most subjective input values. Utilizing the Bluffs HOA test site was utilized to test the goodness of fit of the ROI Calculator tool results. Additionally, in this case study, the Management Multiplier was used to pinpoint changes in water use over a period of time.

The ROI Calculator tool opens discussion regarding landscape BMP recommendations, availability of rebates, and the importance of management. In many cases, the output may not be wholly followed, but foster discussion to engage in some level of water saving landscape BMP practices nonetheless.
Acknowledgements

The Municipal Water District of Orange County would like to thank the following partners in this project: the United States Department of Interior Bureau of Reclamation, Metropolitan Water District of Southern California, City of Santa Rosa, Contra Costa Water District, City of Anaheim, City of Brea, City of Buena Park, East Orange County Water District, El Toro Water District, City of Fountain Valley, City of Fullerton, City of Garden Grove, Golden State Water Company, City of Huntington Beach, Irvine Ranch Water District, City of La Habra, City of La Palma, Laguna Beach County Water District, Mesa Water District, Moulton Niguel Water District, City of Newport Beach, City of Orange, City of San Clemente, City of San Juan Capistrano, City of Santa Ana, Santa Margarita Water District, City of Seal Beach, Serrano Water District, South Coast Water District, Trabuco Canyon Water District, City of Tustin, City of Westminster, and the Yorba Linda Water District.
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Introduction
The Municipal Water District of Orange County (MWDOC), in partnership with the City of Santa Rosa and Contra Costa Water District, propose the development of a Return on Investment Educational Program (ROIEP) to include the development of a Return on Investment Calculator, Educational Materials, and Workshops, with the ultimate goal of transforming traditional, turf-intensive landscapes to California Friendly landscapes. The target audience for use of the ROIEP included landscape maintenance contractors, commercial and residential property managers, and other property owners such as homeowners associations (HOA), cities, and counties.

The approach was based on the belief that landscape owners will replace high water use plants if there is a compelling economic scenario to do so. Rising water rates, tiered and water budget rates, maintenance costs, and more should be compared to the costs for adapting landscapes in order to motivate owners to change their landscape. A guide of how to change a landscape will then be provided as a roadmap for any city or HOA to follow.

The ROIEP also sought to educate and empower the landscape contractor to sell work that saves water. By recognizing the technical limitations of the landscape industry, the ROIEP provides a tool, from an independent public agency party to assist in business based decision making on the part of property owners.

The process evaluation details the Program’s methodology and format, including a pictorial description of the impact and utilization plans through three models: (1) a logic model; (2) an impact theory model; and (3) a process theory model. The impact evaluation for this Program will look at two components: (1) an analysis of water savings results provided by the ROI Calculator through sensitivity analysis approach and (2) real site examples (case studies) comparing the water savings estimates results to actual water use following the proposed project.

Process Evaluation
Program Summary
The ROIEP provides a tool for use by property owners and managers to evaluate an array of landscape and irrigation management improvements customized to site, climate, and historic water use. It provides for both cost-based improvements, such as installation of new equipment or plant palate changes, as well as management techniques. It is a business case decision-making tool that has not yet been employed by water agencies and complements existing incentive based programs offered by water agencies.

The goals of the ROIEP were to develop/refine the ROI Calculator tool, develop a user manual (see reference section), and market and host twelve (12) outreach workshops. The tool was only disseminated during the workshop. Workshops were held across California, each workshop running roughly four hours in length, with a lecture and hands-on format.
The ROIEP was implemented by MWDOC in partnership with the City of Santa Rosa and the Contra Costa Water District. Funding for the ROIEP was obtained from an Innovative Conservation Program Grant (ICP Agreement No. 124214) though the Metropolitan Water District of Southern California (MWD) and a Field Services Grant (Agreement No.R11AP35313) through the United States Bureau of Reclamation (USBR). Program progress was tracked through quarterly reports submitted by MWDOC to MWD and semi-annual reports to USBR.

**Key Individuals**

- Joe Berg  
  *Water Use Efficiency Programs Manager*  
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- Melissa Baum-Haley  
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  Contra Costa Water District
- Bob Eagle  
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  Contra Costa Water District
- Deb Lane  
  *Water Resources Analyst*  
  City of Santa Rosa
- Daniel Muelrath  
  *Water Resources Sustainability Manager*  
  City of Santa Rosa
- Claire Nordlie  
  *Clean Energy Advocate*  
  City of Santa Rosa

**Evaluation Need & Program Rationale**

The Program evaluation is required by the agreement MWDOC has with MWD. The evaluation is occurring at the conclusion of the Program term, the second quarter of 2013 and will be utilized by MWDOC, the City of Santa Rosa, and the Contra Costa Water District for Program refinements. The evaluation will also be submitted to MWD and USBR as a deliverable for final reporting purposes. Funding agencies will use the evaluation to assess the water savings and outreach benefits associated with this educational Program.

**Program Effectiveness**

The Landscape Water Management Return on Investment Calculator (ROI Calculator) was created to empower and educate landscape professionals, property owners, property managers and water agency staff by providing a tool to quantify the value of implementing projects that save water and money while supporting ecosystems and reducing environmental impacts.

The ROI Calculator and educational workshops were promoted by water agencies to their large irrigation accounts including HOAs, city and county parks, residential and commercial property managers, school districts, irrigation consultants, and landscape maintenance contractors. The educational workshops were used to introduce the ROI Calculator and describe the range of irrigation management and landscape improvements that could be evaluated in the Calculator. Workshop participants were asked to bring laptops to load and use the Calculator during the workshop; the Calculator was also retained by
workshop participants for continued use. Follow-up assistance was, and will continue to be, provided by MWDOC, the City of Santa Rosa, and the Contra Costa Water District to each of their respective customers. Following the Pilot Phase, the Calculator and educational materials will be posted on agency websites to further disseminate.

