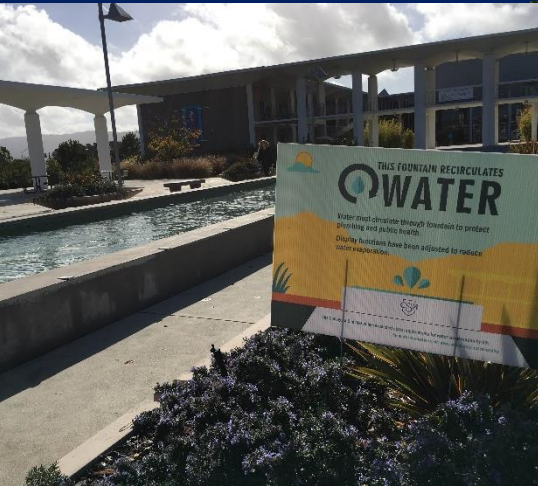




SAN MATEO COUNTY
COMMUNITY
COLLEGE DISTRICT

Water Efficiency Program



December 2015



College of San Mateo



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1.0 Executive Summary

Water conservation is a fundamental component of sustainability at the San Mateo County Community College District (SMCCCD) and is committed to alleviate the economic and ecological risks of water resource availability in the Bay Area. In response to California's ongoing drought, in January 2014 the Chancellor of SMCCCD declared a 25% reduction goal from the 2013 baseline. It is important to note SMCCCD's early adoption and commitment to water conservation, as this was over a year prior to Governor Brown's executive order.

Over the past decade, SMCCCD has taken early steps to reduce water use through: natural turf replacement on athletic fields, adjusting irrigation schedules, implementing weather-based irrigation controllers, new landscaping and planting of native and drought tolerant species, informational signage, installation of low flow indoor fixtures, and altering outdoor fountains. Parallel efforts to further water conservation encompassed writing the SMCCCD Water Efficiency Program (WEP) in order to identify and address information gaps, take action, and educate students, faculty, staff, and the greater San Mateo County Community. The WEP utilizes a six-step process to establish and support this framework.

The WEP steps are designed to be a continuous process, as old strategies are being evaluated while new strategies are being implemented. Each step of the WEP provides direction and instruction while simultaneously evaluating progress in order to ensure program effectiveness. The WEP is also designed to serve as a framework for encouraging water conservation at other college campuses. An accompanying document was created, the Water Efficiency Program Template, and is designed to guide colleges in creating a Water Efficiency Program for their campus.

The Water Efficiency Program is broken up into a six step process:

- Step 1: Measure and Benchmark Water Consumption
- Step 2: Develop a Water Use Profile
- Step 3: Identify and Establish Water Reduction Targets and Goals
- Step 4: Identify, Evaluate, and Select Water Conservation Measures
- Step 5: Plan, Budget, and Implement Selected Water Conservation Measures
- Step 6: Monitor and Evaluate Water Efficiency Program Effectiveness

This living document will serve to communicate the District's commitment to water conservation and thereby fulfill the District's Sustainability Plan goals. It is designed to identify information gaps and guide Program implementation for District staff, faculty, students, and the community.

2.0 Introduction

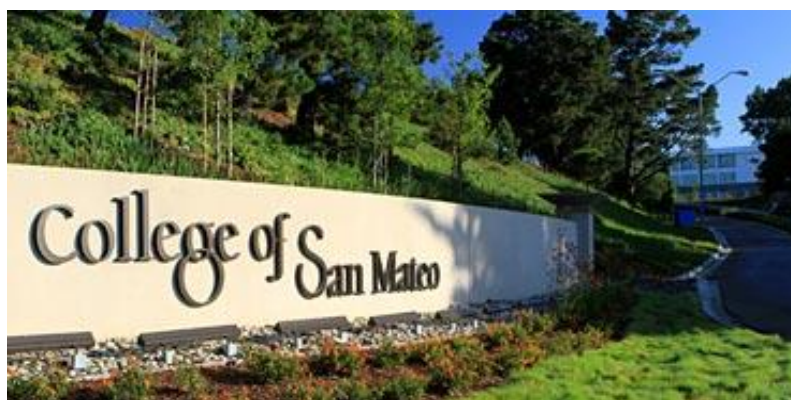
Water is essential for life, but it is often taken for granted as an inexpensive and unlimited resource. Current drought conditions underscore the reality that water supplies are not limitless. Only three percent of the world's water is fresh and two thirds of it is frozen in icebergs, leaving a small fraction of accessible to humans. In many areas, including California and the western United States, future water availability is uncertain. Global climate change variability is a threat to water resource availability as droughts are expected to become more frequent and persistent.

Water conservation is not only a viable climate change mitigation strategy, but it is also a crucial adaptation approach. Integrating water conservation into everyday activities better prepares communities for foreseeable droughts, reducing the need to react to sudden water shortages. Water conservation also provides cost savings in the form of lower water, wastewater and energy bills and increases water availability for high priority human needs and ecological systems that support us, including local streams, wetlands, and their natural inhabitants. These factors, among many others, place a premium on conserving water resources.

The San Mateo County Community College District (SMCCCD/District) Water Efficiency Program (WEP) has a variety of factors that will impact water efficiency planning. These include the geographic location, area climate, and local water resources that will change over time due to climatic and political responses. With this in mind, the WEP is intended to be a living document.



Cañada College



College of San Mateo



Skyline College

2.1 District & Campus Overview

Established in 1922, SMCCCD has been providing accessible education in the Bay Area through the operation of three colleges: Cañada College, College of San Mateo, and Skyline College. Each year, the District serves approximately 45,000 students and offers the first two years of college-level instruction with a wide variety of transfer programs. SMCCCD facilities, at date of publishing, consists of over 80 buildings representing 1.75 million gross square feet and over 400 acres of landscaped areas throughout the District.

2.2 District & Campus Geographic Location and Area Climate

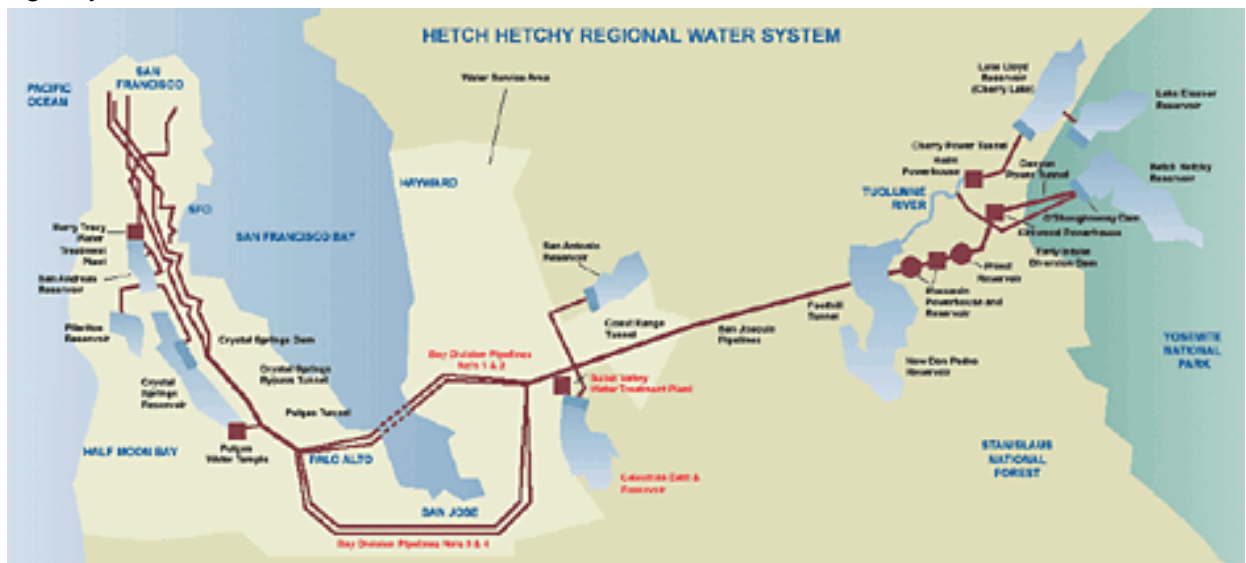


SMCCCD is located in San Mateo County, in California and is comprised of three campuses located in the northern, central, and southern portions of the county. Each campus is accessed from main arterial roadways, and in close proximity to Interstate 280 which traverses San Mateo County from north to south, on the east side parallel to the Santa Cruz mountain range at its northern tip. Each of the three campuses is situated on hilltops, also on the eastern side of the mountain range.

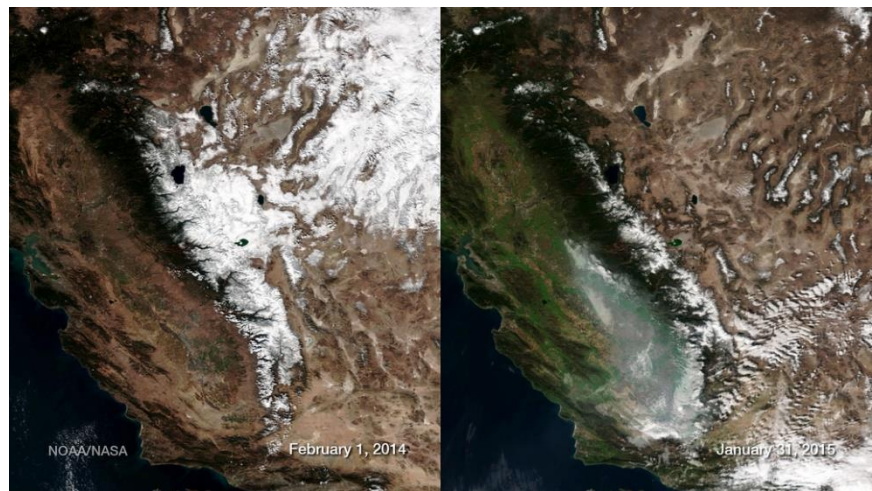
2.3 Local Water Resources

The San Francisco Bay area is served by a complex water infrastructure that begins with the Hetch Hetchy reservoir. Local storage for San Mateo County is contained largely within the Crystal Springs reservoir. This complex system includes a series of reservoirs, tunnels, pipelines, and treatment systems that transports snowmelt into the Tuolumne River. It is managed by the San Francisco Public Utilities Commission (SFPUC) and serves as a wholesale water provider to local agencies.

Cañada College, College of San Mateo, and Skyline College have different water provider agencies. Cañada College receives potable water from the City of Redwood City, College of San Mateo from California Water Service Company (Cal Water), and Skyline College from the City of San Bruno. The City of San Bruno purchases approximately 50% of its water from the SFPUC and the remainder 50% is groundwater resources from local Bay Area reservoirs. Cal Water and City of Redwood City purchase 100% of their water from SFPUC. Each agency provides water quality monitoring and distribution to its local residential, commercial, and industrial users. Appendix B provides website and contact resources for each agency.



Due to the reduced snowpack and snowmelt into the Tuolumne River over the past four years, drought is occurring throughout the Hetch Hetchy system and Bay Area water supply. Climate change poses a threat to the Hetch Hetchy system as drought is expected to be more frequent and persistent. For the past five years, the Sierra Nevada Mountains' reduced snowpack has led to reduced snowmelt and freshwater resources. Rising temperatures are also causing snow to melt earlier when we need it during the hot summer months.



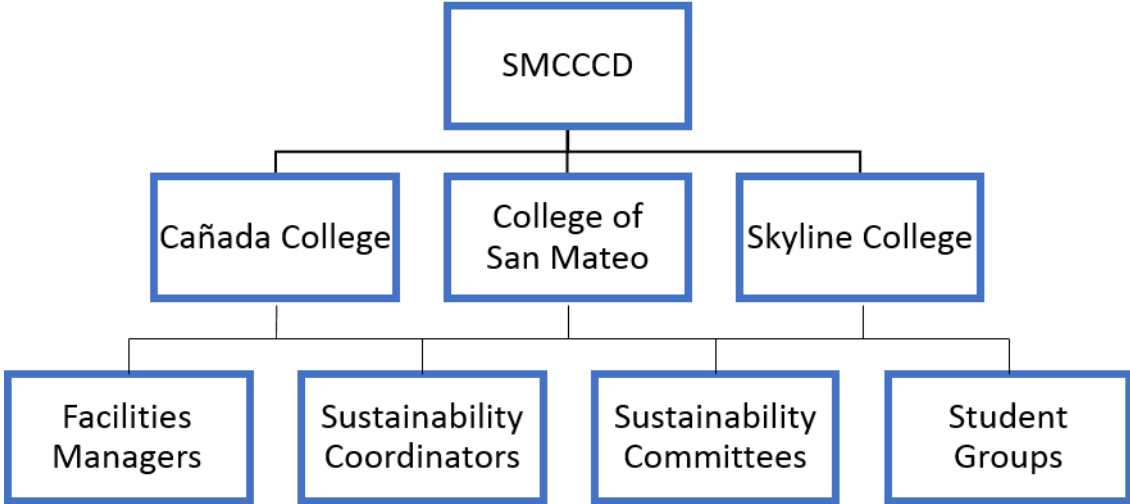
2.4 Establishing District and Campus Water Conservation

Water conservation is a key component to District sustainability efforts. This section serves to combine the details of district and campus structure with water conservation. The following sub-sections will outline the key players, regulatory context of water, history of water conservation, benefits of water conservation, and establish WEP purpose and objectives.

2.4.1 Key Players

San Mateo County Community College District is a complex organization with a variety of key players involved with the WEP. These key players include water efficiency planning, implementation, and communication efforts. As shown in the figure below, SMCCCD oversees District activities, but more specifically the Facilities Planning, Maintenance, and Operations Department oversees planning and implementation of water efficiency strategies. The Sustainability Team, housed in the Facilities Department, serves as internal consultants for District and campus water efficiency strategies.

Cañada College, College of San Mateo and Skyline College each have their own Facilities Managers, Sustainability Coordinators, Sustainability Committees, and Student Groups that are involved with providing input in the planning and implementation process, but lead more of the communication and engagement of the water efficiency measures. Collectively, each of the key players work together to plan, implement, monitor, and communicate the steps of the WEP.



2.4.2 Regulatory Context of Water Conservation

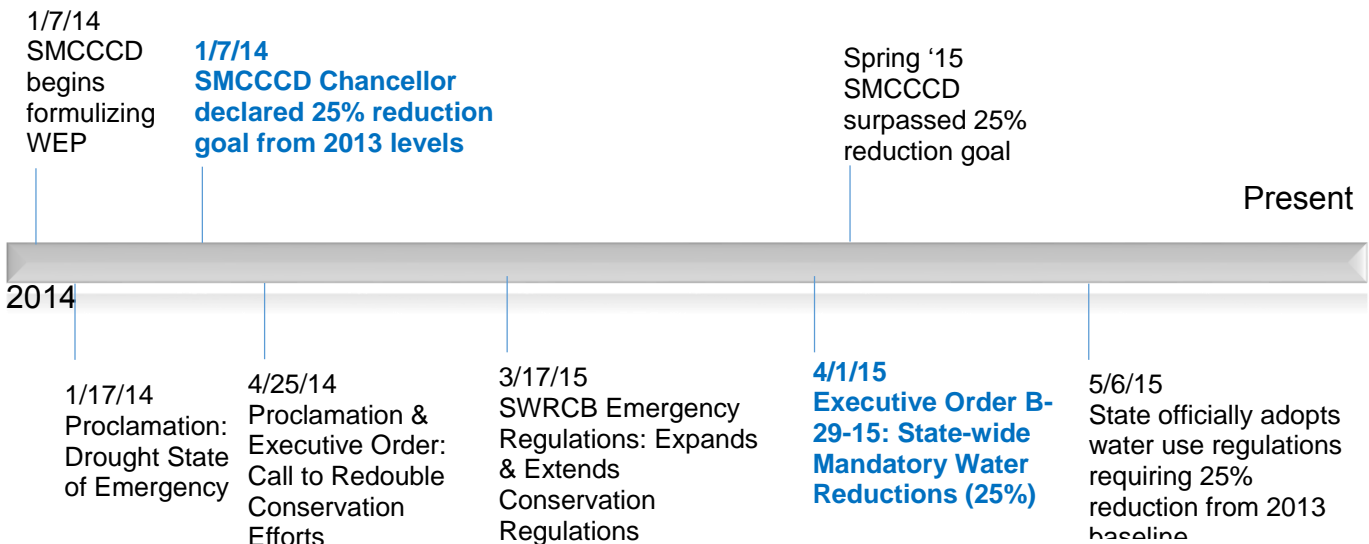
Water conservation is a fundamental component of sustainability and a key priority for the San Mateo County Community College District. The Sustainability Plan for each campus lists water conservation in its priority list of sustainability goals, making water conservation an integral part of campus culture at all three District campuses. Each campus continually strives to reduce potable water use through outreach and education through the implementation of various other water conservation measures. Worsening drought conditions in California and the recent call for reductions in water use statewide add a sense of urgency to achieving the District’s sustainability goals related to water conservation.

In January 2014, the Chancellor issued a 25% District-wide mandate for water use reduction compared to 2013 levels. This mandate was issued more than a year prior to Governor Brown’s emergency regulations.

The timeline below highlights regulatory action implemented recently by California and the concurring SMCCCD regulatory actions in response to the current drought. Appendix A contains a summary of regulatory milestones for water conservation and recent drought-driven regulations. The timeline also shows the parallel efforts by SMCCCD and proactive response to start a 25% water reduction to 2013 baseline prior to the state mandatory reductions.

Water utilities serving District campuses are tasked with implementing federal and state regulations at the local level. Appendix B lists contact information for each water utility. Links to each utility’s website and Urban Water Management Plan are also provided.