Landscape maintenance contractors, irrigation consultants, and property managers will be able to use the Calculator on an ongoing basis to promote landscape improvements as a business development opportunity to their existing and potential new customer base. Such a tool will be instrumental in helping to spawn a landscape transformation from turf intensive to climate appropriate California Friendly landscape. The ROIEP opens up opportunities, as these tools do not currently exist for use by our target audience. In addition, it is anticipated that these tools will provide opportunities to landscape contractors to sell water use efficiency to their clients.

For Landscape Professionals, the industry standard for analyzing a return on investment (ROI) for a landscape project has been “Years to Payback.” Typically, as long as the initial investment is “paid back” within 1-3 years, the customer is more likely to approve a landscape/irrigation upgrade proposal. This is an ineffective standard because it does not provide the entire picture. It ignores the profitability after the initial investment is recouped and often looks unattractive with an excessive number of years to payback when in fact, the project has an overall positive ROI. The ROI Calculator uses several ROI analysis tools that more accurately capture the true ROI. It is our hope that the use of the ROI Calculator will give the landscape professional a competitive advantage to increase sales. It provides an effective business model to evaluate project pricing, maintenance pricing, and new business opportunities.

Program success was measured through the execution of twelve workshops at which the ROI Calculator tool was distributed. The target audience at these workshops (landscape professionals, property owners, property managers, and water agency staff) was expected to utilize the tool and, thereby, promote water efficient landscape modifications. The target audience was marketed through email notifications and flyers distributed at local events (Appendix A). Pre-registration for the workshops was required; however, walk-in attendance was accommodated. Table 1 provides the dates and locations of the regional ROIEP workshops, including the number of registrants vs. the actual number of attendees.

<table>
<thead>
<tr>
<th>Date</th>
<th>Host/Location</th>
<th>No. Registered</th>
<th>No. Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/29/12</td>
<td>Metropolitan Water District of Southern California (Los Angeles)</td>
<td>54</td>
<td>43</td>
</tr>
<tr>
<td>10/30/12</td>
<td>City of San Juan Capistrano</td>
<td>34</td>
<td>26</td>
</tr>
<tr>
<td>2/28/13</td>
<td>Municipal Water District of Orange County (Fountain Valley)</td>
<td>47</td>
<td>35</td>
</tr>
<tr>
<td>3/5/13</td>
<td>City of Rancho Santa Margarita</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>3/6/13</td>
<td>San Diego Water Authority</td>
<td>57</td>
<td>41</td>
</tr>
</tbody>
</table>
Program Follow-up

After attendance at workshops, MWDOC, the City of Santa Rosa, and the Contra Costa Water District followed-up, in person or by phone, with users to assist them in moving from evaluation to implementation of landscape improvements. Follow-up included a review of Calculator input to verify the reasonableness of proposed improvements. This follow-up also gave project partners the opportunity to learn about the strengths and weaknesses of the Calculator to allow for refinements of the Calculator over time. It also allowed for project partners to see what is working and what is not in terms of implementation of landscape improvements. Periodically, project partners also conference to compare notes to further refine the Calculator and educational process.

Additionally, this report will be supplemented by a Follow-up survey of participants to quantify following:

- Receipt of these Program follow-up correspondences
- How many people took action

Program Models

The logic model for the ROI Calculator and educational workshop is displayed in Figure 1. From this model, the far left column displays inputs, which are stated as investments and include the workshop staff, community partners, and presenters. The logistical investments include location, informational materials, presentation handouts, and case studies. The middle column lists the program output; that is, what was done and who was reached. The outputs of what was done includes: promote and conduct workshop, create a networking arena for contractors and agency staff, train the contractors etc. on using the ROI Calculator, and promote local rebates. The output of who was reached through the Program includes: irrigation contractors, landscapers, HOA property managers, other irrigation/landscape sales representatives, government employees, extension agents, and local water retailers. The right column displays the outcomes by short and long term impacts. The short-term outcomes result from learning and include: awareness, knowledge, attitudes, skills, opinions, and motivation. The medium-term outcomes result from action and include behavioral and practice changes. A behavioral change would be the promotion of landscape BMPs by any participant. Practices change would be the increase in implementation of the BMPs. The long-term condition changes are that landscape will follow the trend of the landscape new norm thereby resulting in the use of less water for irrigation, due to increased efficiencies and palate changes, as well as a reduction of runoff. This will also lead to market transformation. Important components to the logic model are the assumptions and external factors. The assumptions are that contractors are willing to use the ROI Calculator tool and want to be in compliance with landscape BMPs. The external factors include end-user wants, policy changes, weather trends, and the definition of the new norm.

The logic model illustrates the major components and outcomes of the program as a complete picture, which is useful for program development. However, the logic model does not show the direct connection between the outputs and outcomes. To relate concepts, relationships, and better describe how the program works, an impact theory model can be used (Figure 2). A primary difference between a logic model (Figure 1) and more detailed models is the inclusion of confounding factors (extraneous
variables). In the impact theory model, it can be seen that although the program will lead to the use of the ROI Calculator and the long term goal of reduction of water use and runoff, because of confounding factors this goal could be reached by non-participants as well.

The impact model (Figure 2), traces the path of the Program and the subsequent outcomes. Initially, the Program is advertised, resulting in participant attendance at the Training workshop. At the workshop, the participants obtain knowledge and develop skills regarding the ROI Calculator tool and landscape BMP recommendations (action hypothesis). Because the workshop includes training, education, and networking sections, the participant personally meets with water district and agency staff (intervention hypothesis). This results in participants recommending and implementing landscape BMPs and the long term outcome of reduced irrigation water use and runoff (causal hypothesis).

The impact theory model also illustrates that some of the confounding factors (extraneous variables) will facilitate the goal, and others will inhibit it. If a contractor is aware of regional/local rebates, they may directly implement select landscape BMPs without utilizing the ROI Calculator. Whereas, if there is no knowledge of the water savings principles behind these BMPs or if there is distrust/dislike for BMPs and the new norm, the contractor would be less inclined to participate in the workshop. The contractor may also have preexisting beliefs about the ROI tool, how it will work, or what the results will show. For example, the contractor must be willing to use innovative technology or alter the plant palate or schedule to achieve an acceptable return on investment length. Additional confounding factors include end-user wants, policy changes, water rate increases, market transformation with respect to landscape norms or irrigation technologies, and the introduction of new rebate programs.