SMCCCD



State of California

2.4.3 History of Water Conservation at District Facilities

Considerable information gaps persist in water use and conservation efforts on all three campuses within the District. This WEP aims to address these gaps and implement and/or improve water efficiency strategies. In calendar year 2013 the District spent nearly \$750,000 on water. That number, after implementation of key components of this program dropped to less than \$600,000 in calendar year 2014 even as water prices climbed.

It is estimated that 50 - 80% of potable water is used for landscape irrigation throughout the District. Hence the focus for conservation in the Irrigation use category has been, and remains, the highest priority. The remainder is used for industrial processes including for the heating and cooling of buildings and maintaining fountains and pools, domestic uses, and educational functions such as laboratories. In an effort to reduce water use and associated costs, a number of water conservation measures were implemented within the last 5 years, including the following:

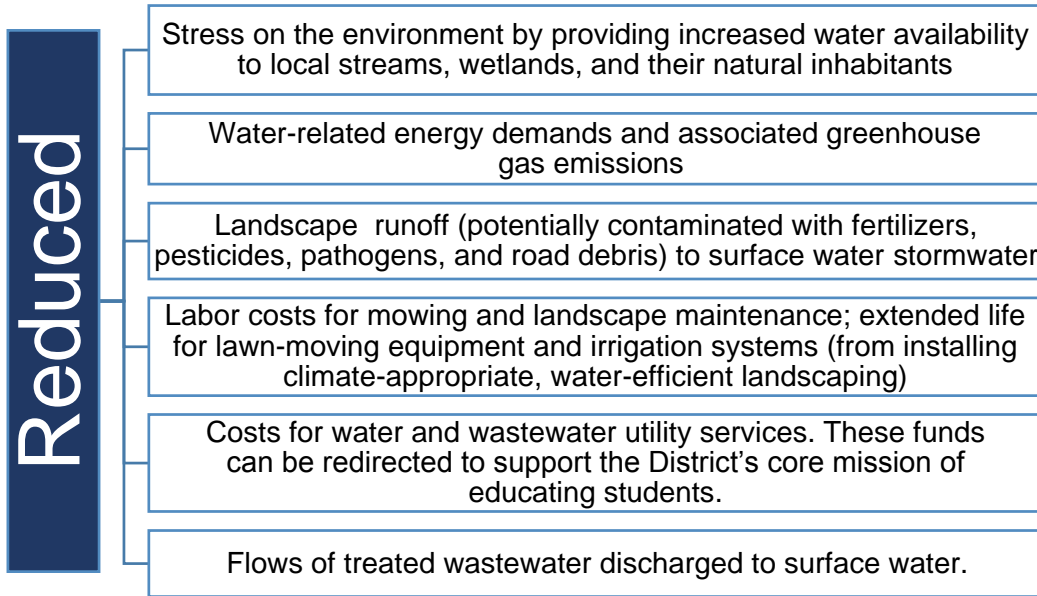
- Campus Sustainability Plans' water efficiency goals
- Athletic grass fields replaced with synthetic turf. Maintenance and water cost savings are approximately 5.8 million gallons with an annual cost savings of approximately \$370,000
- Implementation of Weather-Based Irrigation Controllers installed at CSM and SKY enabled automated adjustment of irrigation rates based on real-time weather data
- Irrigation timers were shifted to evening hours to significantly reduce evaporation resulting in a 25% irrigation reduction at all three campuses
- New landscaping with the planting of native and drought-tolerant species to reduce long-term maintenance and irrigation needs. At CSM, the centralized irrigation system and drought tolerant plant selections reduced water use by 71% near the Health and Wellness building and 58% near the College Center
- Automatic flow sensors and efficient low-flow fixtures are installed in new buildings. At the CSM, installation of these devices reduced water use by 46% for the Health and Wellness building and nearly 49% for College Center
- The District increased outreach efforts at all 3 campuses by posting signage to raise awareness of drought conditions and the importance of conserving water
- District staff identified additional potential strategies including covering pools while not in use, altering fountains, and installing water meters at to further identify areas where potential water savings can be achieved

Appendix C lists water conservation measures currently in place throughout the District and includes estimates of water savings for each measure where data are available.



2.4.4 Benefits of Water Conservation at District Facilities

Environmental and economic benefits will continue to accrue as water conservation goals identified in the District’s Sustainability Plan are implemented. There are direct District benefits to implementing water conservation strategies, however there are additional indirect benefits identified. Some of these benefits are as follows:



2.4.5 Establish Purpose

SMCCCD is committed to water conservation efforts as it is in line with District and campus sustainability initiatives, goals, and programs. The purpose of the WEP is stated below:

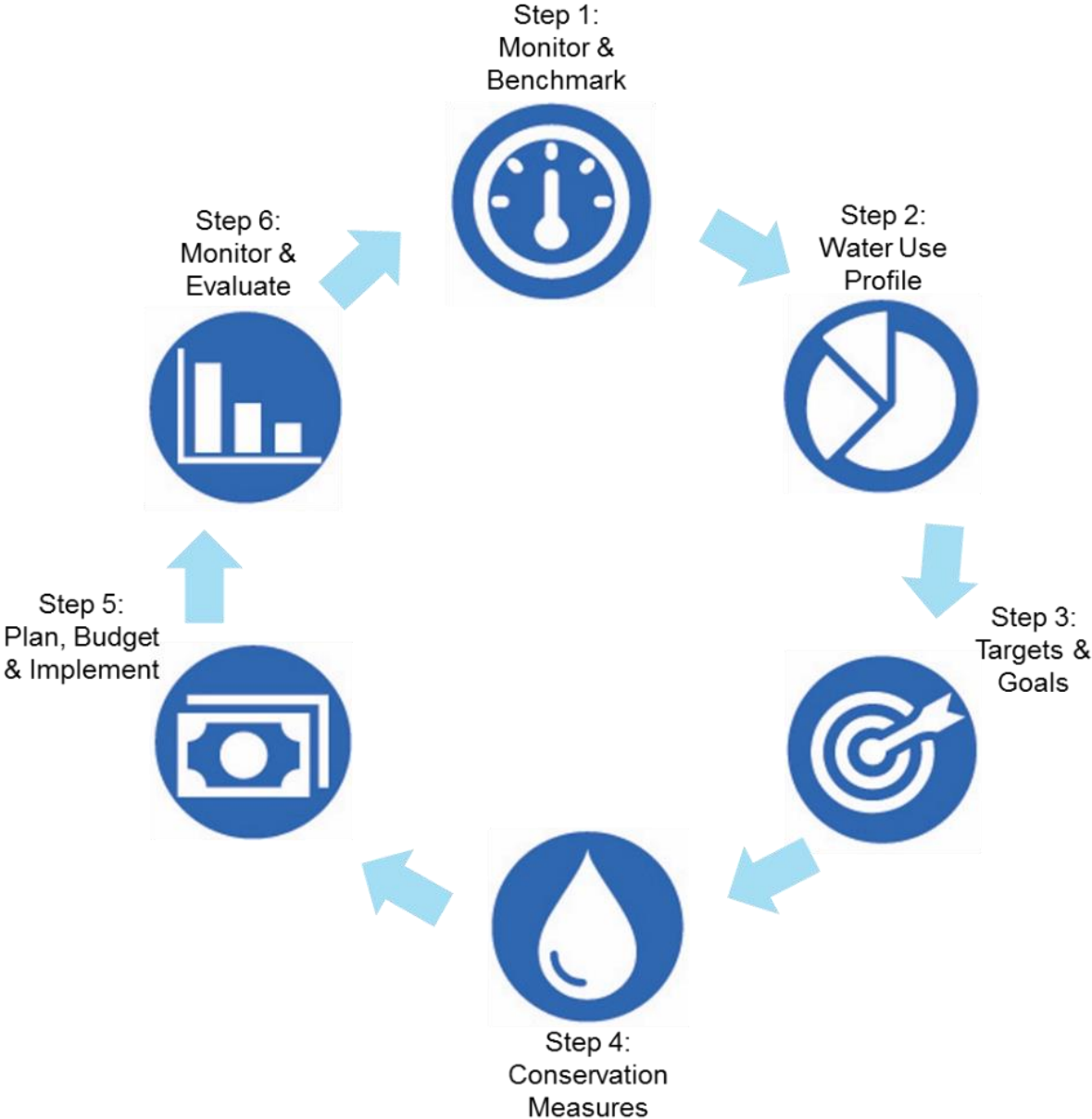
The Water Efficiency Program (WEP) serves to communicate the District’s commitment to water conservation and thereby fulfill the District’s Sustainability Plan goals. It is designed to identify information gaps and guide Program implementation for District staff, faculty, students, and the community.

The WEP will require periodic revisions as information gaps are filled, best management practices evolve and as the path to increased water efficiency becomes more distinct. It documents the current status of water conservation efforts at the District’s three campuses, including current water usage at each campus, water conservation measures currently in place and the estimated water savings for each measure, and additional water conservation measures successfully implemented elsewhere.