A process model (Figure 3) is more detailed than the impact model (Figure 2). The process model outlines the expected pathways and gaps. From this model, the role of Program personnel is also highlighted. The model splits the diagram into two parts: the Program’s organization plan and the utilization plan. The organization plan takes into account the tasks of the Program staff and affiliates to set up and host the workshop. The utilization half of the diagram traces the path of the participants from seeing the solicitation to workshop attendance, through increase in BMP implementation.

The dashed lines in the model (Figure 3) represent the pathway which results in gaps or BMP implementation from confounding factors. The gaps will result in the following consequences: the contractor does not see the workshop advertisement, the contractor attends the workshop, but does not utilize the ROI Calculator (although could still implement the BMPs), or the contractor uses the ROI Calculator, but does not implement landscape BMPs. The alternative path that could be taken is that the contractor does not attend the workshop, but independently learns about regional/local rebates, which could also result in increased landscape BMP implementations.
Figure 1. Logic model for ROI Calculator and educational training workshops

Assumptions: Participants are willing to use the ROI Calculator tool, want to be in compliance with landscape BMPs.

External Factor: End-user wants, policy changes, weather, and landscape new norm
Figure 2. Impact theory model for ROI Calculator and educational training workshops
Figure 3. Process theory model for ROI Calculator and educational training workshops
Impact Evaluation

The Municipal Water District of Orange County will perform a statistical water savings analysis of the ROI Calculator tool. This analysis will include sites that implement improvements evaluated in the Calculator. The evaluation will employ advanced statistical methods, including regression and weather normalization. The impact evaluation for this Program will look at two components: (1) an analysis of water savings results provided by the ROI Calculator though a sensitivity analysis approach and (2) real site examples (case studies) comparing the water savings estimates results to actual water use following the proposed project.

Sensitivity Analysis

The ROI Calculator categorizes expected water savings into three unique components: (1) global changes, (2) changes by hydrozone, and (3) management changes. Each of these categories is treated mutually exclusive and compared though a sensitivity analysis.

![Water Savings Approach Diagram]

*Figure 4. Approach of landscape water use efficiency upgrade proposal using the ROI Calculator*

The ROI Calculator model requires a number of input parameters. Although many of these parameters are referenced and not pure assumptions, it is possible that there may have been either measurement or selection error with any of the input values. Therefore, to test the model response to fluctuation of these parameters, a sensitivity analysis was performed.
When conducting a sensitivity analysis, parameters are selected that vary individually through an expected range of values. The range of output values from each input variable can be compared visually with a spider graph (Figure 5). The equations that govern a sensitivity analysis are presented below:

- **Sensitivity** – rate of change in one factor with respect to change in another factor
  - \( S = \frac{dR}{dP} \) where \( R \) is result, \( P \) is parameter
- **Relative sensitivity** – allows comparison across parameters and results of varying magnitudes
  - \( SR = \frac{dR}{P} / \frac{dP}{R} \)

As each parameter is individually varied, the water savings projected by the model output changes. At zero percent variation, the ROI Calculator model yielded the water savings percentage with all parameters set to the initial assumptions for the example case. The percent variation in each parameter was ±100% of the initial assumed value, unless the variation beyond a certain percentage yielded an unrealistic result for the given parameter. Refer to Table 2 for actual variation ranges used in this analysis.

### Table 2. ROI Calculator model parameter assumptions and sensitivity analysis parameter variation.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Base Value</th>
<th>Variation</th>
<th>Analysis Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Multiplier</td>
<td>1.50</td>
<td>-100% to 93%</td>
<td>10.00 to 0.10</td>
</tr>
<tr>
<td>Stop Irrigation/Cap</td>
<td>10,000 ft²</td>
<td>-100% to 100%</td>
<td>0 to 40,000 ft²</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drip Conversion</td>
<td>10,000 ft²</td>
<td>-100% to 100%</td>
<td>0 to 40,000 ft²</td>
</tr>
<tr>
<td></td>
<td>DU 0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PF 0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency Upgrades</td>
<td>10,000 ft²</td>
<td>-100% to 100%</td>
<td>0 to 40,000 ft²</td>
</tr>
<tr>
<td></td>
<td>DU 0.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Changes</td>
<td>20%</td>
<td>-100% to 100%</td>
<td>50% to 0%</td>
</tr>
</tbody>
</table>

The spider graph, in Figure 5, plots the overall water savings output versus the percent fluctuation for each parameter individually. To interpret the sensitivity of a parameter from the spider graph, the slope of each is compared. Lines with greater slopes represent an increased sensitivity within the model for parameter fluctuation. That is, the greater the slope, the more the model output will be affected change or error from a particular variable.
For this analysis, the model projected an overall water savings rate of 39%, where 7% was the result of Management, 17% was the result of Stop or Cap Irrigation, 15% was the result of Drip Conversion, 3% was the result of Efficiency Upgrades, and the 20% Global upgrades lessened the overall water savings by -3%. For this theoretical site analysis, the initial distribution uniformity (DU) was 0.5, the plant factor (PF) was 1.0, and the Management Multiplier (MM) was estimated at 1.37. The DU increased to 0.75 as the result of Efficiency Upgrades in one hydrozone, and in another the DU increased to 0.9 and the PF was reduced to 0.3 as a result of Drip Conversion and plant material retrofit.

For the ROI Calculator model tested, the Management parameter had the strongest affect on the theoretical overall water savings output. The baseline percent savings attributed to the Management factor was 7%. By manipulating the MM down to 0.1 (-100%) and up to 3.0 (+93%) the savings attributed to the Management factor ranged from 56% to -47% respectively, yielding an overall water savings rate from 89% to -14%. A negative water savings rate denotes an increase in projected water use, in this case due to extreme mismanagement.

To a lesser degree of magnitude, the Hydrozone components Stop or Cap Irrigation and Drip Conversion yielded an effect. Interestingly, as these two Hydrozone factors varied, they also caused the water savings attributed to Management to also vary simultaneously.

The influence of Global water savings resulted in an inverse effect. The input represented the percent reduction in water use due to global upgrades (pressure regulation, master valve, etc., not including controller upgrades). The Global water savings produced a reduction in total water use, thereby resulting in a reduction of potential water savings.

Figure 5. ROI Calculator projected water savings sensitivity analysis spider graph
Case Studies

Case Study # 1 - Southern California Homeowners Association

*Site Profile:* The Bluffs, a 40 year-old community with approximately 75 acres of turfgrass landscaping. The Bluffs Homeowner’s Association (HOA) management, board, and committees recognize that a manicured turfgrass and landscape combination constitutes the most expensive style of landscape to maintain. High water costs, weekly mowing and edging, dump fees for clippings removal, and seasonal fertilization contribute to the high cost to maintain turfgrass.

With recognition of the growing cost to maintain the HOA landscape since 2007, management has instituted water efficiency measures. The first measure consisted of installing 54 WeatherTRAK smart controllers. The result was a decrease in annual water use by 25%. The smart controllers also revealed inefficient irrigation sprinklers across the association is landscape. The association implemented the installation of approximately 1,100 high efficiency nozzles. Those irrigation system upgrades reduced water use another 5%. The combined controller and irrigation upgrades resulted in a 30% annual water use reduction.

Water rates in Newport Beach are among the highest in Orange County at $2.20/ccf, making the association’s costs high to maintain the large turf greenbelts. Further, water rates are expected to increase approximately 25% by 2014. This will mean the cost to maintain the Bluffs common area landscape, including water bills, will become more expensive each year.

At the same time, the location of the Bluffs directly adjacent to the Newport Bay heightens the need to reduce water use and chemicals that can be washed into the Back Bay. Regional and Federal regulations prohibit fertilizers, pesticides, and herbicides from washing into the Bay. Traditional turfgrass and high water use landscapes contribute to polluted water runoff into waterways. While maintenance costs are the prime concern of the Bluffs HOA, it is also a goal of the association to reduce any pollutants washing into the Newport Bay.

The Bluffs management and a wide range of Bluffs residents have recognized that a more aggressive water reduction program is needed to significantly reduce association costs. Management has identified a turf replacement program to be the most effective means to (1) significantly reduce water and maintenance costs while (2) maintaining a community-acceptable landscape that also supports property values. A variety of association groups, the Water Issues Research Committee, the Landscape Committee, and Bluffs board members have discussed an approach to consider how to move forward with the goals to (1) reduce water costs for the HOA; (2) reduce overall landscape maintenance costs, (3) improve the overall appearance of the association (to maintain and improve property values) and (4) reduce or eliminate chemical use that may navigate into Newport Bay through natural runoff.

The results of the projected water savings from the ROI Calculator model was compared to the actual water savings yielded at the site. The “Test Site” is a 10,000 ft² hydrozone area of HOA parkway that received a plant retrofit. At the same time, a similarly sized hydrozone area of HOA parkway was monitored as a “Control Site.”
The existing association turf is a mix of both warm and cool season turfgrass. Bermudagrass (*Cynodon dactylon*) and Kikuyugrass (*Pennisetum clandestinum*) are known as warm season turfgrasses. These grasses are tough, moderate water users, spread via stolons, also known as runners, and go dormant in cool winter months. Tall Fescue (*Festuca arundinacea*) is a cool season grass that stays green all year. Tall Fescue is a high water use turfgrass. Together, these turfgrasses make up two-thirds to three-quarters of the association acreage in greenbelts and parkways. The existing Bluffs turfgrass requires weekly mowing, irrigation of at least 3 days per week in the summer and 1 to 2 days per week in the fall/winter/spring depending upon rainfall and temperatures. Fertilization is also needed on a regular basis.

As a plant material retrofit, a new hybrid of turfgrass, developed by University of California (UC) Davis and UC Riverside, called UC Verde (*Buchloe dactyloides*) was used. It is a variety of turfgrass commonly known as Buffalograss, and it is one of the few grasses native to the U.S. It was specifically bred to be used as a low water use turfgrass in coastal US landscapes. In research plots the UC Verde turfgrass used up to 75% less water to maintain a healthy appearance when compared to Tall Fescue. UC Verde also required less mowing (estimated to be 50% less mowing than Tall Fescue) and less fertilization to maintain an attractive appearance. UC Verde does not produce rhizomes; it laterally spreads via stolons to new plants at each node, leading to dense coverage. With these characteristics, it is estimated that the use of UC Verde as a replacement turfgrass could save the Bluffs HOA both water and maintenance cost savings.

![Monthly Water Use at the Bluffs](chart.png)

*Figure 6. Monthly water use for the Bluffs Test and Control Sites*

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1 UC Davis and UC Riverside. 2003. UC Verde Turfgrass. US Patent #12910
The retrofit at the Test Site commenced with the removal of the existing turfgrass. In May 2011, the UC Verde was planted by plug. The establishment period lasted until November 2011. During the establishment period, the management level would be considered very active (MM close to 1.0). Figure 6 illustrates that water use for both the Test and Control Sites from the time of planting through October 2012, which is the establishment period plus one year of post-establishment monitoring. Both sites had sub meters installed for accurate water monitoring.

The water savings at the site is listed in Table 3. The actual water savings resulted in a gross savings of 28% of the site water use (May 2011 thru October 2012). When looking at the water use excluding the establishment period, the water savings is 45% (November 2011 thru October 2012). Through statistical analysis of means, this water savings is significant at the 90% confidence level.

A change in property management occurred during late spring 2012, which influenced the MM. Therefore, we examined the water savings following the establishment period before and after this management change. The water savings following the change in management decreased to 17%.