The WEP also provides methodologies for evaluating and selecting water conservation measures and for assessing Program effectiveness with a view toward achieving continual Program improvements and increased water efficiency. Information gaps are identified herein to help characterize current conditions and water conservation efforts more accurately and to lay the foundation for a benchmarking study.

3.0 Water Efficiency Program

The WEP is designed to serve as a framework for accomplishing water conservation at other college campuses, in particular those in the 113 school California community College System. SMCCCD utilizes a six-step process to establish and support this framework. The schematic below shows the continuous improvement process designed to constantly come back to the beginning in order to manage existing conservation measures, build upon these measures, add additional measures, and increase overall water efficiency. The details of each step are described on the following subsections.





Step 1: Measure and Benchmark Current Water Consumption

This is vital for tracking progress so that the District can continue to measure consumption on an ongoing basis and quantify the savings from reduction efforts. Water reduction opportunities will become apparent once water use is measured and benchmarked.



Step 2: Develop a Water Use Profile

This will help clarify how water is used in various building types and facilities systems in order for the District to identify and prioritize the best water reduction opportunities. Must also include determining the impact of existing conservation efforts on current water use.



Step 3: Identify and Establish Water Use Reduction Targets and Goals

Identify current short and long term targets and goals set by regulatory agencies or by District leadership and staff. Establish targets and goals that can be reached through water conservation strategies.



Step 4: Identify, Evaluate and Select Water Conservation Measures

Identify all conservation measures that save water – “hardware” devices and technologies as well as behavior and management practices – and develop a matrix of measures that may be considered suitable for District facilities. Evaluate candidate measures by performing a benefit-cost analysis, and select measures to implement. Appendix C contains a list of water conservation measures currently implemented at District facilities. Appendix D contains a list of potential conservation measures for evaluation.



Step 5: Plan, Budget, and Implement Selected Water Conservation Measures

Prepare an implementation plan by detailing the budget, schedule and staffing.



Step 6: Monitor and Evaluate Water Efficiency Program Effectiveness

The effectiveness of this WEP depends on timely review and adaptation as conditions change and knowledge evolves. This step is designed to verify that conservation measures are effectively reducing water use, to measure progress toward attainment of specific targets/goals, to track costs and savings, and to inform next steps toward further Program improvements.

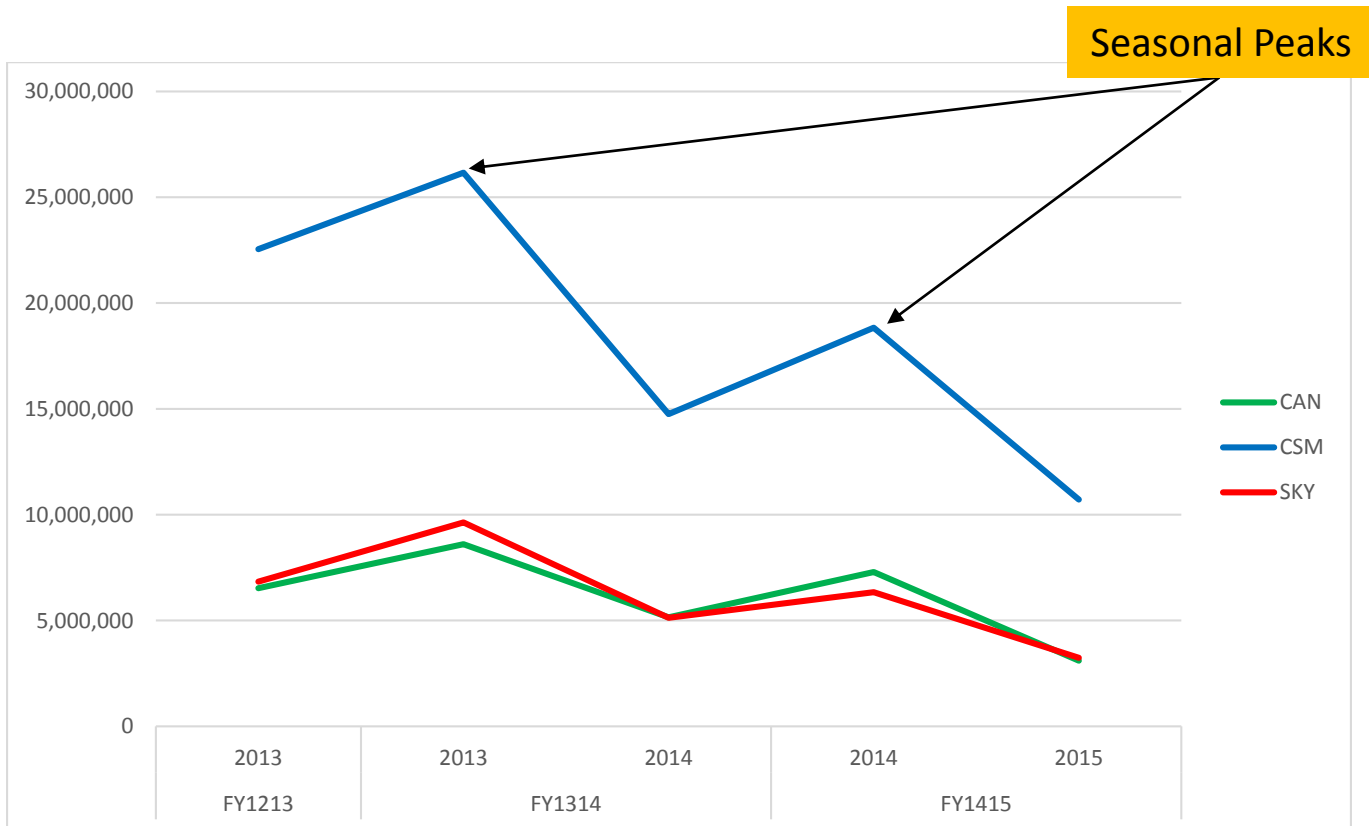
3.1 Step 1: Measure and Benchmark Current Water Consumption

Measuring current water consumption is commonly done by gathering and analyzing data from installed water meters. At the time of publication, measuring water consumption at the District is difficult due to the lack of metering infrastructure and real time data. Therefore, the District used monthly billing data from the campus' water agencies to get a rough estimate of water consumption and established a benchmark.

The established benchmark is calendar year 2013 and was chosen based on newly completed construction projects that increased overall water consumption. The District uses the 2013 benchmark to show that water consumption can be significantly decreased even with an increase of students and buildings consuming more water.

Since establishing the 2013 benchmark there have been consistent reductions, however there are months that fall below the 2013 baseline and months that go above. It is an ongoing effort to monitor exact monthly and annual water consumption, however the District is mindful for the opportunities of improving water metering infrastructure.

Although the District set the benchmark for calendar year 2013, analyses for the WEP will examine fiscal year water consumption. SMCCCD fiscal year begins in July and ends in June the following year.



3.2 Step 2: Develop a Water Use Profile

Water use profiles are typically developed by analyzing real time water use data using installed water meters. At the time of publication, SMCCCD does not have access to real time water consumption data for specific categories. Therefore, the District has identified four major use categories based on understanding that we use water for irrigation, industrial processes, domestic indoor use, and everything else is categorized as “miscellaneous.” Efforts are currently underway at District facilities to use install water meters and use real time water consumption data to characterize the volume of water consumed for various uses including the following categories:

Irrigation



Irrigation use to maintain landscaped areas, including planted areas of bushes, shrubs, fescues and trees

Industrial



Industrial use, which includes water used for such purposes as fabricating, processing, washing hard surfaces and heating and cooling

Domestic



Domestic use, which includes water used for drinking fountains, faucets, and flushing water closets and urinals.

Miscellaneous



Until further metering to separate out sub-categories, miscellaneous use is water used for preparing food, bathing, washing clothes, dishwashing, servicing swimming pools and fountains, and other uses not included in the above categories

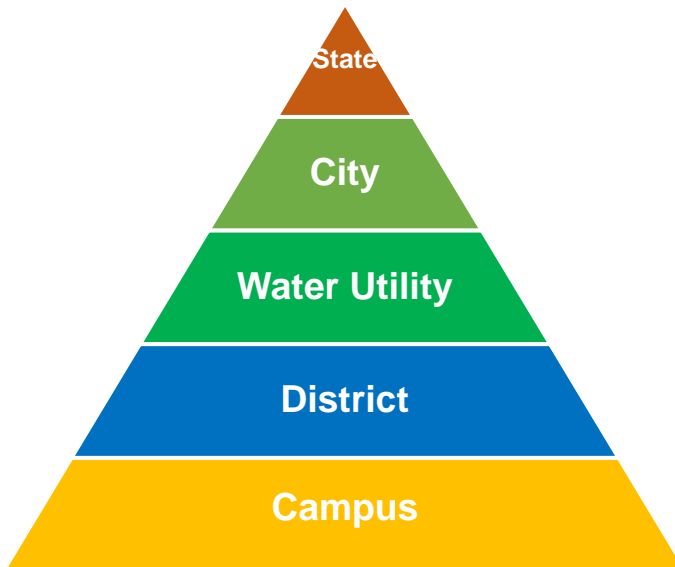
At the time of publication, landscape irrigation is presumed to be the most significant end use of water at each campus. Work in progress includes irrigation audits at each campus and sub-metering irrigation flows through the commissioning of Weather-Based Irrigation Controllers (WBIC) at the College of San Mateo and Skyline College.

Accurately metering irrigation water use has benefits beyond identifying opportunities for water conservation: irrigation water use data can be used to support the case for a sewer use bill adjustment. As stated previously, sewer use charges are often calculated off water utility bills and may significantly increase the cost of potable water, even though water used for irrigation is never discharged to the sanitary sewer system. This artificially doubles the cost of irrigation category uses.

At the time of publication, the District is in the process of implementing water meters. Once installed, real-time data will be collected and analyzed to expand on the four current water use profile categories.

3.3 Step 3: Identify and Establish Water Reduction Target and Goals

Short- and long-term targets and goals established by regulatory agencies or by District leadership or staff and can be designed to reflect a basic, intermediate or more aggressive approach to reducing water use. Targets/goals will help inform which water conservation measures to implement to achieve stated goals. These may include percent or volume reductions for a given time period, reduced costs for water and/or wastewater services, reducing energy combustion byproducts that contribute to air pollution including greenhouse gas emissions, reduced impacts in the water environment (instream flows, effects on wetlands), increased student and community involvement in WEP implementation, etc.



Certain goals may not provide measurable data with which to evaluate progress toward achieving water use reduction targets. For example, an outreach goal may involve providing a defined number of K-12 school programs each year, or issuing a defined number of announcements each year through a specific social media outlet. Targets and goals may not be the same from campus to campus because of differences in the water use profile at each campus, and targets/goals will likely change over time as the WEP is refined to adapt to changing conditions.

It is important to keep in mind the different levels of regulatory targets and goals already set. The graphic to the right demonstrates the various levels to keep in mind when identifying and establishing goals.

It is important to note that SMCCCD established a 25% water reduction goal to the 2013 baseline over a year ahead of Governor Jerry Brown's 2014 executive order. This has allowed the District to establish targets and goals early on. The following SMCCCD target and goals have been established:

1. In January 2014, SMCCCD, under direction from the Board of Trustees, has committed to an overall reduction of 25% from the previous year's baseline water use.
2. Perform a campus Facilities Measurement, Verification, and Benchmarking Study using the appropriate benchmarking tool(s). Based on the results of the Benchmarking Study, establish annual water use reduction goals and implement appropriate water efficiency measures to meet goals.
3. Evaluate Water Efficiency Program effectiveness every 5 years and refine Program strategies accordingly to achieve continuous improvement.

Additional targets and/or goals may be established as conditions change and the Program evolves.

3.4 Step 4: Identify, Evaluate, and Select Water Conservation Measures

When identifying water conservation measures, it is important to revisit the water use profile established in Step 2. This will assist in identifying the highest uses and focus on implementing water conservation measures for larger savings. SMCCCD has identified irrigation as its largest user and has implemented a variety of conservation measures to reduce irrigation of athletic fields and patches of aesthetic natural turf.

After identifying conservation measure options, we also keep in mind the varying economic, environmental, and social factors will have a major influence on efficiency strategies at each campus. The graphic to the right is a visual example of these things to keep in mind.

When selecting water conservation measures, it is important to examine the initial cost, maintenance cost(s), estimated water reduction, estimated annual cost savings, payback period, and any additional notes for each measure you select.

3.5 Step 5: Plan, Budget, and Implement Selected Water Conservation Measures

In this section you will develop a plan from the most attractive measures that includes budgets, a schedule for implementation and a staffing plan, where applicable.

Planning the implementation of the selected water conservation measures can be organized by creating a timeline. This timeline will include when a measure is implemented, when it requires maintenance, pay-back period, and when it needs to be upgraded.

Creating a budget that goes along with the planning process will help organize the cost of the initial project, maintenance, and upgrades and match it with the pay-back period.

The plan and budget will need to be reviewed by the respective administrative parties and once it is approved, the water conservation measures can be implemented.



3.6 Step 6: Monitor and Evaluate Water Efficiency Program Effectiveness

Once water conservation measures are in place, monitoring water consumption will tell you if your efficiency measures are working. If you have water metering infrastructure, real-time water meter data is the most effective way to evaluate the measures' effectiveness. Water meter data should be monitored daily and weekly at a minimum to identify leaks. If you don't have water meter infrastructure, monthly utility bills will provide you with monthly consumption data.

Some items to look for when monitoring monthly and annual data include: water conservation measures are working as expected, new buildings and projects, student population changes, seasonal and weather variations, number of academic days per month, and special events held on campus (i.e. buildings and rooms rented out on the weekends for community events, conferences, or weddings).

Water consumption data will identify the effectiveness of the measure and if maintenance is required to increase efficiency. It may be helpful to assess Program effectiveness according to an established schedule to ensure an adaptive approach to Program management and continual improvement in water use efficiency.

One such schedule is outlined in the table below. Findings from each evaluation performed should be well-documented, with information summarized for presentation to District leadership, students, faculty and other groups of interest.

Frequency	Evaluation
Annually	<ul style="list-style-type: none"> - Compile all meter and sub-meter data for the year - Compile all cost data for the year - Evaluate the data set with data from previous years to assess water use trends, including annual water usage and costs - Evaluate cost and usage reductions or increases, and attempt to correlate these with implemented water conservation measures, to campus population dynamics, campus build-out, or other variables - Compare water use reductions with reduction targets and goals to determine whether the gap is closing - Review conservation measures that target behavior modification to determine if goals were met - Prepare a brief summary of program activities and achievements for the year, and include any recommendations for program improvements - Publicize successes
Every 2 years	<ul style="list-style-type: none"> - Identify, if possible, which water conservation measures are effectively making gains toward attaining water reduction targets and which are not - If possible, determine why ineffective measures are ineffective and document findings. - Compare expected reductions for each conservation measure vs. actual reductions. Refine assumptions as necessary - Revisit the benefit-cost analysis to update assumptions, and recalculate benefit-cost ratios - Review literature for new technologies or processes, and append the list of potential conservation measures with new measures - Perform the benefit-cost analysis on new measures
Every 5 years	<ul style="list-style-type: none"> - Evaluate conservation measures implemented - Decide whether to modify the approach or continue working the same implementation plan. - Implement new or more aggressive conservation measures if necessary to meet established targets/goals - Revise the schedule for attaining targets/goals if necessary

4.0 Student, Faculty and Community Engagement





Sustainability at SMCCCD is reverberated throughout each campus through facilities and campus specific goals. It is a priority to not only reach, but surpass water conservation goals. Engagement is a vital component of the WEP as the District’s constituents have the opportunity to learn and take these lessons home to even further conservation efforts throughout San Mateo County and surrounding communities.

4.1 Audience

SMCCCD’s direct audience includes anyone who frequently visits any of the three campuses. This includes approximately over 40,000 students and 2,250 faculty and staff. Each year there are thousands of community visitors attending a variety of community related events each year including: farmers markets, weddings, conferences, sports events, San Mateo Athletic Club,

4.2 Channels of Communication

Existing channels of communication offer an ideal opportunity to maximize current channels and spread water conservation tips, updates, and notices. New channels of communication are channels that have been identified and plan on being utilized in the near future. There are District level channels as well as campus specific channels and are identified below:

District/ Campus	Existing Channels	New Channels
	<ol style="list-style-type: none"> 1. Email listserves (faculty and staff) 2. Signage and posters 	<ol style="list-style-type: none"> 1. New Employee Handbook 2. Sustainability Newsletter
	<ol style="list-style-type: none"> 1. Email listserves (faculty and staff) 2. Olive Press – online student led newsletter 3. Flex Day (faculty) 4. Student organization projects and events 5. Campus Sustainability Committee 6. Curriculum 	<ol style="list-style-type: none"> 1. Green Events (Checklist) 2. New Student Orientation
	<ol style="list-style-type: none"> 1. Email listserves (faculty and staff) 2. Flex Day (faculty) 3. Student organization projects and events 4. Campus Sustainability Committee 5. Curriculum 	<ol style="list-style-type: none"> 1. Green Events (Checklist) 2. New Student Orientation
	<ol style="list-style-type: none"> 1. Email listserves (faculty and staff) 2. Skyline Shines – online student led newsletter 3. Flex Day (faculty) 4. Student organization projects and events 5. Campus Sustainability Committee (SAN) 6. Curriculum 	<ol style="list-style-type: none"> 1. Green Events (Checklist) 2. New Student Orientation

4.3 Engagement

Engagement varies by audience and channel of communication. The first steps of engagement were outlined above by identifying SMCCCD audience and channels of communication. Next would be to establish a plan as to how to increase engagement.