Table 3. Water use and savings per notable time period at the Bluffs test site.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Description</th>
<th>Water use (gal)</th>
<th>Water Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2011 to Oct 2012</td>
<td>Establishment period plus one year monitoring</td>
<td>845,754</td>
<td>609,676</td>
</tr>
<tr>
<td>Nov 2011 to Oct 2012</td>
<td>One year monitoring period (post establishment)</td>
<td>606,354</td>
<td>335,276</td>
</tr>
<tr>
<td>Jun 2012 to May 2013</td>
<td>One year monitoring (post change in management)</td>
<td>543,270</td>
<td>449,262</td>
</tr>
</tbody>
</table>

At the Test Site, the ROI Calculator tool estimated a water savings of 46%, where 5% was the result of management improvement and 41% was the result of the turfgrass conversion. The water consumption versus budget for the site is depicted in Table 4 and the associated Figure 7.

Table 4. ROI calculator Multipliers for the Bluffs test site.

<table>
<thead>
<tr>
<th>Consumption to Budget</th>
<th>Existing</th>
<th>Upgraded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget (Site Water Need)</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Irrigation Inefficiencies</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Management Inefficiencies</td>
<td>9%</td>
<td>5%</td>
</tr>
<tr>
<td>Total</td>
<td>127%</td>
<td>123%</td>
</tr>
<tr>
<td>Irrigation Multiplier</td>
<td>1.18</td>
<td>1.18</td>
</tr>
<tr>
<td>Management Multiplier***</td>
<td>1.09</td>
<td>1.05</td>
</tr>
</tbody>
</table>
Figures 8 to 11 illustrate the cumulative and monthly water use for the Control and Test Sites at the Bluffs normalized on a gallons per square foot per month basis. These graphs also show the theoretical irrigation (grey shaded band) need in the background. The theoretical need is calculated based as a range considering the irrigation efficiencies and management multiplier, where the width of the band varies based on these multipliers. Ultimately, it would be expected that the Test Site falls within the band, or relatively close. Although Test Site water use deviated from month to month compared to the theoretical irrigation need, the overall cumulative use graph (Figure 9) depicts the actual use with significant accuracy at the 95% confidence level. The post-upgrade MM was estimated at 1.05, based on the previous the water use at the Test Site.

However, following the change in property management, the water use at the Test Site begins to increase. This is most evident beginning in fall 2012. The MM following the change in property management was increased from 1.05 to 1.25. This increase captures the cumulative water use trend during the last 12 months. The increased MM range is depicted by a blue shaded band. Using the ROI Calculator as a tool to assess the increase in water directly to management, the water applied to the Test Site is steadily increased post-management change, presumably due to misunderstanding of the plant-water needs.
Figure 8. Monthly water use at the Bluffs for 7 month period following establishment and prior to new property management.

Figure 9. Cumulative water use at the Bluffs for 7 month period following establishment and prior to new property management.
**Figure 10.** Monthly water use at the Bluffs for 12 month period since following new property management.

**Figure 11.** Cumulative water use at the Bluffs for 12 month period following new property management.
Case Study # 2 - Northern California Homeowners Association

Site Profile: This HOA was interested in reducing water costs. Reducing landscape water consumption was identified as the low hanging fruit. The HOA Board President met with the association members to identify priorities and preferences. The association agreed that non-functional turf would be eliminated and converted to a low water use landscape. The Board President and the landscape contractor worked together to identify a project area. The area chosen was all on the same irrigation meter. It was large section of non-functional turf bordering on the main street along one side of the property perimeter. The area is sloped. Mature Sycamore trees are also established in the project area. The association approved the proposal to convert 23,593 square feet of turf with overhead spray irrigation to low water use plants irrigated with in-line drip tubing. The proposal price included adding separate drip irrigation zones to the Sycamore trees. The decision was made to plant sparsely with new plants in order to keep costs down and because the association’s aesthetic preferences would be met without the need for dense planting. Tables 5 and 6 display the site data before and after the project implementation.

**Table 5. Site data prior to project implementation.**

<table>
<thead>
<tr>
<th>Current Landscape</th>
<th>High Water Use</th>
<th>Moderate Water Use</th>
<th>Low Water Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Factor</td>
<td>1.0</td>
<td>0.60</td>
<td>0</td>
</tr>
<tr>
<td>Distribution Uniformity</td>
<td>0.50</td>
<td>0.50</td>
<td>0</td>
</tr>
<tr>
<td>Square Feet</td>
<td>30,836</td>
<td>748</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 5. Site data following to project implementation.**

<table>
<thead>
<tr>
<th>Upgraded Landscape</th>
<th>High Water Use</th>
<th>Moderate Water Use</th>
<th>Low Water Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Factor(K_L)</td>
<td>1.0</td>
<td>0.60</td>
<td>0.15</td>
</tr>
<tr>
<td>Distribution Uniformity</td>
<td>0.50</td>
<td>0.50</td>
<td>0.90</td>
</tr>
<tr>
<td>Square Feet</td>
<td>7,243</td>
<td>748</td>
<td>23,593</td>
</tr>
</tbody>
</table>

Landscape Coefficient after Upgrades: The Plant Factor for plant types chosen in the upgraded area is 0.30. However, due to the sparseness of planting, less supplemental irrigation will be needed in the
upgraded hydrozone. In order to use accurate data inputs in the ROI Calculator, the sparse density in the upgraded area was taken into consideration using the Landscape Coefficient formula: $K_L = PF \times K_{density} \times K_{microclimate}$. A density factor of .50 was used. The microclimate is average, which equals a factor of one (1.0): $K_L = 0.30 \times 0.5 \times 1.0 = 0.15$

Management Challenges: The combination of poor uniformity, high precipitation rates and slopes made it difficult to manage the application of irrigation water efficiently in the turf areas that were proposed to be eliminated. The Management Multiplier before upgrades was 2.63 (see below).