Water Efficiency is a goal in each of the campus Sustainability Plans, and in 2016 the plans are being updated. The update will include communications and engagement strategies for each of the goals, including water efficiency.

Below are some engagement strategies that are planned for 2016:

1. Campus as a Living Laboratory: Indoor water audit
2. Sustainability website article
3. World Water Day event
4. Campus as a Living Laboratory: Outdoor water irrigation audit kit
5. Earth Day event
6. Campus Sustainability Month (October)

Additional engagement strategies may be established as conditions change and the Program evolves.

Appendix A: Summary of Regulatory Milestones in Water Conservation and Drought-Driven Regulations in California 2014-2015

Summary of Regulatory Milestones

The following summary of regulatory milestones in water conservation was obtained in part from Volume 3 of the Draft California Water Plan Update 2013, prepared by the California Department of Water Resources. ¹

1983 Urban Water Management Planning Act (UWMP Act)

The UWMP Act requires urban water suppliers to report water availability and use, long-range planning activities, and the implementation of fourteen Demand Management Measures. The Act has been updated numerous times in its nearly 30 year history.

1991 Formation of California Urban Water Conservation Council (CUWCC)

Water suppliers who sign the CUWCC Memorandum of Understanding (MOU) pledge to develop and implement comprehensive water conservation Best Management Practices (BMPs) (adapted from the Demand Management Measures of the UWMP Act). The Council incubated a national organization, the Alliance for Water Efficiency, to carry on advocacy and technical assistance in other states. ²

1992 to Present: U.S. Energy Policy Act

This act established water efficiency standards in the form of maximum flow / flush rates for faucets, shower heads and water closets manufactured after January 1, 1994. For example, the mandatory federal maximum for new water closets was 1.6 gallons per flush (gpf). Plumbing codes for water closets have steadily increased water closet efficiencies. Before 1980 water closets typically used 5.0 gpf. In 1980 the plumbing codes set the standard water closet flush volumes to 3.6 gpf. Beginning in 2014, no water closet sold or installed can use more than 1.28 gpf. Residential water closet retrofits have had the greatest impact on urban water use, accounting for almost half of all BMP water savings through 2004.

2009 SBX 7-7

This legislation requires the state to reduce urban per capita water use by 20% by 2020.

2010 Model Water Efficient Landscape Ordinance (MWELO)

This ordinance requires cities and counties to adopt a water efficient landscape ordinance at least as effective in water savings as the Model Ordinance by January of 2010.

2011 Cal Green Building Code

This code requires a 20% reduction in indoor water use, separate water meters for indoor and outdoor water uses in nonresidential buildings, and moisture-sensing irrigation systems for larger landscape projects.

Recent Drought-Driven Regulatory Activity

¹ California Department of Water Resources, http://www.water.ca.gov/calendar/materials/vol3_urbanwue_apr_release_16033.pdf, unless otherwise noted.

² California Urban Water Conservation Council, <http://www.cuwcc.org/Portals/0/Document%20Library/About%20Us/Strategic%20Plans/Strategic%20Plans%20for%200Years%202011-2015.pdf>

*January 17, 2014 State of Emergency Drought Proclamation*³

With California in its third year of below-average rainfall and facing the driest year in recorded state history, Governor Brown proclaimed a drought state of emergency and directed state officials to take all necessary actions to prepare for drought conditions. The Governor called on Californians to voluntarily reduce their water use by 20% and noted that mandatory restrictions could be forthcoming.

*April 25, 2014 Executive Order*⁴

The Governor issued an executive order to strengthen the state's ability to manage water and habitat effectively in drought conditions and called on all Californians to redouble their efforts to conserve water. Underscoring the increasing severity of the drought, this second proclamation waived compliance with the California Environmental Quality Act (CEQA) and the state water code for a number of actions, including water transfers, wastewater treatment projects, habitat improvements for winter-run Chinook salmon imperiled by the drought and curtailment of water rights. The order also called on all Californians to avoid using water to clean sidewalks, driveways, parking lots and other hardscapes; to wash vehicles only at car washes that use recycled water; and to limit landscape watering to twice weekly. It encouraged outdoor sports facilities to similarly reduce irrigation of playing fields, and it urged hotels and restaurants to give patrons options to reduce water consumption, such as limiting laundering of linens and making water available only on request.

*July 28, 2014 Emergency Drought Regulations*⁵

In spite of worsening drought conditions and repeated calls to cut water usage by 20% statewide, a May/June 2014 survey of water suppliers serving 25 million Californians showed that current voluntary and mandatory conservation efforts had resulted in a 1% *increase* in water use during May 2014, compared to a 3-year average of the same month from 2011 through 2013. In response to the survey results, the State Water Resources Control Board approved regulations intended to reduce outdoor urban water use. The regulations prohibit the following:

- The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
- The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use;
- The application of potable water to driveways and sidewalks; and
- The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

The regulations, which became effective on July 28, 2014 and expire on April 25, 2015, authorize water agencies to impose fines of up to \$500 for each day in which the violation occurs.

*March 17, 2015 Emergency Drought Regulations*⁶

³ California Office of Governor, <http://gov.ca.gov/news.php?id=18368>

⁴ California Office of Governor, <http://gov.ca.gov/news.php?id=18496>

⁵ State Water Resources Control Board
(http://www.waterboards.ca.gov/press_room/press_releases/2014/pr071514.pdf)

⁶ State Water Resources Control Board
(http://www.waterboards.ca.gov/press_room/press_releases/2015/pr031715_renewed_emergency_wtr_regs.pdf)

As California entered its fourth year of drought, the State Water Resources Control Board adopted an expanded emergency regulation that includes the prohibitions in the July 28, 2014 regulation as well as the following additional requirements:

- Irrigating turf or ornamental landscapes during and 48 hours following measurable precipitation is prohibited;
- Restaurants and other food service establishments can only serve water to customers on request;
- Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option;
- Urban water suppliers must now limit the number of days per week that customers can irrigate outdoors;
- Local agencies can fine property owners up to \$500 per day for violations, and the State Water Board can issue a cease and desist order against water agencies that don't impose mandatory conservation measures upon their retail customers. Water agencies that violate cease and desist orders are subject to civil liability of up to \$10,000 a day.

The regulations went into effect March 27, 2015.

April 1, 2015 Executive Order ⁷

For the first time in state history, the Governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25%. Among other actions, the order will:

- Replace 50 million square feet of lawns with drought tolerant landscaping in partnership with local governments;
- Direct the creation of a temporary, statewide consumer rebate program to replace old appliances with more water and energy efficient models;
- Require campuses, golf courses, cemeteries and other large landscapes to make significant cuts in water use;
- Prohibit new homes and developments from irrigating with potable water unless water-efficient drip irrigation systems are used, and ban watering of ornamental grass on public street medians; and
- Update the State Model Water Efficient Landscape Ordinance (MWELO).

May 5, 2015 Emergency Drought Regulations

In response to the Governor's April 1, 2015 Executive Order, the State Water Resources Control Board adopted emergency regulations to reduce urban water usage by 25% statewide. The emergency regulation identifies how much water communities must conserve based on their average residential water use, per person per day, during summer 2014. New prohibitions include the following:

- Irrigation with potable water of ornamental turf on public street medians;
- Irrigation with potable water outside of newly constructed homes and buildings not in accordance with emergency regulations or other building requirements.

The regulations went into effect May 18, 2015.

May 29, 2015 Approval of New Water Efficiency Requirements for Nonresidential and School Construction

⁷ State of California (ca.gov/Drought/topstory/top-story-29.html)

The California Building Standards Commission approved new water efficiency requirements for (1) nonresidential construction projects that are permitted beginning in June 2015; and (2) new or modernization construction projects submitted to the Division of the State Architect later this summer for K-12 public schools and community colleges. The emergency changes to the 2013 California Green Building Standards Code enhance elements of the existing State Model Water Efficient Landscape Ordinance (MWELO) and are intended to improve water efficiency in new exterior landscaped areas.

Indicators of Drought Severity

2014 was California's hottest year on record, and the 2014-2015 winter was the warmest on record. Recently, climate studies have warned of an increased risk of megadroughts – severely dry conditions that sometimes last for decades.⁸

Measurements of the Sierra Nevada snowpack in 2015 provided evidence of the state's dire situation: the snow survey conducted on April 1, 2015, considered to be the peak of the snow season, showed that the snowpack was about 5% of the historical average of 28.3 inches for April 1. These measurements indicated that the statewide snowpack contained less water content than any April 1 since 1950. The lack of snowpack on April 1 rendered the May 2015 survey moot.⁹

The drought has had numerous far-reaching effects. According to a UC Davis economist, the drought caused a loss of approximately 17,000 jobs in 2014 and will result in mid-20,000 job losses in 2015. He estimates that 428,000 acres were left fallow in 2014 and that the figure will likely grow by 30 to 40 percent in 2015.¹⁰ At the ACWA Drought Briefing in May 2015, State Office of Emergency Services personnel reported that statewide, more than 1,800 residential wells had already gone dry.