Results: The ROI results include indirect annual savings of $6,200.00 because of a reduction in the landscape maintenance price (due to the elimination of turf). The project cost was $26,663 and the total amount rebated was $6,000.00. Water costs were assumed to increase 5% a year based on regional trends. The sustained savings were estimated to last for 15 years. The customer’s cost of capital was two percent (2%). These results are actual and not estimated. They are calculated using three years of metered consumption, pre and post installation respectively. The ROI Calculator results are presented in Table 7.

Table 7. Summary of financial results output from ROI Calculator.

<table>
<thead>
<tr>
<th>Summary of all upgrades with rebate</th>
<th>Years to Payback</th>
<th>Net Present Value</th>
<th>Annual Rate of Return</th>
<th>Annual gallons saved</th>
<th>Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>$221,006</td>
<td>73.8%</td>
<td>1,617,000</td>
<td>81%</td>
</tr>
</tbody>
</table>

In the Detailed Analysis by Project (Table 8), we see that both the improvement in Management and the turf conversion showed a positive ROI. Even with the additional project cost to irrigate the Sycamore trees separately, the choice to plant sparsely allowed a lower project price (reduced labor and materials costs), which resulted in a positive ROI for the turf conversion. The reduction in site water requirement resulted in a 31% reduction in the water consumption. The payback for the improvement in Management is less than one year.

Table 8. Detailed Analysis by Project output from ROI Calculator.

<table>
<thead>
<tr>
<th>Detailed Analysis by Project</th>
<th>Years to Payback</th>
<th>Net Present Value</th>
<th>Annual Rate of Return</th>
<th>Annual gallons saved</th>
<th>Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>0</td>
<td>$92,626</td>
<td>0% (^3)</td>
<td>500,000</td>
<td>50%</td>
</tr>
<tr>
<td>Turf Conversion</td>
<td>8</td>
<td>$31,204</td>
<td>13%</td>
<td>662,000</td>
<td>31%</td>
</tr>
</tbody>
</table>

Approximately 75% of all of the high water-use turf was eliminated off of this meter. These areas were difficult to manage as discussed above. After the upgrades were implemented, the landscape contractor

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\(^3\) Because no dollar amount was charged for improved Management, a Rate of Return cannot be calculated.
was able to tighten up the controller programming to more closely match site water requirement. The new landscape is now irrigated efficiency with low precipitation rate drip irrigation. The Management Multiplier went from 2.63 to 1.20 (Table 9).

**Table 9. ROI Calculator multipliers.**

<table>
<thead>
<tr>
<th>Consumption to Budget</th>
<th>Current</th>
<th>Upgraded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Water Requirement</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Irrigation Inefficiencies</td>
<td>43%</td>
<td>25%</td>
</tr>
<tr>
<td>Management Inefficiencies</td>
<td>163%</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>305%</td>
<td>145%</td>
</tr>
<tr>
<td><strong>Multipliers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation Multiplier</td>
<td>1.43</td>
<td>1.25</td>
</tr>
<tr>
<td>Management Multiplier</td>
<td>2.63</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Additional Benefits: Due to the significant annual dollar savings in water and maintenance fees, the implementation of this landscape water-use efficiency improvement allowed the association to reduce its annual homeowner dues by 15%. Even the few association members who initially expressed some concern with a sparser look are now pleased with the project’s outcome.

**Case Study # 3 - Northern California Shopping Center**

*Site Profile:* Before project implementation, this shopping center landscape consisted of a moderate amount of low water-use planting areas (drip irrigation), several large concrete planters for seasonal color (hand watered), and decorative turf areas (overhead spray), including a long narrow strip at the frontage of the property and two large “berms” on either side of the entrance (Table 10). Consumption to budget was 305%.

**Table 10. Site data prior to project implementation.**

<table>
<thead>
<tr>
<th>Current Landscape</th>
<th>High Water Use</th>
<th>Moderate Water Use</th>
<th>Low Water Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Factor(K_L)</td>
<td>1.0</td>
<td>0.65 (container plants)</td>
<td>0.30</td>
</tr>
<tr>
<td>Distribution Uniformity</td>
<td>.50</td>
<td>0.90</td>
<td>0.90</td>
</tr>
<tr>
<td>Square Feet</td>
<td>21,780</td>
<td>2,000</td>
<td>41,560</td>
</tr>
</tbody>
</table>

Management Challenges: There is one central irrigation controller and also several battery operated “actuators.” These actuators were installed over time as a result of a loss of electrical continuity from each irrigation valve to the controller. In addition to the central controller, each individual actuator must be programmed to match site and weather requirements. Each activator is the equivalent of adding another “controller,” thereby losing the ability to centrally manage the irrigation water and adding complexity to the system’s management. The turf/spray areas had a high precipitation rate on slopes which, in conjunction with poor uniformity, made it difficult to minimize water loss due to run off. Two different landscape professionals manage this site. One contractor manages the maintenance and controller programming of the majority of the site, and another designer manages the seasonal color contract and hand watering of the container pots. This adds complexity to the site water management...
and stresses the need for effective communication between all stakeholders. All of these factors are likely contributors to the amount of waste due to management practices (see below).

**Customer Preferences:** The property management company has an efficiency ethic and wanted to save water on this site and eliminate the decorative turf. They were enthusiastic about participating in the turf conversion and irrigation efficiency improvement rebates offered by the water retailer. All turf areas were converted to low water-use plants. The overhead turf spray system was converted to in-line drip tubing.

**Results:** The Summary Financial Results include indirect annual savings of $3,700.00 because of a reduction in the landscape maintenance price (due to the elimination of turf). The project cost was $53,000 and the total amount rebated was $5,700.00. Water costs were assumed to increase 5% a year based on regional trends. The sustained savings were estimated to last for 15 years. The customer’s cost of capital was three percent (3%). These results are actual and not estimated. They are calculated using three years of metered consumption, pre and post installation respectively. The ROI Calculator results are presented in Table 11.