With no end of the drought in sight, formalizing the District's Water Conservation Program and striving for continual improvements in water use efficiency takes on greater urgency.

⁸ Washington Post (www.washingtonpost.com/blogs/capital-weather-gang/wp/2015/03/16/californias-ridiculous-run-of-record-heat-inflaming-dire-water-situation/)

⁹ California Department of Water Resources (<http://water.ca.gov/news/archive/>)

¹⁰ UC Davis (https://watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_0.pdf)

Appendix B: Water Utility Contact Information

Campus / Utility	Information	Contact	Title/Dept	Phone No.	Email address
Skyline College City of San Bruno	Rebates & Programs	Conservation hotline	Debra Ivazes	[650] 780-7436	
	Billing/ Usage		Finance Dept/ Public Works	[650] 780-7210 [650] 780-7464	
	Regulations	Justin Chapel	Supervisor, Water Utility Services	[650] 780-7469	jchapel@redwoodcity.org
	Website: https://www.redwoodcity.org/publicworks/water/water_conservation.htm UWMP: www.redwoodcity.org/publicworks/water/uwmp2011/Final_UWMP.pdf				
College of San Mateo Cal Water (Bayshore District)	Rebates & Programs	Jade Joesten	Conservation Dept	[408] 367-8369	jjoesten@calwater.com
	Billing & Usage	Lori Doty		[650] 558-7800	ldoty@calwater.com
	Regulations	Lori Doty		[650] 558-7800	ldoty@calwater.com
	Website: https://www.calwater.com/conservation/ UWMP: www.calwater.com/docs/uwmp/bay/Mid-Peninsula/2010_Urban_Water_Management_Plan_(MPS).pdf Rule 14.1: www.calwater.com/docs/rates/rules/rule_14.1.pdf (Water Conservation and Rationing Plan)				
Skyline College City of San Bruno	Rebates & Programs	Mark Reinhardt	Water System and Conservation Manager	[650] 616-7167	mreinhardt@sanbruno.ca.gov
	Billing & Usage	Joanne Ryan	Utility Billing	[650] 616-7033	jryan@sanbruno.ca.gov
	Regulations	Mark Reinhardt	Water System and Conservation Manager	[650] 616-7167	mreinhardt@sanbruno.ca.gov
	Website: http://sanbrunowater.ca.gov/ UWMP: www.sanbruno.ca.gov/works_images/UWMP_San_Bruno_%202011.pdf				

Appendix C: Water Conservation Measures in Place

Campus	Measure Type	Water Conservation Measure	Timeframe	Expected Water Savings	Notes	Information Gaps
District-wide	Program Management	Created campus-led Sustainability Committees and a Sustainability Plan with water efficiency goals for each campus	Complete	-----		Formalize reduction targets / goals
District-wide	Audit	Conduct a comprehensive irrigation system audit to evaluate water use efficiency status	8/25/2014	TBD	Performed by Toro technical reps in collaboration with grounds keeping and District Facilities staffs	Status of water use efficiency on each campus; potential areas where improvements can be made. Audit findings to guide formulating an action plan
District-wide	Audit	Conduct a comprehensive industrial water use analysis to evaluate water use efficiency status	1/15/15	TBD	Performed by Facilities Maintenance and Operations staff in collaboration with Sustainability Committees and other appropriate stakeholders	Status of water use efficiency on each campus; potential areas where improvements can be made. Audit findings to guide formulating an action plan
District-wide	Audit	Conduct a comprehensive domestic water use analysis to evaluate water use efficiency status. Includes auditing all interior water fixtures including faucet sensors to ensure accurate sensitivity.	6/1/15	TBD	Performed by Facilities Maintenance and Operations staff in collaboration with Sustainability Committees and other appropriate stakeholders. Key area of opportunity for student/staff engagement and curriculum integration	Status of water use efficiency on each campus; potential areas where improvements can be made. Audit findings to guide formulating an action plan
District-wide	Rebates	Identify all potential rebates and utility resources for conservation upgrades, retrofits and actions.	Ongoing	Item-specific		Comprehensive list of rebate sources
District-wide	Irrigation	Irrigation sub-metering	8/31/2014	TBD	Data may also be used to support reduction in sewer use fees	Accurate data on irrigation water end use
CSM, SKY, CAN	Irrigation	Commission Weather-Based Irrigation Controllers	8/31/2014	TBD		
District-wide	Irrigation	Irrigation hardware retrofits/replacements: Identify faulty or broken fixtures in high-use hydrozones and replace fixtures with higher efficiency versions	Ongoing	TBD	Component of the action plan stemming from the comprehensive irrigation audit.	

Campus	Measure Type	Water Conservation Measure	Timeframe	Expected Water Savings	Notes	Information Gaps
District-wide	Irrigation	Reduce irrigation time by 25%	Complete	25%	25% water savings realized in irrigation run time; overall savings TBD	
District-wide	Irrigation	Change irrigation timing to evening hours	Complete	TBD		
District-wide	Irrigation	Replace natural turf with artificial turf	Complete	200,000 cu ft/yr	Savings = 2,000 CCF or ~1.5 million gallons/yr; nearly \$700,000 in annual operations and water costs.	Total square footage replaced at each campus; water savings at each campus
District-wide	Irrigation	Establish individual water budgets for main landscape hydrozones	8/31/2014	TBD		
District-wide	Irrigation	Employ drip irrigation in selected landscape hydrozones	8/31/2014	TBD		
CSM	Irrigation	Install >5,000 free efficient sprinkler nozzles throughout irrigation system	Completed 2014	TBD	Acquired via Toro and a CalWater Rebate; \$16,000 savings in hardware alone	Expected water savings
District-wide	Design	Sustainable design and construction practices (LEED Silver requirement for all new buildings)	Complete	measure-specific		
CSM	Fixtures	0.5 gpm lavatory faucets and automatic sensors: Health & Wellness and College Center Buildings	Complete	1.7 gpm	Savings represents 20% Reduction specs over Fixture Flow Rates (2010 CA Green Building Standards).	Number and type/rating of fixtures installed in each building
CSM	Fixtures	1.28 gpf high efficiency water closets (dual flush, sensor-based): Health & Wellness and College Center Buildings	Complete	0.32 gpf	Savings represents 20% Reduction specs over Fixture Flow Rates (2010 CA Green Building Standards).	Number and type/rating of fixtures installed in each building
CSM	Fixtures	0.5 gpf high efficiency urinals: Health & Wellness and College Center Buildings	Complete	0.5 gpf	Savings represents 20% Reduction specs over Fixture Flow Rates (2010 CA Green Building Standards).	Number and type/rating of fixtures installed in each building
CSM	Fixtures	2.0 gpm showerheads: Health & Wellness and College Center Buildings	Complete	0.5 gpm	Savings represents 20% Reduction specs over Fixture Flow Rates (2010 CA Green Building Standards).	Number and type/rating of fixtures installed in each building

Campus	Measure Type	Water Conservation Measure	Timeframe	Expected Water Savings	Notes	Information Gaps
District-wide	Equipment	Use Gumwand™ to eliminate the practice of power-washing concrete surfaces	Acquired 2014	TBD	Removes gum from concrete; eliminates need for power-washing sidewalks.	Expected water savings
District-wide	Equipment	Aqua-Barrier® portable water-inflated dam	Acquired 2014	TBD	Eliminates need to drain fountains for maintenance	Expected water savings
CSM	Equipment	Repair cooling tower leak	Completed 2014	TBD		Duration of leak; expected water savings
District-wide	Outreach	Campus awareness and Action Campaigns: engage campus Sustainability Committees to create and implement awareness and action throughout the campus community	9/2/14	-----	This is a key area of opportunity for student/ staff engagement and curriculum integration; a high priority for FY14/15	
District-wide	Outreach	Conduct drought outreach through Sustainability Committees / post signage at each campus, including showers at CSM Health Club	Ongoing	-----		Formalize outreach goals & develop metric for measuring progress
District-wide	Outreach	Develop multi-media materials and alerts to changes in policy for distribution to all campus communities	Ongoing	-----		Formalize outreach goals & develop metric for measuring progress
District-wide	Outreach	Targeted behavior change / education campaigns (e.g., Sustainability Plans and water conservation flyers posted on District Sustainability web page)	Ongoing	-----		Formalize outreach goals & develop metric for measuring progress
District-wide	Outreach	Increase communication through web and social media where applicable	Ongoing	-----		Formalize outreach goals & develop metric for measuring progress
District-wide	Outreach	Host a series of forums and other events to bolster awareness and action	Ongoing	-----		Formalize outreach goals & develop metric for measuring progress
District-wide	Outreach	Partner with instructional staff, students, campus Sustainability Committees and other community members/organizations to aid in outreach and educational efforts and to help derive systems to track vital metrics	Ongoing	-----		Formalize outreach goals & develop metric for measuring progress

Appendix D: Potential Water Conservation Measures

Campus	Measure Type	Water Conservation Measure	Notes	Information Gaps
District-wide	Program Mgt	Explore membership / participation in conservation groups (California Urban Water Conservation Council (CUWCC), Alliance for Water Efficiency (AWE), Sustainable San Mateo County, Sustainable Silicon Valley, etc.		
District-wide	Program Mgt	Develop or acquire tools for performing benchmarking, benefit-cost analysis and for program documentation.		
District-wide	Audit	Employ sub-metering to develop water use profile	Measure / monitor domestic and process (e.g., cooling tower) water use	Relatively accurate data required to develop a water use profile
District-wide	Audit	Conduct benchmarking study (e.g., use San Mateo County Energy Watch or other benchmarking tool for public schools)	Data collected through measuring & monitoring water use will be used to identify & prioritize water reduction opportunities	The District's water use efficiency in relation to other community colleges and opportunities for improvement
District-wide	Irrigation	Replace water-intensive landscaping with climate-appropriate species		Irrigation audit findings and opportunities for improvement; potential for support from leadership
District-wide	Irrigation	Install soil moisture sensors		Irrigation audit findings and opportunities for improvement
District-wide	Irrigation	Install a WaterWise Demonstration Garden		
District-wide	Fixtures	Install simple, low-cost devices (e.g., aerators, flow reducers) to reduce water consumption at existing faucets with minimal impact on performance.		Number of potential opportunities for improvement
District-wide	Fixtures	Evaluate potential savings from fixture retrofits (all faucets, water closets, urinals, showerheads, etc.) and install retrofits where feasible		Potential opportunities for improvement
District-wide	Fixtures	Consult with water utility to determine availability of incentives for fixture replacement		
District-wide	Fixtures	Eliminate fixture, equipment and piping leaks		Records of repairs that include estimated water savings therefrom
District-wide	Equipment	Install water-efficient dishwasher in commercial kitchens	15-50 gal/100 lb ice (air cooled) vs. 100-300 gal/100 lb ice (water cooled)	Potential opportunities for improvement

Campus	Measure Type	Water Conservation Measure	Notes	Information Gaps
District-wide	Equipment	Install "boilerless steamer" in commercial kitchens	Uses recirculating steam to heat steamers	Potential opportunities for improvement
District-wide	Equipment	Install air cooled ice machine in commercial kitchens		
District-wide	Equipment	Use recirculating closed-loop chilled water for equipment cooling (lasers, electron microscopes, distillation, etc.)	Prohibit once-through tap or chilled water cooling	Potential opportunities for improvement
District-wide	Equipment	Install water mizers on all autoclaves and steam sterilizers	Water mizers monitor the steam condensate temperature and apply cold water only when needed, vs. continuous flow.	Potential opportunities for improvement
District-wide	Equipment	Insulate hot water system equipment and piping	Insulating domestic hot water system components, heating water and steam components will maintain water temperature in piping throughout the system and reduce both energy use for heating and faucet run time.	Potential opportunities for improvement
District-wide	Equipment	Regularly inspect the boiler, condensate system and steam traps and lines for leaks and to ensure proper operation; make repairs promptly.		Records of inspections & repairs that include estimated water savings therefrom
District-wide	Equipment	Install flow meters on cooling tower makeup and blowdown lines.	Install with a data logger or include regular readings during maintenance inspections and use data to calculate actual cycles of concentration and compare them with the target number. The data will also be useful for identifying and tracking system leaks and other maintenance issues.	Data required to develop a water use profile
District-wide	Equipment	Install a conductivity controller on cooling towers to maximize cycles	Install with a data logger to track system performance.	Potential opportunities for improvement
District-wide	Equipment	Increase thermostat setting in buildings to reduce cooling tower use		Potential opportunities for improvement
District-wide	Equipment	Purchase vehicle wash rack / pad that recycles/reuses wash water		Available funding
District-wide	Equipment	Eliminate on- and off-campus vehicle washing		Potential for support of leadership
CSM	Water features	Cover pools when not in use		

Campus	Measure Type	Water Conservation Measure	Notes	Information Gaps
CSM	Water features	Install sphagnum (peat) moss filtration system on pool	Reduces water and chemical use	Available funding; potential for effective filtration
CSM	Water features	Turn off fountains		Potential for support of leadership
CSM	Water features	Drain fountains		Potential for support of leadership
District-wide	Water features	Convert fountains to planters with climate appropriate plants and drip irrigation.		
CSM	Reuse	Reuse pool water currently discharged to the sanitary sewer	Use water for landscape irrigation, make-up water for cooling towers, etc.	Water quality suitability for potential reuse applications
District-wide	Reuse	Harvest rainwater / capture stormwater for reuse	Use water for landscape irrigation, make-up water for cooling towers, etc.	Adequacy of storage; water quality suitability for potential reuse applications
District-wide	Reuse	Consider use of reclaimed water from wastewater utilities as it becomes available; use for landscape irrigation, flushing water closets, etc.		
District-wide	Curriculum	Design curriculum for future drought conditions	e.g., reduce water use in fire safety exercises, science laboratory experiments, art classes, etc.	Potential opportunities for improvement
District-wide	Outreach	Install shower timers in all showers at District facilities		Availability of funding or incentives from water utility; potential for vandalism or theft
District-wide	Outreach	Establish water conservation hotline for reporting leaky fixtures, irrigation systems, irrigation runoff, etc.	Element of Campus Awareness and Action Campaigns	
District-wide	Outreach	Educate facilities staff on the proper use & maintenance of retrofits, new operation procedures & new technologies		Availability of funding and staff time for training
District-wide	Outreach	Regularly open facilities to public tours and produce bulletins and posters highlighting water and energy conservation achievements		Availability of funding and staff time
District-wide	Outreach	Incorporate water conservation into curriculum		Applicable academic program(s) and funding
District-wide	Outreach	Develop a school information program to promote water conservation in K-12 schools	Help socialize young people about the value of water and conservation techniques	Applicable academic program(s) and funding

Appendix E: Additional Resources

Associations, Agencies, etc.

- Alliance for Water Efficiency: <http://www.allianceforwaterefficiency.org>
- American Water Works Association: www.awwa.org
- Association of California Water Agencies (ACWA): www.acwa.com
- Bay Area Water Supply and Conservation Agency: www.bawsca.org
- BeWaterWise.com (Metropolitan Water District of Southern CA)
- California Urban Water Conservation Council: www.cuwcc.org
- National Association of Water Companies: www.nawc.org
- Pacific Institute/The California Drought: www.californiadrought.org
- San Francisco Public Utilities Commission: www.sfwater.org
- San Mateo County Energy Watch: www.smcenergywatch.com
- SaveOurWater.com (ACWA, CA DWR)
- WaterReuse Association: www.watereuse.org

Publications

- BC Water News/California (requires subscription): www.bcwaternews.com
- California Water Service Company, Mid-Peninsula District Conservation Master Plan: 2011-2015, [http://www.water.ca.gov/urbanwatermanagement/2010uwmps/CA%20Water%20Service%20Co%20-%20Mid%20Peninsula%20District/Appendix G - Conservation MP.pdf](http://www.water.ca.gov/urbanwatermanagement/2010uwmps/CA%20Water%20Service%20Co%20-%20Mid%20Peninsula%20District/Appendix%20G%20-%20Conservation%20MP.pdf)
- Handbook of Water Use and Conservation (Vickers, WaterPlow Press, 2010)
- WaterSmart Guidebook for Businesses (EBMUD): <http://www.ebmud.com/water-and-wastewater/water-conservation/water-smart-guidebook>

State and Federal Resources

- California Department of Water Resources: <http://www.water.ca.gov/waterconditions>
- California Green Building Standards Code: <http://law.resource.org/pub/us/code/bsc.ca.gov/gov.ca.bsc.2013.11.pdf>
- California Integrated Management Information System (CIMIS): www.cimis.water.ca.gov
- California Plumbing Code: www.iapmo.org/2010%20California%20Plumbing%20Code/Chapter%2004.pdf
- California Weekly Drought Brief: ca.gov/drought/pdf/Weekly-Drought-Update.pdf
- Energy Efficiency and Renewable Energy: energy.gov/eere/efficiency/buildings
- Greening EPA: http://www.epa.gov/oaintnrt/water/best_practices.htm
- National Renewable Energy Laboratory: www.nrel.gov
- State Water Resources Control Board: www.swrcb.ca.gov/waterrights/water_issues/programs/drought/emergency_regulations_waterconservation.shtml
- US Drought Monitor (CA): CA
- US Drought Portal: www.drought.gov/drought
- US Geological Survey: ca.water.usgs.gov/data/drought/
- Water Recycling and Reuse (EPA Region 9): www.epa.gov/region9/water/recycling
- WaterSense: <http://www.epa.gov/watersense>
- WaterSMART (Bureau of Reclamation): www.usbr.gov/WaterSMART/

University Programs

- California Institute for Water Resources (UC): ciwr.ucanr.edu
- Chapman University: www.chapman.edu (see Environmental Audit Results: <http://www.chapman.edu/campus-services/facilities-management/sustainability/environmental-audit>)