**Table 11. Summary of financial results output from ROI Calculator.**

<table>
<thead>
<tr>
<th>Summary of all upgrades with rebate</th>
<th>Years to Payback</th>
<th>Net Present Value</th>
<th>Annual Rate of Return</th>
<th>Annual gallons saved</th>
<th>Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>6</td>
<td>$84,602</td>
<td>20.1%</td>
<td>1,254,000</td>
<td>56%</td>
</tr>
</tbody>
</table>

The Detailed Analysis by Project (Table 12) below indicates that the improvement in Management showed a positive ROI, while the turf conversion had a negative ROI. Notice though that the turf conversion did result in a significant reduction in consumption (22%). The customer might have been initially hesitant to approve this project when just looking at the negative ROI for the turf conversion, but the combination of the reduced site water requirement, reduced maintenance fees, and the improvement in Management all combined together to drive an impressive ROI.

**Table 12. Detailed Analysis by Project output from ROI Calculator.**

<table>
<thead>
<tr>
<th>Years to Payback</th>
<th>Net Present Value</th>
<th>Annual Rate of Return</th>
<th>Annual gallons saved</th>
<th>Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>0</td>
<td>$53,334</td>
<td>0%&lt;sup&gt;4&lt;/sup&gt;</td>
<td>752,000</td>
</tr>
<tr>
<td>Turf Conversion</td>
<td>Exceeds upgrade life</td>
<td>$(17,409)</td>
<td>Less than Cost of Capital</td>
<td>502,000</td>
</tr>
</tbody>
</table>

It is interesting to look at the Management Multiplier. In the three years since the upgrade was installed, the site has been managed to a multiplier of 2.30 (Table 13). This is a relatively high Management Multiplier, but the ROI is still favorable. In this case, it was wise to choose a higher Management Multiplier.

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<sup>4</sup> Because no dollar amount was charged for improved Management, a Rate of Return cannot be calculated.
Multiplier during the proposal phase. While the turf conversion improved the ability to efficiently manage the water, the other management challenges previously described still exist.

Table 13. ROI Calculator multipliers.

<table>
<thead>
<tr>
<th>Consumption to Budget</th>
<th>Current</th>
<th>Upgraded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Water Requirement</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Irrigation Inefficiencies</td>
<td>29%</td>
<td>6%</td>
</tr>
<tr>
<td>Management Inefficiencies</td>
<td>176%</td>
<td>130%</td>
</tr>
<tr>
<td>Total</td>
<td>305%</td>
<td>236%</td>
</tr>
<tr>
<td><strong>Multipliers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation Multiplier</td>
<td>1.29</td>
<td>1.06</td>
</tr>
<tr>
<td>Management Multiplier</td>
<td>2.76</td>
<td>2.30</td>
</tr>
</tbody>
</table>

Next Steps: After the success of this project, perhaps a second ROI Calculator proposal that focuses on saving more water in the Management “bucket” can be presented to the property manager. The proposal could include a price to restore the continuity to all of the valves and to install a Smart controller. This would offer the ability to reduce the Management Multiplier. The project price to restore the continuity for all valves could prove to be too costly due to the large amount of hardscape areas, but it is worth investigating further.

Interviews with End-Users
MWDOC engaged in discussions with the Orange County Chapter of the California Landscape Contractors Association (CLCA). This audience was engaged through the ROIEP workshops. Following the implementation of the ROI Calculator workshops, the CLCA provided the following desires:

- Clarification of estimating MM values
- Expansion of ROI Calculator to address multiple meter sites
- Resource access for data inputs (e.g. $ET_{0\text{(net)}}$)
- Interest in additional training workshops

Immediately addressing the need for data input, MWDOC developed a resources page (text provided in Appendix B) to be added to the MWDOC website. This information focuses on weather data resources within Orange County, although it can be applied state-wide. It also includes an explanation of $ET_{0\text{(net)}}$.

Additional discussion with users and their customers would benefit this evaluation. We would be interested in knowing the following:

- Who is being utilizing the tool
- How is the tool being utilized
- What facets of the tool are most beneficial to the implementation of the suggested BMPs
- Which BMPs are most received with the most receptively
Quantification of this information will be addressed through a follow-up survey. The results will be proved as a supplement to this report.

**Evaluation Conclusion**

It is anticipated that the ROI Calculator will have a multiple year useful life. In addition, when refinements are needed, MWDOC and the City of Santa Rosa will jointly update the Calculator to extend its useful life. The Calculator will be retained by workshop participants for use on an on-going basis, with updated versions sent to participants through follow-up communication. Following the Pilot Phase, the Calculator and educational materials will be posted on agency websites to further disseminate its use.

There is also a loop of accountability in landscape water management that is related to communication. Homeowner’s association board members and/or property owners typically do not have the technical knowledge needed in landscape water management. They need to rely on the landscape professional that they hire to have the expertise to do the job. It is the landscape professional who must know landscape water management. Each stakeholder must educate on another in making choices and conveying their perspectives. Optimal landscape water management will be a result of a successful communication strategy.

For property owners, the use of the ROI Calculator can help with managing landscape assets. A healthy and resource efficient landscape will have a positive impact on property values. Converting unused high water use areas to an attractive low water-use landscape and improving the efficiency of the existing irrigation system will not only lead to sustained dollar savings over time that will drive an attractive ROI, but these improvements will also increase the property’s value and aesthetic quality.

For property managers, the use of the ROI Calculator can help reduce expenses while improving the value of a client’s properties. It is an effective tool to prioritize sites for landscape upgrades. By entering existing site data into the ROI Calculator, a property manager (in collaboration with the landscape professional) can analyze the landscape’s water-use efficiency and identify potential expense reductions in operation and maintenance, as well as future capital outlay. It can help provide a financial analysis for landscape maintenance and water management services. One landscape professional might charge a higher maintenance price, but when analyzing their landscape water management expertise using the ROI Calculator, the water that they are able to save can more than offset a higher maintenance price. In the opposite situation, the ROI Calculator can aid the property manager in defining the need for improved landscape water management services.

For agencies, the ROI Calculator was created to provide a tool to: support the technical education and training of local landscape professionals, property owners, and property managers; facilitate the necessary communication among stakeholders; and increase rebate and incentive program participation. Water agencies have access to water consumption records and are in an influential position to help identify prime properties for upgrades. Effective agencies create strong relationships with their water customers and can be an objective third party to facilitate and support the use of this innovative tool.
The impact analysis focused on the accuracy of the ROI Calculator tool. The sensitivity analysis performed on the model illustrates that the variable that results in the greatest influence on projected water savings is the Management Multiplier. This is also the variable with the most subjective input values. Utilizing the Bluffs HOA test site was utilized to test the goodness of fit of the ROI Calculator tool results. Additionally, in this case study, the Management Multiplier was used to pinpoint changes in water use over a period of time.

**Lesson Learned**

The ROIEP was a well-received program providing a financially based marketing tool that was expected to result in the implementation of landscape BMPs. The ROI Calculator is a tool that will primarily be used as part of the landscape designs stage. The ROI Calculator tool opens discussion regarding landscape BMP recommendations, availability of rebates, and the importance of management. In many cases, the output may not be wholly followed, but foster discussion to engage in some level of water saving landscape BMP practices nonetheless.

To quantify the actual water savings that resulted through the direct use of this tool proved to be difficult. The local ROIEP workshops were conducted from October 2012 through March 2013. This provided a limited time for both the implementation of output recommendations and subsequent monitoring period.

The following behavioral questions remain to be addressed:

- Receipt of these ROIEP Program follow-up correspondences
- How many people took action (used the ROI Calculator tool, etc.)
- Who the tool is being utilized by
- How is the tool being utilized
- What facets of the tool are most beneficial to the implementation of the suggested BMPs
- Which BMPs are most received with the most receptively

The results of a post-Program follow-up survey of participants will be provided as a supplement to this report.

**Reference Guidebook**

“Investing in Landscape Water-Use Efficiency – A Companion Guidebook to the Landscape Water Management Return on Investment Calculator”
Appendix A
Marketing Material - Workshop flyer
Selling Landscape Water Use Efficiency

Hosted by: Municipal Water District of Orange County

This FREE workshop is designed to help you:

- Understand the costs and benefits of water-saving landscape projects, such as turf replacement, irrigation system upgrades, smart irrigation timers, enhanced water management, and more.

- Learn how to calculate potential water and dollar savings for your projects using the new Landscape Water Management Return on Investment (ROI) Calculator.

COST: FREE to all property owners, managers, and landscape contractors

BRING: A laptop with Microsoft Excel (to use the free downloadable ROI calculator) for hands-on practice sessions

WHEN: Thursday, February 28, 2013 9:00 a.m. to noon OR Tuesday, March 5, 2013 9:00 a.m. to noon

WHERE: Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

City of Rancho Santa Margarita
Bell Tower Regional Comm. Ctr.
22232 El Paseo
Santa Margarita, CA 92688

REGISTER: You must pre-register online at http://tinyurl.com/asxq8bx (Space is limited to 50 participants.)

Questions? Contact Joe Berg at (714) 593-5008 or jberg@mwdoc.com.
Appendix B

ET_o(net) webpage for local user information
**Orange County Weather Data**

Evapotranspiration (ET<sub>o</sub>) is the amount of water lost through evaporation or transpiration (water used by plants). Since it is very difficult to actually separate evaporation and transpiration mathematically, these two terms are combined. When calculating ET<sub>o</sub>, a number of weather factors are considered, such as wind, humidity, temperature, and solar radiation. All of these characteristics of weather vary throughout the year and from season to season.

The water requirements of a plant also vary throughout the year. Of course, every plant uses water differently, and so each plant has a specific value (called a “crop coefficient”) that represents the amount of water the plant might need relative to its seasonal growing pattern. A plant’s specific evapotranspiration rate (denoted by the subscript “c” making it ET<sub>c</sub>) will either be increased or decreased based on crop coefficient.

When looking at the landscape as a whole, the landscape coefficient (K<sub>L</sub>) can be used instead. Unlike a crop or turfgrass, landscape plantings are typically composed of more than one species. Collections of species are commonly irrigated within a single irrigation zone, and the different species within the irrigation zone may have widely different water needs. For this reason, it is recommended that plants with similar water needs be zoned together to better implement efficient irrigation management.

With the amount of a plant specific evapotranspiration rate changing from week to week, month to month, and season to season, it becomes clear why your irrigation schedule needs to vary as well. How much water that needs to be replaced is not static.


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**California Irrigation Management Information System (CIMIS) website**

A helpful source for finding ET<sub>o</sub> rates is the California Irrigation Management Information System (CIMIS) website. CIMIS is a program of the Office of Water Use Efficiency of the California Department of Water Resources (DWR). It manages a network of over 120 automated weather stations in the state of California. CIMIS was developed in 1982 by DWR and the University of California, Davis to assist irrigators in managing their water resources efficiently. Although CIMIS was initially designed to help agricultural growers and turf managers administering parks, golf courses, and other landscapes to develop water budgets for
determining when to irrigate and how much water to apply, the user base has expanded over the years.

To access CIMIS go to: [http://wwwcimis.water.ca.gov](http://wwwcimis.water.ca.gov)

**What is ETo(Net)?**

The Return on Investment (ROI) Calculator Tool asks you for ETo(Net). This refers to the ETo value less effective rainfall (Pe).

\[
ETo - Pe = ETo(Net)
\]

Effective rainfall is only that amount of rainfall that can be used beneficially within the plant’s root zone. Effective rainfall is *not* runoff or deep percolation (drainage below the root zone).

### General ETo(Net) values for Orange County

<table>
<thead>
<tr>
<th>Year</th>
<th>ETo(Net)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>50.59</td>
</tr>
<tr>
<td>2010</td>
<td>43.07</td>
</tr>
<tr>
<td>2011</td>
<td>43.02</td>
</tr>
<tr>
<td>2012</td>
<td>Check back soon</td>
</tr>
</tbody>
</table>